SUBMITTAL

ALBI CLAD 800

(1-3 Hours Fireproofing)

Albi Clad 800
Los Angeles International Airport
Los Angeles, CA
Photo: Timothy Hursley

- Intumescent Fireproofing
- For Exposed Interior & Exterior Structural Steel
- Withstands Severe Weathering and Abuse
- UL Classified for Up to 3 hours

Albi

ALBI CLAD 800

DESCRIPTION

Albi Clad 800 intumescent coating is applied to protect both internal and external structural steel, concrete and other construction materials from fire. Its superior resistance to weathering and abuse makes it the universal material for severe environments. Albi Clad 800 is UL classified for one to three hour protection under E-119 and UL 1709 High Rise, Hydrocarbon fire test criteria. It is available in standard, attractive, white finish.

ALBI CLAD 800 ADVANTAGES

- UL classified for up to 3 hours protection of both interior and exterior steel.
- Lightweight, hammer-hard, thin-film application follows the contour of substrate.
- Outstanding wear resistance eliminates dusting, flaking, cracking and delamination.
- Approved by major building codes and insurance underwriters.
- Outstanding fire protection even after years of extreme exterior weathering, abuse and vibration.
- High resistance to ultraviolet exposure.
- Asbestos-free formulation
- Single-component, factory formulated to eliminate job-site blending.
- Aesthetic, architectural finish

Albi Clad 800
Petroleum Refinery Plant
Gulf Coast

WHERE TO SPECIFY

Specify Albi Clad 800 whenever and wherever you need a dependable, long-lasting exterior fire-resistant coating capable of resisting abrasion, impact, freezing and thawing. Rugged, lightweight and attractive, Albi Clad 800 is optimal for application in a great many commercial, institutional and industrial environments.

PROVEN PERFORMANCE

Tested by Underwriters Laboratories, Inc. and in numerous actual applications, Albi Clad 800 has provided superior performance under a wide range of environmental extremes throughout the world. Even under the most adverse conditions, lightweight Albi Clad 800 maintains long-term protection with outstanding hardness and durability. Its ability to withstand the adverse effects of wind, rain and weather makes Albi Clad 800 the preferred fireproofing material for offshore drilling platforms, petrochemical plants power plants, dock facilities and a range of commercial and industrial applications.

TYPICAL ALBI CLAD 800 UL FIRE-RESISTANCE LISTINGS

FIRE TEST ASTM E-119

Typical System	Hourly Rating	Thickness	Reinforcement	UL Design No.
Column W10 x 49 (Contour)	1	0.25" wft	None	X606
	2	0.50" wft	Fiberglass ribbon	X601
Column W10 x 49 (Boxed)	1-1/2	0.375" wft	Fiberglass ribbon	X604
	2	0.437" wft	Fiberglass ribbon	X602
Column 4" Pipe Sch. 40	1	0.38" dft	Wire Mesh	X615
	1-1/2	0.61" dft	Wire Mesh	X615
	2	0.85" dft	Wire Mesh	X615
Beam W8 x 17 (Contour)	1/2	.125" wft	None	N604
	3/4	.187" wft	None	N603
	1	3.12" wft	None	UL Report 8/2/74
	2	0.5" wft	Fiberglass ribbon	N601
Beam W8 x 17 (Boxed)	2	3.75" wft	Fiberglass ribbon	N602

FIRE TEST UL 1709

Column W10 x 49 (Contour)	1	0.25" dft	None	UL XR607
	1-1/2	0.35" dft	Fiberglass ribbon	UL XR608
	2	0.51" dft	Fiberglass ribbon	UL XR608
	2-1/2	0.62" dft	Fiberglass ribbon	UL XR609
	3	0.75" dft	Fiberglass ribbon	UL XR609
Column 8" Pipe Sch. 40	1	0.30" dft	Wire Mesh	UL XR603
	1-1/2	0.58" dft	Wire Mesh	UL XR603
	2	0.98" dft	Wire Mesh	UL XR603

**See Technical bulletin 0788 for complete UL listings.*

EASY APPLICATION

For quick, easy installation, Albi Clad 800 is sprayed directly from the shipping container using standard, heavy-duty pneumatic spray equipment. Application may be performed in inclement weather. Application thickness depends on specified fire endurance rating. Albi Clad 800 must be applied by qualified, factory trained people in accordance with the manufacturer's printed instructions and in compliance with specific test specifications. Steel surfaces must be primed with an approved primer before the application of Albi Clad 800.

TYPICAL INSTALLATIONS

- Offshore Drilling Platforms
- Petrochemical Plants
- Power Plants
- Dock Facilities
- Clean Rooms
- Commercial Buildings
- Industrial Sites

PHYSICAL PROPERTIES

Dry Applied Density	68 PCF
Lap Shear	ASTM D1002 – >371 PSI
Bond Strength	ASTM D4541 – >375 PSI
Compressive Strength	ASTM D695 – 2100 PSI
Modulus of Elasticity	ASTM D695 – 94,800 PSI
Flexural Strength	ASTM D790 – 1420 PSI
Modulus of Elasticity	ASTM D790 – 158,000 PSI
Tensile Strength	ASTM D638 – 756 PSI
Abrasion Resistance	ASTM D1044 – 0.40 gm. loss/1000 cycles
Impact Resistance	ASTM D256 – 0.54 ft.lb./in. of notch
Hardness	Shore D – 65 - 70
Weight/Gallon	10.5 ± 0.2 lb.
Coefficient of Thermal Expansion	ASTM D697 – 1.44 x 10 -5 in./in./°F
Thermal Conductivity	ASTM F433 – 3.0 BTU in., hr. ft2 °F
Flame Spread	ASTM E84 – 15 (Class A)
Smoke Developed	ASTM E84 – 40 (Class A)
Shelf Life	12 months from date of manufacture if stored between 60° and 90°F under normal warehouse conditions.

* See complete marking on package

Made in the USA

Other Albi 800 Literature

- Albi Clad 800 Long Form Guide Specification
- Albi Fireproofing Catalog
- Albi Clad 800 Field Application Manual
- Albi Clad 800 CSI SPEC-DATA®
- Albi Clad 800 CSI MANU-SPEC®

Also inquire about these fireproofing products from Albi:

Albi Clad TF

Water-based, thin-film intumescent fireproofing for exposed interior structural steel

Albi DriClad

Low-cost, uniform density mineral board that installs dry year-round

See us in Sweet's

ALBI MANUFACTURING

For more than four decades, American made Albi fireproofing materials have demonstrated superior performance and reliability under a wide range of extreme environments worldwide. These proprietary formulations also meet global building/fire codes and insurance requirements. Lightweight Albi materials provide long-term protection, outstanding durability, aesthetic properties and are completely free from asbestos.

Albi

[1] A wholly-owned subsidiary of StanChem, Inc.

ALBI CLAD 800

Product Data Information

Albi Clad 800 is an intumescent mastic coating applied to structural steel, concrete and other construction materials for the purposes of fire protection. Albi Clad 800 carries a wide range of UL listings for interior and exterior uses under both the E-119 and the UL 1709 High Rise Hydrocarbon test criteria.

RECOMMENDED USES

Listed by Underwriter's Laboratories for both interior and exterior application, Albi Clad 800 should be specified wherever long-lasting fireproofing with high abrasion and impact resistance is required. Albi Clad 800 is ideal for use in a wide variety of commercial, institutional and industrial environments where conventional fireproofing is not sufficiently rugged, lightweight or attractive. Albi Clad 800 will withstand weathering and chemical fumes. It is highly recommended for use on offshore drilling platforms, petrochemical plants, power plants and dock facilities:

FEATURES

- UL listed for 1 to 3 hours to ASTM E-119 & UL 1709.• UL tested for both interior & exterior exposures.
- Application maintains the contours of the substrate.• Lightweight & hammer-hard.
- Asbestos Free.• Factory formulated: eliminates job-site mixing.
- Highly resistant to ultraviolet exposure.• Accepted by building codes and insurance carriers.
- Maintains excellent fire protective properties when exposed to years of extreme abuse and vibration.

APPLICATION

Albi Clad 800 is spray applied directly from the shipping container, utilizing standard, heavy-duty, pneumatic spray equipment. Thickness of the application will depend upon the fire endurance rating specified. Albi Clad 800 must be applied by qualified, factory-trained, applicators. Installation must be in accordance with manufacturer's printed instructions, and in compliance with specific test requirements.

PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	VALUE
Dry Applied Density	—	68 PCF
Lap Shear	ASTM D1002	>371 PS I (cohesive failure)
Cohesive/Adhesive Strength	ASTM D4541	>375 PSI (cohesive failure)
Compressive Strength	ASTM D695	2,100 PSI
Modulus of Elasticity	ASTM D695	94,800 PSI
Flexural Strength	ASTM D790	1,420 PSI
Modulus of Elasticity	ASTM D790	158,000 PSI
Tensile Strength	ASTM D638	756 PSI
Abrasion Resistance	ASTM D1044	0.40 gm. loss1000 cycles
Impact Resistance	ASTM D256	0.54 ft. lbs.in.of notch
Hardness	SHORE D	65 - 70
Thermal Expansion Coefficient	ASTM D696	1.44 X 10-5in./in./ o F.
Thermal Conductivity	ASTM F433	3.0 BTU in./hr. ft2/ o F.
Flame Spread	ASTM E84	15
Smoke Developed	ASTM E84	40

SUGGESTED SPECIFICATION

1.0 SCOPE
This specification covers requirements for materials, equipment and application of intumescent mastic to provide fire protection to steel structures and supports as indicated on the design drawings, and in accordance with applicable requirements of contract documents. Further, this specification shall be supplemented by the applicable requirements of building codes, insurance rating organizations and all other authorities having jurisdiction.

1.1 QUALIFICATION OF SUBCONTRACTORS
Application of Albi Clad 800 fireproofing shall be performed by qualified, factory-trained applicators having proper equipment and training to complete the installation in accordance with Albi Manufacturing's recommendations. Proof of such qualification shall be submitted with bid documents.

1.2 SURFACE PREP
1.2.1 Albi Clad 800 intumescent mastic shall be directly applied to surfaces that have been properly prepared to receive this fireproof coating. The surfaces must be clean and dry, free from rust, grease, dust or other contaminants that will interfere with proper bonding.
1.2.2 All steel surfaces shall be primed with compatible metal primer prior to fireproofing application. Phenolic modified alkyd primer shall be Albi 487S or approved equal. For exterior application: steel shall be properly prepared by commercial blast cleaning and primed the same day.
1.2.3 Where existing painted steel is to be fireproofed with intumescent mastic, existing paint surface must be checked for compatibility with intumescent coating prior to fireproofing application. Follow Albi Mfg''s instructions for compatibility check.
1.2.4 If it is determined that the existing paint surface is sensitive to mastic fireproofing solvents, then existing steel shall be sandblasted and reprimed as outlined in section 1.2.2.

1.3 COORDINATION WITH OTHER TRADES
Albi Clad 800 shall be installed after all steel is in place, but before ducts, pipe work, equipment or other obstructions are installed so that fireproofing can be applied to all exposed steel.

1.4 DELIVERY & STORAGE
Albi Clad 800 shall be delivered to the jobsite in factory sealed containers ready to use.

MATERIALS

2.0 FIREPROOFING
Fireproofing shall be applied in accordance with drawings or specifications, and shall conform to fire protective ratings as outlined by UL 263 (ASTM E-119) and/or UL 1709 and classified by Underwriter's Laboratories, Inc. or other independent, acceptable, testing laboratories conducting specific test to meet end-use requirements.

2.1 COATING
Intumescent mastic fireproof coating for interior or exterior use shall be Albi Clad 800 as manufactured by Albi Manufacturing, Division of StanChem, Inc. 401 Berlin Street, East Berlin, Connecticut 06023.

2.2 OVERCOATING
Overcoating is not required with Albi Clad 800. However, if an overcoat is required for color coding, aesthetics or additional surface protection against spills, a suitable topcoat shall be used. For unusually severe environments consult Albi Mfg. for recommendations of appropriate topcoats.

INSTALLATION & FINISH

3.0 INSTALLATION
3.1 Albi Manufacturing recommends that installation be performed with the use of a pneumatic pump designed for application of heavy-duty, viscous materials and a heavy-duty, mastic spray gun. Compressor shall provide at least 80 CFM (2.3 m3/min.) of air at 100 PSI (7 kg/cm2). Material hose must be 3/4" (19.1 mm) I.D. Nylon or other corrosive resistant type suitable for strong solvents. Gun shall have minimum 3/4" (19.1 mm) material inlet and 3/8" (9.5mm) air inlet ports.

3.2 Final wet film thickness application must conform to manufacturer's listed design or to recommendations for specified rating. All surfaces shall be rolled prior to drying of surface film in order to remove unsightly drippings or surface irregularity.

3.3 Small patchwork or damaged areas may be hand-troweled or gloved. When hand troweling, tools must be kept wet with Albi Clad solvent in order to avoid sticking.

3.4 THICKNESS OF APPLICATION
Albi Clad 800 shall be applied to the thickness required in accordance with the acceptable test data. Thickness shall be measured on the basis of wet film thickness taken by frequent random probe measurements during application. Although test data measurements are taken on dry film thickness, supervision of application must be undertaken while material is being installed, since final, cured, dry film thickness will reflect shrinkage due to evaporation of occluded solvents.

3.5 SAMPLE APPLICATION
Before proceeding with the work, the applicator shall apply a section of approximately 100 sq. ft. (9.3 sq. meters) area. This section shall be witnessed by architect's or owner's representative and shall be subject to their approval to be used as guide for texture and thickness of the finished work.

3.6 CLEAN UP
Work area shall be maintained in an orderly condition with good housekeeping conditions prevailing. Upon completion of installation, all debris shall be cleared and removed from jobsite.

3.7 GUARANTEE
3.7.1 Albi Manufacturing shall warrant material to conform to its specification, and be free of manufacturing defects for a period of six months.
3.7.2 Applicator shall guarantee that the installation of material conforms to Albi Manufacturing's recommendations and project specifications, and shall further guarantee the workmanship connected with the installation for a period of one year from date of installation.

Material Safety Data Sheet

Albi Clad 800

Section I - Product Identification

Product Number:	16X0017
Product Name:	Albi Clad 800
Product Class:	Intumescent Mastic

Section II - Health Hazard Data

Effects of Overexposure:

Inhalation:	May be irritating to the respiratory tract and may produce symptoms of headache, fatigue, weakness and dizziness. Over exposure can lead to irritation of the respiratory tract or central nervous system depression producing such effects as nausea, and loss of consciousness. Can be narcotic at high concentrations
Skin:	Prolonged or repeated contact with coating may cause moderate irritation, dermatitis
Eyes:	Severe irritation. Liquid may cause damage to eye tissue
Ingestion:	May cause gastrointestinal nausea, vomiting and diarrhea

Section III - Hazardous Ingredients

		Occupational Exposure Limits					
		ACGIH		OSHA			Vapor Pressure
Ingredient	Percent Wt.	TLV (ppm)	TWA (ppm)	STEL (ppm)	Ceiling (ppm)	Skin (ppm)	@20°C (mmHg)
t-Butyl Acetate CAS #[540-88-5]	19.3	200	200	200	NE	NE	34
1-methoxy-2- acetoxypropane CAS #[108-65-6]	3.2	NE	NE	NE			3.7
Solvent Naphtha (petroleum) Medium Alphatic CAS #[64742-88-7]	3.2	100	100	NE			2.9
Ethylene Glycol Monobutyl Ether CAS #[111-76-2]	2.7	NE	20	NE			0.4
Xylene* CAS #[1330-20-7]	2.0	100	100	150			6.0
Aromatic Petroleum Distillates CAS #[64742-95-6]	2.0	NE	NE	NE			N/A
Isopropyl Alcohol CAS #[67-63-0]	1.3	400	400	NE			2.1

* Contains ethylbenzene CAS # [100-41-4]

Section IV - Health Hazard Data

First Aid Procedures:

Inhalation:	Remove individual to fresh air. Administer oxygen if breathing is difficult. Consult a physician.
Skin:	Wash thoroughly with soap and water. Remove contaminated clothing.
Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes. Consult a physician.
Ingestion:	Dilute with clear fluid, then immediately call a Physician or the Poison Control Center.

Section V - Fire and Explosion Hazard Data

Flammability Classification:

OSHA	Flammable Liquid - Class 1C
DOT	Flammable Liquid
Flash Point	72ºF TCC - Tag Closed Cup
LEL	1.7% @ 212ºF.

Extinguishing Media: Foam Alcohol Foam CO_2 Dry Chemical Fog

Unusual Fire and Explosion Hazards: Keep container tightly closed. Isolate from heat, electrical equipment, sparks, and open flame. Closed containers may explode when exposed to extreme heat. Application to hot surfaces requires special precautions. Vapors are heavier than air. Vapors may travel across the ground and reach remote ignition source causing a flashback fire.Use water to keep exposed containers cool. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

Section VI - Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled Avoid all sources of ignition. Ventilate area. Stop spill at source, dike to prevent spreading. Pump liquid into containers. The remainder should be removed with inert absorbent use non-sparking tools.

Section VII - Safe Handling and Storage

Handling: Use only non sparking tools. Keep away from heat and flames. Containers must be properly grounded before beginning transfer. Empty containers may contain product residue; follow MSDS and label warnings even after the container has been emptied.

Storage: Store closed drums with bung up position. Store only in tightly closed properly vented containers.

Section VIII - Exposure Controls and Personal Protection

Respiratory Protection: Approved chemical/mechanical filters designed to remove a combination of organic vapors and solid airborne particles from overspray during application

Ventilation: Local exhaust as required by job conditions to keep TLV below acceptable limits
Refer to OSHA regulations 29 CFR Part 1910.94

Protective Gloves: Wear chemical resistant gloves

Eye Protection: Use safety eyewear with splash guards or side shields

Other Protective Equipment: None

Hygienic Practices: Eye wash and shower should be available. Use under well ventilated conditions. Personnel should wash thoroughly after handling product. Always wash-up before eating, smoking or using the toilet facilities. Do not breathe vapor, do not contact eyes, skin and clothing

Precautions To Be Taken in Handling and Storing: Keep away from heat or open flames

Other Precautions: Avoid contact with eyes and skin

Section IX - Physical Data

Boiling Range:	180ºF-350ºF (82-177ºC)
Weight per Gallon:	10.3 - 10.7 lb./gal.
Percent Volatility:	33.0 - 35.0%
Viscosity:	280,000-320,000 cps
Solids:	65 - 67%
VOC Content:	248 g/Ll

Section X - Stability and Reactivity

Stability:	Stable
Hazardous Polymerization:	Will not occur
Hazardous Decomposition Products:	Combustion may produce carbon dioxide and/or carbon monoxide
Condition to Avoid:	Heat, sparks, open flame, other ignition sources, and oxidizing conditions
Incompatibility: [Materials to avoid]	Strong oxidizing agents

Section XI - Toxicological Information

Primary Routes of Exposure	Eye contact Skin contact Inhalation Ingestion	
Medical Conditions Prone to Aggravation by Exposure:	Sinus Dermatitis	
Product Toxicology Carcinogenicity:	NTP?	No
	IARC Monographs?	Ethyl Benzene - Group 2B
	OSHA Regulated?	No

Section XII - Ecological Information

Potential to Bioaccumulate:	Unknown
Aquatic Toxicity:	No data available for this product

Section XIII - Disposal Considerations

Waste Disposal Methods:	Disposal should be in accordance with local, state and federal regulations

Section XIV - Transportation

Proper Shipping Name:	Albi Clad 800
Technical Name:	Paint
Identification Number:	3
Hazard Class/Division:	UN1263
Packing Group:	PGII
Harmonized System Code:	320890

The information provided herein may not include the impact of additional regulatory requirements (e.g. for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/or marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

Section XV - Regulatory Information

TSCA:	All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.
SARA 313 Reporting:	A number of the constituents within the formulation are required to be reported under this regulation.

Section XVI - Other Information

Hazard Rating Systems

NFPA 704*		HMIS**		Key:	0 = Insignificant;
Health:	2	Health:	2	1 = Slight	2 = Moderate;
Flammability	3	Flammability	3	3 = High	4 = Extreme;
Reactivity	1	Reactivity	1	I = Respirator, Eye Protection and Gloves	
		Personal Protection	I		

* National Fire Protection Association rating identifies the severity of hazards of material during a fire emergency (i.e., “on fire”)

** Hazardous Materials Identification System, National Paint and Coatings Association rating applies to product “as packaged” (i.e., ambient temperature)

Notice

ALBI CLAD 800
U.L. 1709 LISTINGS

COLUMNS: W10X49 — FIRE TEST: UL 1709 HYDROCARBON

APPLICATION CONTOUR	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
	XR-602	1 hr.	.20 in. dry	wire mesh
	XR-602	1-1/2 hrs.	.41 in. dry	wire mesh
	XR-602	2 hrs.	.76 in. dry	wire mesh
	XR-607	1 hr.	.25 in. dry	none
	XR-608	1-1/2 hrs.	.35 in. dry	fiberglass ribbon
	XR-608	2 hrs.	.51 in. dry	fiberglass ribbon
	XR-609	2-1/2 hrs.	.62 in. dry	fiberglass ribbon
	XR-609	3 hrs.	.75 in. dry	fiberglass ribbon

COLUMNS: 8 INCH PIPE — FIRE TEST: UL 1709 HYDROCARBON

APPLICATION CONTOUR	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
	XR-603	1 hr.	0.31 in. dry	wire mesh
	XR-603	1-1/2 hrs.	0.58 in. dry	wire mesh
	XR-603	2 hrs.	0.98 in. dry	wire mesh

ALBI CLAD 800

Underwriters' Laboratories Listings

COLUMNS: Wide Flange — FIRE TEST: ASTM E-119

COLUMN SIZE	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
W10 x 49 (contour)	X-606	1 hr.	.25 in. wft	none
	X-601	2 hrs.	.50 in. wft	fiberglass ribbon
W10 x 49 (boxed)	X-604	1-1/2 hrs.	.375 in. wft	fiberglass ribbon
	X-602	2 hrs.	.437 in. wft	fiberglass ribbon

COLUMNS: Hollow Sections — FIRE TEST: ASTM E-119

COLUMN SIZE	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
4 Inch Sch. 40	X-615 1 hr.	.38 in. dft	wire mesh	
	X-615 1-1/2 hrs.	.61 in. dft	wire mesh	
	X-615 2 hrs.	.85 in. dft	wire mesh	

BEAMS: Wide Flange — FIRE TEST: ASTM E-119

BEAM SIZE	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
W8 x 17 (contour)	N-604	1/2 hr.	.125 in. wft	none
	N-603 3/4 hr.	.187 in.	wft	none
	UL Report 8/2/74	1 hr.	.312 in. wft	none
	N-601	2 hrs.	.50 in. wft	fiberglass ribbon
W8 x 17 (boxed)	N-602	2 hrs.	.375 in. wft	fiberglass ribbon

COLUMNS: Wide Flange — FIRE TEST: UL 1709 HYDROCARBON

COLUMN SIZE	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
W10 x 49 (contour)	XR-607	1 hr.	25 in. dft	none
	XR-608	1-1/2 hrs.	.35 in. dft	fiberglass ribbon
	XR-608	2 hrs.	.51 in. dft	fiberglass ribbon
	XR-609	2-1/2 hrs.	.62 in. dft	fiberglass ribbon
	XR-609	3 hrs.	.75 in. dft	fiberglass ribbon

COLUMNS: Hollow Sections — FIRE TEST: UL 1709 HYDROCARBON

COLUMN SIZE	U.L. DESIGN NO.	HOURLY RATING	MATERIAL THICKNESS	REINFORCEMENT
8 inch Sch. 40	XR-603	1 hr.	.31 in. dft	wire mesh
	XR-603	1-1/2 hrs.	.58 in. dft	wire mesh
	XR-603	2 hrs.	.98 in. dft	wire mesh

Albi

1. Product Name
ALBI CLAD Intumescent Fireproofing Systems

2. Manufacturer
Albi Manufacturing
Division of StanChem, Inc.
401 Berlin Street
East Berlin, CT 06023
USA

3. Product Description
ALBI CLAD systems are intumescent coatings applied directly to structural steel, concrete and other construction materials for purposes of fire protection.

BASIC USE
ALBI CLAD is used wherever long-lasting, durable, abrasion-resistant fireproofing is required. It provides maximum fire protection with minimum thickness application.

ALBI CLAD is specified in many institutional and industrial buildings because of its hammer hard surface and ability to withstand heavy abuse and vibration. Such installations include manufacturing facilities, warehouses, gymnasiums, auditoriums and vocational training areas.

ALBI CLAD has been widely used for fire protection of pipe rack supports, structural framing and vessel skirts in the petroleum and petrochemical industries. It has withstood exposure to all types of extreme climactic conditions on facilities around the world.

ALBI CLAD is used on commercial buildings where the design calls for a thin, smooth finished fireproofing which maintains the contours of the substrate. It has been used on exposed steel in atriums, on tubular trusses, historic cast iron columns and glazed escape stairways. It is also specified for fire protection in areas where there are severe space limitations.

COMPOSITION & MATERIALS
ALBI CLAD systems are proprietary formulations consisting of heavy bodied resins, binders, intumescent agents and reinforcing inorganic fibers. ALBI CLAD systems contain no asbestos.

ALBI CLAD solvent based and water-based systems are offered in 2 formulations to suit the end-use desired:

- ALBI CLAD 800 - Solvent based; intended for interior or exterior application to exposed structural steel in demanding environments. ALBI CLAD 800 provides an attractive smooth white surface which can be easily topcoated.
- ALBI CLAD TF - Water based; intended for interior application wherever fireproofing material is to be left exposed. Use where thin film, smooth surfaced, architectural finish is required.

ALBI 487S phenolic modified alkyd primer and 490W rust inhibiting acrylic primer are recommended for use with ALBI CLAD materials under most conditions.

PACKAGING
ALBI CLAD systems are shipped to the job site ready to apply directly from the container. ALBI CLAD systems and ALBI primers are shipped in 55 U.S. gallon (208 L) drums or 5 U.S. gallon (19 L) pails.

TEXTURES & FINISHES
Spray application of ALBI CLAD TF results in a smooth finish. Spray application of ALBI CLAD 800 results in a slightly textured finish. Manufacturer recommends that ALBI CLAD 800 be lightly rolled prior to the drying of surface film in order to remove unsightly sags or surface irregularity.

COLORS
ALBI CLAD comes in a natural off-white finish. For special color finish ALBI CLAD can be top coated with a wide range of coatings. ALBI Manufacturing produces several compatible fire inert top coats in a range of colors. Consult manufacturer for recommendations.

LIMITATIONS
ALBI CLAD 800 systems is a solvent based system. The solvents in ALBI CLAD 800 systems will attack some primers, resulting in poor adhesion. It is important to specify metal primers that are compatible with ALBI CLAD 800. On previously painted or primed surfaces, it is necessary to check for compatibility prior to the application of ALBI CLAD 800.

Observe standard red label precautions when using ALBI CLAD 800 solvent based systems. The product contains solvent mixtures and must be protected from open flame. Fire extinguishing equipment should be available during installation. Adequate ventilation must be provided to prevent buildup of vapor concentrations in confined locations. Fresh air hoods or blowers must be provided during application to insure safe operating conditions.

ALBI CLAD 800 systems should not be applied inside occupied buildings. For such conditions consider the use of ALBI CLAD TF.

4. Technical Data

APPLICABLE STANDARD
American Society for Testing & Materials (ASTM)

- ASTM D256 Standard Test Method for Determining the Izod Pendulum Impact Resistance of Plastics
- ASTM D695 Standard Test Method for Compressive Properties of Rigid Plastics
- ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials

British Standards (BS) - BS 476 Fire Tests on Building Materials & Structures

Underwriters Laboratories, Inc. (UL)

- UL 1709 Rapid Rise Fire Test of Protection Materials for Structural Steel
- UL Fire Resistance Directory

FIRE RATINGS
ALBI CLAD systems have been tested extensively by agencies worldwide, including UL, Factory Mutual (FM), FIRTO, and Warrington. ALBI CLAD systems have been tested to a variety of different fire exposures including the ASTM E119 and BS 476 curves, as well as high intensity tests such as the Mobil Hydrocarbon test and UL 1709.

ALBI CLAD systems are listed in the UL Fire Resistance Directory. ALBI CLAD systems are listed for up to 3 hour protection of columns under design numbers X601, X602, X604,

X606, X615, X625, X626, X628, XR607, XR608 and XR609. ALBI CLAD systems are also listed for up to 2 hour protection of beams under design numbers N601, N602, N603 and N604. Certain of these UL design numbers allow the use of direct contour application or boxed configurations for both columns and beams. Consult manufacturer for latest UL column, beam and floor assembly ratings.

Research papers published by the Portland Cement Association indicate that the application of ALBI CLAD to the undersurface of concrete slabs will extend the fire rating of the composite system up to an additional 2 hours.

BUILDING CODES
Approval of ALBI CLAD has been granted by authorities in areas governed by building codes. In addition, ALBI CLAD has been accepted by major insurance rating organizations.

FIRE HAZARD CLASSIFICATION
ASTM E84 Test - Class A rating
- Flamespread - <25
- Smoke developed - <50

PHYSICAL PROPERTIES
ALBI CLAD systems exhibit similar physical properties as outlined below. Specific figures given for ALBI CLAD 800.
- Dry applied density - 68 pcf (1103 kg/m^3)
- Bond strength to steel - ASTM D4541; >375 psi (2.6 MPa)
- Compressive strength - ASTM D695; 2100 psi (14.5 MPa)
- Impact resistance - ASTM D256; 0.54 ft-lb/in of notch (2.4 N/mm)

PHYSICAL CHARACTERISTICS
ALBI CLAD resists impact, abrasion, vibration, flexure and similar physical abuse. It cures to a hard dense film which will not dust, spell or flake, and is resilient enough to permit expansion and contraction of substrate without cracking or spalling.

ALBI CLAD has been subjected to LNG spills and has not shown any deleterious effect due to cryogenic shock. ALBI CLAD has also been subjected to high intensity hydrocarbon spill fire exposure and has withstood the severe high temperature thermal shock without cracking or spalling.

CHEMICAL RESISTANCE
ALBI CLAD has been exposed under actual field conditions to varied chemical and fuel spill environments throughout the petrochemical industry and has demonstrated outstanding resistance to chemical fume attack.

DRYING/CURING TIME
ALBI CLAD products typically dry to the touch within 15 – 30 minutes. Curing time to completely disperse occluded solvents or water is determined by thickness of application and environmental conditions.

5. Installation
ALBI CLAD is applied only by qualified, factory trained applicators. Installation shall be in accordance with manufacturer's printed instructions and in compliance with specific test requirements. Contact manufacturer for a list of recommended qualified applicators.

SURFACE PREPARATION
Surfaces to receive ALBI CLAD must be clean, dry and free of mill scale, loose rust, dirt, grease and oil. Priming is recommended for all environments. The primer must be compatible with ALBI CLAD. Use ALBI 487S, 490W or other compatible primers possessing equal protective properties.

On new or existing work, where substrate is already primed, check compatibility of ALBI CLAD by installing a sample area to determine interface bonding characteristics. Contact manufacturer for test procedure.

METHOD
ALBI CLAD 800 is spray applied directly from the shipping container utilizing standard, heavy duty, pneumatic spray equipment. ALBI CLAD TF utilizes airless spray equipment. Thickness of the application will depend upon the fire endurance rating specified.

Architect's or Owner's approval of an applied sample, large enough to provide a guide to the acceptability of the finished work, should be part of the specifications and contract documents. The completed project must match the thickness and texture of the approved sample.

6. Availability & Cost

AVAILABILITY
Available throughout the U.S. from ALBI Manufacturing, in East Berlin, CT, ALBI CLAD is marketed throughout the world. In some countries, including the U.K. and Germany, the material is sold under the trademark CITEX CLAD through the wholly-owned subsidiary Citex, Ltd.

COST
For cost information, published price lists and approved applicators, contact Albi Manufacturing.

7. Warranty
ALBI offers a limited warranty providing for replacement of defective material, limited to the cost of the material. Copies of the warranty are available for review.

Approved ALBI applicators provide a 1 year limited material and workmanship warranty.

8. Maintenance
Cracks, nicks or dents caused by human or machine abuse can be repaired easily by hand using a putty knife.

When used to upgrade existing fire rating requirements or in plant additions, ALBI CLAD can be applied directly to existing ALBI CLAD surfaces, or to new additional structures.

9. Technical Services
Complete technical information, test reports and literature are available from manufacturer. For design assistance, code and insurance information and specific technical services, contact Albi Manufacturing Technical Department.

10. Filing Systems
- First Source for Products
- Sweet's General Building & Renovation Catalog File
- Sweet's International Catalog File
- SweetSource
- Additional product information is available from the manufacturer.

ALBI PROJECT REFERENCES

REFINERY/PETROCHEM PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Lubrizol	Petrochemical	Louisville,KY	2014
Pemex	Oil Refinery	Mexico	2014
American Styrenics	Petrochemical	Marietta,OH	2013
CVR Refining	Petrochemical	Wynnewood,OK	2013
Phillips66	Petrochemical	Wood River, IL	2013
Jim Beam Refinery	Refinery	Louisville, KY	2013
Valero	Petrochemical	Memphis, TN	2012
Memphis Light, Gas & Water LNG plant	Petrochemical	Memphis, TN	2012
Phillips66	Petrochemical	Wood River, IL	2012
Phillips66	Petrochemical	Sweeney, TX	2012
Phillips66	Petrochemical	Wood River, IL	2011
Valero	Petrochemical	Memphis, TN	2011
Phillips66	Petrochemical	Wood River, IL	2010
Department of Defense	Nerve gas incinerator	Newport, Indiana	2001
Department of Defense	Nerve gas incinerator	Pine Bluff, Arkansas	2000-2001
Department of Defense	Nerve gas incinerator	Anniston, Alabama	1999
Department of Defense	Nerve gas incinerator	Umatilla, Washington	1999
Marathon / Ashland	Petrochemical	Cattlesburg, Kentucky	1996-1999
Rubicon	Petrochemical	Geismer, Louisiana	1994-1999
Borden Chemical	Petrochemical	Illiopolis, Illinois	1989-1999
Dow Chemical	Petrochemical	Plaqamine, Louisiana	1972-1999
CITGO	Petrochemical	Chicago, Illinois	1997
E.I. Dupont	Petrochemical	Orange, Texas	1972-1996
Hinkle Chemical	Petrochemical	Kankakee, Illinois	1993
Sun Chemical	Petrochemical	North Lake, Illinois	1993
Witco	Petrochemical	New Orleans, Louisiana	1993
Department of Defense	Nerve gas incinerator	Tooele, Utah	1992
Breslube	Oil reclamation facility	East Chicago, Illinois	1992
Clark Oil	Refinery	Blue Island, Illinois	1992
Northern Natural Gas	LNG facility	Duluth, Minnesota	1992
Greater Pittsburgh Airport	Airport	Clinton, Pennsylvania	1992
Aramco	Petrochemical	Saudi Arabia	1991
Honam Oil	Refinery	Korea	1990
Fina Oil	Refinery	Big Springs, Texas	1989
Kuk Dong	Refinery	Ulsan, Korea	1989
PetroCanada	Refinery	Montreal, Canada	1988
Ultramar	Refinery	St. Romauld, Canada	1988
Boston Gas	Gas Storage tanks	Various locations	1987
Natural Gas Pipeline	Gas trans. Site	Searcy, Arkansas	1987
Shell Oil Company	Oil company	Various locations	1985
DAS Island ADNOC	Refinery	Abu Dhabi, UAE	1983
Pertamina	Refinery	Indonesia	1981
Arco	Refinery	Watson, California	1980's
Exxon	Refinery	Various locations	1980's
Philadelphia Gas	LNG facility	Philadelphia, Pennsylvania	1980's
Kuwait National Petroleum	Refinery	Kuwait	1980's
Union Oil	Refinery	Rodeo, California	1980
Conoco Murchison	Offshore oil rig	North Sea, United Kingdom	1979
Georgia-Pacific	Petrochemical	Plaquemine, Louisiana	1974
Dow Chemical	Petrochemical	Kings Lynn, England	1973
Getty Oil	Refinery	Delaware City	1972
Mobil	Refinery	Beaumont, Texas	1972
Mobil	Refinery	Joliet, Illinois	1972
Shell Oil	Reformer	Anacortes, Washington	1972
Quaker State	Refinery	Congo, West Virginia	1971

NUCLEAR POWER STATION	TYPE OF FACILITY	LOCATION	YEAR
EMAL Factory	Power Plant	Abu Dhabi, UAE	2015
Savannah River	Nuclear	Aiken, South Carolina	1999
TVA	Nuclear power plant	Alabama	1980's
Trojan Plant	Nuclear power plant	Portland, Oregon	1979
Beaver Valley Nuclear	Nuclear power plant	Shipping Port, Penn	1972
Northeast Utilities	Nuclear power plant	Waterford, Connecticut	1972
Commonwealth Edison	Nuclear power plant	Zion, Illinois	1971

AIRPORT FACILITY & HANGAR	TYPE OF FACILITY	LOCATION	YEAR
Worcester Airport 1	Airport	Worcester, MA	2014
Logan Airport	Airport	Boston, MA	2014
Worcester Airport 2	Airport	Worcester, MA	2014
US Airways	Hangar	Charlotte, North Carolina	1999
Army Aviation	Airport hangar	South Windsor, Conn.	1998
Kansas City Int'l Airport	Airport	Kansas City, Missouri	1994
Boeing	Aircraft manufacturer	Seattle, Washington	1992
National Airport	Airport	Washington, D.C.	1992
TWA	Hangar	Los Angeles, California	1989
Logan Airport	Terminal	Boston, Massachusetts	1973
U.S. Navy	Hanger	Prudoe Bay, Alaska	1970
TWA	Maintenance hangar	Los Angeles, California	1970

ARMY AND NAVY PROJECTS	TYPE OF FACILITY	LOCATION	YEAR
Bluegrass Chemical Agent	Deconstruction pilot plant-DOD	Richmond, KY	2012
Defense Mapping Agency	Military facility	Arnold, Missouri	1998
China Lake	US Naval facility	China Lake, California	1992
Portsmouth Naval Shipyard	Shipyard	Porthsmouth, NH	1992
US Navy	Navy	Various locations	1990
Military Cantonment	Military facility	Saudi Arabia	1981
US Navy	Shipyard	Bremerton, Washington	1972
Vandenberg Air Base	Launch complex	California	1970's

MEDICAL FACILITIES PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Case Univ. Hospitals-Seidman Cancer Center	Hospital	Cleveland, OH	2010
Altru Health	Hospital	Grand Forks, North Dakota	2006
NW Vet Home	Government	Shrevesport, Louisiana	2006
VA Clinic	Hospital	Indianapolis, Indiana	2005
Hopkin's Research Center	Hospital	Baltimore, Maryland	1999
St. Vincent's	Hospital	Worchester, Mass.	1999
St. Vincent's Hospital	Hospital	Toledo, Ohio	1999
Cook County Hospital	Hospital	Chicago, Illinois	1998
University Hospital	Hospital	Cleveland, Ohio	1998
Great River Medical	Medical center	Burlington, Iowa	1998
Mamoidaies Hospital	Hospital	Brooklyn, New York	1997
Fed. Medical Center, Carswell AFB	Medical center	Fort Worth, Texas	1996
Our Lady of the Lake Hospital	Hospital	Baton Rouge, Louisiana	1996
Ind. Univ. Cancer Research Center	University	Indianapolis, Indiana	1994
RI Children's Hospital	Hospital	Providence, Rhode Island	1992
Deaconess Medical Center	Medical center	Billings, Montana	1992

MEDICAL FACILITIES PROJECT cont.	TYPE OF FACILITY	LOCATION	YEAR
Greenwich Hospital	Hospital	Greenwich, Connecticut	1987
Martin Luther King Hospital	Hospital	Los Angeles, California	1986
Memorial Medical Center	Medical center	Springfield, Illinois	1986
St. Elizabeth Hospital	Hospital	Youngstown, Ohio	1980
Osteopathic Hospital	Hospital	Tulsa, Oklahoma	1973

MANUFACTURING PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Capital Resins	Manufacturing	Columbus, OH	2012
Pfizer	Pharmaceutical plant	Terre Haute, Indiana	2000,2007
Lock & Dam #10	Industrial	Iowa	2006
Mid Am Power	Industrial	Omaha, Nebraska	2005
Eli Lilly	Pharmaceutical plant	Indianapolis, Indiana	2004
Bayer Chemical	Industrial	Kansas City, Kansas	2003
Kellogg	Food processing	Omaha, Nebraska	1992-1999
UpJohn	Pharmaceutical plant	Kalamazoo, Michigan	1992,1999
Folgers Coffee	Manufacturing	Kansas City, Missouri	1999
Shackley Drugs	Manufacturing	Norman, Oklahoma	1999
Monsanto Labs	Manufacturing	St. Louis, Missouri	1998
Motorola	Manufacturing	Austin, Texas	1998
Pfizer, UK124	Manufacturing	Lee's Summit, Missouri	1998
Proctor & Gamble	Manufacturing	Ajax, Ontario, Canada	1998
Ford Motor Company	Manufacturing	Dearborn, Michigan	1998
Pfizer, UK124	Manufacturing	Lee's Summit, Missouri	1998
Proctor & Gamble	Manufacturing	Ajax, Ontario, Canada	1998
United Defense	Manufacturing	Minneapolis, Connecticut	1997
BASF	Chemical manufacturing	Various locations	1992
Astra Pharmaceutical	Pharmaceutical plant	Boston, Massachusetts	1992
Lubrizol	Motor oil manufacturer	Painesville, Ohio	1992
Sartomer	Chemical manufacturing	Various locations	1992
Ramesses	Manufacturing	Cairo, Egypt	1992
Sony	Chip manufacturer	San Jose, California	1992
Rohm & Haas	Chemical manufacturing	Various locations	1991
Borden Chemical	Chemical manufacturing	Iliopoulos, Illinois	1991
Numi	Auto manufacturing	California	1991
Mitsui Mining & Smelting	Manufacturing	New York, New York	1991
Hoechst Celanese	Chemical manufacturing	Various locations	1990
Durham Herald Sun	Newspaper printing	Durham, North Carolina	1990
Pfizer	Pharmaceutical plant	Groton, Connecticut	1974-1990
Quantum Chemical	Chemical manufacturing	Morris, Illinois	1989
Safety Kleen	Chemical manufacturing	Various locations	1989
Symtech	Clean room manufacturing	Austin, Texas	1989
Celanese	Fibers plant	Cumberland, Maryland	1989
Aristech Chemical	Chemical manufacturing	Neville Island, Pennsylvania	1988
Koppers Company	Manufacturing	Follansbee, West Virginia	1987
Toyota Motors	Auto manufacturing	Georgetown, Kentucky	1986
Uniroyal	Chemical manufacturing	Naugatuck, Connecticut	1986
Michelin Company	Tire manufacturer	South Carolina	1981
Steel Case	Metal manufacturer	Grand rapids, Michigan	1970,1980
Searle Corporation	Pharmaceutical plant	Augusta, Georgia	1980
General Motors	Auto manufacturing	Various locations	1980's
Hallmark Cards	Paper processing	Kansas	1980's

MANUFACTURING PROJECT cont.	TYPE OF FACILITY	LOCATION	YEAR
Intel	Clean room manufacturing	Detroit, Michigan	1980's
Hexagon-Lee	Pharmaceutical plant	Petersburg, Virginia	1979
Travenol Labs	Pharmaceutical plant	North Carolina	1976
Borg Warner	Manufacturing	Grangemar, Scotland	1974
Chrysler Corporation	Stamping plant	Detroit, Michigan	1974
PPG Industries	Paint manufacturing	Oak Creek, Wisconsin	1974
Eli Lilly	Pharmaceutical plant	Basingstoke, England	1973
Smith, Kline & French	Pharmaceutical plant	Philadelphia, Pennsylvania	1973
Detroit Press	Printing plant	Detroit, Michigan	1972
General Motors	Oldsmobile plant	Lansing, Michigan	1972
Hoechst International	Fibers plant	Spartanburg, SC	1972
Celanese	Fibers plant	Cucumber land, Maryland	1971
General Motors	Cadillac Plant	Detroit, Michigan	1971
Hoffman-LaRoche	Pharmaceutical plant	Belvidere, New Jersey	1971
BASF	Fibers plant	So, Kearny, New Jersey	1970
Sterling Drug	Pharmaceutical plant	Bell Mead, New Jersey	1970
Ford Motors	Stamping plant	Buffalo, New York	1970
General Dynamics	Manufacturing	Sterling Heights, Michigan	1970
Olin-Matheson	Chemical manufacturing	Trexlertown, Pennsylvania	1970
Dow Chemical	Chemical manufacturing	Various locations	1970's
Dow Corning	Chemical manufacturing	Various locations	1970's

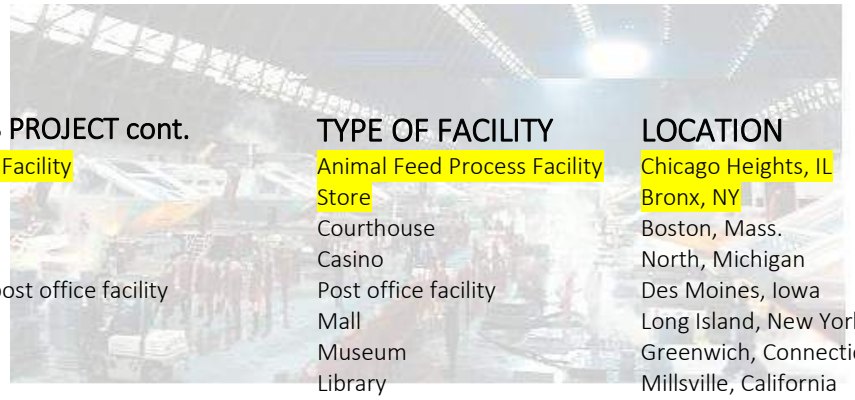
OFFICE COMPLEXES PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Ingersoll Square	Commercial Retail & Condominium complex	Des Moines,IA	2014
GSA Office	Office building	Chicago, Illinois	2005,2006
Phoenix Federal Courthouse	Federal courthouse	Phoenix, AZ	2001
Kraft Foods	Corporate headquarters	Glenview, Illinois	1979,1999
Ocquin Management	Office	Orlando, Florida	1999
Reebok World Headquarters	Office complex	Canton, Mass	1999
USDA	Office	Washington, DC	1999
Staples	Office	Burlington, Mass.	1998
LeValle Brensinger	Architectural office	Burlington, New Hampshire	1997
Federal Reserve Bldg.	Office	Minneapolis, Minnesota	1995
24 West 39th Street	Office building	New York, New York	1993
911 Building	Office	Chicago, Illinois	1993
1301 Pennsylvania Avenue	Office complex	Washington, DC	1992
79 Elm Street	Office complex	Hartford, Connecticut	1992
Mine Safety Building	Office complex	Pittsburg, Pennsylvania	1992
Prudential Center	Hi-rise	Chicago Illinois	1992
Rimland Pacific	Office atrium	Bellingham, Washington	1992
Postal Square	Office complex	Washington, DC	1991
Bectin Dickinson	Corporate headquarters	Franklin Lakes, New Jersey	1990
Lucky Twin Towers	Office building atrium	Seoul, Korea	1983
Hong Kong & Shanghai Bank	Corporate headquarters	Hong Kong	1983-1984
Canadian Revenue Service	Office complex	Nova Scotia, Canada	1975

ATHLETIC FACILITIES PROJECT	TYPE OF FACILITY	LOCATION	YEAR
New Haven Coliseum	Coliseum	New Haven, Connecticut	1991
Weaver High School	Swimming pool	Hartford, Connecticut	1988
Arlington Race Track	race track	Chicago, Illinois	1988
Harvard University	Athletic facility	Cambridge, Massachusetts	1988
Glenview Club	Tennis club	Glenview, Illinois	1987
Joe Louis Arena	Sports complex	Detroit, Michigan	1982

EDUCATIONAL FACILITIES PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Brooklyn & Queens schools	School	Brooklyn, NY	2014
Duxbury High School	High school	Duxbury, MA	2009
Bay West Campus	School	Iron Mountain, Michigan	2007
University of Michigan, SS Lab	University	Ann Arbor, Michigan	2007
St. Francis Gym	School	Louisville, Kentucky	2005
Purdue University	University	Lafayette, Indiana	2004
Winona State	University	Winona, Minnesota	2004
Center High School	School	Kansas City, Kansas	2004
University of Iowa, Hoover Hall	University	Ames, Iowa	2004
University of Evansville	University	Evansville, Indiana	2000
University of Minnesota, Biology Lab	University	St. Paul, Minnesota	2000
Medical College of Ohio	School	Toledo, Ohio	1999
Klein High School	School	Houston, Texas	1999
Yale University	Art school	New Haven, Conn.	1999
Merry Acres	Middle school	Atlanta, Georgia	1999
Middlesex School	Middle school	Westport, Conn.	1999
Riverside Aviation	School	Tulsa, Oklahoma	1999
St. James Academy	High school	Maryland	1999
University of Illinois @ Chicago	School	Chicago, Illinois	1998
Purdue University	University Bay	Lafayette, Indiana	1998
University of Nebraska @ Omaha	School	Omaha, Nebraska	1998
Cambridge High School	School	Cambridge , Minnesota	1998
Middlebury College	College	Middlebury, Vermont	1997
Hill Career	Middle School	New haven, Conn.	1997
Indiana Univ. Medical Science	University	Indianapolis	1996
N.J.I.T	University	Newark, New Jersey	1996
Layola University	University	Chicago, Illinois	1995
Greenville High School	School	Greenville, Texas	1995
Red Deer School (Notre Dame)	School	Red Deer, Alberta, Canada	1995
Southern Illinois University	University	Illinois	1995
West Portsmouth High School	University	West Portsmouth, Ohio	1995
Woodridge Library	School library	Chicago, Illinois	1995
Hudson Middle School	School	Minneapolis, Minnesota	1994
Melrose Elementary	School	Melrose, Minnesota	1993
Dakota High School	High school	Romero, Minnesota	1993
University Michigan, Angel Hall	University	Ann Arbor, Michigan	1993
University of Chicago	University	Chicago, Illinois	1993
Allegheny College	College	Erie, Pennsylvania	1992
Cheney State College	College	Glassboro, New Jersey	1992
Drake University	College	Des Moines, Iowa	1992
Griswold High School	School	Griswold, Connecticut	1992
Glassboro	College	Glassboro, New Jersey	1992
Imlay City	High school	Imlay City, Minnesota	1992

EDUCATIONAL FACILITIES PROJECT cont	TYPE OF FACILITY	LOCATION	YEAR
Japanese Education Center	Elevator shaft	Greenwich, Connecticut	1992
Centennial Junior High School	School	Minnesota	1991
Clayton High School	School	Indiana	1991
Long Beach Polytechnical	School	Long Beach, California	1991
Stanford University	Furst Hall expansion	Palo, Alto, California	1988
Community College	Educational facilities	Greenfield, Massachusetts	1976
Taft High School	School	Chicago, Illinois	1974
Harvard University	School of design	Cambridge, Mass	1972

MISCELLANEOUS PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Muirfield Village Golf Clubhouse	Golf	Dublin, OH	2013
Lyric Opera	Auditorium	Kansas City, MO	2012
Northeastern Ohio Regional Sewer District	Renewable energy /wastewater treatment	Cleveland, OH	2012
629 Euclid Apartment Conversation		Cleveland , OH	2012
Aloft Hotel	Hotel	Cleveland , OH	2012
Ocean Breeze		Staten Island, NY	2011
PSAC Project 911 call center		Bronx, NY	2009
JI Case	Residential	Kansas City, Kansas	2007
Carmichael/Lynch	Office building	Minneapolis, Minnesota	2006
UpShear/Smith	Office building	Minneapolis, Minnesota 2	2006
Burlington Library	Library	Burlington, Iowa	2005
Nelson Art Museum	Museum	Kansas City, Kansas	2005
Art Museum	Government	Rochester, Minnesota	2004
Leows	Home center	Chicago, Illinois	2004
Leows	Home center	Chicago, Illinois	2004
Chamberlain Lofts	Residential	Ames, Iowa	2004
Urban Outfitters	Commercial	Minneapolis, Minnesota	2004
Leows	Home center	Chicago, Illinois	2004
Harbor View Condos	Residential	Petoskey, Michigan	2003
Judicial Building	Courthouse	Des Moines, Iowa	2001
121 South Street Jazz Club	Night club	Pittsburgh, Pennsylvania	1999
Amer. Museum of Natural History	Museum	New York, New York	1999
Anthropologie	Retail store	Chestnut, Mass.	1999
Bally's	Casino	Atlantic City, New Jersey	1999
St. Patrick's Parish	Church	Hartford, Conn.	1999
Whole Foods	Food center	Coral Springs, Florida	1999
Charleston Court	Court house	Charleston, West Virginia	1999
Loews	Home center	Coral Springs, Florida	1999
Wachovia	Bank	Charlotte, North Carolina	1999
Loews	Home center	Middletown, New York	1999
Howland Hook	Fruit storage	Staten Island, New York	1999
Mercer County Convention Center	Convention center	Trenton, New Jersey	1999
Universal Studios	Dr. Seuss Landing	Orlando, Florida	1999
Old Navy	Retail	New York, New York	1998
Hilton Garden Center	Hotel	Philadelphia, Pennsylvania	1998
Sun Micro Systems	Headquarters	Burlington, Mass.	1998
Entertainer Center	Theme park	Chicago, Illinois	1998
New Britain Court	Court house	New Britain, Connecticut	1998
Circuit City	Retail	Pearl River, New Jersey	1997



MISCELLANEOUS PROJECT cont.	TYPE OF FACILITY	LOCATION	YEAR
Animal Feed Process Facility	Animal Feed Process Facility	Chicago Heights, IL	2014
Riverdale BJ's Store	Store	Bronx, NY	2014
Boston City Court	Courthouse	Boston, Mass.	1996
Soaring Eagle Casino	Casino	North, Michigan	1995
U.S. Postal addition post office facility	Post office facility	Des Moines, Iowa	1995
Roosevelt Field Mall	Mall	Long Island, New York	1993
Bruce Museum	Museum	Greenwich, Connecticut	1992
Millsville Project	Library	Millsville, California	1992
Bellvue library	Library	Bellvue, Washington	1992
Champion International	Warehouse	Stamford, Connecticut	1992
Hagen #43 Shopping Center	Shipping complex	Edmonds, Washington	1992
Erie Insurance Company	Insurance company	Erie, Pennsylvania	1992
K-Mart Distribution Center	Distribution center	Canton, Michigan	1992
Kaiser Data Center	Computer center	Corona, California	1992
Safeway 1300	Grocery store	McLead, Virginia	1992
Trenton Federal Courthouse	Courthouse	Trenton, New Jersey	1992
U.S. Surgical research	Research	New Haven, Connecticut	1992
Santos Warehouse	Warehouse	Newark, New Jersey	1992
Northern State Power	Power company	Minnesota	1992
Reading Terminal	Mall	Reading, Pennsylvania	1992
Montgomery Wards	Retail store	Fairfax, Virginia	1992
Westgate	Pedestrian walkway	Chicago, Illinois	1992
Amway Warehouse	warehouse	Ada, Michigan	1991
North Pier Terminal	Retail/residential	Chicago, Illinois	1991
Hamilton Standard	Laboratory	Connecticut	1991
Moscone Center	Exhibition hall	San Francisco, California	1991
MWCC	Waste water treatment	Eagen, Minnesota	1990
National Geography	Warehouse	Gaithersburg, Maryland	1990
Southern California Edison	Remote telephone poles	California	1990
Lynn Waste Water Treatment	Waste water treatment	Lynn, Massachusetts	1989
Compaq Computers	Distribution center	Houston, Texas	1989
National Distillers	Distillery	Frankfort, Kentucky	1987
Piedmont Airlines	Overwing loading docks	Newark, New Jersey	1987
Central Wharf	Condo's	Portland, Maine	1986
McCormick Place	Exhibition hall	Chicago, Illinois	1986
Anheuser-Busch	Brewery	Los Angeles, California	1982
IBM	Data center	Tuscon, Arizona	1981
Sears-Roebuck	Distribution center	Columbus, Ohio	1979
St. Katherine by the Tower	Dock restoration	London, England	1978
Allied Stores	Warehouse	Quincy, Massachusetts	1975
Marine Midland bank	Shopping mall	Syracuse, New York	1975
City of Scottsdale	Waste water treatment	Scottsdale, Arizona	1974
Box Factory	Restaurant	Rochester, New York	1973
Federal Reserve	Archives center	Chicago, Illinois	1973
Krauss-Thompson	Warehouse	Millwood, New York	1971
Disney Quest Virtual Reality			

PRISONS PROJECT	TYPE OF FACILITY	LOCATION	YEAR
Prison	Prison	Dayton, Ohio	1993
Green Bay project	Prison	Fort Worth, Texas	1993
Lovelock Prison	Prison	Carson City, Nevada	1993
Adult Correctional Institute	Prison	Cranson, Rhode Island	1992
Fulton Country Judicial Center	Prison	Atlanta, Georgia	1992

PRISONS PROJECT cont	TYPE OF FACILITY	LOCATION	YEAR
Cheshire Prison	Prison	Cheshire, Connecticut	1991
Northern Nevada Correctional Ctr	Prison	Carson, Nevada	1991
Suffield Correctional Facility	Prison	Suffield, Connecticut	1991
Alameda Country Correctional Inst.	Prison	California	1990
Minorsville Prison	Prison	Minorsville, Pennsylvania	1990
Enfield Prison	Prison	Somers, Connecticut	1988
Federal Penitentiary	Prison	Bradford, Pennsylvania	1988
City of Bridgeport	Penal institution	Bridgeport, Connecticut	1975

TRANSPORTATION	TYPE OF FACILITY	LOCATION	YEAR
Long Island Railroad Overpass	Transportation	Queens, NY	2014
Pinnacle Apartment Parking Garage	Parking garage	Cleveland, OH	2013
Dobbs Ferry Parking	Garage ADC	Dobbs Ferry, NY	2012
Mother Clara Barton	Bus depot	New York, NY	2010
Palisades Parking Garage	Parking garage	West Nyack, NY	2008
Metro North	Train station	New York, New York	1997
Quincy Adams	Parking garage	Braintree, Mass	1997
Cicero Rapid Transit	Transportation	Chicago, Illinois	1996
Cicero Rapid Transit	Transportation	Chicago, Illinois	1996
Fresh Pond Transportation	Bus maintenance facility	Queens, New York	1996
Kansas-DOT	Bridge	Johnson City, Kansas	1992
Kings Bridge Bus Depot	Bus depot	New York, New York	1992
MBTA	Subway station	Various locations	1990
Union Station	Railroad station renovation	New London, Connecticut	1989
Reunion Arena	Parking garage	Dallas, Texas	1985
New Haven Coliseum	Parking garage	New Haven, Connecticut	1971

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