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

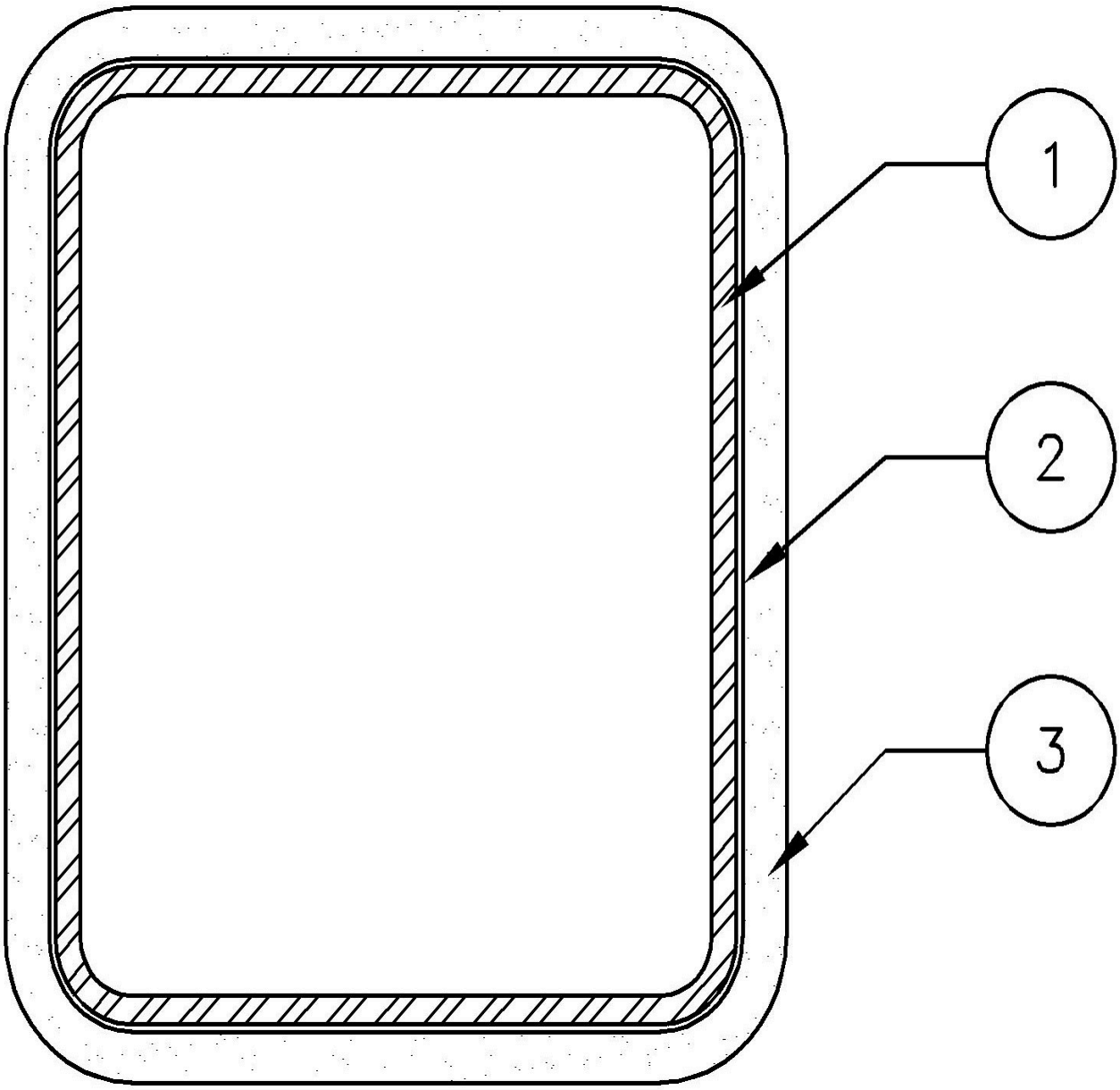
See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

Design No. Y678

August 22, 2025

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

*** 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 Tube Column —** Steel rectangular tube (ST) or pipe (SP) columns with the minimum sizes shown in the tables below.

2. **Primer Coating —** No primer required.

3. **Mastic & Intumescent Coating* —** Coating spray or brush applied in accordance with the manufacturer's instructions at the minimum average dry thickness shown in the thickness below. The thickness shown does not include primer thickness.

As an alternate to the table below, the required thickness of coating (in mm) to be applied to surfaces of Wide-Flange columns may be determined from the equations listed below. The equations may only be used for the indicated hourly rating, and for the corresponding listed ranges of thickness and Hp/A.

Hourly Rating	Thickness Equation (mm)	Thickness Range (mm)	Hp/A Section Factor Range
1	T =((0.0077*Hp/A) + 3.5962)	5.22 - 4.86	212- 165
1	T =((0.037*Hp/A) - 1.245)	4.86 - 1.16	165 - 65
2	T =((0.0576*Hp/A) + 0.466	9.97 - 4.21	165 - 65

	Minimum Required Thickness (mm) for Rating Period						
Hp/A	**30 min**	**45 min**	**60 min**	**90 min**	**120 min**	**150 min**	**180 min**
212	1.29	3.26	5.22	9.15	N/A	N/A	N/A
210	1.28	3.24	5.21	9.08	N/A	N/A	N/A
205	1.27	3.19	5.17	8.92	N/A	N/A	N/A
200	1.25	3.14	5.14	8.75	N/A	N/A	N/A
195	1.23	3.09	5.1	8.59	N/A	N/A	N/A
190	1.21	3.04	5.06	8.43	N/A	N/A	N/A
185	1.2	2.99	5.02	8.27	N/A	N/A	N/A
180	1.18	2.94	4.98	8.11	N/A	N/A	N/A
175	1.16	2.89	4.94	7.95	N/A	N/A	N/A
170	1.15	2.84	4.91	7.78	N/A	N/A	N/A
165	1.13	2.79	4.86	7.63	9.97	N/A	N/A
160	1.1	2.67	4.68	7.38	9.68	N/A	N/A
155	1.06	2.56	4.49	7.14	9.39	N/A	N/A
150	1.03	2.44	4.31	6.89	9.11	N/A	N/A
145	0.99	2.32	4.12	6.64	8.82	N/A	N/A
140	0.96	2.21	3.94	6.39	8.53	N/A	N/A
135	0.93	2.09	3.75	6.15	8.24	N/A	N/A
130	0.89	1.97	3.57	5.90	7.95	N/A	N/A
125	0.86	1.85	3.38	5.65	7.67	N/A	N/A
120	0.82	1.74	3.2	5.40	7.38	N/A	N/A
115	0.79	1.62	3.01	5.16	7.09	N/A	N/A
110	0.76	1.5	2.83	4.91	6.80	N/A	N/A
105	0.72	1.39	2.64	4.66	6.51	N/A	N/A
100	0.69	1.27	2.46	4.41	6.23	N/A	N/A
95	0.65	1.15	2.27	4.17	5.94	N/A	N/A
90	0.62	1.04	2.09	3.92	5.65	N/A	N/A
85	0.59	0.92	1.9	3.67	5.36	N/A	N/A
80	0.55	0.8	1.72	3.42	5.07	N/A	N/A
75	0.52	0.68	1.53	3.18	4.79	N/A	N/A
70	0.48	0.57	1.35	2.93	4.50	N/A	N/A
65	0.45	0.45	1.16	2.68	4.21	5.73	7.26

		Minimum Required Thickness (in) for Rating Period						
HSS Tube Size	**A/P**	**30 min**	**45 min**	**60 min**	**90 min**	**120 min**	**150 min**	**180 min**
8x8x3/16	0.17	0.051	0.128	0.206	0.360	N/A	N/A	N/A
10x10x3/16	0.17	0.051	0.128	0.206	0.360	N/A	N/A	N/A
7x4x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
7x7x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
8x3x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
8x4x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
8x6x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
8x8x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
10x2x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
10x4x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
10x6x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
10x10x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
12x2x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
12x4x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
12x6x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
12x8x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
12x12x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
14x4x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
14x6x1/4	0.23	0.045	0.112	0.193	0.306	0.393	N/A	N/A
3x3x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
3.5x3.5x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
4x2x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
4x3x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
5x2x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
4x4x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
5x3x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
6x2x5/16	0.27	0.039	0.091	0.162	0.261	0.347	N/A	N/A
5x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
5x5x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
6x3x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A

6x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
7x3x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
7x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
8x2x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
8x3x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
6x6x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
7x5x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
7x7x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
8x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
8x6x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
8x8x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
10x2x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
10x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
10x6x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
10x10x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
12x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
12x6x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
12x8x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
14x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
14x6x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
16x4x5/16	0.28	0.038	0.087	0.155	0.252	0.336	N/A	N/A
12x12x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
14x10x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
16x8x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
18x6x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
20x4x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
14x14x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
16x12x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
16x16x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
20x8x5/16	0.29	0.036	0.082	0.148	0.242	0.324	N/A	N/A
4x4x3/8	0.32	0.033	0.072	0.132	0.220	0.298	N/A	N/A
5x3x3/8	0.32	0.033	0.072	0.132	0.220	0.298	N/A	N/A
6x2x3/8	0.32	0.033	0.072	0.132	0.220	0.298	N/A	N/A
5x4x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
6x3x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A

5x5x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
6x4x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
6x6x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
7x3x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
7x4x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
7x5x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
8x2x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
8x3x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
8x4x3/8	0.33	0.032	0.068	0.126	0.213	0.290	N/A	N/A
7x7x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
8x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
10x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
8x8x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
10x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
10x10x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x8x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x12x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
14x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
12x8x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
14x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
14x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
14x10x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
14x14x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
16x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
16x8x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
16x12x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
18x6x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
20x4x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
20x8x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
16x16x3/8	0.34	0.031	0.064	0.119	0.203	0.279	N/A	N/A
4x4x1/2	0.42	0.026	0.045	0.089	0.164	0.234	N/A	N/A
5x3x1/2	0.42	0.026	0.045	0.089	0.164	0.234	N/A	N/A

5x5x1/2	0.43	0.025	0.043	0.085	0.159	0.228	N/A	N/A
6x4x1/2	0.43	0.025	0.043	0.085	0.159	0.228	N/A	N/A
6x6x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
7x5x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
7x7x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
8x4x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
8x6x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
10x4x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
8x8x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
10x6x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
12x4x1/2	0.44	0.024	0.041	0.082	0.154	0.222	N/A	N/A
12x6x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
14x4x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
10x10x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
12x8x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
12x12x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
14x6x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
14x10x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
14x14x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
16x4x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
16x8x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
16x12x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
16x16x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
18x6x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
20x4x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
20x8x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
20x12x1/2	0.45	0.023	0.036	0.075	0.144	0.211	N/A	N/A
8x8x5/8	0.55	0.018	0.018	0.046	0.106	0.166	0.226	0.286
10x10x5/8	0.55	0.018	0.018	0.046	0.106	0.166	0.226	0.286
12x8x5/8	0.55	0.018	0.018	0.046	0.106	0.166	0.226	0.286

CARBOLINE GLOBAL INC — Thermo-Sorb HB, INVESTIGATED FOR INTERIOR GENERAL PURPOSE, INTERIOR CONDITIONED SPACE and EXTERIOR ENVIRONMENTAL

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