



BXUV.Y715

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

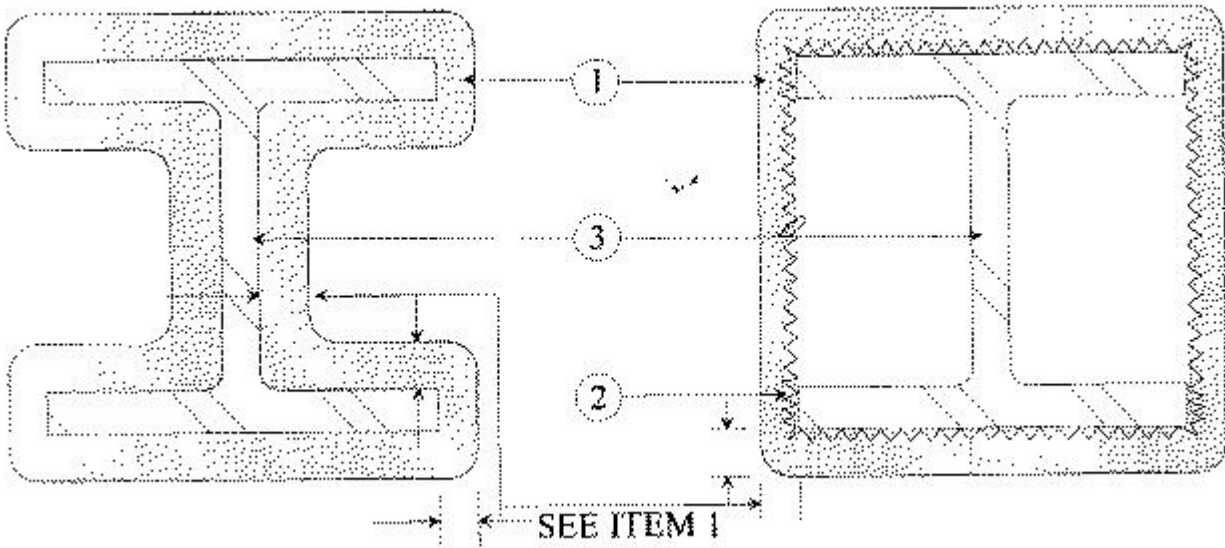
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. Y715

February 01, 2017

Ratings — 1, 1-1/2, 2, 3 and 4 h

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



1. Spray-Applied Fire Resistive Materials* — Applied by mixing with water and spraying in more than one coat to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min avg and min ind density of 15/14 pcf respectively. For method of density determination, see Design Information Section, Sprayed Material. The thickness of Spray-Applied Fire Resistive Materials to be applied to all surfaces of the column (Item 1) required for rating periods of 1 h, 1-1/2 h, 2 h, 3 h, 4 h may be determined by the equation:

$$h = \frac{R}{1.05 (W/D) + 0.61}$$

Where:

h = Spray-Applied Fire Resistive Materials thickness in the range 0.25-3.875 in.

R = Fire resistance rating in hours (1 - 4 h)

D = Heated perimeter of steel column in inches

W = Weight of steel column in pounds per foot

W/D = 0.33 to 6.62

As an alternate to the equation, the min thickness of Spray-Applied Fire Resistive Materials required for various fire resistance ratings of contour sprayed or boxed columns may be determined from the table below:

Min Col Size	W/D	Min Thk In.				
		1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W6X9	0.33	1-1/8	1-1/2	2	2-1/2	3-1/8
W6X16	0.57	13/16	1-1/4	1-11/16	2-1/2	3-5/16
W8X28	0.67	3/4	1-3/16	1-3/8	2	2-11/16
W10X49	0.83	11/16	7/8	1-1/8	1-11/16	2-1/2
W14X228	2.49	5/16	1/2	9/16	7/8	1-1/4
W14X730	6.62	5/16	5/16	5/16	3/8	9/16

The thicknesses contained in the table below are applicable when the Spray-Applied Fire Resistive Materials applied to columns' flange tips are reduced to one-half that shown in the table below:

Member **Half Flange Tip Thickness**

Min. Column Size	W/D	1 hr	1.5 hr	2 hr	3 hr	4 hr
W6x9	0.340	1-1/8	1-5/8	2	2-15/16	3-15/16
W10x12	0.347	1-1/8	1-5/8	2	2-15/16	3-7/8
W12x14	0.363	1-1/16	1-5/8	1-15/16	2-7/8	3-13/16
W12x16	0.410	1-1/16	1-9/16	1-7/8	2-13/16	3-11/16
W8x13	0.421	1-1/16	1-9/16	1-7/8	2-3/4	3-11/16
W10x15	0.429	1-1/16	1-9/16	1-7/8	2-3/4	3-5/8
W6x15	0.431	1	1-9/16	1-7/8	2-3/4	3-5/8
W6x12	0.448	1	1-1/2	1-13/16	2-11/16	3-9/16
W14x22	0.476	1	1-1/2	1-13/16	2-11/16	3-1/2
W8x15	0.481	1	1-1/2	1-13/16	2-5/8	3-1/2
W10x17	0.482	1	1-1/2	1-13/16	2-5/8	3-1/2
W12x19	0.485	1	1-1/2	1-13/16	2-5/8	3-1/2
W8x18	0.499	1	1-7/16	1-3/4	2-5/8	3-7/16
W16x26	0.499	1	1-7/16	1-3/4	2-5/8	3-7/16
W10x22	0.523	15/16	1-7/16	1-3/4	2-9/16	3-7/16
W12x26	0.531	15/16	1-7/16	1-3/4	2-9/16	3-7/16
W10x19	0.538	15/16	1-7/16	1-11/16	2-9/16	3-7/16
W5x16	0.550	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W4x13	0.556	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W14x26	0.559	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W12x22	0.560	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W14x30	0.562	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W6x20	0.563	15/16	1-7/16	1-11/16	2-1/2	3-7/16
W8x21	0.577	7/8	1-3/8	1-11/16	2-1/2	3-3/8
W6x16	0.584	7/8	1-1/4	1-11/16	2-7/16	3-3/8
W8x24	0.591	7/8	1-1/4	1-5/8	2-7/16	3-1/4
W16x31	0.592	7/8	1-1/4	1-5/8	2-7/16	3-1/4
W18x35	0.602	7/8	1-1/4	1-5/8	2-7/16	3-3/16
W12x30	0.607	7/8	1-1/4	1-5/8	2-7/16	3-3/16
W10x26	0.612	7/8	1-1/4	1-5/8	2-7/16	3-3/16

W16x36	0.617	7/8	1-1/4	1-5/8	2-3/8	3-3/16
W14x34	0.633	13/16	1-1/4	1-5/8	2-3/8	3-1/8
W5x19	0.644	13/16	1-3/16	1-5/8	2-3/8	3-1/8
W10x33	0.661	13/16	1-3/16	1-9/16	2-15/16	3-1/16
W8x31	0.665	13/16	1-3/16	1-9/16	2-15/16	3-1/16
W21x44	0.672	13/16	1-3/16	1-9/16	2-15/16	3-1/16
W16x40	0.686	13/16	1-3/16	1-9/16	2-15/16	3-1/16
W8x28	0.688	3/4	1-3/16	1-9/16	2-15/16	3-1/16
W18x40	0.688	3/4	1-3/16	1-9/16	2-15/16	3-1/16
W6x25	0.696	3/4	1-3/16	1-9/16	2-15/16	3
W10x30	0.699	3/4	1-3/16	1-9/16	2-1/4	3
W12x35	0.703	3/4	1-3/16	1-9/16	2-1/4	3
W14x38	0.706	3/4	1-3/16	1-9/16	2-1/4	3
W12x40	0.734	3/4	1-1/8	1-1/2	2-1/4	2-15/16
W8x35	0.749	3/4	1-1/8	1-1/2	2-3/16	2-15/16
W24x55	0.749	3/4	1-1/8	1-1/2	2-3/16	2-15/16
W14x43	0.752	3/4	1-1/8	1-1/2	2-3/16	2-15/16
W21x50	0.754	3/4	1-1/8	1-1/2	2-3/16	2-15/16
W16x45	0.767	3/4	1-1/8	1-1/2	2-3/16	2-7/8
W18x50	0.778	3/4	1-1/8	1-1/2	2-3/16	2-7/8
W10x39	0.780	3/4	1-1/8	1-7/16	2-3/16	2-7/8
W18x46	0.786	3/4	1-1/8	1-7/16	2-3/16	2-7/8
W12x45	0.829	3/4	1-1/16	1-7/16	2-1/8	2-13/16
W14x48	0.835	3/4	1-1/16	1-7/16	2-1/8	2-3/4
W24x68	0.837	3/4	1-1/16	1-7/16	2-1/8	2-3/4
W10x49	0.840	3/4	1-1/16	1-7/16	2-1/16	2-3/4
W24x62	0.844	3/4	1-1/16	1-7/16	2-1/16	2-3/4
W16x50	0.846	3/4	1-1/16	1-7/16	2-1/16	2-3/4
W21x62	0.846	3/4	1-1/16	1-7/16	2-1/16	2-3/4
W8x40	0.849	3/4	1-1/16	1-7/16	2-1/16	2-3/4
W18x55	0.850	3/4	1-1/16	1-7/16	2-1/16	2-3/4

W12x53	0.855	3/4	1-1/16	1-3/8	2-1/16	2-3/4
W21x57	0.857	3/4	1-1/16	1-3/8	2-1/16	2-3/4
W10x45	0.888	3/4	1-1/16	1-3/8	2-1/16	2-11/16
W12x50	0.909	11/16	1-1/16	1-3/8	2	2-11/16
W14x53	0.915	11/16	1-1/16	1-3/8	2	2-5/8
W27x84	0.921	11/16	1-1/16	1-3/8	2	2-5/8
W10x54	0.922	11/16	1	1-3/8	2	2-5/8
W18x60	0.923	11/16	1	1-3/8	2	2-5/8
W12x58	0.925	11/16	1	1-3/8	2	2-5/8
W12x65	0.925	11/16	1	1-3/8	2	2-5/8
W21x68	0.926	11/16	1	1-3/8	2	2-5/8
W14x61	0.928	11/16	1	1-3/8	2	2-5/8
W24x76	0.933	11/16	1	1-3/8	2	2-5/8
W16x67	0.936	11/16	1	1-5/16	2	2-5/8
W16x57	0.963	11/16	1	1-5/16	1-5/16	2-9/16
W18x76	0.971	11/16	1	1-5/16	1-5/16	2-9/16
W21x73	0.989	11/16	1	1-5/16	1-5/16	2-9/16
W18x65	0.997	11/16	1	1-5/16	1-5/16	2-9/16
W8x48	1.000	11/16	1	1-5/16	1-5/16	2-1/2
W30x99	1.000	11/16	1	1-5/16	1-5/16	2-1/2
W10x60	1.010	11/16	1	1-5/16	1-7/8	2-1/2
W12x72	1.020	11/16	1	1-5/16	1-7/8	2-1/2
W24x84	1.020	11/16	1	1-5/16	1-7/8	2-1/2
W27x94	1.030	11/16	1	1-1/4	1-7/8	2-1/2
W14x68	1.040	11/16	15/16	1-1/4	1-7/8	2-1/2
W16x77	1.070	11/16	15/16	1-1/4	1-7/8	2-7/16
W24x104	1.070	11/16	15/16	1-1/4	1-7/8	2-7/16
W14x90	1.080	5/8	15/16	1-1/4	1-13/16	2-7/16
W18x71	1.080	5/8	15/16	1-1/4	1-13/16	2-7/16
W33x118	1.080	5/8	15/16	1-1/4	1-13/16	2-7/16
W18x86	1.090	5/8	15/16	1-1/4	1-13/16	2-7/16

W30x108	1.090	5/8	15/16	1-1/4	1-13/16	2-7/16
W12x79	1.110	5/8	15/16	1-1/4	1-13/16	2-3/8
W27x102	1.110	5/8	15/16	1-1/4	1-13/16	2-3/8
W14x74	1.120	5/8	15/16	1-1/4	1-13/16	2-3/8
W21x83	1.120	5/8	15/16	1-1/4	1-13/16	2-3/8
W21x101	1.130	5/8	15/16	1-3/16	1-13/16	2-3/8
W24x94	1.140	5/8	15/16	1-3/16	1-13/16	2-3/8
W10x68	1.150	5/8	15/16	1-3/16	1-3/4	2-5/16
W36x135	1.150	5/8	15/16	1-3/16	1-3/4	2-5/16
W30x116	1.160	5/8	15/16	1-3/16	1-3/4	2-5/16
W14x99	1.180	5/8	14/16	1-3/16	1-3/4	2-5/16
W33x130	1.180	5/8	14/16	1-3/16	1-3/4	2-5/16
W8x58	1.200	5/8	14/16	1-3/16	1-3/4	2-5/16
W24x117	1.200	5/8	14/16	1-3/16	1-3/4	2-5/16
W12x87	1.220	5/8	14/16	1-3/16	1-11/16	2-1/4
W16x89	1.220	5/8	14/16	1-3/16	1-11/16	2-1/4
W18x97	1.220	5/8	14/16	1-3/16	1-11/16	2-1/4
W14x82	1.230	5/8	14/16	1-3/16	1-11/16	2-1/4
W27x114	1.230	5/8	14/16	1-3/16	1-11/16	2-1/4
W21x93	1.240	5/8	14/16	1-1/8	1-11/16	2-1/4
W21x111	1.240	5/8	14/16	1-1/8	1-11/16	2-1/4
W30x124	1.240	5/8	14/16	1-1/8	1-11/16	2-1/4
W36x150	1.270	5/8	14/16	1-1/8	1-11/16	2-3/16
W10x77	1.280	5/8	14/16	1-1/8	1-11/16	2-3/16
W33x414	1.280	5/8	14/16	1-1/8	1-11/16	2-3/16
W14x109	1.290	9/16	14/16	1-1/8	1-11/16	2-3/16
W30x132	1.320	9/16	14/16	1-1/8	1-5/8	2-3/16
W18x106	1.330	9/16	14/16	1-1/8	1-5/8	2-1/8
W24x131	1.330	9/16	14/16	1-1/8	1-5/8	2-1/8
W12x96	1.340	9/16	13/16	1-1/8	1-5/8	2-1/8
W21x122	1.350	9/16	13/16	1-1/8	1-5/8	2-1/8

W27x146	1.350	9/16	13/16	1-1/8	1-5/8	2-1/8
W36x160	1.350	9/16	13/16	1-1/8	1-5/8	2-1/8
W8x67	1.370	9/16	13/16	1-1/16	1-5/8	2-1/8
W16x100	1.370	9/16	13/16	1-1/16	1-5/8	2-1/8
W33x152	1.370	9/16	13/16	1-1/16	1-5/8	2-1/8
W14x120	1.420	9/16	13/16	1-1/16	1-9/16	2-1/16
W36x170	1.430	9/16	13/16	1-1/16	1-9/16	2-1/16
W10x88	1.450	9/16	13/16	1-1/16	1-9/16	2-1/16
W21x132	1.450	9/16	13/16	1-1/16	1-9/16	2-1/16
W12x106	1.470	9/16	13/16	1-1/16	1-9/16	2
W30x173	1.470	9/16	13/16	1-1/16	1-9/16	2
W18x119	1.480	9/16	13/16	1-1/16	1-1/2	2
W24x146	1.480	9/16	13/16	1-1/16	1-1/2	2
W27x161	1.480	9/16	13/16	1-1/16	1-1/2	2
W36x182	1.520	9/16	12/16	1	1-1/2	2
W14x132	1.560	1/2	12/16	1	1-1/2	1-15/16
W33x201	1.580	1/2	12/16	1	1-7/16	1-15/16
W21x147	1.610	1/2	12/16	1	1-7/16	1-15/16
W30x191	1.620	1/2	12/16	1	1-7/16	1-7/8
W36x194	1.620	1/2	12/16	1	1-7/16	1-7/8
W24x162	1.630	1/2	12/16	1	1-7/16	1-7/8
W27x178	1.630	1/2	12/16	1	1-7/16	1-7/8
W10x100	1.640	1/2	12/16	1	1-7/16	1-7/8
W14x145	1.640	1/2	12/16	1	1-7/16	1-7/8
W12x120	1.650	1/2	12/16	15/16	1-7/16	1-7/8
W36x230	1.690	1/2	12/16	15/16	1-3/8	1-7/8
W33x221	1.730	1/2	11/16	15/16	1-3/8	1-13/16
W36x210	1.740	1/2	11/16	15/16	1-3/8	1-13/16
W30x211	1.760	1/2	11/16	15/16	1-3/8	1-13/16
W14x159	1.780	1/2	11/16	15/16	1-3/8	1-13/16
W36x245	1.790	1/2	11/16	15/16	1-3/8	1-13/16

W10x112	1.810	1/2	11/16	15/16	1-5/16	1-3/4
W12x136	1.860	1/2	11/16	7/8	1-5/16	1-3/4
W33x241	1.870	1/2	11/16	7/8	1-5/16	1-3/4
W36x260	1.900	7/16	11/16	7/8	1-5/16	1-11/16
W14x176	1.960	7/16	11/16	7/8	1-1/4	1-11/16
W36x280	2.030	7/16	10/16	7/8	1-1/4	1-5/8
W12x152	2.040	7/16	10/16	13/16	1-1/4	1-5/8
W14x193	2.140	7/16	10/16	13/16	1-3/16	1-5/8
W36x300	2.170	7/16	10/16	13/16	1-3/16	1-5/8
W12x170	2.260	7/16	10/16	13/16	1-1/8	1-5/8
W14x211	2.320	7/16	9/16	3/4	1-1/8	1-5/8
W12x190	2.500	3/8	9/16	3/4	1-1/16	1-5/8
W14x233	2.550	3/8	9/16	11/16	1-1/16	1-5/8
W12x210	2.730	3/8	8/16	11/16	1-1/16	1-7/16
W14x257	2.780	3/8	8/16	11/16	1-1/16	1-7/16
W12x230	2.960	3/8	8/16	5/8	15/16	1-3/8
W14x283	3.030	5/16	8/16	5/8	15/16	1-3/8
W12x252	3.200	5/16	8/16	5/8	7/8	1-5/16
W14x311	3.300	5/16	7/16	5/8	7/8	1-1/4
W12x279	3.500	5/16	7/16	9/16	13/16	1-1/4
W14x342	3.580	5/16	7/16	9/16	13/16	1-3/16
W12x305	3.760	5/16	7/16	9/16	13/16	1-3/16
W14x370	3.840	5/16	7/16	1/2	3/4	1-1/8
W12x336	4.060	5/16	6/16	1/2	3/4	1-1/8
W14x398	4.090	5/16	6/16	1/2	3/4	1-1/16
W14x426	4.320	5/16	6/16	1/2	11/16	1-1/16
W14x455	4.590	5/16	6/16	7/16	11/16	1
W14x500	4.950	5/16	5/16	7/16	5/8	15/16
W14x550	5.340	5/16	5/16	7/16	5/8	7/8
W14x605	5.820	5/16	5/16	3/8	9/16	7/8
W14x665	6.210	5/16	5/16	3/8	1/2	13/16

W14x730	6.760	5/16	5/16	5/16	1/2	3/4
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ARABIAN VERMICULITE INDUSTRIES — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, MK-6 GF, MK-6 GF Extended Set, MK-1000/HB, MK-1000/HB Extended Set, Type Z-146, Z-146T, Z-156 and Z-156T.

GCP KOREA INC — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6 GF, MK-6 GF Extended Set, MK-6s, MK-1000/HB, MK-1000/HB Extended Set, Monokote Acoustic 1, Type Z-146, Z-146T, Z-156 and Z-156T.

GCP APPLIED TECHNOLOGIES INC — Types MK-6/HY, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, MK-6 GF, MK-6 GF Extended Set, MK-1000/HB, MK-1000/HB Extended Set, Monokote Acoustic 1, RG, Type Z-146, Z-146T, Z-156 and Z-156T.

2. **Metal Lath** — (Optional for contour application) — 3.4 lb per sq yd galv or painted expanded steel lath. Lath shall be lapped 1 in. and tied together with No. 18 SWG galv steel; wire spaced vertically 6 in. OC.

3. **Steel Column** — Wide flange steel column, min sizes as shown in the tables.

*** 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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