



NYC Department of Buildings
280 Broadway, New York, NY 10007
Patricia Lancaster, FAIA, Commissioner
(212) 566-5000, TTY: (212) 566-4769

Report of Materials and Equipment Acceptance Division

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 346-07-M

Manufacturer: Carboline Co.
350 Hanley Industrial Court
Saint Louis, MO 63144

Trade Name(s): Thermo-Lag 3000, Fire-Sorb 1001

Product: Fire resistive coating
MEA Index #310-30 – Fire Protection

Pertinent Code Section(s): 27-323, 27-324

Prescribed Test(s): RS 5-2 (ASTM E119, ASTM E84)

Laboratory: Underwriters Laboratories, Inc.
Omega Point Laboratories, Inc.

Test Report(s): UL Reports: R16350 dated September 16, 1999 &
R6802 dated May 21, 1999, R1635
Omega Point Report Nos: 15521-10324, 103726,
102866, 103051, 100753, 15521-103 and 103406.

Description: Thermo-Lag 3000 Subliming Material – A two component epoxy based Fire resistive material for application to materials of construction. Thermo-Lag 3000 consists essentially of a polymeric binder system, subliming compounds, film forming agents, catalysts, and additives to control rheology, surface characteristics, cohesive strength, adhesion, stability, and other characteristics.

Thermo-Lag 3000 is applied to primed structural steel elements such as beams and columns to reduce, limit or restrict heat transfer to the substrate. The thermal mechanism of sublimation is employed to absorb and block incident heat energy and provide a temperature limiting thermostatic function. Further, when thermally activated the materials forms a low density cellular structure of low heat transfer coefficient reflectivity protecting the substrate from heat source.

Fire-Sorb 1001 Subliming Material – A one component thin film fire-resistive coating for application to materials of construction.

Fire- Sorb 1001 consists essentially of a polymeric binder system, subliming compounds, film forming agents, catalysts, and additives to control surface characteristics, cohesive strength, adhesion, stability, and other characteristics.

Fire-Sorb 1001 is applied to primed structural elements such as beams for the protection against loss of structural strength during exposure to heat energy. Fire-Sorb 1001 provides a durable, tough, aesthetically pleasing finish that allows the shape of the steel to be maintained while providing the specified level of fire resistance.

Fire Resistance Ratings - ANSI/UL 263

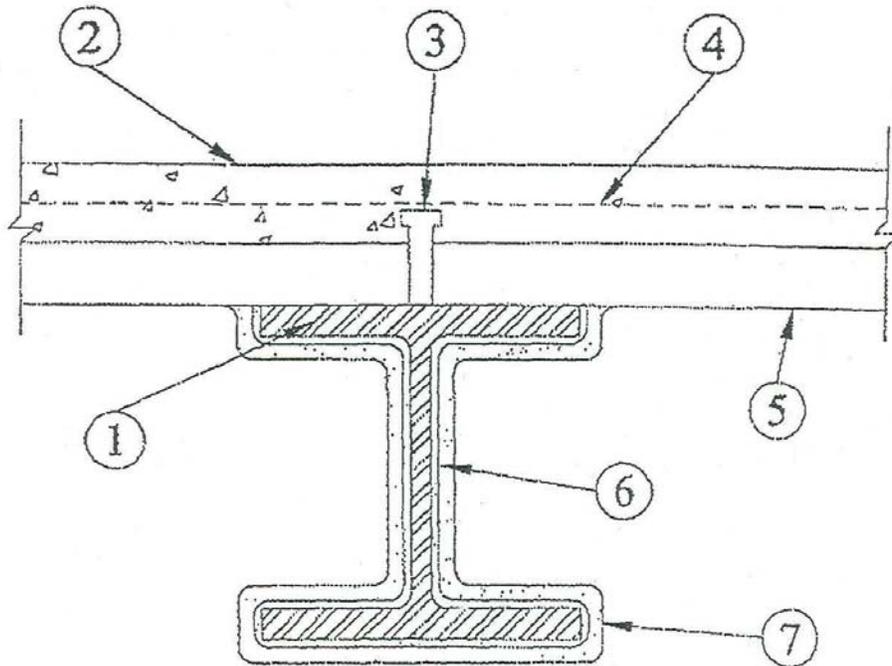
Guide Information

Design No. N608

November 09, 1999

Restrained Beam Ratings—1, 1-1/2, 2, 3, 4 Hr (See Item 7)

Unrestrained Beam Ratings—1, 1-1/2, 2, 3, 4 Hr (See Item 7)



1. Steel Beam W10x88 min size.

2. Normal Weight or Lightweight Concrete Compressive strength, 3000 psi. For

normal weight concrete either carbonate or siliceous aggregate may be used. Unit weight, 148 pcf. For lightweight concrete, unit weight 110 pcf.

3. Shear Connector (Optional) Studs, 3/4 in. diam headed type or equivalent per AISC specifications. Welded to the top flange of beam through the steel floor units.
4. Welded Wire Fabric (Optional) 6 x 6-10/10 SWG.
5. Steel Floor and Form Units 1-1/2, 2, or 3 in. deep fluted, welded to beam.
6. Glass Fiber Mesh 3/16 in. by 3/16 in. square pattern glass fiber reinforcing mesh weighing 5.3 oz per sq. yard shall be placed, following the contour of the beam, in the following manner:

Thkns of Protection Material (in.)	Depth of Placement of Reinforcing Mesh (in.)
.12 - .24	Mid point of Protection Material
.24 and greater	.12

Adjacent pieces of reinforcing mesh along the length of the beam shall be overlapped a min of 2 in.

7. Mastic Coating* Two component spray material applied in more than one coat as described in the manufacturer's application instructions to the thickness shown below. Beams to be primed with an epoxy primer. Flutes above beam to be completely filled with mineral wool insulation having a min density of 6 pcf.

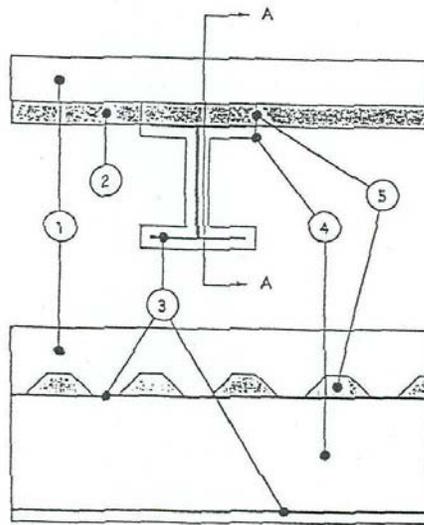
Rating, Hr	Min Thkns, In. Unrestrained Beams	Restrained Beams
1	.12	.12
1-1/2	.12	.12
2	.13	.12
3	.30	.23

CARBOLINE CO. — Type Thermo-Lag 3000 subliming mastic coating.

8. Top Coat — Type Carboguard 1340 intermediate coat applied over mastic coating at 0.0002 inch thickness and Type Carbothane 133HB topcoat applied over intermediate coat at 0.0003 inch thickness.

*Bearing the UL Classification Mark

Design No. B 303
RESTRAINED OR UNRESTRAINED BEAM
ASTM E 119 Rating - 3 hr or less



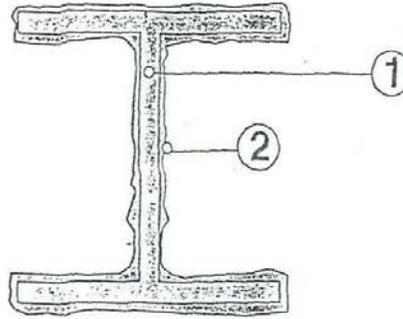
SECTION A-A

1. CONCRETE FLOOR: Normal or lightweight concrete (min. 105 pcf) with a min. depth to comply with designated fire resistive rating.
2. FLUTED STEEL FLOOR UNITS: Corrugated steel decking, min. 1-1/2 in. deep, min. 20 GA.

3. STEEL STRUCTURAL BEAM: See table for min. sizes.
4. FIRE-RESISTIVE COATING: Spray or paint in one or more coats according to the manufacturer's instructions. Thickness determined by table for desired rating and column. Wrap fiberglass reinforcing mesh completely around the column allowing for a minimal (1/2 in.) overlap at the seams. Apply mesh at mid depth of the coating up to max. .240 in. and for thicker coatings apply mesh at .120 in.
- Listed Manufacturer:
 Nu-Chem Inc. -
 High-Performance Coatings
 High-Performance Coating System
 Thermo-Lag 3000
5. FLUTE FILLER: Completely fill the flutes between beam and the fluted steel floor units with 4 pcf mineral wool** or 4 pcf ceramic fiber blanket**. (** Listed with Omega Point Laboratories)

Design No. B 303											
HP/A	W/D	60 min.		90 min.		120 min.		150 min.		180 min.	
l/m	lb./ft/in	mm	In	mm	In	mm	In	mm	In	mm	In
30	4.46	3.0	0.12	3.0	0.12	3.0	0.12	3.0	0.12	3.3	0.13
40	3.34	3.0	0.12	3.0	0.12	3.0	0.12	3.5	0.14	4.2	0.17
50	2.67	3.0	0.12	3.0	0.12	3.3	0.13	4.2	0.17	5.0	0.20
60	2.23	3.0	0.12	3.0	0.12	3.8	0.15	4.8	0.19	5.8	0.23
70	1.91	3.0	0.12	3.2	0.13	4.3	0.17	5.4	0.21	6.5	0.26
75	1.78	3.0	0.12	3.3	0.13	4.5	0.18	5.7	0.22	6.8	0.27
80	1.67	3.0	0.12	3.5	0.14	4.7	0.19	5.9	0.23	7.2	0.28
85	1.57	3.0	0.12	3.7	0.15	4.9	0.19	6.2	0.24	7.5	0.30
90	1.49	3.0	0.12	3.8	0.15	5.1	0.20	6.5			
95	1.41	3.0	0.12	3.9	0.15	5.3	0.21	6.7			
100	1.34	3.0	0.12	4.1	0.16	5.5	0.22	6.9			
110	1.22	3.0	0.12	4.3	0.17	5.9	0.23	7.4			
120	1.11	3.0	0.12	4.6	0.18	6.2	0.24	7.8			
130	1.03	3.1	0.12	4.8	0.19						
140	0.95	3.3	0.13	5.0	0.20						
150	0.89	3.4	0.13	5.2	0.20						
160	0.84	3.6	0.14	5.4	0.21						
170	0.79	3.7	0.15	5.6	0.22						
180	0.74	3.9	0.15	5.8	0.23						
190	0.70	4.0	0.16	6.0	0.24						
200	0.67	4.1	0.16	6.2	0.24						
210	0.64	4.2	0.17								
220	0.61	4.3	0.17								
230	0.58	4.5	0.18								
240	0.56	4.6	0.18								
250	0.53	4.7	0.19								
260	0.51	4.8	0.19								
270	0.50	4.9	0.19								
280	0.48	5.0	0.20								
290	0.46	5.0	0.20								
300	0.45	5.1	0.20								
302	0.44	5.2	0.20								

Design No. C 301
 COLUMN
 ASTM E 119 Rating - 3 hr or less

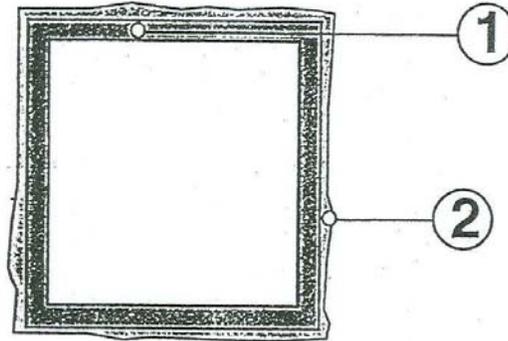


1. STEEL COLUMN: W-Shaped.
2. FIRE-RESISTIVE COATING: Spray or paint in one or more coats according to the manufacturer's instructions. Thickness determined by table for desired rating and column. Wrap fiberglass reinforcing mesh completely around the column allowing for a minimal (1/2 in.) overlap at the seams. Apply mesh at mid depth of the coating up to max. .240 in. and for thicker coatings apply mesh at .120 in.

Listed Manufacturer:
 Nu-Chem Inc. -
 High-Performance Coatings
 High-Performance Coating System
 Thermo-Lag 3000

Design No. C 301											
HP/A	W/D	60 min.		90 min.		120 min.		150 min.		180 min.	
l/m	lb./ft/in	mm	in	mm	in	mm	in	mm	in	mm	in
30	4.46	3.0	0.12	3.0	0.12	3.0	0.12	3.0	0.12	3.3	0.13
40	3.34	3.0	0.12	3.0	0.12	3.0	0.12	3.5	0.14	4.2	0.17
50	2.67	3.0	0.12	3.0	0.12	3.3	0.13	4.2	0.17	5.0	0.20
60	2.23	3.0	0.12	3.0	0.12	3.8	0.15	4.8	0.19	5.8	0.23
70	1.91	3.0	0.12	3.2	0.13	4.3	0.17	5.4	0.21		
75	1.78	3.0	0.12	3.3	0.13	4.5	0.18	5.7	0.22		
80	1.67	3.0	0.12	3.5	0.14	4.7	0.19	5.9	0.23		
85	1.57	3.0	0.12	3.7	0.15	4.9	0.19	6.2	0.24		
90	1.49	3.0	0.12	3.8	0.15	5.1	0.20				
95	1.41	3.0	0.12	3.9	0.15	5.3	0.21				
100	1.34	3.0	0.12	4.1	0.16	5.5	0.22				
110	1.22	3.0	0.12	4.3	0.17	5.9	0.23				
120	1.11	3.0	0.12	4.6	0.18	6.2	0.24				
130	1.03	3.1	0.12	4.8	0.19						
140	0.95	3.3	0.13	5.0	0.20						
150	0.89	3.4	0.13	5.2	0.20						
160	0.84	3.6	0.14	5.4	0.21						
170	0.79	3.7	0.15	5.6	0.22						
180	0.74	3.9	0.15	5.8	0.23						
190	0.70	4.0	0.16	6.0	0.24						
200	0.67	4.1	0.16	6.2	0.24						
210	0.64	4.2	0.17								
220	0.61	4.3	0.17								
230	0.58	4.5	0.18								
240	0.56	4.6	0.18								
250	0.53	4.7	0.19								
260	0.51	4.8	0.19								
270	0.50	4.9	0.19								
280	0.48	5.0	0.20								
290	0.46	5.0	0.20								
300	0.45	5.1	0.20								
302	0.44	5.2	0.20								

Design No. C 302
COLUMN
ASTM E 119 Rating – 3 hr or less



1. STEEL COLUMN: Tubular - Rectangular Hollow Shape
2. FIRE-RESISTIVE COATING: Spray or paint in one or more coats according to the manufacturer's instructions. Thickness determined by table for desired rating and column. All designs with fire endurance ratings of 90 minutes (1-1/2 h) or more and with a thickness of 0.08 in. (2.0 mm) and greater require the use of a single, internal layer of HTF carbon fiber mesh fabric, 1.03 oz/yd min. Apply mesh at mid depth of the coating up to max. .240 in. and for thicker coatings apply mesh at .120 in.

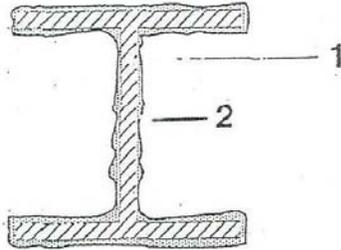
Listed Manufacturer:
Nu-Chem Inc. -
High-Performance Coatings
High-Performance Coating System
Fire-Sorb 1001

Design No. C 302											
HP/A	W/D	60 min.		90 min.		120 min.		150 min.		180 min.	
I/m	lb./ft/in	mm	in	mm	in	mm	in	mm	in	mm	in
25	5.35	0.6	0.02	0.9	0.04	1.5	0.06	2.0	0.08	2.5	0.10
30	4.46	0.6	0.02	1.1	0.04	1.7	0.07	2.4	0.09	3	0.12
35	3.82	0.6	0.02	1.3	0.05	2.0	0.08	2.7	0.11	3.5	0.14
40	3.34	0.6	0.02	1.5	0.06	2.3	0.09	3.1	0.12	3.9	0.15
45	2.97	0.7	0.03	1.6	0.06	2.5	0.10	3.4	0.13	4.4	0.17
50	2.67	0.8	0.03	1.8	0.07	2.8	0.11	3.8	0.15	4.8	0.19
55	2.43	0.9	0.04	2.0	0.08	3.0	0.12	4.1	0.16	5.2	0.20
60	2.23	0.9	0.04	2.1	0.08	3.3	0.13	4.5	0.18	5.6	0.22
65	2.06	1.0	0.04	2.3	0.09	3.5	0.14	4.8	0.19	6.1	0.24
70	1.91	1.1	0.04	2.4	0.09	3.8	0.15	5.1	0.20	6.5	0.26
75	1.78	1.1	0.04	2.6	0.10	4.0	0.16	5.4	0.21	6.9	0.27
80	1.67	1.2	0.05	2.7	0.11	4.2	0.17	5.7	0.22	7.3	0.29
85	1.57	1.3	0.05	2.9	0.11	4.5	0.18	6.0	0.24	7.6	0.30
90	1.49	1.3	0.05	3.0	0.12	4.7	0.19	6.3	0.25	8.0	0.31
95	1.41	1.4	0.06	3.1	0.12	4.9	0.19				
100	1.34	1.5	0.06	3.3	0.13	5.1	0.20				
110	1.22	1.6	0.06	3.5	0.14	5.5	0.22				
120	1.11	1.7	0.07	3.8	0.15	5.9	0.23				
130	1.03	1.8	0.07	4.0	0.16	6.3	0.25				
140	0.95	1.9	0.07	4.3	0.17	6.7	0.26				
150	0.89	2.0	0.08	4.5	0.18	7.0	0.28				
160	0.84	2.1	0.08	4.7	0.19	7.4	0.29				
170	0.79	2.2	0.09								
180	0.74	2.3	0.09								

Design No. C 305

COLUMN

ASTM E119 Rating - 2 hr or less

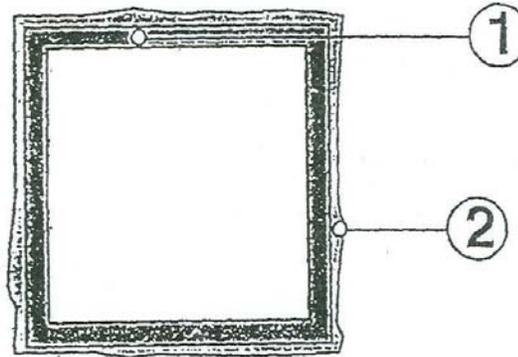


1. STEEL COLUMN: W-Shaped.
2. FIRE-RESISTIVE COATING: Spray or paint in one or more coats according to the manufacturer's instructions. Thickness determined by table for desired rating and column.

Listed Manufacturer:
 Nu-Chem Inc.
 High-Performance Coatings
 High-Performance Coating System
 Fire-Sorb 1001

Design No. C 305									
Hp/A	W/D	30 min		60 min		90 min		120 min	
		Thickness							
(m-1)	(lb/in./ft)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)
45	2.93	0.74	0.029	0.74	0.029	0.84	0.033	1.18	0.046
50	2.64	0.74	0.029	0.74	0.029	0.92	0.036	1.29	0.051
60	2.20	0.74	0.029	0.74	0.029	1.07	0.042	1.50	0.059
70	1.89	0.74	0.029	0.74	0.029	1.21	0.048	1.69	0.067
80	1.65	0.74	0.029	0.80	0.032	1.34	0.053	1.88	0.074
90	1.47	0.74	0.029	0.88	0.035	1.47	0.058		
100	1.32	0.74	0.029	0.95	0.037	1.61	0.063		
110	1.20	0.74	0.029	1.01	0.040	1.74	0.068		
120	1.10	0.74	0.029	1.08	0.042	1.87	0.074		
130	1.02	0.74	0.029	1.14	0.045	2.00	0.079		
140	0.94	0.74	0.029	1.19	0.047	2.14	0.084		
150	0.88	0.74	0.029	1.25	0.049	2.27	0.089		
160	0.83	0.74	0.029	1.30	0.051	2.40	0.095		
162	0.82	0.74	0.029	1.31	0.051	2.42	0.095		

Design No. C 304 NPD
COLUMN
IMO/NPD Hydrocarbon Curve
Rating - 3 hr or less



This Listing is based upon the hydrocarbon fire time-temperature curve conditions required by the International Maritime Organization. The Norwegian Petroleum Directorate, NPD, also defines this exposure.

1. STEEL COLUMN: Tubular - Rectangular Hollow Shape.
2. FIRE-RESISTIVE COATING: Applied by spraying or painting in one or more coats, to a final thickness according to the manufacturer's instructions and according to that product's Listed hourly rated thickness per table.

Listed Manufacturer:

Nu-Chem Inc. -
High-Performance Coatings
High-Performance Coating System
Thermo-Lag 3000

Final thickness of 6 mm or less, the high temperature fabric is placed at the nominal midpoint of the coating (± 1 mm). For Final thicknesses greater than 6 mm, the high temperature fabric is placed 3 mm from the surface of the steel (± 1 mm). The first layer of THERMO-LAG 3000 is applied to the desired thickness. The high temperature fabric is pressed into the uncured coating so as to exude the coating through the openings in the high temperature fabric. The high

temperature fabric is installed to completely cover the surface of the steel column, with 1" (25 mm) overlaps at the seams.

Design No. C 304 NPD											
Data Based on 400°C Average											
H _p /A	W/D	60 min		90 min		120 min		150 min		180 min	
l/in	lb/ft ² /in	mm	in	mm	in	mm	in	mm	in	mm	in
22	6.03	3.2	0.13	3.2	0.13	3.3	0.13	4.4	0.17	5.5	0.22
25	5.35	3.2	0.13	3.2	0.13	3.7	0.15	4.9	0.19		
30	4.46	3.2	0.13	3.2	0.13	4.3	0.17	5.7	0.22		
35	3.82	3.2	0.13	3.2	0.13	4.8	0.19				
40	3.34	3.2	0.13	3.6	0.14	5.4	0.21				
45	2.97	3.2	0.13	3.9	0.15	5.9	0.23				
50	2.67	3.2	0.13	4.2	0.17						
55	2.43	3.2	0.13	4.5	0.18						
60	2.23	3.2	0.13	4.8	0.19						
65	2.06	3.2	0.13	5.1	0.20						
70	1.91	3.2	0.13	5.3	0.21						
75	1.78	3.2	0.13	5.6	0.22						
80	1.67	3.2	0.13	5.8	0.23						
85	1.57	3.2	0.13	6.1	0.24						
90	1.49	3.2	0.13								
95	1.41	3.2	0.13								
100	1.34	3.3	0.13								
110	1.22	3.5	0.14								
120	1.11	3.6	0.14								
130	1.03	3.8	0.15								
140	0.95	4.0	0.16								
150	0.89	4.1	0.16								
160	0.84	4.2	0.17								
170	0.79	4.3	0.17								
180	0.74	4.4	0.17								
190	0.70	4.5	0.18								
200	0.67	4.6	0.18								
210	0.64	4.7	0.19								
212	0.63	4.8	0.19								

Terms and Conditions: The above-described column protection assemblies are accepted for Class I and Class II Buildings only, as having the fire resistance ratings given above, when members framing into the columns have at least the same fire resistance rating, provided that following requirements for application and protection of the intumescent coating fireproofing be adhered to:

1. Where used in Class I Buildings, subject material shall be used for fireproofing of selected structural members and shall be limited to 20% of the gross area of all structural members on any one floor and a maximum of 20% of the gross area of all structural members in the entire building.
2. Where used for protection of floor column(s) in fireproofing buildings, each such column(s) shall bear an identifying tag installed 7'-0" above finished floor. Subject tag shall be of metal construction mechanically attached to such column(s) and shall state the following: "This beam has been fireproofed with MEA approved Thermo-Lag 3000 or Fire-Sorb 1001 finish and such finish shall not be removed" nor any subsequent coating shall be applied other than Thermo-Lag 3000 or Fire-Sorb 1001.
3. Surfaces to receive intumescent coating shall be cleaned prior to the application of the fireproofing.
4. The finished fireproofing shall be applied to a uniformed thickness, and shall not be less than the minimum thickness specified.
5. The general contractor and the owner shall provide qualified personnel to supervise the application on the sprayed fire-resistive material. They shall certify to the Department of Buildings that the finished fire-proofing of the completed building is in full compliance with the acceptance requirements and drawings approved by the Department of Buildings.
6. The installation of the sprayed fire resistive-material shall be subject to the controlled inspection requirements of Section 27-132.
7. The use of this material shall be subject to all pertinent regulations of the Department of Air Resources and the Department of Health.
8. All installations shall comply with 118-68 GR, the New York City Building Code, the Fire Department Directives, the manufacturer's instructions and laboratory recommendations.
9. All shipments and deliveries of the materials, comprising of this assembly, shall be accompanied by a certificate or label certifying that the materials shipped or delivered are equivalent to those tested and are accepted for use, as provided for in Section 27-131 of the New York City Building Code.

Final Acceptance March 6, 2008

Examined By Sium Derkudam