LEEDÔ Green Building Rating System Evaluation for CDOB

Prepared for:
Los Alamos National Laboratories
Risk Reduction and Environmental Stewardship - Prevention Program

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Los Alamos
NATIONAL LABORATORY

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Executive Summary

Leadership in Energy and Environmental Design (LEED) is a performance-based, rating system developed through a consensus process by the U.S. Green Building Council (USGBC). It is intended to be used as both a design and evaluation tool to permit owners and project managers to compare new and remodeled facilities against standard measures for high-performance, "green attributes." Government agencies as well as private companies have used LEED™ to design, construct and operated more healthful, resource-efficient, productive facilities at reduced life-cycle costs. The LEED Green Building Rating System™ incorporates many of the requirements of the new DOE Order 430.2A that is included in Appendix G of the UC contract.

DOE Order 430.2A requires application of energy efficiency and sustainable design principles to new buildings (and building alterations) for the benefit of reduced like-cycle costs and enhance occupant satisfaction. To demonstrate implementation of these principles the order also requires submission of an energy efficiency/ sustainable design (E2/SD) report at the end of Title II. The purpose of this report is to document the present status of SD building practices at Los Alamos National Laboratory (LANL) based on the LEED™ Rating System, provide an example of the required contents and level of detail for a LEED™ certification submittal package, and satisfy the E2/SD report requirements of DOE Order 430.2A.

The Chemistry Division Office Building (CDOB) at LANL was selected for evaluation under the LEED Green Building Rating System™ (version 2.1). As a newly constructed building, CDOB provides an opportunity to evaluate current LANL construction practices for basic office-type facilities. CDOB was constructed as part of the Office Building Replacement Program (OBRP) to provide permanent office space for employees displaced as a result of the Cerro Grande Fire. The facility is a two-story building of metal frame construction with concrete masonry unit exterior finishing and low-slope, single-ply membrane roof. The building consists of 62 single and multiple occupancy offices and is intended to accommodate approximately 85 people.

The LEED Green Building Rating System™ is based on a series of prerequisites and credits. These provide a means for developing a numerical scoring for a building relative to the credits satisfied. Table 1 illustrates the LEED™ scores associated with the different levels of certification. The resulting numerical LEED™ score for CDOB was determined to be 8 with 2 additional points potentially available (credits identified as potential are based on the status of project information available). Since a minimum LEED™ score of 26 is required to attain the lowest green building performance level (see Table 1), the design and construction practices incorporated at CDOB indicate that SD opportunities exist within LANL standard building construction practices. The LEED™ score for CDOB should be interpreted to indicate that SD was not a core requirement for the project. Although the majority of LEED™ credits were not satisfied by CDOB, all the LEED™ prerequisites were satisfied. This is an important result because the LEED Green Building Rating System™ requires compliance with the all prerequisites in order to be considered for any level of certification.

Table 1
LEED™ Certification Rating Requirements

Certification Level	LEED™ Score Required
Certified	26-32
Silver	33-38
Gold	39-51
Platinum	51-69

LEED™ green building certification levels (see Table 1) do not require compliance with specific credits, only that the sum total of points for satisfied credits add up to a certification level. This report shows that many LEED™ credits could have been achieved for CDOB without additional first cost impact by understanding the LEED™ credit requirements and incorporating such requirements into the building design at the initial stages of the project. As appropriate, information is provided in this LEED™ evaluation report for CDOB to indicate how such LEED™ credits that were not attained could have been obtained.

Introduction

Sustainable Design and Development at LANL
Designing, constructing, and operating facilities in an efficient, healthful, resource-efficient and environmentally sound manner is important to Los Alamos National Laboratories (LANL). This is commonly referred to as sustainable (or green building) design and development. The intent is to produce world class facilities with a productive working environment that are consistent with and representative of the LANL scientific community and natural environment, and meet or exceed regulatory and U.S. Department of Energy (DOE) requirements.

Several requirements guide the incorporation of sustainable design features into LANL facilities. These include:

- U.S. Environmental Protection Agency's Comprehensive Procurement Guidelines requires that federal agencies purchase certain products with a minimum recycled content.

- DOE Order 413.3 requires DOE facilities to use sustainable design principles for the design and construction of all facilities

- DOE Order 430.2A requires application of energy efficiency and sustainable design principles to new buildings (and building alterations) for the benefit of reduced life-cycle costs and enhanced occupant satisfaction. To demonstrate implementation of these principles, the order also requires submission of an energy efficiency/sustainable design (E2/SD) report at the end of Title II Design.

LANL is pursuing several initiatives to meet these requirements and improve the performance of their buildings. These include:

- Reviewing and revising construction specifications and the LANL Engineering Manual to incorporate sustainable design features.

- Creation of a Sustainable Design Guide to complement LANL standards and provide guidance to design and construction contractors.

- Use of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ as a tool to develop programming documents and evaluate proposals, designs, and constructed buildings.

- Use of the USGBC LEED Green Building Rating System™ in procurement as a required component in proposal submittals to identify SD commitments in construction projects.

This report provides a benchmark of current construction practices against sustainable building practices by application of the LEED Green Building Rating System™ (version 2.1) to a new building at LANL. The recently completed Chemistry Division Office Building (CDOB) was selected to represent a typical office building at LANL. This report also provides an example LEED™ certification package for CDOB and is organized according to the LEED™ Green Building Rating System.

CDOB Description

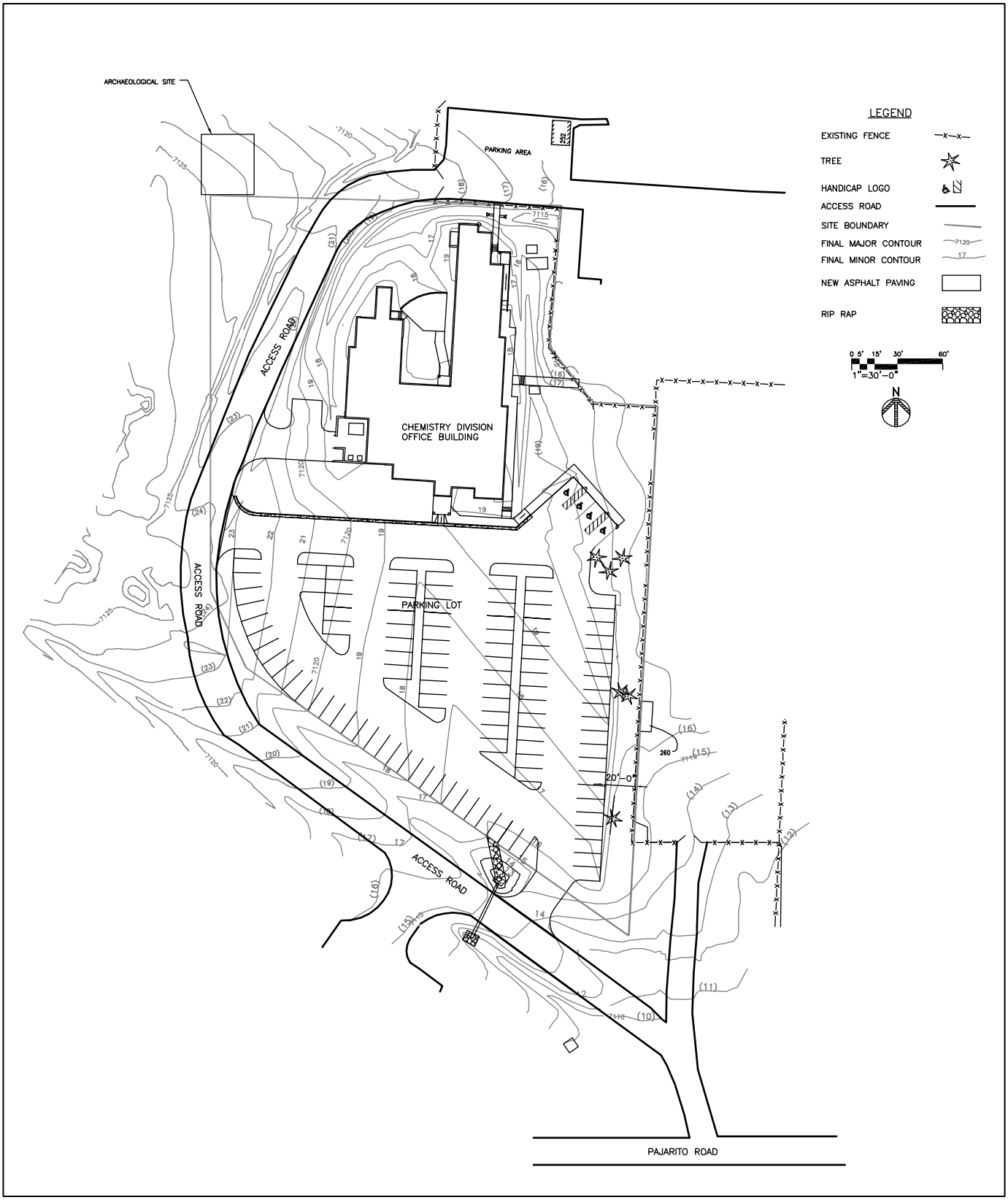
LANL instituted the Office Building Replacement Program (OBRP) to provide permanent office space for employees displaced as a result of the Cerro Grande Fire. Implementation of the OBRP has resulted in the design and construction of several GPP funded office buildings. These new office buildings provide an opportunity to evaluate current LANL construction practices for office facilities relative to the LEED Green Building Rating System for sustainable building practices.

CDOB is a two-story building of metal frame construction with concrete masonry unit exterior finishing and low-slope roof covered by a single-ply membrane. The heating, ventilation, and air conditioning design consists of a closed-loop, variable-air-volume system with air handling units, distribution ductwork, variable-air-volume boxes with water reheat coils, and supply air diffusers. The air handling units have economizer operation capability. Cooling is provided by chilled water refrigeration and hot water boilers provide heating. The building consists of 62 single and multiple occupancy offices. Ground level parking is provided in front of the building. The building is located outside the fence on the west side of TA-46. Figure 1 shows a north facing view of the building entrance and Figure 2 provides the general site layout. CDOB provides general office space with no laboratory or experimentation capability. General project data for CDOB is presented in Table 1.

Table 1
General Project Data for CDOB

Project Information	Project Name	CDOB
	Location	LANL, TA-46
	LEED™ Project #	NA
Site Characteristics	Site Area (acres)	~ 3.0
	Building Square Footage (sf)	21,024
	Unbuilt Area (acres)	~ 0.5
	Building Footprint (sf)	13,000
Building Occupancy	Male	42
	Female	43
	Annual Work Days	250
Parking Characteristics	Parking Area (acres)	~ 1.2
	Parking Footprint (sf)	53,000
Constructed Areas	Building (sf)	21,024
	Parking (sf)	53,000
	Total (sf)	54,024
Budget/Sq. Ft.		~ $ 238
Number of Floors		2
Owner Occupied?		Yes

Figure 1.□ Chemistry Division Office Building



833094.02000000/A4

Figure 2. Chemistry Division Office Building Site Plan

LEED Green Building Rating System™ Summary
The LEED Green Building Rating System™ is a voluntary, consensus-based, market driven building rating system based on existing proven construction technologies and practices. The rating system provides a means to evaluate environmental performance from a whole building perspective over a building's life cycle, providing a specific standard for defining a "green building." The LEED Green Building Rating System™ was developed by representatives from all segments of the building industry and has been open to public scrutiny.

LEED™ is a measurement system developed for rating new and existing commercial, institutional, and high-rise residential buildings. LEED™ is organized into the five environmental categories of Sustainable Sites, Water Efficiency, Energy & Atmosphere, Indoor Environmental Quality, and Materials & Resources. An additional category, Innovation & Design Process, addresses design measures not covered under the five environmental categories as well as sustainable building expertise.

The rating system is based on a series of criteria, under each of the five environmental categories, where credits are earned for compliance. Different levels of green building certification are awarded based on the total credits earned. Table 2 summarizes the credit requirements and corresponding LEED™ certification levels.

Table 2
LEED™ Certification Rating Requirements

Certification Level	LEED™ Score Required
Certified	26-32
Silver	33-38
Gold	39-51
Platinum	51-69

LEED™ Scoring Results for CDOB
The resulting LEED™ score for CDOB was determined to be 8 with 2 additional points possible (see Project Checklist at end of Introduction), based on the status of project information available. Since a minimum LEED™ rating score of 26 is required to attain the lowest green building recognition level (see Table 2), the design and construction practices incorporated into CDOB indicate many sustainable design opportunities exist within LANL standard building construction projects. The LEED™ score for CDOB is typical of buildings constructed on the basis of standard industry practices. The score merely implies that sustainable building design and construction practices were not primary considerations for CDOB.

Although the majority of LEED™ credits were not satisfied by CDOB, all the LEED™ prerequisites were satisfied. This is an important result because the LEED Green Building Rating System™ requires compliance with the all prerequisites in order to be considered for any level of certification. Beyond the prerequisites, LEED™ Green Building certification levels (see Table 2) do not require compliance with specific credits, only that the sum total of points for satisfied credits add up to a certification level.

Many LEED™ credits could have been achieved for CDOB without additional first cost impact by understanding the LEED™ credit requirements and incorporating such requirements into the building design at the initial stages of the project. As appropriate, information is provided in this LEED™ certification package for CDOB to indicate how such LEED™ credits that were not attained could have been obtained. Success in achieving sustainably designed and constructed buildings at LANL requires commitment by all project team members to the whole-building design approach, which integrates all aspects of the project from site planning to building design, construction, and operation and maintenance.

A number of the LEED™ credits are beyond the scope of the A/E/C firm's responsibility. The Project Checklist at the end of the Introduction identifies the party responsible for decisions that determine credit compliance. For example, site selection (Sustainable Sites Credit 1) is clearly the responsibility of LANL. However, it should be noted that credits listed as the responsibility of LANL indicates only that the A/E/C firm preparing the LEED™ evaluation would obtain the necessary information from LANL. The potentially responsible parties listed in the Project Checklist include LANL, the contractor (or A/E/C firm), and the Agent (or Commissioning Agent). In addition, the Project Checklist identifies those LEED™ credits that are satisfied by employing the LANL Engineering Standards set forth in the LANL Engineering Manual and Construction Specifications.

LEED™ Evaluation Process Summary for CDOB

This report is intended to provide LANL PM personnel, A/E/C firms, and other interested parties with general direction and guidance on conducting LEED™ evaluations and completing LEED™ submittal certification packages when required for LANL building construction projects. The body of this report is organized according to the prerequisites and credits associated with the five LEED™ environmental categories of Sustainable Sites (SS), Water Efficiency (WE), Energy & Atmosphere (AE), Materials and Resources (MR), and Indoor Environmental Quality (EQ). A description of the intent, requirements, and submittals is presented for each of the prerequisites and credits based on the draft Version 2.1 of the LEED Green Building Rating System™. In addition, a narrative is provided for each prerequisite and credit to indicate the status of compliance for CDOB. The narratives also describe how to obtain and/or prepare compliance submittal documentation.

Compliance submittal documentation is provided for each prerequisite and credit, as appropriate. In a formal submittal package to be presented to the USGBC for actual certification, submittal documentation is not required for credits that are not satisfied. However, the pertinent documentation for CDOB is presented here for each credit (regardless of credit compliance) to illustrate the required level of documentation to support credit compliance. This is significant because a LEED™ evaluation report constitutes compliance with the DOE Order 430.2A requirement for an E2/SD report. However, under that order each credit must be addressed regardless of whether the credit is satisfied or not.

LEED™ version 2.1 is an administrative update of the 2.0 standard for new commercial and high-rise residential buildings. Its purpose is to simplify the documentation requirements and costs of certifying projects to the LEED™ 2.0 standard. These changes are intended to significantly reduce the costs of documenting LEED™ credits and simplify the documentation

process. Although this report is based on LEED™ version 2.1, the LEED™ Reference Guide for Version 2.0 is considered a required reference and should be consulted whenever conducting a LEED™ evaluation. This Guide assists in understanding LEED™ criteria and provides examples of compliance strategies, case studies, and additional resource information.

LEED™ and Procurement

The LEED Green Building Rating System™ is an ideal tool for use in the procurement process to incorporate sustainable design in LANL construction projects. A preliminary LEED™ scoring could be a required component of a bid proposal submittal package. This preliminary scoring would indicate to LANL the sustainability aspects and features a contractor is committed to incorporating in the construction project. The preliminary scoring presented in the proposal could then be considered in the contract award decisions.

LEED™ Certification Process Overview

Although not formally employed for CDOB, the actual certification process is described for informational purposes. To apply for LEED™ certification a project must first be registered with the USGBC. Following registration a certification submittal package (similar to this report) is prepared over the course of the project based on specific design and construction features of the building. For certification under LEED™ version 2.1, a certification submittal package is developed that consists of a completed LEED™ Letter Template and any required supporting documentation.

The LEED™ Letter Template is the primary means to document LEED™ credit certification and requires signatures by applicable project team members that the credit requirements are satisfied by the project. Most credits require validation and signatures by members of the Contractor's team. Other credits require validation and signatures by LANL staff. The project checklist that follows this Introduction indicates who bears the responsibility for each credit. Some credits also require submission of additional supporting information such as lists of features, drawings highlighting a specific aspect of the project, or minor calculations indicating compliance with a particular credit requirement. The documentation requirements necessary to complete a certification submittal package under LEED™ version 2.1 are considered to be more limited than for version 2.0, and therefore up to a third of the credits are actually audited by the USGBC during the certification assessment. Audits require proof of compliance beyond the LEED™ Letter Template requirements. Such audit submittals consist of design and construction documentation that exists in standard project files and calculation spreadsheets that would already have been created by the contractor to assess LEED™ credit compliance.

The LEED™ Letter Template under version 2.1 of the rating system will not be available from the USGBC until near the end of 2002. Therefore, for the purpose of this LEED™ evaluation task, credit requirements under the LEED™ version 2.1 rating system are presented without the LEED™ Letter Template but with required submittal information provided as additional documentation. For example, credit certification statements are provided as submittal documentation in this report that would otherwise require only a signature by the appropriate project team member on the LEED™ Letter Template.

For more information about LEED™ visit the U.S. Green Building Council website at www.usgbc.org.

Project Checklist

Y	?	N				Responsible Party	LANL Engr. Stds
Sustainable Sites					14 Possible Points		
☒			Prereq 1	**Erosion & Sedimentation Control**	Required	Contractor	Yes
☒	☐	☐	Credit 1	**Site Selection**	1	LANL	Yes
☐	☐	☒	Credit 2	**Development Density**	1	LANL	No
☐	☐	☒	Credit 3	**Brownfield Redevelopment**	1	LANL	No
☒	☐	☐	Credit 4.1	**Alternative Transportation,** Public Transportation Access	1	LANL	No
☐	☐	☒	Credit 4.2	**Alternative Transportation,** Bicycle Storage & Changing Rooms	1	LANL	No
☐	☐	☒	Credit 4.3	**Alternative Transportation,** Alternative Fuel Refueling Stations	1	LANL	No
☐	☐	☒	Credit 4.4	**Alternative Transportation,** Parking Capacity	1	LANL	No
☐	☐	☒	Credit 5.1	**Reduced Site Disturbance,** Protect or Restore Open Space	1	LANL/Contractor	No
☐	☐	☒	Credit 5.2	**Reduced Site Disturbance,** Development Footprint	1	LANL/Contractor	No
☐	☐	☒	Credit 6.1	**Stormwater Management,** Rate or Quantity	1	Contractor	No
☐	☐	☒	Credit 6.2	**Stormwater Management,** Treatment	1	Contractor	No
☐	☐	☒	Credit 7.1	**Landscape & Exterior Design to Reduce Heat Islands,** NonRoof	1	Contractor	No
☒	☐	☐	Credit 7.2	**Landscape & Exterior Design to Reduce Heat Islands,** Roof	1	Contractor	No
☐	☐	☒	Credit 8	**Light Pollution Reduction**	1		No
Water Efficiency					5 Possible Points		
☒	☐	☐	Credit 1.1	**Water Efficient Landscaping,** Reduce by 50%	1	LANL	Yes
☒	☐	☐	Credit 1.2	**Water Efficient Landscaping,** No Potable Use or No Irrigation	1	LANL	Yes
☐	☐	☒	Credit 2	**Innovative Wastewater Technologies**	1	Contractor	No
☐	☐	☒	Credit 3.1	**Water Use Reduction,** 20% Reduction	1	Contractor	No
☐	☐	☒	Credit 3.2	**Water Use Reduction,** 30% Reduction	1	Contractor	No
Energy & Atmosphere					17 Possible Points		
☒			Prereq 1	**Fundamental Building Systems Commissioning**	Required	LANL or Agent	No
☒			Prereq 2	**Minimum Energy Performance**	Required	Contractor	Yes
☒			Prereq 3	**CFC Reduction in HVAC&R Equipment**	Required	Contractor	Yes
☒	☐	☐	Credit 1.1	**Optimize Energy Performance,** 20% New / 10% Existing	2	Contractor	No
☐	☐	☒	Credit 1.2	**Optimize Energy Performance,** 30% New / 20% Existing	2	Contractor	No
☐	☐	☒	Credit 1.3	**Optimize Energy Performance,** 40% New / 30% Existing	2	Contractor	No
☐	☐	☒	Credit 1.4	**Optimize Energy Performance,** 50% New / 40% Existing	2	Contractor	No
☐	☐	☒	Credit 1.5	**Optimize Energy Performance,** 60% New / 50% Existing	2	Contractor	No
☐	☐	☒	Credit 2.1	**Renewable Energy,** 5%	1	Contractor	No
☐	☐	☒	Credit 2.2	**Renewable Energy,** 10%	1	Contractor	No
☐	☐	☒	Credit 2.3	**Renewable Energy,** 20%	1	Contractor	No
☐	☐	☒	Credit 3	**Additional Commissioning**	1	LANL or Agent	No
☐	☐	☒	Credit 4	**Ozone Depletion**	1	Contractor	No
☐	☐	☒	Credit 5	**Measurement & Verification**	1	Contractor	No
☐	☐	☒	Credit 6	**Green Power**	1	LANL	No

Y	?	N				Responsible Party	LANL Engr. Stds?
Materials & Resources					13 Possible Points		
☒			Prereq 1	**Storage & Collection of Recyclables**	Required	LANL	Yes
☐	☐	☒	Credit 1.1	**Building Reuse,** Maintain 75% of Existing Shell	1	Contractor	No
☐	☐	☒	Credit 1.2	**Building Reuse,** Maintain 100% of Shell	1	Contractor	No
☐	☐	☒	Credit 1.3	**Building Reuse,** Maintain 100% Shell & 50% Non-Shell	1	Contractor	No
☐	☐	☒	Credit 2.1	**Construction Waste Management,** Divert 50%	1	LANL	No
☐	☐	☒	Credit 2.2	**Construction Waste Management,** Divert 75%	1	LANL	No
☐	☐	☒	Credit 3.1	**Resource Reuse,** Specify 5%	1	Contractor	No
☐	☐	☒	Credit 3.2	**Resource Reuse,** Specify 10%	1	Contractor	No
☐	☒	☐	Credit 4.1	**Recycled Content,** Specify 25%	1	Contractor	Yes
☐	☐	☒	Credit 4.2	**Recycled Content,** Specify 50%	1	Contractor	No
☐	☒	☐	Credit 5.1	**Local/Regional Materials,** 20% Manufactured Locally	1	Contractor	Yes
☐	☐	☒	Credit 5.2	**Local/Regional Materials,** of 20% Above, 50% Harvested Locally	1	Contractor	No
☐	☐	☒	Credit 6	**Rapidly Renewable Materials**	1	Contractor	No
☐	☐	☒	Credit 7	**Certified Wood**	1	Contractor	No
Indoor Environmental Quality					15 Possible Points		
☒			Prereq 1	**Minimum IAQ Performance**	Required	Contractor	Yes
☒			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required	LANL	Yes
☒	☐	☐	Credit 1	**Carbon Dioxide (CO_2) Monitoring**	1	Contractor	No
☐	☐	☒	Credit 2	**Increase Ventilation Effectiveness**	1	Contractor	No
☐	☐	☒	Credit 3.1	**Construction IAQ Management Plan,** During Construction	1	Contractor	No
☐	☐	☒	Credit 3.2	**Construction IAQ Management Plan,** Before Occupancy	1	Contractor	No
☐	☐	☒	Credit 4.1	**Low-Emitting Materials,** Adhesives & Sealants	1	Contractor	No
☐	☐	☒	Credit 4.2	**Low-Emitting Materials,** Paints	1	Contractor	No
☒	☐	☐	Credit 4.3	**Low-Emitting Materials,** Carpet	1	Contractor	No
☐	☐	☒	Credit 4.4	**Low-Emitting Materials,** Composite Wood	1	Contractor	No
☐	☐	☒	Credit 5	**Indoor Chemical & Pollutant Source Control**	1	Contractor	No
☐	☐	☒	Credit 6.1	**Controllability of Systems,** Perimeter	1	Contractor	No
☐	☐	☒	Credit 6.2	**Controllability of Systems,** Non-Perimeter	1	Contractor	No
☐	☐	☒	Credit 7.1	**Thermal Comfort,** Comply with ASHRAE 55-1992	1	Contractor	Yes
☐	☐	☒	Credit 7.2	**Thermal Comfort,** Permanent Monitoring System	1	Contractor	No
☐	☐	☒	Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1	Contractor	No
☐	☐	☒	Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1	Contractor	No
Innovation & Design Process					5 Possible Points		
☐	☐	☒	Credit 1.1	**Innovation in Design:** Specific Title	1	LANL/Contractor	No
☐	☐	☒	Credit 1.2	**Innovation in Design:** Specific Title	1	LANL/Contractor	No
☐	☐	☒	Credit 1.3	**Innovation in Design:** Specific Title	1	LANL/Contractor	No
☐	☐	☒	Credit 1.4	**Innovation in Design:** Specific Title	1	LANL/Contractor	No
☐	☐	☒	Credit 2	**LEED™ Accredited Professional**	1	LANL/Contractor	No
Project Totals					69 Possible Points		

8	2	59	**Certified** 26-32 points	**Silver** 33-38 points	**Gold** 39-51 points	**Platinum** 52-69 points

SUSTAINABLE SITES

SS Prerequisite 1: Erosion & Sedimentation Control

Intent

Control erosion to reduce negative impacts on water and air quality.

Requirements

Design a sediment and erosion control plan, specific to the site, that conforms to United States Environmental Protection Agency (EPA) Document No. EPA 832/R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.

Submittals

☒ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring whether the project follows local erosion and sedimentation control standards or the referenced EPA standard. Provide a brief list of the measures implemented. If local standards and codes are followed, describe how they meet or exceed the referenced EPA standard.

Narrative

Prerequisite satisfied (see attached certification statement). LANL's standard practice for building construction includes compliance with the above referenced EPA document (which can be found on-line at http://cfpub2.epa.gov/npdes). Also, as indicated in the attached certification statement, a number of best management practices were implemented as part of the CDOB construction and design. Because of the location, orientation and gradient, silt fencing met most containment needs at the site. The remaining erosion and sedimentation control needs were satisfied through the other measures listed, which included triangular silt dikes, erosion blankets, and permanent seeding.

Sustainable Sites Prerequisite 1

I _____ (Contractor's Civil Engineer) have designed, specific to the site, a sediment and erosion control plan that conforms to EPA Document No. EPA 832-R-92-005 (Stormwater Management for Construction Activities) (which can be found on-line at http://cfpub2.epa.gov/npdes) as follows:

List of Measures Implemented	EPA 832-R-92-005
Silt Fencing	Sec. 3.2.2 Page 3-52
Triangular Silt Dikes	Sec. 3.2.2 Page 3-37
Permanent Seeding	Sec. 3.2.1 Page 3-20
Erosion Blankets	Sec. 3.2.1 Page 3-17

Name: (Contractor's Civil Engineer)

Organization: (Company Name)

Role in Project: (Civil Engineer)

Signature: (as appropriate)

Date: (as appropriate)

SS Credit 1: Site Selection

Intent

Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

Requirements

Do not develop buildings, roads, or parking areas on portions of sites that meet any one of the following criteria:

- Prime farmland as defined by the United States Department of Agriculture.
- Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by FEMA.
- Land which is specifically identified as habitat for any species on Federal or State threatened or endangered lists.
- Within 100 feet of any water including wetlands as defined by 40 CFR, Parts 230- 233 and Part 22, and isolated wetland or areas of special concern identified by state or local rule OR greater than distances given in state or local regulations as defined by local or state rule or law, whichever is more stringent.
- Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects are exempt).

Submittals

☒ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the project site does not meet any of the prohibited criteria.

Narrative

Credit satisfied (see attached certification statement). In the interests of protecting threatened or endangered species, LANL has developed a Habitat Management Plan in consultation with the U.S. Fish and Wildlife Service. Under that plan, sites proposed for development are categorized by zone ("core," "buffer," or "developed"). Sites are then subject to any zone-related constraints. Because the construction occurred within a developed area it was not subject to any building restrictions related to biological resources and was not found to impact any threatened or endangered species.

As an additional part of LANL's review, new construction projects are evaluated with respect to wetland and floodplain conditions. The CDOB site underwent LANL and NEPA reviews in October 2000. It was not found to be located within any restricted flood zone or wetland.

SS Credit 1: Site Selection

(continued)

The CDOB property and surrounding area has never been considered to be prime agricultural land, nor located within the confines of any parkland. See the attached certification statement and NEPA documentation.

Sustainable Sites Credit 1

I _____ (LANL NEPA Reviewer) hereby certify that the site selected for the Chemistry Division Office Building (CDOB) at Los Alamos National Laboratory does not meet any of the prohibited criteria of this LEED credit. The construction site is not located on or near any wetlands; nor is it within the range of the 100-year floodline as specified in LEED; nor is it located on prime farmland or land which was ever considered parkland; and finally, as indicated in the attached NEPA review letter, it is not located on land which is considered habitat for any sensitive species.

Name: (LANL NEPA Reviewer)

Organization: (Company Name)

Role in Project: (NEPA Reviewer)

Signature: (as appropriate)

Date: (as appropriate)

NEPA REVIEW
LAN-00-

U#:100151-L-1-
10122001-111-0

Project/Activity Title: ***Chemistry Technical Support Building***	Accession No: 8044 LAN-01-002	Date: 10/12/00
Location: TA-46, between Building 1 and 30	Schedule: FY 01-02	Cost: $4.75M
DOE Program Office: DP	Non-DOE Sponsor:	
Project Contact: George Martinez (gmartinez1@lanl.gov), FWO-SME, MS K558, 505-665-5247		
Preparer/Contact: Jacie Siino, LANL ESH-20 Signature: Jacie M Siino	NEPA Reviewer: Margaret A. Powers, LANL ESH-20 Signature: Margaret A. Powers	

DESCRIPTION OF PROPOSED ACTION:

LANL proposes to construct a new office building at TA-46. The new building would be used to house displaced scientists and technicians from burned buildings within TA-46. The new two-story building would be approximately 23,000 square feet and house about 50 personnel. The proposed building would be used for offices and conference rooms; no laboratory or light laboratory space would be provided. No additional parking would be required.

The new building would be constructed at TA-46 between Building 1 and Building 30 and south of Building 154. Construction personnel would use typical equipment, such as backhoes, cranes, forklifts, etc., and materials to construct the building. The building would contain appropriate utilities, telecommunications, heating/ventilation/air conditioning, fire protection, etc. Trenching would be conducted to provide electrical, water, sewer, natural gas, and telecommunications lines to the new building.

The proposed project is located within a developed buffer zone for a federally protected species. Because this area is developed, there are no building restrictions related to biological resources. There are also no cultural resource concerns since this is a previously developed area. All water quality requirements, such as controlling stormwater runoff, would be followed, as required by LANL's Water Quality personnel. Best management practices (BMPs) would be employed to control erosion. Construction waste would be appropriately disposed of or recycled if possible.

The proposed project is encompassed by the categorical exclusion for *Support Structures at LANL, FY99-01*, LAN-96-022. This document covers the siting, construction, and operation of support structures, such as small permanent buildings, for a variety of purposes, including offices. The document also covers installation of infrastructure, parking lots, sidewalks, etc. The proposed project would be conducted according to LAN-96-022.

NEPA DETERMINATION BASED ON ABOVE DESCRIPTION:

☐ Covered by prior NEPA review: _____, LAN- - _____, _____

☐ Requires EIS: 10 CFR 1021, Subpart D, Appendix D _____

☒ LANL recommended CX: 10 CFR 1021, Subpart D, Appendix B 1.15

☐ CX exception - Prepare EA (refer to appropriate sections of 10 CFR 1021 for full definition (check all that apply)):

- ☐ extraordinary circumstances (410(b)(2):_____
- ☐ threaten violation of regulation (Subpart D, Appendix B (1)):
- ☐ uncontrolled release of hazardous substance (Subpart D, Appendix B (3))
- ☐ connected action (410(b)(3):_____
- ☐ siting or expansion of waste TSD facility (Subpart D, Appendix B (2))
- ☐ adverse effect sensitive resource (Subpart D, Appendix B (4))

☐ None of the above: Prepare EA. [If applicable :10 CFR 1021, Subpart D, Appendix C]

☐ Other: _____

NEPA REVIEW
LAN-00-

NCO CLASSIFICATION/DETERMINATION:

This proposed action is covered by the categorical exclusion for "Siting, construction (or modification), and operation of support buildings and support structures (including, but not limited to, trailers and prefabricated buildings) within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible). Covered support buildings and structures include those for office purposes; parking; cafeteria services; education and training; visitor reception; computer and data processing services; employee health services or recreation activities; routine maintenance activities; storage of supplies and equipment for administrative services and routine maintenance activities; security (including security posts); fire protection; and similar support purposes, but excluding facilities for waste storage activities, except as provided in other parts of this appendix" (10 CFR 1021, Appendix B 1.15).

If changes are made to the scope of action so that it is no longer bound by the action described in the attached checklist, or is expanded to encompass other actions, NEPA requirements for the action will need to be reassessed at that time and further analysis may be required.

Signature: 

Date: November 20, 2000

Elizabeth R. Withers, NEPA Compliance Officer

CX AMENDMENT REQUEST

Prepared by: Margaret Powers

Date:2/6/2001

ORIGINAL NEPA DETERMINATION:

LAN-01-002	CX Date: 11/29/00
Title: Chemistry Technical Support Building (New Location)	

New Project/Activity Accession No. (or other reference): 8227

DESCRIPTION:
The categorical exclusion for the activity referenced above is amended to include the following: The location of the building has changed to outside the fence, west of TA-46, Bldg. 231. The new location has been reviewed for cultural resource and biological resources and certain cultural resources have been identified for avoidance. All other aspects of the work are as stated in the original documentation.

If changes are made to the scope of action so that it is no longer bound by the action described in the original documentation, as amended, or is expanded to encompass other actions, NEPA requirements for the action will need to be reassessed at that time and further NEPA analysis may be required.

Signature :

Date: February 13, 2001

Elizabeth R. Withers, NEPA Compliance Officer

SS Credit 2: Development Density

Intent

Channel development to urban areas with existing infrastructure, protect greenfields, and preserve habitat and natural resources.

Requirements

Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (two story downtown development).

Submittals

- ☐ Provide the LEED Letter Template,, signed by the civil engineer, Architect or other responsible party, declaring that the project has achieved the required development densities. Provide density calculations for the project and for the surrounding area.
- ☐ Provide an area plan with the project location highlighted.

Narrative

Credit not satisfied. Area can not be considered urban. A positive aspect of this project was that the CDOB increased the density of Tech Area(TA)-46 rather than spreading into an undeveloped area of LANL property.

SS Credit 3: Brownfield Redevelopment

Intent

Rehabilitate or make useful damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

Requirements

Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment) OR on a site classified as a brownfield by a local, state or federal government agency. Provide remediation as required by EPA's Sustainable Redevelopment of Brownfields Program.

Submittals

- ☐ Provide a copy of the pertinent sections of the Phase II Environmental Site Assessment documenting the site contamination OR provide a letter from a local, state or federal regulatory agency confirming that the site is classified as a brownfield by a local, state or federal government agency.
- ☐ Provide the LEED Letter Template signed by the civil engineer or responsible party, declaring the type of damage that existed on the site and describing the remediation performed.

Narrative

Credit not satisfied. Site was not previously contaminated and therefore did not require any form of remediation or rehabilitation prior to development of CDOB.

SS Credit 4.1: Alternative Transportation - Public Transportation Access

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

Locate project within 1/2 mile of a commuter rail, light rail or subway station or 1/4 mile of 2 or more public or campus bus lines usable by building occupants.

Submittals

☒ Provide an area drawing or transit map highlighting the building location and the fixed rail stations and bus lines, and indicate the distances between them. Include a scale bar for distance measurement.

Narrative

Credit satisfied. The CDOB is serviced by three bus routes of the Los Alamos Bus System (see attached route map). All three routes pass through residential neighborhoods of the city of Los Alamos, make stops at LANL itself, including TA-46 within 1/4 mile of where the CDOB is located, and then travel on to White Rock, a residential community for many LANL employees.

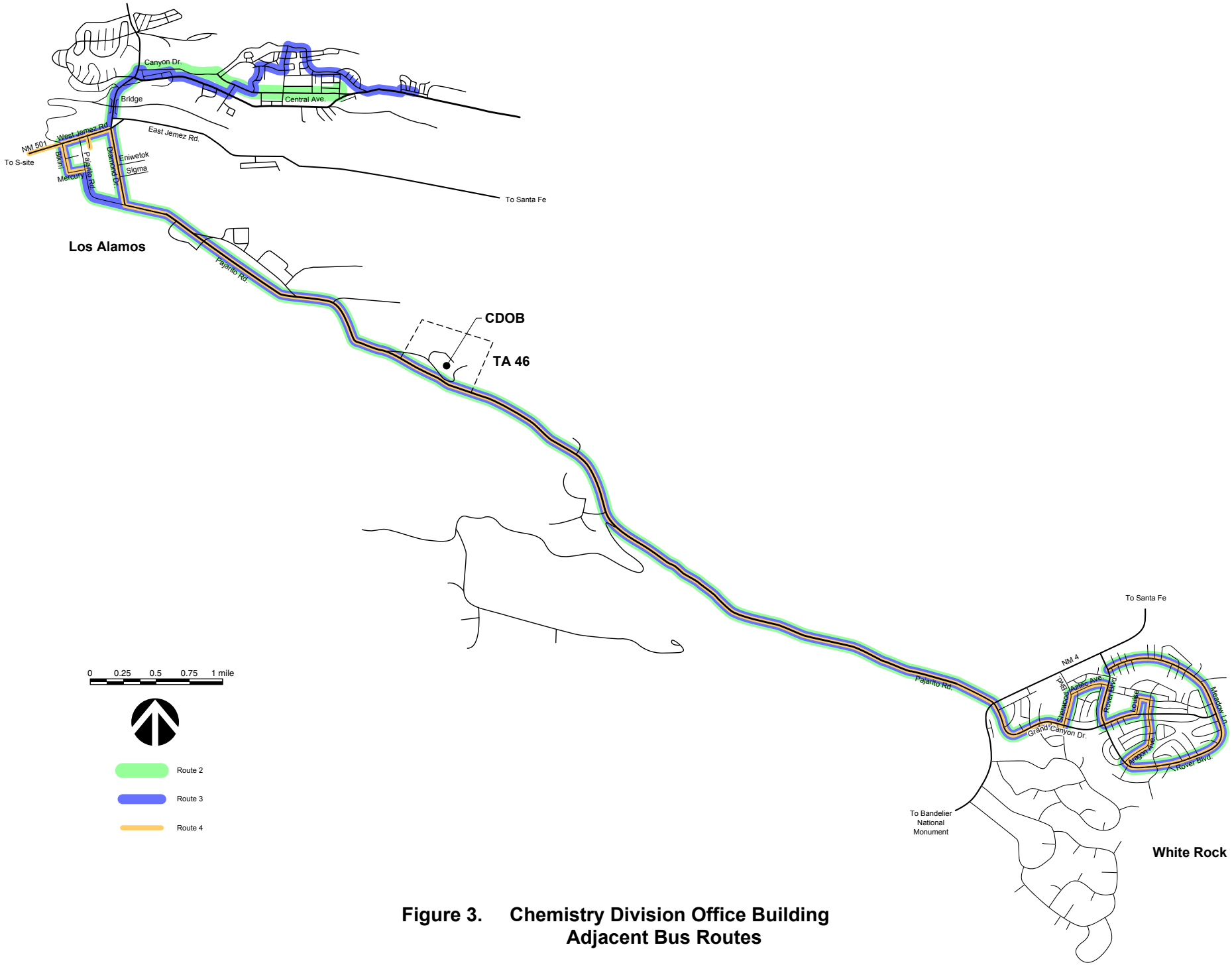


Figure 3. Chemistry Division Office Building Adjacent Bus Routes

SS Credit 4.2: Alternative Transportation - Bicycle Storage & Changing Rooms

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

For commercial or institutional buildings, provide secure bicycle storage, with convenient changing/shower facilities (within 200 yards of the building) for 5% or more of regular building occupants. For residential buildings, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities.

Submittals

☐ For commercial projects: provide the LEED Letter Template, signed by the Architect or responsible party, declaring the distance to bicycle storage and showers from the building entrance and demonstrating that these facilities can accommodate at least 5% of building occupants.

OR

☐ For residential projects: provide the LEED Letter Template, signed by the architect or responsible party, declaring the design occupancy for the buildings, number of covered bicycle storage facilities for securing bicycles, and demonstrating that these facilities can accommodate at least 15% of building occupants.

Narrative

Credit not satisfied. Bicycle storage (i.e., lockers or racks) and changing facilities have become relatively standard practice for construction of public and private office buildings. LEED requires that bicycle storage and changing facilities are provided for 5% of the building's FTE occupants to satisfy this credit. Assuming the CDOB will have an occupancy of 100 full-time employees, only five people would need to be accomodated for bicycle storage and changing facilities. Since a shower facility is already located within 100 yards of the CDOB at Building 231 (LEED requires one within 200 yards), installation of a five-unit bicycle storage rack near the building would have satisfied the requirements of this credit. However, no secure bicycle storage was provided.

SS Credit 4.3: Alternative Transportation - Alternative Fuel Vehicles

Intent

Reduce pollution and land development impacts from automobile use.

Requirements

Provide alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles, OR install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.

Submittals

☐ Provide proof of ownership of, or 2 year lease agreement for, alternative fuel vehicles and calculations indicating that alternative fuel vehicles will serve 3% of building occupants. Provide site drawings or parking plan highlighting preferred parking for alternative fuel vehicles.

OR

☐ Provide specifications and site drawings highlighting alternative fuel refueling stations. Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.

Narrative

Credit not satisfied. LANL's Alternative Fuel Vehicle (AFV) fleet includes 1400 vehicles. At least 244 of these are powered by alternative fuels (mostly ethanol/gasoline) and 20 are electric pickup trucks. The Lab has installed an E-85 (ethanol) 12,000-gallon tank alternative refueling station at TA-16, which is in a fairly remote area of LANL. It is also exploring a local/vendor contract agreement with businesses in the city of Los Alamos to provide alternative refueling capabilities for Lab vehicles as well as for the general community. AFV-use privileges are provided through the individual Lab organizations. Presently it is uncertain whether CDOB occupants will have access to any of these vehicles and no preferred parking is designated.

SS Credit 4.4: Alternative Transportation - Parking Capacity

Intent

Reduce pollution and land development impacts from single occupancy vehicle use.

Requirements

Size parking capacity to meet, but not exceed, minimum local zoning requirements AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants; OR add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants.

Submittals

☐ For new projects, provide the LEED Letter Template signed by the civil engineer or responsible party stating any relevant minimum zoning requirements and declaring that parking capacity is sized to meet, but not exceed them. Provide copies of photos showing the carpooling slots.

OR

☐ For rehabilitation projects, provide the LEED Letter Template signed by the civil engineer or responsible party declaring that no new parking capacity has been added.

Narrative

Credit not satisfied. LANL is not subject to any local zoning requirements. Parking guidance is provided by LANL's urban planner and traffic engineer. No preferred parking spaces for van pools or carpools are designated in the parking lot for CDOB. Assuming the CDOB will have an occupancy of 100 full-time employees, serving 5% of building occupants would mean only five individuals. Since LEED allows the 5% of FTE occupants to be divided by 2 (the minimum number of people per carpool), designation of only 2.5 (or 3) preferred parking spaces for van pools or carpools at CDOB would have met the requirements for this credit.

SS Credit 5.1: Reduced Site Disturbance - Protect or Restore Open Space

Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements

On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area; OR, on previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adapted vegetation.

Submittals

☐ For greenfield sites, provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that site disturbance (including earthwork and clearing of vegetation) has been limited to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walk ways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces. Provide site drawings and specifications highlighting limits of construction disturbance.

OR

☐ For previously developed sites, provide a LEED Letter Template, signed by the civil engineer or responsible party, declaring and describing restoration of degraded habitat areas. Include highlighted site drawings with area calculations demonstrating that 50% of the site area that does not fall within the building footprint has been restored.

Narrative

Credit not satisfied. During construction, site disturbances resulted from heavy equipment and vehicles that were parked more than 25 feet beyond construction areas (to the south of the access road). Additional site disturbance resulted from the "construction staging area" that was established more than 40 feet beyond the building perimeter (to the west). The other intent of this credit was not met in that there was no restoration or protection of habitat or promotion of biodiversity in those impacted areas beyond the site boundary.

SS Credit 5.2: Reduced Site Disturbance - Development Footprint

Intent

Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements

Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%.

Submittals

☐ Provide a copy of the local zoning requirements highlighting the criteria for open space. Provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that the development footprint exceeds the local zoning open space requirement for the site by 25%.

OR

☐ For areas with no local zoning requirements (e.g., some university campuses, military bases), designate open space area adjacent to the building that is equal to the development footprint. Provide a letter from the property owner stating that the open space will be conserved for the life of the building.

Narrative

Credit not satisfied. The canyon area located behind the CDOB was left undisturbed, in accordance with LANL policies. Since this area was not within the CDOB site boundary and already protected from development, it is not clear whether a letter from the property owner stipulating that this area would remain undisturbed would meet this credit requirement. For this situation, the U.S. Green Building Council would need to be contacted for a credit equivalency determination.

SS Credit 6.1: Stormwater Management - Rate and Quantity

Intent

Limit disruption and pollution of natural water flows by managing stormwater runoff.

Requirements

If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate.

OR

If existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.

Submittals

☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the post-development 1.5 year, 24 hour peak discharge rate does not exceed the pre-development 1.5 year 24 hour peak discharge rate. Provide calculations demonstrating that existing site imperviousness is less than or equal to 50%.

OR

☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that the stormwater management strategies result in at least a 25% decrease in the rate and quantity of stormwater runoff. Provide calculations demonstrating that existing site imperviousness exceeds 50%.

Narrative

Credit not satisfied. The existing imperviousness (prior to development) of the site designated for CDOB was less than 50%. The stormwater management plan for the CDOB (see attached) relies on a swale that traverses the south, west, and northern edges of the site. This will carry water to culverts outside the site boundary. The water will then drain to a tributary of the Rio Grande. Wetlands and other sensitive areas were protected from receiving discharges from the construction site. However, no special measures were incorporated to decrease overall rate or quantity of stormwater runoff. Therefore, with the addition of a building and parking lot, the runoff coefficient for the site increased from 0.30-0.40 before construction to 0.65-0.90 after construction. As a result, the stormwater discharge rate from the site increased from undeveloped to developed conditions.

FLINTCO
Constructive Solutions
WEST

Flintco West, Inc.
6020 Indian School Road N.E.
Albuquerque, NM 87110
(505) 262-1888 • fax (505) 262-1979
www.flintco.com

October 5, 2001

Storm Water Notice of Intent (4203)
US EPA
401 M. Street, SW
Washington, D.C. 20460

SUBJECT: APPLICATION FOR COVERAGE UNDER EPA, REGION 6, NPDES STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY.

Enclosed is the Flintco Inc. Notice-of-Intent to discharge storm water from the Cerro Grande Fire Flood Mitigation and Fire Recovery Project at the Los Alamos National Laboratory. This construction project, the Chemistry Division Office Buildiing, will involve the disturbance 2.2 acres of soil and is part of a larger common plan of development at the Laboratory. A Storm Water Pollution Prevention Plan (SWPP) Plan has been developed in accordance with the EPA Region 6 General Permit for Construction Activities. The delegation of signatory authority letter to delegate an authorized representative to sign reports, Plans, and certifications other than the NOI is attached.

If you have any questions concerning the Flintco Inc.Notice-of-Intent, please contact Dennis Heflick, Vice President at (505)262-1888. Please send all correspondence to:

Flintco Inc.
6020 Indian School Road NE
Albuquerque, NM 87110
Attn: Jon Hendrickson

Sincerely,

Dennis Heflick

Enclosures: Notice-of-Intent to discharge
delegation of signatory authority letter

Cy: R. Powell, NMED/SWQB, Santa Fe, New Mexico, w/enc.
M. Alexander, ESH-18, w/enc., MS K497
R. Reynolds, ESH-18, w/enc., MS K497
D. Erickson, ESH-DO, w/enc., MS K491

Add as appropriate
D. Padilla, FWO-UI, w/enc., MS K718
F. Kloer, PM-DS, w/enc., MS M984
K. Rendell, EM/DD, w/enc., MS M769
J. Miglio, FWO-SWO, w/enc., MS M769

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W E S T

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Albuquerque, NM 87110
(505) 262-1888 • fax (505) 262-1979
www.flintco.com

"Director"
US EPA Region 6
1445 Ross Ave., Suite 1200 (6EN-W)
Dallas, TX 75202-2733

NPDES Storm Water General Permit No. SEE SWPP ON FILE
Delegating an "Authorized Representative"

Dear Director:

This letter serves to designate either a person or specifically described position as an authorized person for signing reports, storm water pollution prevention plans, certifications or other information requested by the Director or required by the permit. This authorization cannot be used for signing an NPDES permit application (e.g. Notice of Intent (NOI)) in accordance with 40 CFR 122.22. The following person or position is hereby authorized to sign reports, plans or certifications other than the NOI application:

JON HENDRICKSON

By signing this authorization, I confirm that I meet the following requirements to make such a designation as set forth in either Part VI.G.1 of the Construction general permit [63 Fed Reg 36506] or Part 9.7. of the Multi-Sector general permit [65 Fed Reg 64746-64880].

For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy or decision making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

For a municipality, State, Federal or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrators of EPA).

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name	Title	Date
Dan D Hoyle	V.P.	10-5-01

THIS FORM REPLACES PREVIOUS FORM 3510-6 (8-98)
See Reverse for Instructions

Form Approved. OMB No. 2040-0188

NPDES FORM

EPA

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY Under a NPDES General Permit

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with construction activity in the State/Indian Country Land identified in Section II of this form. Submission of this Notice of Intent also constitutes notice that the party identified in Section I of this form meets the eligibility requirements in Part I.B. of the general permit (including those related to protection of endangered species determined through the procedures in Addendum A of the general permit), understands that continued authorization to discharge is contingent on maintaining permit eligibility, and that implementation of the Storm Water Pollution Prevention Plan required under Part IV of the general permit will begin at the time the permittee commences work on the construction project identified in Secion II below. IN ORDER TO OBTAIN AUTHORIZATION, ALL INFORMATION REQUESTED MUST BE INCLUDED ON THIS FORM. SEE INSTRUCTIONS ON BACK OF FORM.

I. Owner/Operator (Applicant) Information

Name: FLINTCO INC. Phone: 5052621888

Address: 6020 INDIAN SCHOOL RD NE Status of Owner/Operator: P

City: ALBUQUERQUE State: NM Zip Code: 84110-

II. Project/Site Information

Is the facility located on Indian Country Lands? Yes ☐ No ☑

Project Name: C-DIVISION OFFICE BUILDING

Project Address/Location: LOS ALAMOS NATIONAL LABORATORY

City: LOS ALAMOS State: NM Zip Code: 87545-

Latitude: 355113 Longitude: 1061659 County: LOS ALAMOS

Has the Storm Water Pollution Prevention Plan (SWPPP) been prepared? Yes ☑ No ☐

Optional: Address of location of SWPPP for viewing ☐ Address in Section I above ☐ Address in Section II above ☑ Other address (if known) below:

SWPPP Address: TA-46 JOBSITE TRAILER Phone: 5052590328

City: LOS ALAMOS State: NM Zip Code: 87545-

Name of Receiving Water: CANADA DEL BUEY

10152001 (Month Day Year) Estimated Construction Start Date

10012002 (Month Day Year) Estimated Completion Date

Estimate of area to be disturbed (to nearest acre): 3

Estimate of Likelihood of Discharge (choose only one):

1. ☐ Unlikely
2. ☑ Once per month
3. ☐ Once per week
4. ☐ Once per day
5. ☐ Continual

Based on instruction provided in Addendum A of the permit, are there any listed endangered or threatened species, or designated critical habitat in the project area? Yes ☑ No ☐

I have satisfied permit eligibility with regard to protection of endangered species through the indicated section of Part I.B.3.e.(2) of the permit (check one or more boxes): (a) ☐ (b) ☐ (c) ☐ (d) ☑

III. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: DENNIS HEFLICK Date: 10/29/01

Signature: Dennis Heflick

EPA Form 3510-9 replaced 3510-6 (8-98)

EPA

Instructions – EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity to be Covered Under a NPDES Permit

Form Approved. OMB No. 2040-0188

Who Must File a Notice of Intent Form

Under the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et.seq.; the Act), except as provided by Part I.B.3 the permit, Federal law prohibits discharges of pollutants in storm water from construction activities without a National Pollutant Discharge Elimination System Permit. Operator(s) of construction sites where 5 or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least 5 acres, or any site designated by the Director, must submit an NOI to obtain coverage under an NPDES Storm Water Construction General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a State agency, write to or telephone the Notice of Intent Processing Center at (703) 931-3230.

Where to File NOI Form

NOIs must be sent to the following address:

Storm Water Notice of Intent (4203)
USEPA
401 M. Street, SW
Washington, D.C. 20460

Do not send Storm Water Pollution Prevention Plans (SWPPPs) to the above address. For overnight/express delivery of NOIs, please include the room number 2104 Northeast Mall and phone number (202) 260-9541 in the address.

When to File

This form must be filed at least 48 hours before construction begins.

Completing the Form

OBTAIN AND READ A COPY OF THE APPROPRIATE EPA STORM WATER CONSTRUCTION GENERAL PERMIT FOR YOUR AREA. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, call the Notice of Intent Processing Center at (703) 931-3230.

Section I. Facility Owner/Operator (Applicant) Information

Provide the legal name, mailing address, and telephone number of the person, firm, public organization, or any other entity that meet either of the following two criteria: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have the day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. Each person that meets either of these criteria must file this form. Do not use a colloquial name. Correspondence for the permit will be sent to this address.

Enter the appropriate letter to indicate the legal status of the owner/operator of the project: F = Federal; S = State; M = Public (other than federal or state); P = Private.

Section II. Project/Site Information

Enter the official or legal name and complete street address, including city, county, state, zip code, and phone number of the project or site. If it lacks a street address, indicate with a general statement the location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility in degrees, minutes, and seconds to the nearest 15 seconds. The latitude and longitude of your facility can be located on USGS quadrangle maps. Quadrangle maps can be obtained by calling 1-800 USA MAPS. Longitude and latitude may also be obtained at the Census Bureau Internet site: http://www.census.gov/cgi-bin/gazetteer.

Latitude and longitude for a facility in decimal form must be converted to degrees, minutes and seconds for proper entry on the NOI form. To convert decimal latitude or longitude to degrees, minutes, and seconds, follow the steps in the following example.

Convert decimal latitude 45.1234567 to degrees, minutes, and seconds.

1) The numbers to the left of the decimal point are degrees.
2) To obtain minutes, multiply the first four numbers to the right of the decimal point by 0.006. 1234 x .006 = 7.404.
3) The numbers to the left of the decimal point in the result obtained in step 2 are the minutes: 7'.
4) To obtain seconds, multiply the remaining three numbers to the right of the decimal from the result in step 2 by 0.06: 404 x 0.06 = 24.24. Since the numbers to the right of the decimal point are not used, the result is 24".
5) The conversion for 45.1234 = 45° 7' 24".

Indicate whether the project is on Indian Country Lands.

Indicate if the Storm Water Pollution Prevention Plan (SWPPP) has been developed. Refer to Part IV of the general permit for information on SWPPPs. To be eligible for coverage, a SWPPP must have been prepared.

Optional: Provide the address and phone number where the SWPPP can be viewed if different from addresses previously given. Check appropriate box.

Enter the name of the closest water body which receives the project's construction storm water discharge.

Enter the estimated construction start and completion dates using four digits for the year (i.e. 05/27/1998).

Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest acre; if less than 1 acre, enter "1." Note: 1 acre = 43,560 sq. ft.

Indicate your best estimate of the likelihood of storm water discharges from the project. EPA recognizes that actual discharges may differ from this estimate due to unforeseen or chance circumstances.

Indicate if there are any listed endangered or threatened species, or designated critical habitat in the project area.

Indicate which Part of the permit that the applicant is eligible with regard to protection of endangered or threatened species, or designated critical habitat.

Section III. Certification

Federal Statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner of the proprietor, or

For a municipality, state, federal, or other public facility: by either a principal executive or ranking elected official. An unsigned or undated NOI form will not be granted permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Director, OPPE Regulatory Information Division (2137), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

STORM WATER POLLUTION PREVENTION PLAN

Chemistry Division Office Building

Los Alamos National Laboratory

a requirement of the
NPDES GENERAL PERMIT
for Storm Water Discharges Associated with Construction Activities

Prepared By:
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600 Sixth St.
Los Alamos, NM 87544
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Revision 0: October 2001

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STORM WATER POLLUTION PREVENTION PLAN
for construction of the

Chemistry Division Office Building
LOS ALAMOS NATIONAL LABORATORY

PREFACE

On July 6, 1998, Environmental Protection Agency (EPA), Region VI, issued the final National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity. Permit requirements include the following:

- Conduct a critical habitat and threatened/endangered species study
- Develop and implement a Storm Water Pollution Prevention (SWPP) Plan
- Submit a Notice of Intent (NOI) at least 2 days prior to the start of construction
- Conduct and document storm water inspections during construction
- Maintain Best Management Practices (BMPs)
- Amend the SWPP Plan as necessary
- Submit a Notice of Termination (NOT) following both project completion and final stabilization

For construction projects disturbing at least five (5) acres, or for smaller areas, which are part of a larger common plan of development, authorization to discharge storm water is required under this Permit. Permit regulations also identify the specific non-storm water discharges from active construction sites that may be authorized under Permit coverage. With the exception of fire fighting activity discharges, non-storm water discharges are authorized under Permit coverage only if they are identified in the SWPP Plan.

All parties that meet the definition of Operator (see Section 1.1) must be permitted. Each permittee is not required to develop and implement a separate SWPP Plan. The only requirement is that there be at least one SWPP Plan for a site that incorporates the required elements for all Operators. Responsibilities of Operators with day-to-day operational control of project activities include:

- Ensure that the SWPP Plan indicates areas of the project where they have operational control over day-to-day activities
- Ensure that the SWPP Plan, for portions of the project where they are Operators, meets the minimum requirements for SWPP Plans and identifies the parties responsible for implementation of control measures identified in the Plan
- Ensure that the SWPP Plan, for portions of the project where they are Operators, indicates the name and NPDES Permit number of the party with control over project plans and specifications, including the ability to make modifications to plans or specifications

This SWPP Plan applies to discharges of storm water from construction activities related to the Chemistry Division Office Building at Los Alamos National Laboratory. The Plan, which will be developed as a joint Plan for LANL and Flintco, Inc., describes potential sources of pollution and identifies the Best Management Practices (BMPs) to minimize the potential for erosion and storm water pollution.

The Plan was developed in accordance with the provisions of the Clean Water Act (33 U.S.C. § §1251 et seq., as amended by the Water Quality Act of 1987, P.L. 100-4), and the regulations established by the U.S. Environmental Protection Agency (EPA) for National Pollutant Discharge Elimination System (NPDES) General Permits for Storm Water Discharges Associated with Construction Activities in Region 6.

Chemistry Division office Building
STORM WATER POLLUTION PREVENTION PLAN

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

NPDES Permit Number: **NMR10B828—DOE**
NMR10B829—LANL

ORGANIZATION: **University of California (Los Alamos National Laboratory)**
Contact: **Michele Poling**
Title: **Project Engineer**

_____ _____
(signature) (date)

Chemistry Division Office Building
STORM WATER POLLUTION PREVENTION PLAN

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

NPDES Permit Number: NOI attached

ORGANIZATION: **Flintco, Inc.**
Contact: **Jon Hendrickson**
Title: **Project Manager**

(signature) 10/12/01 (date)

1. GENERAL PROJECT INFORMATION

The Flood Mitigation and Fire Recovery Project is a result of the Cerro Grande Fire that burned over 50,000 acres including LANL property. Approximately 7,500 acres burned within LANL as well as many drainage areas above Laboratory property. The fire created the potential for significant erosion and flooding. The Cerro Grande Fire Recovery Project was initiated in the year 2000 to ensure that facilities at LANL would provide safe, secure, long term stewardship of associated nuclear materials, worker health and safety, and the environment while protecting the public.

The University of California (LANL) and DOE shall retain a single NPDES permit for all aspects of the Flood Mitigation and Fire Recovery Project. For major elements of the Project, individual SWPP Plans will be developed under this single permit. Each contractor responsible for a subproject will obtain a NPDES Permit applicable to their work and become co-permittees with LANL and DOE.

This SWPP Plan covers the construction of the Chemistry Division (C-Division) Office Building, a two-story structure with a footprint of just over 10,000 square feet, and an associated parking lot. The building will be located on the north end of TA-46, and the asphalt parking lot will cover the southern part of the site. Construction on the site will commence in early October and will continue for 12 months. Throughout the entire duration, Best Management Practices will be in place and maintained according to this Plan and the construction specifications. All waste disposal, sanitary sewer, or septic systems within the permitted area will be consistent with applicable state, tribal, and local regulations. Descriptions of the project site and the work performed are provided in Sections 2.0 and 3.0, respectively.

1.1. Operators

The "operator" of a storm water discharge associated with construction activity is the individual or party responsible for applying to the EPA for NPDES Permit coverage. The EPA defines an "operator" to be anyone who meets either of the following two criteria:

1) Has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, or
2) Has day-to-day operational control of project activities.

The permittee with operational control over construction plans and specifications for this project, including the ability to make modifications to those plans and specifications is:

University of California
Los Alamos National Laboratory (LANL)
Los Alamos, NM 87545
Contact: Bill Atkin
NPDES Permit #: NMR10B828—DOE
NMR10B829—LANL

The permittee with day-to-day operational control of project activities is:

Company: Flintco, Inc
Address: 6020 Indian School Rd. NE, Albuquerque, NM 87110
Contact: Jon Hendrickson
NPDES Permit #: NOI Attached

Operators shall ensure that project plans and specifications meet the minimum requirements of this SWPP Plan.

1.2. Posting Requirements

Operators will post on site the following information:

- NPDES Permit number and/or copies of NOIs until the Permit number is received
- The name and telephone number of a local contact person
- A brief description of the project
- Location of the current plan

A sample posting form is included with the permit regulations in Appendix A.

1.3. Inspections

Disturbed areas and stabilization and structural control measures shall be inspected at least once every fourteen (14) calendar days, and within 24 hours or the next working day of the end of a storm event exceeding ½ inch of precipitation. If a portion of the site has been finally or temporarily stabilized, runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), or during seasonal arid periods, inspections shall be conducted at least once every month.

Inspections to be performed by qualified personnel shall include the following:

- Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system.
- Sediment and erosion control measures identified in the SWPP Plan shall be observed to ensure that they are operating correctly.
- Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.
- Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable.
- Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Inspections shall be documented on the inspection and maintenance form provided in Appendix B. Where a report does not identify any incidents of noncompliance, Operators shall certify that the facility is in compliance with the SWPP Plan and the Permit. Inspections shall be continued by LANL Water Quality and Hydrology Group assigned personell until final stabilization of an area is achieved as defined in Section 4.5 and/or the Notice of Termination is submitted. ESH-18 may conduct routine inspections throughout the project, and the LANL Project Director or his authorized representative will certify these inspections. Inspector qualifications are included in Appendix B.

1.4. Maintenance

All erosion and sediment control measures, stabilization and structural controls, and other protective measures identified in this Plan will be maintained in effective operating condition by the contractor. Maintenance procedures for this project will include but are not limited to the following:

- If sediment escapes the construction site, off-site accumulations of sediment will be removed at a frequency sufficient to minimize offsite impacts. This includes mud on roadways, overtopped silt fences, etc.
- Sediment will be removed from sediment retention structures when design capacity has been reduced by 50% or retained sediment has reached ½ the height of the structure.
- Offsite material storage areas used solely by the permitted project shall be addressed in the SWPP Plan and controls associated with these areas shall be maintained as appropriate.

If inspections indicate that existing BMPs require modification, or additional BMPs are necessary, implementation shall be completed before the next anticipated storm event. If implementation before the next anticipated storm event is impracticable, it shall be completed as soon as practicable.

1.5. Record Keeping

A copy of the SWPP Plan will be maintained onsite for the use of all Operators and those identified in the SWPP Plan as having on-site responsibilities, the EPA, ESH-18 representatives, State or Tribal agencies, and local government officials until the permit is terminated. The Plan will contain required signatures, a copy of Permit language, all reports required by Permit coverage, and any other applicable documentation. Items that will be maintained and attached to the SWPP include:

- Inspection Reports (Appendix B)
- Plan Amendment Tracking Form (Appendix C)
- Site Map (Appendix D)
- Land Disturbance Log containing: dates when major soil disturbing activities occur, dates when construction activities temporarily or permanently cease on a portion of the site, and dates when stabilization measures are initiated (Appendix E)
- Material Inventory Form of equipment and construction and waste materials to be stored on site (Appendix F)
- Spill Tracking Form (Appendix H)

Copies of SWPP Plans, inspection records, spill reports, all reports required by NPDES Permit coverage, and data used to complete the NOI shall be retained by the permittees for a period of at least three (3) years from the date of final stabilization. LANL will also retain records in accordance with DOE policy.

1.6. Plan Amendment

This SWPP Plan will be amended when:

- There is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to the waters of the United States and such change has not been addressed in the SWPP Plan.
- If the inspection report identifies problems or inadequacies with the current BMPs, the SWPP Plan shall be modified as necessary to include additional or modified BMPs designed to correct the problems. Revisions to the SWPP Plan shall be completed within seven (7) calendar days following the inspection.
- In the event of a spill equal to or in excess of a reportable quantity, the SWPP Plan will be amended within 14 calendar days of the release. The amendment will provide the release date, a description of the release, and the circumstances leading to the release. The SWPP Plan will also be reviewed to identify measures to both prevent the reoccurrence of such a release and to properly respond to such releases.

A record of Plan amendments will be maintained using the table provided in Appendix C.

2. SITE DESCRIPTION

The Chemistry Division Office Building will be located in TA-46, west of buildings 250, 202, and 231. The parking lot will be located south of the new building, and west of buildings 231, 232, and 234. The site is south of Cañada del Buey, the canyon to which TA-46 drains. Prior to construction, the site slopes slightly to the northeast and southeast corners of the site. Vegetation consists primarily of native field grasses and a few small Piñon trees, and the surface soil is clayey sand. During construction, the job site will be graded down and approximately 4900 cubic yards of material will be removed. Following construction, the site will still gently slope in the same directions as prior to construction. The site is approximately three acres, of which approximately 2.9 acres will be disturbed by clear and grub, grading, and utility trenching work. All staging will occur in the main portion of the site; there will not be any off site storage.

2.1. Storm Water Characteristics

The project site is located in a semi-arid region that typically receives an annual rainfall of 10-20 inches. Data describing the quality of discharge from this area of TA-46 can be found in the annual discharge monitoring reports prepared by ESH-18. Prior to construction, the site slopes slightly and drains to the south and southeast. There is a swale located on the outside of the service road along the west side. This overall drainage pattern is used in the final project design. The service road may be expanded to accept heavier traffic, but the drainage features will remain as described.

Prior to construction, the runoff coefficient, C, is approximately 0.30-0.40. Following construction, a building and an asphalt parking lot will cover a majority of the site, increasing the runoff coefficient to approximately 0.65-0.90.

2.2. Threatened & Endangered Species and Historic Property

An NPDES review for the site was conducted by ESH-20. Based on the requirements of the NPDES Permit, the eligibility criteria for "listed species" as well as "historic properties" will be met if the following conditions area met:

Biological Resources:
This project is adjacent to locations with federal and state species of concern. There are no biological timing restrictions with this project.

Section 8a (listed species):
Based on the requirements of NPDES Permit, the eligibility criteria for "listed species" and critical habitat will be met if the release meets the following conditions:

1) The water release must be distributed and mitigated so that the flow rate from the discharge is comparable to normal water flows in the affected canyons. The rate and volume of release should not cause erosion or remove vegetation. All releases should be containable in the current water runoff areas.

2) The site will require erosion protection during all aspects of construction and the re-vegetation (with native grasses) of bare soil following the project.

3) ESH-20 must be notified of any scope or location changes associated with the outdoor construction of this project.

Archeological Resources:

There is one archaeological site located to the northwest of the project's area of potential effects (APE) (Excavation Permit 01X-0418 map), immediately to the west of the paved access road. This site has been flagged off for avoidance from all project activities. All staging and laydown areas must stay within the approved APE. Site drainage must be directed away from the northwest corner of the APE.

Section 8b (historic properties):
Based on the requirements of Addendum B of the NPDES Permit, the eligibility criteria for protection of culturally significant historic properties has been met. Water discharges must be directed away from the archaeological site located to the northwest of the APE.

2.3. Receiving Waters and Wetlands

There is a swale around the south, west, and northern portions of the site. Storm water from the site will sheet flow into the swale, which carries the water to an existing culverts northeast of 46-250 and south of 46-234. The storm water eventually drains to Cañada del Buey, which is a tributary to the Rio Grande. No wetlands or other special aquatic sites will be disturbed or receive discharges from disturbed areas of the project.

2.4. Site Maps

Site maps provide information on drainage patterns, receiving streams, general land features, storm water control structures, and potential pollutant sources. Appendix D contains site maps that identify the following features:

- General site location.
- Drainage patterns and approximate slopes after major grading activities.
- Areas where soil will be disturbed and areas where soil will not be disturbed.
- Locations of major structural and nonstructural controls identified in the SWPP Plan.
- Locations where stabilization practices are expected to occur.
- Locations of surface waters.
- Locations where storm water discharges to surface waters or canyons.

3. PROJECT DESCRIPTION

The types of construction activity associated with the this project are excavation and grading activity, utility installation and tie-in, erection of a building, asphalt and concrete placement, and stabilization of the sites.

The sequence of major soil disturbing activities associated with the C-Division Office Building project includes:

1. Installing silt fence, Triangular Silt Dike, and other appropriate BMPs as indicated on the site maps in Appendix D.
2. Clearing and grubbing of site
3. Cutting, grading and compacting the general site area
4. Transporting and stockpiling bedding/backfill material
5. Trenching, stockpiling, and backfilling for installation of utilities
6. Excavating, stockpiling, and backfilling for installation of the building foundation
7. Performing final grading activities
8. Removing excess material
9. Executing stabilization activities

As major soil disturbing activities occur, their dates will be added to the Land Disturbance Log (Appendix E) with the Plan.

3.1. Materials Inventory

Equipment and materials will be stored onsite within the project areas in defined staging areas in the main portion of the site. No off-site storage is planned at this time. Appropriate controls including but not limited to, silt fence, berming and covering will be established based on site conditions and the type of equipment/materials used. As equipment and materials are used on the project, project personnel will add the item and its applicable storm water control to the Material Inventory Form provided in Appendix F. Controls that may be used are discussed in more detail in Section 4.

3.2. Potential Pollutants

Typical potential pollutants may include, but are not limited to:

- Construction and demolition debris (i.e. asphalt, concrete, wire cuttings, piping materials, packaging materials backfill materials)
- Construction materials (i.e. pipe, bedding, fill materials, rebar, wire conduit, building interior and exterior finish products)
- Vehicle fluids such as hydraulic fluid, motor oil, gasoline, and diesel fuel
- Sediment from exposed areas and excavations

Typical controls to be used for each of these potential pollutants are included in Section 4.

3.3. Non-Storm Water Discharges

Non-storm water discharges are defined as significant discharges of water not associated with the natural runoff from a storm event. Controls are discussed in Section 4.2 for the following possible non-storm water discharges included under this Permit:

- Water used for dust suppression
- Potable water used for utility line flushing

- Water application to allow optimum soil compaction
- Potable water used for irrigation.
- Vehicle or equipment washing where detergents are not used

4. CONTROLS

This SWPP Plan incorporates proper erosion and sediment controls as well as appropriate stabilization procedures. Controls are used to prevent the contamination of storm water runoff by retaining sediment on-site; minimizing contact with spoils, other disturbed soils, and equipment; and by diverting it from the locations in which erosion or sediment transport regularly take place. This is achieved using applicable stabilization methods, structural controls and appropriate work procedures. Installation details for controls are included in Appendix G and locations of controls are shown on the site maps. Additional information on installation, inspection, and maintenance of controls is provided in the LANL Storm Water/Surface Water Pollution Prevention Best Management Practices Guidance Document (http://drambuie.LANL.gov/~esh18/index.html).

Stabilization and structural controls identified in the Plan will be implemented and maintained by the Operator with day-to-day control of project activities. This responsibility shall remain in place until final stabilization of disturbed areas is achieved and Permit coverage is terminated. The following Sections identify controls that may be implemented or locations that require the implementation of appropriate controls.

4.1. Structural Controls and Other Best Management Practices

Structural controls are used to store flows, divert flows from exposed soils, or otherwise limit runoff and the discharge of pollutants from exposed areas. The Operator with day-to-day control of Project activities (Flintco, Inc.) will implement structural controls as needed and maintain them as required until final stabilization is achieved. Controls are not limited to the controls described below:

Installing silt fence, Triangular Silt Dike, and other appropriate BMPs as indicated on the site maps in Appendix D (October 2001)

1. Soil disturbance will be minimized to the extent possible.
2. Any excess excavated material will be placed on the upslope side of installed BMPs.

Clearing and grubbing of site (October 2001)

1. All clearing and grubbing activities will take place on the upslope side of the installed BMPs.

Cutting, grading, and compacting of the general site area (November 2001)

1. All excavation, backfilling, and compaction activities will take place on the upslope side of the installed BMPs.
2. Material shall be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or spillage.

Transporting and stockpiling bedding/backfill material (November 2001)

1. Material shall be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or spillage.
2. If material stockpiles are placed outside the area protected by BMPs, the down slope side of the stockpile shall be bermed with triangular silt dike, silt fence, or other appropriate controls.

Trenching, stockpiling, and backfilling for installation of utilities (November 2001)

1. All excavation activities will take place on the upslope side of trench or the installed BMPs.
2. Material shall be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or spillage.

3. Stockpiles of excavated and/or backfill material shall be maintained within the area protected by BMPs or shall have the down slope side of the stockpile bermed with Triangular Silt Dike, silt fence, earth berm, or other appropriate controls.
4. Material cuttings, concrete waste, solvents or other chemicals, and any other waste associated with utility installation shall be managed or disposed of at the end of each work day or prior to an anticipated storm event.

Excavating, stockpiling, and backfilling for installation of buildling foundation (November 2001)

1. All excavation activities will take place on the upslope side of the installed BMPs.
2. Material shall be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or spillage.
3. Stockpiles of excavated and/or backfill material shall be maintained within the area protected by BMPs or shall have the down slope side of the stockpile bermed with Triangular Silt Dike, silt fence, earth berm, or other appropriate controls.
4. Material cuttings, concrete waste, solvents or other chemicals, and any other waste associated with concrete placement shall be managed or disposed of at the end of each work day or prior to an anticipated storm event.
5. Concrete waste and washout will be done within a defined area surrounded by Triangular Silt Dike, silt fence, earth berm, or other appropriate controls. Excess concrete will be properly disposed of.

Performing final grading activities (June 2002)

1. All excavation, backfilling, and compaction activities will take place on the upslope side of the installed BMPs.
2. Material shall be transported in appropriate containers or vehicles so that facility locations outside the project boundaries and public roadways will not be adversely impacted through sediment tracking or spillage.

Removing excess material (June 2002)

1. Any waste material shall be removed from work areas.
2. To minimize contact between storm water and potential pollutants (fuels, chemicals, waste material, etc.), good housekeeping practices shall be employed in equipment and material storage areas, equipment shall be properly maintained, and materials properly handled.

Executing stabilization activities (July 2002)

1. Stabilization activities shall disturb only the minimum amount of soil necessary to implement the stabilization.
2. Silt fences and other BMPs shall not be removed until stabilization is achieved.

For the Potential Pollutants listed in Section 3.2, the following BMPs will be implemented.

Construction and demolition materials and debris (i.e. asphalt, concrete, wire cuttings, packaging materials, piping materials, backfill materials, pipe, bedding, fill materials, rebar, wire conduit, building interior and exterior finish products)

1. Material waste shall be managed or disposed of at the end of each workday or prior to an anticipated storm event.
2. All fill material and backfill material shall be stored upslope of the installed BMPs, or other controls shall be implemented.
3. Good Housekeeping Practices will be maintained and exposure to storm water will be minimized to the extent practicable.

Vehicle fluids such as hydraulic fluid, motor oil, gasoline, and diesel fuel

1. All vehicles and equipment will be inspected for leaks and, if found, not allowed onsite until fixed.
2. All fuel or other vehicle fluids that are stored on-site will be stored inside of a lined berm.
3. Equipment will be parked on asphalt or concrete when possible.
4. Fluids and storage containers will be exposed to storm water to the minimum extent practicable.

Sediment from exposed areas and excavations

1. All sediment from exposed areas and excavations will be contained on the upslope side of the installed BMPs.

4.2. Controls for Non-Storm Water Discharges

Non-storm water discharge control is the responsibility of the Operator with day-to-day operational control of the project area (Flintco, Inc.). The Operator will not cause, contribute to, or have reasonable potential to cause or contribute to a violation of a water quality standard. If additional controls are required they will be implemented and added to the Plan. The following controls will be implemented for non-storm water discharges.

- The contractor will ensure that the dust suppression water application, irrigation water, and water applied for soil compaction does not result in runoff. If runoff from such an application does occur, appropriate controls will be established prior to the next anticipated discharge and the SWPP Plan will be amended to reflect such a change.
- Vehicle or equipment washing will occur on pavement or areas stabilized with base course. Triangular Silt Dike, silt fence or other appropriate controls shall be placed down slope of the wash area to reduce runoff velocity and retain transported material onsite.
- Utility flushing discharges will be captured and transported by truck to a location where they can be directed to an appropriate stabilized location. Controls will be placed along and within the flow path and around drop inlets to minimize erosional damage in the area and the transport of sediment.

4.3. Other Controls

Additional controls to be incorporated with the Project activity include but are not limited to:

Sanitary Waste: If used, portable lavatories will be used and maintained in accordance with manufacturer recommendations. Lavatory waste will be treated off-site.

Dust Generation: Where deemed necessary, dust generation shall be minimized with the application of water.

Sediment discharge controls: If sediment-laden water is required to be pumped and discharged, a discharge bag or other appropriate control shall be used.

Off-site Vehicle Tracking: Any off-site tracking of sediment from construction areas adjacent to paved roadways will be removed by sweeping. If sweeping is shown to be ineffective, a stabilized construction entrance shall be constructed with 6" of gravel.

4.4. Post Construction Storm Water Management

Storm water management consists of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. After construction is complete, pollutants in storm water discharges will be controlled by the following permanent measures:

- Paving of perimeter road and parking lot and placement of concrete walkways (eliminates contact with soil and the transport of sediment in storm water discharges)
- Perennial seeding (and blanketing on slopes 2:1 or greater) of disturbed areas not surfaced with asphalt, concrete or riprap (minimizes erosion and the potential for sediment transport in storm water discharges)
- Riprap at site drainage areas up slope from culvert (reduces storm water contact with soil, runoff velocity, and the transport of sediment in storm water discharges)
- Culverts and swales (will collect and convey storm water runoff, minimizing contact with soils and the potential for off-site sediment transport)

These facilities have been designed to control run-off in accordance with good engineering practice and to meet construction-related NPDES requirements.

4.5. Stabilization

At site locations where construction activities have temporarily or permanently ceased, stabilization measures will be initiated as soon as practicable but no more than 14 days after construction activities have finally or temporarily ceased in an area. Where the initiation of measures by the 14th day is precluded by snow cover, frozen ground, or seasonal aid conditions, stabilization shall be initiated as soon as practicable. For areas where land-disturbing activity is to be resumed within 21 days, stabilization measures will not be initiated on that portion of the site. Dates for stabilization of areas will be added to the Land Disturbance Log (Appendix E). Stabilization efforts will be continued until the area achieves final stabilization, where final stabilization is defined as: all soil disturbing activities at the site have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. Such determination will be made by personnel from the LANL Water Quality & Hydrology Group (ESH-18).

The following permanent stabilization measures will be implemented following completion of site activity:

Asphalt and Concrete

The perimeter road and parking lot will be permanently stabilized through asphalt resurfacing. Sidewalks will be stabilized with the placement of concrete. Additional disturbed areas, in accordance with the project construction drawings, may be surfaced with asphalt or concrete.

Riprap

Riprap will be placed at the drainage areas upstream of the culvert in the northeast portion of the site as specified on the project construction drawings.

Revegetation

Disturbed areas not permanently stabilized with asphalt, riprap, or concrete will be seeded with a perennial mix to establish permanent vegetative stabilization. Mulch will be used in conjunction with the seeding of disturbed areas. Where seeding will be performed on slopes 2:1 or greater, erosion control blankets or other appropriate controls will be used in conjunction with the seeding.

The Operator with day-to-day control of Project activities (Flintco, Inc.) is responsible for implementation and maintenance of stabilization methods until final stabilization is achieved.

4.6. Spill Prevention, Response & Reporting

Spill Prevention for this project includes inspecting equipment regularly for safety, cleanliness and leaks and implementation of appropriate controls at staging areas. Equipment found to be leaking will be removed from service and repaired. Equipment will be parked on asphalt or concrete when possible. Deficient controls will be repaired as soon as practicable.

The discharge of hazardous substances or oil resulting from an on-site spill is not authorized under this Permit coverage. Spills or releases shall be reported in accordance with LANL LIR 402-130-01.0, Abnormal Events. If fire or explosion is present, or if the potential for such exists, the situation will be reported by dialing 911.

In accordance with LANL requirements, internal spill reporting will be completed in the event of any release. Spill reports will be completed by the LANL organization responsible for overseeing site operations, and copies of the reports will be maintained by both the responsible organization and ESH-18. Federal reporting is the responsibility of ESH-18, and the determination for such notification will be made by ESH-18 and the EM&R Office in accordance with Laboratory and DOE policies and federal and state regulatory reporting requirements.

In the event of a release equal to or in excess of a reportable quantity, the SWPP Plan will be amended as stated in Section 1.6. All spills will be documented in the Spill Tracking Table (Appendix H.)

SS Credit 6.2: Stormwater Management - Treatment

Intent

Limit disruption of natural water flows by eliminating stormwater runoff, increasing on-site infiltration and eliminating contaminants.

Requirements

Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. Do so by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency's (EPA's) Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (Document No. EPA-840-B-93-001c January 1993) or the local government's BMP document (whichever is more stringent).

Submittals

☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, demonstrating and declaring that the design complies with or exceeds EPA or local government Best Management Practices (whichever set is more stringent) for removal of TSS and TP.

Narrative

Credit not satisfied. As described previously in the narrative for SS Credit 6.1, the stormwater management system for CDOB relies primarily on conveyance to a discharge point outside the site boundary. As a result, no "treatment" components were included in the overall stormwater management system for CDOB.

SS Credit 7.1: Heat Island Effect - Non-Roof

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

Provide shade (within 5 years) AND/OR use light-colored/high-albedo materials (reflectance of at least 0.3) or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area.

Submittals

☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, referencing the site plan to demonstrate areas of paving, landscaping (list species) and building footprint, and declaring that:

A minimum of 30% of non-roof impervious surfaces areas are constructed with high-albedo materials and/or will be shaded within five years

OR a minimum of 50% of parking spaces have been placed underground or are covered by structured parking

OR an open-grid pavement system (less than 50% impervious) has been used for a minimum of 50% of the parking lot area.

Narrative

Credit not satisfied. The parking lot constitutes the majority of non-roof impervious surface area at CDOB. The black, asphalt pavement at CDOB does not satisfy the "light-colored/high-albedo material" requirement, nor will the vegetation at the site provide shading for at least 30% of the parking area and walkways.

SS Credit 7.2: Heat Islands Effect - Roof

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

Use ENERGY STAR Roof-compliant, high-reflectance AND high emissivity roofing (for low slope roofs: initial reflectance of at least 0.65 and three-year-aged reflectance of at least 0.5 when tested in accordance with ASTM E903 and emissivity of at least 0.9 when tested in accordance with ASTM 408; for steep slope roofs: initial reflectance of at least 0.25 and three-year-aged reflectance of at least 0.15 when tested in accordance with ASTM E903 and emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a "green" (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

Submittals

☒ Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and declaring that the roofing materials comply with the Energy Star Label requirements and have a minimum emissivity of 0.9. Demonstrate that high-albedo and vegetated roof areas combined comprise at least 75% of the total roof area.

OR

☐ Provide the LEED Letter Template, signed by the architect, civil engineer or responsible party, referencing the building plan and demonstrating that vegetated roof areas comprise at least 50% of the total roof area.

Narrative

Credit satisfied. The entire roof of the CDOB (with the exception of mechanical systems) has been covered with an Energy Star-compliant system manufactured by Stevens Roofing Systems. It includes a white, reflective TPO membrane with a minimum emissivity rating of 0.9 (see attached certification statement).

Sustainable Sites Credit 7.2

I _____ (Contractor-Project Architect) hereby certify that the Chemistry Division Office Building at Los Alamos National Laboratory has been fitted with a Stevens TPO Energy Star-compliant high reflectance/high emissivity roofing system. The minimum emissivity rating for the roof is 0.9 and, with the exception of any mechanical equipment, the membrane covers the entire roof.

Name: (Contractor-Project Architect)

Organization: (Company Name)

Role in Project: (Lead Project Architect)

Signature: (as appropriate)

Date: (as appropriate)

SS Credit 8: Light Pollution Reduction

Intent

Eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments.

Requirements

Meet or provide lower light levels and uniformity ratios than those recommended by the Illuminating Engineering Society of North America (IESNA) Recommended Practice Manual: Lighting for Exterior Environments (RP-33-99). Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior lighting shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light or brightness from that luminaire crosses the property boundary.

Submittals

☐ Provide exterior lighting design drawings demonstrating that the objectives and measures of the credit have been met, that the IESNA RP-33 uniformity of light and maximum illuminance values have not been exceeded, and that the design will not create glare or light trespass onto neighboring property or streets, nor create light pollution in the night sky.

☒ Provide cut sheets for all exterior luminaires with more than 3500 lumen lamps, demonstrating that they meet the Full Cutoff IESNA Classification.

☒ Provide interior lighting design drawings for the building's perimeter areas demonstrating that the maximum candela value of interior lighting falls within the building and not out through the windows.

Narrative

Credit not satisfied. Evaluation of the lighting design for CDOB indicates that all exterior luminaries meet the Full Cutoff IESNA Classification. In addition, the lighting design demonstrates that the maximum candela values of interior lighting falls within the building and not outside through the windows. However, the exterior lighting calculations indicate that 20:1 uniformity ratios are not satisfied between light poles in the parking lot. Illuminance levels between light poles result in a uniformity ratio between approximately 8:1 and 10:1. See the attached lighting design data.

Type X1

Catalog number KSE2 400S R5S TB SP04-

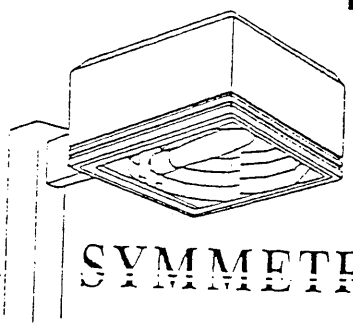
MONARCH

Premium Cutoff Lighting

KSE2 400S

400W HIGH PRESSURE SODIUM

20' to 35' Mounting



SYMMETRA™

FEATURES

HOUSING — Rugged, heavy-gauge, .12" thick, lightweight extruded aluminum housing. Square shape, seam-welded and internally sealed for weathertight integrity. Standard finish is dark bronze (DDB), polyester powder, electrostatically-applied and oven-cured. Other powder architectural colors available.

DOOR FRAME — Naturally anodized, extruded, aluminum door frame is sealed to housing by a silicone, closed-cell gasket and is secured with (3) quarter turn closing screws. Can be hinged from any of the four sides.

LENS — .125" thick impact-resistant, tempered glass.

MOUNTING — Extruded, 4" aluminum arm for pole or wall mounting is shipped in fixture carton. Optional mountings available.

OPTICS — Reflectors are anodized and segmented for superior uniformity and control, which allows the flexibility to mix distributions without compromising the overall lighting job. Reflectors attach with toolless fasteners and are rotatable and interchangeable. Four cutoff distributions available: Type II (Roadway), Type III (Asymmetric), Type IV (Forward Throw)and Type V (Square).

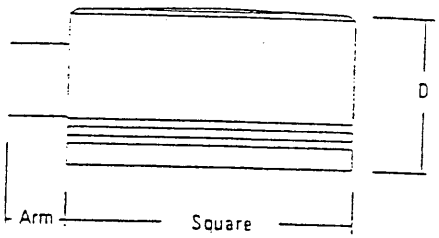
ELECTRICAL SYSTEM — Constant-wattage autotransformer, copper wound and 100% factory tested. Removable power tray and positive locking disconnect plug.

SOCKET — Porcelain, horizontally-oriented, mogul-base socket with copper alloy, nickel-plated screw shell and center contact. UL listed 1500W-600V, 4KV pulse rated.

LISTING — UL 1572 listed for wet locations. Listed and labeled to comply with Canadian standards (see options).

Standard dimensions

EPA: 1.9 ft² (.18m²) (includes arm)
Square: 19 (48.3)
Depth: 10-15/16 (27.8)
Arm length: 4 (10.2)
Weight: 39.4 lbs (17.9kg)



All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

Example: KSE2 400S R3 120 SP04 SF DDB

KSE2 400S | R5S | TB | SP04

Series

KSE2 400S

Distribution

R2 IES Type II Roadway
R3 IES Type III Asymmetric
R4 IES Type IV Forward Throw
R5S IES Type V Square

Voltage

120
208[1]
240[1]
277
347
480[1]
TB[2]

Mounting[6]

SP04 Square pole (4" arm) (standard)[3]
SP09 Square pole (9" arm)
RP04 Round pole (4" arm)[3]
RP09 Round pole (9" arm)
WW04 Wood pole or wall (4" arm)[3]
WW09 Wood pole or wall (9" arm)
WB04 Wall bracket (4" arm)
WB09 Wall bracket (9" arm)
L/ARM When ordering KMA, DA12

OPTIONAL MOUNTING
(shipped separately)

DA12P Degree arm (pole)
DA12WB Degree arm (wall)
KMA Mast arm adapter
KTMB Twin mounting bar

Options

Shipped Installed In Fixture

SF Single fuse (120, 277, 347V, n/a TB)
DF Double fuse (208, 240, 480V, n/a TB)
PER NEMA twist-lock receptacle only
QRS Quartz restrike system (150W max) (lamp not included)
EC Emergency circuit
CR Corrosion-resistant finish
CSA Listed and labeled to comply with Canadian standards

Shipped Separately[4]

PE1 NEMA twist-lock photocontrol (120, 208, 240V)
PE3 NEMA twist-lock photocontrol (347V)
PE4 NEMA twist-lock photocontrol (480V)
PE7 NEMA twist-lock photocontrol (277V)
SC Shorting cap for PER option
KSE2HS House side shield (R2,R3)
KSE2VG Vandal guard

Architectural Colors (powder finish)[5]

Standard Colors

DDB Dark bronze (standard)
DWH White
DBL Black

Classic Colors

DMB Medium bronze
DNA Natural aluminum
DSS Sandstone
DGC Charcoal gray
DTG Tennis green
DBR Bright red
DSB Steel blue

Striping[7]

Architectural Class 1 Anodize

ADB Dark Bronze
ABL Black

NOTES:

1 Consult factory for availability in Canada.
2 Optional multi-tap ballast (120, 208, 240, 277V). (120, 277, 347V in Canada).
3 The SP09, RP09 or WW09 must be used when two or more luminaires are oriented on a 90° drilling pattern.
4 May be ordered as accessory.
5 Additional architectural colors available; please see paint brochure.
6 For arm mounting, refer to technical data section in the Monarch binder for drilling template:

Mounting Option	Drilling Template
SPxx, RPxx, DA12P	5
WBxx, DA12WB	6
WWxx	7

7 For striping, add the prefix "S" in front of desired color for stripe (i.e. SDWH for white stripe).

Accessories: Tenon Mounting Slipfitter

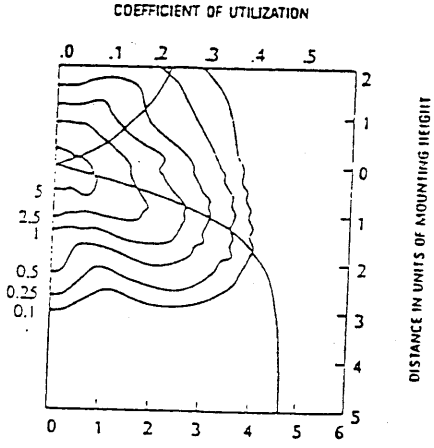
Order as separate catalog number.

Tenon O.D	Number of fixtures: One	Two@180°	Two@90°[3]	Three@120°	Three@90°[3]	Four@90°[3]
2-3/8"	T20-190	T20-280	T20-290	T20-320	T20-390	T20-490
2-7/8"	T25-190	T25-280	T25-290	T25-320	T25-390	T25-490
4"	T35-190	T35-280	T35-290	T35-320	T35-390	T35-490

KSE2 400S Premium Cutoff Lighting X1

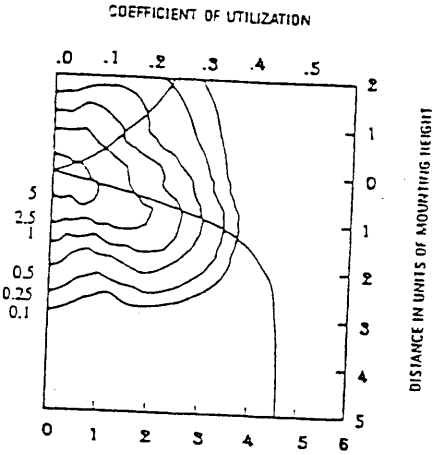
Coefficient of Utilization _____
Initial Footcandles _____

KSE2 R2 Test no. 1195020510



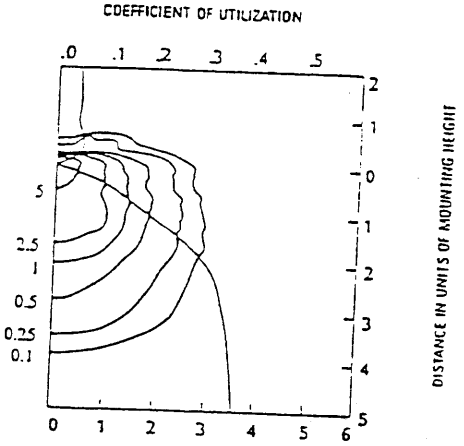
400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type II, cutoff.

KSE2 R3 Test no. 1195020561



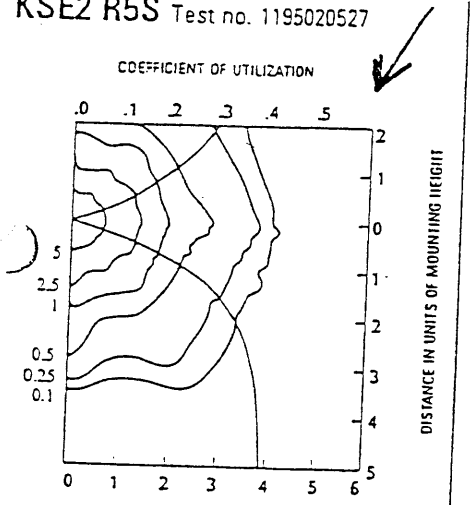
400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type III, cutoff.

KSE2 R4 Test no. 1195020525



400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type IV, cutoff.

KSE2 R5S Test no. 1195020527



400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type V, cutoff.

NOTES:

1. For electrical characteristics, consult technical data tab.
2. Tested to current IES and NEMA standards under stabilized laboratory conditions. Various operating factors can cause differences between laboratory and actual field measurements. Dimensions and specifications are based on the most current available data and are subject to change.

Mounting Height Correction Factor

(Multiply the fc level by the correction factor)

25 ft.= 1.44
32 ft.= .88
35 ft.= .73

$$\frac{\text{Existing Mounting Height}^2}{\text{New Mounting Height}^2} = \text{Correction Factor}$$

FEATURES

SHAFT — Weldable grade hot-rolled commercial-quality carbon steel tubing with a minimum yield of 55,000 psi (7 gauge), 50,000 psi (11 gauge). Uniform wall thickness of .125" or .188". Shafts are one-piece with a longitudinal electric resistance weld. Uniformly square in cross-section with flat sides, small corner radii and excellent torsion. Available shaft widths are 4", 5" and 6".

ANCHOR BASE — Fabricated from hot-rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. The anchor base is provided with round holes on 4" slotted holes on 5" and 6" poles.

HANDHOLE — A rectangular reinforced handhole rim having nominal dimensions of 3x5" for all shafts. Included is a steel cover with attachment screws.

GROUNDING — A nut holder located immediately inside the handhole rim is provided with a 1/2" – 13 UNC ground bolt and nut.

ANCHOR BOLTS — Top 12" galvanized per ASTM A-153. Made of 3/4" or 1" diameter steel rod having a minimum yield strength of 55,000 psi.

HARDWARE — Fasteners are high-strength galvanized zinc-plated or stainless steel.

TOP CAP — Weatherproof, high-strength plastic cap standard for drill-mount poles.

FINISHES — Dark bronze (DDB) polyester powder finish standard. Other architectural colors available.

BASE COVER — Automotive-grade ABS plastic full-cover finished to match pole.

Type X1

Catalog number SSS-30'-5/.188-DM19

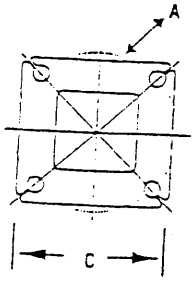
MONARCH

Anchor Base Poles

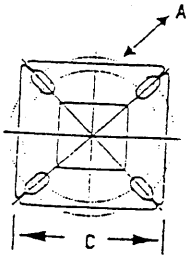
SSS

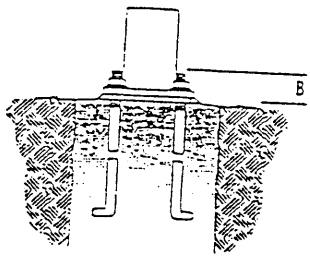
SQUARE STRAIGHT STEEL
10' to 39' Mounting

SSS 4" SHAFT



SSS 5" & 6" SHAFT





ORDERING INFORMATION

Example: SSS 30 5G DM19 DDB

Choose the boldface catalog nomenclature that best suits your needs and fill in the appropriate blank.

SSS 30' 5/.188 DM19

Shaft type
SSS

Nominal mounting height
10 – 39 feet
(See back page.)

Nominal shaft base size/ wall thickness
(See back page.)

Mounting

Tenon Mounting

PT[1]	Open top
T20	2-3/8" O.D. (2" NPS)
T25	2-7/8" O.D. (2-1/2" NPS)
T30[2]	3-1/2" O.D. (3" NPS)
T35[2]	4" O.D. (3-1/2" NPS)

Drill Mounting

DM19x[3]	1 at 90°
DM28x[3]	2 at 180°
DM28xPL[3]	2 at 180° with one side plugged
DM29x[3]	2 at 90°
DM39x[3]	3 at 90°
DM49x[3]	4 at 90°

Options

Architectural Colors (powder finish)[4]

Standard Colors

DDB	Dark bronze
DWH	White
DBL	Black

Classic Colors

DMB	Medium bronze
DNA	Natural aluminum
DSS	Sandstone
DGC	Charcoal gray
DTG	Tennis green
DBR	Bright red
DSB	Steel blue

Shaft Base Size	Bolt Circle A	Bolt Projection B	Base Square C	Anchor Bolt Description	Warehouse Anchor Bolt Description	Template Number
4"C	8-1/2"	2-3/4"–4"	8"	ABSSS-4C	AB18-0	PJ50004
4"G	8-1/2"	2-3/4"–4"	8"	ABSSS-4G	AB30-0	PJ50004
5"	10"–12"	3-3/8"–4"	11"	ABSSS-5	AB36-0	PJ50010
6"	11"–13"	3-3/8"–4"	12-1/2"	ABSSS-6	AB36-0	PJ50011

NOTES:
1. KKS series luminaires will fit 4" square poles only.
2. 3-1/2" and 4" Tenons available on 5" and 6" shafts only.
3. The drilling template to be used for a particular luminaire depends on the luminaire that is used.

Replace "x" with	Drilling Template Reference Number	Drilling for Luminaire Series
1	1	ORCG1, ORDG1
2	2	KRES1
3	3	KRE1, KRES2, KSES1, ORCG2, ORDG2
KSS2 4	4	KRE2, KSES2, ORC1, ORC2, ORD1, ORD2
→ Blank	5	All other Lithonia Area Luminaires

Refer to the Technical Data Section of the Monarch Binder for Drilling Templates.

4. Additional architectural colors available: see paint brochure

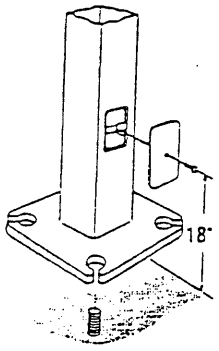
IMPORTANT:
1. Do not erect poles without fixtures in place.
2. Factory-supplied templates must be used when setting anchor bolts. Lithonia will not be responsible for claim for incorrect anchorage placement due to failure to use factory template.
3. If poles are stored outside, protective wrapping paper and cardboard must be removed immediately to prevent finish damage.

SSS Square Straight Steel Poles

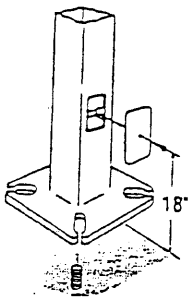
TECHNICAL INFORMATION

Catalog Number	Nominal mounting height (feet)	Pole Shaft Size (inches x feet)	Wall Thickness (inches)	EPA (ft²) with 1.3 gust				Max. weight	Bolt Circle (inches)	Bolt Size (in. x in. x in.)	Approximate ship weight (pounds)
				70 mph	80 mph	90 mph	100 mph				
SSS 10 4C	10	4.0 x 10.0	0.125	43.8	31.0	25.6	19.5	300	8-1/2	¾ x 18 x 3	96.7
SSS 12 4C	12	4.0 x 12.0	0.125	35.5	25.5	20.4	14.5	300	8-1/2	¾ x 18 x 3	109.6
SSS 14 4C	14	4.0 x 14.0	0.125	29.4	20.5	16.5	11.5	300	8-1/2	¾ x 18 x 3	122.5
SSS 16 4C	16	4.0 x 16.0	0.125	19.8	13.5	10.7	7.5	300	8-1/2	¾ x 18 x 3	135.4
SSS 18 4C	18	4.0 x 18.0	0.125	16.6	11.0	8.5	5.5	300	8-1/2	¾ x 18 x 3	148.4
SSS 20 4C	20	4.0 x 20.0	0.125	13.9	9.5	6.7	4.5	300	8-1/2	¾ x 18 x 3	161.3
SSS 20 4G	20	4.0 x 20.0	0.188	21.8	15.1	11.4	8.0	300	8-1/2	¾ x 30 x 3	226.5
SSS 20 5C	20	5.0 x 20.0	0.125	23.7	16.8	12.1	8.8	300	10--12	1 x 36 x 4	164.3
SSS 20 5G	20	5.0 x 20.0	0.188	36.7	24.5	20.0	14.5	400	10--12	1 x 36 x 4	293.7
SSS 25 4C	25	4.0 x 25.0	0.125	7.9	4.7	2.6	1.2	300	8-1/2	¾ x 18 x 3	200
SSS 25 4G	25	4.0 x 25.0	0.188	15	9.5	6.7	3.5	300	8-1/2	¾ x 30 x 3	273.6
SSS 25 5C	25	5.0 x 25.0	0.125	15.7	10.4	6.6	4.0	300	10--12	1 x 36 x 4	224.2
SSS 25 5G	25	5.0 x 25.0	0.188	26.3	16.5	12.9	8.5	400	10--12	1 x 36 x 4	353.5
SSS 30 5C	30	5.0 x 30.0	0.125	10	5.5	2.4	--	300	10--12	1 x 36 x 4	260.8
SSS 30 5G	30	5.0 x 30.0	0.188	18.7	12.1	7.6	4.4	400	10--12	1 x 36 x 4	413.4
SSS 30 6G	30	6.0 x 30.0	0.188	30	18.0	13.7	7.6	400	11--13	1 x 36 x 4	496.2
SSS 35 5G	35	5.0 x 35.0	0.188	11.5	5.5	2.8	--	400	10--12	1 x 36 x 4	473.2
SSS 35 6G	35	6.0 x 35.0	0.188	19.6	10.5	6.9	2.5	400	11--13	1 x 36 x 4	568.8
SSS 39 6G	40	6.0 x 39.0	0.188	14.5	7.5	3.1	--	400	11--13	1 x 36 x 4	626.9

BASE DETAIL SSS 4" SHAFT



BASE DETAIL SSS 5" & 6" SHAFT



POLE OPTIONS

SUFFIX	DESCRIPTION
FDL [1,2]	Festoon Outlet – less electrical
FGL [1,2]	Festoon GFI Outlet – less electrical
H1-18S [1]	Horizontal Arm Bracket – 1 fixture
VD	Vibration Damper (5" and 6" poles only)
L/AB	Less Anchor Bolts
HH [3]	Extra Handhole

IMPORTANT:

- These specifications are intended for general purposes only. Lithonia reserves the right to change ...l or design, without prior notice, in a continuing effort to upgrade its products.
- ...llation requires grout to be packed under base to ensure full contact with foundation.

NOTES:

1. Specify location orientation when ordering (specify orientation from handhole).
2. Consult factory for more details concerning festoon outlets.
3. Combination of Tenon-top and drill mount requires extra handhole.

LITHONIA LIGHTING
SPECIFICATION OUTDOOR LIGHTING
1515 EAST ELMORE ST. CRAWFORDS...

Type X2

Catalog number R4 TB SP04

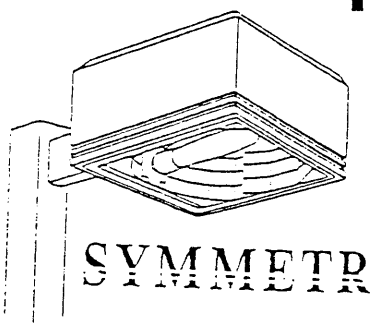
MONARCH

Premium Cutoff Lighting

KSE2 400S

400W HIGH PRESSURE SODIUM

20' to 35' Mounting



SYMMETRA

FEATURES

HOUSING — Rugged, heavy-gauge, .12" thick, lightweight extruded aluminum housing. Square shape, seam-welded and internally sealed for weathertight integrity. Standard finish is dark bronze (DDB), polyester powder, electrostatically-applied and oven-cured. Other powder architectural colors available.

DOOR FRAME — Naturally anodized, extruded, aluminum door frame is sealed to housing by a silicone, closed-cell gasket and is secured with (3) quarter turn closing screws. Can be hinged from any of the four sides.

LENS — .125" thick impact-resistant, tempered glass.

MOUNTING — Extruded, 4" aluminum arm for pole or wall mounting is shipped in fixture carton. Optional mountings available.

OPTICS — Reflectors are anodized and segmented for superior uniformity and control, which allows the flexibility to mix distributions without compromising the overall lighting job. Reflectors attach with toolless fasteners and are rotatable and interchangeable. Four cutoff distributions available: Type II (Roadway), Type III (Asymmetric), Type IV (Forward Throw)and Type V (Square).

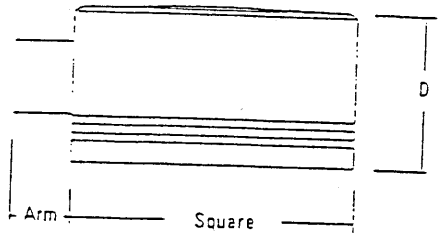
ELECTRICAL SYSTEM — Constant-wattage autotransformer, copper wound and 100% factory tested. Removable power tray and positive locking disconnect plug.

SOCKET — Porcelain, horizontally-oriented, mogul-base socket with copper alloy, nickel-plated screw shell and center contact. UL listed 1500W-600V, 4KV pulse rated.

LISTING — UL 1572 listed for wet locations. Listed and labeled to comply with Canadian standards (see options).

Standard dimensions

EPA: 1.9 ft² (.18m²) (includes arm)
Square: 19 (48.3)
Depth: 10-15/16 (27.8)
Arm length: 4 (10.2)
Weight: 39.4 lbs (17.9kg)



All dimensions are inches (centimeters) unless otherwise specified.

ORDERING INFORMATION

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number.

Example: KSE2 400S R3 120 SP04 SF DDB

KSE2 400S R4 TB SP04

Series

KSE2 400S

Distribution

R2	IES Type II Roadway
R3	IES Type III Asymmetric
R4	IES Type IV Forward Throw
R5S	IES Type V Square

Voltage

120
208[1]
240[1]
277
347
480[1]
TB[2]

Mounting[6]

SP04	Square pole (4" arm) (standard)[3]
SP09	Square pole (9" arm)
RP04	Round pole (4" arm)[3]
RP09	Round pole (9" arm)
WW04	Wood pole or wall (4" arm)[3]
WW09	Wood pole or wall (9" arm)
WB04	Wall bracket (4" arm)
WB09	Wall bracket (9" arm)
L/ARM	When ordering KMA, DA12

OPTIONAL MOUNTING
(shipped separately)

DA12P	Degree arm (pole)
DA12WB	Degree arm (wall)
KMA	Mast arm adapter
KTMB	Twin mounting bar

Options

Shipped Installed In Fixture

SF	Single fuse (120, 277, 347V, n/a TB)
DF	Double fuse (208, 240, 480V, n/a TB)
PER	NEMA twist-lock receptacle only
QRS	Quartz restrike system (150W max) (lamp not included)
EC	Emergency circuit
CR	Corrosion-resistant finish
CSA	Listed and labeled to comply with Canadian standards

Shipped Separately[4]

PE1	NEMA twist-lock photocontrol (120, 208, 240V)
PE3	NEMA twist-lock photocontrol (347V)
PE4	NEMA twist-lock photocontrol (480V)
PE7	NEMA twist-lock photocontrol (277V)
SC	Shorting cap for PER option
KSE2HS	House side shield (R2,R3)
KSE2VG	Vandal guard

Architectural Colors (powder finish)[5]

Standard Colors

DDB	Dark bronze (standard)
DWH	White
DBL	Black

Classic Colors

DMB	Medium bronze
DNA	Natural aluminum
DSS	Sandstone
DGC	Charcoal gray
DTG	Tennis green
DBR	Bright red
DSB	Steel blue

Striping[7]

Architectural Class 1 Anodize

ADB	Dark Bronze
ABL	Black

NOTES:

1 Consult factory for availability in Canada.

2 Optional multi-tap ballast (120, 208, 240, 277V). (120, 277, 347V in Canada).

3 The SP09, RP09 or WW09 must be used when two or more luminaires are oriented on a 90° drilling pattern.

4 May be ordered as accessory.

5 Additional architectural colors available; please see paint brochure.

6 For arm mounting, refer to technical data section in the Monarch binder for drilling template:

Mounting Option	Drilling Template
SPxx, RPxx, DA12P	5
WBxx, DA12WB	6
WWxx	7

7 For striping, add the prefix "S" in front of desired color for stripe (i.e. SDWH for white stripe).

Accessories: Tenon Mounting Slipfitter

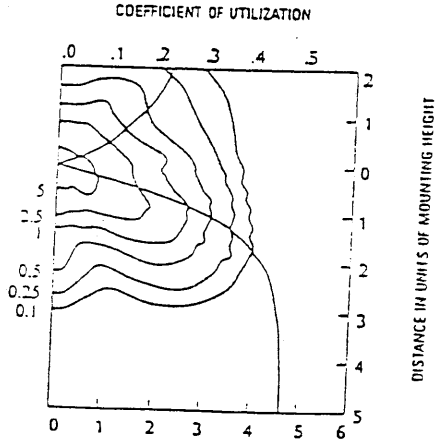
Order as separate catalog number.

Tenon O.D.	Number of fixtures: One	Two@180°	Two@90°[3]	Three@120°	Three@90°[3]	Four@90°[3]
2-3/8"	T20-190	T20-280	T20-290	T20-320	T20-390	T20-490
2-7/8"	T25-190	T25-280	T25-290	T25-320	T25-390	T25-490
4"	T35-190	T35-280	T35-290	T35-320	T35-390	T35-490

KSE2 400S Premium Cutoff Lighting X2

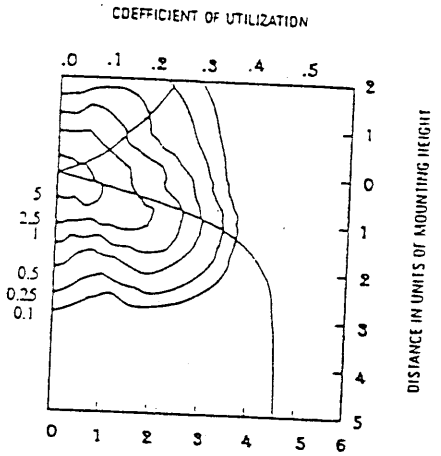
Coefficient of Utilization _____
Initial Footcandles _____

KSE2 R2 Test no. 1195020510



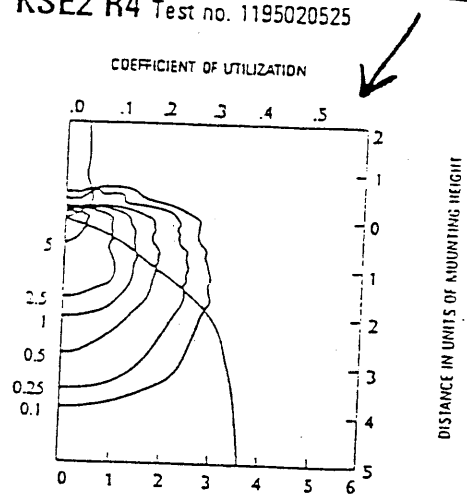
400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type II, cutoff.

KSE2 R3 Test no. 1195020561



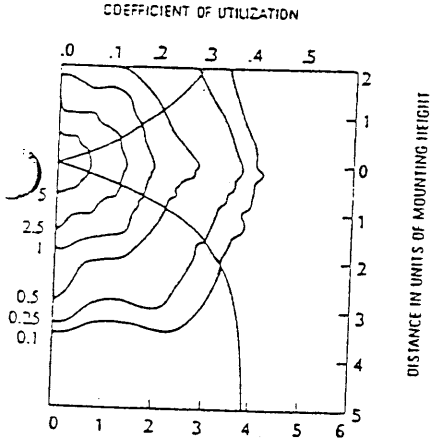
400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type III, cutoff.

KSE2 R4 Test no. 1195020525



400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type IV, cutoff.

KSE2 R5S Test no. 1195020527



400W High Pressure Sodium Lamp, 50,000 rated lumens. Footcandle values based on 30' mounting height. Distribution Type V, cutoff.

NOTES:

1. For electrical characteristics, consult technical data tab.
2. Tested to current IES and NEMA standards under stabilized laboratory conditions. Various operating factors can cause differences between laboratory and actual field measurements. Dimensions and specifications are based on the most current available data and are subject to change.

Mounting Height Correction Factor

(Multiply the fc level by the correction factor)

25 ft.= 1.44
32 ft.= .88
35 ft.= .73

$$\frac{\text{Existing Mounting Height}^2}{\text{New Mounting Height}^2} = \text{Correction Factor}$$

Type X2

Catalog number SSS-30'-5/.188-DM19

MONARCH

Anchor Base Poles

SSS

SQUARE STRAIGHT STEEL
10' to 39' Mounting

FEATURES

SHAFT — Weldable grade hot-rolled commercial-quality carbon steel tubing with a minimum yield of 55,000 psi (7 gauge), 50,000 psi (11 gauge). Uniform wall thickness of .125" or .188". Shafts are one-piece with a longitudinal electric resistance weld. Uniformly square in cross-section with flat sides, small corner radii and excellent torsion. Available shaft widths are 4", 5" and 6".

ANCHOR BASE — Fabricated from hot-rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. The anchor base is provided with round holes on 4" slotted holes on 5" and 6" poles.

HANDHOLE — A rectangular reinforced handhole rim having nominal dimensions of 3x5" for all shafts. Included is a steel cover with attachment screws.

GROUNDING — A nut holder located immediately inside the handhole rim is provided with a 1/2" – 13 UNC ground bolt and nut.

ANCHOR BOLTS — Top 12" galvanized per ASTM A-153. Made of 3/4" or 1" diameter steel rod having a minimum yield strength of 55,000 psi.

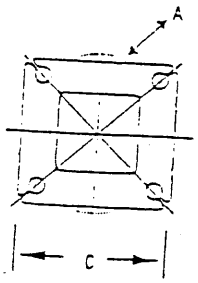
HARDWARE — Fasteners are high-strength galvanized zinc-plated or stainless steel.

TOP CAP — Weatherproof, high-strength plastic cap standard for drill-mount poles.

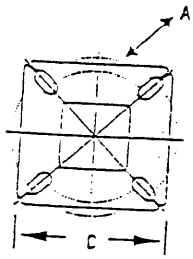
FINISHES — Dark bronze (DDB) polyester powder finish standard. Other architectural colors available.

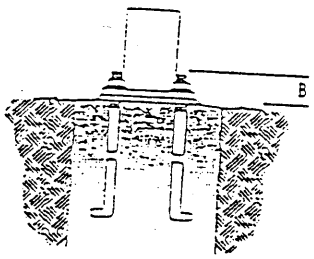
BASE COVER — Automotive-grade ABS plastic full-cover finished to match pole.

SSS 4" SHAFT



SSS 5" & 6" SHAFT





ORDERING INFORMATION

Use the boldface catalog nomenclature that best suits your needs and fill in the appropriate blank.

Example: SSS 30 5G DM19 DDB

SSS	30'	5/.188	DM19	
Shaft type	Nominal mounting height	Nominal shaft base size/ wall thickness	Mounting	Options
SSS	10 – 39 feet (See back page.)	(See back page.)		

Tenon Mounting

PT	Open top
T20	2-3/8" O.D. (2" NPS)
T25	2-7/8" O.D. (2-1/2" NPS)
T30 [2]	3-1/2" O.D. (3" NPS)
T35 [2]	4" O.D. (3-1/2" NPS)

Drill Mounting

DM19x [3]	1 at 90°
DM28x [3]	2 at 180°
DM28xPL [3]	2 at 180° with one side plugged
DM29x [3]	2 at 90°
DM39x [3]	3 at 90°
DM45x [3]	4 at 90°

Options

Architectural Colors (powder finish) [4]

Standard Colors

DDB	Dark bronze
DWH	White
DBL	Black

Classic Colors

DMB	Medium bronze
DNA	Natural aluminum
DSS	Sandstone
DGC	Charcoal gray
DTG	Tennis green
DBR	Bright red
DSB	Steel blue

Shaft Base Size	Bolt Circle A	Bolt Projection B	Base Square C	Anchor Bolt Description	Warehouse Anchor Bolt Description	Template Number
4"C	8-1/2"	2-3/4"–4"	8"	ABSSS-4C	AB18-0	PJ50004
4"G	8-1/2"	2-3/4"–4"	8"	ABSSS-4G	AB30-0	PJ50004
5"	10"–12"	3-3/8"–4"	11"	ABSSS-5	AB36-0	PJ50010
6"	11"–13"	3-3/8"–4"	12-1/2"	ABSSS-6	AB36-0	PJ50011

NOTES:

1. KKS series luminaires will fit 4" square poles only.
2. 3-1/2" and 4" Tenons available on 5" and 6" shafts only.
3. The drilling template to be used for a particular luminaire depends on the luminaire that is used.

Replace "X" with	Drilling Template Reference Number	Drilling for Luminaire Series
1	1	ORCG1, ORDG1
2	2	KRES1
3	3	KRE1, KRES2, KSES1, ORDG2, ORDG7
4	4	KRE2, KSES2, ORC1, ORC2, ORD1, ORD2
→ Blank	5	All other Lithonia Area Luminaires

KSS2

Refer to the Technical Data Section of the Monarch Binder for Drilling Templates.

4 Additional architectural colors available: see paint brochure

IMPORTANT:

Do not erect poles without fixtures in place.

Factory supplied templates must be used when setting anchor bolts. Lithonia will not be responsible for incorrect anchorage placement due to failure to use factory template.

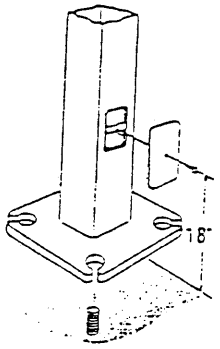
Pole must be stored outside, protective wrapping paper and cardboard must be removed immediately to prevent finish damage.

SSS Square Straight Steel Poles X2

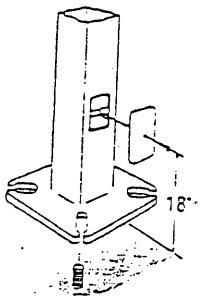
TECHNICAL INFORMATION

Catalog Number	Nominal mounting height (feet)	Pole Shaft Size (inches x feet)	Wall Thickness (inches)	EPA (ft²) with 1.3 gust				Max. weight	Bolt Circle (inches)	Bolt Size (in. x in. x in.)	Approximate ship weight (pounds)
				70 mph	80 mph	90 mph	100 mph				
SSS 10 4C	10	4.0 x 10.0	0.125	43.8	31.0	25.6	19.5	300	8-1/2	¾ x 18 x 3	96.7
SSS 12 4C	12	4.0 x 12.0	0.125	35.5	25.5	20.4	14.5	300	8-1/2	¾ x 18 x 3	109.6
SSS 14 4C	14	4.0 x 14.0	0.125	29.4	20.5	16.3	11.5	300	8-1/2	¾ x 18 x 3	122.5
SSS 16 4C	16	4.0 x 16.0	0.125	19.8	13.5	10.7	7.5	300	8-1/2	¾ x 18 x 3	135.4
SSS 18 4C	18	4.0 x 18.0	0.125	16.6	11.0	8.5	5.5	300	8-1/2	¾ x 18 x 3	148.4
SSS 20 4C	20	4.0 x 20.0	0.125	13.9	9.5	6.7	4.5	300	8-1/2	¾ x 18 x 3	161.3
SSS 20 4G	20	4.0 x 20.0	0.188	21.8	15.1	11.4	8.0	300	8-1/2	¾ x 30 x 3	226.5
SSS 20 5C	20	5.0 x 20.0	0.125	23.7	16.8	12.1	8.8	300	10--12	1 x 36 x 4	164.3
SSS 20 5G	20	5.0 x 20.0	0.188	36.7	24.5	20.0	14.5	400	10--12	1 x 36 x 4	293.7
SSS 25 4C	25	4.0 x 25.0	0.125	7.9	4.7	2.6	1.2	300	8-1/2	¾ x 18 x 3	200
SSS 25 4G	25	4.0 x 25.0	0.188	15	9.5	6.7	3.5	300	8-1/2	¾ x 30 x 3	273.6
SSS 25 5C	25	5.0 x 25.0	0.125	15.7	10.4	6.6	4.0	300	10--12	1 x 36 x 4	224.2
SSS 25 5G	25	5.0 x 25.0	0.188	26.3	16.5	12.9	8.5	400	10--12	1 x 36 x 4	353.5
SSS 30 5C	30	5.0 x 30.0	0.125	10	5.5	2.4	--	300	10--12	1 x 36 x 4	260.8
SSS 30 5G	30	5.0 x 30.0	0.188	18.7	12.1	7.5	4.4	400	10--12	1 x 36 x 4	413.4
SSS 30 6G	30	6.0 x 30.0	0.188	30	18.0	13.7	7.5	400	11--13	1 x 36 x 4	496.2
SSS 35 5G	35	5.0 x 35.0	0.188	11.5	5.5	2.8	--	400	10--12	1 x 36 x 4	473.2
SSS 35 6G	35	6.0 x 35.0	0.188	19.6	10.5	6.9	2.5	400	11--13	1 x 36 x 4	568.8
SSS 39 6G	40	6.0 x 39.0	0.188	14.5	7.5	3.1	--	400	11--13	1 x 36 x 4	626.9

BASE DETAIL SSS 4" SHAFT



BASE DETAIL SSS 5" & 6" SHAFT



POLE OPTIONS

SUFFIX	DESCRIPTION
FDL [1,2]	Festoon Outlet – less electrical
FGL [1,2]	Festoon GFI Outlet – less electrical
H1-18S [1]	Horizontal Arm Bracket – 1 fixture
VD	Vibration Damper (5" and 6" poles only)
LAB	Less Anchor Bolts
HH [3]	Extra Handhole

IMPORTANT:

...e specifications are intended for general purposes only. Lithonia reserves the right to change ...l or design, without prior notice, in a continuing effort to upgrade its products.

...ion requires grout to be packed under base to ensure full contact with foundation.

NOTES:

1. Specify location orientation when ordering (specify orientation from handhole).
2. Consult factory for more details concerning festoon outlets.
3. Combination of Tenon-top and drill mount requires extra handhole.

LITHONIA LIGHTING
SPECIFICATION OUTDOOR LIGHTING

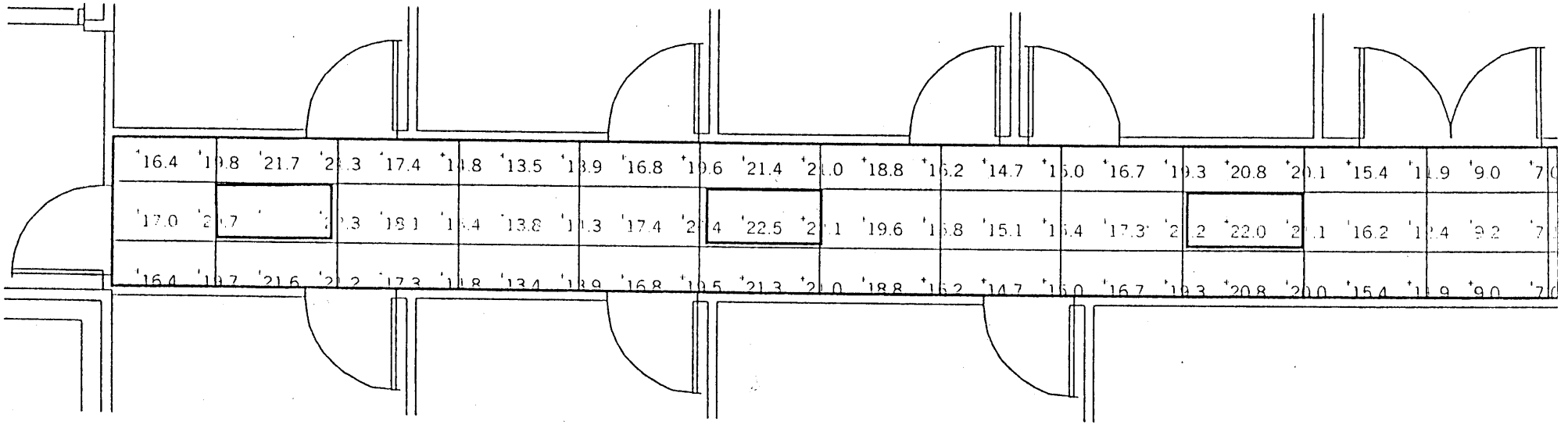
LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	J2	3	2SP 2 32 A12	SPEC TROFFER, 2'X4' 2LP T8 A12 PRISMATIC LENS	2900 LM LAMP	L4876.ies.txt	2900	0.75	71

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
SURFACE	17.0 fc	22.8 fc	7.0 fc	3.3:1	2.4:1

CORRIDOR
100D



Plan View

Scale 1" = 5'

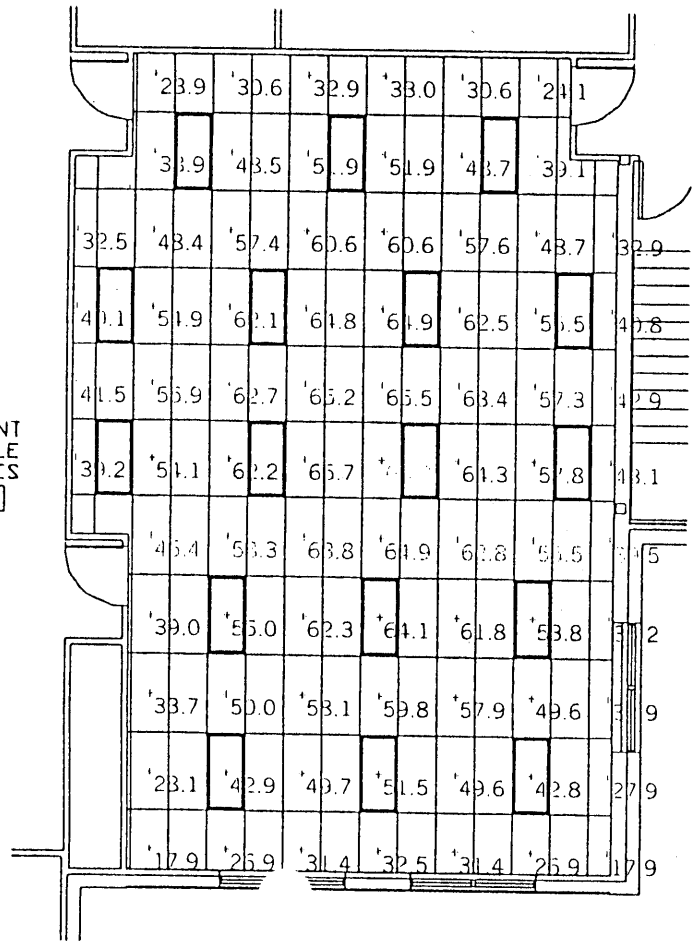
CHEMISTRY - 1st FLOOR

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
[ ]	A3	17	2SP 3 32 A12125 1/3 TUBI	SPECIFICATION PREMIUM TROFFER 2' X 4' 3 LAMP T8 REFRACTIVE GRID LENS	2850 LM LAMP	L5861.ies.txt	2850	0.75	87

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #1	48.0 fc	66.2 fc	17.9 fc	3.7:1	2.7:1



Plan View
Scale 1" = 10'

STUDENT CUBICLE OFFICES
233

CHEMISTRY - 2nd FLOOR

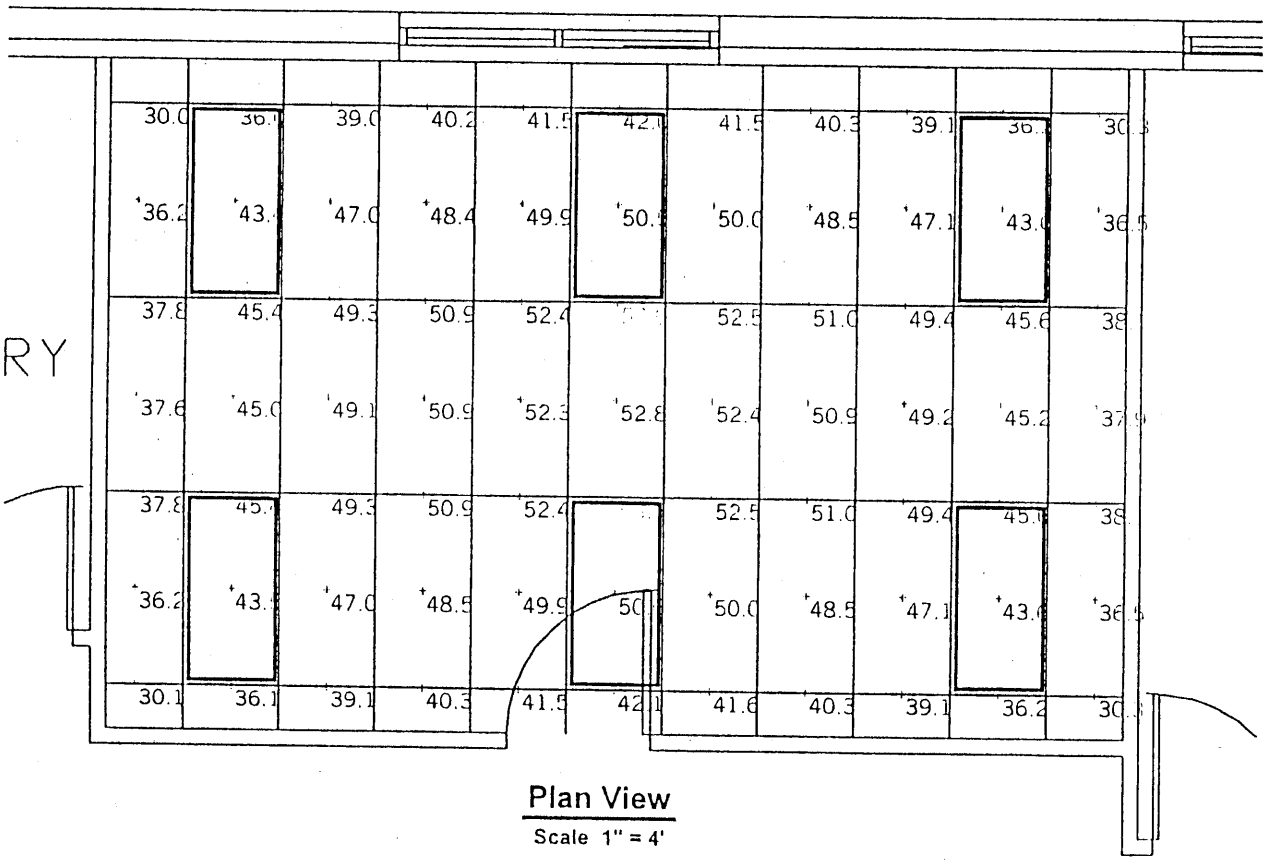
Calculated

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A2	6	2SP 2 32 A12	SPEC TROFFER, 2'X4' 2LP T8 REFRACTIVE GRID LENS	2900 LM LAMP	L4876.ies.txt	2900	1.00	71

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #8	44.3 fc	53.0 fc	30.0 fc	1.8:1	1.5:1



Plan View
Scale 1" = 4'

CHEMISTRY - 2nd FLOOR

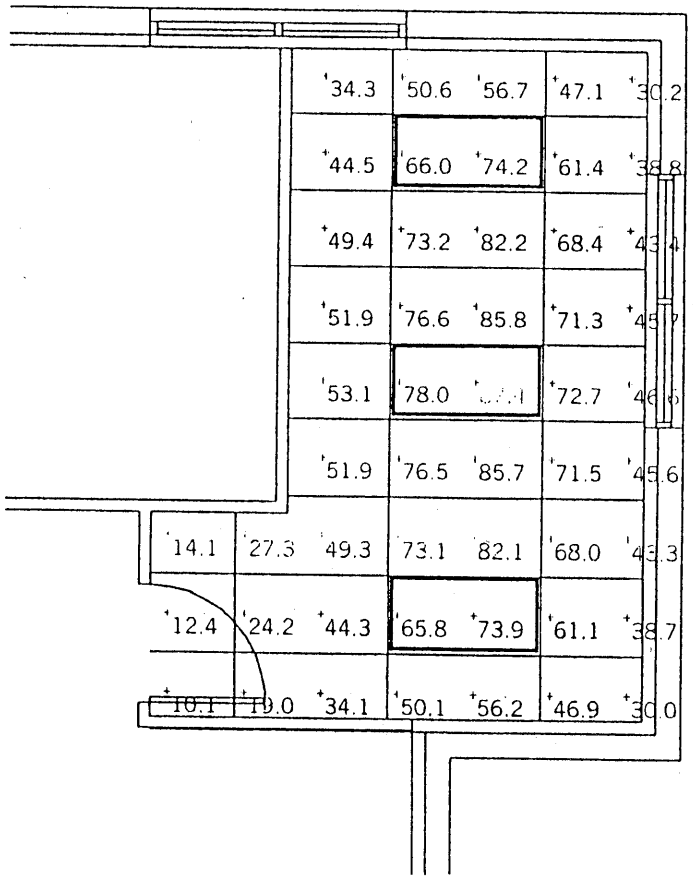
Calculated

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	A4	3	2SP 4 32 A12	SPEC TROFFER, 2'X4' 4LP T8 REFRACTIVE GRID LENS	2900 LM LAMP	L5540.ies.txt	2900	0.75	119

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
WORKPLANE	53.8 fc	87.4 fc	10.1 fc	8.7:1	5.3:1



Plan View

Scale 1" = 5'

CHEMISTRY - 2nd FLOOR

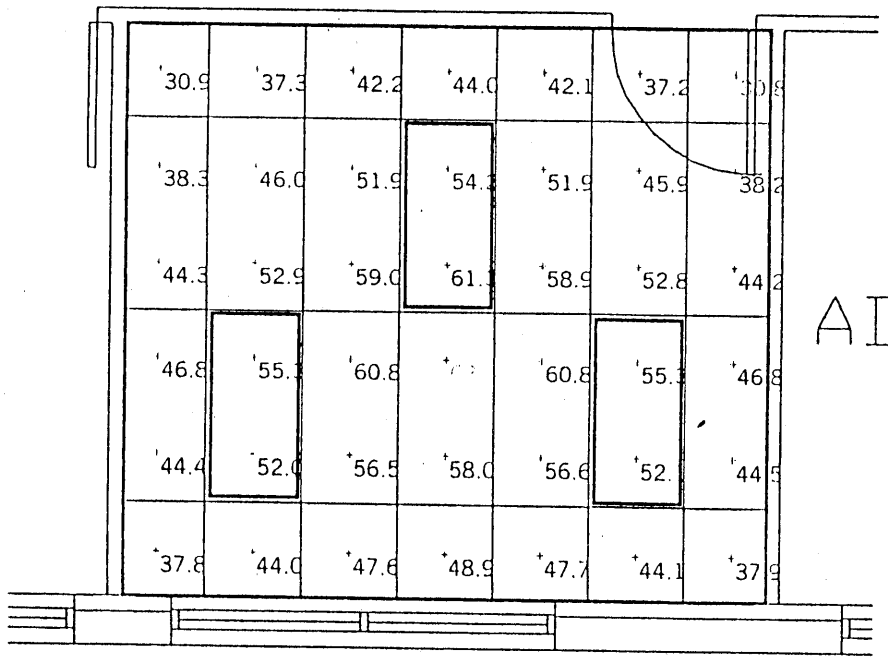
Calculated ; include direct and interreflected components.

LUMIN. .RE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF
	A3	3	2SP 3 32 A12125 1/3 TUBI	SPECIFICATION PREMIUM TROFFER 2' X 4' 3 LAMP T8 REFRACTIVE GRID LENS	2850 LM LAMP	L5861.ies.txt	2850	0.71

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #7	48.2 fc	62.7 fc	30.8 fc	2.0:1	1.6:1



E-DIVISION
ADMINISTRATIVE
4.3

ROOM 119

CHEMISTRY - 1st FLOOR

Plan View
Scale 1" = 4'

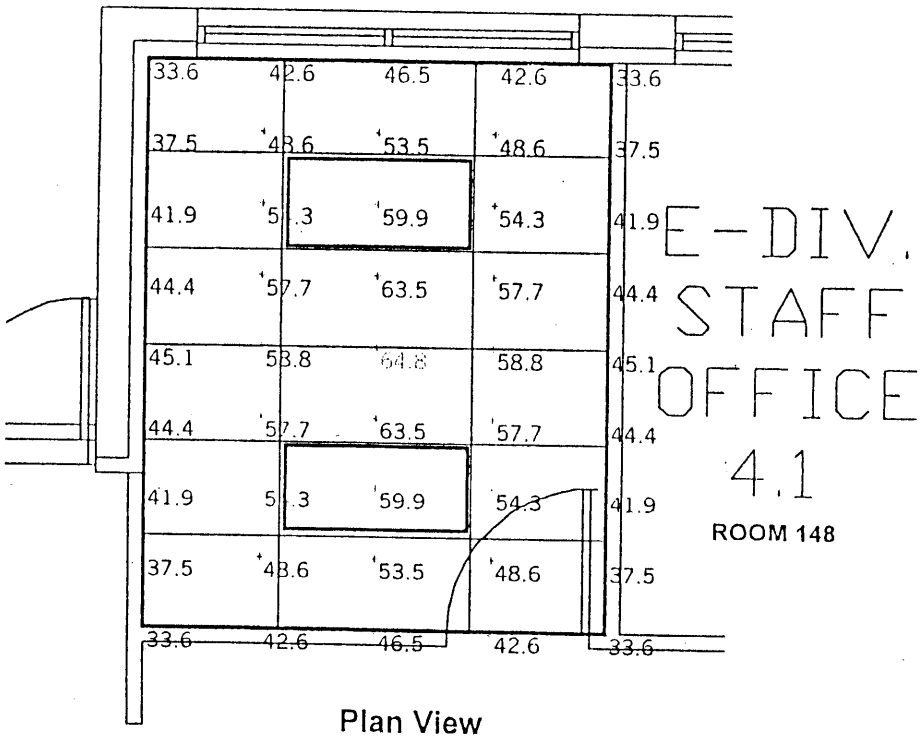
Calculated Include direct and interreflected components.

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF
	A4	2	2SP 4 32 A12	SPEC TROFFER, 2'X4' 4LP T8 REFRACTIVE GRID LENS	2900 LM LAMP	L5540.ies.txt	2900	0.71

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #12	48.0 fc	64.8 fc	33.6 fc	1.9:1	1.4:1



Plan View

Scale 1" = 4'

CHEMISTRY - 1st FLOOR

Calculated v include direct and interreflected components

1. Purpose and Objective

To determine appropriate lighting parameters and perform lighting calculations based on those parameters.

2. The Methodology and Acceptance Criteria

The lighting calculations will be done utilizing the "Visual" computer program, Release 2, as distributed by Lithonia Lighting. The point by point method will be used with lighting levels as recommended by the IESNA Handbook, Ninth Edition as required by the RFP Specification Section 16525.

3. The Design Inputs

From IESNA Handbook, Ninth Edition, Chapter 22

- Recommended illuminance values for parking lots:
  - Minimum horizontal illuminance = 0.2 foot candles
  - Maximum-to-Minimum uniformity ratio = 20:1 or less

4. The References

- Project RFP
- IESNA Handbook, Ninth Edition, Chapter 22
- "Visual" computer program, Release 2 light fixture photometric data.

5. The Calculations

See attached.

6. The Summary and Conclusions

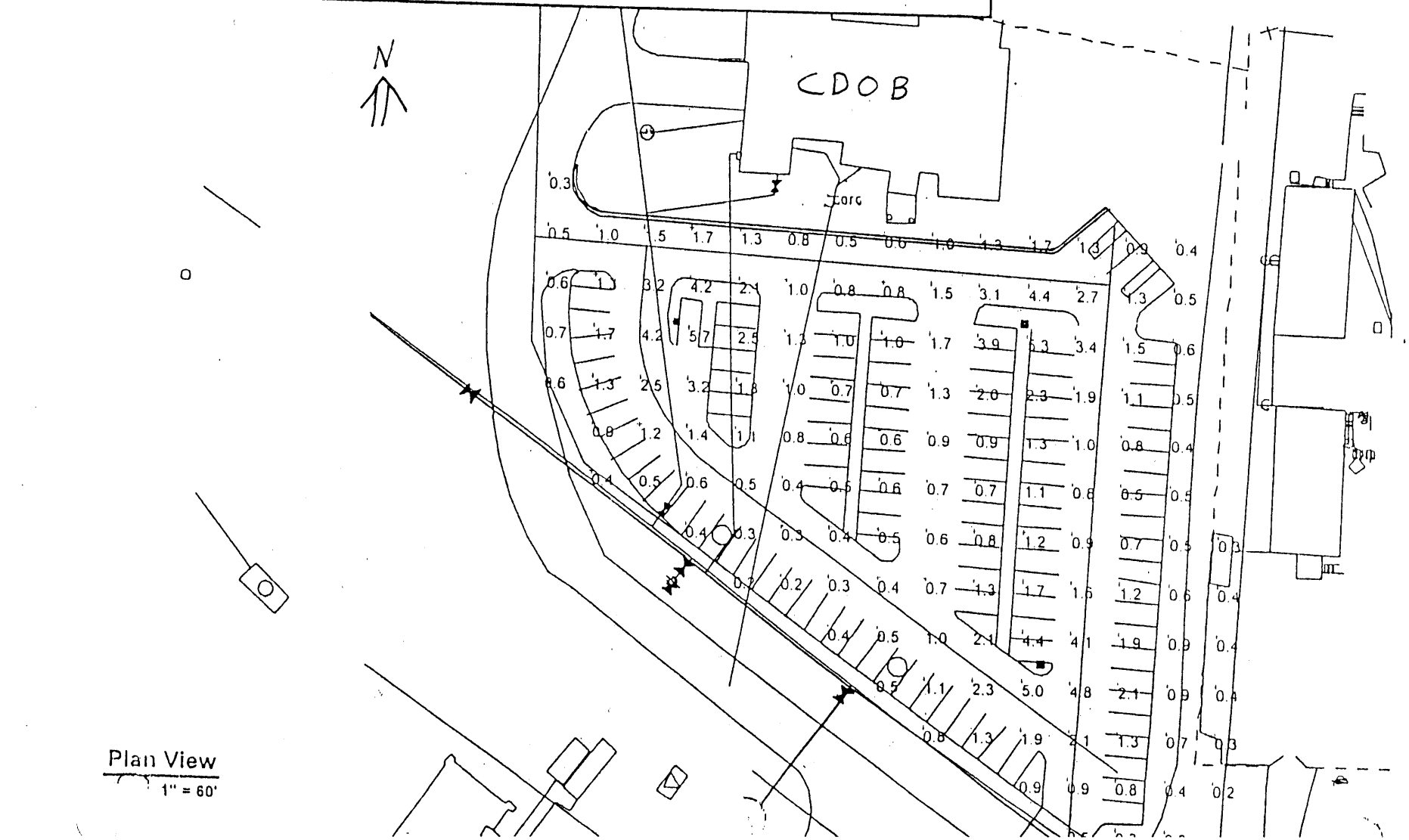
- The East Parking Lot calculation is extended back to the sidewalk area adjacent to the building to illustrate that there is adequate light to illuminate this area. The calculation shows if the parking lot itself is evaluated for maximum to minimum uniformity, the maximum is 1.9 and the minimum is .7 for a uniformity ratio of 2.7:1. This is well within the 20:1 uniformity ratio and .2 footcandles minimum required.
- The West Parking Lot has a minimum horizontal illuminance of 0.2 footcandles with a maximum to minimum uniformity ratio of 28.5:1. The minimum footcandle value meets the IESNA requirement. The maximum to minimum ratio does not meet the IESNA requirement. To meet the 20:1 maximum to minimum ratio, the minimum value would have to be 0.3 footcandles. There are only 3 points on the calculation that are less than 0.3 footcandles and these points are at the outer limits of the calculation. If we throw out those 3 points, the lighting layout meets the IESNA maximum to minimum ratio.

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF
	X1	3	KSE2 400S R5S	TYPE 5 , SHORT , CUTOFF	400 WATT HIGH PRESSURE SODIUM	KSE2400S.ies .txt	50000	0.75

STATISTICS

Description	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #2	1.3 fc	5.7 fc	0.2 fc	28.5:1	6.5:1



WATER EFFICIENCY

WE Credit 1.1: Water Efficient Landscaping - Reduce by 50%

Intent

Limit or eliminate the use of potable water for landscape irrigation.

Requirements

Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

Submittals

☒ Provide the LEED Letter Template, signed by the architect, engineer or responsible party, declaring that potable water consumption for site irrigation has been reduced by 50%. Include a brief narrative of the equipment used and/or the use of drought tolerant or native plants.

Narrative

Credit satisfied (see attached certification statement).

Water Efficiency Credit 1.1

I _____ (LANL PMD Construction Project Manager) do hereby certify that the Chemistry Division Office Building (CDOB) at Los Alamos National Laboratory does not have permanent landscape irrigation. The majority of the project site is covered by the building, concrete walkways, and asphalt roadways and parking areas. The remaining areas have been reseeded with a perennial mix of native, drought-tolerant flowers and grasses. Straw mulch was used in conjunction with seeding, and where seeding was performed on slopes 2:1 or greater, soil retention blankets were used instead of straw mulch. Once temporary watering has established grass stands, no additional water will be required. As a result, no permanent irrigation system was installed at CDOB. The attached figure delineates the landscaped areas associated with CDOB.

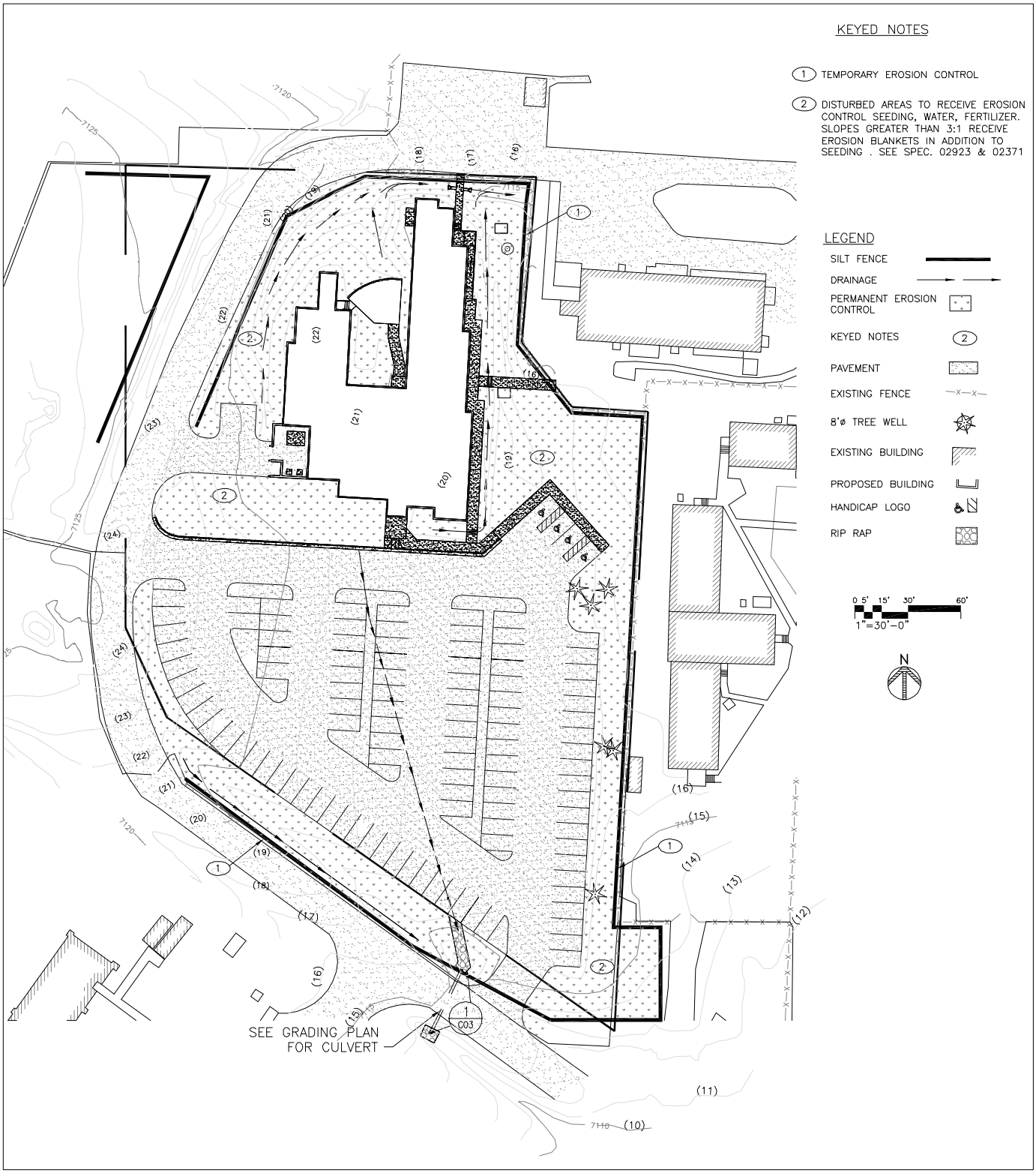
Name: (LANL PMD Construction Project Manager)

Organization: (LANL Project Management Division)

Role in Project: (Construction Project Manager)

Signature: (as appropriate)

Date: (as appropriate)



833094.02000000/A5

Figure 4. Chemistry Division Office Building Landscaping Plan

WE Credit 1.2: Water Efficient Landscaping - No Potable Use or No Irrigation

Intent

Limit or eliminate the use of potable water for landscape irrigation.

Requirements

Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.

Submittals

☐ Provide the LEED Letter Template, signed by the responsible architect and/or engineer, declaring that the project site will not use potable water for irrigation. Include a narrative describing the captured rain system, the recycled site water system, and their holding capacity. List all the plant species used. Include calculations demonstrating that irrigation requirements can be met from captured rain or recycled site water.

OR

☒ Provide the LEED Letter Template, signed by the landscape architect or responsible party, declaring that the project site does not have a permanent landscape irrigation system. Include a narrative describing how the landscape design allows for this.

Narrative

Credit satisfied (see attached certification statement). Most of the site is covered by concrete or asphalt. A few small areas will be seeded with native and/or drought-tolerant flowers and grasses. Once these become acclimated they will not require watering, therefore no permanent irrigation system was installed.

Water Efficiency Credit 1.2

I _____ (LANL PMD Construction Project Manager) do hereby certify that the Chemistry Division Office Building (CDOB) at Los Alamos National Laboratory does not have permanent landscape irrigation. The majority of the project site is covered by the building, concrete walkways, and asphalt roadways and parking areas. The remaining areas have been reseeded with a perennial mix of native, drought-tolerant flowers and grasses. Straw mulch was used in conjunction with seeding, and where seeding was performed on slopes 2:1 or greater, soil retention blankets were used instead of straw mulch. Once temporary watering has established grass stands, no additional water will be required. As a result, no permanent irrigation system was installed at CDOB. (See Figure 4 under Water Efficiency Credit 1.1).

Name: (LANL PMD Construction Project Manager)

Organization: (LANL Project Management Division)

Role in Project: (Construction Project Manager)

Signature: (as appropriate)

Date: (as appropriate)

WE Credit 2: Innovative Wastewater Technologies

Intent

Reduce generation of wastewater and potable water demand, while increasing the local aquifer recharge.

Requirements

Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR treat 100% of wastewater on site to tertiary standards.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, MEP engineer or responsible party, declaring that water for building sewage conveyance will be reduced by at least 50%. Include the spreadsheet calculation and a narrative demonstrating the measures used to reduce wastewater by at least 50% from baseline conditions.

OR

☐ Provide the LEED Letter Template, signed by the civil engineer or responsible party, declaring that 100% of wastewater will be treated to tertiary standards on site. Include a narrative describing the on-site wastewater treatment system.

Narrative

Credit not satisfied. No specific measures were implemented at CDOB to reduce the generation of wastewater and potable water demands. A LANL-specific example of how this credit could be achieved involves the recently constructed Strategic Computing Complex, which was designed to use treated wastewater from the LANL complex for cooling tower applications.

WE Credit 3.1: Water Use Reduction - 20% Reduction

Intent

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

Submittals

- ☐ Provide the LEED Letter Template, signed by the MEP engineer or responsible party, declaring that the project uses 20% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- ☐ Provide the spreadsheet calculation demonstrating that water consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 20% compared to baseline conditions

Narrative

Credit not satisfied. Evaluation of the occupancy-based water consumption at CDOB is based on plumbing fixtures associated with the bathrooms, kitchenette/break room, and drinking fountains. The attached spreadsheet provides a comparison of the occupancy-based water consumption for CDOB relative to baseline fixture performance requirements of EPACT. Although faucets installed in the bathrooms and kitchenette/break room exceed EPACT requirements (thus having lower flow rates), the evaluation shows the primary source of occupancy-based water consumption at CDOB results from water closets and urinals. Since CDOB is equipped with EPACT compliant water closets and urinals, only limited water use reduction relative to EPACT compliant fixtures was identified. Further evaluation shows that if, for example, waterless urinals had also been installed at CDOB this credit would have been satisfied.

Water Efficiency Credit 3.1
Water Efficiency Evaluation for LANL CDOB Facility

Flush Fixtures	Daily Uses	Flow Rate EPACT Compliant (gpf)	Flow Rate CDOB Fixtures (gpf)	Duration (flush)	Auto Controls	Occupants	Total Daily Water Use EPACT Compliant (gal)	Total Daily Water Use CDOB Fixtures (gal)
Water Closet (male)	1	1.6	1.6	1	NA	40	64.00	64.00
Water Closet (female)	3	1.6	1.6	1	NA	45	216.00	216.00
Urinal (male)	2	1.0	1.0	1	NA	40	80.00	80.00
Urinal (female)	0	1.0	1.0	1	NA	45	0.00	0.00

Flow Fixtures	Daily Uses	Flow Rate EPACT Compliant (gpm)	Flow Rate CDOB Fixtures (gpm)	Duration (sec.)	Auto Controls (% saved)	Occupants	Total Daily Water Use EPACT Compliant (gal)	Total Daily Water Use CDOB Fixtures (gal)
lavatory sink	3	2.5	2.0	15	NA	85	159.38	127.50
kitchen sink	1	2.5	2.2	15	NA	85	53.13	46.75
drinking fountain	2	0.5	0.5	10	NA	85	14.17	14.17

	Total Water Use EPACT (gal)	Total Water Use CDOB (gal)
Total Daily Water Use (gal)	586.67	548.42
Work Days	245	245
Annual Water Use (gal)	143,733	134,362
Annual Water Use Reduction (%)		6.5%

Water Efficiency Credit 3.1
Water Efficiency Evaluation for LANL CDOB Facility
(Assuming Use of Waterless Urinals)

Flush Fixtures	Daily Uses	Flow Rate EPACT Compliant (gpf)	Flow Rate CDOB Fixtures (gpf)	Duration (flush)	Auto Controls	Occupants	Total Daily Water Use EPACT Compliant (gal)	Total Daily Water Use CDOB Fixtures (gal)
Water Closet (male)	1	1.6	1.6	1	NA	40	64.00	64.00
Water Closet (female)	3	1.6	1.6	1	NA	45	216.00	216.00
Urinal (male)	2	1.0	**0.0**	1	NA	40	80.00	**0.00**
Urinal (female)	0	1.0	1.0	1	NA	45	0.00	0.00

Flow Fixtures	Daily Uses	Flow Rate EPACT Compliant (gpm)	Flow Rate CDOB Fixtures (gpm)	Duration (sec.)	Auto Controls (% saved)	Occupants	Total Daily Water Use EPACT Compliant (gal)	Total Daily Water Use CDOB Fixtures (gal)
lavatory sink	3	2.5	2.0	15	NA	85	159.38	127.50
kitchen sink	1	2.5	2.2	15	NA	85	53.13	46.75
drinking fountain	2	0.5	0.5	10	NA	85	14.17	14.17

	Total Water Use EPACT (gal)	Total Water Use CDOB (gal)
Total Daily Water Use (gal)	586.67	468.42
Work Days	245	245
Annual Water Use (gal)	143,733	114,762
Annual Water Use Reduction (%)		**20.2%**

WE Credit 3.2: Water Use Reduction - 30% Reduction

Intent

Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements

Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including outdoor irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

Submittals

- ☐ Provide the LEED Letter Template, signed by the MEP engineer or responsible party, declaring that the project uses 30% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- ☐ Provide the spreadsheet calculation demonstrating that water consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 30% compared to baseline conditions.

Narrative

Credit not satisfied. See narrative for WE Credit 3.1.

ENERGY & ATMOSPHERE

EA Prerequisite 1: Fundamental Building Systems Commissioning

Intent

Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirements

Implement or have a contract in place to implement all of the following fundamental best practice commissioning procedures.

- Engage a commissioning authority.
- Develop owner's performance requirements for energy, water and IEQ and review the basis of design to verify performance requirements have been met.
- Incorporate commissioning requirements into the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and operation and maintenance documentation.
- Complete a commissioning report.

Submittals

☐ Provide a LEED Letter Template, signed by the commissioning authority, certifying that the fundamental commissioning procedures as listed in the credit requirements have been successfully executed and the design intent of the building has been achieved.

OR

☒ Provide a LEED Letter Template, signed by the owner or responsible party, affirming that commissioning services will be provided under contract. Include a copy of the signed contract.

Narrative

Prerequisite satisfied. To satisfy the submittal requirements for this prerequisite prior to actually conducting all of the commissioning activities requires certification that commissioning services will be provided under contract (with copy of signed contract attached). Since the contractor will provide the commissioning services for CDOB with verification oversight provided by a LANL testing and inspection team, contract documentation of the required commissioning services to be provided would meet this submittal requirement (see attached certification statement and evaluation table). It is important to note that contractual requirements should directly correspond to the commissioning procedure requirements listed for this credit. Specifications 15100 and 15900 delineate the contracted commissioning services to be provided for CDOB. These

EA Prerequisite 1: Fundamental Building Systems Commissioning

(continued)

specifications could be revised to better reflect correspondence between the commissioning procedures required for compliance with this prerequisite and the commissioning services to be provided by the contractor.

Energy & Atmosphere Prerequisite 1

I _____ (LANL PMD Project Manager) do hereby certify that the fundamental commissioning procedures as listed in the credit requirements will be provided by (contractor or subcontractor, as appropriate) as described in the attached scope of work.

Name: (LANL PMD Project Manager)

Organization: (LANL Project Management Division)

Role in Project: (Construction Project Manager)

Signature: (as appropriate)

Date: (as appropriate)

Energy & Atmosphere Prerequisite 1:
Fundamental Building Systems Commissioning Compliance Evaluation

Prerequisite Requirements	Basis for Compliance
Engage a commissioning authority	Commissioning of the fundamental building systems for CDOB is the responsibility of the Contractor, based on Specifications 15100 and 15900. In addition, a LANL testing and inspection team will confirm building commissioning results by performing an acceptance test following completion of the contractor's commissioning activities.
Development of energy, water, and IEQ performance requirements and verify design meets intent	CDOB performance requirements for energy, water, and IEQ, could require specific documentation as part of the overall commissioning plan, but may be developed as part of the energy conservation goals described in Specification 15100, Paragraph 1.4 (minimum compliance with ASHRAE 90.1) as well as the Energy Conservation Report. Specification 15900, Section 3.2, A (1), requires a testing and inspection (i.e., commissioning) program that ensures the systems are "functioning as specified and as required." In addition, Specification 15900, Section 2.2, B, requires the control system to be integral in attaining the energy conservation goals described in Specification 15100, Paragraph 1.4, which includes the Energy Conservation Report (ECR).
Incorporate commissioning requirements into construction documents	Specifications 15100 and 15900 provide contractual requirements to perform building systems commissioning. Specification 15100 specifically requires use of ASHRAE Guideline 1 for commissioning of the HVAC system.
Develop and utilize a commissioning Plan	Specification 15900 requires development and approval of a Testing and Inspection Program.
Verify installation, functional performance, training and O&M documentation	Installation and functional performance are required as part of the required on-site operational acceptance test. Specification 15900, Paragraph 3.3, provides training requirements and O&M documentation requirements.
Complete a commissioning report	Specification 15900, Paragraph 3.2 (B 7), requires the contractor to maintain complete test and inspection records and incorporate these into a report for each piece of equipment tested. The test reports are to be included as a section in the O&M manual.

EA Prerequisite 2: Minimum Energy Performance

Intent

Establish the minimum level of energy efficiency for the base building and systems.

Requirements

Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments) or the local energy code, whichever is more stringent.

Submittals

☒ Provide a LEED Letter Template, signed by a licensed professional engineer or architect, stating that the building complies with ASHRAE/IESNA 90.1-1999 or local energy codes. If local energy codes were applied, demonstrate that the local code is equivalent to, or more stringent than, ASHRAE/IESNA 90.1-1999 (without amendments).

Narrative

Prerequisite satisfied (see attached certification statement).

Energy & Atmosphere Prerequisite 2

I _____ (Contractor's Licensed Professional Engineer) do hereby certify that the CDOB complies with ASHRAE/IESNA 90.1-1999 as determined by application of the Energy Budget Method (or applicable energy modeling code).

Name: (Contractor's Licensed Professional Engineer)

Organization: (Company Name)

Role in Project: (as appropriate)

Signature: (as appropriate)

Date: (as appropriate)

EA Prerequisite 3: CFC Reduction in HVAC&R Equipment

Intent

Reduce ozone depletion.

Requirements

Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion.

Submittals

☒ Provide a LEED Letter Template, signed by a licensed professional engineer or architect, declaring that the building's HVAC&R systems do not use CFC-based refrigerants.

Narrative

Prerequisite satisfied. Review of the product literature for the YORK Model YCAL0050EC46XBA Air Cooled Scroll Chiller and the Liebert Model MMD18E-PHE0G Mini-Mate 2 Evaporator/Condensor units revealed these systems utilize the refrigerant R-22, which is an HCFC. Therefore, this prerequisite is satisfied (see attached certification statement).

Energy & Atmosphere Prerequisite 3

I _____ (Contractor's Licensed Professional Engineer) do hereby certify that the HVAC&R equipment specified and installed at CDOB do not use CFC-based refrigerants.

Name: (Contractor's Licensed Professional Engineer)

Organization: (Company Name)

Role in Project: (as appropriate)

Signature: (as appropriate)

Date: (as appropriate)

EA Credit 1: Optimize Energy Performance

Intent

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirements

Reduce design energy cost compared to the energy cost budget for energy systems regulated by ASHRAE/IESNA Standard 90.1-1999 (without amendments), as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of the Standard.

New Bldgs.	Existing Bldgs.	Points
15%	5%	1
20%	10%	2
25%	15%	3
30%	20%	4
35%	25%	5
40%	30%	6
45%	35%	7
50%	40%	8
55%	45%	9
60%	50%	10

Regulated energy systems include HVAC (heating, cooling, fans, and pumps), service hot water, and interior lighting. Non-regulated systems include plug loads, exterior lighting, garage ventilation and elevators (vertical transportation). Two methods may be used to separate energy consumption for regulated systems. The energy consumption for each fuel may be prorated according to the fraction of energy used by regulated and non-regulated energy. Alternatively, separate meters (accounting) may be created in the energy simulation program for regulated and non-regulated energy uses.

If an analysis has been made comparing the proposed design to local energy standards and the USGBC has determined equivalency between the local code and ASHRAE/IESNA Standard 90.1-1999, then the comparison against the local code may be used in lieu of the ASHRAE Standard.

Project teams are encouraged to apply for innovation credits if the energy consumption of non-regulated systems is also reduced.

EA Credit 1: Optimize Energy Performance

(continued)

Submittals

☒ Complete the LEED Letter Template incorporating a quantitative summary table showing the energy saving strategies incorporated in the building design.

☒ Demonstrate via summary printout from energy simulation software that the design energy cost is less than the energy cost budget as defined in ASHRAE/IESNA 90.1-1999, Section 11.

Narrative

Credit satisfied. The attached energy performance evaluation summary presents the submittal documentation required to support compliance with this credit. Conducting such an energy performance evaluation would be the responsibility of the AE contractor. Based on the 20.37 percent reduction in design energy cost for CDOB, 2 points are achieved under this credit.

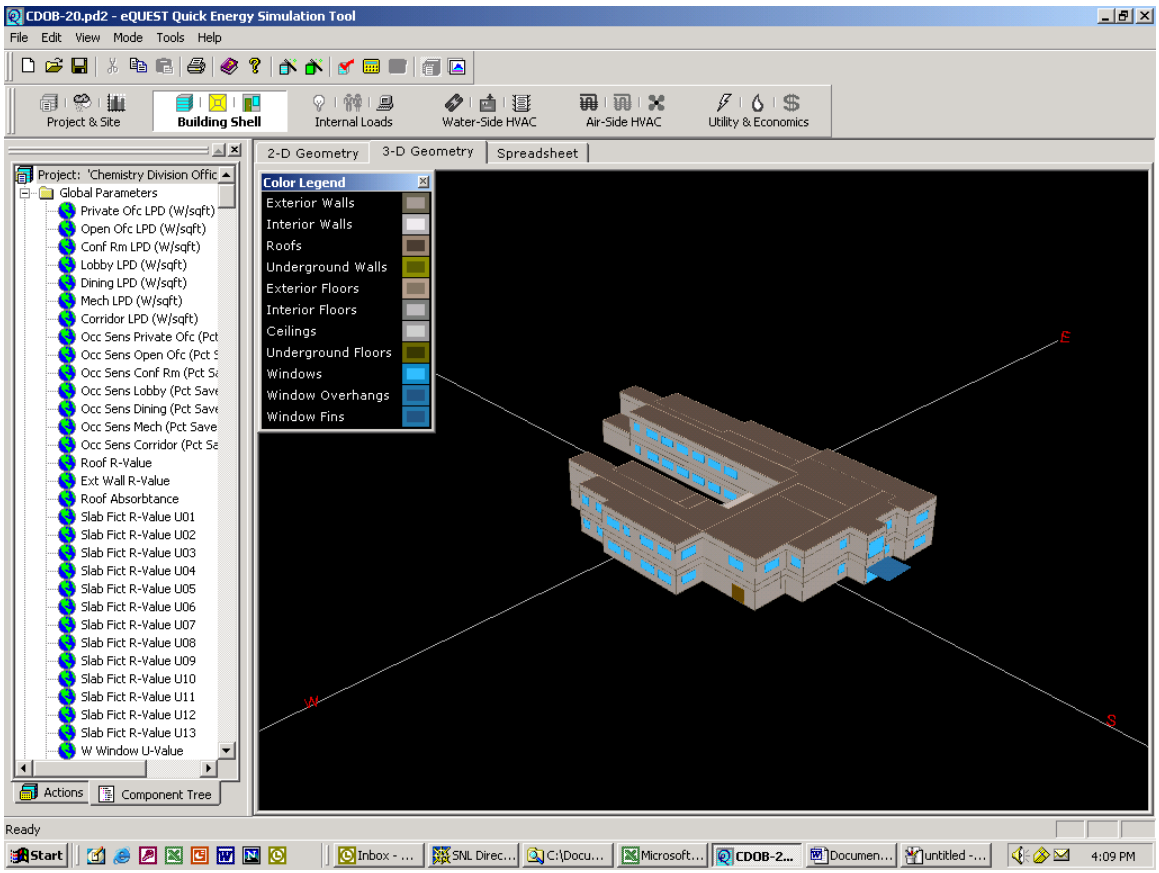
Energy & Atmosphere Credit 1

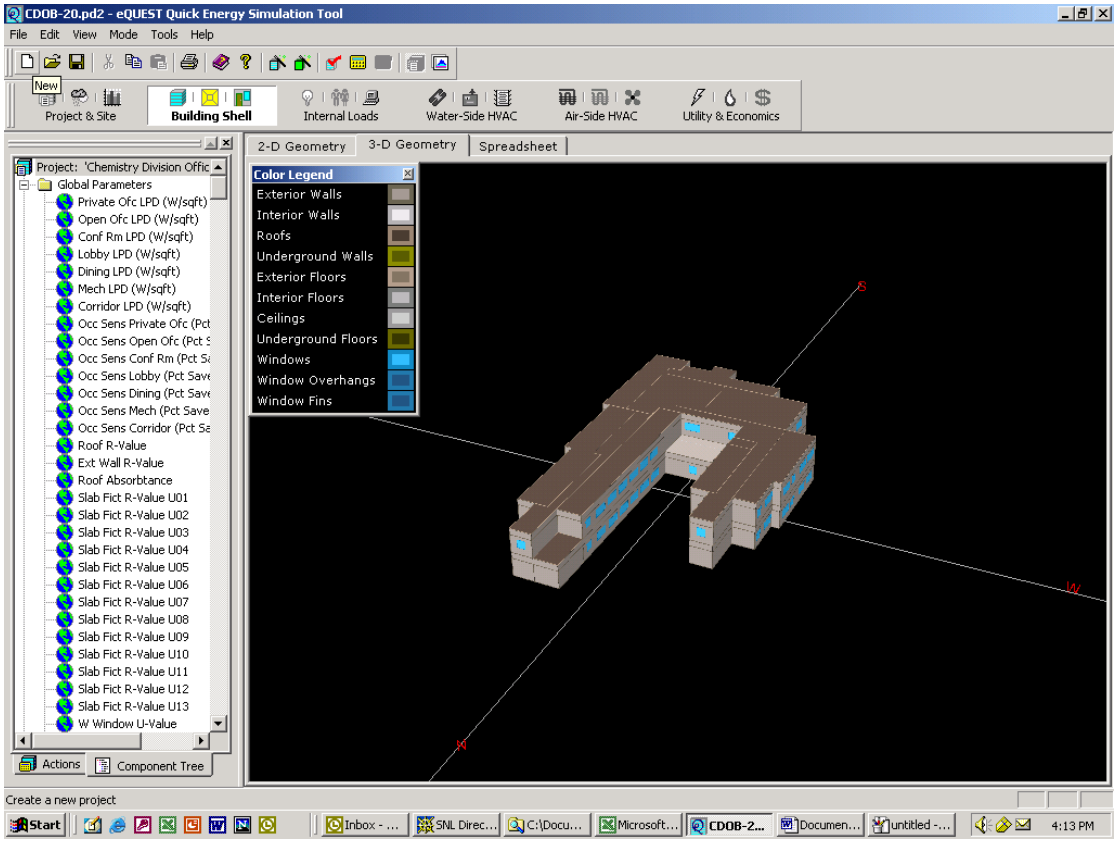
The LANL Chemistry Division Office Building (CDOB) incorporated the following energy-saving measures.

- Added insulation to the roof and a highly reflective roof surface.
- Additional insulation in the exterior walls.
- Perimeter and under slab insulation
- Energy efficient glazing and thermally broken window frames
- Occupancy sensors
- High efficiency boilers and chillers

These energy saving features result in a cost savings of 20.37% when compared to an ASHRAE 90.1-1999 code compliant building, resulting in 2 LEED credits.

To determine the design energy cost (DEC) compared to the energy cost budget (ECB) for regulated components an energy simulation was performed using eQuest/DOE2 software. The CDOB was constructed in the model using exact dimensions and performance data from construction drawings, submittals and construction specifications. The two screens below show the building as portrayed in the eQuest/DOE2 model.





The Table below compares the basic ASHRAE 90.1-1999 requirements for building components with those actually installed in CDOB. These values were translated into parameters in eQuest/DOE2 and formed the basis for the simulation.

Comparison of ASHRAE 90.1-1999 Base Building Requirements and Chemistry Division Office Building

Building Component	Energy Efficient Feature	Unit	ASHRAE 90.1 Base Building	Chemistry Division Office Building
Roof	Roof Insulation	R value (min)	15	40
	Roof Assembly	U value (max)	0.063	0.025
	Albedo	reflectivity	0.3	0.45
Exterior Walls, Above Grade	Wall Insulation	R value (min)	8.13	8.46
	Wall Assembly	U value (max)	0.123	0.118
Slab	Insulation	NR		
	Assembly	F value (max)	0.73	0.48
Doors	Opaque Doors, non-swinging	U Value (max)	1.45	1.45
	Air Leakage	cfm/SF	0.4	.4
Fenestration	Vertical Glazing (10-20% of wall)	U (west)	0.57	0.31
		U (all)	0.57	0.48
		SC (north)	0.57	0.46
		SC (west)	0.45	0.38
		SC (all)	0.45	0.46

Comparison of ASHRAE 90.1-1999 Base Building Requirements and
Chemistry Division Office Building (continued)

Building Component	Energy Efficient Feature	Unit	ASHRAE 90.1 Base Building	Chemistry Division Office Building
Private Office	Lighting	LPD (W/sqft)	1.5	1.88
	Occ Sens % Savings		0%	25%
Open Office	Lighting	LPD (W/sqft)	1.3	1.24
	Occ Sens % Savings		0%	10%
Conference Rooms	Lighting	LPD (W/sqft)	1.5	1.33
	Occ Sens % Savings		0%	45%
Lobby	Lighting	LPD (W/sqft)	1.8	1.33
	Occ Sens % Savings		0%	30%
Dining Area	Lighting	LPD (W/sqft)	1.4	1.49
	Occ Sens % Savings		0%	20%
Electrical/Mechanical	Lighting	LPD (W/sqft)	1.3	1.4
	Occ Sens % Savings		0%	50%
Aggregate Corridor	Lighting	LPD (W/sqft)	0.72	0.73
	Occ Sens % Savings		0%	30%
Chiller	Efficiency	COP	2.800	2.836
Boiler	Efficiency	Eff	75%	84%

The results from the simulation are contained below. For the both the ECB (ASHRAE 90.1-1999 base case) and the DEC (CDOB as constructed), two of the simulation files are presented. The BEPU file identifies the end uses of energy (electric and natural gas) for both non-regulated and regulated energy uses. Non-regulated uses represent end uses that can be excluded form the ASHRAE analysis, because they are fixed sources and identical for both the ECB and the DEC. In the case of the CDOB these are plug loads and computer room equipment. These end uses were assigned to a separate meter (NonRegElec) in the model. The ES-D file summarizes the overall cost of energy for regulated and non-regulated end uses.

The table below presents the energy cost savings for CDOB when compared to an ASHRAE Base Building.

Energy Cost Budget Building				
Energy Use	Regulated?	Amount	Units	Cost
electric	yes	120477	kWh	$7,229
electric	no	43340	kWh	$2,600
natural gas	yes	4426	Therm	$1,326
			TOTAL (ECB-regulated)	$8,555
Design Energy Cost Building				
Energy Use	Regulated?	Amount	Units	Cost
electric	yes	90962	kWh	$5,458
electric	no	43281	kWh	$2,597
natural gas	yes	4453	Therm	$1,354
			TOTAL (DEC-regulated)	$6,812
			% SAVED = ($ECB - $DEC)/$ECB =	20.37%

CDOB DESIGNED ENERGY COST BUILDING SIMULATION FILES

Chemistry Division Office Building DOE-B2.2D38g 10/29/2002 17:03:01 BDL RUN 1

REPORT- BEPU Building Utility Performance (Chemistry Division Office Building) WEATHER FILE- Los Alamos NM TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
NonR ELECTRICITY													
KWH	0.	0.	41156.	548.	1186.	0.	301.	91.	0.	0.	0.	0.	43281.
RegL ELECTRICITY													
KWH	37723.	0.	0.	2776.	27967.	43.	6264.	10728.	0.	0.	5461.	0.	90962.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	4453.	0.	0.	0.	0.	0.	0.	0.	0.	4453.

TOTAL ELECTRICITY 134243. KWH 6.347 KWH /SQFT-YR GROSS-AREA 6.347 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS 4453. THERM 0.211 THERM /SQFT-YR GROSS-AREA 0.211 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.2
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0
NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Chemistry Division Office Building DOE-B2.2D38g 10/29/2002 17:03:01 BDL RUN 1

REPORT- ES-D Energy Cost Summary WEATHER FILE- Los Alamos NM TMY2

UTILITY-RATE	RESOURCE	METERS	METERED ENERGY UNITS/YR	TOTAL CHARGE ($)	VIRTUAL RATE ($/UNIT)	RATE USED ALL YEAR?
RegElec LANL Rate	ELECTRICITY	RegL	90962. KWH	5458.	0.0600	YES
LANL NatGas Rate	NATURAL-GAS	FM1	4453. THERM	1354.	0.3040	YES
NonRegElec LANL Rate	ELECTRICITY	NonR	43281. KWH	2597.	0.0600	YES
				==========		
				9408.		

ASHRAE 90.1-1999 ENERGY COST BUDGET BUILDING SIMULATION FILES

Chemistry Division Office Building DOE-B2.2D38g 10/29/2002 17:01:52 BDL RUN 1

REPORT- BEPU Building Utility Performance (ASHRAE 90.1-1999 BASE BUILDING) WEATHER FILE- Los Alamos NM TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
NonR ELECTRICITY													
KWH	0.	0.	41156.	529.	1273.	0.	291.	92.	0.	0.	0.	0.	43340.
RegL ELECTRICITY													
KWH	53365.	0.	0.	2542.	32412.	52.	3910.	22734.	0.	0.	5461.	0.	120477.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	4526.	0.	0.	0.	0.	0.	0.	0.	0.	4526.

TOTAL ELECTRICITY 163818. KWH 7.746 KWH /SQFT-YR GROSS-AREA 7.746 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS 4526. THERM 0.214 THERM /SQFT-YR GROSS-AREA 0.214 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.6
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.0
NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Chemistry Division Office Building DOE-B2.2D38g 10/29/2002 17:01:52 BDL RUN 1

REPORT- ES-D Energy Cost Summary (ASHRAE 90.1-1999 BASE BUILDING) WEATHER FILE- Los Alamos NM TMY2

UTILITY-RATE	RESOURCE	METERS	METERED ENERGY UNITS/YR	TOTAL CHARGE ($)	VIRTUAL RATE ($/UNIT)	RATE USED ALL YEAR?
RegElec LANL Rate	ELECTRICITY	RegL	120477. KWH	7229.	0.0600	YES
LANL NatGas Rate	NATURAL-GAS	FM1	4526. THERM	1376.	0.3040	YES
NonRegElec LANL Rate	ELECTRICITY	NonR	43340. KWH	2600.	0.0600	YES
				11205.		

EA Credit 2.1: Renewable Energy - 5%

Intent

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements

Supply 5% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that 5% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that 5% of total energy costs are supplied by the renewable energy system(s).

Narrative

Credit not attempted. No on-site renewable energy technologies (such as solar, wind, or biomass power generation) were included in the scope of CDOB.

EA Credit 2.2: Renewable Energy- 10%

Intent

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements

Supply 10% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that 10% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that 10% of total energy costs are supplied by the renewable energy system(s).

Narrative

Credit not attempted. No on-site renewable energy technologies (such as solar, wind, or biomass power generation) were included in the scope of CDOB.

EA Credit 2.3: Renewable Energy- 20%

Intent

Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements

Supply 20% of the building's total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that 20% of the building's energy is provided by on-site renewable energy. Include a narrative describing on-site renewable energy systems installed in the building and calculations demonstrating that 20% of total energy costs are supplied by the renewable energy system(s).

Narrative

Credit not attempted. No on-site renewable energy technologies (such as solar, wind, or biomass power generation) were included in the scope of CDOB.

EA Credit 3: Additional Commissioning

Intent

Verify and ensure that the entire building is designed, constructed and calibrated to operate as intended.

Requirements

In addition to the Fundamental Building Commissioning prerequisite, implement or have a contract in place to implement the following additional commissioning tasks:

1. A commissioning authority independent of the design team shall conduct a focused review of the design prior to the construction documents phase.
2. The independent commissioning authority shall conduct a focused review of the construction documents near completion of the construction document development and prior to issuing the contract documents for construction.
3. The independent commissioning authority shall review the contractor submittals relative to systems being commissioned.
4. Provide information to the owner in a single document (manual) that is required for re-commissioning building systems.
5. Have a contract in place to review building operation with O&M staff, including a plan for resolution of outstanding commissioning-related issues within one year after construction completion date.

Submittals

☐ Provide the LEED Letter Template, signed by the independent commissioning agent(s), confirming that Tasks 1-5 of the credit requirements have been successfully executed.

OR

☐ Provide the LEED Letter Template affirming that these services will be provided under contract(s) together with a signed copy of the contract(s) stating that Tasks 1-5 of the credit requirements will be implemented within one year from completion of the project.

Narrative

Credit not satisfied. This credit would require LANL (not the contractor) to contract an independent commissioning authority to conduct reviews of the building design and construction documents throughout the project. Also required of the independent commissioning authority would be the development of a re-commissioning plan for the building to be implemented following occupancy. The commissioning efforts established for CDOB (see EA Prerequisite 1) were the responsibility of the contractor, not an

EA Credit 3: Additional Commissioning

(continued)

independent commissioning authority. In addition, no post occupancy commissioning requirements were established for CDOB.

EA Credit 4: Ozone Protection

Intent

Reduce ozone depletion and support early compliance with the Montreal Protocol.

Requirements

Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs or Halons.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or engineer stating that HVAC&R systems as-built are free of HCFCs and Halons.

Narrative

Credit not satisfied. As described under the narrative for Prerequisite 3 of Energy and Atmosphere, the refrigerants used in the HVAC&R systems is R-22, which is an HCFC. Therefore the requirements of this credit are not satisfied. However, it should be noted that contacting both YORK and Liebert revealed that alternative refrigerants (i.e., HFCs) are available for the systems installed at CDOB. These may require a price premium.

EA Credit 5: Measurement and Verification

Intent

Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement

Install continuous metering equipment for the following end-uses:

- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/ton)
- Cooling load
- Air and water economizer and heat recovery cycles
- Air distribution static pressures and ventilation air volumes
- Boiler efficiencies
- Building-related process energy systems and equipment
- Indoor water risers and outdoor irrigation systems

Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 *International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings*.

Submittals

☐ Provide the LEED Letter Template, signed by the licensed engineer or other responsible party, describing the metering equipment installed for each end-use and declaring the option to be followed under IPMVP version 2001.

☐ Provide a copy of the M&V plan following IPMVP, version 2001, including an executive summary.

Narrative

Credit not attempted. The IPMVP (www.ipmvp.org) provides best practice techniques available for continuously measuring and verifying energy and water consumption performance for projects. LANL typically does not meter gas, steam, and water usage at individual buildings. As a result, no such measures were implemented to define, track, and verify equipment component energy and water usage at CDOB.

EA Credit 6: Green Power

Intent

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirements

Provide at least 50% of the building's electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are as defined by the Center for Resource Solutions (CRS) Green-e products certification requirements. Green power may be procured from a Green-e certified power marketer, a Green-e accredited utility program, or through Greene certified Tradable Renewable Certificates.

Submittals

- ☐ Provide the LEED Letter Template, signed by the owner or other responsible party, documenting that the supplied renewable power is equal to 50% of the project's energy consumption and the sources meet the Green-e definition of renewable energy.
- ☐ Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources.

Narrative

Credit not attempted. DOE negotiates electricity rates for LANL on an annual basis. Although "green power" is not available in New Mexico through the local utility provider (Los Alamos County Utility), it is possible that DOE could negotiate the supply of green power to LANL. However, no green power is currently available for consumption by CDOB.

MATERIALS & RESOURCES

MR Prerequisite 1: Storage & Collection of Recyclables

Intent

Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirements

Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

Submittals

☒ Provide the LEED Letter Template, signed by the architect or owner, declaring that the area dedicated to recycling is easily accessible and accommodates the building's recycling needs.

☒ Provide a plan showing the area(s) dedicated to recycled material collection and storage.

Narrative

Prerequisite satisfied. LANL's Facility and Waste Operations, Solid Waste Group, collects recyclable materials from all LANL sites and delivers them to the Materials Recycling Facility (MRF). At the CDOB, paper, plastic, and aluminum will be picked up every two weeks for delivery to the MRF. As mentioned in the attached certification statement, glass is separated from LANL's solid waste stream at the MRF and diverted for recycling. Cardboard receptacles located outside the building will be emptied every week for delivery to the MRF. See attached certification statement and site plan showing the locations in the CDOB for recycling collection. Also collected regularly from all LANL facilities sites (including CDOB) are mixed office paper, transparencies, books, catalogs, and toner cartridges.

Materials and Resources Prerequisite 1

I _____ (LANL Building Owner) hereby certify that the Chemistry Division Office Building (CDOB) at Los Alamos National Laboratory will dedicate sufficient accessible space to the collection of recyclable materials. In keeping with lab-wide practices, recycling receptacles for office paper, plastics, and aluminum will be located on the first floor. The second floor will also be equipped with paper receptacles. Cardboard will be collected in an outdoor dumpster. Glass receptacles are not provided to individual sites, however glass is separated from LANL's solid waste stream and diverted for recycling. Collection bins for metals other than aluminum are provided by LANL on an as-needed basis.

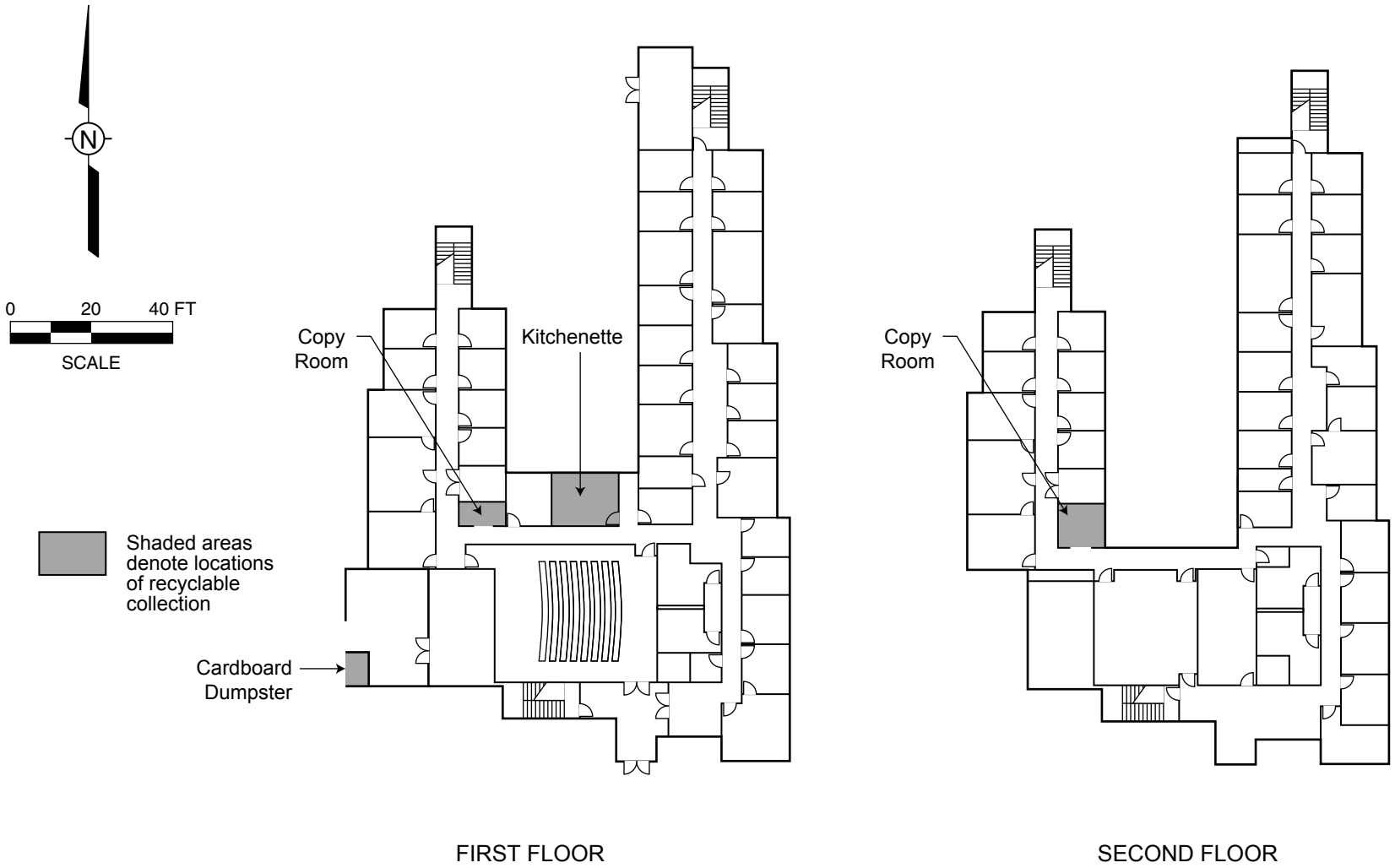
Name: (LANL Building Owner)

Organization: (Company Name)

Role in Project: (LANL Building Owner)

Signature: (as appropriate)

Date: (as appropriate)



833094.02000000/A3

Figure 5. Chemistry Division Office Building Collection of Recyclables

MR Credit 1.1: Building Reuse - Maintain 75% of Existing Walls, Floors and Roof

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain at least 75% of existing building structure and shell (exterior skin and framing, excluding window assemblies).

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, listing the retained elements and declaring that the above requirements have been met.

Narrative

Credit not satisfied. There were no preexisting structures at this location.

MR Credit 1.2: Building Reuse - Maintain 100% of Existing Walls, Floors and Roof

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing, excluding window assemblies) and non-structural roofing material..

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the above requirements have been met.

Narrative

Credit not satisfied. There were no preexisting structures at this location.

MR Credit 1.3: Building Reuse - Maintain 100% of Shell/Structure and 50% of Non-Shell/Non-Structure

Intent

Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirements

Maintain 100% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material) AND at least 50% of non-shell areas (interior walls, doors, floor coverings and ceiling systems).

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the above requirements have been met.

Narrative

Credit not satisfied. There were no preexisting structures at this location.

MR Credit 2.1: Construction Waste Management - Divert 50% From Landfill

Intent

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

Requirements

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the above requirements have been met.

Narrative

Credit not satisfied. No waste management plan or diversion goals were developed for the CDOB. LANL construction practices do allow for collection and recycling of some construction waste materials. LANL supports construction waste recycling by requiring the Site Support Sub-Contractor (SSS) (who provides maintenance, custodial and other support) to adhere to the same stringent recycling requirements as regular laboratory operations. Although LANL also encourages construction contractors to recycle, such measures were not implemented during CDOB construction. Concrete and asphalt are normally collected by LANL, crushed and stockpiled for backfill at other LANL sites. Most likely there were none to be disposed of at CDOB since there were no preexisting structures. Carpet is not recycled by LANL but carpet padding is baled and sent to a company in Albuquerque for reuse. Again there may not have been any excess carpet padding. Excess metals were likely generated. The CDOB contractor or LANL's Solid Waste Group could have provided roll-off bins for metals and diverted the material for recycling.

Land clearing debris, such as soil and rubble, could also have been stockpiled for use as fill elsewhere at LANL. This has been done at other LANL construction sites.

MR Credit 2.2: Construction Waste Management - Divert 75% From Landfill

Intent

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

Requirements

Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage an additional 25% (75% total) of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the above requirements have been met.

Narrative

Credit not satisfied. See narrative for MR Credit 2.2.

MR Credit 3.1: Resource Reuse - 5%

Intent

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirements

Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of building materials.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the above requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.

Narrative

Credit not satisfied. LANL contractually prohibits construction contractors from installing used or salvaged building materials (see *General Provisions: Fixed Price Construction Contracts, Article 36(A), "Materials and Workmanship,"* University of California, Los Alamos National Laboratory, July 15, 1991). The salvage and reuse that is carried out at LANL is limited primarily to furniture and office equipment.

MR Credit 3.2: Resource Reuse- 10%

Intent

Extend the life cycle of targeted building materials by reducing environmental impacts related to materials manufacturing and transport.

Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirements

Use salvaged, refurbished or reused materials, products and furnishings for at least **10%** of building materials.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the above requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of all materials for the project.

Narrative

Credit not satisfied. See narrative for MR Credit 3.1.

MR Credit 4.1: Recycled Content - Use 5% post-consumer or 10% post-consumer + post-industrial

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Intent

Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials.

Requirements

Use materials with recycled content such that post-consumer recycled content constitutes at least 5% of the total value of the materials in the project OR combined post-consumer and post-industrial recycled content constitutes at least 10%.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, *Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e)*, available at www.ftc.gov/bcp/grnrule/guides980427.htm.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the above requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

Narrative

Credit may be satisfied. The CDOB does utilize materials containing recycled content. The exact recycled percentage was not calculable because information about exact costs and quantities for the materials used was not available. The following list details what is known.

- **CMUs (Concrete Masonry Units) contain 12% fly ash**
- **Fiberglass insulation contains on average 30% recycled glass content (26% post-industrial/4% post-consumer)**
- **Wallboard contains on average 31% (26% post-industrial/5% post-consumer) [however this varies widely with distributor and is not tracked]**

MR Credit 4.1: Recycled Content - Use 5% post-consumer or 10% post-consumer + post-industrial

(continued)

- **Structural steel (per LEED and Steel Recycling Institute [SRI]) contains 98.8% (29.5% post-industrial/69.3% post-consumer)**
- **Other steel (per LEED and SRI) contains 30.3% (8.6% post-industrial/21.7% post-consumer)**
- **Ceiling tiles 49% (42% post-industrial/7% post-consumer)**
- **Ceiling grid 25% (breakdown unknown)**
- **Carpet has no recycled content (100% recyclable)**

Should credit be satisfied, a certification statement must be provided as outlined above under "Submittals."

MR Credit 4.2: Recycled Content - Use 10% post-consumer or 20% post-consumer + post-industrial

Intent

Increase demand for building products that incorporate/have incorporated recycled content materials, therefore reducing the impacts resulting from extraction and processing of new virgin materials.

Requirements

Use materials with recycled content such that post-consumer recycled content constitutes at least 10% of the total value of the materials in the project OR combined post-consumer and post-industrial recycled content constitutes at least 20%.

The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at www.ftc.gov/bcp/grnrule/guides980427.htm.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or other responsible party, declaring that the above requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

Narrative

Credit not satisfied. See narrative for MR Credit 4.2.

MR Credit 5.1: Regional Materials - 20% manufactured regionally

Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby reducing the environmental impacts resulting from transportation and supporting the regional economy.

Requirements

Use a minimum of 20% of building materials and products that are manufactured* regionally within a radius of 500 miles.

* Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia and the joist is assembled in Kent, Washington; then the location of the final assembly is Kent, Washington.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the above requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

Narrative

Credit probably satisfied. It is likely that at least 20% of the building materials used at the Chemistry Division Office Building (CDOB) at Los Alamos National Laboratory were manufactured within a 500-mile radius. However, because exact costs and quantities are uncertain, such a determination could not be made. The following is known:

- **CMU, mortar, all other concrete, asphalt, base course, window frames, square duct work and rebar were fabricated in Albuquerque, NM**
- **Structural steel fabricated in Santa Fe, NM**

The contractor estimated these materials to amount to $600,000, which would comprise well over 20% of the total material costs.

Should this credit be satisfied, a certification statement must be provided as outlined above under "Submittals."

MR Credit 5.2: Regional Materials - 50% extracted regionally

Intent

Increase demand for building materials and products that are extracted and manufactured within the region, thereby reducing the environmental impacts resulting from transportation and supporting the regional economy.

Requirements

Of these regionally manufactured materials, use a minimum of 50% of building materials and products that are extracted, harvested or recovered (as well as manufactured) within 500 miles.

* Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia and the joist is assembled in Kent, Washington; then the location of the final assembly is Kent, Washington.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the above requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

Narrative

Credit not satisfied. See narrative for MR Credit 5.1.

MR Credit 6: Rapidly Renewable Materials

Intent

Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

Requirements

Use rapidly renewable building materials and products (made from plants that are typically harvested within a ten-year or shorter cycle) for 5% of the total value of all building materials and products used in the project.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that the above requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of rapidly renewable products. Show their cost and percentage of rapidly renewable components, and the total cost of all materials for the project.

Narrative

Credit not satisfied. Typical construction materials considered to be rapidly renewable include various wood products (like wheatgrass cabinetry, sunflower seed board, or poplar oriented-strand board), floor coverings (like bamboo flooring, wool carpet, or linoleum flooring), and cotton batt insulation. None of these products were installed at CDOB.

MR Credit 7: Certified Wood

Intent

Encourage environmentally responsible forest management.

Requirements

Use a minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council Guidelines, for wood building components including, but not limited to, structural framing and general dimensional framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers. To qualify for this credit, wood-based materials and products must constitute at least 2% of the total value of all materials for the building.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, owner or responsible party, declaring that the above requirements have been met and listing the FSC-certified materials and products used. Include calculations demonstrating that the project incorporates the required percentage of FSC-certified materials/products and their cost together with the total cost of all materials for the project. For each material/product used to meet these requirements, provide the vendor's or manufacturer's Forest Stewardship Council chain-of-custody certificate number.

Narrative

Credit not satisfied. Some wood products were used at the CDOB, including doors and cabinetry. However, none of these wood products were "certified." A list of certified wood products suppliers is available at www.certifiedwood.org.

INDOOR ENVIRONMENTAL QUALITY

EQ Prerequisite 1: Minimum IAQ Performance

Intent

Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, thus contributing to the health, comfort and well-being of the occupants.

Requirements

Meet the minimum requirements of voluntary consensus standard ASHRAE 62-2001, Ventilation for Acceptable Indoor Air Quality and approved published Addenda using the Ventilation Rate Procedure.

Submittals

☒ Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the project is fully compliant with ASHRAE 62-2001 (and all official Addenda approved by ASHRAE) and describing the procedure employed in the IAQ analysis (Ventilation Rate Procedure).

Narrative

Prerequisite satisfied (see attached certification statement). Design calculations indicating ASHRAE 62 compliance for outside air ventilation are required for CDOB per Specification 15100. The ASHRAE 62 analysis conducted for CDOB is attached to satisfy the Ventilation Rate Procedure description required for this prerequisite. The project mechanical design engineer is responsible for certification of this prerequisite.

Indoor Environmental Quality Prerequisite 1

I _____ (Contractor's Project Mechanical Design Engineer) do hereby certify that the ventilation system design for the Chemistry Division Office Building (CDOB) meets the minimum requirements of the voluntary consensus standard ASHRAE 62-2001, Ventilation for Acceptable Indoor Air Quality (and approved Addenda). The attached describes the procedure employed in the Ventilation Rate Procedure analysis for CDOB.

Name: (Contractor's Project Mechanical Design Engineer)

Organization: (Company Name)

Role in Project: (Mechanical Systems Design Engineer)

Signature: (as appropriate)

Date: (as appropriate)

Ventilation Analysis - Chemistry Division Office Building - AHU-C-1

English Units

min VAV Flow,% 50%

Room Number	VAV Box Number	Area (sf)	People	Diversity Intermitant Occupancy	O.A. cfm/ person	O.A. cfm/sf	Total Vent cfm	Max Room S.A. cfm	Zmax Crit Room Z	Fraction VAV Box	Min Room S.A. cfm	Zmin Crit Room Z
128	1	143	1	1.0	20	-	20	275	0.073	0.50	138	0.15
126	2	130	1	1.0	20	-	20	270	0.074	0.50	135	0.15
124	3	234	1	1.0	20	-	20	315	0.063	0.50	158	0.13
122	4	130	1	1.0	20	-	20	270	0.074	0.50	135	0.15
120	5	130	1	1.0	20	-	20	270	0.074	0.50	135	0.15
118	6	130	1	1.0	20	-	20	270	0.074	0.50	135	0.15
132	7	220	0	1.0	-	0.05	11	80	0.138	0.50	40	0.28
100F	7	622	0	1.0	-	0.05	31	260	0.120	0.50	130	0.24
116	8	130	1	1.0	20	-	20	270	0.074	0.50	135	0.15
114	9	240	1	1.0	20	-	20	315	0.063	0.50	158	0.13
117	10	104	0	1.0	-	0.50	52	365	0.142	0.50	183	0.28
119	11	182	1	1.0	20	-	20	415	0.048	0.50	208	0.10
121	12	130	1	1.0	20	-	20	325	0.062	0.50	163	0.12
123	13	130	1	1.0	20	-	20	325	0.062	0.50	163	0.12
125	14	130	1	1.0	20	-	20	325	0.062	0.50	163	0.12
127	15	182	1	1.0	20	-	20	415	0.048	0.50	208	0.10
129	16	130	1	1.0	20	-	20	325	0.062	0.50	163	0.12
131	17	130	1	1.0	20	-	20	325	0.062	0.50	163	0.12
230	18	143	1	1.0	20	-	20	290	0.069	0.50	145	0.14
228	19	130	1	1.0	20	-	20	280	0.071	0.50	140	0.14
226	20	130	1	1.0	20	-	20	280	0.071	0.50	140	0.14
224	21	234	1	1.0	20	-	20	350	0.057	0.50	175	0.11
232	22	220	0	1.0	-	0.05	11	125	0.088	0.50	63	0.18
200F	22	559	0	1.0	-	0.05	28	325	0.086	0.50	163	0.17
220	23	315	3	1.0	20	-	60	530	0.113	0.50	265	0.23
218	24	224	1	1.0	20	-	20	340	0.059	0.50	170	0.12
214	25	130	1	1.0	20	-	20	280	0.071	0.50	140	0.14
215	26	78	0	1.0	-	0.50	39	370	0.105	0.50	185	0.21
217	27	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
219	28	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
221	29	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
223	30	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
225	31	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
227	32	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
229	33	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
231	34	130	1	1.0	20	-	20	345	0.058	0.50	173	0.12
115	Electrical Room	120	0	1.0	-	-	-	T.A.	-	0.50	T.A.	-

AHU-C-1

211	Electrical Room	117	0	1.0	-	-	-	T.A.	-	0.50	T.A.	-
133	Mechanical Room	338	0	1.0	-	-	-	-	-	0.50	-	-
Totals			32				812	11,345			5,673	

AHU-C-1	Vmax (Summer)	Vmin (Winter)
Uncorrected %OA X =	0.072	0.143
Worst zone %OA Z =	0.142	0.285
Corrected %OA Y =	**0.077**	**0.167**
CORRECTED OA, cfm	**874**	**946**
Actual OA cfm/person @peak	27.3	29.6

Where Y = X / (1+X-Z)

ASSUMPTIONS:

1. The ventilation rate Procedure was used, and design will need to re-evaluated if, at a later time, the space use changes occur. People loading was determined using the individual room descriptions in the LANL Program Document.

2. It can be assumed that Outdoor Air Contaminant Levels meet the National Primary Ambient-Air Quality Standards for Outdoor Air as Set by the U.S. Environmental Protection Agency in Table of ASHRAE Std 62-1999, as determined by ASHRAE Std 62-1999 6.1.1 Step 1 (f).

3. Conference Rooms and the Kitchen/Foyer will have a peak occupancy less than 3 hours duration. Therefore, the outdoor airflow rate will determined on the average occupancy. The average occupancy is less than 50% of peak, so a 50% diversity will be used.

4. Janitor Closets, Machine Rooms, and Electrical Rooms will be ventilated by Transfer Air (T.A.) and exhausted.

5. Rooms with CRAC's will be directly vented from a O.A. Louver.

Staff office	1 person
Technician Office	2 person
Manager offices	1 person
Restroom Exhaust	3 cfm/sf of Transfer Air
Kitchenette	10 person
Visiting Scientist	1 person
Corridors & Stairs	0.05 cfm/sf
Copy Rooms	0.50 cfm/sf
Large Conference Room 103	100 person
Secretary Offices	3 person
Student Cubicles	20 person
Small Conference 203A	20 person
Small Conference 203B	10 person

Ventilation Analysis - Chemistry Division Office Building - AHU-C-2

English Units

min VAV Flow,% 50%

Room Number	VAV Box Number	Area (sf)	People	Diversity Intermitant Occupancy	O.A. cfm/ person	O.A. cfm/sf	Total Vent cfm	Max Room S.A. cfm	Zmax Crit Room Z	Fraction VAV Box	Min Room S.A. cfm	Zmin Crit Room Z
137	1	255	1	1.0	20	-	20	400	0.050	0.50	200	0.10
139	2	323	3	1.0	20	-	60	560	0.107	0.50	280	0.21
147	3	220	0	1.0	-	0.05	11	80	0.138	0.50	40	0.28
100E	3	400	0	1.0	-	0.05	20	200	0.100	0.50	100	0.20
141	4	221	1	1.0	20	-	20	370	0.054	0.50	185	0.11
143	5	130	1	1.0	20	-	20	330	0.061	0.50	165	0.12
145	6	143	1	1.0	20	-	20	340	0.059	0.50	170	0.12
148	7	143	1	1.0	20	-	20	280	0.071	0.50	140	0.14
146	8	130	1	1.0	20	-	20	275	0.073	0.50	138	0.15
144	9	130	1	1.0	20	-	20	275	0.073	0.50	138	0.15
142	10	130	1	1.0	20	-	20	275	0.073	0.50	138	0.15
138	11	72	0	1.0	-	0.50	36	350	0.103	0.50	175	0.21
136	12	168	2	1.0	20	-	40	215	0.186	0.50	108	0.37
103	13	1379	100	0.5	20	-	1,000	2,310	0.433	0.50	1,155	0.87
134	14	238	10	0.5	20	-	100	775	0.129	0.50	388	0.26
100D	14	265	0	1.0	-	0.05	13	140	0.095	0.50	70	0.19
100 & 100B	15	424	0	1.0	-	0.05	21	400	0.053	0.50	200	0.11
101	15	220	0	1.0	-	0.05	11	80	0.138	0.50	40	0.28
100A	15	120	0	1.0	-	0.05	6	260	0.023	0.50	130	0.05
102	16	294	1	1.0	20	-	20	430	0.047	0.50	215	0.09
104	17	169	2	1.0	20	-	40	310	0.129	0.50	155	0.26
106	17	169	2	1.0	20	-	40	310	0.129	0.50	155	0.26
108	18	130	1	1.0	20	-	20	260	0.077	0.50	130	0.15
110	19	130	1	1.0	20	-	20	260	0.077	0.50	130	0.15
107	20	162	0	1.0	-	0.05	8	100	0.081	0.50	50	0.16
109	20	162	0	1.0	-	0.05	8	100	0.081	0.50	50	0.16
100G	20	48	0	1.0	-	0.05	2	150	0.016	0.50	75	0.03
140	CRAC	108	0	1.0	-	0.05	5	-	-	0.50	-	-
111	Jan. Clo.	40	0	1.0	-	0.50	20	-	T.A.	0.50	T.A.	-
105	Machine Room	56	0	1.0	-	0.50	28	-	T.A.	0.50	T.A.	-
135	Mechanical Room	480	0	1.0	-	-	-	-	-	0.50	-	-
235	21	255	1	1.0	20	-	20	375	0.053	0.50	188	0.11
239	22	323	3	1.0	20	-	60	610	0.098	0.50	305	0.20
241	23	221	1	1.0	20	-	20	410	0.049	0.50	205	0.10
243	24	130	1	1.0	20	-	20	350	0.057	0.50	175	0.11
245	25	143	1	1.0	20	-	20	365	0.055	0.50	183	0.11
244	26	143	1	1.0	20	-	20	300	0.067	0.50	150	0.13

AHU-C-2

242	27	130	1	1.0	20	-	20	285	0.070	0.50	143	0.14
240	28	130	1	1.0	20	-	20	285	0.070	0.50	143	0.14
238	29	130	1	1.0	20	-	20	285	0.070	0.50	143	0.14
234	30	156	0	1.0	-	0.50	78	420	0.186	0.50	210	0.37
200E	30	390	0	1.0	-	0.05	20	200	0.098	0.50	100	0.20
247	30	220	0	1.0	-	0.05	11	80	0.138	0.50	40	0.28
200D	30	170	0	1.0	-	0.05	9	300	0.028	0.50	150	0.06
233	31	1260	20	1.0	20	-	400	1,980	0.202	0.50	990	0.40
201	32	220	0	1.0	-	0.05	11	80	0.138	0.50	40	0.28
200	32	403	0	1.0	-	0.05	20	420	0.048	0.50	210	0.10
202	33	215	2	1.0	20	-	40	480	0.083	0.50	240	0.17
204	34	169	2	1.0	20	-	40	350	0.114	0.50	175	0.23
206	34	169	2	1.0	20	-	40	350	0.114	0.50	175	0.23
208	35	169	2	1.0	20	-	40	350	0.114	0.50	175	0.23
210	35	169	2	1.0	20	-	40	350	0.114	0.50	175	0.23
205	36	162	0	1.0	-	0.05	8	150	0.054	0.50	75	0.11
205A	36	53	0	1.0	-	0.05	3	75	0.035	0.50	38	0.07
207	36	147	0	1.0	-	0.05	7	150	0.049	0.50	75	0.10
207A	36	53	0	1.0	-	0.05	3	75	0.035	0.50	38	0.07
209	Jan. Clo.	147	0	1.0	-	0.50	74	T.A.	-	0.50	-	-
203A	37	252	20	0.5	20	-	200	520	0.385	0.50	260	0.77
203B	38	154	10	0.5	20	-	100	300	0.333	0.50	150	0.67
Totals			201				3,053	19,730			9,865	

AHU-C-2	Vmax (Summer)	Vmin (Winter)
Uncorrected %OA X =	0.155	0.309
Worst zone %OA Z =	0.433	0.866
Corrected %OA Y =	0.214	0.698
CORRECTED OA, cfm	4,229	6,881
Actual OA cfm/person @peak	21.0	34.2

Where Y = X / (1+X-Z)

ASSUMPTIONS:

1. The ventilation rate Procedure was used, and design will need to re-evaluated if, at a later time, the space use changes occur. People loading was determined using the individual room descriptions in the LANL Program Document.

2. It can be assumed that Outdoor Air Contaminant Levels meet the National Primary Ambient-Air Quality Standards for Outdoor Air as Set by the U.S. Environmental Protection Agency in Table of ASHRAE Std 62-1999, as determined by ASHRAE Std 62-1999 6.1.1 Step 1 (f).

3. Conference Rooms and the Kitchen/Foyer will have a peak occupancy less than 3 hours duration. Therefore, the outdoor airflow rate will determined on the average occupancy. The average occupancy is less than 50% of peak, so a 50% diversity will be used.

AHU-C-2

4. Janitor Closets, Machine Rooms, and Electrical Rooms will be ventilated by Transfer Air (T.A.) and exhausted.

5. Rooms with CRAC's will be directly vented from a O.A. Louver.

Staff office	1	person
Technician Office	2	person
Manager offices	1	person
Restroom Exhaust	3	cfm/sf of Transfer Air
Kitchenette	10	person
Visiting Scientist	1	person
Corridors & Stairs	0.05	cfm/sf
Copy Rooms	0.50	cfm/sf
Large Conference Room 103	100	person
Secretary Offices	3	person
Student Cubicles	20	person
Small Conference 203A	20	person
Small Conference 203B	10	person

EQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

Intent

Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirements

Zero exposure of non-smokers to ETS by EITHER

Prohibiting smoking in the building and locating any exterior designated smoking areas away from entries and operable windows,

OR

Providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge). Exhaust air from the smoking room must exhaust directly to the outdoors with no recirculation of ETS-containing air to the non-smoking areas of the building.

Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining nonsmoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Submittals

☒ Provide the LEED Letter Template, signed by the building owner or responsible party, declaring that the building will be operated under a policy prohibiting smoking.

OR

☐ Provide the LEED Letter Template declaring and demonstrating that designated smoking rooms are enclosed with impermeable deck-to-deck partitions and that their performance has been verified by tracer gas testing as described in the ASHRAE Standard 129-1997. Indicate that the smoking room ventilation system exhausts directly to the outdoors and is independent of nonsmoking building areas. The independent ventilation system must be operated at a negative pressure of at least 7 PA compared with the surrounding spaces.

EQ Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

(continued)

Narrative

Prerequisite satisfied (see attached certification statement). Smoking is prohibited in all LANL buildings. Although no formal outside smoking area has been designated at CDOB, a patio located in the rear of the building provides an outdoor break area for CDOB occupants. Smoking in this patio area is away from entries and air intakes, and no operable windows were installed at CDOB. The LANL building owner is responsible for certification of this prerequisite.

Indoor Environmental Quality Prerequisite 2

I _____ (LANL Building Owner) do hereby certify that the Chemistry Division Office Building (CDOB) is a smoke-free facility. As a federal facility the CDOB is subject to Executive Order 13058, which bans smoking in federal buildings. In addition, LANL is committed to providing laboratory and contract employees a healthy work environment and therefore does not permit smoking inside any buildings within the Laboratory.

Name: (LANL Building Owner)

Organization: (LANL Facilities Waste Operations)

Role in Project: (LANL Building Owner)

Signature: (as appropriate)

Date: (as appropriate)

EQ Credit 1: Carbon Dioxide (CO_2) Monitoring

Intent

Provide capacity for indoor air quality (IAQ) monitoring to help sustain long-term occupant health, comfort and well-being.

Requirements

Install a permanent carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments. Refer to the CO_2 differential for all types of occupancy in accordance with ASHRAE 62-2001, Appendix D.

Submittals

☒ Provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring and summarizing the installation, operational design and controls/zones for a carbon dioxide monitoring system.

Narrative

Credit satisfied (see attached certification statement). The permanent CO_2 monitoring system at CDOB consists of duct-mounted sensors located at the return air side of each air handling unit. The sensors are integrated with the building automation system such that when CO_2 levels exceed 1,000 parts-per-million, the outside air dampers open completely until CO_2 levels decrease to acceptable levels. This sequence of operation complies with ASHRAE 62 guidance that indicates CO_2 concentrations should not exceed 700 ppm above outdoor air levels (where CO_2 concentrations in acceptable outdoor air typically range from 300 to 500 ppm).

Indoor Environmental Quality Credit 1

I _____ (Contractor's Project Mechanical Design Engineer) do hereby certify that the HVAC system designed and installed at the CDOB includes a permanent CO_2 monitoring system that is integrated with the building automation system to automatically control ventilation rates based on monitored CO_2 concentrations. The following description summarizes the installation, operational design and controls/zones for the CO_2 monitoring system:

The CDOB has two air-handling units (AHUs). One AHU covers the zone defined by office space on the first and second floors along the eastern portion of the building while the second AHU covers the zone defined by the office and meeting areas on the first and second floors along the southern and western portions of the building. A CO_2 monitoring sensor is installed at the return-air side of each AHU and hard-wired into the power circuitry using carrier wave communications. The CO_2 sensors are integrated with the Building Automation System such that when CO_2 levels are detected in the return air at 1,000 parts-per-million (ppm) or more, the system will open the outside air dampers 100 percent to flush the building until CO_2 levels decrease to acceptable levels. At this point, the air handling unit will resume normal control of the building.

Name: (Contractor's Project Mechanical Design Engineer)

Organization: (Company Name)

Role in Project: (Mechanical Systems Design Engineer)

Signature: (as appropriate)

Date: (as appropriate)

EQ Credit 2: Ventilation Effectiveness

Intent

Provide for the effective delivery and mixing of fresh air to support the health, safety, comfort and well-being of building occupants.

Requirements

For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.

Submittals

☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design achieves an air change effectiveness of 0.9 or greater in each ventilated zone. Include a table summarizing the air change effectiveness achieved for each zone.

OR

☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design complies with the recommended design approaches in ASHRAE 2001 Fundamentals Chapter 32, Space Air Diffusion. Include a table summarizing for each zone the air change effectiveness, which must be 0.9 or greater.

OR

☐ For naturally ventilated spaces: provide the LEED Letter Template, signed by the mechanical engineer or responsible party, declaring that the design provides effective ventilation in at least 90% of each room or zone area in the direction of airflow for at least 95% of hours of occupancy. Include a table summarizing for each zone the airflow simulation results. Include sketches indicating the airflow pattern for each zone.

Narrative

Credit not satisfied. No contractual requirements are in place to achieve a particular air change effectiveness associated with the ventilation system design for CDOB. This credit is not easily satisfied and based on information provided at a recent LEED™ Workshop conducted at LANL on 8/18/02, to date this credit has not been achieved by any certification applicants.

EQ Credit 3.1: Construction IAQ Management Plan - During Construction

Intent

Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the long-term health, comfort and well-being of construction workers and building occupants.

Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- During construction meet or exceed the minimum requirements recommended in Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995.
- Protect stored on-site or installed absorptive materials from moisture damage.
- Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction, and a MERV of 8, for media used to protect HVAC at each return air grill during construction.

Submittals

☐ Provide the LEED Letter Template, signed by the general contractor or responsible party, listing each different filtration media used during construction and at the end of construction. Include the MERV value, manufacturer name and model number.

AND EITHER

☐ Provide 6 photographs at 3 different occasions during construction along with a brief description of the SMACNA approach employed, documenting implementation of the IAQ management measures (such as protection of ducts and on-site stored or installed absorptive materials).

OR

☐ Declare the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3 which were used during building construction. Include a brief description of some of the important design approaches employed.

EQ Credit 3.1: Construction IAQ Management Plan - During Construction

(continued)

Narrative

Credit not satisfied. No contractual requirements are in place to develop and implement a construction IAQ management plan for CDOB. Based on the referenced guidance for this credit, "SMACNA IAQ Guidelines for Buildings Under Construction," such an IAQ plan requires implementation of appropriate contaminant/pollutant control measures to prevent construction

activities from adversely affecting IAQ. The minimum requirements are based on five categories of control measures, including HVAC protection, pollutant source control, pollutant pathway interruption, housekeeping, and scheduling of construction activities.

Specification 01600, Material and Equipment, describes the storage and protection requirements for construction products. Protection of installed materials is not specifically addressed, unless covered under the manufacturer's written installation recommendations. Compliance for this aspect of the credit requires photographs of the methods of protection from moisture damage for on-site stored or installed absorptive materials (such as carpet, ceiling tiles, gypsum wall board, fabric furnishings, insulation, etc.). No such photographs were taken, or required to have been taken, at CDOB.

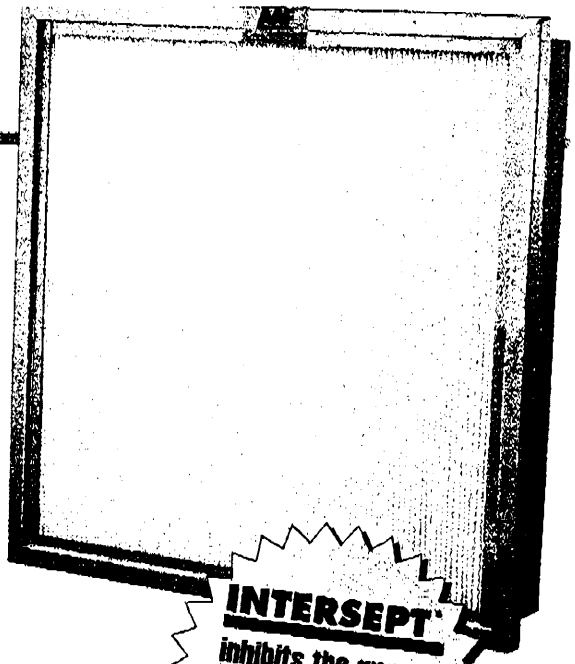
The filtration media installed in the air-handling units at CDOB do not meet the required MERV value for this credit. Since the final filter has the highest efficiency, this filter would need to satisfy the required MERV value for compliance with this credit. The following table summarizes the relevant information for filtration media installed at CDOB:

Application	Type	MERV	Replaced Following Construction?
Air-Handling Unit #1	Prefilter: American Air Filter, PerfectPleat	6	Yes, per Specification 15950, Testing, Adjusting, and Balancing.
	Final-filter: American Air Filter, VariCel II	10	
Air-Handling Unit #2	Prefilter: American Air Filter, PerfectPleat	6	Yes, per Specification 15950, Testing, Adjusting, and Balancing.
	Final-filter: American Air Filter, VariCel II	10	

VariCel® II MH

Extended Surface Mini-Pleat Filter with Metal Header and Cell Sides Available with INTERSEPT®

Attn: Doug V.
(505) 262-8893
(6) pgs.



- ***Metal Construction Improves Performance Under the Most Difficult Operating Conditions***
- ***Superior Moisture Resistance***
- ***Engineered to Improve Indoor Air Quality (IAQ)***
- ***True High-Efficiency Filters (Only 4" Thick Media Pack)***
- ***Three Efficiencies: 90-95%, 80-85%, 60-65%***
- ***Available with INTERSEPT® Antimicrobial***

AAF International introduces the latest addition to its VariCel II line of high-efficiency, mini-pleat filters – the VariCel II MH. This new filter is designed and constructed using the same high standards for efficiency and performance characteristic of the VariCel II die-cut model. It also has the identical microglass paper media and mini-pleat arrangement. The difference is the VariCel II MH, with AAF's unique interlocked metal header and cell sides, can be used in extremely turbulent operating conditions and in applications where high moisture is an issue. When combined with the water repellent binder used in the media, the metal construction makes the VariCel II MH truly moisture resistant. The metal header also makes the VariCel II MH ideal for use in side access systems.

INTERSEPT® inhibits the growth of microorganisms documented to affect Indoor Air Quality

INTERSEPT®

- ✓ A durable, low toxicity, broad spectrum antimicrobial that inhibits the growth of mold, mildew, bacteria, and fungi.
- ✓ EPA Registered, environmentally safe.
- ✓ Your first step to improved Indoor Air Quality.

UNIQUE COMBINATION OF HIGH PERFORMANCE AND COST-SAVING FEATURES

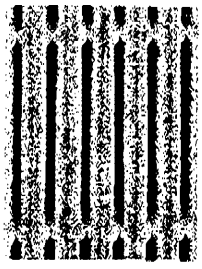
- — Ideal for the most difficult operating conditions, especially where moisture is an issue
- — Microglass paper media with water repellent binder
- — Available with INTERSEPT® in 90-95% and 60-65% efficiencies
- — Slim line packaging reduces shipping costs and storage space
- — Header has rolled edges for safe handling
- — Easy to install and remove

SLIM-LINE DESIGN

The slim-line design of the VariCel II MH provides minimum resistance and maximum dust loading capacity, while lowering operating costs. Rows of adhesive beads are used to maintain even pleat spacing and provide maximum airflow with minimal resistance. The consistent pleat spacing of the media allows higher dust holding capacity and full use of the entire depth of the media.

AVAILABLE WITH INTERSEPT® ANTIMICROBIAL

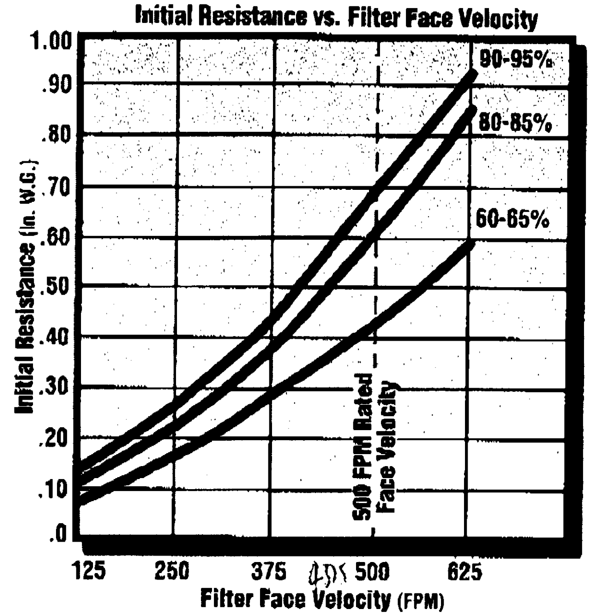
90-95% and 60-65% efficient VariCel II MH filters are available with INTERSEPT® antimicrobial. INTERSEPT® acts as a preservative to ensure the integrity of the media throughout the life of the filter. EPA registered and environmentally safe, INTERSEPT® inhibits the growth of microorganisms documented to affect IAQ.



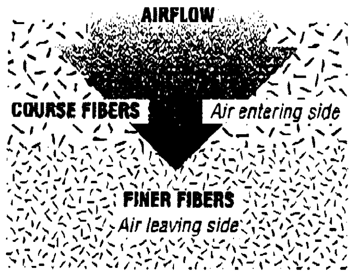
AAF INTERNATIONAL

VariCel® II MH / VariCel® II MH with INTERSEPT®

OPERATING DATA



DUAL-DENSITY MEDIA INCREASES DUST HOLDING CAPACITY



VariCel II MH filter is made of microglass paper with a water repellent binder. The fibers are formed with dual-density construction, consisting of coarser fibers on the air entering side and finer fibers on the air leaving side. This design allows for collection of particulate throughout the full thickness of the media, substantially increasing dust holding capacity. The media is water repellent and can withstand intermittent exposure to water without affecting performance.

VARICEL® II MH PRODUCT INFORMATION

(1) Rated Filter Face Velocity (FPM)	(2) Nominal Size (Inches) (W x H x D)	(2) Actual Size (Inches) (W x H x D)	(3) Rated AirFlow Capacity (CFM)	(3) Rated Initial Resistance (In W.G.)	(4) Recommended Final Resistance (In W.G.)	Gross Media Area (Sq.Ft.)
		(3)90-95% AVERAGE EFFICIENCY *(Available with INTERSEPT®)*				
500	24 x 24 x 4(6)	23-3/8 x 23-3/8 x 4-1/4	2000	.70	1.5	127
	20 x 25 x 4	19-3/8 x 24-3/8 x 4-1/4	1750	.70	1.5	111
	20 x 24 x 4(6)	19-3/8 x 23-3/8 x 4-1/4	1650	.70	1.5	106
	20 x 20 x 4	19-3/8 x 19-3/8 x 4-1/4	1400	.70	1.5	88
	18 x 24 x 4	17-3/8 x 23-3/8 x 4-1/4	1500	.70	1.5	95
	16 x 25 x 4	15-3/8 x 24-3/8 x 4-1/4	1400	.70	1.5	88
	16 x 20 x 4	15-3/8 x 19-3/8 x 4-1/4	1100	.70	1.5	70
	12 x 24 x 4(6)	11-3/8 x 23-3/8 x 4-1/4	1000	.70	1.5	63
		(3)80-85 AVERAGE EFFICIENCY				
500	24 x 24 x 4(6)	23-3/8 x 23-3/8 x 4-1/4	2000	.61	1.5	127
	20 x 25 x 4	19-3/8 x 24-3/8 x 4-1/4	1750	.61	1.5	111
	20 x 24 x 4(6)	19-3/8 x 23-3/8 x 4-1/4	1650	.61	1.5	106
	20 x 20 x 4	19-3/8 x 19-3/8 x 4-1/4	1400	.61	1.5	88
	18 x 24 x 4	17-3/8 x 23-3/8 x 4-1/4	1500	.61	1.5	95
	16 x 25 x 4	15-3/8 x 24-3/8 x 4-1/4	1400	.61	1.5	88
	16 x 20 x 4	15-3/8 x 19-3/8 x 4-1/4	1100	.61	1.5	70
	12 x 24 x 4(6)	11-3/8 x 23-3/8 x 4-1/4	1000	.61	1.5	63
		(3)60-65% AVERAGE EFFICIENCY *(Available with INTERSEPT®)*				
500	24 x 24 x 4(6)	23-3/8 x 23-3/8 x 4-1/4	2000	.43	1.5	127
	20 x 25 x 4	19-3/8 x 24-3/8 x 4-1/4	1750	.43	1.5	111
	20 x 24 x 4(6)	19-3/8 x 23-3/8 x 4-1/4	1650	.43	1.5	106
	20 x 20 x 4	19-3/8 x 19-3/8 x 4-1/4	1400	.43	1.5	88
	18 x 24 x 4	17-3/8 x 23-3/8 x 4-1/4	1500	.43	1.5	95
	16 x 25 x 4	15-3/8 x 24-3/8 x 4-1/4	1400	.43	1.5	88
	16 x 20 x 4	15-3/8 x 19-3/8 x 4-1/4	1100	.43	1.5	70
	12 x 24 x 4(6)	11-3/8 x 23-3/8 x 4-1/4	1000	.43	1.5	63

(1) Filters can be operated up to 125% of rated face velocity.
(2) Width and height dimensions are interchangeable. VariCel II MH filters may be installed with the pleats either vertical or horizontal.
(3) All performance data based on ASHRAE 52.1-1992 test method. Performance tolerances conform to Section 7.4 of ARI Standard 850-93. For maximum service life, VariCel II MH filters should always be operated with a prefilter.
(4) The final operating resistance shown is typical of systems currently in operation. Filters can be operated to a higher or lower final resistance without materially affecting filter efficiency; however, dust holding capacity will be reduced if the filters are changed at a lower final resistance.
(5) VariCel II MH filters are packed two per carton.
(6) Available for side access installations designed with a 13/16' wide stationary track.

Underwriters Laboratories Classification: All VariCel II MH filters are classified U.L. Class 2. Testing was performed according to U.L. Standard 900 and CAN 4-S111.

Continuous Operating Temperature Limits: 150°F (66°C)

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P O BOX 35690 LOUISVILLE KY 40232-5690
www.aafintl.com

For Additional Information On AAF Products, Call The Answer Center
Toll Free 888.AAF.2003

ISO-9001 DNV

ASHRAE Std. 52.2 Air Cleaner Performance Report Summary

This report applies to the tested device only.

Laboratory Data

Report No.	05240003	Date	5-24-00
Test Laboratory	Research Triangle Institute		
Operator	Clayton	Supervisor	Owen/Hanley
Particle Counter(s):	Brand Climet	Model	Spectro 500

Device Manufacturer's Data

Manufacturer	AAF
Product Name	Varicell II, 60%
Product Model	
Test requested by	AAF
Sample obtained from	AAF

Catalog rating:	Airflow rate	NA	Initial dP (in. wg)	NA
Specified test conditions:	Airflow (cfm)	1968	Final dP (in. wg)	1.00
	Face Velocity (fpm)	492		

Device Description

Nominal Dimensions (in.):	24 X 24 X 4 (height x width x depth)		
Generic name	Pleated Panel	Media color	White
Amount and type of adhesive	NA		
Other attributes	5 Pleats/ inch		

Test Conditions

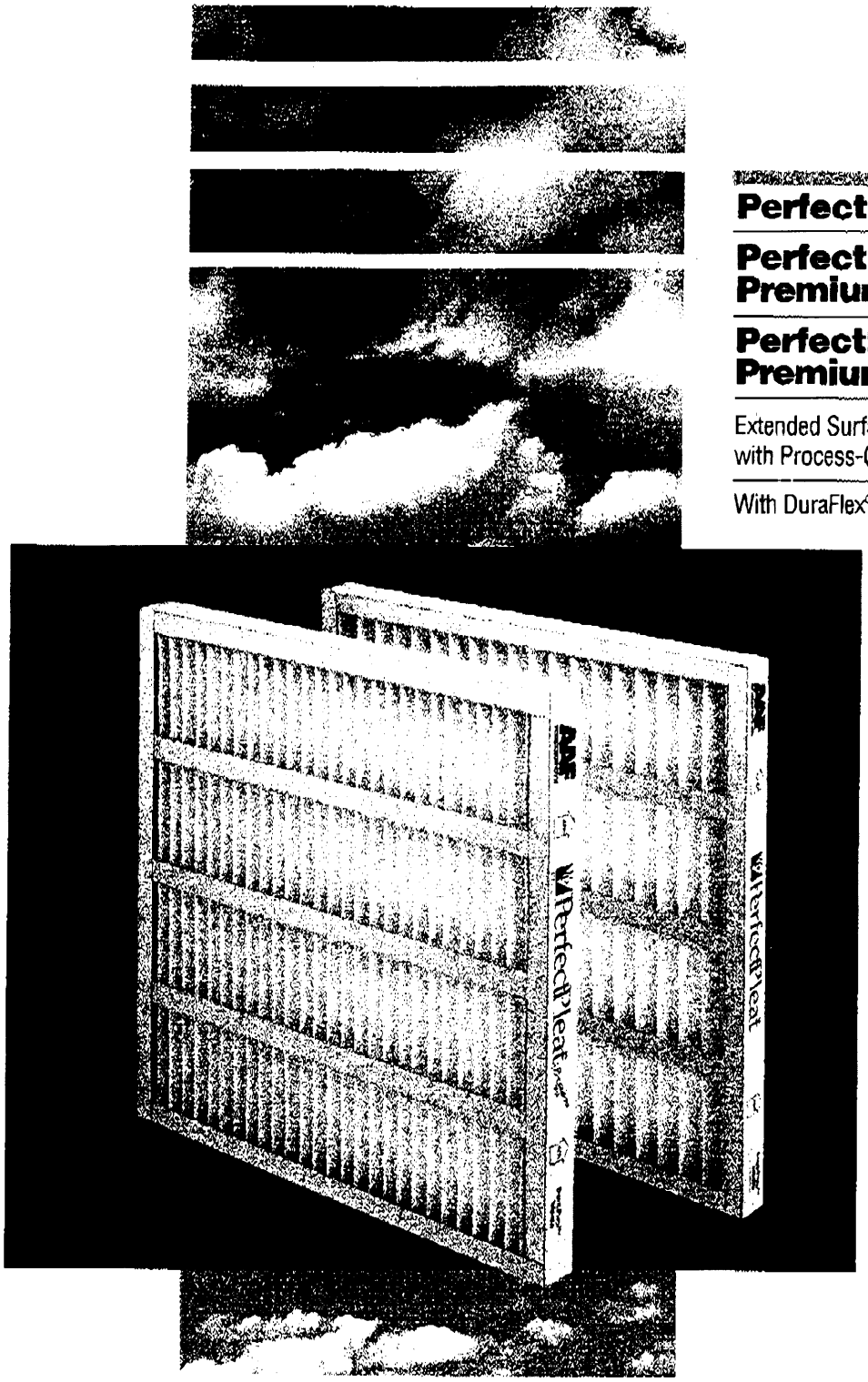
Airflow (cfm)	1968	Temperature (F)	75	RH (%)	48
Face Velocity (fpm)	492	Final Pressure Drop (in. wg)		1.00	
Test aerosol type:	KCl				
Remarks	New, Slight Corner Damage				

Resistance Test Results

Initial resistance (in. wg)	0.38	Final resistance (in. wg)	1.00

Minimum Efficiency Reporting Data

Composite average efficiencies	E1	23	E2	64	E3 92
Air cleaner average Arrestance per Std 52.1:	NA				
Minimum efficiency reporting value (MERV) for the device:	10 @ 1968 cfm				



PerfectPleat®

PerfectPleat® Premium

PerfectPleat® Premium HM

Extended Surface, Pleated Filter with Process-Controlled Quality

With DuraFlex® Media

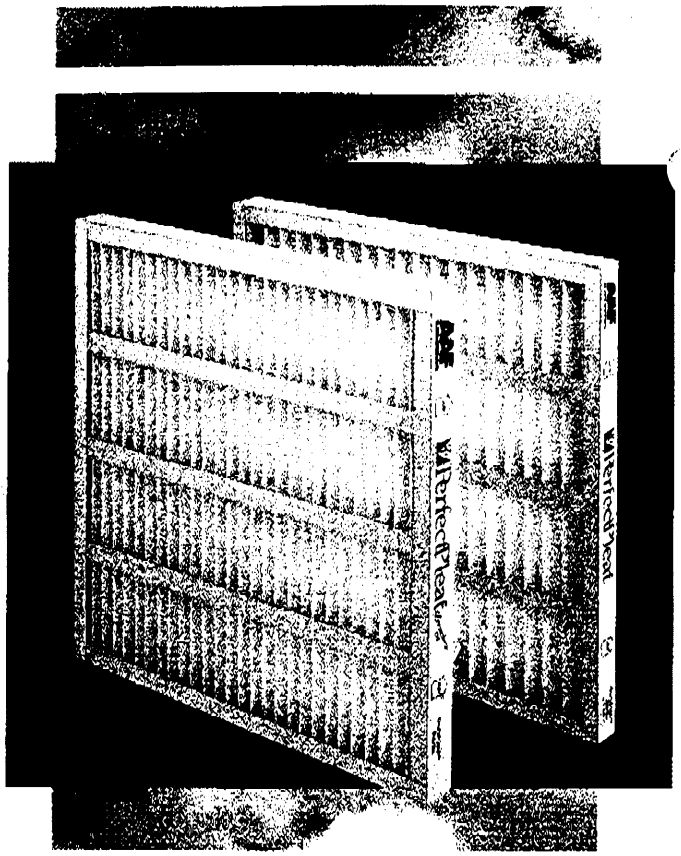
BETTER AIR IS OUR BUSINESS®

AAF INTERNATIONAL

PerfectPleat®
PerfectPleat® Premium
PerfectPleat® Premium HM

Extended Surface, Pleated Filter with Process-Controlled Quality

- ***Patented media*, patent pending filter design and manufacturing process***
- ***Form and fit unlike any other pleat available today***
- ***Self-supporting DuraFlex® media made from virgin fiber; no wire support needed***
- ***Consistent media with controlled fiber size and blend***
- ***HM (High Moisture) model available for applications where moisture is an issue***



The Air Filtration Leader

AAF International, one of the world's largest manufacturers of air filtration products, is extremely proud to announce a true innovation in the extended surface, pleated panel filter – the PerfectPleat. It is a filter with form and fit unlike any pleated filter in the marketplace today – and with the filtering efficiency you need and expect.

PerfectPleat® - Superior Design and Construction

Drawing on its years of experience in manufacturing quality air filters, AAF has created a state-of-the-art process for producing pleated filters. The extremely high quality of these filters is a result of three unique innovations: a new automated manufacturing process; a unique, self-supporting media*; and a filter construction that provides incredible strength without wire support.

Since their introduction, pleated filters have become a larger and more important segment of the filtration marketplace. However, current design and process are not conducive to the manufacture of consistently pleated media packs or finished filters. Inconsistency in pleat arrangement, variations in media, improper bonding of media to frame, along with antiquated manufacturing techniques, have a negative impact on efficiency, resistance, durability, and strength.

**Patent No. US 6,254,653 B1*

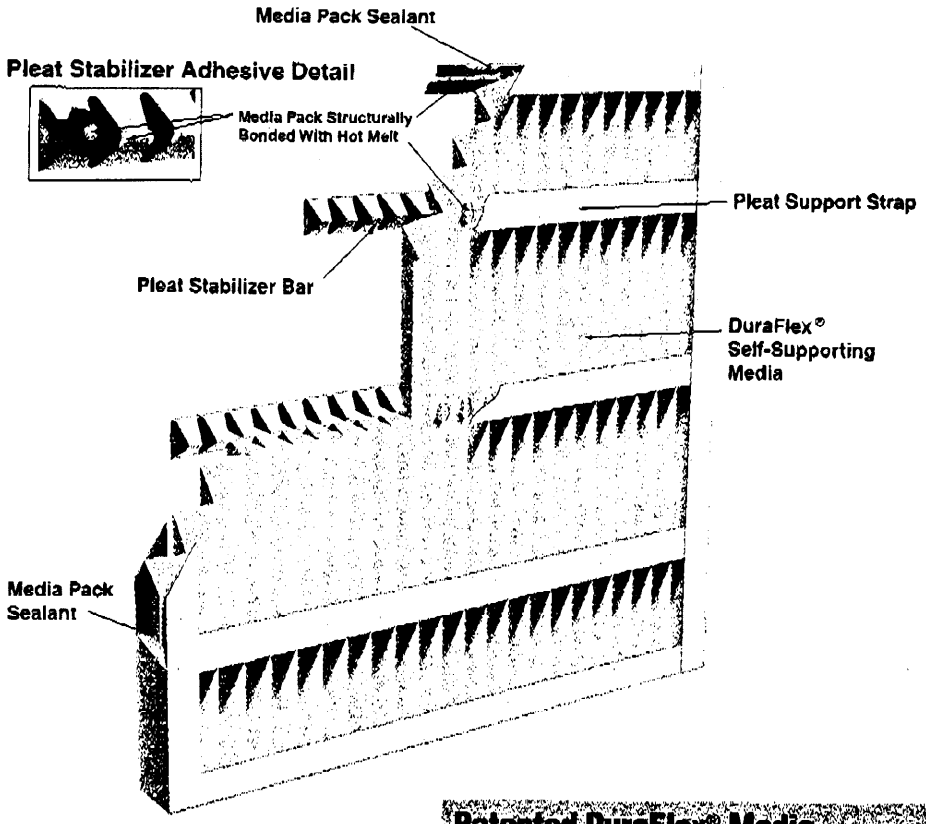
The new automated and controlled process AAF has developed for the PerfectPleat eliminates these inconsistencies and irregularities. Our new automated manufacturing process offers consistency our competitors cannot match in the everyday manufacture of pleated filters.

DuraFlex® Media - Patented Media Design

Uniform size virgin fibers are assembled in closely controlled blends to create a media that is both self-supporting and remarkably consistent in performance. The self-supporting characteristics allow a pleating pattern that promotes excellent dust holding and resistance characteristics. The PerfectPleat meets or exceeds all current expectations for service life and required airflow and has a guaranteed Minimum Efficiency Reporting Value (MERV) of 6.

DuraFlex® Media is Self-Supporting

DuraFlex media's unique construction makes it self-supporting. When pleated, DuraFlex will hold its shape without the wire support characteristic of conventional pleated filters. That means no potential for the formation of rust and safer handling - no nicks or cuts for the installer. With the superior resiliency of DuraFlex media and no need for wire support, the PerfectPleat can sustain significant abuse and maintain its shape and pleat spacing. The absence of the wire also makes the filter totally incinerable, which simplifies disposal.



Heavy Duty Frame

The perimeter frame of the PerfectPleat Premium is constructed from 28 pt. clay-coated board stock securely bonded to the media pack. The 28 pt. thickness improves filter strength and helps resist damage. For high moisture applications, PerfectPleat Premium HM, with the highest wet-strength beverage carrier board available, is recommended.

Newly designed pleat stabilizers, bonded to the media to ensure uniform pleat spacing, provide additional strength. Three sets of pleat stabilizers are positioned on the air-leaving side of the filter. On the air-entering side, three support straps add to the PerfectPleat's strength. The support straps and pleat stabilizers ensure integrity against turbulent airflow and provide excellent lateral stability for installation in side-access systems.

Applications

The PerfectPleat Premium HM and PerfectPleat Premium are ideal for applications where pleated filters are currently in use and higher efficiencies are required or desired.

The PerfectPleat is identical to the PerfectPleat Premium but with approximately 25% less media. It is best suited for standard capacity pleated filter applications.

Every PerfectPleat offers superior durability and performance when properly installed and maintained.

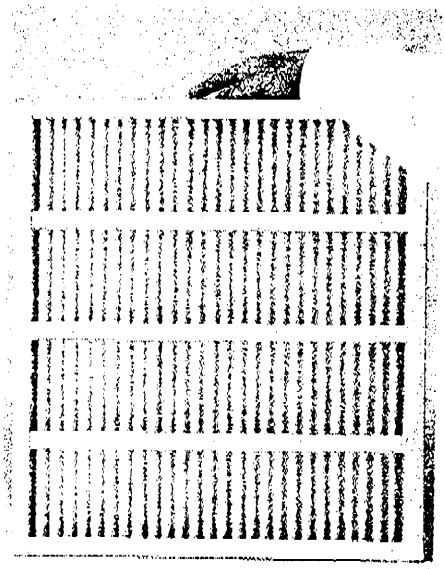
Patented DuraFlex® Media

More than a year ago, the Research and Development Group at AAF began a search for a self-supporting media that would provide consistent performance and excellent durability. The goal was to create a media that could be used in a new generation of pleated filters. The result was a breakthrough in media technology — DuraFlex Self-Supporting Media. DuraFlex offers consistency of performance, durability, and flexibility unlike any media used in pleated filters today.

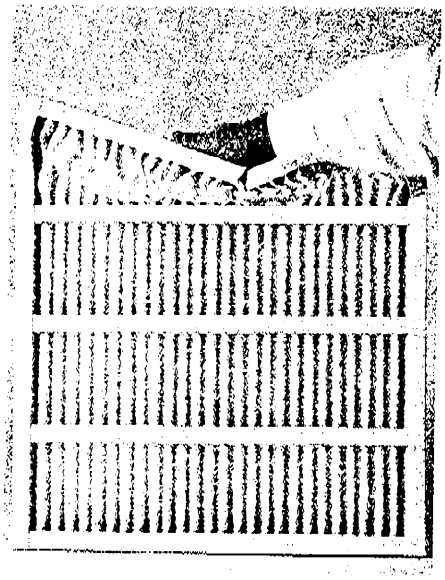
The consistent performance of DuraFlex media is derived from a controlled and repeatable blend of size specific virgin fibers. Not relying on an electret charge, and typical of filters whose performance is based on mechanical filtration properties, the efficiency of DuraFlex media increases from its rated level the longer the product is in service. This increase in efficiency continues until the filter reaches its rated final resistance. The fiber blend consistency of DuraFlex media could not be obtained with the recycled cotton polyester fibers typically used to make pleated filter media. Only the use of a controlled blend of size specific virgin fibers could produce the consistency and performance required for PerfectPleat.

Also, DuraFlex media is self-supporting and remarkably durable, with a "memory" that allows it to spring back to its original form even when severely crushed or distorted. This gives the PerfectPleat filter the ability to maintain its shape even when the frame has been compromised. DuraFlex media, coupled with the new and stronger design of the PerfectPleat's frame, means that each PerfectPleat will give you the durability and strength to stand up to the most demanding applications.

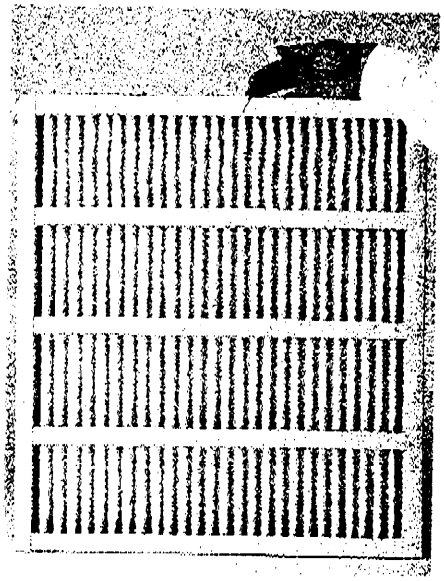
DuraFlex® – Media With A Memory



PerfectPleat with DuraFlex media produces a filter with excellent form and fit.



As a result of its unique design, PerfectPleat can withstand significant damage.



DuraFlex media has "memory" which allows PerfectPleat to remain functional, even when the frame has been compromised.

Product Information Standard Sizes PerfectPleat Premium HM, PerfectPleat Premium, and PerfectPleat

Nominal Sizes (Inches) (W x H x D)	Actual Sizes (Inches) (W x H x D)	Rated Airflow Capacity (SCFM) 300 FPM	500 FPM	625 FPM	Pleats Per Filter PerfectPleat Premium HM / PerfectPleat Premium	Pleats Per Filter PerfectPleat
10 X 20 X 2	9-1/2 X 19-1/2 X 1-3/4	400	**700**	850	11	8
12 X 20 X 2	11-1/2 X 19-1/2 X 1-3/4	500	**850**	1050	14	10
12 X 24 X 2	11-3/8 X 23-3/8 X 1-3/4	600	**1000**	1250	14	10
14 X 25 X 2	13-1/2 X 24-1/2 X 1-3/4	750	**1200**	1500	16	11
15 X 20 X 2	14-1/2 X 19-1/2 X 1-3/4	650	**1050**	1300	17	12
15 X 25 X 2	14-1/2 X 24-1/2 X 1-3/4	800	**1300**	1650	17	12
16 X 16 X 2	15-1/2 X 15-1/2 X 1-3/4	550	**900**	1100	19	13
16 X 20 X 2	15-1/2 X 19-1/2 X 1-3/4	650	**1100**	1400	19	13
16 X 24 X 2	15-3/8 X 23-3/8 X 1-3/4	800	**1350**	1650	19	13
16 X 25 X 2	15-1/2 X 24-1/2 X 1-3/4	850	**1400**	1750	19	13
18 X 25 X 2	17-1/2 X 24-1/2 X 1-3/4	950	**1550**	1950	21	15
18 X 24 X 2	17-3/8 X 23-3/8 X 1-3/4	900	**1500**	1900	21	15
20 X 20 X 2	19-1/2 X 19-1/2 X 1-3/4	850	**1400**	1750	24	17
20 X 24 X 2	19-3/8 X 23-3/8 X 1-3/4	1000	**1650**	2100	24	17
20 X 25 X 2	19-1/2 X 24-1/2 X 1-3/4	1050	**1750**	2150	24	17
24 X 24 X 2	23-3/8 X 23-3/8 X 1-3/4	1200	**2000**	2500	29	20
25 X 25 X 2	24-1/2 X 24-1/2 X 1-3/4	1300	**2150**	2700	30	21

PerfectPleat filters are classified U.L. Class 2. Testing was performed according to U.L. Standard 900 and CAN 4-S111.

Performance Data

PerfectPleat 2" Filter	Pleats Per Lineal Foot	Rated Initial Resistance (In. W.G.) 300 FPM	500 FPM	625 FPM	Recommended Final Resistance (In. W.G.)	ASHRAE 52.2 MERV	ASHRAE 52.1 Rated Average Efficiency (%)	Continuous Operating Temperature Limits °F	°C
Premium	14.0	.12	.28	.43	1.0	6	25-30	140°	60°
Premium HM	14.0	.12	.28	.43	1.0	6	25-30	140°	60°
PerfectPleat	10.0	.14	.30	.45	1.0	6	25-30	140°	60°

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Member National Air Filtration Association

ISO-9001 QMI

AFP-1-200C AUG '01 MP 15M

EQ Credit 3.2: Construction IAQ Management Plan - After Construction

Intent

Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the long-term health, comfort and well-being of construction workers and building occupants.

Requirements

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- After construction ends and prior to occupancy conduct a minimum two week building flush-out with new filtration media at 100% outside air. Replace filtration media used after the flush-out with new filtration media that have a MERV of at least 13.

OR

- Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency's current Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.

Submittals

☐ Provide the LEED Letter Template, signed by the architect, general contractor or responsible party, describing the building flush-out procedures including dates of building flush-out.

OR

☐ Provide a copy of the IAQ testing results indicating that the maximum chemical contaminant concentration requirements are not exceeded.

Narrative

Credit not satisfied. The credit is not available without complying with EQ Credit 3.1. As stated in the narrative of EQ Credit 3.1, no contractual requirements are in place to develop and implement a construction IAQ management plan for CDOB. No pre-occupancy "flush-out" was conducted at CDOB with a corresponding filter replacement.

EQ Credit 4.1: Low-Emitting Materials - Adhesives & Sealants

Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the health, comfort and well-being of installers and occupants.

Requirements

The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168 AND all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing the adhesives and sealants used in the building and declaring that they meet the noted requirements.

☒ Provide a manufacturer's catalog cut sheet and a Material Safety Data Sheet (MSDS) highlighting the stated VOC emissions for each adhesive and sealant used in the building.

Narrative

Credit not satisfied. The VOC content of sealants used for CDOB are tabulated for comparison to LEED credit requirements. As indicated in the table below, the VOC content of sealants used for CDOB are below the limits established for LEED credit compliance. The sealants listed below represent the product literature identified within available documentation and may not be representative of all potential building sealants used for the project. [Note: Cut sheet and MSDS material provided as available (see attached)].

CDOB Sealants VOC Assessment

Sealant Product Descriptions	Product Label VOC Content	LEED VOC Content Limit	Satisfies LEED Credit?
Dow Corning 795 Silicone Building Sealant	**28 g/L**	**250 g/L**	**Yes**
Pecora AC-20 Silicone Sealant	**31 g/L**	**250 g/L**	**Yes**

EQ Credit 4.1: Low-Emitting Materials - Adhesives & Sealants

(continued)

CDOB Sealants VOC Assessment (continued)

Sealant Product Descriptions	Product Label VOC Content	LEED VOC Content Limit	Satisfies LEED Credit?
Sika Sikaflex-2C	**29.5 g/L (NS) 91.6 g/L (NS/SL)**	**250 g/L**	**Yes**
Sonneborn Sonolastic NP 2™	**53-80 g/L**	**250 g/L**	**Yes**

The VOC content of adhesives used for CDOB are tabulated for comparison to LEED credit requirements. As indicated in the table below, the VOC content of adhesives used for CDOB are above the limits established for LEED credit compliance. The adhesives listed below represent the product literature identified within available documentation and may not be representative of all potential building adhesives used for the project.

CDOB Adhesives VOC Assessment

Adhesive Product Descriptions	Product Label VOC Content	LEED VOC Content Limit	Satisfies LEED Credit?
DAP WELDWOOD Original Contact Cement	**700-710 g/L**	**150 g/L**	**No**
EP Bonding Adhesive	**579 g/L**	**250 g/L**	**No**

Product Information

DOW CORNING

Dow Corning® 795 Silicone Building Sealant

Neutral, one-part silicone sealant

FEATURES

- Suitable for most new construction and remedial sealing applications
- Versatile – high performance structural glazing and weathersealing from a single product
- Available in 11 standard colors; custom colors also available

BENEFITS

- Excellent weatherability – virtually unaffected by sunlight, rain, snow, ozone and temperature extremes of -40°F (-40°C) to 300°F (149°C)
- Excellent unprimed adhesion to a wide variety of construction materials and building components, including *Kynar*®[1] and anodized and coated aluminum[2]
- Ease of application – ready to use as supplied
- Ease of use – all-temperature gunnability, easy tooling and low-odor cure byproduct
- Meets global standards (Americas, Asia and Europe)

COMPOSITION

- Neutral, one-part silicone sealant

APPLICATIONS

- Structural and nonstructural glazing
- Structural attachment of many panel systems
- Panel stiffener applications
- Weathersealing of most common construction materials including glass, aluminum, steel, painted metal, EIFS, granite and other stone, concrete, brick and plastics

TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Method	Test	Unit	Result
As Supplied			
ASTM C 679	Tack-Free Time, 50% RH	hours	3
	Curing Time		
	at 25°C (77°F) and 50% RH	days	7-14
	Full Adhesion	days	14-21
ASTM C 639	Flow, Sag or Slump	inches (mm)	0.1 (2.54)
	Working Time	minutes	20-30
As Cured – After 21 days at 25°C (77°F) and 50% RH			
ASTM D 2240	Durometer Hardness, Shore A	points	35
ASTM C 794	Peel Strength	lb/in (kg/cm)	32 (5.7)
ASTM C 1135	Tensile Adhesion Strength		
	at 25% extension	psi (MPa)	45 (0.310)
	at 50% extension	psi (MPa)	60 (0.414)
ASTM C 719	Joint Movement Capability	percent	±50
ASTM C 1248	Staining (granite, marble, limestone, brick and concrete)		None
As Cured – After 21 days at 25°C (77°F) and 50% RH followed by 10,000 hours in a QUV weatherometer, ASTM G 53			
ASTM C 1135	Tensile Adhesion Strength		
	at 25% extension	psi (MPa)	35 (0.241)
	at 50% extension	psi (MPa)	50 (0.345)

DESCRIPTION

Dow Corning® 795 Silicone Building Sealant is a one-part, neutral-cure, architectural-grade sealant that easily extrudes in any weather and cures quickly at room temperature.

This cold-applied, non-sagging silicone material cures to a medium-modulus silicone rubber upon exposure to atmospheric moisture. The cured sealant is durable and flexible enough to accommodate ±50 percent movement of original joint dimension when installed in a properly designed weatherseal joint. In a properly designed structurally glazed joint, the sealant is strong enough to support glass and other panel materials under high windload.

SPECIFICATIONS

Dow Corning 795 Silicone Building Sealant meets the requirements of:

- Federal Specification TT-S-001543A (COM-NBS) Class A for silicone building sealants

[1]*Kynar* is a trademark of Atofina Chemicals Inc.
[2]Contact your local Dow Corning sales office for specifics.

- Federal Specification TT-S-00230C (COM-NBS) Class A for one-component building sealants
- ASTM Specification C-920 Type S, Grade NS, Class 25, Use NT, M, G, A and O
- Canadian Specification CAN2-19.13-M82

COLORS

Dow Corning 795 Silicone Building Sealant is available in 11 colors: black, white, gray, limestone, bronze, sandstone, adobe tan, dusty rose, rustic brick, blue spruce and charcoal. Custom colors may be ordered to match virtually any substrate.

HOW TO USE

Please consult the *Dow Corning Americas Technical Manual*, Form No. 62-1112, for detailed information on state-of-the-art application methods and joint design. Please contact your local Dow Corning sales office for specific advice.

Preparation

Clean all joints, removing all foreign matter and contaminants such as grease, oil, dust, water, frost, surface dirt, old sealants or glazing compounds and protective coatings.

Application Method

Install backing material or joint filler, setting blocks, spacer shims and tapes. Mask areas adjacent to joints to ensure neat sealant lines. Primer is generally not required on non-porous surfaces, but may be necessary for optimal sealing of certain porous surfaces. A test placement is always recommended. Apply *Dow Corning* 795 Silicone Building Sealant in a continuous operation using positive pressure. (The sealant can be applied using many types of air-operated guns and most types of bulk dispensing equipment.) Before a skin forms (typically within 15 minutes), tool the sealant with light pressure to spread the sealant against the backing material and joint surfaces. Remove masking tape as soon as the bead is tooled.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION.

USABLE LIFE AND STORAGE

When stored at or below 27°C (80°F), *Dow Corning* 795 Silicone Building Sealant has a shelf life of 12 months from the date of manufacture. Refer to product packaging for "Use By Date."

PACKAGING

Dow Corning 795 Silicone Building Sealant is supplied in 10.3-fl oz (305-mL) disposable plastic cartridges that fit ordinary caulking guns, 20-fl oz (590-mL) sausages and 2- and 4.5-gal (7.5- and 17-L) bulk containers.

LIMITATIONS

Dow Corning 795 Silicone Building Sealant should not be used:

- In structural applications without prior review and approval by Dow Corning Technical Service
- In below-grade applications
- When surface temperatures exceed 50°C (122°F) during installation
- On surfaces that are continuously immersed in water
- On building materials that bleed oils, plasticizers or solvents that may affect adhesion
- On frost-laden or wet surfaces
- In totally confined joints (the sealant requires atmospheric moisture for cure)
- If the sealant is intended to be painted (paints do not typically adhere to most silicone sealants)
- To surfaces in direct contact with food or other food-grade applications

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, www.dowcorning.com, or consult your local Dow Corning representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

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Dow Corning

Fax Cover Sheet [default]

www.dowcorning.com

DATE: Sep 25, 2002

TO: Doug Vetter

FAX: 5052628893

TEL:

FROM: MARTIN J. (MJHILGER) HILGER

SITE FAX:

TEL:

E-MAIL:

SENDER FAX:

TEL: 989-496-7716

Number of pages including cover sheet: 2

RE: VOC levels of 795 Sealant

Message:

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martin.hilger@dowcorning.com

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PO Box 994 CO2232
Midland MI 48686
Fax: 989-496-4821

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Good News!! Many Dow Corning technical data sheets as well as Material Safety Data Sheets (MSDS) are now available online! Just visit our site: www.dowcorning.com <http://www.dowcorning.com>

You may search under the product name or number, product family or industry. Some of this information is also available in several languages - just choose which country and language you want.

VOC DATA

Information based on South Coast Air Quality Management District of

9/25/2002

PRODUCT DOW CORNING(R) 795 SILICONE BUILDING SEALANT - WHITE

MAXIMUM VOC INCLUSIVE OF WATER AND EXEMPT COMPOUNDS:	28	**G/l**
MAXIMUM VOC EXCLUSIVE OF WATER AND EXEMPT COMPOUNDS:	28	**G/l**
MAXIMUM VOC EXCLUSIVE OF WATER AND EXEMPT COMPOUNDS AFTER THINNING:		**G/l**
MAXIMUM VOC EXCLUSIVE OF WATER AND EXEMPT COMPOUNDS AFTER THINNING:		**G/l**

A SOLVENT IN THIS PRODUCT IS PHOTOCHEMICALLY REACTIVE: IT CONTAINS SOUTH COAST AIR QUALITY MANAGEMENT RULE 102 DEFINED CHEMICALS AS FOLLOWS:

% Group A

% Group B

% Group C

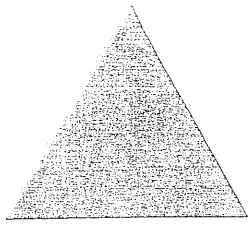
THE SOLVENT IN THIS PRODUCT IS PHOTOCHEMICALLY REACTIVE: IT CONTAINS SOUTH COAST AIR QUALITY MANAGEMENT RULE 102 DEFINED CHEMICALS AS FOLLOWS:

% Group A

% Group B

% Group C

Sikaflex Sealant
Sika Facade Coa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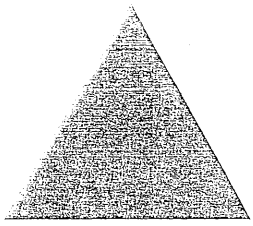
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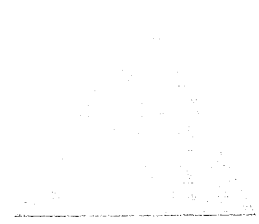
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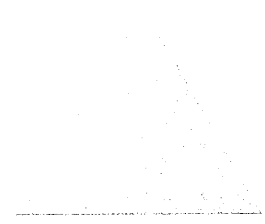
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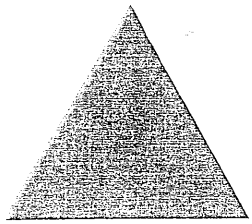
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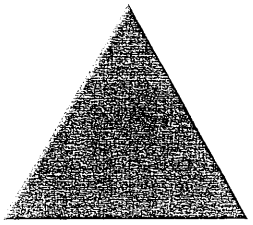
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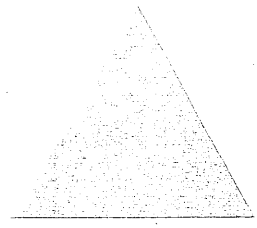
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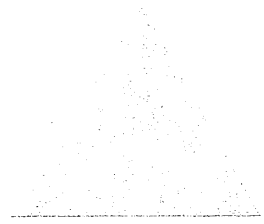
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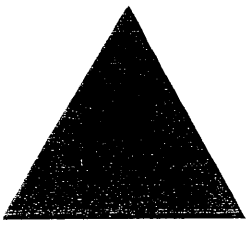
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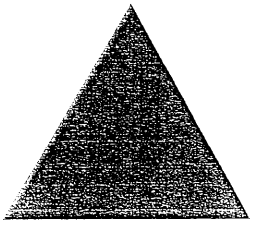
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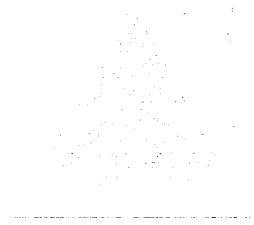
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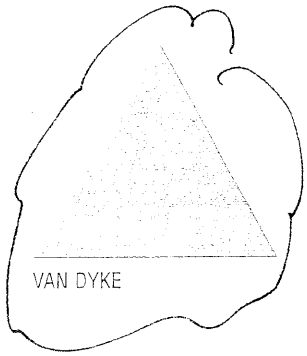
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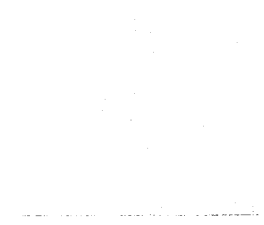
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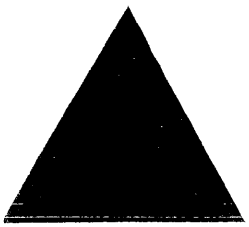
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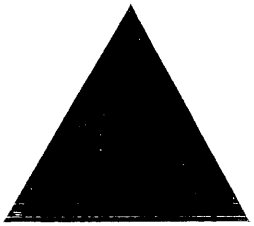
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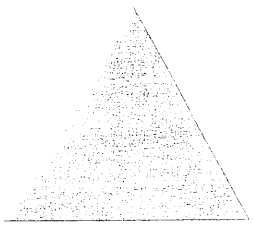
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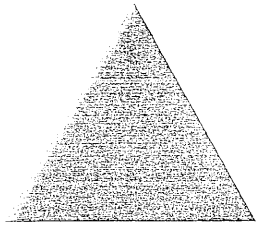
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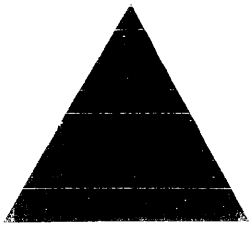
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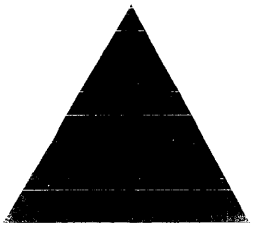
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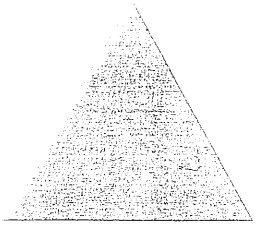
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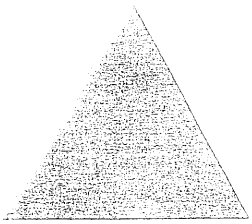
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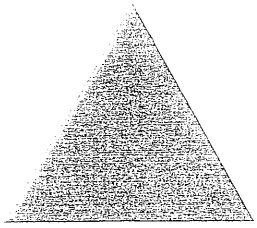
MINNESOTA GRAY

Sika Sealants...Sika Coatings...
For Packaging Needs That Meet And Exceed Your Specs.

Sikaflex-1A/Sikaflex-15LM

Federal Specification TT-S-00230C, Type II, Class A, ASTM C-920, Type S, Grade NS, Class 25. Sikaflex-15LM: Federal Specification for silicones TT-S-001543A, Type NS. Sikaflex 1a gives you ± 25% movement; 15LM a substantial +100,-50%. Available in 7 standard colors.

Cartridges -10.3-fl-oz cartridges, 24/carton

Uni-pacs -20-fl-oz sausages, 20/carton

Pails -1.8-gal (special order)
-4.5 gal (special order)
Drums -55 gal (special order)

Sikaflex-2C

Non-Sag: Federal Specification TT-S-00227E, Type II, Class A, ASTM C-920, Type M, Grade NS, Class 25. Self-leveling: Federal Specification TT-S-00227E, Type I, Class A, ASTM C-920, Type M, Grade P, Class 25. Both non-sag and self-leveling Sikaflex 2C are capable of ±50% joint movement. Available in 40 designer colors. Additional colors also available with Sika's color matching process, coordinated through the Customer Service Department.

Pails -1.5-gal pails
-3 gal units(special order)

Sika Elastocolor

Water-based, seamless, 100% acrylic, flexible waterproofing coating. Seals out water; breathes, lets vapor escape. Crack-bridging capabilities protect your structure even when existing cracks move. Available in all 40 colors shown, stocked in the 5 standard colors plus a tint base. Available in both smooth and textured varieties. Additional colors available with distributor in pail tinting or contact the Customer Service Department.

Pails -5-gal pails
Drums -55 gal drums(special order)

Sikagard 550W Elastic

Advanced, dynamic crack-bridging, anti-carbonation coating based on a partially cross-linked copolymer which provides superior appearance and performance (especially at low temperatures) and long-term protection against water, chlorides, carbon dioxide, and UV exposure. (Allows water vapor diffusion.)

Pails -5-gal units
Drums -55 gal drums(special order)

Sikagard 670W

Water-based, anti-carbonation coating based on an aliphatic resin which provides excellent appearance and long-term protection against water, chlorides, carbon dioxide, and UV exposure when crack bridging is not required. (Allows water vapor diffusion.)

Pails -5-gal units
Drums -55 gal drums(special order)

Contact Sika At:
Phone: 1-800-933-SIKA NATIONWIDE
Internet: www.sikausa.com
Fax Back: 740-375-0063

Sika Corporation (USA)
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Lyndhurst, NJ 07071
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Fax: 201-933-6225

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

Sika Canada, Inc.
601 Delmar Avenue
Point Claire,
Quebec H9R4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sikaflex® - 2c SL

3/02

Polyurethane elastomeric sealant

DESCRIPTION

Sikaflex-2c, SL is a 2-component, premium-grade, polyurethane-based, elastomeric sealant. It is principally a chemical cure in a self-leveling consistency. Meets ASTM C-920, Type M, Grade P, Class 25, use T, NT, M, G, A, O and Federal Specification TT-S-00227E.

WHERE TO USE

- ▲ Intended for use in all properly designed working joints with a minimum depth of ¼ inch.
- ▲ Ideal for horizontal applications.
- ▲ Placeable at temperatures as low as 40F.
- ▲ Adheres to most substrates commonly found in construction.
- ▲ Submerged conditions, such as canal and reservoir joints.

ADVANTAGES

- ▲ True self-leveling properties.
- ▲ Capable of ±50% joint movement.
- ▲ Chemical cure allows the sealant to be placed in joints exceeding ½ in. in depth.
- ▲ High elasticity with a tough, durable, flexible consistency.
- ▲ Exceptional cut and tear resistance.
- ▲ Exceptional adhesion to most substrates without priming.
- ▲ Available in 40 architectural colors.
- ▲ Color uniformity assured via Color-pak system.
- ▲ Available in prepigmented Limestone Gray (no Color-pak needed).
- ▲ Self-leveling consistency, easy to apply in horizontal joints.
- ▲ Easy to mix.
- ▲ Paintable with water-, oil-, and rubber-base paints.
- ▲ Jet fuel resistant.
- ▲ USDA approved.
- ▲ No color-pak needed in prepigmented Limestone.

COVERAGE

1 gal. yields 231 cu. in. or 154 lin. ft. of a ½ in. X ¼ in. joint.

PACKAGING

1.5 gal. unit.
3 gal. units
Color-pak is purchased separately.
Limestone Gray color available prepigmented.

TYPICAL DATA FOR SIKAFLEX-2C, SL (Material and curing conditions 73F (23C) and 50% R.H.)		
SHELF LIFE	One year in original, unopened containers.	
STORAGE CONDITIONS	Store dry at 40-95F (4-35C). **Condition material to 65-75F before using.**	
COLORS	A wide range of architectural colors are available. Special colors available on request.	
APPLICATION TEMPERATURE	40 to 100F, ambient and substrate temperatures. Sealant should be installed when joint is at mid-range of its anticipated movement.	
SERVICE RANGE	-40 to 170F (-40-75C).	
CURING RATE (ASTM C-679)	Tack-free Time 6-8 hrs Final Cure 3 days	
APPLICATION LIFE	TT-S-00227E	4 hrs
TEAR STRENGTH	ASTM D-624	100 lb./in.
SHORE A HARDNESS	ASTM D-2240	40 ± 5
TENSILE PROPERTIES (ASTM D412)		
Tensile Strength at Break	175 psi	
Tensile Elongation	650%	
100% Modulus	100 psi	
ADHESION IN PEEL (FED SPEC. TT-S-00227E)		
Substrate	**Peel Strength**	**% Adhesion Loss**
Concrete	30 lb.	Zero
WEATHERING RESISTANCE	Excellent	
CHEMICAL RESISTANCE	Good resistance to water, diluted acids, diluted alkalines, and residential sewage. Consult Technical Service for specific data.	

HOW TO USE

SURFACE PREPARATION

All joint-wall surfaces must be clean, sound, and frost-free. Joint walls must be free of oils, grease, curing compound residues, and any other foreign matter that might prevent bond. Ideally this should be accomplished by mechanical means.
Bond breaker tape or backer rod must be used in bottom of joint to prevent bond.

PRIMING

Priming is typically not necessary. Most substrates only require priming if sealant will be subjected to water immersion after cure. Testing should be done, however, on questionable substrates, to determine if priming is needed.
Consult Technical Service or Sikaflex Primer Technical Data Sheet for additional information on priming.

MIXING

Pour entire contents of Component 'B' into pail of Component 'A'. Add entire contents of Color-pak into pail and mix with a low-speed drill (400-600 rpm) and Sikaflex paddle.* Mix for 3-5 minutes to achieve a uniform color and consistency. Scrape down sides of pail periodically. Avoid entrapment of air during mixing.
Color-pak must be used with tint base.
Note: When mixing 3 gal. unit, two containers of Component B and two color-paks must be used.
*For prepigmented Limestone base, just mix with low speed drill and Sikaflex paddle (no Color-pak needed).

APPLICATION

Recommended application temperatures 40-100F. Pre-conditioning units to approximately 70F is necessary when working at extremes. Move pre-conditioned units to work areas just prior to application.

Apply sealant only to clean, sound, dry, and frost-free substrates. Sikaflex-2c should be applied into joints when joint slot is at mid-point of its designed expansion and contraction.

To place, pour or extrude the SL grade in one direction and allow it to flow and level as necessary. If extruding, load mixed sealant directly into bulk gun or use follower plate loading system. Place nozzle of gun into bottom of joint and fill entire joint. Keeping the nozzle deep in the sealant, continue with a steady flow of sealant preceding nozzle to avoid air entrapment. Also, avoid overlapping of sealant since this also entraps air. Tool as required. Joint dimension should allow for 1/4 inch minimum and 1/2 inch maximum thickness for sealant. Proper design is 2:1 width to depth ratio.

LIMITATIONS

- ▲ The ultimate performance of Sikaflex-2c, depends on good joint design and proper application.
- ▲ Minimum depth in working joint is ¼ in.
- ▲ Maximum expansion and contraction should not exceed 50% of average joint width.
- ▲ Do not cure in the presence of curing silicones.
- ▲ Avoid contact with alcohol and other solvent cleaners during cure.
- ▲ Allow 3-day cure before subjecting sealant to total water immersion.
- ▲ Avoid exposure to high levels of chlorine. (Maximum level is 5ppm).
- ▲ Do not apply when moisture vapor transmission exists since this can cause bubbling within the sealant.
- ▲ Avoid over-mixing sealant.
- ▲ Light color shades tend to yellow over time when exposed to ultraviolet rays.
- ▲ When overcoating: an on-site test is recommended to determine actual compatibility.
- ▲ The minimum depth of sealant in horizontal joints subject to traffic is 1/2 inch.
- ▲ Do not tool with detergent or soap solution.

CAUTION

Component 'A'; Irritant - Avoid contact. Product is a skin, respiratory and eye irritant. Use of safety goggles and chemical resistant gloves recommended. Use of a NIOSH/MSHA approved respirator required if PELs are exceeded. Use with adequate ventilation.

Component 'B'; Combustible; Sensitizer; Irritant - Contains Xylene. Keep away from heat, sparks and open flame. Use with adequate ventilation. Product is a respiratory and skin sensitizer. Avoid contact. Product is an eye, skin, and respiratory irritant. Use of safety goggles and chemical resistant gloves recommended. Use of a NIOSH/MSHA approved respirator required if PELs are exceeded.

FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes; contact physician. For respiratory problems, remove to fresh air. Wash clothing before re-use. Discard contaminated shoes.

CLEAN UP

Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. For spillage, collect, absorb, and dispose of in accordance with current, applicable local, state, and federal regulations.

Linear Feet of Sealant per Gallon

Depth

Width Inches	¼	½	¾	1	1¼	1½
¼	308.0					
½	154.0	77.0				
¾	102.7	51.3	34.2			
1	77.0	38.5	25.7	19.3		
1¼	61.6	30.8	20.5	15.4	12.3	
1½	51.3	25.7	17.1	12.8	10.3	8.6

KEEP CONTAINER TIGHTLY CLOSED **KEEP OUT OF REACH OF CHILDREN**
NOT FOR INTERNAL CONSUMPTION **FOR INDUSTRIAL USE ONLY**
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Sika warrants its products to be free from manufacturing defects and to meet Sika's current published properties when applied in accordance with Sika directions and tested in accordance with ASTM and Sika Standards. User determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product and excludes labor or the cost of labor. Any claim for breach of this warranty must be brought within one year of the date of purchase.

NO OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY WARRANTY OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. SIKA SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND, RESULTING FROM ANY CLAIM OF BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR ANY LEGAL THEORY. SIKA ASSUMES NO LIABILITY FOR USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANOTHER'S PATENT.

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Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

Quality Certification Numbers: Lyndhurst: 93-062B, Marion: 93-086B, Kansas City: 94-258B, Santa Fe Springs: 94-195C

Sikaflex® - 2c NS

3/02

Polyurethane elastomeric sealant

DESCRIPTION

Sikaflex-2c, NS is a 2-component, premium-grade, polyurethane-based, elastomeric sealant. It is principally a chemical cure in a non-sag consistency. Meets ASTM C-920, Type M, Grade NS, Class 25, use NT, M, G, A, O and Federal Specification TT-S-00227E, Type II, Class A.

WHERE TO USE

- ▲ Intended for use in all properly designed working joints with a minimum depth of ¼ inch.
- ▲ Ideal for vertical and horizontal applications.
- ▲ Placeable at temperatures as low as 40F.
- ▲ Adheres to most substrates commonly found in construction.
- ▲ An effective sealant for use in Exterior Insulation Finish Systems (EIFS).
- ▲ Submerged environments, such as canal and reservoir joints.

ADVANTAGES

- ▲ Capable of ±50% joint movement.
- ▲ Chemical cure allows the sealant to be placed in joints exceeding ½ in. in depth.
- ▲ High elasticity with a tough, durable, flexible consistency.
- ▲ Exceptional cut and tear resistance.
- ▲ Exceptional adhesion to most substrates without priming.
- ▲ Available in 40 architectural colors.
- ▲ Color uniformity assured via Color-pak system (no Color-pak needed).
- ▲ Available in pre-pigmented Limestone Gray.
- ▲ Non-sag even in wide joints.
- ▲ Easy to mix.
- ▲ Paintable with water-, oil-, and rubber-base paints.
- ▲ ANSI/NSF 61 approval for contact with potable water.

COVERAGE

1 gal. yields 231 cu. in. or 154 lin. ft. of a ½ in. x ¼ in. joint.

PACKAGING

1.5 gal. unit.
Available on special order, 3 gal units.
Color-pak is purchased separately.
Limestone Gray color available prepigmented.

HOW TO USE

SURFACE PREPARATION

All joint-wall surfaces must be clean, sound, and frost-free. Joint walls must be free of oils, grease, curing compound residues, and any other foreign matter that might prevent bond. Ideally this should be accomplished by mechanical means.
Bond breaker tape or backer rod must be used in bottom of joint to prevent bond.

TYPICAL DATA FOR SIKAFLEX-2C, NS (Material and curing conditions 73F (23C) and 50% R.H.)		
SHELF LIFE	One year in original, unopened containers.	
STORAGE CONDITIONS	Store dry at 40-95F (4-35C). **Condition material to 65-75F before using.**	
COLORS	A wide range of architectural colors are available. Special colors available on request.	
APPLICATION TEMPERATURE	40 to 100F, ambient and substrate temperatures. Sealant should be installed when joint is at mid-range of its anticipated movement.	
SERVICE RANGE	-40 to 170F (-40-75C).	
CURING RATE (ASTM C-679)	Tack-free Time 6-8 hrs Final Cure 3 days	
APPLICATION LIFE	3-4 hrs	
TEAR STRENGTH	ASTM D-624	45 lb./in.
SHORE A HARDNESS	ASTM D-2240	25 ± 5
TENSILE PROPERTIES (ASTM D412)		
Tensile Strength at Break	120 psi	
Tensile Elongation	500%	
100% Modulus	70 psi	
ADHESION IN PEEL (FED SPEC. TT-S-00227E)		
Substrate	**Peel Strength**	**% Adhesion Loss**
Concrete	25 lb.	Zero
WEATHERING RESISTANCE	Excellent	
CHEMICAL RESISTANCE	Good resistance to water, diluted acids, diluted alkalines, and residential sewage. Consult Technical Service for specific data.	

PRIMING

Priming is typically not necessary. Most substrates only require priming if sealant will be subjected to water immersion after cure. Testing should be done, however, on questionable substrates, to determine if priming is needed.
Consult Technical Service or Sikaflex Primer Technical Data Sheet for additional information on priming.
Note: Most Exterior Insulation Finish Systems (EIFS) manufacturers recommend the use of a primer. When EIFS manufacturer specifies a primer or if on-site bond testing indicates a primer is necessary, Sikaflex 429 primer is recommended. On-site adhesion testing is recommended with final system prior to the start of a job.

MIXING

Pour entire contents of Component 'B' into pail of Component 'A'. Add entire contents of Color-pak into pail and mix with a low-speed drill (400-600 rpm) and Sikaflex paddle.* Mix for 3-5 minutes to achieve a uniform color and consistency. Scrape down sides of pail periodically. Avoid entrapment of air during mixing.

When mixing in cold weather (<50F), do not force the mixing paddle to the bottom of the pail. After adding Component 'B' and Color-pak into Component 'A', mix the top 1/2 to 3/4 of the pail during the first minute of mixing. After scraping down the sides of the pail, mix again for another minute. The paddle should reach the bottom of the pail between the first and second minute of mixing. Scrape down the sides of the pail a second time and then mix for an additional 2-3 minutes until the sealant is well blended.
Color-pak must be used with tint base. For prepigmented Limestone base, just mix with low speed drill and Sikaflex paddle (no Color-pak needed).

APPLICATION

Recommended application temperatures 40-100F. Pre-conditioning units to approximately 70F is necessary when working at extremes. Move pre-conditioned units to work areas just prior to application.

Apply sealant only to clean, sound, dry, and frost-free substrates. Sikaflex-2c should be applied into joints when joint slot is at mid-point of its designed expansion and contraction.

To place, load directly into bulk gun or use a follower plate loading system. Place nozzle of gun into bottom of joint and fill entire joint. Keeping the nozzle deep in the sealant, continue with a steady flow of sealant preceding nozzle to avoid air entrapment. Also, avoid overlapping of sealant since this also entraps air. Tool as required. Joint dimension should allow for 1/4 inch minimum and 1/2 inch maximum thickness for sealant. Proper design is 2:1 width to depth ratio.

LIMITATIONS

- ▲ The ultimate performance of Sikaflex-2c, depends on good joint design and proper application.
- ▲ Minimum depth in working joint is ¼ in.
- ▲ Maximum expansion and contraction should not exceed 50% of average joint width.
- ▲ Do not cure in the presence of curing silicones.
- ▲ Avoid contact with alcohol and other solvent cleaners during cure.
- ▲ Allow 3-day cure before subjecting sealant to total water immersion.
- ▲ Avoid exposure to high levels of chlorine. (Maximum level is 5ppm).
- ▲ Do not apply when moisture vapor transmission exists since this can cause bubbling within the sealant.
- ▲ Avoid over-mixing sealant.
- ▲ Light color shades tend to yellow over time when exposed to ultraviolet rays.
- ▲ When overcoating: an on-site test is recommended to determine actual compatibility.
- ▲ In horizontal joints exposed to vehicular or foot traffic, "TG" additive is recommended. See Sikaflex-2c NS TG data sheet for specific details.

CAUTION

Component 'A'; Irritant - Avoid contact. Product is a skin, respiratory and eye irritant. Use of safety goggles and chemical resistant gloves recommended. Use of a NIOSH/MSHA approved respirator required if PELs are exceeded. Use with adequate ventilation.

Component 'B'; Combustible; Sensitizer; Irritant - Contains Xylene. Keep away from heat, sparks and open flame. Use with adequate ventilation. Product is a respiratory and skin sensitizer. Avoid contact. Product is an eye, skin, and respiratory irritant. Use of safety goggles and chemical resistant gloves recommended. Use of a NIOSH/MSHA approved respirator required if PELs are exceeded.

FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes; contact physician. For respiratory problems, remove to fresh air. Wash clothing before re-use. Discard contaminated shoes.

CLEAN UP

Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. For spillage, collect, absorb, and dispose of in accordance with current, applicable local, state, and federal regulations.

Linear Feet of Sealant per Gallon

Width \ Depth	¼	½	¾	1	1¼	1½
¼	308.0					
½	154.0	77.0				
¾	102.7	51.3	34.2			
1	77.0	38.5	25.7	19.3		
1¼	61.6	30.8	20.5	15.4	12.3	
1½	51.3	25.7	17.1	12.8	10.3	8.6

Product Code 464. Sika and Sikaflex are registered trade marks. Made in USA. Printed in USA. March, 2002.

KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION

KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Sika warrants its products to be free from manufacturing defects and to meet Sika's current published properties when applied in accordance with Sika directions and tested in accordance with ASTM and Sika Standards. User determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product and excludes labor or the cost of labor. Any claim for breach of this warranty must be brought within one year of the date of purchase.

NO OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING ANY WARRANTY OF MERCHANTIBILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. SIKA SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND, RESULTING FROM ANY CLAIM OF BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR ANY LEGAL THEORY. SIKA ASSUMES NO LIABILITY FOR USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANOTHER'S PATENT.

Visit our website at www.sikausa.com
1-800-933-SIKA NATIONWIDE
Regional Information and Sales Centers
For the location of your nearest Sika sales office, contact your regional center.

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Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

Quality Certification Numbers: Lyndhurst: 93-062B, Marion: 93-086B, Kansas City: 94-258B, Santa Fe Springs: 94-195C

MATERIAL SAFETY DATA SHEET

SIKAFLEX 2C, NS - PART A

HMIS

HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
SIKA CORPORATION
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: Kristin Kelley
Telephone Number: (201) 933-8800
FAX Number: (201) 933-9379
Web Site: www.sikausa.com

Manufacturer
SIKA CORPORATION
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: Kristin Kelley
Telephone Number: (201) 933-8800
FAX Number: (201) 933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Issue Date: 09/18/2001

Product Name: SIKAFLEX 2C, NS - PART A
CAS Number: Not Established
Chemical Family: POLYURETHANE
MSDS Number: 1652
Product Code: NO. 464-130

Synonyms
RMF-2283

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
CALCIUM CARBONATE	471-34-1		
CALCIUM OXIDE	1305-78-8		
XYLENE(MIXED ISOMERS)	1330-20-7		1 - 5

3. Hazards Identification

Eye Hazards
May cause eye irritation.

Skin Hazards
May cause skin irritation.

3. Hazards Identification - Continued

Ingestion Hazards

May be harmful if swallowed.

Inhalation Hazards

May cause respiratory tract irritation.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS, PERSIST CONSULT PHYSICIAN.

Ingestion

DILUTE WITH WATER. CONSULT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: 230 °F
Autoignition Point: N/AV °F

Fire And Explosion Hazards

DURING A FIRE, IRRITATING AND/OR TOXIC GASES AND AEROSOLS FROM THE DECOMPOSITION/COMBUSTION PRODUCTS MAY BE PRESENT.

Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

Fire Fighting Instructions

Firefighters should wear self-contained breathing apparatus and full protective gear.

6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL AND TRANSFER INTO SUITABLE CONTAINERS. AVOID CONTACT. VENTILIATE ENCLOSED AREA.

7. Handling And Storage

Handling And Storage Precautions

STORE AT 32F MIN. - 122F MAX. IDEAL STORAGE TEMPERATURE 50-80F. IF CLOSED CONTAINER IS EXPOSED TO HEAT, PRESSURE CAN BUILD UP. IF MOISTURE ENTERS CONTAINER, PRESSURE MAY BUILD UP DUE TO REACTION. STORE IN COOL, DRY AREA IN TIGHTLY CLOSED CONTAINERS, AWAY FROM SPARKS AND OPEN FLAMES.

Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

8. Exposure Controls/Personal Protection

Engineering Controls
Use with adequate general and local exhaust ventilation.

Eye/Face Protection
Safety glasses with side shields or goggles.

Skin Protection
WEAR CHEMICAL RESISTANT GLOVES. WEAR LONG SLEEVE SHIRT AND LONG PANTS.
AVOID SKIN CONTACT.

Respiratory Protection
In areas where the P.E.L.s are exceeded, use a properly fitted NIOSH-approved respirator.

Other/General Protection
WASH THOROUGHLY AFTER HANDLING.

Ingredient(s) - Exposure Limits
CALCIUM CARBONATE
- ACGIH TLV-TWA 10 mg/m3
- OSHA PEL-TWA 15 mg/m3
- OSHA PEL-TWA 5 mg/m3

CALCIUM OXIDE
- ACGIH TLV-TWA 2 mg/m3
- OSHA PEL-TWA 5 mg/m3

XYLENE (MIXED ISOMERS)
- ACGIH TLV-STEL 150 ppm
- ACGIH TLV-TWA 100 ppm
- OSHA PEL-TWA 100 ppm

9. Physical And Chemical Properties

Appearance
PASTE

Odor
AROMATIC ODOR

Chemical Type: Mixture
Physical State: Solid
Melting Point: N/AV °F
Boiling Point: N/AV °F
Specific Gravity: 1.55
Percent Volatiles: 1.9
Percent VOCs: 1.90
Packing Density: 12.95 #/GAL
Vapor Pressure: N/AV
Vapor Density: > AIR
Solubility: N/AV
Evaporation Rate: SLOWER THAN ETHER
V.O.C. content 0.246 # / gal 29.48 g /l

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

10. Stability And Reactivity - Continued

Conditions To Avoid (Stability)
OPEN FLAME, HEAT

Incompatible Materials
WATER, ALCOHOLS AND AMINES

Hazardous Decomposition Products
CO, CO2, OXIDES OF NITROGEN

11. Toxicological Information

No Data Available...

12. Ecological Information

No Data Available...

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Proper Shipping Name
NOT REGULATED BY D.O.T.

15. Regulatory Information

U.S. Regulatory Information
All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

SARA Hazard Classes
Acute Health Hazard
Chronic Health Hazard
Fire Hazard

SARA Section 313 Notification
This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372. This information must be included in all MSDSs that are copied and distributed for this material.

Ingredient(s) - U.S. Regulatory Information
XYLENE (MIXED ISOMERS)
SARA Title III - Section 313 Form "R"/TRI Reportable Chemical
SARA - Acute Health Hazard
SARA - Chronic Health Hazard
SARA - Fire Hazard

Ingredient(s) - State Regulations
CALCIUM CARBONATE
Pennsylvania - Workplace Hazard
CALCIUM OXIDE
New Jersey - Workplace Hazard
Pennsylvania - Workplace Hazard
Massachusetts - Hazardous Substance
New York City - Hazardous Substance

15. Regulatory Information - Continued

Ingredient(s) - State Regulations - Continued

XYLENE (MIXED ISOMERS)
- New Jersey - Workplace Hazard
- New Jersey - Environmental Hazard
- New Jersey - Special Hazard
- Pennsylvania - Workplace Hazard
- Pennsylvania - Environmental Hazard
- Massachusetts - Hazardous Substance
- New York City - Hazardous Substance

16. Other Information

HMIS Rating
Health: 1
Fire: 1
Reactivity: 0
PPE: C

Revision/Preparer Information
MSDS Preparer: Kristin Kelley
This MSDS Supercedes A Previous MSDS Dated: 11/11/1999

Reference Documentation

Disclaimer

The data in this Material Safety Data Sheet relates only to the specific material herein and does not relate to use in combination with any other materialor in any process. The information set forth herein is based on technical da ta that Sika believes to be reliable as of the date hereof. Since conditions of use are outside our control, we make no warranties, express or implied andassume no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under or a recommendation to i nfringe any patents.

SIKA CORPORATION

MATERIAL SAFETY DATA SHEET

SIKAFLEX 2C, SL - PART A

HMIS	
HEALTH	2
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
SIKA CORPORATION
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: Kristin Kelley
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FAX Number: (201) 933-9379
Web Site: www.sikausa.com

Manufacturer
SIKA CORPORATION
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: Kristin Kelley
Telephone Number: (201) 933-8800
FAX Number: (201) 933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Issue Date: 09/18/2001

Product Name: SIKAFLEX 2C, SL - PART A
CAS Number: Not Established
Chemical Family: POLYURETHANE
Chemical Formula: RMF-2057
MSDS Number: 1101
Product Code: NO. 465-130

Synonyms
RMF-2057

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
POLYISOCYANATE PREPOLYMER	TradeSecret		
XYLENE(MIXEDISOMERS)	1330-20-7		1 - 5

3. Hazards Identification

Eye Hazards
Causes eye irritation.

Skin Hazards
May cause skin irritation.

3. Hazards Identification - Continued

Ingestion Hazards

May be harmful if swallowed.

Inhalation Hazards

May cause nose, throat, and lung irritation.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

Ingestion

DILUTE WITH WATER. CONSULT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: 230 °F
Autoignition Point: N/AV °F

Fire And Explosion Hazards

DURING A FIRE, IRRITATING AND/OR TOXIC GASES AND AEROSOLS FROM THE DECOMPOSITION/COMBUSTION PRODUCTS MAY BE PRESENT.

Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

Fire Fighting Instructions

Firefighters should wear self-contained breathing apparatus and full protective gear.

6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL AND TRANSFER INTO SUITABLE CONTAINERS. AVOID CONTACT. VENTILIATE ENCLOSED AREA.

7. Handling And Storage

Handling And Storage Precautions

STORE AT 32F MIN. - 122F MAX. IDEAL STORAGE TEMPERATURE 50-80F. IF CLOSED CONTAINER IS EXPOSED TO HEAT, PRESSURE CAN BUILD UP. IF MOISTURE ENTERS CONTAINER, PRESSURE MAY BUILD UP DUE TO REACTION. STORE IN COOL, DRY AREA IN TIGHTLY CLOSED CONTAINERS, AWAY FROM SPARKS AND OPEN FLAMES.

Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

8. Exposure Controls/Personal Protection

Engineering Controls
Use with adequate general and local exhaust ventilation.

Eye/Face Protection
Safety glasses with side shields or goggles.

Skin Protection
WEAR CHEMICAL RESISTANT GLOVES. WEAR LONG SLEEVE SHIRT AND LONG PANTS.
AVOID SKIN CONTACT.

Respiratory Protection
In areas where the P.E.L.s are exceeded, use a properly fitted NIOSH-approved respirator.

Other/General Protection
WASH THOROUGHLY AFTER HANDLING.

Ingredient(s) - Exposure Limits
XYLENE (MIXED ISOMERS)
ACGIH TLV-STEL 150 ppm
ACGIH TLV-TWA 100 ppm
OSHA PEL-TWA 100 ppm

9. Physical And Chemical Properties

Appearance
PASTE

Odor
AROMATIC ODOR

Chemical Type: Mixture
Physical State: Solid
Specific Gravity: 1.60
Packing Density: 13.38 #/GAL
Vapor Density: > AIR
Evaporation Rate: SLOWER THAN ETHER
V.O.C. CONTENT = 75 g/L

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

Conditions To Avoid (Stability)
OPEN FLAME, HEAT

Incompatible Materials
WATER, ALCOHOLS AND AMINES

Hazardous Decomposition Products
CO, CO2, OXIDES OF NITROGEN

11. Toxicological Information

Miscellaneous Toxicological Information
CHRONIC OVEREXPOSURE TO XYLENE MAY CAUSE KIDNEY AND/OR LIVER DAMAGE.

11. Toxicological Information - Continued

Conditions Aggravated By Exposure

EYE DISEASE, SKIN DISORDERS, CHRONIC RESPIRATORY DISORDERS.

12. Ecological Information

No Data Available...

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Proper Shipping Name

NOT REGULATED BY D.O.T.

15. Regulatory Information

U.S. Regulatory Information

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

SARA Hazard Classes

Acute Health Hazard
Chronic Health Hazard
Fire Hazard

SARA Section 313 Notification

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372. This information must be included in all MSDSs that are copied and distributed for this material.

Ingredient(s) - U.S. Regulatory Information

XYLENE (MIXED ISOMERS)
- SARA Title III - Section 313 Form "R"/TRI Reportable Chemical
- SARA - Acute Health Hazard
- SARA - Chronic Health Hazard
- SARA - Fire Hazard

Ingredient(s) - State Regulations

XYLENE (MIXED ISOMERS)
- New Jersey - Workplace Hazard
- New Jersey - Environmental Hazard
- New Jersey - Special Hazard
- Pennsylvania - Workplace Hazard
- Pennsylvania - Environmental Hazard
- Massachusetts - Hazardous Substance
- New York City - Hazardous Substance

16. Other Information

HMIS Rating

Health: 2
Fire: 1
Reactivity: 0
PPE: C

16. Other Information - Continued

HMIS Rating - Continued
Revision/Preparer Information
MSDS Preparer: Kristin Kelley
This MSDS Supercedes A Previous MSDS Dated: 04/24/2000

Disclaimer

The data in this Material Safety Data Sheet relates only to the specific material herein and does not relate to use in combination with any other materialor in any process. The information set forth herein is based on technical da ta that Sika believes to be reliable as of the date hereof. Since conditions of use are outside our control, we make no warranties, express or implied andassume no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under or a recommendation to i nfringe any patents.

SIKA CORPORATION

MATERIAL SAFETY DATA SHEET

SIKAFLEX 2C, NS & SL - PART B

HMIS

HEALTH	2
FLAMMABILITY	2
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
SIKA CORPORATION
201 Polito Ave
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Company Contact: Kristin Kelley
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FAX Number: (201) 933-9379
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Manufacturer
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FAX Number: (201) 933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Issue Date: 11/11/1999

Product Name: SIKAFLEX 2C, NS & SL - PART B
CAS Number: Not Established
Chemical Family: POLYURETHANE
MSDS Number: 1100
Product Code: NO. 464-140

Synonyms
NO. 464-140 REVISION #1

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
POLYISOCYANATEPREPOLYMER	57451-08-8		
XYLENE(MIXEDISOMERS)	1330-20-7		5 - 10

3. Hazards Identification

Eye Hazards
EYE IRRITANT.

Skin Hazards
MAY CAUSE SKIN IRRITATION. PROLONGED AND/OR REPEATED CONTACT WITH SKIN MAY CAUSE AN ALLERGIC REACTION/SENSITIZATION. MAY CAUSE DERMATITIS (SKIN REDNESS,DRYNESS, SCALING, ETC.) FROM REPEATED OR PROLONGED CONTACT.

3. Hazards Identification - Continued

Ingestion Hazards

LOW ORDER OF ACUTE TOXICITY. HARMFUL IF ASPIRATED INTO LUNGS.

Inhalation Hazards

MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE RESPIRATORY SENSITIZATION. HIGH VAPOR CONCENTRATIONS OF XYLENE (GREATER THAN APPROX. 1000 PPM) MAY CAUSE HEADACHES, DIZZINESS, ANESTHESIA, DROWSINESS, UNCONSCIOUSNESS, AND OTHER CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DEATH.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

Ingestion

DILUTE WITH WATER. CONSULT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: 112 °F
Autoignition Point: N/AV °F
Lower Explosive Limit: N/AV
Upper Explosive Limit: N/AV

Fire And Explosion Hazards

DURING A FIRE, IRRITATING AND/OR TOXIC GASES AND AEROSOLS FROM THE DECOMPOSITION/COMBUSTION PRODUCTS MAY BE PRESENT.

Extinguishing Media

FOAM/DRY CHEMICAL/CO2/WATER FOG

Fire Fighting Instructions

WEAR NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR.

6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL AND TRANSFER INTO SUITABLE CONTAINERS. AVOID CONTACT. VENTILIATE ENCLOSED AREA.

7. Handling And Storage

Handling And Storage Precautions

STORE AT 32F MIN. - 122F MAX. IDEAL STORAGE TEMPERATURE 50-80F. IF CLOSED CONTAINER IS EXPOSED TO HEAT, PRESSURE CAN BUILD UP. IF MOISTURE ENTERS CONTAINER, PRESSURE MAY BUILD UP DUE TO REACTION. STORE IN COOL, DRY AREA IN TIGHTLY CLOSED CONTAINERS, AWAY FROM SPARKS AND OPEN FLAMES.

Work/Hygienic Practices

WASH HANDS THOROUGHLY AFTER USE.

8. Exposure Controls/Personal Protection

Engineering Controls
LOCAL EXHAUST HIGHLY RECOMMENDED. VENTILATION SHOULD BE SUFFICIENT TO REDUCE AIR CONTAMINANTS TO BELOW PELs. MECHANICAL EXHAUST HIGHLY RECOMMENDED.

Eye/Face Protection
SAFETY GLASSES/CHEMICAL GOGGLES.

Skin Protection
WEAR CHEMICAL RESISTANT GLOVES. WEAR LONG SLEEVE SHIRT AND LONG PANTS. AVOID SKIN CONTACT.

Respiratory Protection
IF PELs ARE EXCEEDED, WEAR APPROPRIATE, PROPERLY FITTED NIOSH/MSHA APPROVED RESPIRATOR.

Other/General Protection
WASH THOROUGHLY AFTER HANDLING.

Ingredient(s) - Exposure Limits
POLYISOCYANATE PREPOLYMER
- ACGIH TLV: NOT ESTABLISHED
- OSHA PEL: NOT ESTABLISHED
- NTP: NO
- IARC: NO

XYLENE (MIXED ISOMERS)
- OSHA PEL - TWA: 100 PPM
- OSHA PEL - STEL: 150 PPM
- ACGIH TLV - TWA: 100 PPM
- ACGIH TLV - STEL: 150 PPM
- CONTAINS 15% ETHYL BENZENE 100-41-4
- E.B. OSHA PELs 100 PPM / 125 PPM

9. Physical And Chemical Properties

Appearance
CLEAR LIQUID

Odor
AROMATIC ODOR

Chemical Type: Pure
Specific Gravity: 1.02
Molecular Weight: 0.00
Percent Volatiles: 9.0
Percent VOCs: 0.00
Packing Density: 8.5 #/GAL
Vapor Density: > AIR
Evaporation Rate: SLOWER THAN ETHER
V.O.C. content 0.765 # / gal 91.66 g / l

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

Conditions To Avoid (Stability)
OPEN FLAME, HEAT

10. Stability And Reactivity - Continued

Incompatible Materials
WATER, ALCOHOLS AND AMINES

Hazardous Decomposition Products
CO, CO2, OXIDES OF NITROGEN

11. Toxicological Information

Miscellaneous Toxicological Information
CHRONIC OVEREXPOSURE TO XYLENE MAY CAUSE KIDNEY AND/OR LIVER DAMAGE.

Conditions Aggravated By Exposure
EYE DISEASE, SKIN DISORDERS AND ALLERGIES, CHRONIC RESPIRATORY DISORDERS.

12. Ecological Information

Other Environmental Information
VOC 91 grams/liter

13. Disposal Considerations

AS SUPPLIED, THIS MATERIAL WOULD BE CONSIDERED A RCRA HAZARDOUS WASTE.
DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

14. Transport Information

Proper Shipping Name
NOT REGULATED BY D.O.T., EXCEPT BY AIR

15. Regulatory Information

SARA Hazard Classes
Acute Health Hazard
Chronic Health Hazard
Fire Hazard

Ingredient(s) - U.S. Regulatory Information
XYLENE (MIXED ISOMERS)
SARA Title III - Section 313 Form "R"/TRI Reportable Chemical

16. Other Information

HMIS Rating
Health: 2
Fire: 2
Reactivity: 0
PPE: C

Reference Documentation
SIKAFLEX 1A - VOC 97 GRAMS/LITER

Disclaimer

The data in this Material Safety Data Sheet relates only to the specific material herein and does not relate to use in combination with any other materialor in any process. The information set forth herein is based on technical da ta that Sika believes to be reliable as of the date hereof. Since conditions of use are outside our control, we make no warranties, express or implied andassume no liability in connection with any use of this information. Nothing herein is to be taken as a license to operate under or a recommendation to i nfringe any patents.

Disclaimer - Continued
SIKA CORPORATION

PECORA CORPORATION

SPECIFICATION DATA

1. PRODUCT NAME

AC-20® + Silicone

One-part, non-sag, acrylic latex caulking compound.

2. MANUFACTURER

Pecora Corporation
165 Wambold Road
Harleysville, PA 19438
Phone: (215) 723-6051
(800) 523-6688
FAX: (215) 721-0286
Web: www.pecora.com

3. PRODUCT DESCRIPTION

AC-20 is a pure acrylic latex sealant for general purpose interior and exterior* caulking in architectural applications where slight to moderate movement is anticipated. Formulated with the highest quality ingredients including a silicone additive for greater adhesion and weatherability, AC-20 is completely compatible with premium-grade latex and oil paints and will not stain adjacent surfaces.

Basic Uses: AC-20's elastomeric properties make it an excellent sealant for caulking interior concrete joints, hollow core ceiling and floor planks, window and door frames, vinyl, aluminum, steel and plywood siding, sheet rock, baseboards and bathroom and kitchen fixtures. It may be used to grout marble and ceramic tile, repair mortar joints, and, under controlled conditions, to bed insulated glass units and storm windows **

AC-20 has superb color stability and resistance to ultraviolet rays, ozone and airborne contaminants. It is mildew resistant and has United States Department of Agriculture acceptance for use in meat and poultry processing plants. In addition to the substrates listed above, AC-20 is compatible with polystyrene, polyurethane, cork, foamed and fibrous glass and gypsum board.

Limitations: *The sealant must be protected from water for 24 hours after application; do not caulk outdoors when rain is imminent.

**Windows must be properly weeped or entrapped water could cause reversion. Sealant must be given additional time to fully cure before windows are installed because of the closed-in conditions.

Packaging: Available in 10.5 fl. oz. (.310 L) plastic cartridges; 30 fl. oz. (.887 L) fiber cartridges; 5-gallon (18.9 L) pails; and 55-gallon (208 L) drums.

Standard Colors: Black, Ivory, Limestone, Brown, Bronze, Cedar, Almond, Tan, Beige-Grey, Tru-White and Aluminum Stone

4. TECHNICAL DATA

Applicable Standards: AC-20 exceeds the requirements of ASTM C834 Specification For Latex Sealants.

Movement Capability: 7-1/2% in extension, 7-1/2% in compression (15%) when installed in properly designed joints within its range of thermal movement capabilities. Refer to Test Data Box below for further technical information.

Joint Design: The width of the joint should be approximately 12 times the anticipated movement and should fall within the range of 1/4" (6 mm) to 3/4" (19 mm). The depth of the joint should be 1/4" (6 mm) minimum to 3/8" (9 mm) maximum.

TYPICAL PHYSICAL PROPERTIES

Property	Value	Test Method
Adhesion loss (%)	0.5	ASTM C736
Artifical weathering		ASTM C732
Adhesion loss (%)	1.0	ASTM C732
Cracking	None	ASTM C732
Discoloration	None	ASTM C732
Slump	None	ASTM C732
Wash-out	None	ASTM C732
Elongation, ultimate (%)	400-500	ASTM D412
Extrudability (gram/sec)	9.8	ASTM C731
Low-temperature flexibility (pass/fail)	Pass	ASTM C734
Modulus (psi)	15-20	ASTM D412
Recovery (%)	90	ASTM C736
Slump (in/mm)	0.05/1.3	ASTM D2202
Stain index	1.1	ASTM D2203
Tack-free time (pass/fail)	Pass	ASTM D2377
Tensile, ultimate (psi)	30-40	ASTM D412
VOC Content (g/L)	31	ASTM D3960
Volume Shrinkage (%)	21.9	ASTM C733

07920

Material Safety Data Sheet

Date last revised: April, 2001

I. GENERAL INFORMATION

Chemical Name & Synonyms ACRYLIC LATEX SEALANT	Trade Name & Synonyms AC-20 ARCYLIC LATEX PLUS SILICONE
Chemical Family ACRYLIC LATEX	Formula MIXTURE
Proper DOT Shipping CAULKING COMPOUND	DOT Hazard Classification NONE
Manufacturer PECORA CORPORATION	Manufacturer's Phone Number 215-723-6051
Manufacturer's Address 165 Wambold Road, Harleysville, PA 19438	Chemtrec Phone Number 800-424-9300

II. INGREDIENTS

Principal Hazardous Components MINERAL SPIRITS (CAS # 64741-41-9)	Percent < 5	Threshold Limit Value (Units) 500 PPM
HEALTH 0 FLAMMABILITY 0		REACTIVITY 1

III. PHYSICAL DATA

Boiling Point (°F) N/A	Specific Gravity (H2O = 1) 1.56
Vapor Pressure (mm Hg.) 10 MINERAL SPIRITS	Percent Volatile by Volume (%) 15 - 20%
Vapor Density (Air = 1) HEAVIER	Evaporation Rate (ETHER = 1) SLOWER
Solubility in Water SOLUBLE IN WET STATE, INSOLUBLE IN CURED STATE	PH 7.0 - 7.5
Appearance & Odor SMOOTH PASTE - SLIGHT MINERAL SPIRITS ODOR	

IV. FIRE & EXPLOSION HAZARD DATA

Flash Point (Test Method) > 200° F. T.C.C.	Auto Ignition Temperature 540° F. MINERIAL SPIRITS
Flammable Limits	LEL 0.8 MINERAL SPIRITS UEL 5.0 MINERAL SPIRITS
Extinguishing Media Small Fires: WATER SPRAY, CARBON DIOXIDE, FOAM, DRY CHEMCIALS	
Special Fire Fighting Procedures: WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING FIRES INVOLVING CHEMICALS.	
Unusual Fire & Explosion Hazards: NONE KNOWN	

V. Health Hazard Data

OSHA Permissible Exposure Limit	ACGIH Threshold Limit Value

SEE SECTION II	SEE SECTION II
Carcinogen NO	Carcinogen NO

Symptoms of Exposure: NO KNOWN EFFECTS REPORTED IN NORMAL USE OF THIS COMPOUND. AS A PRECAUTIONARY MEASURE PRECLUDE FROM THOSE INDIVIDUALS HAVING A HISTORY OF RESPIRATORY AILMENTS.

Medical Conditions Aggravated By Exposure:
NONE KNOWN

Primary Route (s) of Entry:
SKIN AND INALATION

Emergency First Aid: SKIN: WASH WITH SOAP AND WATER. INHALATION: MOVE TO FRESH AIR. EYES: FLUSH WITH COPIOUS AMOUNTS OF WATER.

VI. REACTIVITY DATA

Stability		Unstable	Conditions to Avoid
	X	Stable	Conditions to Avoid EXCESSIVE HEAT AND FREEZING TEMPERATURES
Incompatibility			Materials to Avoid
Hazardous		May Occur	Conditions to Avoid
Polymerization	X	Will Not Occur	Conditions to Avoid EXCESSIVE HEAT AND FREEZING TEMPERATURES

Hazardous Decomposition Products: CO, CO_2, AND POSSIBLY OXIDES OF NITROGEN

VII. ENVIRONMENTAL PROTECTION PROCEDURES

Spill Response: SCRAPE UP AND PLACE IN CONTAINERS. WASH AREA WITH WARM, SOAPY WATER OR MINERAL SPIRITS.

Waste Disposal Method: BURY IN SUITABLE LANDFILL WHERE PERMITTED UNDER APPROPRIATE LOCAL, STATE AND FEDERAL REGULATIONS.

VIII. SPECIAL PROTECTION INFORMATION

Eye Protection GLASSES OR GOGGLES	Skin Protection COTTON OR PLASTIC GLOVES
Respiratory Protection (Specific Type) ORGANIC TYPE IN CONFINED AREAS	Ventilation Recommended GENERAL ROOM VENTILATION

Other Protection:
BARRIER SKIN CREAM

IX. SPECIAL PRECAUTIONS

Hygienic Practices In Handling & Storage: STORE IN COOL, DRY PLACE. PROTECT FROM FREEZING. WASH HANDS BEFORE EATING OR SMOKING.

Precautions For Repair & Maintenance of Contaminated Equipment:
SEE SECTION V.

Other Precautions:
NOT RECOMMENDED FOR CONTINUOUS WATER IMMERSION. AVOID INTENSE WATER CONTACT FOR 24 HOURS AFTER APPLICATION.

KEEP OUT OF REACH OF CHILDREN!!!!!

Sonneborn®

Sealant

CONTRACT REVIEW DATA

Shop Drwgs ☐ Product Data ☒ Samples ☐

The attached data has been reveiwed for conformance with the contract documents in accordance with AIA 3.12. Contractor has endeavored to identify all deviations from the contract documents. This data is being submitted for approval in accordance with AIA 4.2.7 and in conformance with the Architect's design. The contractor is not responsible for errors or omissions by the Architect in his design of the project.

PROJECT LDNC

BY _____ DATE SUBMITTED 5/31/02

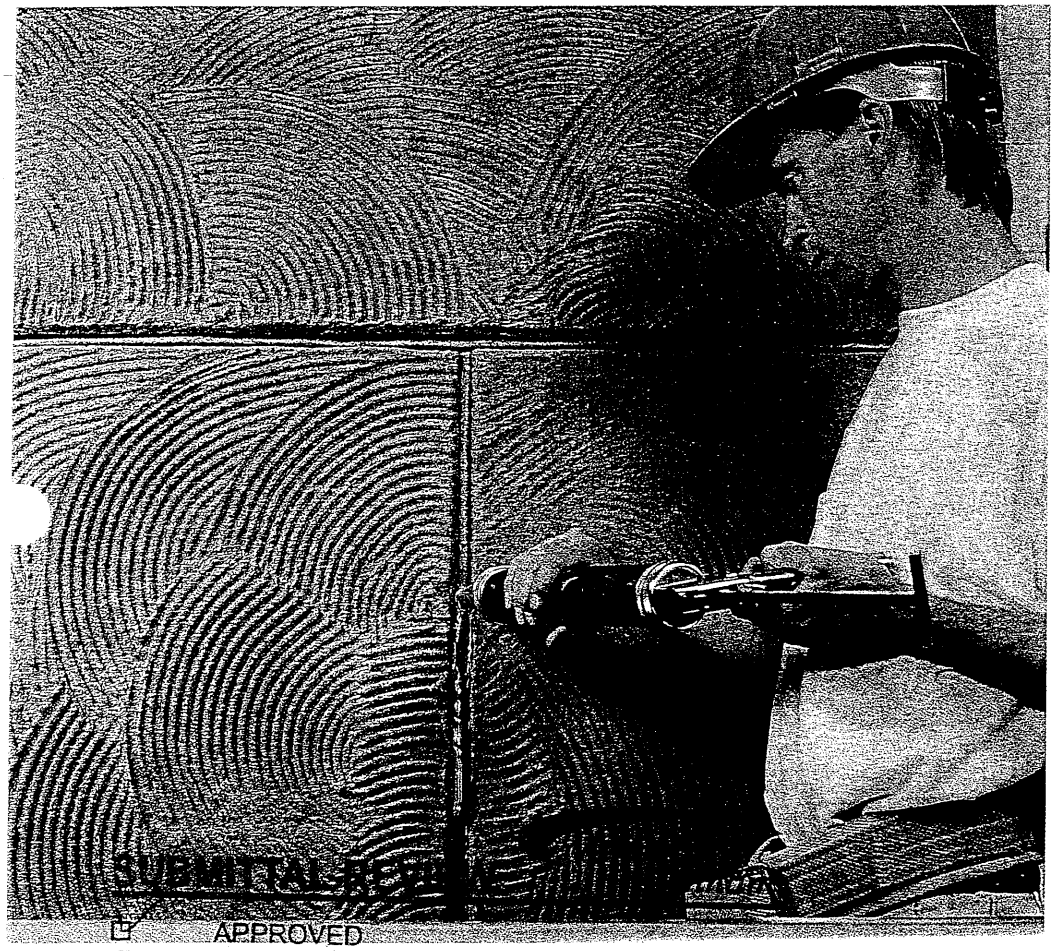
FLINTCO, INC.

DATE REC'D BACK FROM ARCHITECT _____

SONOLASTIC®

NP 2™

Multiple-component high-performance polyurethane sealant



SUBMITTAL RETURN

☒ APPROVED
☐ APPROVED AS NOTED
☐ PARTIAL APPROVAL / RESUBMIT AS NOTED
☐ REVISE AND RESUBMIT
☐ NOT APPROVED

Where to Use NP 2™

- Concrete
- Masonry
- Aluminum
- Marble
- Granite
- Brick
- Stucco
- Limestone
- Expansion wall joints
- Curtain walls
- Panel walls
- Precast units
- Perimeter window caulking
- Exterior insulation walls
- Tilt-up panel joints
- Vinyl siding
- Interior and exterior
- Parking decks

Benefits

- Added protection against unanticipated movement
- No primer on many construction materials
- Long-lasting performance on all applications
- Use for cold climate applications, speeds initial cure
- Speeds application
- 65 custom colors possible
- Use where aesthetics are a primary concern
- Passes 4 hour 4 inch fire and hose stream test when used with Ultra-Block®

degussa.

Construction Chemicals Americas

How to Apply NP 2™

Joint Preparation

The number of joints and the joint width should be designed for a maximum of ±25% movement.

The depth of the sealant should be 1/2 the width of the joint. The maximum depth is 1/2" (13 mm) and the minimum is 1/4" (6 mm). Refer to Table 1.

In deep joints, the sealant depth must be controlled by Closed-Cell Backer-Rod or Soft Backer-Rod. (Refer to Form Nos. 1017927 and 1017925.) Where the joint depth does not permit the use of backer-rod, a bond-breaker (polyethylene strip) must be used to prevent three-point bonding.

To maintain the recommended sealant depth, install backer-rod by compressing and rolling it into the joint channel without stretching it lengthwise. Closed-Cell Backer-Rod should be about 1/8" (3 mm) larger in diameter than the width of the joint to allow for compression. Soft Backer-Rod should be approximately 25% larger in diameter than the joint width. The sealant does not adhere to it, and no separate bondbreaker is required. Do not prime or puncture the backer-rod.

Table 1

Joint Width and Sealant Depth

Joint width (inches)	Joint width (mm)	Sealant depth at midpoint (inches)	Sealant depth at midpoint (mm)
1/4 to 1/2	6 - 13	1/4	6
1/2 to 3/4	13 - 19	1/4 to 3/8	6 - 10
3/4 to 1	19 - 25	3/8 to 1/2	10 - 13
1 to 2	25 - 51	1/2	13

Surface Preparation

Surfaces must be structurally sound, fully cured, dry, clean, free of dirt, moisture, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofings, curing and parting compounds, and membrane materials.

Concrete, stone, and other masonry

Clean by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and laitance.

Wood

New and weathered wood must be clean and sound. Scrape away paint to bare wood. Any coating that cannot be removed must be tested to verify adhesion of sealant or determine an appropriate primer.

Metal

Remove scale, rust, and coatings from metal to expose a bright white surface. Remove protective coatings as well as any chemical residue or film. Aluminum window frames are frequently coated with a clear lacquer that must be removed before the application of NP 2™. Any coating that cannot be removed must be tested to verify adhesion of sealant or determine an appropriate primer. Remove any other protective coatings or finishes that could interfere with adhesion.

Priming

NP 2™ is generally considered a non-priming sealant, but special circumstances or substrates may require a primer. It is the user's responsibility to check the adhesion of the cured sealant on typical test joints at the project site before and during application. Refer to Technical Data Guide on Primer 733 or 766 (Form No. 1017962), and consult Technical Services for additional information.

Apply primer full strength with a brush or clean cloth. A light, uniform coating is sufficient for most surfaces. Porous surfaces require more primer, however, do not overapply.

Allow primer to dry before applying NP 2™. Depending on temperature and humidity, primer will be tack free in 15 to 120 minutes. Priming and sealing must be done on the same work day.

Mixing

NP 2™ is a three-component system and must be thoroughly mixed before use. The oversize Part A container allows for the addition and mixing of Part B and Sonolastic® color pigment into Part A.

1-1/2 gallon (5.67 L) unit: Transfer entire contents of Part B to Part A container using a spatula or a margin trowel.

It is imperative that Part B be mixed thoroughly with Part A. Before adding Sonolastic® pigment, scrape sides of container to ensure complete mixing of Parts A and B.

With a slow-speed drill and a sealant mixing paddle, mix 4 - 6 minutes. The paddle blade must be kept below the surface of the sealant to avoid whipping air into the sealant.

Transfer the entire contents of the Sonolastic® pigment can into the mixed Part A and B. Use a spatula or knife to remove all the pigment from the container. Continue mixing with a slow-speed (500-600 rpm) drill and slotted paddle until color is uniform. During the process, the sides and bottom of the container must be scraped several times to obtain a complete mix.

3 gallon (11.37 L) unit: Use 2 Part B and 2 Sonolastic® pigment containers for each Part A container. Mix as instructed under 1-1/2 gallon (5.7 L) unit.

The pot life of mixed NP 2™ is influenced by temperature. See Table 2 for specific data. NP 2™ accelerator or extender may be added to adjust the initial cure rate.

Application

Except when structural joint conditions dictate the use of knife or spatula, NP 2™ is applied by professional bulk gun loaded at the jobsite. Joints should be filled from the bottom up to the exterior face by holding a properly sized nozzle against the joint bottom.

Proper tooling ensures the correct bead configuration and a neat joint. Equally important, it ensures maximum adhesion to the sides of the joint. For best results, dry tool. DO NOT use water or soapy water to tool. Avoid overtooling of sealant.

Field experience recommends that all caulking and sealing be done when temperatures are above 40°F (4°C) to avoid application to moisture-laden surfaces. Moisture on substrates will adversely affect adhesion.

Application may proceed as low as 20°F (-6°C) if there is certainty that substrates are completely dry, free of moisture, and clean as described under Surface Preparation.

Clean Up

Immediately after use and before sealant has cured, clean equipment with Reducer 990 or xylene. Cured sealant may be removed by cutting with a sharp-edged tool; thin films by abrading.

Curing

NP 2™ cures by a chemically controlled reaction. Initial cure is within 24 hours, and complete cure takes approximately 7 days. Cure rates are dependent on temperature and humidity.

The initial cure rate of NP 2™ can be adjusted for seasonal and geographic climactic conditions. See Table 2 for use of accelerator and extender.

Table 2

	Working Times, hours		
	Standard conditions (73°F or 23°C, 50% relative humidity)	Higher temp (95°F or 35°C, 75% to 90% relative humidity)	Colder temperatures (40°F or 4°C)
No accelerator/extender	2 - 3	1 - 2	4 - 6
1 accelerator	1 - 2	<1	2 - 3
2 accelerators	<1	–	1.5 - 2.5
1 extender	3 - 4	2 - 3	–
2 extenders	4 - 5.5	3 - 4	–

For Best Performance

- Do not allow uncured NP 2™ to come into contact with alcohol-based materials or solvents.
- Do not apply polyurethane sealants in the vicinity of uncured silicone sealants.

  NP 2™ should not come in contact with oil-based caulking, silicone sealants, polysulfides, or fillers impregnated with oil, asphalt, or tar.
- Do not apply epoxy-based coatings in the vicinity of uncured NP 2™.
- Do not open containers until ready for use.
- Units are prepackaged; do not use partial units.
- NP 2™ may yellow in the presence of unvented artificial heat; this is a surface phenomenon that does not affect sealant performance.
- NP 2™ should not be used for continuous immersion in water. Call Technical Services for recommendations.
- Substrates such as copper, stainless, and galvanized typically require the use of a primer. Primers 733 or 766 are acceptable. For Kynar coating use Primer 733 only. An adhesion test is recommended for any other questionable substrate.
- Do not use as a cap, heel, or toe bead for exterior glazing. Refer to Sonolastic® 150 data guide (Form No. 1017910).
- Use only color packs designed for use with NP 2™.
- Make certain the most current version of this data guide is being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by ChemRex® personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Technical Data

Compliances

- Federal Specification TT-S-00227E, Type I, Class A
- Corps of Engineers CRD-C-506
- ASTM C 920, Type M,Grade NS, Class 25, use NT, T, G, A, M, and O
- Canadian Standards Board CAN/CGSB-19.24-M90, Classification MCG-2-40-A-N, No. 81029
- Canadian approval for use in establishments that handle food
- USDA compliant for use in meat and poultry areas
- Underwriters Laboratories Inc.® classified (fire resistance only).
- SWRI validated at ±25%

Typical Properties

Property	Result
Service temperature range, °F (°C)	-40 to 180 (-40 to 82)
Expected life	Up to 15 years
Shrinkage	None

Test Data

Property	Value*	Test Method
Tensile strength, psi (MPa)	150 (1.0)	ASTM D 412
Ultimate elongation at break, %	300	ASTM D 412
Stain and color change (no visible stain)	Passes	ASTM C 510
Extrusion rate, seconds	Passes	ASTM C 603
3 hrs. after mixing	6	
Rheological (flow) at 120°F (49°C)	Non-sag	ASTM C 639
Hardness at standard conditions, shore A	25	ASTM C 661
Hardness after heat aging (maximum Shore A 50)	22	ASTM C 661
Tack-free time, hrs. (maximum 72 hrs.)	< 48 hours	ASTM C 679
Bond durability,*, %, on glass, aluminum, and concrete	± 25	ASTM C 719
Weight loss after heat aging, %	4.7	ASTM C 792
Cracking and chalking after heat aging	None	ASTM C 792
Artificial weathering Xenon arc, 250 hours	Passes	ASTM C 793
Artificial weathering Xenon arc, 2,000 hours	No surface cracking	ASTM G 26
Adhesion in peel on glass, aluminum and concrete*, pli	>10	ASTM C 794
Adhesion in peel *after UV radiation through glass	>10	ASTM C 794

* Primed for water immersion dictated by ASTM C 920. Concrete and aluminum primed with 733, glass primed with 766.

Test results are averages obtained under laboratory conditions. Reasonable variations can be expected.

Order Information

Packaging

NP 2™

- 1-1/2 gallon unit in 2 gallon pail (5.67 liters)
- 3 gallon unit in 3-1/2 gallon pail (11.3 liters)

Available in pretinted colors: Precast Gray, Limestone

- 1-1/2 gallon unit in 2 gallon pail (5.67 liters)
- 3 gallon unit in 3-1/2 gallon pail (11.3 liters)

Shelf life is 1 year when stored in unopened containers under normal conditions.

Colors

- 40 standard, stocked colors are available. Refer to the Rainbow of Colors® popular palette, Form No. 1017994.

465 standard (nonstocked) colors are also available, and custom matching can be done upon request. Refer to the Rainbow of Colors® fandeck.

Coverage

	Linear Feet per Gallon						
Joint	Joint Width (inches)						
Depth (inches)	1/4	3/8	1/2	5/8	3/4	7/8	1
1/4	308	205	154	122			
3/8				82	68	58	51
1/2					51	44	38

	Meters per Liter						
Joint	Joint Width (mm)						
Depth (mm)	6	10	13	16	19	22	25
6	24.8	16.5	12.4	9.8			
10				6.6	5.5	4.7	4.1
13					4.1	3.5	3.0

Warning

NP 2™ Part A contains mineral spirits, calcium carbonate, toluene diisocyanate, 1, 2, 4 trimethyl benzene, naphtha-light aromatic, titanium dioxide crystalline silica

Risks

May cause skin and eye irritation. May cause dermatitis and allergic responses. Potential skin and/or respiratory sensitizer. Inhalation may cause irritation and intoxication with headaches, dizziness and nausea. Ingestion may cause irritation. Reports associate repeated or prolonged occupational overexposure to solvents with damage to brain, nervous system, liver or kidneys. INTENTIONAL MISUSE BY DELIBERATELY INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Prevent contact with skin, eyes and clothing. Wash thoroughly after handling. Use only with adequate ventilation. Keep container closed when not in use. DO NOT take internally. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state and local regulations. Empty container may contain hazardous residues. All label warnings must be observed until container is commercially cleaned or reconditioned.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

Proposition 65

This product contains materials listed by the state of California as known to cause cancer, birth defects, or other reproductive harm.

VOC Content

53 - 80 g/L or 0.44 - 0.67 lbs/gal less water and exempt solvents.

Warning

NP 2 Part B contains toluene diisocyanate mix

Risks

May cause skin, eye, or respiratory irritation. May cause dermatitis and allergic reactions. Potential skin and respiratory sensitizer. Ingestion may cause irritation.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Prevent contact with skin, eyes, and clothing. Wash thoroughly after handling. DO NOT take internally. Ingestion may cause irritation. Use only with adequate ventilation. Inhalation may cause irritation. Keep container closed. Use impervious gloves, eye protection, and if the TLV is exceeded or if used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state, and local regulations.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

Proposition 65

This product contains materials which are known to the state of California as known to cause cancer, birth defects, or other reproductive harm.

VOC Content

8.09 g/L or 0.07 lbs. per gallon, less water and exempt solvents.

Warning

NP 2™ Accelerator contains mineral oil, 2-ethylhexanoic acid

Risks

May cause skin, eye or respiratory irritation. May be absorbed through the skin. May cause dermatitis and allergic reactions. Ingestion may cause irritation. Repeated or prolonged absorption may affect the kidneys.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Prevent contact with skin, eyes and clothing. Wash thoroughly after handling. DO NOT take internally. Use only with adequate ventilation. Inhalation may cause irritation. Keep container closed. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable federal, state and local regulations.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

Proposition 65

This product does not knowingly contain materials which are known to the state of California as known to cause cancer, birth defects, or other reproductive harm.

VOC Content

0 g/L or 0 lbs per gallon less water and exempt solvents.

For medical emergencies only, call ChemTrec (1/800/424-9300)

Limited Warranty Notice

Every reasonable effort is made to apply ChemRex® exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, CHEMREX® MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and CHEMREX® shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the ChemRex® Technical Manager.

Sonneborn®

ChemRex®

Corporate Office:
889 Valley Park Drive; Shakopee, MN 55379

Customer Service: 1/800/433-9517
Technical Services: 1/800/ChemRex (1/800/243-6739)
Web Site: www.chemrex.com

Form No. 1017911

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M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Multi Component Activator
IDENTIFICATION NUMBER: 42-399 DATE PRINTED: 02/11/99
PRODUCT USE/CLASS : Sealant

SUPPLIER:

MANUFACTURER:
ChemRex Inc.
Sonneborn Building Products
889 Valley Park Drive
Shakopee, MN 55379

EMERGENCY TELEPHONE:

EMERGENCY TELEPHONE:(800)424-9300
24 HRS A DAY 7 DAYS A WEEK

PREPARER: Scott Shinn, PHONE: 612-496-6000, PREPARE DATE: 01/05/99

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	Toluene diisocyanate mix	26471-62-5	2.0 %

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	COMPANY TLV-TWA	SKIN
01	0.04 mg/m3	0.15 mg/m3	0.04 mg/m3	0.15 mg/m3	N.E.	NO

(See Section 16 for abbreviation legend)

SECTION 3 - HAZARDOUS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Causes skin irritation. Allergic reactions are possible. Repeated or prolonged contact with skin may cause sensitization.

EFFECTS OF OVEREXPOSURE - INHALATION: Can cause severe respiratory irritation.

EFFECTS OF OVEREXPOSURE - INGESTION: Moderately toxic.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: This product may contain a small amount [<0.1%] of toluene diisocyanate. NIOSH, NTP and IARC list

(Continued on Page 2)

SECTION 3 - HAZARDS IDENTIFICATION

toluene diisocyanate as a suspected carcinogen. Note also that prolonged repeated exposure to isocyanates can lead to skin sensitation. For persons so sensitized even breif exposures to the isocyanate can produce reddening, swelling, rash, or blisters. Similarly, prolonged and repeated exposure to isocyanates can lead to respiratory sensitization. In such individuals brief exposures to isocyanates at levels well below the TLV can produce chemical asthma, and nonspecific asthmatic conditions.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Flush eye with water for 15 minutes. Get medical attention.

FIRST AID - SKIN CONTACT: Remove contaminated clothing. Wash skin with soap and water. Get medical attention.

FIRST AID - INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

FIRST AID - INGESTION: If swallowed, DO NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Should vomiting occur, be sure to keep victum's head below hips to avoid aspiration of vomitus into lungs.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 260 F

LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

AUTOIGNITION TEMPERATURE: N/D

EXTINGUISHING MEDIA: CO2 DRY CHEMICAL FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: Direct stream of water into hot burning mat'l will cause splattering.

SPECIAL FIREFIGHTING PROCEDURES: Containers exposed to fire should be kept cool with water spray. As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

(Continued on Page 3)

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Repeat sorbent/sweep cycle until the spill has dried up. Avoid runoff into storm sewers and ditches which lead to waterways.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Keep out of reach of children.

STORAGE: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respiratory protection when the product is mixed or applied in a poorly ventilated area or if workplace levels of ingredients exceed the TLV. Follow applicable federal, state, and local regulations.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear chemical resistant gloves, chemical safety goggles with a face sheild, and clean protective clothing to cover arms and legs to keep exposure to a minimum.

HYGIENIC PRACTICES: Do not take internally. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 460 - 484 F	VAPOR DENSITY	: Is heavier than air
ODOR	: Mild	ODOR THRESHOLD	: N/D
APPEARANCE	: Smooth liquid	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Slight [<0.1]		
FREEZE POINT	: N/D	SPECIFIC GRAVITY	: 1.1000
VAPOR PRESSURE	: N/D	pH @ 0.0 %	:
PHYSICAL STATE	: Liquid	VISCOSITY	: N/D

COEFFICIENT OF WATER/OIL DISTRIBUTION: N/D

(See Section 16 for abbreviation legend)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Long term exposure to elevated temperatures.

INCOMPATIBILITY: Strong bases or oxidants. Strong Lewis or mineral acids.

(Continued on Page 4)

SECTION 10 - STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

PRODUCT DERMAL LD50: No Information PRODUCT ORAL LD50: No Information
PRODUCT LC50: No Information

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	DERMAL LD50	ORAL LD50	LC50
Toluene diisocyanate mi	>10 g/kg	4130 mg/kg	11 ppm/4H

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not regulated

DOT TECHNICAL NAME: N/A

DOT HAZARD CLASS: N/A HAZARD SUBCLASS: N/A

DOT UN/NA NUMBER: N/A PACKING GROUP: N/A RESP. GUIDE PAGE:

DOT PLACARD AT: N/A

DOT CLASS NUMBER: N/A

UN PROPER SHIPPING NAME: Not regulated

UN HAZARD CLASS: N/A

UN CLASS NUMBER: AIR N/A MARINE N/A

(Continued on Page 5)

SECTION 14 - TRANSPORTATION INFORMATION

HAZARD SUBCLASS: AIR N/A MARINE N/A

UN UN/NA NUMBER: N/A UN PACKING GROUP: AIR N/A MARINE N/A

UN PLACARD AT: N/A

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

---------- CHEMICAL NAME ----------	CAS NUMBER	WT/WT % IS LESS THAN
Toluene diisocyanate mix	26471-62-5	2.0 %

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

---------- CHEMICAL NAME ----------	CAS NUMBER
Chlorobenzene	108-90-7
2-ethylhexanoic acid	149-57-5

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

---------- CHEMICAL NAME ----------	CAS NUMBER
Toluene diisocyanate mix	26471-62-5

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

(Continued on Page 6)

SECTION 15 - REGULATORY INFORMATION

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 2 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: G

PREVIOUS MSDS REVISION DATE: 01/05/99

REASON FOR REVISION: General revision

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.07 lbs/gal, 8 grams/ltr

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

<END OF MSDS>

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : NP2/SL2 ACCELERATOR
IDENTIFICATION NUMBER: 42-420 DATE PRINTED: 12/21/98
PRODUCT USE/CLASS : Additive

SUPPLIER:

MANUFACTURER:
ChemRex Inc.
Sonneborn Building Products
889 Valley Park Drive
Shakopee, MN 55379

EMERGENCY TELEPHONE:

EMERGENCY TELEPHONE:(800)424-9300
24 HRS A DAY 7 DAYS A WEEK

PREPARER: Mark Horton, PHONE: 612-496-6000, PREPARE DATE: 03/24/97

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	2-ethylhexanoic acid	149-57-5	5.0 %

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	COMPANY TLV-TWA	SKIN
01	N.E.	N.E.	N.E.	N.E.	N.E.	NO

(See Section 16 for abbreviation legend)

SECTION 3 - HAZARDOUS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Substance may cause slight skin irritaion.

EFFECTS OF OVEREXPOSURE - INHALATION: May cause respiratory tract irritation.

EFFECTS OF OVEREXPOSURE - INGESTION: Irritating to mouth, throat and stomach.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: Chronic overexposure may cause kidney damage. No known components of this product are listed as known or

(Continued on Page 2)

SECTION 3 - HAZARDS IDENTIFICATION

suspected carcinogens per NIOSH, NTP, IARC, or OSHA.

PRIMARY ROUTE(S) OF ENTRY: INHALATION SKIN CONTACT SKIN ABSORPTION

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Flush eye with water for 15 minutes. Get medical attention.

FIRST AID - SKIN CONTACT: Remove contaminated clothing. Wash skin with soap and water. Get medical attention.

FIRST AID - INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

FIRST AID - INGESTION: If swallowed, DO NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Should vomiting occur, be sure to keep victum's head below hips to avoid aspiration of vomitus into lungs.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 221 F (TAGLIABUE CLOSED CUP)

LOWER EXPLOSIVE LIMIT: 0.8 %
UPPER EXPLOSIVE LIMIT: 6.0 %

AUTOIGNITION TEMPERATURE: N/D

EXTINGUISHING MEDIA: CO2 DRY CHEMICAL WATER FOG FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS: No Information.

SPECIAL FIREFIGHTING PROCEDURES: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Repeat sorbent/sweep cycle until the spill has dried up. Avoid runoff into storm sewers and ditches which lead to waterways.

(Continued on Page 3)

SECTION 7 - HANDLING AND STORAGE

HANDLING: Keep out of reach of children.

STORAGE: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respiratory protection when the product is mixed or applied in a poorly ventilated area or if workplace levels of ingredients exceed the TLV. Follow applicable federal, state, and local regulations.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear chemical resistant gloves, chemical safety goggles wi th a face sheild, and clean protective clothing to cover arms and legs to keep exposure to a minimum.

HYGIENIC PRACTICES: Do not take internally. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 227 - 290 F	VAPOR DENSITY	: Is heavier than air
ODOR	: Odorless	ODOR THRESHOLD	: N/D
APPEARANCE	: Amber liquid	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Negligible		
FREEZE POINT	: N/D	SPECIFIC GRAVITY	: 0.9976
VAPOR PRESSURE	: <1mm Hg @ 70F	pH @ 0.0 %	: N/D
PHYSICAL STATE	: Liquid	VISCOSITY	: N/D

COEFFICIENT OF WATER/OIL DISTRIBUTION: N/D

(See Section 16 for abbreviation legend)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Long term exposure to elevated temperatures.

INCOMPATIBILITY: Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

(Contin ued on Page 4)

SECTION 11 - TOXICOLOGICAL PROPERTIES

PRODUCT DERMAL LD50: No Information PRODUCT ORAL LD50: No Information
PRODUCT LC50: No Information

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	DERMAL LD50	ORAL LD50	LC50
2-ethylhexanoic acid	1260 mg/kg	3 gm/kg	No Information

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not Regulated

DOT TECHNICAL NAME: N/A

DOT HAZARD CLASS: N/A HAZARD SUBCLASS: N/A

DOT UN/NA NUMBER: N/A PACKING GROUP: N/A RESP. GUIDE PAGE:

DOT PLACARD AT: N/A

DOT CLASS NUMBER: N/A

UN PROPER SHIPPING NAME: Not Regualted

UN HAZARD CLASS: N/A

UN CLASS NUMBER: AIR N/A MARINE N/A

HAZARD SUBCLASS: AIR N/A MARINE N/A

UN UN/NA NUMBER: N/A UN PACKING GROUP: AIR N/A MARINE N/A

UN PLACARD AT: N/A

(Continued on Page 5)

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

---------- CHEMICAL NAME ----------	CAS NUMBER	WT/WT % IS LESS THAN

No SARA Section 313 components exist in this product.

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

---------- CHEMICAL NAME ----------	CAS NUMBER
2-ethylhexanoic acid	149-57-5

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

---------- CHEMICAL NAME ----------	CAS NUMBER

No Proposition 65 chemicals exist in this product.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 2 FLAMMABILITY: 2 REACTIVITY: 0
PERSONAL PROTECTION: G

PREVIOUS MSDS REVISION DATE: 11/22/94

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.00 lbs/gal, 0 grams/ltr

(Continued on Page 6)

SECTION 16 - OTHER INFORMATION

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

<END OF MSDS>

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : NP2 BASE
IDENTIFICATION NUMBER: 42-350 (untinted) DATE PRINTED: 03/21/00
42-362 Precast Gray
42-365 Limestone
PRODUCT USE/CLASS : Sealant

SUPPLIER:

MANUFACTURER:
ChemRex Inc.
Commercial Construction
Products Division
889 Valley Park Drive
Shakopee, MN 55379

EMERGENCY TELEPHONE:

EMERGENCY TELEPHONE:(800)424-9300
24 HRS A DAY 7 DAYS A WEEK

PREPARER: Scott Shinn, PHONE: 612-496-6000, PREPARE DATE: 03/21/00

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	Mineral spirits (Stoddard type)	8052-41-3	10.0 %
02	Toluene diisocyanate mix	26471-62-5	5.0 %
03	Calcium carbonate	471-34-1	30.0 %
04	Naphtha-light aromatic	64742-95-6	5.0 %
05	Titanium dioxide	13463-67-7	5.0 %
06	1,2,4 Trimethyl Benzene	95-63-6	5.0 %
07	Silica, quartz	14808-60-7	1.0 %

	EXPOSURE LIMITS					
	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	100 ppm	N.E.	525 mg/m3	N.E.	N.E.	NO
02	0.04 mg/m3	0.15 mg/m3	0.04 mg/m3	0.15 mg/m3	N.E.	NO
03	10 mg/m3	N.E.	15 mg/m3	N.E.	N.E.	NO
04	N.E.	N.E.	435 mg/m3	N.E.	N.E.	NO
05	10 mg/m3	N.E.	15 mg/m3	N.E.	N.E.	NO
06	123 mg/m3	N.E.	125 mg/m3	N.E.	N.E.	NO
07	.1 mg/m3	N.E.	.1 mg/m3	N.E.	N.E.	NO

(See Section 16 for abbreviation legend)

(Continued on Page 2)

SECTION 3 - HAZARDS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash). May cause irritation. Repeated or prolonged contact with skin may cause sensitization.

EFFECTS OF OVEREXPOSURE - INHALATION: Harmful if inhaled. Headaches, dizziness, nausea, decreased blood pressure, changes in heart rate and cyanosis may result from over-exposure to vapor.

EFFECTS OF OVEREXPOSURE - INGESTION: Irritating to mouth, throat and stomach.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: This product contains solvents. Reports associate repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Reports also indicate that solvents cause liver damage, kidney damage, and mucous membrane irritation. Be warned that intentional misuse by deliberately inhaling the vapors and/or the product contents (a process often called "sniffing") may be harmful or fatal. This product may contain a small amount [<0.1%] of toluene diisocyanate. NIOSH, NTP and IARC list toluene diisocyanate as a suspected carcinogen. Note also that prolonged repeated exposure to isocyanates can lead to skin sensitation. For persons so sensitized even breif exposures to the isocyanate can produce reddening, swelling, rash, or blisters. Similarly, prolonged and repeated exposure to isocyanates can lead to respiratory sensitization. In such individuals brief exposures to isocyanates at levels well below the TLV can produce chemical asthma, and nonspecific asthmatic conditions.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Flush eye with water for 15 minutes. Get medical attention.

FIRST AID - SKIN CONTACT: Remove contaminated clothing and shoes. Wash affected area(s) throughly with soap and water. If irritation persist, seek medical attention.

FIRST AID - INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

FIRST AID - INGESTION: If swallowed, DO NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Should vomiting occur, be sure to keep victum's head below hips to avoid aspiration of vomitus into lungs.

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SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 125 F
(PENSKY-MARTENS C.C.)

LOWER EXPLOSIVE LIMIT: 0.9 %
UPPER EXPLOSIVE LIMIT: 7.0 %

AUTOIGNITION TEMPERATURE: N.D.

EXTINGUISHING MEDIA: ALCOHOL FOAM CO2 DRY CHEMICAL WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors can travel to a source of ignition and flash back. "Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; CONTAINERS MAY EXPLODE AND CAUSE INJURY OR DEATH. Solid stream of water or foam may cause frothing. Direct stream of water into hot burning mat'l will cause splattering.

SPECIAL FIREFIGHTING PROCEDURES: Containers exposed to fire should be kept cool with water spray. Containers can build up pressure if exposed to heat (fire). As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate the area and remove all sources of ignition. Evacuate unneccessary personnel. Large spills should be handled carefully. Put on respiratory protection and necessary personal protective equipment. Dike or impound spilled liquid. Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Repeat sorbent/sweep cycle until the spill has dried up. Avoid runoff into storm sewers and ditches which lead to waterways.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Use only in a well ventilated area. Keep out of reach of children. Ground and bound containers when transferring material. If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminents below the exposure limit.

STORAGE: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

(Continued on Page 4)

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respiratory protection when the product is mixed or applied in a poorly ventilated area or if workplace levels of ingredients exceed the TLV. Follow applicable federal, state, and local regulations.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear chemical resistant gloves, chemical safety goggles with a face sheild, and clean protective clothing to cover arms and legs to keep exposure to a minimum.

HYGIENIC PRACTICES: Do not take internally. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid breathing vapors from heated material. Avoid contact with eyes, skin, and clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 308 - 484 F	VAPOR DENSITY	: Is heavier than air
ODOR	: Paint thinner	ODOR THRESHOLD	: N.D.
APPEARANCE	: Smooth paste	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Slight <0.1 %		
FREEZE POINT	: N.D.	SPECIFIC GRAVITY	: 0.9129
VAPOR PRESSURE	: N.D.	pH @ 0.0 %	: N.D.
PHYSICAL STATE	: Paste	VISCOSITY	: N.D.

COEFFICIENT OF WATER/OIL DISTRIBUTION: N/D

(See Section 16 for abbreviation legend)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Long term exposure to elevated temperatures.

INCOMPATIBILITY: Alcohols and water. Avoid contact with oxidizing material.

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

PRODUCT DERMAL LD50: No Information PRODUCT ORAL LD50: No Information
PRODUCT LC50: No Information

(Continued on Page 5)

SECTION 11 - TOXICOLOGICAL PROPERTIES

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	DERMAL LD50	ORAL LD50	LC50
Mineral spirits (Stodda	No Information	> 5 g/kg	No Information
Toluene diisocyanate mi	>10 g/kg	4130 mg/kg	11 ppm/4H
Calcium carbonate	No Information	6450 mg/kg	No Information
Naphtha-light aromatic	>4 ml/kg	4.7 g/kg	>3670 ppm/8H
Titanium dioxide	No Information	> 7500 mg/kg	No Information
1,2,4 Trimethyl Benzene	No Information	12.7 gm/kg	18 gm/m3/4H
Silica, quartz	No Information	No Information	No Information

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

SECTION 14 - TRANSPORTATION INFORMATION

This material has been determined to ba a non-Combustible solid by ASTM test methods.

DOT PROPER SHIPPING NAME: Not Regulated

DOT TECHNICAL NAME: N.A.

DOT HAZARD CLASS: N.A. HAZARD SUBCLASS: N.A.

DOT UN/NA NUMBER: N.A. PACKING GROUP: N.A. RESP. GUIDE PAGE:

DOT PLACARD AT: N.A.

DOT CLASS NUMBER: N.A.

UN PROPER SHIPPING NAME: Not Regulated

UN HAZARD CLASS: N.A.

UN CLASS NUMBER: AIR N.A. MARINE N.A.

HAZARD SUBCLASS: AIR N.A. MARINE N.A.

UN UN/NA NUMBER: N.A. UN PACKING GROUP: AIR N.A. MARINE N.A.

UN PLACARD AT: N.A.

(Continued on Page 6)

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD CHRONIC HEALTH HAZARD FIRE HAZARD

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

---------- CHEMICAL NAME ----------	CAS NUMBER	WT/WT % IS LESS THAN
Toluene diisocyanate mix	26471-62-5	5.0 %
1,2,4 Trimethyl Benzene	95-63-6	5.0 %

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

---------- CHEMICAL NAME ----------	CAS NUMBER
1,2 benzenedicarboxylic acid	68515-47-9

U.S. STATE REGULATIONS: AS FOLLOWS -

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

---------- CHEMICAL NAME ----------	CAS NUMBER
Acrylonitrile	107-13-1
toluene	108-88-3
Silica, quartz	14808-60-7
Toluene diisocyanate mix	26471-62-5
inorganic lead	7439-92-1
Arsenic	7440-38-2
1,1-dichloroethylene	75-35-4

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

(Continued on Page 7)

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 2 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: G

PREVIOUS MSDS REVISION DATE: 01/08/99

REASON FOR REVISION: Reformulation

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.44 - 0.67 lbs/gal or 53 - 80 grams/ltr

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

<END OF MSDS>

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : PIGMENTS - NP2/SL2
IDENTIFICATION NUMBER: 49-XXX DATE PRINTED: 12/21/98
PRODUCT USE/CLASS : Pigments

SUPPLIER:

MANUFACTURER:
ChemRex Inc.
Sonneborn Building Products
889 Valley Park Drive
Shakopee, MN 55379

EMERGENCY TELEPHONE:

EMERGENCY TELEPHONE:(800)424-9300
24 HRS A DAY 7 DAYS A WEEK

PREPARER: Mark Horton, PHONE: 612-496-6000, PREPARE DATE: 04/16/97

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	carbon black	1333-86-4	<25.0 %
02	titanium dioxide	13463-67-7	<45.0 %
03	Aluminum hydroxide	21645-51-2	<5.0 %
04	iron oxide	51274-00-1	<25.0 %
05	Silica, amorphous	7631-86-9	<10.0 %
06	ferric oxide	1309-37-1	<35.0 %

	EXPOSURE LIMITS					
	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	3.5 mg/m3	N.E.	3.5 mg/m3	N.E.	N.E.	NO
02	10 mg/m3	N.E.	15 mg/m3		N.E.	NO
03	2 mg/m3	N.E.	N.E.	N.E.	N.E.	NO
04	10 mg/m3	N.E.	15 mg/m3		N.E.	NO
05	10 mg/m3	N.E.	6 mg/m3	N.E.	N.E.	NO
06	5 mg/m3	N.E.	10 mg/m3	N.E.	N.E.	NO

(See Section 16 for abbreviation legend)

SECTION 3 - HAZARDOUS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - EYE CONTACT: May cause slight irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: Substance may cause slight skin irritaion.

(Continued on Page 2)

SECTION 3 - HAZARDS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - INHALATION: May cause respiratory tract irritation.

EFFECTS OF OVEREXPOSURE - INGESTION: Irritating to mouth, throat and stomach.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: No known components of this product are listed as known or suspected carcinogens per NIOSH, NTP, IARC, or OSHA. Preexisting respiratory or skin condition(s) may be aggravated by exposure.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION EYE CONTACT

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Flush eye with water for 15 minutes. Get medical attention.

FIRST AID - SKIN CONTACT: Remove contaminated clothing. Wash skin with soap and water. Get medical attention.

FIRST AID - INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

FIRST AID - INGESTION: If swallowed, DO NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Should vomiting occur, be sure to keep victum's head below hips to avoid aspiration of vomitus into lungs.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 380 F (PENSKY-MARTENS C.C.)

LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

AUTOIGNITION TEMPERATURE: N/D

EXTINGUISHING MEDIA: CO2 DRY CHEMICAL WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: Fire produces irritating or poisonous gas.

SPECIAL FIREFIGHTING PROCEDURES: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

(Continued on Page 3)

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Repeat sorbent/sweep cycle until the spill has dried up. Avoid runoff into storm sewers and ditches which lead to waterways.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Keep out of reach of children. If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminents below the exposure limit.

STORAGE: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respiratory protection when the product is mixed or applied in a poorly ventilated area or if workplace levels of ingredients exceed the TLV. Follow applicable federal, state, and local regulations.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear chemical resistant gloves, chemical safety goggles with a face sheild, and clean protective clothing to cover arms and legs to keep exposure to a minimum.

HYGIENIC PRACTICES: Do not take internally. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: N.A.	VAPOR DENSITY	: Is heavier than air
ODOR	: Slight	ODOR THRESHOLD	: N/D
APPEARANCE	: Pigmented paste	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Appreciable		
FREEZE POINT	: N/D	SPECIFIC GRAVITY	: >1.0000
VAPOR PRESSURE	: N/D	pH @ 0.0 %	: N/D
PHYSICAL STATE	: Solid	VISCOSITY	: N/D

COEFFICIENT OF WATER/OIL DISTRIBUTION: N/D

(See Section 16 for abbreviation legend)

(Continued on Page 4)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Long term exposure to elevated temperatures.

INCOMPATIBILITY: Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

PRODUCT DERMAL LD50: No Information PRODUCT ORAL LD50: No Information
PRODUCT LC50: No Information

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	DERMAL LD50	ORAL LD50	LC50
carbon black	No Information	440 mg/kg	No Information
titanium dioxide	No Information	> 7500 mg/kg	No Information
Aluminum hydroxide	No Information	770 mg/kg	No Information
iron oxide	No Information	>10 g/kg	No Information
Silica, amorphous	No Information	No Information	No Information
ferric oxide	No Information	5500 mg/kg	No Information

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not Regulated

DOT TECHNICAL NAME: N/A

DOT HAZARD CLASS: N/A HAZARD SUBCLASS: N/A

DOT UN/NA NUMBER: N/A PACKING GROUP: N/A RESP. GUIDE PAGE:

DOT PLACARD AT: N/A

(Continued on Page 5)

SECTION 14 - TRANSPORTATION INFORMATION

DOT CLASS NUMBER: N/A

UN PROPER SHIPPING NAME: Not Regulated

UN HAZARD CLASS: N/A

UN CLASS NUMBER: AIR N/A MARINE N/A

HAZARD SUBCLASS: AIR N/A MARINE N/A

UN UN/NA NUMBER: N/A UN PACKING GROUP: AIR N/A MARINE N/A

UN PLACARD AT: N/A

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

---------- CHEMICAL NAME ---------- CAS NUMBER WT/WT % IS LESS THAN
No SARA Section 313 components exist in this product.

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

---------- CHEMICAL NAME ---------- CAS NUMBER
No information is available.

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

---------- CHEMICAL NAME ---------- CAS NUMBER
No Proposition 65 chemicals exist in this product.

(Continued on Page 6)

SECTION 15 - REGULATORY INFORMATION

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: B

PREVIOUS MSDS REVISION DATE: 05/05/95

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.00 lbs/gal, 0 grams/ltr

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

<END OF MSDS>

SONOLASTIC NP2 EXTENDER

Version 1.2 7/11/01

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company	:	ChemRex US 889 Valley Park Drive SHAKOPEE, MN 55379 USA	ChemRex CA 1800 Clark Blvd BRAMPTON, ON L6T 4M7 Canada
Phone	:	(952) 496-6000	
Fax	:		
Emergency contact	:	(800) 424-9300	

Product name	:	SONOLASTIC NP2 EXTENDER
MSDS	:	11306

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % LESS THAN
01	phosphoric acid	7664-38-2	5.0 %

EXPOSURE LIMITS

ITEM	ACGIH TLV-TWA	ACGIH TLV-STEL	OSHA PEL-TWA	OSHA PEL-CEILING	COMPANY TLV-TWA	SKIN
01	1 mg/m3	3 mg/m3	1 mg/m3	N.E.	N.E.	YES

(See Section 16 for abbreviation legend)

SECTION 3 - HAZARDOUS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - EYE CONTACT: Causes eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: May be absorbed through skin. May skin irritation.

EFFECTS OF OVEREXPOSURE - INHALATION: Slightly irritating to respiratory tract.

EFFECTS OF OVEREXPOSURE - INGESTION: Irritating to mouth, throat and stomach.

SONOLASTIC NP2 EXTENDER

Version 1.2 7/11/01

SECTION 3 - HAZARDOUS IDENTIFICATION

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: No known components of this product are listed as known or suspected carcinogens per NIOSH, NTP, IARC, or OSHA.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INGESTION EYE CONTACT SKIN ABSORBTION

SECTION 4 - FIRST AID MEASURES

FIRST AID - EYE CONTACT: Flush eye with water for 15 minutes. Get medical attention.

FIRST AID - SKIN CONTACT: Remove contaminated clothing. Wash skin with soap and water. Get medical attention.

FIRST AID - INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

FIRST AID - INGESTION: If swallowed, DO NOT induce vomiting. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Should vomiting occur, be sure to keep victim's head below hips to avoid aspiration of vomitus into lungs.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: >200

LOWER EXPLOSIVE LIMIT: N.D.
UPPER EXPLOSIVE LIMIT: N.D.

AUTOIGNITION TEMPERATURE: N.D.

EXTINGUISHING MEDIA: ALCOHOL CO2 DRY CHEMICAL FOAM WATER FOG

UNUSUAL FIRE AND EXPLOSION HAZARDS: No Information.

SPECIAL FIREFIGHTING PROCEDURES: As in any fire, wear self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Repeat sorbent/sweep cycle until the spill has dried up. Avoid runoff into storm sewers and ditches, which lead to waterways.

SECTION 7 - HANDLING AND STORAGE

HANDLING: Keep out of reach of children.

STORAGE: Keep container closed when not in use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

RESPIRATORY PROTECTION: Wear NIOSH/MSHA approved respiratory protection when the product is mixed or applied in a poorly ventilated area or if workplace levels of ingredients exceed the TLV. Follow applicable federal, state, and local regulations.

OTHER PROTECTIVE EQUIPMENT: Where contact is likely, wear chemical resistant gloves, chemical safety goggles with a face shield, and clean protective clothing to cover arms and legs to keep exposure to a minimum.

HYGIENIC PRACTICES: Do not take internally. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE	: 295 - 316 F	VAPOR DENSITY	: Is heavier than air
ODOR	: slight	ODOR THRESHOLD	: N.D.
APPEARANCE	: Colorless liquid	EVAPORATION RATE	: Is slower than Butyl Acetate
SOLUBILITY IN H2O	: Slight		
FREEZE POINT	: N.D.	SPECIFIC GRAVITY	: 1.0000
VAPOR PRESSURE	: N.D.	pH @ 100.0 %	: N.D.
PHYSICAL STATE	: Liquid	VISCOSITY	: N.D.

COEFFICIENT OF WATER/OIL DISTRIBUTION: N.D.

(See Section 16 for abbreviation legend)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Long term exposure to elevated temperatures.

INCOMPATIBILITY: Strong bases or oxidants. Strong Lewis or mineral acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes. Oxides of carbon.

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

PRODUCT DERMAL LD50: No Information PRODUCT ORAL LD50: No Information
PRODUCT LC50: No Information

COMPONENT TOXICOLOGICAL INFORMATION:

CHEMICAL NAME	DERMAL LD50	ORAL LD50	LC50
phosphoric acid	2740 mg/kg	1530 mg/kg	No Information

SECTION 12 - ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Review all local, state, and federal regulations concerning health and pollution for appropriate disposal procedures.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Not Regulated

DOT TECHNICAL NAME: N.A.

DOT HAZARD CLASS: N.A. HAZARD SUBCLASS: N.A.

DOT UN/NA NUMBER: N.A. PACKING GROUP: N.A. RESP. GUIDE PAGE:

SONOLASTIC NP2 EXTENDER

Version 1.2 7/11/01

SECTION 14 - TRANSPORTATION INFORMATION

DOT PLACARD AT: N.A.

DOT CLASS NUMBER: N.A.

UN PROPER SHIPPING NAME: Not Regulated

UN HAZARD CLASS: N.A.

UN CLASS NUMBER: AIR N.A. MARINE N.A.

HAZARD SUBCLASS: AIR N.A. MARINE N.A.

UN UN/NA NUMBER: N.A. UN PACKING GROUP: AIR N.A. MARINE N.A.

UN PLACARD AT: N.A.

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

CERCLA - SARA HAZARD CATEGORY:
This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

---------- CHEMICAL NAME ----------	CAS NUMBER	WT/WT % IS LESS THAN
phosphoric acid	7664-38-2	5.0 %

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

---------- CHEMICAL NAME ----------	CAS NUMBER
None known.	

SONOLASTIC NP2 EXTENDER

Version 1.2 7/11/01

SECTION 15 - REGULATORY INFORMATION

U.S. STATE REGULATIONS: AS FOLLOWS -

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause cancer, birth defects or other reproductive harm:

---------- CHEMICAL NAME ---------- CAS NUMBER
No Proposition 65 chemicals are known to exist in this product.

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 1 FLAMMABILITY: 1 REACTIVITY: 0
PERSONAL PROTECTION: B

PREVIOUS MSDS REVISION DATE: New.

VOLATILE ORGANIC COMPOUNDS (VOCS): 0.46 lbs/gal, 55 grams/ltr

LEGEND: N.A. - Not Applicable, N.E. - Not Established,
N.D. - Not Determined

<END OF MSDS>

Technical Bulletin

2400 Boston Street, Suite 200, Baltimore, Maryland 21224
Phone: 410-675-2100 or 800-543-3840

Revised: 9/21/01

DAP® WELDWOOD® Original Contact Cement

- **Premium Quality**
- **Requires only one coat on most surfaces**
- **Meets all CPSC requirements**

Company Identification:

Manufacturer:	DAP Inc., 2400 Boston St., Baltimore, Maryland 21224
Usage Information:	DAP HELPLINE: 888-DAP-TIPS, 9:00 am to 7:00 pm EST.
Order Information:	800-327-3339
Fax Number:	410-534-2650

Also, visit the DAP website at **www.dap.com.**

Product Description:

DAP® WELDWOOD® Original Contact Cement is a neoprene rubber adhesive that forms permanent bonds on a variety of surfaces. This professional quality adhesive offers instant adhesion to eliminate the need for clamps or temporary fasteners. Used extensively to bond high pressure laminates for counter tops, tabletops, and cabinets. Forms a durable, super-strong bond when parts are assembled and momentary pressure is applied. Meets performance requirements of Federal Specification MMM-A-130B. Meets all CPSC requirements.

Suggested Uses:

Ideal for bonding:

- *High Pressure Plastic Laminates*
- *Wood and Plastic Veneers*
- *Paneling*
- *Leather*
- *Fabrics*
- *Rubber*
- *Paper*
- *Cardboard*
- *Other materials to wood, particle board, plywood, metal, concrete and similar surfaces*

Performance Characteristics:

- Spreads on easily and requires only one coat on most porous and non-porous surfaces.
- Dries tack free quickly and offers a long open time of up to 2 hours.
- When pressed together, surfaces bond instantly on contact with high green strength, allowing immediate use of assembly.
- Cured bond resists the effects of heat (up to 180°F), water, weather, grease, oil and household chemicals. Interior/exterior use.

Surface Preparation & Application:

- PREPARATION: Prefit all parts before applying cement. Surfaces to be bonded must be clean, dry and free of irregularities. Remove all paint, varnish, grease, oil, dust, sawdust and other foreign materials. Roughen non-porous materials. Air and substrate temperatures should be above 65°F.

- APPLICATION: Stir cement thoroughly. Using a brush, short nap roller or notched spreader, apply one uniform coat of cement to each surface to be bonded, working cement in one direction only.
- Let coated surfaces dry for 15 minutes. Dry time may vary with temperature, humidity and thickness of coat applied. Properly coated surfaces feel tacky and appear glossy when dry. Test for dryness by pressing kraft paper against adhesive surface. When dry, adhesive should bond slightly to, but not transfer to, the kraft paper. Recoat any dull spots after first coat is dry. Two coats may be required on rough or porous surfaces.
- ASSEMBLY: Surfaces may be assembled up to 2 hours after cement is applied. If the cement is allowed to dry more than 2 hours, reactivate it by applying another coat of cement and drying normally.
- Align surfaces into exact position and press together, moving from one end to the other to avoid bubbles. Cement joins on contact, surfaces cannot be shifted. For large areas, use dowels to prevent surface contact while positioning surfaces. Place dowels every 6 to 12 inches. Remove dowels as surfaces are pressed together.
- Apply firm pressure to the entire area using a J-Roller (not over 3 inches wide) or a wood block and hammer. Insufficient pressure may allow blisters or bubbles to form later. Work from the center to the edges to avoid bubbles. Apply extra pressure to edges.
- Trimming or finishing operations can be performed immediately after bonding. Let adhesive assemblies cure for at least 72 hours before exposure to direct sunlight or temperatures over 150°F.
- Should not be used for structural applications, or for bonding copper, copper alloys or Styrofoam. The solvents in this cement may stain or damage painted surfaces, vinyls and some plastics. Test a small area first before actual use. Not recommended for heavy gauge metal.

Physical & Chemical Characteristics:

Volatile:	Toluene, Petroleum Spirits, Methyl Ethyl Ketone
Flash Point:	21°F Minimum, Seta-Closed Cup
Solids:	18-20% by Weight
Weight/Gallon:	7.4 lbs.
Color:	Tan
Consistency:	Pourable Liquid
Application Temperature	65°F to 110°F
Service Temperature Range:	-40°F to 180°F (-40°C to 82°C)
Bond Strength:	Excellent
Open Time:	2 Hours
Coverage:	140 sq. ft./gallon
Shelf Life:	1 Year, Minimum
Packaging:	

UPC	*SIZE*
00271	Pint
00272	Quart
00273	Gallon
00274	5 Gallon

MSDS No. 30503

Clean Up:

Tools and other equipment may be cleaned with DAP®WELDWOOD® Contact Cement Cleaner and Thinner.

Safety:

See product label or Material Safety Data Sheet for safety information. You can request an MSDS sheet by calling 888-DAP-TIPS or by visiting our website at **www.dap.com.**

Warranty Information:

If not satisfied with product performance when used as directed, return used container and sales receipt to DAP Inc., Technical Customer Service, 2400 Boston St., Baltimore, MD, 21224, for product replacement or sales price refund. DAP will not be liable for incidental or consequential damage.

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

THIS MATERIAL SAFETY DATA SHEET IS AVAILABLE IN SPANISH UPON REQUEST.

LOS DATOS DE SEGURIDAD DEL PRODUCTO PUEDEN OBTENERSE EN ESPANOL SI LO REQUIERE.

PRODUCT NAME : Original Contact Cement
UPC NUMBER : 7079800262, 7079800271, 7079800272, 7079800273, 7079800274, 7079800277
PRODUCT USE/CLASS : Contact Adhesive

MANUFACTURER:
DAP INC.
2400 BOSTON STREET
BALTIMORE, MD 21224

24 HOUR EMERGENCY:
TRANSPORTATION: 1-800-535-5053 (352-323-3500)
MEDICAL : 1-800-327-3874 (513-558-5111)

PREPARE DATE : 08/11/1999
REVISION NO. : 15
REVISION DATE: 08/11/1999

GENERAL INFORMATION:
DAP INC. : 1-888-DAP-TIPS (1-888-327-8477)

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

ITEM	CHEMICAL NAME	CAS NUMBER	WT/WT % RANGE
01	Toluene	108-88-3	50.0-60.0 %
02	Aliphatic Petroleum Distillate	64742-89-8	10.0-20.0 %
03	Methyl ethyl ketone	78-93-3	10.0-20.0 %

EXPOSURE LIMITS

	ACGIH		OSHA		COMPANY	
ITEM	TLV-TWA	TLV-STEL	PEL-TWA	PEL-CEILING	TLV-TWA	SKIN
01	50 ppm.	N.E.	100 ppm.	N.E.	N.E.	YES
02	400 ppm	N.E.	400 ppm	N.E.	N.E.	NO
03	200 ppm	300 ppm	200 ppm	N.E.	N.E.	NO

(See Section 16 for abbreviation legend)

Remaining ingredients are not considered hazardous per the OSHA Hazard Communication Standard.

Listed Permissible Exposure Levels (PEL) are from the U.S. Dept. of Labor OSHA Final Rule Limits (CFR 29 1910.1000); limits may vary between states.

(Continued on Page 2)

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: DANGER! Flammable liquid and vapor. Vapor harmful. Harmful
If inhaled. Harmful or fatal if swallowed. Vapors may cause flash fire or explosion. Aspiration hazard if swallowed - can enter lungs and cause damage.

POTENTIAL HEALTH EFFECTS:

EFFECTS OF OVEREXPOSURE - EYE CONTACT: May cause eye irritation.

EFFECTS OF OVEREXPOSURE - SKIN CONTACT: May irritate skin. Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash).

EFFECTS OF OVEREXPOSURE - INHALATION: Vapor harmful if inhaled. Vapor may irritate nose and upper respiratory tract. Vapor inhalation may affect the brain or nervous system causing dizziness, headache or nausea.

EFFECTS OF OVEREXPOSURE - INGESTION: This material may be harmful or fatal if swallowed. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal. If ingested, this product may cause vomiting, diarrhea, and depressed respiration.

EFFECTS OF OVEREXPOSURE - CHRONIC HAZARDS: Reports have associated permanent brain and nervous system damage with prolonged and repeated occupational overexposure to solvents. Overexposure or misuse of toluene can cause liver, kidney, and brain damage as well as cardiac abnormalities. Symptoms include: loss of memory, loss of intellectual ability, and loss of coordination.

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: None known.

PRIMARY ROUTE(S) OF ENTRY: SKIN CONTACT INHALATION

SECTION 4 - FIRST AID MEASURES

EYE CONTACT: Flush with large quantities of water until irritation subsides. Contact a physician.

SKIN CONTACT: Wash with soap and water.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Contact a physician immediately.

NOTE: Only trained personnel should administer artificial respiration or give
oxygen.

(Continued on Page 3)

SECTION 4 - FIRST AID MEASURES

INGESTION: DO NOT INDUCE VOMITING. If irritation or complications arise, contact a physician or Regional Poison Control Center immediately.

COMMENTS: Call 1-800-327-3874 if irritation persists or complications arise from
any exposure.

SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT: 21 F. minimum SETAFLASH CLOSED CUP)

LOWER EXPLOSIVE LIMIT: N.A.
UPPER EXPLOSIVE LIMIT: N.A.

AUTOIGNITION TEMPERATURE: N.E.

EXTINGUISHING MEDIA: CO2 DRY CHEMICAL FOAM

UNUSUAL FIRE AND EXPLOSION HAZARDS: Flammable liquid. Material will readily ignite at room temperature. Vapors may form an explosive mixture with air. Vapors can travel long distances to a source of ignition and flashback.
Containers may explode if exposed to extreme heat. Eliminate sources of ignition: heat, electrical equipment, sparks, and flames. Do not put in contact with oxidizing or caustic materials.

SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment, including self-contained breathing apparatus, is recommended to protect from combustion products. Cool exposed containers with water.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL OR LEAK PROCEDURES: Immediately eliminate sources of ignition. Dike spill area. Use absorbent material or scrape up dried material and place into containers.

SECTION 7 - HANDLING AND STORAGE

HANDLING INFORMATION: KEEP OUT OF REACH OF CHILDREN. Avoid skin and eye contact. Avoid breathing vapors. Use only in a well ventilated area.

STORAGE INFORMATION: Store away from caustics and oxidizers. Keep away from heat, spark, and flame. Keep containers tightly closed when not in use. Keep containers from excessive heat and freezing. Do not store at temperatures above 120 degrees F.

(Continued on Page 4)

SECTION 7 - HANDLING AND STORAGE

OTHER PRECAUTIONS: Intentional misuse by deliberately concentrating and inhaling vapors may be harmful or fatal. Do not take internally. Construction and repair activities can adversely affect indoor air quality. Consult with the occupants or other representative(i.e. maintenance,
building manager, industrial hygienist, or safety officer) to determine ways to minimize any impact.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide sufficient mechanical ventilation (local or general exhaust) to maintain exposure below PEL and TLV. Vapors are heavier than air and will collect in low areas. Check all low areas (basements, sumps, etc.) for vapors before entering.

RESPIRATORY PROTECTION: If 8 hour exposure limit or value is exceeded for any component, use an approved NIOSH/OSHA respirator. Consult your safety equipment supplier and the OSHA regulation, 29 CFR 1910.134 for respirator requirements. A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

EYE PROTECTION: Goggles or safety glasses with side shields.

SKIN PROTECTION: Solvent impervious gloves.

OTHER PROTECTIVE EQUIPMENT: Provide eyewash and solvent impervious apron if body contact may occur.

HYGIENIC PRACTICES: Remove contaminated clothing and wash before reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

BOILING RANGE : 170 - 180 F VAPOR DENSITY : Is heavier than air
ODOR : Hydrocarbon
APPEARANCE : Tan Mobile Liquid EVAPORATION RATE: Is faster than Butyl
SOLUBILITY IN H2O : Negligible Acetate
SPECIFIC GRAVITY : 0.8903
VAPOR PRESSURE : 70 mm Hg @ 68F.
PHYSICAL STATE : Liquid

(See Section 16 for abbreviation legend)

(Continued on Page 5)

SECTION 10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Excessive heat and freezing.

INCOMPATIBILITY: Strong oxidizers and caustics.

HAZARDOUS DECOMPOSITION PRODUCTS: Normal decomposition products, i.e. COx, NOx

HAZARDOUS POLYMERIZATION: Will not occur under normal conditions.

STABILITY: This product is stable under normal storage conditions.

SECTION 11 - TOXICOLOGICAL PROPERTIES

No product toxicological information is available.

SECTION 12 - ECOLOGICAL INFORMATION

No Information.

SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT/DISPOSAL: Dispose of according to Federal, State, and Local Standards. Discarded material should be incinerated at a permitted facility. Liquids cannot be disposed of in a landfill. Do not reuse empty container. State and Local regulations/restrictions are complex and may differ from Federal regulations. Responsibility for proper waste disposal is with the owner of the waste.

EPA WASTE CODE - If discarded (40 CFR 261): D001-Ignitable.

SECTION 14 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Adhesive(Consumer Commodity*)

DOT HAZARD CLASS: 3(ORM-D*)

DOT UN/NA NUMBER: UN 1133(NONE*) PACKING GROUP: III(NONE*)

* For containers of 1 gallon or less.

Note: The shipping information provided is applicable for domestic ground transport only. Different categorization may apply if shipped via other modes of transportation and/or to non-domestic destinations.

(Continued on Page 6)

SECTION 15 - REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS: AS FOLLOWS -

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

SARA SECTION 313:
This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	WT/WT % RANGE
Toluene	108-88-3	45.0-50.0 %
Methyl ethyl ketone	78-93-3	10.0-15.0 %

TOXIC SUBSTANCES CONTROL ACT:
This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

CHEMICAL NAME	CAS NUMBER
No information is available.	

NEW JERSEY RIGHT-TO-KNOW:
The following materials are non-hazardous, but are among the top five components in this product:

CHEMICAL NAME	CAS NUMBER
Polychlorinated Rubber	TSRN-618608-5001P
Polychlorinated Rubber	TSRN-618608-5023P

PENNSYLVANIA RIGHT-TO-KNOW:
The following non-hazardous ingredients are present in the product at greater than 3%:

CHEMICAL NAME	CAS NUMBER
Polychlorinated Rubber	proprietary
Phenolic resin	proprietary

CALIFORNIA PROPOSITION 65:
WARNING: The chemical(s) noted below and contained in this product, are known to the state of California to cause birth defects or other reproductive harm:

CHEMICAL NAME	CAS NUMBER
Toluene	108-88-3

INTERNATIONAL REGULATIONS: AS FOLLOWS -

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for use of the 16 headings.

CANADIAN WHMIS CLASS: No information available.

(Continued on Page 7)

SECTION 16 - OTHER INFORMATION

HMIS RATINGS - HEALTH: 2 FLAMMABILITY: 3 REACTIVITY: 0

PREVIOUS MSDS REVISION DATE: 02/01/1997

VOC less water, less exempt solvent: 700-710 gm/l(78-79%)
VOC material: 700-710 gm/l

LEGEND:
- ACGIH - AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
- N.A. - NOT APPLICABLE
- N.E. - NOT ESTABLISHED
- PEL - PERMISSIBLE EXPOSURE LIMIT
- NTP - NATIONAL TOXICOLOGY PROGRAM
- SARA - SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
- STEL - SHORT TERM EXPOSURE LIMIT
- TLV - THRESHOLD LIMIT VALUE(8 HR. TIME WEIGHTED AVERAGE OR TWA)
- VOC - VOLATILE ORGANIC COMPOUND
- NJRTK - NEW JERSEY RIGHT TO KNOW LAW
- N.D. - NOT DETERMINED

Supersedes MSDS# 30503

< End OF MSDS >

TECHNICAL BULLETIN

STEVENS Roofing Systems™

Bulletin No. **96-5**

To: Stevens Authorized Applicators

From: Steve Moskowitz

VOC = 579 g/L

Subj: **Hi-Tuff/EP Bonding Adhesive Use Instructions**

Date: August 9, 1996

Nine Sullivan Road

Holyoke Mass. 01040

Tel: 800/621-ROOF

Fax: 413/552-0924

The following pages detail the recommended application procedures for Hi-Tuff/EP Bonding Adhesive. In this bulletin, we define the physical properties, cautions and warnings, shelf life and most importantly, recommended installation guidelines to be followed when using this product.

If you still have questions about the application of the Hi-Tuff/EP Bonding Adhesive after reading this document, please contact the JPS Technical Department at 800/621-7663 Ext. 1002, 1006 or 1021.

General:

Hi-Tuff/EP Bonding Adhesive is a solvent-based contact adhesive to be used for bonding Hi-Tuff/EP membrane to various substrates including concrete, JPS approved insulation boards, metal and wood.

Typical Properties and Characteristics:

Base Polymer:	Synthetic rubber
Color:	Translucent Green
Solids:	24-26%
Viscosity:	5000 - 9000 cps @ 25° C (77° F)
Weight per Gallon:	6.4 - 6.9 pounds per gallon
Flash Point:	-20° F
Dry Time:	*5 to 15 minutes at 60° - 80° F and 50% R.H.
Open Time:	0-15 minutes after drying at 60° - 80° F and 50% R.H. If the relative humidity is lower than 50%, the adhesive will dry faster and if the temperature rises above 80° F the adhesive will dry faster. When these faster drying conditions exist, the available open assembly time of the adhesive will decrease. In order

to make up for the reduction in surface tack of the adhesive, more force is required to mate Hi-Tuff/EP membrane to substrate. The additional force that is required to produce proper mating of adhesive surfaces will be obtained by a weighted pressure roller such as a 3 foot wide x 2 foot diameter lawn roller full of water. The pressure should be applied immediately after closing the Hi-Tuff/EP membrane onto the substrate. Although it is not recommended to use the adhesive under 40° F it should be noted that at lower temperatures the air is usually drier and this condition will increase speed of solvent release therefore the adhesive should be mated sooner rather than later.

Packaging: 5 Gallon Pail

Shelf Life: Six months in unopened container

* Cool, overcast, damp days with decreasing temperature gradients are the worst adhesive drying conditions. It is possible that evaporation of solvents will be substantially reduced resulting in some swelling of the membrane. This would be further aggravated by a heavy application of adhesive. If swelling of trapped solvent results in bubbling or blistering of membrane, it would be advisable to re-roll those areas after further drying to remate membrane to substrate.

If this condition exists, prior to continuing, contact JPS Technical Department immediately.

Cautions and Warnings:

1. Review the Material Safety Data Sheet for complete safety information prior to use.
2. Hi-Tuff/EP Bonding Adhesive is Flammable - It contains solvents that are dangerous fire and explosion hazards when exposed to heat, flame or sparks. Do not smoke while applying. Do not use in confined or unventilated areas. Vapors from Hi-Tuff/EP Bonding Adhesive are heavier than air and may travel along ground or may be moved by ventilation. Pilot lights, other flames, sparks, heaters, lit cigarette smoking, electrical motors, static discharge, or other sources can ignite vapors at locations distant from material handling point. All containers of bonding adhesive should be grounded when material is transferred from one container to another. A red caution label is required when shipping. A fire extinguisher is to be available at all times. In case of fire, use water spray, foam, dry chemical or carbon dioxide. Do not use a solid stream of water because it can scatter and spread the fire.

3. Avoid breathing vapors. Keep all containers closed when not in use. Use with adequate ventilation. If inhaled, move the person into fresh air. If the victim is not breathing, perform artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately. During application, efforts must be made to prevent fumes from entering the building via air ventilation ducts. Do not place open containers or mix adhesive near fresh air intake units. When possible, shut down or seal off the closest units.
4. If swallowed, DO NOT INDUCE VOMITING. Call a physician immediately.
5. Avoid contact with eyes. Safety glasses or goggles are recommended. If splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
6. Avoid contact with skin. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water. Contact physician if irritation persists.
7. Do not thin Hi-Tuff/EP Bonding Adhesive. Thinning will affect performance. Excessively thick or gelled material should be discarded.
8. The shelf life of the Hi-Tuff/EP Bonding Adhesive is six months. Shelf life is based on storage in original, unopened or undamaged containers at temperatures ranging from 60° F to 80°F (15° to 26° C). Should the Hi-Tuff/EP Bonding Adhesive be exposed to lower temperatures, restore to room temperature prior to use. Due to the chemical composition of solvent-based adhesives, it is very important to monitor the shelf life of the product and rotate stock regularly. Should this product exceed its shelf life, it may not perform satisfactorily.
9. Opened containers of Hi-Tuff/EP Bonding Adhesive should be used as soon as possible. Adhesives will begin to thicken after initial use, making it difficult and eventually impossible, to control adhesive application. In hot weather, do not leave sealed containers on roof for prolonged periods of time. In cold weather, keep material above 60° F until ready to use. Stir adhesive occasionally while using.
10. KEEP OUT OF THE REACH OF CHILDREN.

Mixing:

Stir thoroughly until all settled pigments are dispersed and the adhesive is uniform in color. A minimum of five minutes stirring is recommended. **Note**: On days with an outside temperature greater than 80° F, 50% relative humidity, *only stir adhesive for one minute* by hand with the pail cover off and the stirrer reaching the bottom of the pail.

Coverage Rates:

Substrate	Recommended Coverage Rate*
Isocyanurate Insulation Board and other JPS approved insulation boards with facers and metal	60 Square Feet/Gallon

Cold weather, inconsistent spreading and rough or porous substrates (i.e.: plywood, woodfiber, concrete) will consume more adhesive. Membrane must have 100% adhesion to the approved substrate.

* Coverage rates are average and may vary due to the conditions on the job site.

Fully Adhered Roof System Membrane Application:

1. The surface, on to which the adhesive is to be applied, shall be clean, smooth, and dry.
2. For roofs with interior drainage, start with first sheet centered on drain valley. Fold sheet in half so that the bottom side of full length by half the width is presented.
3. Apply a 100% continuous coat of Hi-Tuff/EP Bonding Adhesive to the exposed bottom side of membrane and the area of substrate exposed by folding membrane back.

NOTE: Adhesive must be spread out by roller as necessary to achieve 100% coverage on the substrate and membrane. Adhesive should never be broomed or mopped. Adhesive must not be cut or extended. Outside ambient air temperature must be a minimum 40° F and rising.

4. Allow adhesive to dry to point of being tacky, but not sticky and stringy to the touch. When sufficiently dry, carefully unroll the glued portion of the membrane and lower it onto the glued substrate surface, avoiding any wrinkles or air pockets. Immediately roll the adhered area using a weighted pressure roller such as a three-foot wide x two-foot diameter lawn roller filled with water applying pressure to promote full contact.

NOTE: Extreme summer ambient conditions may dictate adhering lesser areas of membrane at a time to prevent over drying of adhesive.

5. Repeat the procedure for the other half of the sheet.

6. For roofs with edge drainage, start at the low edge with the first sheet.

NOTE: Adhesive coverage should be 60 square feet per gallon for coating substrate and membrane. This will consume about ten gallons of adhesive per standard (76.5-in. X 100 ft.) roll of membrane if applied without excessive waste. Cold weather, inconsistent spreading and rough or porous substrates (i.e. wood fiber, concrete) will consume more adhesive. Membrane must have 100% adhesion to the approved substrate. Several peel tests should be performed daily to ensure proper adhesion of membrane to substrate.

7. Lay out the second sheet with a minimum 2-in. overlap on the edge of the first sheet. Heat weld lap. After weld has cooled, completely expose the bottom side of the second sheet by folding back along the splice. Apply adhesive evenly to both underside of membrane and substrate surface, allow to dry to the point where the adhesive is tacky, and carefully turn membrane back onto glued substrate surface avoiding any wrinkles or air pockets. Roll surface using a weighted pressure roller applying pressure to promote full contact. Repeat procedure for each sheet proceeding across roof.

CAUTION: If the substrate type prevents truly effective tie-off and inability to reach high points or complete roof by end of day, such a condition may dictate starting membrane at high points. However, this practice will result in laps bucking water flow and should be avoided whenever possible by taking the extra steps needed to reverse laps from one sheet to the next.

WARNING: If adhesive has been contaminated by blowing dust, moisture, walking in it, etc. it should be allowed to completely dry (no longer tacky) and new adhesive applied to both surfaces.

Bonding to Parapet Walls Application:

1. Apply Hi-Tuff/EP Bonding Adhesive to both underside of flashing membrane and surface to which it is to be bonded, at a rate of approximately one gallon per 60 square feet when applied to both surfaces.

NOTE: Hi-Tuff/EP Bonding Adhesive shall not be applied to that portion of the flashing that overlaps onto itself. Hot-air welding shall be used throughout the system where Hi-Tuff/EP Membrane overlaps itself.

2. Hi-Tuff/EP Bonding Adhesive shall be allowed to dry until tacky to finger touch and until it does not string or stick to a dry finger. Roll the flashing into the dry adhesive. Care must be taken to assure that the flashing does not bridge where there is any elevation or directional change. Completely roll the flashing

membrane against the substrate using a hand roller, J-Roller or similar device, applying positive pressure to the entire surface area.

☛This product is approved for use by Stevens Hi-Tuff/EP Authorized Applicators only and is for the exclusive use to install Hi-Tuff/EP roofing systems.

☛Note: General properties. Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

☛Note: Review current Stevens Roofing Systems specifications and details for specific application requirements.

☛JPS' Technical Services Department (1-800-621-ROOF, ext. 1007) stands ready to answer any of your Hi-Tuff/EP Bonding Adhesive questions and should be consulted if you have a specific concern.

MATERIAL SAFETY DATA SHEET

Printed : 05/22/97
Revised : 05/22/97

SECTION I - PRODUCT IDENTIFICATION

Manufacturer: JPS ELASTOMERICS CORPORATION
Carolina Plant
Route 2, Box 136
Westfield NC
27053

Information Phone: 910-351-3131
Emergency Phone: 413-552-1024
CHEMTREC Phone: 800-424-9300
in Washington D.C. or International: 202-483-7616

Product Class: ROOFING ADHESIVE
Trade Name : EP BONDING ADHESIVE
Product Code : 2086195
C.A.S. Number: MIXTURE
D.O.T. Hazard Class : HAZARD CLASS 3 UN #: UN1133
Proper Shipping Name: ADHESIVES
Technical Name : Packing Group II

! Hazard Ratings: Health - 2
! none -> extreme Fire - 3
! 0 ---> 4 Reactivity - 0
!
Personal Protection - B

SECTION II - HAZARDOUS INGREDIENTS

Ingredients	CAS #	Weight %	Exposure Limits ACGIH/TLV	Exposure Limits OSHA/PEL	VP mm HG
TOLUENE	108-88-3	65.7	100 ppm STEL = 150 ppm	100 ppm 150 ppm	22 @ 68F
			Toluene ceiling limit=300ppm, Peak=500ppm.		
HEXANE	110-54-3	7.3	50 ppm STEL = N.E.	50 ppm N.E	0

N.E. = Not Established

SECTION III - PHYSICAL DATA

Boiling Range: 156 - 231 Deg. F
Evap. Rate: Faster than n-Butyl Acetate.

Vapor Density: Heavier than Air.
Liquid Density: Lighter than Water.
Spec. Gravity: 0.7

Appearance: Green opaque liquid with a solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DANGER

Flammability Class: T.D.G.R. Flash Point: 23° F LEL: 1.0% UEL: 8.0%

-EXTINGUISHING MEDIA
Alcohol Foam, dry chemical, carbon dioxide.

SECTION IV - FIRE AND EXPLOSION HAZARD DANGER (cont.)

-SPECIAL FIREFIGHTING PROCEDURES

Water should not be used except to cool containers exposed to flames or high heat. Respiratory equipment should be worn to avoid inhalation of concentrated fumes.

-UNUSUAL FIRE & EXPLOSION HAZARDS

Handle as a flammable liquid. Vapors form an explosive mixture in air between the upper and lower explosive limit which can be ignited by many sources, such as pilot lights, open flame, electrical motors and switches. Store in cool, well ventilated areas.

SECTION V - HEALTH HAZARD DATA

-PERMISSIBLE EXPOSURE LEVEL: See Section II

-PRIMARY ROUTES OF EXPOSURE

Eyes, skin, inhalation

-EFFECTS OF OVEREXPOSURE

Inhalation: Prolonged inhalation of high vapor concentrations may result in an acute narcotic effect ranging from dizziness, nausea, and headaches to unconsciousness. No chronic health effects.
Eyes: Severe irritation, tearing, redness, burning sensation, and blurred vision.
Skin: Removal of skin oils, irritation, cracking, dermatitis.
Ingestion: Can cause gastrointestinal irritation, vomiting, nausea and diarrhea.

-MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Anesthesia, respiratory tract irritation, dermatitis, nausea and vomiting.

-FIRST AID:

Inhalation: Get fresh air. If breathing stops, apply artificial respiration and seek medical attention.
Skin: Wash with mild soap and water, and consult a doctor.
Eyes: Flush with water for at least 15 minutes, get medical attention if problem persists.
Ingestion: DO NOT INDUCE VOMITING, this can cause chemical pneumonitis and pulmonary edema. Contact a physician immediately.

SECTION VI - REACTIVITY DATA

STABILITY: [ ] Unstable [x] Stable
HAZARDOUS POLYMERIZATION: [ ] May occur [x] Will not occur

NCOMPATIBILITY

Strong oxidizing agents, strong acids and bases.

-CONDITIONS TO AVOID:

Excessive heat, poor ventilation, corrosive atmospheres, excessive ageing.

SECTION VI - REACTIVITY DATA (cont.)

-HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide, oxides of nitrogen, and possibly acrolein.

SECTION VII - SPILL OR LEAK PROCEDURES

-STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Eliminate ignition sources, provide ventilation, dike the spill area, and add absorbent earth or sawdust to spilled material. Clean-up personnel should wear rubber gloves and respiratory protection.

-WASTE DISPOSAL METHOD

Collect absorbent material into metal waste containers and dispose of in accordance with all local, state and federal hazardous waste regulations pertaining to the listed hazardous ingredients.

SECTION VIII - SPECIAL PROTECTION INFORMATION

-RESPIRATORY PROTECTION

If vapors exceed TLV use self-contained NIOSH-approved organic mask. When using in poorly ventilated and confined spaces use a fresh air supplying respirator or a self-contained breathing apparatus.

-VENTILATION

Sufficient to keep workroom concentration below TLV. Ventilation equipment should be explosion proof.

-PROTECTIVE GLOVES

Chemical resistant gloves.

-EYE PROTECTION

Safety glasses or face shield. Eye wash stations should be in working area.

-OTHER PROTECTIVE EQUIPMENT:

Use impermeable clothing whenever possible to prevent skin contact. Safety showers and eye baths should be in working area.

SECTION IX - SPECIAL PRECAUTIONS

-PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Store in a well ventilated area, away from heat sparks, open flame. Use non-sparking utensils when handling liquid mixtures.

OTHER PRECAUTIONS:

Smoking in area where this material is stored should be strictly prohibited. Tools used with this material should be made from copper, brass or aluminum. Plastic utensils should not be used because they may generate sparks.

SECTION X - ADDITIONAL REGULATORY INFORMATION

-SARA TITLE III SECTION 313

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right To Know Act of 1986 and of 40 CFR 372:

CAS#	Chemical Name	Percent by Weight
108-88-3	TOLUENE	65.7
110-54-3	HEXANE	7.3

-PROP 65 (CARCINOGEN)

WARNING: This product contains a chemical known to the state of California to cause cancer.

CAS#	Chemical Name
	NONE

-PROP 65 (TERATOGEN)

WARNING: This product contains a chemical known to the state of California to cause birth defects or other reproductive harm.

CAS#	Chemical Name
108-88-3	TOLUENE

-PROP 65 (BOTH CARCINOGEN AND TERATOGEN)

WARNING: This product may contain a chemical known to the state of California to cause cancer or birth defects or other reproductive harm

CAS#	Chemical Name
	None

SECTION XI - DISCLAIMER

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of JPS Elastomerics. The data on this sheet relates only to the specific material designated herein. JPS Elastomerics assumes no legal responsibility for use or reliance upon these data.

EQ Credit 4.2: Low-Emitting Materials - Paints and Coatings

Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the health, comfort and well-being of installers and occupants.

Requirements

VOC emissions from paints must not exceed the VOC and chemical component limits of Green Seal requirements.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the paints and coatings used in the building and stating that they comply with the current VOC and chemical component limits of Green Seal requirements.

☐ Provide a manufacturer's catalog cut sheet and a Material Safety Data Sheet (MSDS) highlighting VOC limits and chemical component limits for each paint or coating used in the building.

Narrative

Credit requirements not satisfied. The VOC content of architectural paints used for CDOB are tabulated for comparison to Green Seal standards. Green Seal compliant paints are available from nearly all major paint manufacturers. A list of zero-VOC content paints and manufacturers can be found on the internet at www.aqmd.gov/business/brochures/zerovoc.html.

CDOB Paint VOC Assessment

Paint Product Descriptions	Product Label VOC Content	Green Seal VOC Content Limit	Satisfies LEED Credit?
Kwal Paints			
1500 SERIES ACCU-TONE FLAT LATEX	117 g/L	50 g/L	No
2300 SERIES ACCU-TONE INTERIOR LATEX SEMI-GLOSS ENAMEL	161 g/L	150 g/L	No
3200 SERIES AMBASSADOR ACRYLIC LATEX SEMI-GLOSS	246 g/L	150 g/L	No
4600 SERIES ACCU-PRO INTERIOR/EXTERIOR ALKYD SEMI-GLOSS ENAMEL	373 g/L	150 g/L	No

EQ Credit 4.2: Low-Emitting Materials - Paints and Coatings

(continued)

CDOB Paint VOC Assessment (continued)

Paint Product Descriptions	Product Label VOC Content	Green Seal VOC Content Limit	Satisfies LEED Credit?
9210 RUST INHIBITING METAL PRIMER	**432 g/L**	**250 g/L**	**No**
9800 ACCU-PRO SERIES ALKYD GLOSS ENAMEL	**305 g/L**	**150 g/L**	**No**
Coronado Paints			
138 Acrylic Epoxy Enamel	**231 g/L**	**150 g/L**	**No**
Industrial Marine Coatings			
Structural Steel Primer	**350 g/L**	**250 g/L**	**No**
Heavy Duty Primer	**360 g/L**	**250 g/L**	**No**

1500 SERIES ACCU-TONE FLAT LATEX

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: KWAL-HOWELLS/HANLEY best commercial architectural interior latex wall paint. This flat latex paint is superior for new or repaint work. The formulation is ideal for brush, roll or airless spray application.

BENEFITS: Good hiding, high film build, water clean up, good scrubbability, good stain removal, ease of application and excellent soft appearance.

FINISH/USAGE: Flat/Interior.

TYPE: Vinyl/Acrylic Emulsion.

COLORS AVAILABLE: White and off whites. Full "Color Guild" range.

PRACTICAL COVERAGE: 375 square feet per gallon.

SPECIFICATIONS

Surfaces: Interior plaster, drywall, masonry, cement plaster, wood and metal.

Surface Preparation: Surface must be clean, dry, free of dirt, wax, grease, loose or peeling paint and other foreign material. Repair cracks and other holes with suitable filler. Spot prime all patching work. Glossy, glazed or dense surfaces must be dulled.

New Work: Wood surfaces should be primed with #4200 Alkyd Enamel Undercoat. Prime plaster and drywall with #0880 Latex Primer Sealer. Fill porous concrete and cement block with #5890 Acrylic Block Filler. Ferrous metal surfaces should be primed with #9201, #9207 or #9210 Rust Inhibiting Metal Primer. Galvanized metal and aluminum require special preparation prior to painting. (See Section 5 Reference.)

Refinish Work: Fill all holes and cracks with suitable filler. Spot prime or prepare surfaces as listed above under "New Work". Allow all primers to dry thoroughly before applying finish coats.

Surface Temperature: For best results, temperature should be above 50°F and should be under 95°F.

Thinning: This material should not require thinning. If additional thinning is desired, use only small quantities of water.

Application: Stir well with a lifting motion before using. Best results are achieved with airless spray application.

Coverage: 325 to 400 square feet per gallon depending on surface, porosity, application method and texture.

Recommended Application: 350 square feet per gallon results in 1 1/2 mil dry film.

Drying Time: Dries dust free in 1 hour. May be recoated after 4 hours. Drying time variable depending on temperature and humidity.

Clean Up: Clean application equipment with soap and water.

Flash Point: N/A (water reduced)

Viscosity: 97-103 K.U.

Gloss: Flat. 85° gloss less than 2.0%

TYPICAL ANALYSIS(+ OR - 2%)

Pigment	42.00%

	TiO^2	16.70%
	Silicates	21.10T
	Mica	4.20%
Vehicle		58.00%
	Vinyl Acrylic Emulsion	17.60%
	Water & Glycols	37.20%
	Miscellaneous Additives	3.20%
Solids by Weight		55.00%
Solids by Volume		35.80%
V.O.C.		95 grams per liter
Weight Per Gallon		11.83 pounds

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#1500 SERIES ACCU-TONE FLAT LATEX MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwalhowells.com

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ACCU-TONE INT. FLAT , WHITE HMIS CODES: H F R P
PRODUCT CODE: 1511 S 1 0 0 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-5600
DATE REVISED: 01-17-95 NAME OF PREPARER: C. TAFOYA
REASON REVISED: RMPCC

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	VAPOR PRESSURE OTHER	mm HG	@ Temp	WEIGHT Percent
*ETHYLENE GLYCOL	107-21-1	N/A	50ppm	N/A	0.1	68f	2
CRYSTALLINE SILICA	14808-60-7	.1 mg/M3	.1 mg/M3			N/A	2.68

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 379 deg F SPECIFIC GRAVITY (H20=1): 1.4
VAPOR DENSITY: Lighter than air EVAPORATION RATE: Slower than ether
COATING V.O.C.: 0.98 LB/GL (117 G/L)
SOLUBILITY IN WATER: Soluble
APPEARANCE AND ODOR: Viscous liquid with slight ammonia or sweet odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 241 deg F METHOD USED: PMCC
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical, water fog
SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment including a self-contained breathing apparatus recommended to protect fire fighters from any hazardous combustion products.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Water may be used to cool containers to prevent pressure build up and explosion when exposed to extreme heat.

SECTION V - REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: Do not heat above 200 F.
INCOMPATIBILITY (MATERIALS TO AVOID): None known at this time.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None known at this time.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapors may cause headache, nausea and irritation of the nose, throat, and lungs.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Eye contact may cause irritation or burning of the eyes. Repeated liquid contact may cause skin irritation and dermatitis.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritation, nausea, vomiting and diarrhea, vomiting can result in aspiration of material into the lungs which can cause chemical pneumonitis.
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure may cause headache, nausea, skin and eye irritation.
CHRONIC: (LONG TERM) Unprotected over exposure may cause serious health problems.
CARCINOGENICITY: NTP? YES IARC MONOGRAPHS? YES OSHA REGULATED? NO
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physician.
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician.
INGESTION: Drink 1 or 2 glasses of water to dilute. Consult a physician or poison control center immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area. Prevent skin and eye contact and breathing of vapor. Contain and remove with inert absorbent.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills with sand, clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 200 f.
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: None required for brush and roll application. For spray application, wear a properly fitted NIOSH/MSHA (TC-23C) approved vapor/particulate respirator until all vapors and spray mist are exhausted..
VENTILATION: Provide sufficient ventilation in volume and pattern to keep air contaminant concentration below applicable OSHA PEL or ACGIH occupational exposure limits. (SECTION II).
PROTECTIVE GLOVES: Impervious gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray application. Protective creams may be used for ease of clean up, not for protection..
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX - DISCLAIMER

DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith tc comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

2300 SERIES ACCU-TONE INTERIOR LATEX SEMI-GLOSS ENAMEL

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: ACCU-TONE is our best professional grade enamel offering good brushability and spatter resistance. It is an excellent commercial coating for interior walls and woodwork which require a durable semi-gloss finish.

BENEFITS: Excellent scrub reistance, low odor, superior hiding and film build when brushed and rolled, fast 'set-up' and dry times and water clean up.

FINISH/USAGE: Semi-Gloss/Interior.

TYPE: Vinyl Acrylic Emulsion.

COLORS AVAILABLE: White, off whites and a full range of Millennium Colors.

PRACTICAL COVERAGE: 400 square feet per gallon.

SPECIFICATIONS

Surfaces: Interior plaster, drywall, concrete, masonry, wood, and metal

Surface Preparation: Surface must be clean, dry, free from dirt, wax, grease, loose or peeling paint and other foreign material. Repair cracks and other holes with suitable filler. Glossy, glazed or dense surfaces must be dulled.

New Work: For maximum durability, wood surfaces should be primed with #4200 Alkyd Enamel Undercoat. Prime plaster and drywall with #0800 Latex Primer Sealer or #0880 Drywall Primer Sealer. Fill porous concrete and cement block with #5890 Acrylic Block Filler. Ferrous metal surfaces should be primed with #9210 Rust Inhibiting Metal Primer. Galvanized metal and aluminum require special preparation prior to painting.

Refinish Work: Fill all holes and cracks with suitable filler. Spot prime or prepare surfaces as listed above under "New Work". Allow primers to dry thoroughly before applying finish coats. On surfaces where durability requirement are paramount, two coats of finish product are recommended.

Surface Temperature: For best results, surface

Thinning: This product should not require thinning. If additional thinning is desired, use only small quantities of water.

Coverage: 350 to 450 square feet per gallon depending on surface porosity, texture, and application method.

Drying Time: Dries dust free in 1 hour. May be recoated after 2-4 hours. Dry time will vary depending on temperature and humidity.

Clean Up: Clean application equipment with soap and water.

Flash Point: N/A (water reduced)

Viscosity: 90-100 K.U.

temperature should be above 50°F and should be under 95°F.

Application: Stir well with a lifting motion before using. Apply with brush, roller, airless or conventional spray equipment.

Gloss: 60° gloss 55%-65%

TYPICAL ANALYSIS(+ OR - 2%)

Pigment		25.62%
	Titanium Dioxide	20.96%
	Silicates	4.66%
Vehicle		74.28%
	Vinyl Acrylic Emulsion	38.99%
	Water & Glycol's	29.68%
	Miscellaneous Additives	5.61%
Solids by Weight		49.84%
Solids by Volume		37.50%
V.O.C.		161 grams per liter
Weight Per Gallon		10.74 lbs.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#2300 SERIES ACCU-TONE INTERIOR LATEX SEMI-GLOSS ENAMEL MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwalhowells.com

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: ACCU-TONE SEMI-GLOSS, WHITE HMIS CODES: H F R P
PRODUCT CODE: 2310 D 1 0 0 B

SECTION I - MANUFACTURER IDENTIFICATION
MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-5600
DATE REVISED: 10/09/98 NAME OF PREPARER: M. ZINK
REASON REVISED: RMPCC

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	VAPOR PRESSURE OTHER	mm HG	@ Temp	WEIGHT Percent
*ETHYLENE GLYCOL	107-21-1	N/A	50ppm	N/A	0.1	68f	3

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS
BOILING POINT: 379 Deg. F SPECIFIC GRAVITY (H20=1): 1.29
VAPOR DENSITY: Lighter than air EVAPORATION RATE: Slower than ether
COATING V.O.C.: 1.34 LB/GL
SOLUBILITY IN WATER: Soluble
APPEARANCE AND ODOR: Viscous liquid with slight ammonia or sweet odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: 241 Deg. F METHOD USED: PMCC
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical, Water Fog
SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment including a self-contained breathing apparatus recommended to protect fire fighters from any hazardous combustion products.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Water may be used to cool containers to prevent pressure build up and explosion when exposed to extreme heat.

SECTION V - REACTIVITY DATA
STABILITY: Stable
CONDITIONS TO AVOID: Do not heat above 200 F.
INCOMPATIBILITY (MATERIALS TO AVOID): None known at this time.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None known at this time.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapors may cause headache, nausea and irritation of the nose, throat, and lungs.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Eye contact may cause irritation or burning of the eyes. Repeated liquid contact may cause skin irritation and dermatitis.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritation, nausea, vomiting and diarrhea, vomiting can result in aspiration of material into the lungs which can cause chemical pneumonitis.
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure may cause headache, nausea, skin and eye irritation.
CHRONIC: (LONG TERM) Unprotected over exposure may cause serious health problems.
CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.

EMERGENCY AND FIRST AID PROCEDURES
INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physician.
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician.
INGESTION: Drink 1 or 2 glasses of water to dilute. Consult a physician or poison control center immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area. Prevent skin and eye contact and breathing of vapor. Contain and remove with inert absorbent.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills with sand, clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 200 f.
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII - CONTROL MEASURES
RESPIRATORY PROTECTION: None required for brush and roll application. For spray application, wear a properly fitted NIOSH/MSHA (TC-23C) approved vapor/particulate respirator until all vapors and spray mist are exhausted..
VENTILATION: Provide sufficient ventilation in volume and pattern to keep air contaminant concentration below applicable OSHA PEL or ACGIH occupational exposure limits. (SECTION II).
PROTECTIVE GLOVES: Impervious gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray application. Protective creams may be used for ease of clean up, not for protection..
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX - DISCLAIMER
DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

3200 SERIES AMBASSADOR ACRYLIC LATEX SEMI-GLOSS

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: Our finest quality semi-gloss latex enamel. Dries to a rich, scubbable semi-gloss finish.

BENEFITS: Premium quality, excellent durability, superior hiding, full color range and water clean up.

FINISH/USAGE: Semi-Gloss/Interior. Exterior trim.

TYPE: 100% Acrylic.

Colors Available: White, off whites and full "Color Guild" range.

PRACTICAL COVERAGE: 350 square feet per gallon.

SPECIFICATIONS

Surfaces: Interior plaster, drywall, concrete, masonry, wood, and metal. Exterior trim.

Surface Preparation: Surface must be clean, dry, and free of dirt, wax, grease, loose or peeling paint and other foreign material. Repair cracks and other holes with suitable filler. Spot prime all patching work. Glossy, glazed or dense surfaces must be dulled.

New Work: Interior wood surfaces should be primed with #4200 Alkyd Enamel Undercoat or #5800 100% Acrylic Primer. Exterior wood surfaces should be primed with #5800 100% Acrylic Primer or #9200 Duo Primer. Hardboard, if factory primed, does not require a special primer, but on unprimed use #4200 Alkyd Enamel Undercoat or #5800 Acrylic Primer. Prime plaster and drywall with #0800 Latex Primer Sealer. Fill porous concrete and cement block with #5890 Acrylic Block Filler. Ferrous metal Surfaces should be primed with #9201, #9207, #9210 Rust Inhibiting Metal Primer. Galvanized metal and aluminum require special preparation prior to painting. (See Section 5 Reference).

Refinish Work: Fill all holes and cracks with suitable filler. Spot prime or prepare surfaces as listed above under "New Work". Allow all primers to dry thoroughly before applying finish coats. On surfaces where durability requirements are

Thinning: This material should not require thinning. If additional thinning is desired, use only small quantities of water.

Application: Stir well with a lifting motion before and during use. Apply with brush, roller, airless or conventional spray equipment.

Coverage: 300-400 square feet per gallon depending on surface porosity, color, application method and texture.

Recommended Application: 350 square feet per gallon results in 1 1/2 mil dry film.

Drying Time: Dries to the touch in 1 hour. May be recoated after 4 hours. Drying time variable depending on temperature and humidity.

Clean Up: Clean application equipment with soap and water.

Flash Point: N/A (water reduced)

paramount, two coats of this product are recommended. Chalky surfaces should be thoroughly washed.

Surface Temperature: Temperature must be above 50°F and should be under 95°F.

Viscosity: 95-100 K.U.

Gloss: 60° gloss 55%-60%

TYPICAL ANALYSIS(+ OR - 2%)

Pigment		25.28%
	Titanium Dioxide	23.41%
	Silicates	1.87%
Vehicle		74.72%
	100% Acrylic Emulsion	45.82%
	Water & Glycols	21.34%
	Miscellaneous Additives	7.56%
Solids by Weight		49.83%
Solids by Volume		21.34%
V.O.C.		246 grams per liter
Weight Per Gallon		10.68 lbs.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#3200 SERIES AMBASSADOR ACRYLIC LATEX SEMI-GLOSS MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwal-howells.com

PRODUCT NAME: ACRYLIC SEMI-GLOSS, WHITE BASE HMIS CODES: H F R P
PRODUCT CODE: 3210 L 1 0 0 B

MATERIAL SAFETY DATA SHEET

SECTION I - MANUFACTURER IDENTIFICATION
MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-5600
DATE REVISED: 01-17-95 NAME OF PREPARER: C. TAFOYA
REASON REVISED: RMPCC

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	OTHER	VAPOR PRESSURE mm HG	@ Temp	WEIGHT Percent
*ETHYLENE GLYCOL	107-21-1	N/A	50ppm	N/A	0.1	68f	3

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS
BOILING POINT: 379 Deg. F SPECIFIC GRAVITY (H20=1): 1.3
VAPOR DENSITY: Lighter than air EVAPORATION RATE: Slower than ether
COATING V.O.C.: 2.06 LB/GL (247 G/L)
SOLUBILITY IN WATER: Soluble
APPEARANCE AND ODOR: Viscous liquid with slight ammonia or sweet odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: 241 Deg. F METHOD USED: PMCC
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical, Water Fog
SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment including a self-contained breathing apparatus recommended to protect fire f ghters from any hazardous combustion products.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Water may be used to cool containers to prevent pressure build up and explosion when exposed to extreme heat.

SECTION V - REACTIVITY DATA
STABILITY: Stable
CONDITIONS TO AVOID: Do not heat above 200 F.
INCOMPATIBILITY (MATERIALS TO AVOID): None known at this time.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None known at this time.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapors may cause headache, nausea and irritation of the nose, throat, and lungs.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Eye contact may cause irritation or burning of the eyes. Repeated liquid contact may cause skin irritation and dermatitis.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritation, nausea, vomiting and diarrhea vomiting can result in aspiration of material into the lungs which can cause chemical pneumonitis.
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure may cause headache, nausea, skin and eye irritation.
CHRONIC: (LONG TERM) Unprotected over exposure may cause serious health problems.
CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.
EMERGENCY AND FIRST AID PROCEDURES
INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physician.
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician.
INGESTION: Drink 1 or 2 glasses of water to dilute. Consult a physician or poison control center immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area. Prevent skin and eye contact and breathing of vapor. Contain and remove with inert absorbent.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills with sand, clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 200 f.
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII - CONTROL MEASURES
RESPIRATORY PROTECTION: None required for brush and roll application. For spray application, wear a properly fitted NIOSH/MSHA (TC-23C) approved vapor/particulate respirator until all vapors and spray mist are exhausted..
VENTILATION: Provide sufficient ventilation in volume and pattern to keep air contaminant concentration below applicable OSHA PEL or ACGIH occupational exposure limits. (SECTION II).
PROTECTIVE GLOVES: Impervious gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray application. Protective creams may be used for ease of clean up, not for protection..
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX - DISCLAIMER
DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

4600 SERIES ACCU-PRO INTERIOR/EXTERIOR ALKYD SEMI-GLOSS ENAMEL

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: Accu-Pro Semi-Gloss Enamel is our finest quality alkyd enamel which dries to a scrubbable, mar-resistant finish.

TYPE: Alkyd (solvent thinned).

BENEFITS: A moisture resistant, interior/exterior, scrubbable and mar-resistant semi-gloss enamel that is ideal for areas requiring above average adhesion and durability, such as metal siding, doors, window sash, kitchens, bathrooms, laundry rooms, and trim. The effortless brushing characteristics and medium gloss of this product make it an excellent choice for use on areas which require enamel-like protection without the high gloss.

COLORS: A full range of "Color Guild" colors from the off-whites to the neutral decorator matches-5 bases.

SPECIFICATIONS

Surfaces: Interior or exterior plaster, drywall, concrete, masonry, cement plaster, wood, and metal.

New Work: For maximum durability of new wood, plaster, drywall, concrete or ferrous metal, we recommend that you first treat the surface with one of Kwal-Howells/Hanley quality primers listed below: Primers Interior Wood 4200, Exterior 5800 or 9200. Plaster or Drywall Interior 0800, Exterior N/A. Concrete/Cement Block: Interior 5890, Exterior 5890. Ferrous Metal: Interior 9201, 9207, 9210; Exterior 9201, 9207, 9210. Galvanized metal and aluminum require special preparation before painting.

Refinish Work: Fill all holes and cracks with suitable filler. Spot prime or prepare surfaces as listed above under "New Work". Allow all primers to dry thoroughly before applying this product.

Surface Temperature: Temperature must be above 50°F and should be under 95°F. Application below 50°F will slow dry time and may cause

Application: Apply with brush, airless or conventional spray equipment.

Coverage: 350 to 400 square feet per gallon depending upon the surface and color.

Recommended Application: 400 square feet per gallon results in 1.5 mil dry film.

Drying Time: Dries to the touch in 6 hours. May be recoated after 24 hours. Dry time variable depending on temperature and humidity.

Clean Up: Clean application equipment with mineral spirits.

Flash Point: 104°F TCC **(Combustible)**

Viscosity: 85-90 K.U.

application problems. Avoid frost, fog, or damp conditions.

Thinning: Thinning is not recommended if maximum hide per coat is expected. If thinning is required, use only small amounts of mineral spirits or paint thinner.

Gloss: 55%-60% @ 60°.

TYPICAL ANALYSIS(+ OR - 2%)

Pigment		40.8%
	Titanium Dioxide	23.8%
	Silica & Silicates	13.7%
	Calcium Carbonate	1.9%
	Zinc Oxide	1.4%
Vehicle		59.2%
	Alkyd Resin	45.1%
	Solvent & Driers	12.4%
	Miscellaneous Additives	1.7%
Solids by Weight		64.2%
Solids by Volume		43.2%
V.O.C.		450 grams per liter
Weight Per Gallon		10.49 pounds

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#4600 SERIES ACCU-PRO INTERIOR/EXTERIOR ALKYD SEMI-GLOSS ENAMEL MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwalhowells.com

4600 SERIES ACCU-PRO INTERIOR/EXTERIOR ALKYD SEMI-GLOSS ENAMEL

PRODUCT NAME: ACCU-PRO ALKYD S/G, WHITE HMIS CODES: H F R P
PRODUCT CODE: 4610 L 2 2 0 G
SECTION 1-MANUFACTURER INDENTIFICATION
MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-56
DATE REVISED: 01-17-95 NAME OF PREPARER: C TAFOYA
REASON REVISED: RMPCC

SECTION II-HAZARDOUS INGREDIENTS/SARAIII INFORMATION

		OCCUPATIONAL EXPOSURE LIMITS			VAPOR PRESS
HAZARDOUS COMPONENTS	CAS NUMBER	OSHA PEL	ACGIH TLV	OTHER	mm HG
MINERAL SPIRITS	8052-41-3	500PPM	100PPM	100(shell)	7.

***No toxic chemical(s) subject to the reporting requirements of section 313 of Titl

BOILING POINT: 325 deg. F SPECIFIC GRAVITY (H20=1): 1.4
VAPOR DENSITY: Heavier than air EVAPORATION RATE: Slower than Et
COATING V.O.C.: 3.11LB/GL (373 G/L)
SOLUBILITY IN WATER: Insoluble
APPEARANCE AND ODOR: Viscous liquid with solvent odor.

SECTION IV-FIRE AND EXPLOSION HAZARD DATA
FLASH POINT: 105 Deg. F METHOD USED: TCC
FLAMMABLE LIMITS IN AIR BY VOLUME-LOWER 1.0% UPPER: 6.0%
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical, Water Fog
SPECIAL FIREFIGHTING PROCEDURES: full protective equipment including a self-contained breathing appar should be used. Water may be used to cool closed containers to prevent pressure build up and possible auto-ign or explosion when exposed to extreme heat.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed, isolate from heat, electrical e sparks and open flame. Closed containers may explode when exposed to extreme heat. During emergency condition: exposure to decomposition products may pose a health hazard.

SECTION V-REACTIVITY DATA
STABILITY: STABLE
CONDITIONS TO AVOID: Extreme Heat, Sparks or Flame.
INCOMPATABILITY (MATERIALS TO AVOID): Strong oxidizing materials.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Incomplete combustion can produce carbon mo
HAZARDOUS POYMERIZATION: Will not occur.

SECTION VI-HEALTH HAZARD DATA
INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapor ma to nasal irritation, headache, nausea, asphyxiation or unconsciousness.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Repeated contact can defat skin and dermatitis. Eye contact can cause severe irritation, redness, tearing or blurred vision.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time.
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritatic vomiting and diarrhea, vomiting can result in aspiration of material into the lungs which can cause chemical pn
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure can cause eye and skir can cause acute nervous system depression characterized by nasal irritation, headache, dizziness, confusion or

unconsciousness.
CHRONIC: (LONG TERM) Repeated and prolonged overexposure to vapors may cause kidney or liver damage, perman and central nervous system damage, and other serious health problems.
CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO
Laboratory studies with rats have shown that petroleum distillates cause kidney and evaluating petroleum workers have not shown significant increases of kidney damage,
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physic
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician
INGESTION: Drink 1 or 2 glasses of water to dilute. Consult a physician or poison control center immediate

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area. Remove all sour hot surfaces, electrical, static or frictional sparks). Avoid skin contact and breathing vapors. Contain and inert absorbent and non-sparking tools.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool, well ventilated area away fr Store large quantities only in buildings designed to comply with OSHA 1910.106
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII-CONTROL MEASURES

RESPIRATORY PROTECTION: Wear a properly fitted NIOSH/MSHA approved vapor/particulate respirator or an ai respirator unless ventilation is adequate to keep airborne contamination below applicable OSHA, PEL or ACGIH TL exposure limits.
VENTILATION: Provide sufficient ventilation in volume and pattern, with explosion proof equipment to keep contaminant concentration below applicable OSHA PEL or ACGIH TLV occupational exposure limits.(SECTION II)
PROTECTIVE GLOVES: Rubber or Neoprene gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray ap Protective creams may be used for ease of clean up, not for protection.
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX-DISCLAIMER

DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be acc and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or repr with respect to such information is intended or given.

#4600 SERIES ACCU-PRO INTERIOR/EXTERIOR ALKYD SEMI-GLOSS ENAMEL SPECS

More MSDS INFORMATION

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwalhowells.com

9201/9210 RUST INHIBITING METAL PRIMER

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: Kwal-Howells 9201, 9210 Rust Inhibiting Metal Primer is a premium quality, interior/exterior non-toxic lead and chromate-free primer and finish coat for iron and steel.

BENEFITS: A durable, non-toxic (when dry), rust inhibiting metal primer for iron and steel. Its excellent adhesion, dry, and flexibility allow its use on a variety of surfaces. Kwal-Howells #9201 can be used on properly prepared wood where a dark primer is desired, and Kwal-Howells #9210 can be used as a mildew resisting primer or finish coat in pastel colors.

FINISH/USAGE: Satin/Interior-Exterior.

TYPE: Alkyd Resin (solvent reduced).

COLORS AVAILABLE: Kwal-Howells #9201 (Red Oxide), and Kwal-Howells #9210(White may be tinted to pastel or medium base colors).

SPECIFICATIONS

Surfaces: Interior and Exterior ferrous metal.

Surface Preparation: Surface must be clean, dry, and free of dirt, wax, oil, grease, loose or peeling paint, and other foreign material. Galvanized metal must be pretreated with a chemical cleaner before priming.

New Work: Apply at recommended coverage rates. Surface preparation is important for good, long term results. Chemical cleaners and etching materials should be considered before priming metals(Galvaprep, Metalprep, Alumniprep, or equal). After primer dries, it may be topcoated with latex or oil type finish coats.

Refinish Work: Prepare surface as listed above. This is an ideal primer for one coat refinishing of previously coated interior or exterior metal or masonry where rust inhibiting and/or mildew resistance is a necessity. Sand problem areas (rust or peeling) and spot prime as soon as practical. Follow with a complete prime coat. Kwal-Howells

Thinning: This material should not require thinning. If additional thinning is desired, use only small quantities of mineral spirits or paint thinner. For slightly faster set-up time on spray application, replace mineral spirits with VM & P Naptha.

Application: Stir well with a lifting motion before using. Apply with brush, roller, airless, or conventional spray equipment.

Recommended Application: 475 square feet per gallon results in 1 1/2 mil dry film.

Drying Time: Dries dust free in 4 hours. May be recoated after overnight drying. Drying time variable depending upon temperature, humidity, and ventilation.

Clean Up: Clean application equipment with mineral spirits or paint thinner.

Flash Point: 104°F. **TCC (FLAMMABLE).**

#9210 can be tinted to pastel shades as a final finish coat as this primer has excellent exterior durability on metal or concrete.

Viscosity: 85-90 K.U.

Surface Temperature: Temperature must be over 50°F and below 95°F. Avoid frost, fog, and damp conditions and painting in direct sunlight.

Gloss: 5%-10% @ 60°.

TYPICAL ANALYSIS(+ OR - 2%)

Pigment	42.40%
Titanium Dioxide	21.10%
Barium Metaborate	9.40%
Silicates	9.40%
Diatomaceous Earth	2.50%
Vehicle	57.60%
Alkyd Resin	44.90%
Solvent & Driers	12.40%
Miscellaneous Additives	0.30%
Solids by Weight	67.40%
Solids by Volume	44.50%
V.O.C.	434 grams per liter
Weight Per Gallon	10.75 pounds, mixed

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#9201/9210 RUST INHIBITING METAL PRIMER MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406

E mail:info@kwalhowells.com

PRODUCT NAME: RUST INHIB PRIMER, WHITE HMIS CODES: H F R P

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 9210 D 2 2 0 G

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-5600
DATE REVISED: 01-17-95 NAME OF PREPARER: C. TAFOYA
REASON REVISED: RMPCC

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	VAPOR PRESSURE OTHER	mm HG	@ Temp	WEIGHT Percent
Mineral Spirits (Stoddard Solvent)	8052-41-3	500 ppm	100 ppm	100(sheil)	7.0	100F	30

*** No toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372 are present.***

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 325 deg F SPECIFIC GRAVITY (H20=1): 1.3
VAPOR DENSITY: Heavier than air EVAPORATION RATE: Slower than ether
COATING V.O.C.: 3.61 lb/gl (432 g/l)
SOLUBILITY IN WATER: Insoluble
APPEARANCE AND ODOR: Viscous liquid with solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 105 deg F METHOD USED: T.C.C.
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: 1.0% UPPER: 6.0%
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical
SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment, including a self-contained breathing apparatus, should be used. Water may be used to cool closed containers to prevent pressure build up and possible auto-ignition or explosion when exposed to extreme heat.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed, isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. During emergency conditions, over exposure to decomposition products may pose a health hazard.

SECTION V - REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: Extreme heat, sparks or flame.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing materials.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Incomplete combustion can produce carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapor may lead to nasal irritation, headache, nausea, asphyxiation or unconsciousness.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Repeated contact can defat skin causing irritation and dermatitis. Eye contact can cause severe irritation, redness, tearing or blurred vision.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Vomiting can result in aspiration of material into the lungs which can cause chemical pneumonitis.
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure can cause eye and skin irritation. Inhalation can cause acute nervous system depression characterized by nasal irritation, headache, dizziness, confusion or unconsciousness.
CHRONIC: (LONG TERM) Repeated and prolonged overexposure to vapors may cause kidney or liver damage, permanent brain and central nervous system damage, and other serious health problems.
CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO
Laboratory studies with rats have shown that petroleum distillates cause kidney and liver damage or tumors. Several studies evaluating petroleum workers have not shown significant increases of kidney damage, nor kidney or liver tumors.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physician.
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician if irritation persists.
INGESTION: Drink 1 or 2 glasses of water to dilute. Do not induce vomiting! Consult a physician or poison control center immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate the area. Remove all sources of ignition (flame, hot surfaces, electrical, static or frictional sparks). Avoid skin contact and breathing vapors. Contain and remove with inert absorbent and non-sparking tools.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills with sand, clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool, well ventilated area away from sources of ignition. Store large quantities only in buildings designed to comply with OSHA 1910.106.
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Wear a properly fitted NIOSH/MSHA approved vapor/particulate respirator or an air supplying respirator unless ventilation is adequate to keep airborne contamination below applicable OSHA, PEL or ACGIH TLV occupational exposure limits.
VENTILATION: Provide sufficient ventilation in volume and pattern, with explosion proof equipment to keep air contaminant concentration below applicable OSHA PEL or ACGIH TLV occupational exposure limits. (SECTION II).
PROTECTIVE GLOVES: Rubber or neoprene gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray application. Protective creams may be used for ease of clean up, not for protection..
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX - DISCLAIMER

DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

9800 ACCU-PRO SERIES ALKYD GLOSS ENAMEL

Environmental Considerations: Formulated without lead or mercury

PROFILE

DESCRIPTION: Our finest full gloss interior/exterior alkyd enamel. Gives excellent resistance to weathering, mild chemical fumes, and light abrasion.

BENEFITS: High gloss gives optimum ease of cleaning, sanitation, and protections. Flexible finish with easy application and good drying properties make this ideal for toys, machinery, doors and trim.

TYPE: Alkyd(solvent thinned).

COLORS AVAILABLE: A full range of Millenium colors.

PRACTICAL COVERAGE: 350 square feet per gallon.

SPECIFICATIONS

Surfaces: Intended for new or repaint work. Recommended for properly prepared wood trim, painted surfaces, masonry, and metal interior/exterior. Not recommended for direct application to wood surfaces that undergo imentional changes, bare metal, or untreated galvanized or aluminum.

Surface Preparation: Surface must be clean, dry, free of all loose or peeling paint, dirt, wax, grease, and other foreign material. Repair all cracks and holes with suitable filler. Spot prime all patching work. Glossy, glazed and dense surface must be lightly sanded and wiped down.

New Work: See listed primers below:

	INTERIOR	EXTERIOR
Wood	#4200	#9200/#5800
Plaster/Drywall	#0800	
Poured Concrete	#0860	#5860/5800/5840
Concrete Block	#5890	#5890
Ferrous Metal	#9210	#9210

For maximum durability, two coats of this product are recommended. For concrete floors, etch with 10% muriatic acid and rinse thoroughly. Then after application of latex primer apply two coats of this product: 1st coat reduced 25% with mineral spirits. For wood floors, apply 2 coats of this product after

Thinning: This material should not require thinning, except on concrete floors. If additional thinning is desired, use only small quantities of mineral spirits or paint thinner. (1/2 pt. per gallon) For.

Application: Stir well with a lifting motion before using. Apply with brush, roller, airless or conventional spray equipment.

Coverage: 300 to 400 square feet per gallon depending on surface porosity, color.

Recommended Application: 425 square feet per gallon depending on surface porosity, color.

Drying Time: Dries dust free in 6 hours. May be recoated after overnight drying. Drying time variable depending on temperature, humidity and ventilation.

Clean Up: Clean application equipment with mineral spirits or paint thinner.

application of 4200 Fast Dry Alkyd Undercoat.

Refinish Work: Fill all holes and cracks with suitable filler. Spot prime or prepare surfaces as listed above under "New Work". Allow all primers to dry thoroughly before applying finish coats.

Flash Point: 104°F TCC**(COMBUSTIBLE)**

Surface Temperature: Best results if over 50°F and should be under 95°F. Application below 50°F will slow dry and may cause application problems.

Viscosity: 85-90 K.U.

TYPICAL ANALYSIS(+ OR - 2%)

Pigment	27.8%
Titanium Dioxide	26.23%
Zinc Oxide	1.57%
Vehicle	73.9%
Alkyd Resin	59.03%
Solvent & Driers	11.44%
Miscellaneous Additives	1.73%
Solids by Weight	59.68%
Solids by Volume	41.22%
V.O.C.	214 grams per liter
Weight Per Gallon	9.53 pounds

These suggestions and data are based on information we believe to be reliable. They are offered in good faith and limited guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them. Specifications subject to change without notice.

#9800 ACCU-PRO SERIES ALKYD GLOSS ENAMEL MSDS

More SPECS

Kwal-Howells Paint
3900 Joliet Street
Denver, CO 80239-3231
Phone:303-371-5600 Fax:303-373-5688
Phone: 800-383-8406
E mail:info@kwalhowells.com

PRODUCT NAME: ACCU-PRO ALKYD GLOSS ENAMEL, WHITE HMIS CODES: H F R P

MATERIAL SAFETY DATA SHEET

PRODUCT CODE: 9810 D 2 2 0 G

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: KWAL-HOWELLS INC.
ADDRESS: 3900 JOLIET STREET, DENVER, CO 80239
EMERGENCY PHONE: 303-629-1123 INFORMATION PHONE: 303-371-5600
DATE REVISED: 03-27-98 NAME OF PREPARER: C. TAFOYA

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	OCCUPATIONAL EXPOSURE LIMITS OSHA PEL	ACGIH TLV	VAPOR PRESSURE OTHER	mm HG @ Temp	WEIGHT Percent
Mineral Spirits (Stoddard Solvent)	8052-41-3	500 ppm	100 ppm	100(shell)	7.0 100F	20
CRYSTALLINE SILICA	14808-60-7	.1 mg/M3	.1 mg/M3		N/A	2.52

*** No toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372 are present.***

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 325 deg F SPECIFIC GRAVITY (H20=1): 1.14
VAPOR DENSITY: Heavier than air EVAPORATION RATE: Slower than ether COATING V.O.C.: 1.79 lb/gl (305 g/l)
SOLUBILITY IN WATER: Insoluble APPEARANCE AND ODOR: Viscous liquid with solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 105 deg F METHOD USED: T.C.C.
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: 1.0% UPPER: 6.0%
EXTINGUISHING MEDIA: Foam, alcohol foam, CO2, dry chemical
SPECIAL FIREFIGHTING PROCEDURES: Full protective equipment, including a self-contained breathing apparatus, should be used. Water may be used to cool closed containers to prevent pressure build up and possible auto-ignition or explosion when exposed to extreme heat.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Keep containers tightly closed, isolate from heat, electrical equipment, sparks and open flame. Closed containers may explode when exposed to extreme heat. During emergency conditions, over exposure to decomposition products may pose a health hazard.

SECTION V - REACTIVITY DATA

STABILITY: Stable
CONDITIONS TO AVOID: Extreme heat, sparks or flame.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing materials.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Incomplete combustion can produce carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Inhalation of high concentrations of vapor may lead to nasal irritation, headache, nausea, asphyxiation or unconsciousness.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Repeated contact can defat skin causing irritation and dermatitis. Eye contact can cause severe irritation, redness, tearing or blurred vision.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: None known at this time
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Swallowing can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Vomiting can result in aspiration of material into the lungs which can cause chemical pneumonitis.
HEALTH HAZARDS (ACUTE AND CHRONIC): ACUTE: (SHORT TERM) Over exposure can cause eye and skin irritation. Inhalation can cause acute nervous system depression characterized by nasal irritation, headache, dizziness, confusion or unconsciousness.
CHRONIC: (LONG TERM) Repeated and prolonged overexposure to vapors may cause kidney or liver damage, permanent brain and central nervous system damage, and other serious health problems.
CARCINOGENICITY: NTP? YES IARC MONOGRAPHS? YES OSHA REGULATED? NO
Laboratory studies with rats have shown that petroleum distillates cause kidney and liver damage or tumors. Several studies evaluating petroleum workers have not shown significant increases of kidney damage, nor kidney or liver tumors.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known at this time.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove to fresh air. If breathing has stopped, apply artificial respiration. Consult a physician.
EYE CONTACT: Wash eyes with clean water for at least 15 minutes. Consult a physician.
SKIN CONTACT: Wash affected areas with soap and water. Remove contaminated clothing. Consult a physician if irritation persists.
INGESTION: Drink 1 or 2 glasses of water to dilute. Do not induce vomiting! Consult a physician or poison control center immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate the area. Remove all sources of ignition (flame, hot surfaces, electrical, static or frictional sparks). Avoid skin contact and breathing vapors. Contain and remove with inert absorbent and non-sparking tools.
WASTE DISPOSAL METHOD: Do not allow material to contaminate ground water systems. Absorb large spills with sand, clay, or diatomaceous earth. Dispose of in accordance with local, state and federal disposal requirements.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool, well ventilated area away from sources of ignition. Store large quantities only in buildings designed to comply with OSHA 1910.106.
OTHER PRECAUTIONS: Do not take internally. Keep out of reach of children.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Wear a properly fitted NIOSH/MSHA approved vapor/particulate respirator or an air supplying respirator unless ventilation is adequate to keep airborne contamination below applicable OSHA, PEL or ACGIH TLV occupational exposure limits.
VENTILATION: Provide sufficient ventilation in volume and pattern, with explosion proof equipment to keep air contaminant concentration below applicable OSHA PEL or ACGIH TLV occupational exposure limits. (SECTION II).
PROTECTIVE GLOVES: Rubber or neoprene gloves are recommended to prevent skin contact.
EYE PROTECTION: Use chemical safety goggles or face shield to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Coveralls, gloves and hood are recommended during spray application. Protective creams may be used for ease of clean up, not for protection..
WORK/HYGIENIC PRACTICES: Wash hands before eating or using the restroom.

SECTION IX - DISCLAIMER

DISCLAIMER: As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

coronado coronado

INDUSTRIAL

TAB 7
IMA - 709

ACRYLIC EPOXY ENAMEL

138 Series

Type	Sheen	Spread Rate	Recommended Application	Thinner	Clean Up	Dry Time		
						Tack Free	Recoat	Full Cure
Acrylic Epoxy	Gloss & Semi-Gloss	Up to 450 Sq. Ft. Per Gallon	Brush, Roller, or Spray	Clean Water	Warm Soapy Water	2 Hours	12 Hours	7 Days

Product Name: 138 Line Acrylic Epoxy Enamel	This is a two component water thinned coating system which combines the resistance properties of epoxies with the color and gloss retention of acrylics. Both components are lead and mercury free, low in odor, and meet most local air quality standards. This coating cleans easily and is abrasion and stain resistant. It can be applied by spray, roller or brush - for best results it is recommended that two coats be applied. Acrylic Epoxy is available in both a gloss and semi-gloss finish.
Where to use:	Metal Drywall On interior or exterior areas such as metal buildings, Masonry Plaster machinery, halls, restrooms, equipment and concrete Wood floors.
Surface Preparation:	Substrate should be thoroughly dry and free of dust, grease, oil, wax, mildew, soap or powdery residue, mill scale, rust and other contaminates. Patch voids and cracks in masonry. Remove loose or chalky coatings and level surface projections. Remove grease, form oil or parting compound with Sur-Prep I. Rake mortar joints clean. Fill voids and pores in concrete block with a Coronado Block Filler. Remove chemical contamination by water wash. Sandblast steel to at least SSPC-SP 6-63 (commercial blast). Glossy surfaces must be dulled by sanding. Primers: Ferrous Metal - DTM Primer 180-11, Rust Scat Primers 35-111, 35-147 or 35-153. Non-Ferrous Metal - Perma Bond 100-10. Galvanized - Apply directly to galvanized metal or use DTM Primer 180-11 or Grip & Seal 116-11. Wood Interior - Use Coronado Alkyd Undercoat 37-11 or Latex Undercoat 78-11. Wood Exterior - Use Coronado Crylicote Primer 410-11. Drywall/Plaster - Use Coronado Latex Primer Sealer 40-11. Concrete - Use 138 Line as self priming or use Masonry Sealer 48-11.
Mixing:	The proper mixing ratio is 6 parts of Component A to one part of Component B. The contents of cans are pre measured to achieve this ratio. To mix, empty the full contents of the short filled quart container of "B" Component into the short filled gallon container of "A" Component and mix thoroughly. Allow to stand for 15 minutes. Thinning is not necessary. When mixed, the yield will be one gallon.
Tinting:	Acrylic Epoxy may be tinted with the 896 Aqua Chem Colorants. Additionally, the 138-1 can be tinted with up to 4 ounces of gylcol based colorant. Colorant should be added to the "A" Component prior to mixing with the "B" Component.
Application:	May be applied by nylon or polyester brush, roller or spray at a rate of up to 450 square feet per gallon. If thinning is necessary, use clean water, up to 5%. Apply only when surface and air temperatures are between 50°F and 90°F.
	NOTE: Formulated without mercury or lead.

FINISH	GLOSS FINISH 138-XXA with 138-250B	SEMI-GLOSS FINISH 138-XXA with 138-251B
Resin Type:	Acrylic Epoxy	Acrylic Epoxy
Solids:	Weight - 49.7% Volume - 37.5%	Weight - 50.0% Volume - 37.6%
Weight Per Gallon:	10.36 lbs. ± 0.20	10.38 lbs ± 0.20
Viscosity:	85 - 90 KU	85 - 90 KU
Flash Point:	200° F. or over (Seta)	200°F. or over (Seta)
Specular Gloss:	75 - 85% @ 60° degrees	45 - 55% @ 60° degrees
Sag Rating:	8 wet min.	8 wet min.
Recommended Film Thickness:	Wet - 4.0 to 5.0 mils Dry - 1.5 to 1.8 mils	Wet - 4.0 - 5.0 mils Dry - 1.5 to 1.8 mils
Light Reflectance:	90% (White or lightest colors)	90% (White or lightest colors)
Pot Life:	6 hours @ 70°F	6 hours @ 70°F
Dry Heat Resistance:	250°F	250°F
Mixing Ratio:	6 to 1	6 to 1
Cautions:	DO NOT FREEZE	
VOC/VOS Statement:	This product contains a maximum of 1.9 pounds VOC/VOS per gallon of coating.	
Chemical Abstract Number:	**Ingredient** — **CAS. NO.** Acrylic Resin — Proprietary Epoxy Emulsion — Proprietary Diethylene Glycol Methyl Ether — 111-77-3 Diethylene Glycol Butyl Ether — 112-34-5 Titanium Dioxide — 13463-67-7 Water — 7732-18-5	
USDA/FDA Approval:	138 Line is approved by the U.S.D.A. and F.D.A.	

JMA 709

coronado paint company

968 OLD COUNTY ROAD · EDGEWATER, FL U.S.A. · PHONE: 904-428-8461 · FAX: 904-427-7130
2250 ARTHUR AVENUE · ELK GROVE, IL U.S.A. · PHONE: 847-439-4200 · FAX: 847-439-4211
7451 FM 3009 · SCHERTZ, TX U.S.A. · PHONE: 210-651-8998 · FAX: 210-651-5261

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT ID	138-250B
PRODUCT CLASS	PAINT, WATER BASE
TRADE NAME	ACRYLIC EPOXY ENAMEL - PART B
FORMULA ID	138-250B
MSDS PREPARATION DATE	04/14/2000

MANUFACTURER IDENTIFICATION:

NAME	CORONADO PAINT CO.
ADDRESS	308 OLD COUNTY ROAD
	EDGEWATER FL 32132
TELEPHONE	904-428-6461
EMERGENCY CONTACT	CHEMTREC
EMERGENCY TELEPHONE	(800) 424-9300

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

****

This product contains no reported carcinogens or suspected carcinogens.

****

****

This product contains no reportable hazardous ingredients. This Material Safety Data Sheet contains information on good industrial practice for safe handling of all industrial chemicals.

****

SECTION 3 - HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Primary irritant.

SKIN: N/A

INHALATION: With poor ventilation, vapor or spray mist may irritate respiratory mucous membranes, causing headache & nausea.

INGESTION: N/A

CHRONIC EFFECTS: None recognized.

ROUTE(S) OF EXPOSURE

Exposure may be INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

CARCINOGENICITY

If applicable, refer to Section 2.

SECTION 4 - FIRST AID MEASURES

EYE CONTACT: Flush at once with large amounts of luke warm water for at least 15 minutes and get medical attention.

SKIN CONTACT: Remove from skin with soap and water. Remove drenched clothing. If irritation persists, consult a physician.

INHALATION: If affected by inhalation of vapor or spray mist, remove to fresh air. If necessary, restore breathing; in this case contact physician at once.

CORONADO PAINT CO.
MATERIAL SAFETY DATA SHEET

136-2506 1

INGESTION: If victim is conscious, give 2 glasses of water to dilute. Do not induce vomiting. Consult physician or poison control center at once.

SECTION 5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSIVE PROPERTIES OF THE CHEMICAL:

Flammability Classification	: N/A	
Flashpoint	: N/A	
Explosion Level	: Low	- -N/A
	High	- -N/A

EXTINGUISHING MEDIA

Use extinguishing media appropriate for surrounding fire. After water evaporates, remaining material will burn; use CO2, dry chemical or foam (National Fire Protection Association Class B extinguisher).

FIRE-FIGHTING PROCEDURES AND EQUIPMENTS

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat; use water spray to cool. Product in open containers may spatter when temperature exceeds boiling point of water.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Ventilate as described in Section VIII. Avoid unnecessary skin contact. Stop and/or contain spill if it can be done safely, avoiding discharge into drains, sewers or waterways.

CLEAN-UP

Collect by absorption, shovel and/or wet moping.

SECTION 7 - HANDLING AND STORAGE

HANDLING

Transfer only to approved containers with complete & appropriate labeling. Do not take internally. Keep out of the reach of children.

STORAGE

Do not store above 120 degrees F. Close container after each use.

SPECIAL COMMENTS

Do not take internally. Wash with soap and water before eating, drinking, smoking or using toilet. Avoid FREEZING this product.

CORONADO PAINT CO.
MATERIAL SAFETY DATA SHEET
1

138-250B

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

Where exposures are below the PEL, no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH or full protective suit with air supply appropriate for the material and level of exposure.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

PROTECTIVE GLOVES

None required.

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor & spray mist. Avoid contact with skin and eyes. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Vapor Density	N/A
Vapor Pressure	17mmHg@ 68 Degrees F (water)
Physical State	LIQUID
Boiling Range	Lower - 212.0 oF Higher - -N/A oF
Specific Gravity	1.061
Formula Weight per Volume	8.8307 LB/GL
VOC - Total (lbs/gal)	.060
Evaporation Rate	.000 (n-Butyl Acetate = 1)
Volatile by Weight	63.8106
Volatile by Volume	67.6821

SECTION 10 - STABILITY AND REACTIVITY

STABILITY

This product is stable.

INCOMPATIBILITIES (Materials to Avoid)

None known.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID

High temperatures.

PRODUCT DATA SHEET
STEEL SPEC

INDUSTRIAL AND MARINE COATINGS

STRUCTURAL STEEL PRIMER
B50NV12 - BROWNISH RED
B50AV11 - GRAY

PRODUCT DESCRIPTION

STRUCTURAL STEEL PRIMER is a heavy duty primer which offers outstanding protection for steel in normal industrial environments where extended exposure is required. **STRUCTURAL STEEL PRIMER** is a high solids, low VOC (less than 350 gms./ltr.) rust inhibitive primer which is free of heavy metals. It is easy to apply by spray, fast drying and can be topcoated with alkyd and latex coatings.

USES:
For industrial and commercial application to steel to protect against atmospheric corrosion.

- Interior and exterior use.
- Fast drying maintenance primer.
- Lead, chromate and barium free pigmentation.

PERFORMANCE INFORMATION:
High build to protect abrasive blasted steel.

- Good corrosion and rust undercutting protection.
- Abrasion resistant.
- Primer that may be used under a variety of latex and alkyd topcoats.

LIMITATIONS:
Not recommended for immersion service or exposure to acid, alkalies or strong solvents.

CHARACTERISTICS

- **Color/Finish:** Brownish Red
  Gray
- **Curing Mechanism:** Solvent Evaporation
  Oxidation
- **Drying Schedule:** @ 77°F 50% RH

To Touch:	15 min.
Tack Free:	1.5 hours
Recoat:	7 hours

Primer coats used for exterior applications should not be left untopcoated in excess of six months.

- **Flash Point:** 60°F
  (Pensky-Martens/Seta Flash)
- **Viscosity:** 90 - 95 KU
- **Volume Solids:** Brownish / Red - 54% ± 2%
  Gray - 55% ± 2%
- **Weight Solids:** 74% ± 2%
- **Weight/Gallon:** Brownish / Red-11.43 ± .2%
  Gray - 11.17 ± .20%

VOC #'s/Gal. as Packaged: Brownish / Red - 2.88
Gray - 2.83

Recommended DFT: 2 to 3 mils

10/96

INDUSTRIAL AND MARINE COATINGS

PRODUCT DATA SHEET

STEEL SPEC
HEAVY DUTY PRIMER
B50RV2900 - RED
B50AV2969 - GRAY
B50WV2009 - WHITE

PRODUCT DESCRIPTION
A heavy duty primer free of lead and chromate hazards, yet it offers superior protection for steel in normal industrial environments where severe or extended exposure puts unusual demands on the shop applied primer.

USES:
Can be used on structural steel, bridges, marine exposures, etc.

PERFORMANCE INFORMATION:
Meets Rule 66 and similar air pollution requirements and California Air Resources Board regulations (CARB).
Test Data;
SALT SPRAY: Panels painted with 2 mils dry film thickness withstood 500 hours exposure to 5% salt spray tested in accordance with ANSI/ASTM B 117-73. Scribed panel had less than 1/32" creep back and passed 9 MD blister test in accordance with ASTM D 714-56. By comparison, TT-P-636c only requires passing 150 hours salt fog exposure.
WATER RESISTANCE: Passed 500 hours exposure with excellent recovery and no film failure.
HUMIDITY CABINET: Passed 500 hours exposure with excellent recovery and no film failure.
WELDING THROUGH: B50RV2900 Heavy Duty Primer can be welded through during erection to yield sound welds.

CHARACTERISTICS
TYPE: Modified Soya Oil Alkyd Resin - Lead & Chromate Free
COMPONENTS: One
COLORS: Red (B50RV2900), Gray (B50AV2969), White (B50WV2009)
GLOSS: Flat
FLASH POINT: 102°F (38°C)
SOLIDS BY VOLUME: Red, Gray & White - 55.0%
VOC: Red, Gray & White 2.95 lbs./gal.
RECOMMENDED FILM THICKNESS: 2.0 - 2.5 mils dry
SPREADING RATE: Apply at 440 square feet per gallon for 2.0 mils dry film thickness (3.6 mils wet) or 350 square feet per gallon for 2.5 mils dry film (4.5 mils wet) at 100% paint utilization.
SURFACE PREPARATION: Surface should be free of dirt, oil, grease, moisture and other contaminants. All loose rust, loose mill scale and loose paint must be removed in accordance with SSPC-SP 2, Hand Tool Cleaning or SSPC-SP 3, Power Tool Cleaning.
MIXING: Stir thoroughly prior to application.
POT LIFE: n/a
SHELF LIFE: 2 years

EQ Credit 4.3: Low-Emitting Materials - Carpet

Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the health, comfort and well-being of installers and occupants.

Requirements

Carpet systems must meet or exceed the requirements of the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.

Submittals

☒ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the carpet systems used in the building and stating that they comply with the current VOC limits of the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.

☒ Provide a manufacturer's catalog cut sheet highlighting the VOC limits for each carpet product used in the building.

Narrative

Credit satisfied. All Collins & Aikman Powerbond floor coverings meet the requirements of the Carpet and Rug Institute Green Label Indoor Air Quality Test Program (see attachments). All major carpet manufacturers offer products compliant with the requirements of this credit.

Indoor Environmental Quality Credit 4.3

I _____ (Contractor-Project Architect) hereby certify that the following Collins & Aikman floor coverings were used to carpet the CDOB: Powerbond® Vinyl Cushion, Powerbond RS® Vinyl Cushion, C-36E Floor Primer, and C-54 Seam Weld (see attached manufacturer's cutsheets). All Collins & Aikman floor covering products meet the CRI Green Label requirements for VOC limits.

Name: (Contractor-Project Architect)

Organization: (Company Name)

Role in Project: (Lead Project Architect)

Signature: (as appropriate)

Date: (as appropriate)

VOC EMISSION TESTING

CRI "GREEN LABEL" CRITERIA

The CRI (Carpet & Rug Institute) "Green Label" program requires that member companies test carpet products (exclusive of cushion and adhesive) for the below emissions and meet the following requirements:

- TVOC emission factor less than 0.50 mg/sq mtr*hr.
- Styrene less than 0.40 mg/sq mtr*hr.
- 4-PC less than 0.05 mg/sq mtr*hr
- Formaldehyde less than 0.05 mg/sq mtr*hr

This testing is carried out with the same type of equipment as that used in the State of Washington protocol. Please note the CRI Green Label program does not require testing be conducted with cushion or installation adhesive and far less information is made available to the customer.

CRI allows a TVOC emission factor of 0.5-mg/m^2hr (milligrams/m^2hr) for carpet only. C&A Floorcoverings' Powerbond RS® products (inclusive of adhesive and, if applicable, cushion) have been tested according to and meet the criteria of CRI "Green Label" protocol for carpet only.

CRI's adhesive testing program allows a TVOC emission factor of 10-mg/m^2hr. CRI also allows a TVOC emission factor of 1-mg/m^2hr for cushion. Therefore, CRI allows a cushion product installed with a wet adhesive to have a TVOC emission factor of 11.5-mg/m^2hr (0.5 for carpet, 1 for cushion, 10 for adhesive). Again, C&A Floorcoverings' Powerbond RS products fall below CRI's TVOC allowances for carpet only (0.5-mg/m^2hr).

NOTE: Some results are reported in "ug/m^2hr" (micrograms/m^2hr). The formula to convert is as follows:

$$mg/m^2hr\ (x)\ 1000 = ug/m^2hr$$

COLLINS&AIKMAN *floorcoverings*

Product Specification Sheet

EXPEDITION
POWERBOND® VINYL CUSHION
POWERBOND RS® VINYL CUSHION

	IMPERIAL	METRIC	
Face Construction			
CONSTRUCTION	Accuweave™ Patterned Loop		
Gauge	1/12	47.2 rows/10 cm	
Pile Units per Inch	11.5	45.3 pu/10 cm	(ASTM D-418, Section 12)
Tuft Density	138.0 tufts/sq in	21.4 tufts/sq cm	
Pile Height Average	0.156 inch	4.0 mm	(ASTM D-418, Section 12)
Pile Thickness	0.092 inch	2.3 mm	(ASTM D-418, Section 10)
Density Factor	6,261 oz/cu yd	231.7 kg/cu m (Kilotex: 9.3)	(UM44D)
Fiber System	100% Dynex SD® BCF Nylon 6,6		
Dye Method	Solution Dyed		
Soil/Stain Protection	Ensure		
Pattern Match	18" x 31.3" (Width x Length)		
Powerbond Cushion Backing System			
Product Width	6 ft.	1.8 m	
Primary Tufting Substrate	Synthetic Non-Woven		
Fusion Coat	Sealant Vinyl		
Backing	Closed-Cell Vinyl Cushion		
Weight	35.5 oz/sq yd	1203 g/sq m	(ASTM D-1667)
Density	18.5 lbs/cu ft	296 kg/cu m	(ASTM D-1667)
Thickness	0.156 inch	3.96 mm	(ASTM D-1667)
Compression Set	Max. 10%	Max. 10%	(ASTM D-1667)
Compression Deflection	Min. 7 lbs/sq inch @ 25%	Min. 492 g/sq cm	(ASTM D-1667)
	Max. 25 lbs/sq inch @ 25%	Max. 1758 g/sq cm	
RS Adhesive System	Microencapsulated Tackifier applied to 100% of backing during manufacturing		
Total Product Weight RS (Non-RS)	81.2 (78.7) oz/sq yd +/- 5%	2753 (2668) g/sq m	

Product Testing/Information

Surface Flammability	Passes CPSC FF 1-70	(ASTM D-2859)
Flooring Radiant Panel	Class 1 (mean average CRF: 0.45 w/sq cm or higher)	(ASTM E-648)
Electrostatic Propensity	0.3 kV or lower Permanent Conductive Fiber	(AATCC 134)
Colorfastness to Light	≥ 4 after 100 hours	(AATCC 16E)
Fluorine	Minimum 500 ppm	(CRI TM-102)
	After two AATCC 171: Minimum 400 ppm	(CRI TM-102)

The product, when tested with its attached backing as represented by averages of testing from random samplings of production lots, meets flammability requirements for the following nationally recognized Building Codes for floor coverings: BOCA National Building Code (11th Ed., 1990, 922.8, p. 203), NFPA Life Safety Code for Safety to Life in Buildings and Structures (1991 Ed., Appendix A, A-6-5.2, pp. 101-264), Standard Building Code (1991, 704.7.2-3, p. 177), Uniform Fire Code (1991). It is the responsibility of the end user to determine if the product meets appropriate local codes.

Warranties

20 year non-prorated limited warranty against excessive surface wear and static, delamination, edge ravel, zippering, and backing resiliency loss. See warranty for details.

Product Notes

1. Product specifications are derived from averages resulting from normal manufacturing tolerances in yarn, fiber, temperature, humidity, and color, and may vary within normal industry and standardized testing tolerances.

2. These specifications reflect mean averages based on tests of production runs of this carpet style by independent laboratories. A range of variances is implicit in the testing process. Furthermore, the standard test methods established to derive the specifications lack a high degree of precision and repeatability; therefore, individual test results on the actual carpet purchased may vary above or below the mean average.

3. Colors may vary slightly from dye lot to dye lot.

4. Backing or other materials may be changed without prior notice when shortages occur or when technological advancements become available which provide for improvement of the product's performance.

5. All Powerbond products are 100% recyclable through Collins & Aikman Floorcoverings' *Infinity Initiative* Program.

6. This style is also available in 18" x 18" modular tile.

FLAMMABILITY

All Powerbond® products, when tested with attached backing as represented by averages of testing from random sampling of production lots, meet flammability requirements for floor coverings specified by the following nationally recognized building codes.

NFPA 101 Life Safety Code
Standard Building Code
Uniform Fire Code
BOCA

All Powerbond products meet or exceed Class 1 requirements (mean average CRF: $\geq$ 0.45 watts/sq cm) per ASTM E-648 Flooring Radiant Panel (NFPA 253) and pass Federal Flammability requirements per CPSC FF 1-70 (ASTM D-2859 / 16 CFR 1630).

Also, Powerbond products comply with Smoke Density (ASTM E-662 / NFPA 258) requirements set forth by the General Services Administration (GSA): CMD mean average $\leq$ 450 - Flaming Mode. Please note that national building codes such as NFPA and BOCA no longer regulate floor coverings on the basis of smoke development. NFPA's 1997 Life Safety Code Handbook states such limits are not practical or necessary since floor coverings typically do not contribute to a fire until the fire reaches large proportions. The commentary further states that results achieved per current test methods are not indicative of performance in actual fires.

The Pittsburgh Protocol is utilized as a standard test method for evaluating Combustion Toxicity of floor covering products. In this method, the toxic make-up of the combustion gasses emitted when a product is burned is analyzed and compared to known or suspected toxic chemicals. Combustion Toxicity testing shows Powerbond products are no more toxic than red oak when burned under the same conditions.

Wall coverings and/or ceiling materials must be tested per ASTM E-84 Steiner Tunnel Test (NFPA 255). This test is not required nor recommended as a test method for floor covering products. Typically, soft-surface floor coverings can be used as a carpet base, but cannot exceed 6 inches up the wall. Anything exceeding 6 inches is considered a wall covering. Powerbond products are not designed or recommended for use as wall coverings.

Please note that requirements specified by the U.S. Coast Guard (USCG), New York City Local Law 16, and New York/New Jersey Port Authority differ from information given here. Contact our Technical Services department for more information on these requirements and/or to inquire if particular style(s)/backing(s) meet such requirements.

It is the responsibility of the end-user to determine if Powerbond products meet appropriate local codes.

*NFPA – National Fire Protection Association
BOCA – Building Officials & Code Administrators International

MATERIAL SAFETY DATA SHEET

C&A
COLLINS & AIKMAN
FLOORCOVERINGS

IDENTITY: Powerbond® Vinyl Cushion, Powerbond RS® Vinyl Cushion

SECTION I

Manufacturers Name: C&A Floorcoverings, Inc.
Emergency Telephone: (706) 259-2698 Information Telephone: (706) 259-2698
Address: 1000 Vista Drive, PO Box 1447 Dalton, GA 30721 Revised: 6/01
Product Class: Nylon faced floor covering with attached closed-cell vinyl cushion.

SECTION II - Hazardous Ingredients

Hazardous Components: CAS# OSHA PEL ACGIH TLV Rec %(approx) None per OSHA 1910.120

SECTION III - Physical Data

Boiling Point: NA Specific Gravity (water= 1): >1
Vapor Pressure: NA Melting Point: NA
Vapor Density: (Air=1) NA Evap Rate: NA
Volatile Volume: <1% Water Vol: NA
Solubility in Water: NA
Appearance: Nylon faced floor covering with attached closed-cell vinyl cushion.

SECTION IV - Fire and Explosion Data

Flash Pt (Method):Does not flash (ASTM-D 1929-77)
Flammable Limits: NA LEL: UEL:
Extinguishing Media: Water or other Class A extinguishing agent
Special Fire Fighting Procedures: None. Use same precautions required by a wood or paper type fire.

SECTION V - Reactivity Data

Stability Stable: XX Unstable:
Incompatibility: NA
Hazardous Decomposition or By-Products: Will not decompose below 660°F.
Decomposition products no more toxic than wood under similar conditions.
Hazardous Polymerization Will Not Occur: XX May Occur:

SECTION VI - Health and Hazard Data

Route(s) of Entry: NA Inhalation? Skin? Ingestion?
Health Hazards (Acute and Chronic): None Known
Carcinogenicity: NA NTP? IARC Monographs? OSHA Regulated?
Signs and Symptoms of Exposure: None
Medical Conditions Aggravated by Exposure: None
Emergency First Aid Procedures: NA

SECTION VII - Precautions for Safe Handling and Use

Steps to be taken in case material is released or spilled: None Waste Disposal Method:
All C&A Floorcoverings products are 100% recyclable. Recycle through C&A Floorcoverings, Inc. *Infinity Initiative* program.
Precautions to be taken in Handling and Storage: Keep dry - Store between 60°F-85°F.
Other Precautions: NA
Transportation: DOT Hazard Classification - None Placard Required - None

SECTION VIII - Control Measures

NOTE: This section refers to the above-mentioned C&A Floorcoverings product only. If additional installation products are used, always refer to the MSDS for all applicable installation products.

Respiratory Protection (Type): Not Required
Ventilation Local Exhaust: Not Required Special:
Mechanical (General): Not Required Other:
Protective Gloves: Not Required Eye Protection: Not Required
Other Protective Clothing or equipment: None
Work/Hygienic Practices: NA

MATERIAL SAFETY DATA SHEET

C-36E
Floor Primer

COLLINS & AIKMAN FLOORCOVERINGS

Revised: 01/01

Collins & Aikman Floorcoverings
P.O. Box 1447 • 1000 Vista Drive
Dalton, GA 30721
Emergency Telephone: 1 (800) 424-9300
Information Telephone: 1(706) 259-9711
International Emergency:
Call (USA 202-483-7616

I. PRODUCT IDENTIFICATION

Name: Collins & Aikman Floorcoverings
C-36E Floor Primer
Description: Water-based dispersion

II. DEPT. OF TRANSPORTATION INFORMATION

SHIPPING NAME: Not Classified. HAZARD CLASS: N/A. ID#: N/A.
FOR CHEMICAL EMERGENCY: Spill, Leak, Fire, Exposure or Accident
Call Chemtrec - Day or Night 1-800-424-9300

III. HMIS (0 = minimal hazard; 4 = severe hazard):

Health = 1 Flammability = 1 Reactivity = 0 PPE = B

IV. PRODUCT CONTENT

This product does not contain chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372. All components are on TSCA inventory. This product does NOT contain asbestos.

V. HAZARDOUS INGREDIENTS

INGREDIENT:	PERCENT	OCCUPATIONAL EXPOSURE LIMITS
NONE	N/A	N/A

VI. PHYSICAL DATA

APPEARANCE: Milky blue liquid. ODOR: Slight ammonia odor. BOILING POINT: 212°F (water). MELTING POINT: N/A. VAPOR PRESSURE: N/A. VAPOR DENSITY: Lighter than air. % VOLATILE BY WEIGHT (30 min. @ 275°F): 85% EVAPORATION RATE: Water. WT/GAL (Water = 8.3): 8.6. SOLUBILITY IN WATER: Dispersible. SPECIFIC GRAVITY: 1.02. ZERO VOC CONTENT: calculated at 70°F/21°C , SCAQMD. pH: 9.75.

VII. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD): >200°F (Setaflash Closed Tester). FLAMMABLE RANGE: LEL: N/A; UEL: N/A. EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, water spray. SPECIAL FIRE FIGHTING PROCEDURES: Protect fire fighters from toxic products of combustion by wearing self-contained breathing apparatus. UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers in a fire may rupture due to pressure build-up; use water to cool containers to prevent this.

VIII. HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: N/A. TARGET ORGANS: N/A. EFFECTS OF OVEREXPOSURE: SKIN AND EYES: May produce slight transient irritation to the eyes. INHALATION: N/A CARCINOGENICITY: NTP: No; IARC Monographs: No; OSHA Regulated: No. No ingredient in this product has been identified as a carcinogen by NTP, IARC or OSHA. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None. FIRST AID PROCEDURES: SKIN AND EYES: Flush any eye contact with plenty of water. With skin contact, wash with soap and water. Refer to physician if irritation develops or symptoms persist. INHALATION: N/A

IX. REACTIVITY DATA

STABILITY: Stable. INCOMPATIBILITY: Strong oxidizing agents. HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide, carbon dioxide, and other toxic vapors and gases that are common to thermal degradation of organic compounds. HAZARDOUS POLYMERIZATION: Will not occur.

X. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Contain ll, preventing it from entering sewer lines or waterways. Use absorbent to assist the pick-up of material. Scrape up product and place into container. Residual product, while still wet, can be cleaned up with warm soapy water. WASTE DISPOSAL METHOD: Dispose of container and any unused contents in accordance with Federal, State, and Local Waste Disposal Regulations. Do not flush unused contents or residue down drains. Do not reuse container.

XI. SAFE HANDLING AND USE INFORMATION

VENTILATION: Normal, ambient ventilation should be sufficient. RESPIRATORY PROTECTION: Should not be required. SKIN AND EYE PROTECTION: It is always a good safety practice to avoid contact with eyes and prolonged contact with skin. Use spectacle-type glasses and latex or rubber gloves to avoid contact.

XII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Use and store in a cool, dry, well-ventilated area away from incompatible materials. Recommended storage temperature is below 90°F. For 24 hours before installation, storage temperature should be 65-85°F. OTHER PRECAUTIONS: Protect from freezing. Close container after each use. Minimize skin contact and breathing of vapors. Keep out of reach of children. Shelf life is one year. WORK SITE ENVIRONMENT: Initially there may be a potential adverse impact on indoor air quality within the general work area during the installation process. Therefore you should advise the building manager or other appropriate person that: • It will be necessary to establish and maintain adequate ventilation of the work area, without causing the entry of contaminants to other parts of building; and • Persons who are sensitive to odors and/or chemicals should be advised to avoid the work area during this process

MATERIAL SAFETY DATA SHEET

H=1 R=0
F=3 PPE=B

C-54 Seam Weld
For Powerbond® Roll Goods

C&A
COLLINS & AIKMAN
FLOORCOVERINGS

Revised: 01/01

Collins & Aikman Floorcoverings
P.O. Box 1447 • 1000 Vista Drive
Dalton, GA 30721
Emergency Telephone: 1 (800) 424-9300
Information Telephone: 1(706) 259-9711
International Emergency:
Call (USA 202-483-7616

I - PRODUCT IDENTIFICATION
NAME: Collins & Aikman C-54 Seam Weld
CLASS: Solvent Based Adhesive

II - TRANSPORTATION DATA
D.O.T. SHIPPING NAME: Flammable liquids, n.o.s. (Methyl Ethyl Ketone, Isopropanol).
D.O.T. HAZARD CLASS: 3 PG II
D.O.T. IDENTIFICATION NO.: UN 1993
LABEL REQUIRED: Flammable Liquid 3 -Red.
FOR CHEMICAL EMERGENCY: Spill, Leak, Fire, Exposure or Accident
Call Chemtrec - Day or Night 1-800-424-9300

III- PRODUCT CONTAINS
This product does contain chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372. All Components are on TSCA inventory. This product does NOT contain asbestos.

IV - HAZARDOUS INGREDIENTS

INGREDIENT:	% BY WEIGHT	OCCUP. EXPOS. LMT.: PEL:	TLV:	STEL:	VAP. PRESS.:
Methyl Ethyl Ketone, CAS # 78-93-3	50-60%	200 ppm	200 ppm	300 ppm	83 mm Hg @ 75° F.
Isopropyl Alcohol, CAS # 67-63-0	10-20%	400 ppm[b]	400 ppm	150ppm	32 mm Hg @ 68°F.

*Subject to the reporting requirements of § 313 SARA Title III and 40 CFR 372. [b]NIOSH recommends a limit of 400 ppm, 8-hour TWA; 800 ppm, ceiling.

V - PHYSICAL DATA
APPEARANCE: Clear, colorless liquid. ODOR: Strong ketone. SOLUBILITY IN WATER: Appreciable. BOILING POINT: 175-180°F. VAPOR DENSITY: Heavier than air. EVAPORATION RATE: Slower than ether. % VOLATILE VOLUME: Approx. 66-70 WT/GAL: 7.7 lbs. VOC CONTENT: 625 g/l, calculated @ 70°F/21°C, SCAQMD Non-Photochemically Reactive.

VI - FIRE AND EXPLOSION HAZARD DATA
FLASH POINT (METHOD): 20°F (TCC). LOWER EXPLOSIVE LIMIT: 2.0% UPPER EXPLOSIVE LIMIT: .5%. EXTINGUISHING MEDIA: Alcohol foam, dry chemical, CO_2. HAZARDOUS DECOMPOSITION PRODUCTS: If burned, produces carbon monoxide, dioxide and other harmful products. UNUSUAL FIRE AND EXPLOSION HAZARDS: Highly flammable vapors, heavier than air may accumulate in low areas or spread along ground to a distant source of ignition. Closed containers exposed to extreme heat may rupture due to pressure buildup. SPECIAL FIREFIGHTING PROCEDURES: Use SCB and other protection as required

VII - HEALTH HAZARD DATA
PRIMARY ROUTES OF ENTRY: Inhalation, skin and eye contact. EFFECTS OF OVEREXPOSURE: ACUTE: Can cause severe eye irritation; blurred vision and eye damage. Skin contact may cause skin irritation. Prolonged or repeated contact may cause dermatitis. Inhalation of high vapor concentrations is irritating to the eyes and respiratory tract, and may cause headaches, numbness of the extremities, drowsiness, and other central nervous system effects. In extreme cases, asphyxiation may occur. Ingestion can cause gastric disturbances. Swallowing or vomiting can cause aspiration pneumonitis, evidenced by coughing, labored breathing and bluish skin. CHRONIC: TARGET ORGANS: CNS, liver and kidneys. Occupational overexposure to solvents may lead to permanent brain and nervous system damage, kidney and liver effects. CARCINOGENICITY: No ingredient has been reported as carcinogen by IARC, NTP or OSHA. REPRODUCTIVE TOXICITY: May be harmful to fetus, based on laboratory animal overexposure study. MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: Pre-existing skin, eye, respiratory disorders, impaired liver or kidney functions. EMERGENCY OR FIRST AID PROCEDURES: EYES: Immediately flush eyes with plenty of running water for at least 15 minutes, lifting upper and lower lids occasionally. Remove contact lenses. Get immediate medical attention. Remove contaminated clothing and thoroughly wash affected skin with soap and water. If irritation or redness develops, get medical attention. INHALATION: If inhalation problems occur, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet, and get immediate medical attention. Exposure to high concentrations of solvent may be associated with cardiac arrhythmias. INGESTION: Aspiration hazard: Do not induce vomiting or anything by mouth. This material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious, place on the left side with the head down. If possible, do not leave victim unattended. Keep person warm, quiet and get immediate medical attention.

VII - REACTIVITY DATA
STABILITY: Stable. HAZARDOUS POLYMERIZATION: Will not occur. CONDITIONS TO AVOID: Open flame, sparks, heat. INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids, bases, oxidizers, aldehydes, and halogens. Do Not use with aluminum containers or equipment above 120°F.

IX - SPILL OR LEAK PROCEDURES
SPILLS: Remove or extinguish all sources of ignition in the area, including equipment, which may spark. Ventilate confined spaces. Open all windows and doors. Wear protective equipment as exposure conditions warrant. Scoop material into DOT approved container. Remove to a safe place to dry. WASTE DISPOSAL METHOD: Dispose of in accordance with federal, state and local regulations. Do not flush adhesive down drains.

X - SAFE HANDLING AND USE INFORMATION
VENTILATION: Extremely flammable vapors may ignite explosively or cause flash fire. Adequate ventilation is essential to prevent exceeding occupational exposure limits or buildup of explosive concentrations of vapors. Open all windows and doors and utilize other fire-safe means to assure fresh air entry and exhaust during use and until vapors are gone. FIRE PREVENTION: Vapors are heavy and can flow to a distant source of ignition. Extinguish all flames, including pilot lights (the surest way to put out gas pilot lights is to turn off the main gas valve). Turn off all electrical appliances. Disconnect electric pilot lights or "spark ignition systems." Do not use electrical switches, fans or tools, such as electrical drills. Do not smoke. RESPIRATORY PROTECTION: Wear NIOSH approved respiratory protection when the stated exposure limits may be exceeded. PROTECTIVE GLOVES: Nitrile rubber gloves to avoid prolonged or repeated skin contact. EYE PROTECTION: Goggles to prevent eye contact EYE PROTECTION: Goggles to prevent eye contact. OTHER PROTECTIVE EQUIPMENT: A source of clean water should be available in the work area for flushing eyes and skin. Wear impervious clothing as needed. HYGIENIC PRACTICES: Avoid breathing vapor. Avoid prolonged or repeated contact with the skin. Remove contaminated clothing and shoes and thoroughly clean before reuse. Wash skin thoroughly with waterless hand cleaner followed by washing thoroughly with soap and water.

XI - SPECIAL PRECAUTIONS
HANDLING AND STORING: Use and store in a cool, dry, well-ventilated area away from incompatible materials. Keep away from heat, sparks, flames and all other sources of ignition. OTHER PRECAUTIONS: Keep out of reach of children. Use only as directed on label. Close container after each use. Do not reuse container. Avoid skin and eye contact. WORK SITE ENVIRONMENT: Initially there may be a potential adverse impact on indoor air quality within the general work area during the installation process. Therefore you should advise the building manager or other appropriate person that: · It will be necessary to establish and maintain adequate ventilation of the work area, without causing the entry of contaminates to other parts of building; and, · Persons who are sensitive to odors and/or chemicals should be advised to avoid the work area during this process.

EQ Credit 4.4: Low-Emitting Materials - Composite Wood

Intent

Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the health, comfort and well-being of installers and occupants.

Requirements

Composite wood and agrifiber products must contain no added urea-formaldehyde resins.

Submittals

- ☐ Provide the LEED Letter Template, signed by the architect or responsible party, listing all the composite wood products used in the building and stating that they contain no added urea-formaldehyde resins.
- ☐ Provide a manufacturers catalog cut sheet for each composite wood or agrifiber product used in the building indicating that the bonding agent used in each product contains no added urea-formaldehyde.

Narrative

Credit not satisfied. Urea-formaldehyde resins were found to be used in the composite wood used at CDOB for cabinetry and interior wood doors (particle board cores). Both the door and cabinetry manufacturers carry non-formaldehyde composite wood alternatives, although such non-formaldehyde products may require a price premium.

EQ Credit 5: Indoor Chemical & Pollutant Source Control

Intent

Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

Requirements

Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways.

Where chemical use occurs (including housekeeping areas and copying/printing rooms), provide segregated areas with deck to deck partitions with separate outside exhaust at a rate of at least 0.50 cubic feet per minute per square foot, no air recirculation and maintaining a negative pressure of at least 7 PA (0.03 inches of water gauge).

Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, declaring that:

- Permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. are provided at all high volume entryways.
- Chemical use areas and copy rooms have been physically separated with deck-to-deck partitions; independent exhaust ventilation has been installed at 0.5 cfm/square foot and that a negative pressure differential of 7 Pa has been achieved.
- In spaces where water and chemical concentrate mixing occurs, drains are plumbed for environmentally appropriate disposal of liquid waste.

Narrative

Credit not satisfied. The entryway system at CDOB consists of a removable nylon carpet entrance mat mounted in a recessed frame system. This satisfies the permanent entryway system requirements for this credit. Since the CDOB is an office building with no laboratory or process related activities, no water and chemical mixing requiring separate plumbing for environmentally appropriate disposal of such liquids is required. It should be noted that LANL has specific waste acceptance criteria for liquid waste discharged to the sanitary sewer line to ensure environmentally appropriate disposal, ensure compatibility with sanitary sewer treatment system, and prevent mixing of incompatible liquid wastes.

EQ Credit 5: Indoor Chemical & Pollutant Source Control

(continued)

However, the credit requirement for independent exhaust ventilation of designated chemical use areas (copy rooms and housekeeping areas) is not satisfied. The ventilation system design for CDOB combines return air from copy room areas with return air from other areas and redistributes throughout the building.

EQ Credit 6.1: Controllability of Systems- Perimeter Spaces

Intent

Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the health, productivity, comfort and well-being of building occupants.

Requirements

Provide minimum of one operable window and one lighting control zone per 200 SF for all occupied areas within 15 feet of the perimeter wall.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that for regularly occupied perimeter areas of the building, a minimum of one operable window and one lighting control zone are provided per 200 square feet on average.

Narrative

Credit not satisfied. All regularly occupied areas within CDOB satisfy the perimeter space definition (regularly occupied areas within 15 feet of the perimeter wall). The large conference room, or auditorium, on the first floor is considered to be perimeter space since this room is located within 15 feet of the perimeter wall defining the front of the building. Since a permanent wall does not separate the two small conference rooms on the second floor, these two rooms would be considered one for the purpose of this credit evaluation. The small conference rooms on the second floor (if considered one room) are within 15 feet of the perimeter wall defining the north side of the building. The perimeter spaces at CDOB satisfy the lighting control requirements for this credit, based on the light switches provided for every space. However, even though thermostats provide airflow and temperature control in nearly every office space and all conference rooms, this credit requires operable windows for compliance. As a result, compliance with the requirements of this credit has not been satisfied.

EQ Credit 6.2: Controllability of Systems- Non-Perimeter Spaces

Intent

Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the health, productivity, comfort and well-being of building occupants.

Requirements

Provide controls for each individual for airflow, temperature, and lighting for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Submittals

☐ Provide the LEED Letter Template, signed by the architect or responsible party, demonstrating and declaring that controls for individual airflow, temperature and lighting are provided for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Narrative

Credit not satisfied. There are no "non-perimeter spaces" at CDOB (see explanation under the narrative for EQ Credit 6.1).

EQ Credit 7.1: Thermal Comfort - Compliance with ASHRAE 55-1992

Intent

Provide a thermally comfortable environment that supports the productivity, health and well-being of building occupants.

Requirements

Comply with ASHRAE Standard 55-1992, Addenda 1995, for thermal comfort standards including humidity control within established ranges per climate zone. For naturally ventilated buildings, utilize the adaptive comfort temperature boundaries, using the 90% acceptability limits as defined in the California High Performance Schools (CHPS) Best Practices Manual, Appendix C– A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

Submittals

☐ For mechanically ventilated spaces: provide the LEED Letter Template, signed by the engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-1992, Addenda 1995. Include a table that identifies each thermally controlled zone, and that summarizes for each zone the temperature and humidity control ranges and the method of control used.

OR

☐ For naturally ventilated spaces: provide the LEED Letter Template, signed by the engineer or responsible party declaring that the project complies with the 90% acceptability limits of the adaptive comfort temperature boundaries in the California High Performance Schools (CHPS) Best Practices Manual Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

Narrative

Credit not satisfied. This credit requires provision of both temperature and humidity comfort within the ranges established in ASHRAE 55-1992 (plus Addenda 1995). The temperature control ranges established for CDOB (75 +- 2.5 degrees F for summer and 72 +- 2.5 degrees F for winter, per Specification 15100) are compliant with the referenced standard, based on the assumption that building occupants perform light, primarily sedentary activities (office work). In addition, the 50 percent upper limit for relative humidity established for CDOB is compliant with the referenced standard. Temperature control for the HVAC system is provided by chilled or heated water. Condensing excess water vapor in the air as it moves past the cooling coils automatically controls the upper limit for relative humidity. However, there is no means of controlling the lower limit of relative humidity (approximately 30 percent) that is prone to occur during the heating season. As a result, the requirements of this credit are not satisfied for CDOB.

EQ Credit 7.2: Thermal Comfort - Permanent Monitoring System

Intent

Provide a thermally comfortable environment that supports the productivity, health and well-being of building occupants.

Requirements

Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and the effectiveness of humidification and/or dehumidification systems in the building.

Submittals

- ☐ Provide the LEED Letter Template, signed by the engineer or responsible party, declaring that a permanent temperature and humidity monitoring system will operate throughout all seasons to permit control of the building zones within the seasonal thermal comfort ranges defined in ASHRAE 55-1992, Addenda 1995.
- ☐ Provide the LEED Letter Template, signed by the owner or responsible party, declaring that the temperature and humidity controls were included as part of the scope of work for Energy and Atmosphere Prerequisite 1 (fundamental building systems commissioning). Include the document name and section number where the commissioning work is listed.

Narrative

Credit not satisfied. The credit is not available without complying with EQ Credit 7.1. The building automation system for CDOB does integrate temperature monitoring and control to maintain temperature within the established range for ASHRAE 55 compliance. However, there is no humidity monitoring and control to maintain humidity with the established range for ASHRAE 55 compliance. As a result, the requirements for this credit are not satisfied.

EQ Credit 8.1: Daylight and Views - Daylight 75% of Spaces

Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks. Spaces excluded from this requirement include copy rooms, storage areas, mechanical plant rooms, laundry and other low occupancy support areas. Other exceptions for spaces where tasks would be hindered by the use of daylight will be considered on their merits.

Submittals

☐ Provide the LEED Letter Template and area calculations that define the daylight zone and provide prediction calculations or daylight simulation.

Narrative

Credit not satisfied. A simple spreadsheet calculation can be used to evaluate a design or a constructed building to determine compliance with this credit. It is important to note that the daylight factor must be calculated for all space occupied for critical visual tasks, which is defined by LEED™ to include offices, meeting areas, and cafeterias. The daylight calculation methodology is as follows:

DF = (WA/FA)*(WGF)*(T-vis/T-min)*(WHF)

where, DF = Daylight factor
WA = Window area
FA = Floor area
WGF = Window geometry factor
T-vis = Visible light transmittance of installed or specified windows
T-min = Minimum visible light transmittance
WHF = Window height factor

The terms WGF, T-min, and WHF are constants based on the window configuration for the room to which the calculation is being applied. A more detailed discussion of this calculation along with a summary of window configurations and applicable values for the constant terms in the daylight factor calculation is presented in the LEED™ 2.0 Reference Guide. Compliance is determined by calculating the daylight factor for each applicable room in the building and then summing the floor area for those rooms at or above the 2% daylight factor requirement. Compliance is achieved if this total constitutes 75 percent of the total floor area (for applicable rooms only). The daylight evaluation for CDOB is

EQ Credit 8.1: Daylight and Views - Daylight 75% of Spaces

(continued)

attached, which indicates that approximately 60 percent of the regularly occupied spaces satisfy the credit requirements for daylighting.

Indoor Environmental Quality Credit 8.1: CDOB Daylighting and Views Evaluation

Room Types	# of Rooms	Room Floor Area (sq. ft.)	Total Floor Area (sq. ft.)	Window Area (sq. ft.)	Window (Type)	Geometry (Factor)	Transmittance		Window Height (factor)	Daylight Factor	Daylight Area (sq. ft.)	Views (sq. ft.)
							(T-vis) (Actual)	(Min.)				
1st Floor Rooms												
Group Ldr	1	195	195	32	vision	0.1	0.55	0.4	0.8	0.018		195
Group Ldr	1	270	270	48	vision	0.1	0.55	0.4	0.8	0.020	270	270
Group Ldr	1	165	165	32	vision	0.1	0.55	0.4	0.8	0.021	165	165
Admin	2	143	286	32	vision	0.1	0.6	0.4	0.8	0.027	286	286
Pro. Mgr.	1	187	187	40	vision	0.1	0.6	0.4	0.8	0.026	187	187
Pro. Mgr.	1	182	182	32	vision	0.1	0.6	0.4	0.8	0.021	182	182
Tech.	1	132	132	24	vision	0.1	0.6	0.4	0.8	0.022	132	132
Tech.	2	132	264	32	vision	0.1	0.6	0.4	0.8	0.029	264	264
Conf. Rm.	1	1320	1320	0	NA	NA	NA	NA	NA	NA	NA	NA
Break Rm.	1	176	176	16	vision	0.1	0.6	0.4	0.8	0.011		176
Visiting Staff	1	238	238	56	vision	0.1	0.6	0.4	0.8	0.028	238	238
Staff	4	110	440	16	vision	0.1	0.6	0.4	0.8	0.017		440
Staff	8	110	880	32	vision	0.1	0.6	0.4	0.8	0.035	880	880
Staff	3	110	330	24	vision	0.1	0.6	0.4	0.8	0.026	330	330
Staff	2	110	220	16	vision	0.1	0.55	0.4	0.8	0.016		220
Staff	2	110	220	32	vision	0.1	0.55	0.4	0.8	0.032	220	220
2nd Floor Rooms												
Group Ldr	1	270	270	48	vision	0.1	0.55	0.4	0.8	0.020	270	270
Group Ldr	1	210	210	64	vision	0.1	0.55	0.4	0.8	0.034	210	210
Group Ldr	1	165	165	32	vision	0.1	0.55	0.4	0.8	0.021	165	165
Group Ldr	1	187	187	32	vision	0.1	0.6	0.4	0.8	0.021	187	187
Group Ldr	1	231	231	48	vision	0.1	0.6	0.4	0.8	0.025	231	231
Group Ldr	1	195	195	32	vision	0.1	0.6	0.4	0.8	0.020	195	195
Tech.	4	121	484	32	vision	0.1	0.6	0.4	0.8	0.032	484	484
Tech.	1	128	128	48	vision	0.1	0.6	0.4	0.8	0.045	128	128
Conf. Rm.	1	364	364	0	NA	NA	NA	NA	NA	NA	NA	NA
Students	1	1066	1066	64	vision	0.1	0.6	0.4	0.8	0.007		1066
Staff	4	110	440	16	vision	0.1	0.6	0.4	0.8	0.017		440
Staff	7	110	770	32	vision	0.1	0.6	0.4	0.8	0.035	770	770
Staff	3	110	330	24	vision	0.1	0.6	0.4	0.8	0.026	330	330
Staff	2	110	220	16	vision	0.1	0.55	0.4	0.8	0.016		220
Staff	2	110	220	32	vision	0.1	0.55	0.4	0.8	0.032	220	220

Total Bldg Sq. Ft. =	10,785
Total Daylight Area Sq. Ft. =	6,344
Total Views Area Sq. Ft. =	8,906
% Daylight Space =	58.82%
% Views Space =	82.58%

EQ Credit 8.2: Daylight and Views - Views for 90% of Spaces

Intent

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry and other low occupancy support areas. Other exceptions for spaces where tasks would be hindered by the use of daylight will be considered on their merits.

Submittals

- ☐ Provide the LEED Letter Template and calculations describing, demonstrating and declaring that the building occupants in 90% of regularly occupied spaces will have direct lines of site to perimeter glazing.
- ☐ Provide drawings highlighting the direct line of sight zones.

Narrative

Credit not satisfied. A simple spreadsheet calculation can also be used to evaluate the percentage of regularly occupied spaces providing occupants with direct line of sight to vision glazing. This evaluation can be included with the spreadsheet used to determine compliance with the daylight credit (EQ Credit 8.1). Using floor plans for the building, identify the regularly occupied spaces (or rooms) that provide direct line of sight to vision glazing to 90 percent or more of the room area. Add up the total floor space of regularly occupied spaces complying with the vision requirement. Compliance is achieved if this total constitutes 90 percent of the total floor space for all regularly occupied spaces within the building. A more detailed discussion of the evaluation associated with the credit is presented in the LEED™ 2.0 Reference Guide, including preparation of required drawings indicating the direct line-of-sight zones.

An outdoor views evaluation for CDOB is included with the daylight evaluation spreadsheet attached for EQ Credit 8.1. The result indicates approximately 83% percent of the regularly occupied spaces satisfy the credit requirements. The only spaces within CDOB without direct line of sight to vision glazing are the conference rooms, which account for approximately 16% of the regularly occupied spaces.

INNOVATION & DESIGN PROCESS

ID Credit 1: Innovation in Design

Intent

To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

Requirements

Credit 1.1 (1 point) In writing, identify the **intent** of the proposed innovation credit, the proposed **requirement** for compliance, the proposed **submittals** to demonstrate compliance, and the **design approach** (strategies) that might be used to meet the requirements.

Credit 1.2 (1 point) Same as Credit 1.1

Credit 1.3 (1 point) Same as Credit 1.1

Credit 1.4 (1 point) Same as Credit 1.1

Submittals

☐ Provide the proposal(s) within the LEED Letter Template (including intent, requirement, submittals and possible strategies) and relevant evidence of performance achieved.

Narrative

Credit not satisfied. No innovative sustainable design features identified for CDOB.

ID Credit 2: LEED Accredited Professional

Intent

To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.

Requirement

At least one principal participant of the project team that has successfully completed the LEED Accredited Professional exam

Submittals

☐ Provide the LEED Letter Template stating the LEED Accredited Professional's name, company and contact information.

Narrative

Credit not satisfied. No LEED accredited professionals were principal participants of the CDOB project team.