



BXUV.X649 - FIRE-RESISTANCE RATINGS - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

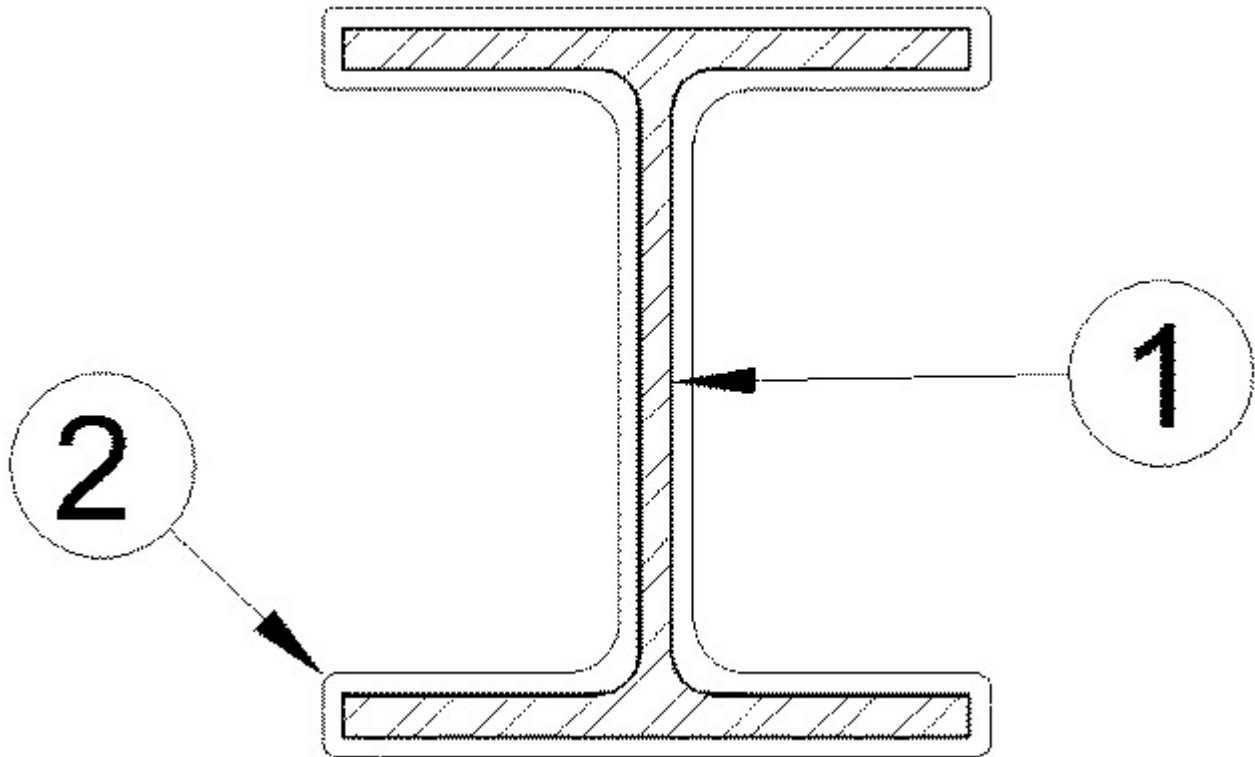
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. X649

October 04, 2016

Ratings - 1, 1-1/2, 2, 3 and 4 Hr. (See Item 2)

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Steel Column** — Wide flange steel columns with the minimum sizes shown in the tables below. Columns shall be free of dirt, loose scale and oil. Columns shall be primed with a phenolic modified alkyd resin primer, a metal alkyd primer, an acrylic primer or an epoxy primer at a nominal thickness of 2 mil.

2. **Mastic and Intumescent Coatings*** — Coating spray, brush or trowel applied directly from containers to desired thickness. See tables below for appropriate final dry thickness and applicable rating.

Steel Size	W/D	1 Hr Min Thickness, In.	1-1/2 Hr Min Thickness, In.	2 Hr Min Thickness, In.	3 Hr Min Thickness, In.	4 Hr Min Thickness, In.
W8 x 10	0.33	0.145	0.266	NR	NR	NR
W12 x 14	0.36	0.133	0.263	NR	NR	NR
W12 x 16	0.41	0.117	0.230	NR	NR	NR
W6 x 12	0.44	0.109	0.215	0.338	NR	NR
W8 x 15	0.48	0.100	0.197	0.310	NR	NR
W10 x 22	0.52	0.092	0.182	0.286	NR	NR
W4 x 13	0.55	0.087	0.172	0.271	NR	NR
W6 X 16	0.58	0.083	0.163	0.257	0.504	NR
W8 x 24	0.59	0.075	0.130	0.213	0.504	NR
W14 x 34	0.63	0.075	0.130	0.213	0.489	NR
W8 x 28	0.68	0.070	0.130	0.213	0.453	NR
W8 x 35	0.74	0.065	0.128	0.201	0.416	NR
W10 x 39	0.78	0.061	0.121	0.191	0.395	NR
W10 x 49	0.84	0.057	0.113	0.177	0.367	NR
W10 x 45	0.89	0.054	0.106	0.167	0.346	NR

W16 x 57	0.95	0.050	0.099	0.157	0.324	NR
W8 x 48	1.00	0.048	0.095	0.149	0.308	NR
W14 x 90	1.07	0.045	0.088	0.139	0.288	NR
W10 x 68	1.14	0.042	0.083	0.131	0.270	NR
W18 x 97	1.21	0.040	0.078	0.123	0.255	NR
W10 x 77	1.28	0.038	0.074	0.116	0.241	NR
W16 x 100	1.36	0.036	0.069	0.109	0.227	NR
W10 x 88	1.45	0.034	0.065	0.103	0.213	NR
W14 x 132	1.54	0.032	0.061	0.097	0.200	NR
W12 x 120	1.64	0.030	0.058	0.091	0.188	NR
W33 x 221	1.72	0.028	0.058	0.088	0.188	0.433
W14 x 159	1.77	0.028	0.056	0.085	0.187	0.423
W14 x 176	1.95	0.025	0.051	0.077	0.178	0.384
W14 x 193	2.12	0.023	0.047	0.071	0.164	0.353
W14 x 211	2.30	0.023	0.043	0.066	0.151	0.326
W14 x 233	2.52	0.023	0.040	0.060	0.138	0.297
W14 x 257	2.75	0.023	0.036	0.055	0.126	0.272
W14 x 283	3.00	0.023	0.033	0.050	0.116	0.194

NR = No Rating

As an alternate to the above table, the required thickness of coating (in inches) to be applied to all surfaces of wide flange steel columns for 1 hour ratings, in the W/D range of 0.33 to 1.14, may be determined from the following equation:

$$T = 0.04785/(W/D)$$

Where T = Thickness of coating in the range of 0.042 to 0.145 in., W = Weight of steel column in pounds per linear foot, D = Heated perimeter of steel column section in inches.

As an alternate to the above table, the required thickness of coating (in inches) to be applied to all surfaces of wide flange steel columns for 1-1/2 hour ratings, in the W/D range of 0.33 to 1.64, may be determined from the following equation:

$$T = 0.0945/(W/D)$$

Where T = Thickness of coating in the range of 0.058 to 0.266 in., W = Weight of steel column in pounds per linear foot, D = Heated perimeter of steel column section in inches.

As an alternate to the above table, the required thickness of coating (in inches) to be applied to all surfaces of wide flange steel columns for 2 hour ratings, in the W/D range of 0.44 to 1.64, may be determined from the following equation:

$$T = 0.1489/(W/D)$$

Where T = Thickness of coating in the range of 0.091 to 0.338 in., W = Weight of steel column in pounds per linear foot, D = Heated perimeter of steel column section in inches.

As an alternate to the above table, the required thickness of coating (in inches) to be applied to all surfaces of wide flange steel columns for 3 hour ratings, in the W/D range of 0.58 to 1.64, may be determined from the following equation:

$$T = 0.3082/(W/D)$$

Where T = Thickness of coating in the range of 0.188 to 0.504 in., W = Weight of steel column in pounds per linear foot, D = Heated perimeter of steel column section in inches.

As an alternate to the above table, the required thickness of coating (in inches) to be applied to all surfaces of wide flange steel columns for 4 hour ratings, in the W/D range of 1.72 to 3.00, may be determined from the following equation:

$$T = 0.749/(W/D)$$

Where T = Thickness of coating in the range of 0.433 to 0.194 in., W = Weight of steel column in pounds per linear foot, D = Heated perimeter of steel column section in inches.

As an alternate to the above, the following table listing metric units may be used.

Steel Size	M/D	Hp/A	1 Hr Min Thickness, mm	1-1/2 Hr Min Thickness, mm	2 Hr Min Thickness, mm	3 Hr Min Thickness, mm	4 Hr Min Thickness, mm
W8 x 10	19.1	412	3.68	6.76	NR	NR	NR
W12 x 14	21.2	371	3.38	6.67	NR	NR	NR
W12 x 16	24.0	327	2.96	5.85	NR	NR	NR
W6 x 12	25.9	303	2.76	5.46	8.60	NR	NR
W8 x 15	28.1	280	2.53	5.00	7.88	NR	NR
W10 x 22	30.4	258	2.34	4.62	7.27	NR	NR
W4 x 13	32.4	242	2.21	4.36	6.88	NR	NR
W6 X 16	33.9	232	2.10	4.14	6.52	12.80	NR
W8 x 24	34.6	227	1.91	3.31	5.42	12.80	NR
W14 x 34	37.1	213	1.91	3.31	5.42	12.43	NR
W8 x 28	40.0	197	1.79	3.31	5.42	11.51	NR
W8 x 35	43.6	181	1.64	3.24	5.11	10.58	NR
W10 x 39	45.4	172	1.56	3.08	4.85	10.04	NR
W10 x 49	49.1	159	1.45	2.86	4.50	9.32	NR
W10 x 45	51.9	151	1.37	2.70	4.25	8.80	NR
W16 x 57	55.9	141	1.28	2.53	3.98	8.24	NR
W8 x 48	58.6	134	1.22	2.40	3.78	7.83	NR
W14 x 90	62.6	125	1.14	2.24	3.53	7.32	NR
W10 x 68	66.9	118	1.07	2.11	3.32	6.87	NR
W18 x 97	71.0	111	1.02	1.98	3.13	6.47	NR
W10 x 77	75.2	105	0.97	1.88	2.95	6.12	NR
W16 x 100	79.4	99	0.91	1.76	2.78	5.76	NR
W10 x 88	84.9	92	0.85	1.66	2.61	5.40	NR
W14 x 132	90.0	87	0.80	1.56	2.46	5.08	NR
W12 x 120	96.2	82	0.75	1.46	2.31	4.77	NR

W33 x 221	100.9	78	0.71	1.47	2.24	4.78	11.0
W14 x 159	103.9	76	0.70	1.43	2.16	4.74	10.7
W14 x 176	114.4	69	0.63	1.30	1.96	4.52	9.75
W14 x 193	124.4	63	0.59	1.19	1.81	4.16	8.97
W14 x 211	135.0	58	0.59	1.10	1.66	3.83	8.28
W14 x 233	147.9	53	0.59	1.00	1.52	3.50	7.54
W14 x 257	161.4	49	0.59	0.92	1.39	3.21	6.91
W14 x 283	176.0	45	0.59	0.84	1.28	2.94	4.92

NR = No Rating

As an alternate to the above table, the required thickness of coating (in mm) to be applied to all surfaces of wide flange steel columns for 1 hour ratings, in the M/D range of 19.1 to 66.9, may be determined from the following equation:

$$T = 71.6/(M/D)$$

Where T = Thickness of coating in the range of 1.07 to 3.68 mm, M = Weight of steel column in kilograms per linear meter, D = Heated perimeter of steel column section in meters.

As an alternate to the above table, the required thickness of coating (in mm) to be applied to all surfaces of wide flange steel columns for 1-1/2 hour ratings, in the M/D range of 19.1 to 96.2, may be determined from the following equation:

$$T = 141.3/(M/D)$$

Where T = Thickness of coating in the range of 1.46 to 6.76 mm, M = Weight of steel column in kilograms per linear meter, D = Heated perimeter of steel column section in meters.

As an alternate to the above table, the required thickness of coating (in mm) to be applied to all surfaces of wide flange steel columns for 2 hour ratings, in the M/D range of 25.9 to 96.2, may be determined from the following equation:

$$T = 222.7/(M/D)$$

Where T = Thickness of coating in the range of 2.31 to 8.60 mm, M = Weight of steel column in kilograms per linear meter, D = Heated perimeter of steel column section in meters.

As an alternate to the above table, the required thickness of coating (in mm) to be applied to all surfaces of wide flange steel columns for 3 hour ratings, in the M/D range of 33.9 to 96.2, may be determined from the following equation:

$$T = 461.0/(M/D)$$

Where T = Thickness of coating in the range of 4.77 to 12.80 mm, M = Weight of steel column in kilograms per linear meter, D = Heated perimeter of steel column section in meters.

As an alternate to the above table, the required thickness of coating (in mm) to be applied to all surfaces of wide flange steel columns for 4 hour ratings, in the M/D range of 100.9 to 176.0, may be determined from the following equation:

$$T = 1116.4/(M/D)$$

Where T = Thickness of coating in the range of 4.92 to 11.0 mm, M = Weight of steel column in kilograms per linear meter, D = Heated perimeter of steel column section in meters.

BERLIN CO LTD — Type WB 3, Investigated for Interior General Purpose. Type WB 4, Investigated for Interior General Purpose. Type WB 4, Investigated for Exterior Use with top coat as described in Item 3

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Type WB 3, Investigated for Interior General Purpose. Type WB 4, Investigated for Interior General Purpose. Type WB 4, Investigated for Exterior Use with top coat as described in Item 3

ISOLATEK INTERNATIONAL — Type SprayFilm-WB 3 and Type WB 3, Investigated for Interior General Purpose. Type SprayFilm-WB 4 and Type WB 4, Investigated for Interior General Purpose. Type SprayFilm-WB 4 and Type WB 4, Investigated for Exterior Use with top coat as described in Item 3

NEWKEM PRODUCTS CORP — Type WB 3, Investigated for Interior General Purpose. Type WB 4, Investigated for Interior General Purpose. Type WB 4, Investigated for Exterior Use with top coat as described in Item 3

3. **Top Coat** — Type SprayFilm — TOPSEAL and Type TOPSEAL required for Exterior Use, applied at a minimum dry thickness of 14 mils (0.34 mm) over the intumescent material.

See Classification information in the **Mastic and Intumescent Coating** (CDWZ) category, Isolatek International, for mixing requirements.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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