

# Development Services

## From Concept to Construction

Phone: 503-823-7300 Email: [bds@portlandoregon.gov](mailto:bds@portlandoregon.gov) 1900 SW 4th Ave, Portland, OR 97201

More Contact Info (<http://www.portlandoregon.gov/bds/article/519984>)



### APPEAL SUMMARY

**Status:** Hold for Additional Information - Reconsideration of ID 11249

<b>Appeal ID:</b> 20426	<b>Project Address:</b> 400 SW Washington St
<b>Hearing Date:</b> 5/22/19	<b>Appellant Name:</b> John Wright
<b>Case No.:</b> B-017	<b>Appellant Phone:</b> 5034607994
<b>Appeal Type:</b> Building	<b>Plans Examiner/Inspector:</b> Peter Drake
<b>Project Type:</b>	<b>Stories:</b> 5 <b>Occupancy:</b> A-2, B, S <b>Construction Type:</b> III-A
<b>Building/Business Name:</b> Oregon pacific Building	<b>Fire Sprinklers:</b> Yes - throughout
<b>Appeal Involves:</b> Reconsideration of appeal	<b>LUR or Permit Application No.:</b> 15-110784-CO
<b>Plan Submitted Option:</b> pdf [File 1] [File 2] [File 3] [File 4] [File 5]	<b>Proposed use:</b> Office, Banquet and Storage

### APPEAL INFORMATION SHEET

#### Appeal item 1

<b>Code Section</b>	Table 601
<b>Requires</b>	One hour rating of Primary Structural Frame for Type III-a Construction
<b>Proposed Design</b>	<p>per appeal item 3 # 11249- The existing building was built in the 1890's and has brick bearing walls around its entire perimeter except from the basement to the second floor at the north and east sides. The interior heavy timber structural floor frame is supported by cast iron pipe columns varying in size from 9" diameter (basement) to 5" diameter (fifth floor), with wall thickness of 1".</p> <p>The proposed design is to coat all interior pipe columns from basement through roof with intumescent paint to achieve a one hour rating. The building is fully sprinklered.</p>
<b>Reason for alternative</b>	<p>per appeal item 3 #11249- A tested assembly for cast iron columns protected with intumescent paint does not exist, and the cost of such a test is extravagantly expensive to perform on a building material that was no longer commonly used structurally after the 1900s. In lieu of formal physical testing of the assembly the appellant has done considerable research to prove that the proposed intumescent coating thicknesses and products selected will perform to their require fire resistance ratings. Working with a fire protection engineer and a representative from Carboline, we have established a paint thickness that will protect the column from reaching its yield point of failure beyond 1 hour. The process for creating this thickness is described in supporting documents as listed below including a letter from a fire protection engineer (3.1). Please reference Detail 3 (3.2) for the plan section of the described column.</p> <p><b>**Change in manufacturer from Carboline to Sherwin Williams**</b></p> <p>Re appeal item 1- ITSdesign_AD-CA90-02.pdf</p> <p>Re appeal item 2- LE - use of FIRETEX with cast iron - 09052019 CB.pdf</p>

Re appeal item 3 -OPB - RFI 227.pdf

The use of intumescent paint allows a cost effective approach to fire proofing the building and allows the original structure of the building to be exposed and expressed.

With the proposed measures listed above, we believe that the fire safety of the columns is not compromised by the alternate method proposed and equal performing life safety and fire protection measures are provided.

## Appeal item 2

**Code Section** Table 601, 704.10

**Requires** Section 704.10 requires load bearing structural members located within the exterior walls to be provided with the highest fire-resistive rating as determined in accordance with table 601 for exterior bearing walls.

Table 601 requirement for exterior bearing walls for type III-A is a 2 hour fire-resistive rating.

**Proposed Design** Per Appeal item 4 # 11249 The existing building was built in the 1890's and has brick bearing walls around its entire perimeter except from the basement to the second floor at the north and east sides. The exterior masonry wall is supported by large I-section cast iron columns (referred to a "double E columns") following the perimeter of the building. The proposed design is to coat all of these columns from the first floor to the second at the beginning of the masonry wall with intumescent paint to achieve a two hour rating. The building is fully sprinklered.

**Reason for alternative** per appeal item 4 #11249- A tested assembly for cast iron columns protected with intumescent paint does not exist, and the cost of such a test is extravagantly expensive to perform on a building material that was no longer commonly used structurally after the 1900s. In lieu of formal physical testing of the assembly the appellant has done considerable research to prove that the proposed intumescent coating thicknesses and products selected will perform to their required fire resistance ratings. Working with a fire protection engineer and a representative from Carboline, we have established a paint thickness that will protect the column from reaching its yield point of failure beyond 2 hours. The process for creating this thickness is described in supporting documents as listed below including a letter from a fire protection engineer (4.1). Please reference Detail 5 (4.2) for the plan section of the described column.

\*\*\*\* Change in manufacturer from Carboline to Sherwin Williams\*\*\*

Re appeal item 1- ITSdesign\_AD-CA90-02.pdf

Re appeal item 2- LE - use of FIRETEX with cast iron - 09052019 CB.pdf

Re appeal item 3 -OPB - RFI 227.pdf

The use of intumescent paint allows a cost effective approach to fire proofing the building and allows the original structure of the building to be exposed and expressed.

With the proposed measures listed above, we believe that the fire safety of the columns is not compromised by the alternate method proposed and equal performing life safety and fire protection measures are provided.

## APPEAL DECISION

**1. Intumescent coating on pipe columns to achieve 1 hour protection per Fire Engineering report: Hold for additional information.**

**2. Intumescent coating on columns to achieve 2 hour protection per Fire Engineering report: Hold for additional information.**

**Appellant may contact John Butler (503 823-7339) with questions.**



CB/CB

9<sup>th</sup> May, 2019

## **Re: The use of FIRETEX coatings on cast iron structural members**

Cast iron, particularly in the form of load bearing columns, has historically been utilised in construction due to its well-recognised strength in compression. Modern buildings typically use steel as the structural element, due to the flexibility afforded to the architect by the desirable properties this material offers. FIRETEX intumescent coatings are formulated and tested on steel and have been used on many of the world's most iconic structures.

There are a numerous pre-existing structures made from cast iron globally; the purpose of this note is to demonstrate that FIRETEX materials are also suitable for use on cast iron structural elements.

Steel is an alloy of iron, containing carbon and several additional elements dependent on the properties required from the steel. Cast iron is also an alloy comprising of iron and carbon, also including silicon. As mentioned, this alloy produces a material of significant compressive strength, similar to a number of low-medium carbon content grades of steel. It is because of this strength in compression that it has historically been used as a vertical load bearing element.

### **Thermal Properties**

Steel and cast iron have very similar thermal conductivity and specific heat capacity properties (taken from Engineersedge.com):

Material	Thermal conductivity (W/m.K)	Specific heat capacity (J/Kg.°C)
0.5% carbon steel	54	465
Cast Iron	55	460.5

These factors show that both grades of material will rise in temperature at effectively the same rate if exposed to the same fire conditions.

### **Strength Retention**

If we consider the graph below, we can see that cast iron retains ~60% of its strength at a temperature of 538°C/1000°F (the temperature that structural columns are tested to as part of ASTM E119/UL263 testing). By comparison, structural steel is seen to retain only 40% of its strength at this temperature, clearly illustrating that cast iron has a greater retention of its strength at elevated temperatures.

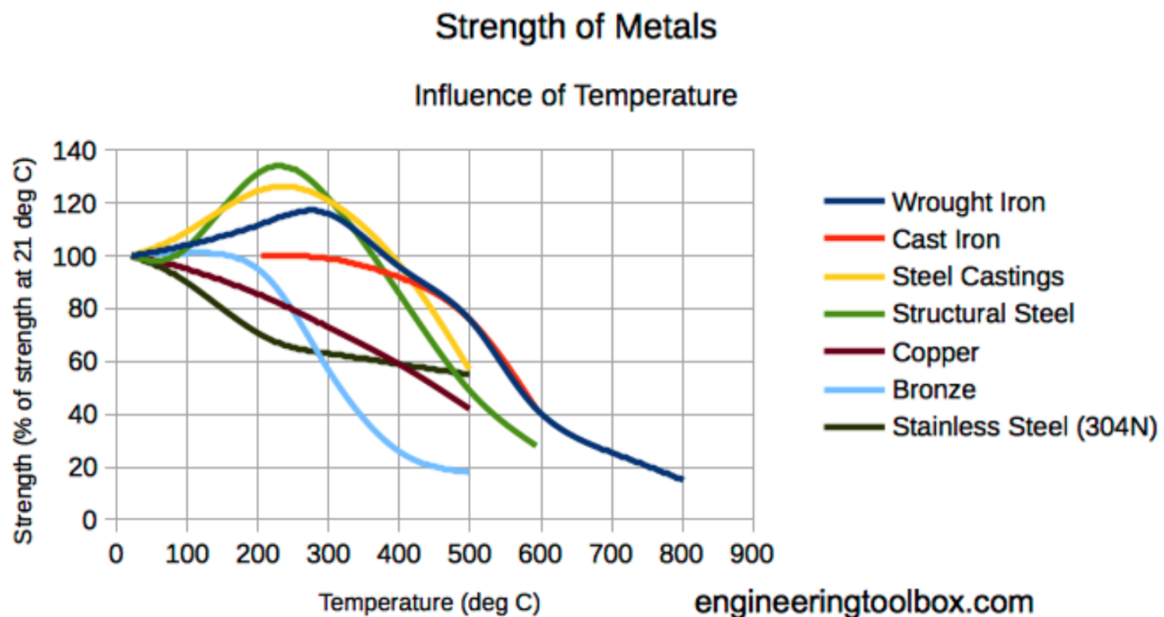


Image copied from engineeringtoolbox.com

### **FIRETEX Intumescent Coatings**

The FIRETEX range of intumescent coatings are formulated to delay the effects of fire on the core temperature of the structural element being protected. These work by undergoing a series of reactions that ultimately produce an insulating char layer to protect the underlying substrate. Through third party testing, a series of thicknesses are calculated designed to protect materials of different W/D (A/P in the case of closed profile elements) for varying time periods eg 60, 120 minutes. FIRETEX materials are designed to provide protection to a wide range of steel sizes, for time periods greater than 120 minutes.

### **FIRETEX on cast iron**

The purpose of using FIRETEX materials on cast iron is to delay the effect of fire on the core temperature of the member, in the same way that FIRETEX is used on steel. By referring to the thermal property information stated above, we can see that steel and cast iron will heat up at effectively the same rate in a fire. As a result of this, FIRETEX materials will afford the same degree of delay in temperature rise on both types of material. As such, it is possible to apply the same thickness of intumescent coating to protect same sized members of cast iron or steel structure.

This is recognised within the scope section of ETAG 018-2, Guideline for European Technical Approval of Fire Protective Products, where reference is made to the fact that “this ETA-Guideline can also be used as a basis for the assessment of cast iron.” This is also echoed in a letter from Exova (third party testing and certification authority in Europe) to Sherwin-Williams dated 11/11/16.



**SHERWIN-WILLIAMS®**  
**Protective & Marine Coatings**



## Conclusion

It has been shown that from a thermal response perspective, cast iron and steel will heat up at effectively the same rate. Subsequently, FIRETEX intumescent coating will provide the same degree of fire protection to structural members of the same size and dimension when made of either cast iron or steel. When we also consider that cast iron retains a greater degree of strength than steel at temperatures  $>400^{\circ}\text{C}$ , it can be seen that we are actually producing a more conservative solution by using FIRETEX on cast iron.

As such, the UL design thicknesses for FIRETEX materials can be used on cast iron members of the same W/D (A/P) as the listed carbon steel profiles.

Yours faithfully,

**Carl Burrell**  
Global Product Manager - Fire  
Sherwin-Williams Protective & Marine Coatings

Westward Homes, LLC

225 SW 1st Ave

Portland, OR 97204

(503) 960-0371

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Greg Beuving

## REQUEST FOR INFORMATION

PROJECT NAME				RFI NUMBER		DATE OF REQUEST	
OPB				227		3/20/2019	
PROJECT LOCATION				PROJECT ID		DRAWING ID	
SW 4th & SW Washington							
RFI OVERVIEW				SECTION(S) REFERENCED			
Intumescent Engineering				None			
CHANGE IN COST				CHANGE IN TIME			
	NO CHANGE				NO CHANGE		
	INCREASE IN COST	\$	-		INCREASE IN TIME	# of Days =	
	DECREASE IN COST	\$	-		DECREASE IN TIME	# of Days =	

## REQUEST / CLARIFICATION REQUIRED

I contacted Sherwin Williams to provide the Intumescent paint for the cast iron/steel at the OPB Project. Please review the attached documentation to verify it meets all of the requirements.

NAME & TITLE OF REQUESTING PARTY			DATE OF REQUEST	
Brett Schulz/John Wright - Architects			03/20/09	

## RESPONSE - REQUESTED BY 3/28/2019

NAME & TITLE OF RESPONDING PARTY			DATE OF RESPONSE	



Protective  
&  
Marine  
Coatings



# FIRETEX FX5090 WATERBASED INTUMESCENT COATING

B59W5090

WHITE

Revised: November 29, 2017

## PRODUCT INFORMATION

### PRODUCT DESCRIPTION

**FIRETEX FX5090** is a waterbased thin-film intumescent fire protection coating for use on interior and exterior\* exposed structural steel substrates. The product is designed to meet the highest performance, aesthetic, and environmental demands of today's commercial construction industry with ratings up to two hours. Its smooth paint-like finish allows architects to design using exposed steel for a decorative and aesthetic final appearance.

- Provides up to 2 hours fire protection
- Single component
- Aesthetic finish
- Impact resistant
- Outstanding application characteristics
- Does not contain TCEP
- UL Classified for exterior use\*

\*When topcoated with Pro Industrial Waterbased Acrolon 100 per the appropriate UL Design

### PRODUCT CHARACTERISTICS

Finish:	Flat
Color:	White
Volume Solids:	69% ± 3% (ASTM-D2697)
Weight Solids:	71%
VOC:	<25g/l VOC, (EPA method 24)

#### Recommended Thickness:

Required total DFT for a specific fire rating is dependent on steel section and size. Consult Sherwin-Williams Sales Representative for details.

#### Recommended Spreading Rate per coat:

	Airless Spray	Brush
Wet mils (microns)*	40.0 (1000)	18.0 (450)
Dry mils (microns)**	28.0 (700)	12.0 (300)
~Coverage sq ft/gal (m <sup>2</sup> /L)	40 (1.0)	92 (2.3)
Theoretical coverage sq ft/gal (m <sup>2</sup> /L) @ 1 mil / 25 microns dft	1104 (27.1)	

\*Maximum sag tolerance is 50.0 mils (1250 microns) wet by airless spray.

#### Drying Schedule:

	@ 41°F/5°C	@ 60°F/15°C	@ 73°F/23°C
*To touch:	12 hours	3 hours	90 minutes
*To recoat:	16 hours	6 hours	4 hours

\*Drying time is temperature, humidity, and film thickness dependent.

**Note; No more than 2 coats by airless spray should be applied within any 24 hour period.**

Shelf Life:	6 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C).
Reducer/Clean Up:	Water
Flash point:	>200°F/93°C

### RECOMMENDED USES

- Interior conditioned spaces (ICSs) (no topcoat required)
- Interior General Spaces (IGSs) (with topcoat)
- Exterior environments with a topcoat of Pro Industrial™ Water-Based Acrolon™ 100 Urethane (note - an epoxy seal coat is not required)
- Suitable for use in USDA inspected facilities
- Commercial buildings
- Healthcare / Hospitals
- Hotels
- Educational buildings
- Stadiums
- School gymnasiums
- Warehouses
- Airports
- Atriums
- Iconic structures
- Public buildings
- Convention centers

### APPROVALS

- UL 263 listed
- UL Classified - UL CDXA and UL CDYD
- FX5090 has been investigated to the requirements of ANSI/UL 263 and CAN/ULC-S101 for Interior Conditioned Space, Interior General Purpose and Exterior use in Design Nos. D994, N642, Y635 and Y636.

### PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060	500 cycles 246 mg loss 1000 cycles 470 mg loss
Adhesion	ASTM D4541-09	318 psi
Durometer Hardness	ASTM D2240-05	Shore D - 61
Impact Resistance	ASTM D2794-93	44 in. lbs.
Surface Burning	ASTM E84	Class A Flame Spread - 0 Smoke Developed - 75

### APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

#### Airless Spray

Nozzle Size: .....HD .X23- .X25 (depending on application requirements)  
Operating Pressure: .....2800-3000 psi (197-211 kg/cm<sup>2</sup>)

Airless fluid line hose with 3/8" ID is recommended. Lengths less than 100' feet of 3/8" ID fluid are recommended with a 10' 1/4 ID whip hose. All pump and gun filters must be removed.

#### Brush

FIRETEX FX 5090 may be brush applied using a quality feather tipped brush such as the Purdy Nylox Soft. The typical maximum film build is 18 mils with faint brush marks remaining.





Protective  
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Marine  
Coatings



# FIRETEX FX5090 WATERBASED INTUMESCENT COATING

B59W5090

WHITE

Revised: November 29, 2017

## PRODUCT INFORMATION

### RECOMMENDED PRIMERS

Must be primed with approved primer. Material can not be applied over zinc rich primers or directly to galvanized steel.

#### Approved Primers:

Kem Kromik Universal Primer  
Pro Industrial ProCryl Universal Primer  
Kem Bond HS  
Recoatable Epoxy Primer

Contact your Sherwin-Williams Representative for specific information.

### RECOMMENDED TOPCOATS

**Must be topcoated with an approved topcoat. Subsequent maintenance and repaint must also be done with an approved topcoat.**

#### Approved Topcoats:

Acrolon 7300  
Duration Home  
EcoSelect  
Emerald  
Harmony  
Hi-Solids Polyurethane  
Metalatex  
Pro Industrial DTM Acrylic  
Pro Industrial Pre-Catalyzed Epoxy  
Pro Industrial Multi-Surface Acrylic  
Pro Industrial Waterbased Acrolon 100 (only topcoat approved for exterior steelwork)  
Pro Mar 200 Zero VOC  
Pro Mar 400 Zero VOC  
Solo  
SuperPaint  
Waterbased Catalyzed Epoxy

Contact your Sherwin-Williams Representative for specific information

### ADDITIONAL NOTES

The dry time of this material is retarded by high humidity conditions. Lack of air movement also slows down the drying process, and under such conditions it is advisable to introduce some method of circulating air over the coated surface in order to speed up the drying. A ventilated air speed of 6 feet per second is recommended.

### CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Water. Clean tools immediately after use with Water. Follow manufacturer's safety recommendations when using any solvent.

### SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

### SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

### TINTING

**DO NOT TINT**

### APPLICATION CONDITIONS

**FIRETEX FX5090 must be applied in a dry internal environment. It must not be exposed to condensation, damp or wet conditions during or after application.**

Temperature: 40°F (5°C) minimum\*  
(air, surface, and material)  
At least 5°F (3°C) above dew point  
Relative humidity: 80% maximum\*\*

\*At application temperatures below 50°F (10°C), drying times will be significantly extended, and spraying characteristics may be impaired. Proper film formation may not occur below 40°F (5°C)

\*\*Relative humidity must be <80% to ensure proper film formation

Extended overcoating times may be required at low temperatures and/or high film thicknesses.

Occasionally cracking may occur on edges of flanges and external or internal angles of structural steel, depending on geometry, over-application and ambient conditions. This does not detrimentally affect the fire performance properties of the product.

### ORDERING INFORMATION

Packaging: 5 gallons (18.9L) of material in 5 gallon pail  
Weight: 11.6 lb/gal ; 1.39 Kg/L

### DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

### WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



## Client Schedule



<b>Project Reference</b>	FE40811	<b>Project Name</b>	OPB
<b>Region/Approval</b>	USA - UL263 / E119		
<b>Date Created</b>	06/03/2019 14:33:18	<b>Date Last Changed</b>	06/03/2019 14:33:18

**Location**

<b>Site Address</b>	<b>Site Contact</b>	<b>Site Phone</b>
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<b>Customer</b>	<b>Design Code</b>	n/a
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**Customer Contact**
**Project Description**

**Comments** NOTE - Dry Film Thickness output of the FIRETEX Design Estimator software is as per the UL Listed/Verified process - see report Verification footnote

Please note any assumptions (A) and any known comments (K)

Exterior / Dry Interior Conditioned Space (ICS) environment assumed. (A)

Floor construction: Concrete Slab + Fluted Deck with FILLED VOIDS. Fire-stop is not included in this offer. The GC should be notified of this cost implication. (A)

In the absence of instruction section exposure assumed as follows - All beams as 3-sided restrained & all columns as 4-sided. (A)

Hourly rating is assumed as 2 hours for ext columns and 1 hour for the rest of the profiles. (A)

Items marked \*\* use Third Party Tested and UL Assessed data for this UL Listed product. This must be approved by Authority Having Jurisdiction (AHJ) / Building Official (BO) for this project.(A)

Topcoat required for exterior environment -Waterbased Polyurethane topcoat, Type Acrolon 100 applied at a dry film thickness of 6 mils. (K)

Joists are not included. (A)

	Reference		Section Details									Fire Protection					Topcoat			
	Group	Item	Designation	Exp	/ Use	Data Type	Qty	Length	UL/Data	UL/Data	Area (f²)	F/R	Product	DFT	WFT	Amount	Topcoat	DFT	WFT	Amount
								(f)	Type	Design				(mils)	(mils)	(US Gallons)		(mils)	(mils)	(US Gallons)
1	**	EXT Column	22"x9"x1.25"	P /			1	40.0	1	Y635	310.0	120 min	FX5090	60	87	16.9	Acrolon100	6	13	2.5
2			12.0x1.0	F /	C	C	1	90.0	1	Y636	282.7	60 min	FX5090	36	52	9.2		0	0	0.0
3			9.0x1.0	F /	C	C	1	30.0	1	Y636	70.7	60 min	FX5090	36	52	2.3		0	0	0.0
4			8.0x1.0	F /	C	C	1	30.0	1	Y636	62.8	60 min	FX5090	36	52	2.1		0	0	0.0
5			HSS8x8x1/2	4S /	C	C	1	30.0	1	Y636	75.7	60 min	FX5090	61	88	4.2		0	0	0.0
6			W10x26	3S /	B	R	1	60.0	1	N642	184.4	60 min	FX5090	48	70	8.0		0	0	0.0
7	**	EXT Column	22"x9"x1.25"	P /			1	136.0	1	Y635	1,054.0	120 min	FX5090	60	87	57.3	Acrolon100	6	13	8.6

## Client Schedule



Project Reference FE40811      Project Name OPB  
 Region/Approval USA - UL263 / E119  
 Date Created 06/03/2019 14:33:18      Date Last Changed 06/03/2019 14:33:18

	Reference		Section Details									Fire Protection					Topcoat			
	Group	Item	Designation	Exp	/ Use	Data Type	Qty	Length (f)	UL/Data Type	UL/Data Design	Area (ft²)	F/R	Product	DFT (mils)	WFT (mils)	Amount (US Gallons)	Topcoat	DFT (mils)	WFT (mils)	Amount (US Gallons)
8			9.0x1.0	F /	C	C	1	153.0	1	Y636	360.5	60 min	FX5090	36	52	11.8		0	0	0.0
9			8.0x0.5	F /	C	C	1	51.0	1	Y636	106.8	60 min	FX5090	56	81	5.4		0	0	0.0
10			W18x106	3S /	B	R	1	130.0	1	N642	748.9	60 min	FX5090	26	38	17.6		0	0	0.0
11			9.0x1.0	F /	C	C	1	132.0	1	Y636	311.0	60 min	FX5090	36	52	10.2		0	0	0.0
12			W10x26	3S /	B	R	1	45.0	1	N642	138.3	60 min	FX5090	48	70	6.0		0	0	0.0
13			W8x21	3S /	B	R	1	20.0	1	N642	52.3	60 min	FX5090	49	71	2.3		0	0	0.0
14			8.0x1.0	F /	C	C	1	132.0	1	Y636	276.5	60 min	FX5090	36	52	9.0		0	0	0.0
15			W10x26	3S /	B	R	1	45.0	1	N642	138.3	60 min	FX5090	48	70	6.0		0	0	0.0
16			W8x21	3S /	B	R	1	20.0	1	N642	52.3	60 min	FX5090	49	71	2.3		0	0	0.0
17			7.0x1.0	F /	C	C	1	132.0	1	Y636	241.9	60 min	FX5090	36	52	7.9		0	0	0.0
18			W10x26	3S /	B	R	1	45.0	1	N642	138.3	60 min	FX5090	48	70	6.0		0	0	0.0
19			W8x21	3S /	B	R	1	20.0	1	N642	52.3	60 min	FX5090	49	71	2.3		0	0	0.0
20			5.0x1.0	F /	C	C	1	132.0	1	Y636	172.8	60 min	FX5090	36	52	5.7		0	0	0.0
21			W10x26	3S /	B	R	1	45.0	1	N642	138.3	60 min	FX5090	48	70	6.0		0	0	0.0
22			W8x21	3S /	B	R	1	20.0	1	N642	52.3	60 min	FX5090	49	71	2.3		0	0	0.0

Theoretical Properties

Product	Area (f²)	Amount (US Gallons)	Number of Units
FX5090	5,020.92	200.78	41 x 5.00 US Gallons
Total Coated	5,020.92	200.78	
Total Area (f²)	5,020.92		
Total Gross 4 Sided (f²)	5292.61		

Topcoat	Area (f²)	Amount (US Gallons)	Number of Units
	3,656.92		
Acrolon100	1,364.00	11.15	12 x 1.00 US Gallon
Total Coated	1,364.00	11.15	
Total Area (f²)	5,020.92		

## Legal Waiver

### DISCLAIMER

FIRETEX Design Estimator™ (“the Software”) is the sole property of Sherwin-Williams Protective and Marine Coatings (“Sherwin-Williams”) and has been developed with the intention of allowing the user to obtain guidance as to the volumes and thicknesses of paints required for any particular construction project.

Sherwin-Williams has exercised reasonable skill and care to ensure that, when correctly installed and used in accordance with the instructions provided, the Software should produce accurate guidance as to the thicknesses and volumes of paints required as verified by the Software's Third Party Verification Certificates (see Verification section below) However, users must carefully check and verify the results and reliance on the Software is at user's own risk.

Please note in particular that, **unless alternatively specified**, quoted Dry Film Thicknesses (“DFT”) and therefore forecast paint volumes, are based upon accepted industry standard practices derived from a number of sources, depending on the particular country, market and design code, and the user should take care to verify (and if necessary adjust) the DFTs and limiting temperatures which it wishes to apply according to its required specification.

The DFTs for cellular beams and fire engineered sections are calculated based upon either limiting temperatures supplied by a third party, upon calculations by Sherwin-Williams or upon data supplied from Sherwin-Williams' product specific cell beam testing and assessments. DFTs for these limiting temperatures will be based upon Sherwin-Williams' own Multi Temperature Analysis product data. Default values for the limiting temperature of cellular beams specified in the Software may have been derived using a third party supplied calculation module embedded within the Software and again should be verified (and if necessary, adjusted) by the user according to its required specification. Notwithstanding that the Software may suggest certain default values for DFT, limiting temperatures or other variables, it remains at all times the responsibility of the user to verify and if necessary alter such values.

Results are provided for general guidance only and are without any warranty of any kind express or implied.

Without prejudice to the generality of the foregoing, Sherwin-Williams accepts no liability whatsoever for any losses incurred by inaccurate or unreliable results received from the Software and which is due to the input by the user of inaccurate, estimated or erroneous data, or by a failure by the user to verify/amend any default or other values which may appear in the Software.

All supplied take-off quantities are based on theoretical figures only and contractor's norms should be included for the calculation of wastage, coatback and other losses.

Contractors must satisfy themselves on the accuracy of the area.

The information contained in this schedule has been produced under the terms of the FDE software license and must not be passed to any third party without written permission from the licensee or Sherwin-Williams.

Technical Notes

PGE denotes an estimated plate girder (built-up I section) section factor has been used where sufficient data regarding web and flange thicknesses cannot be provided.

To comply with U.L. listed Certification, the void above the top flange of a steel beam, where a fluted metal decking profile has been specified, should be filled with a non-combustible material, as per Sherwin-Williams U.L. listed specifications.

Restrained Beam (R) / Unrestrained Beam (U) / Restrained Assembly (RA) / Column (C) data types may have been selected as noted, if in doubt consult with Sherwin-Williams.

Please note that the DFTs given in this document MAY have been derived using fire engineering principles.

UL Type refers to use of different classifications of UL Listings. 1 = UL263, 2 = CDXA, 3 = CDYD, 4 = E119 please consult with your Sherwin-Williams Representative for further clarification or go to the UL website (www.ul.com).

Verification

UL verifies that the FDE correctly calculates the W/D or A/P ratios for the steel sections given in ASTM A6/A36 and outputs the appropriate thickness of FIRETEX FX5120 for a specified steel section and fire resistance period in accordance with the UL listings under Code Categories BXUV and BXUV7 for Designs N636, Y623, Y624 and D981 and Code Category CDXA Certificate BS-RC-0012 (This relates to the performance in accordance with BS 476: Part 21: 1987 only and does not confer nor imply compliance with any UL 263 listings). The UL Verification is covered by UL Reference: File R38275 Project Number 478 678 2911, for clarification and full verification scope please refer to the UL website www.ul.com

The output is suitable for solid sections only.

UL verifies that the FDE correctly calculates the W/D or A/P ratios for the steel sections given in ASTM A6/A36 and outputs the appropriate thickness of FIRETEX FX5090 for a specified steel section and fire resistance period in accordance with the UL listings under Code Categories BXUV and BXUV7 for Designs N642, Y635, Y636 and D994 and Code Categories CDYD (Certificate ISO-RC-0010) and CDXA (Certificate BS-RC-0018). CDYD and CDXA listings only relate to the performance in accordance with ISO 834-11: 2014 and BS 476: Part 21: 1987 respectively and do not therefore confer nor imply compliance with UL263.

- The verification of the software does not address the following:
- Given the nature of software, the verification does not verify that the software will always operate uninterrupted or error free.
  - The accuracy and bona fide nature of output files or reports.
  - Verification that the software cannot be misused or abused.
  - The procedure for updating the software.

Key

Exp = Exposure

3S = 3-Sided, 4S = 4-Sided, 3SA = 3-sided A, 3SB = 3-Sided B, P = Partial Exposure, MSA = Mid-Span A, MSB = Mid-Span B, EdA = Edge A, EdB = Edge B, F = Full

Use = Section Use

B = Beam, EB = Edge Beam, C = Column, Br = Fully Loaded Brace

BC = Building Category

1 = UL263, 2 = CDXA, 3 = CDYD, 4 = E119

