



BXUV.X827 - 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

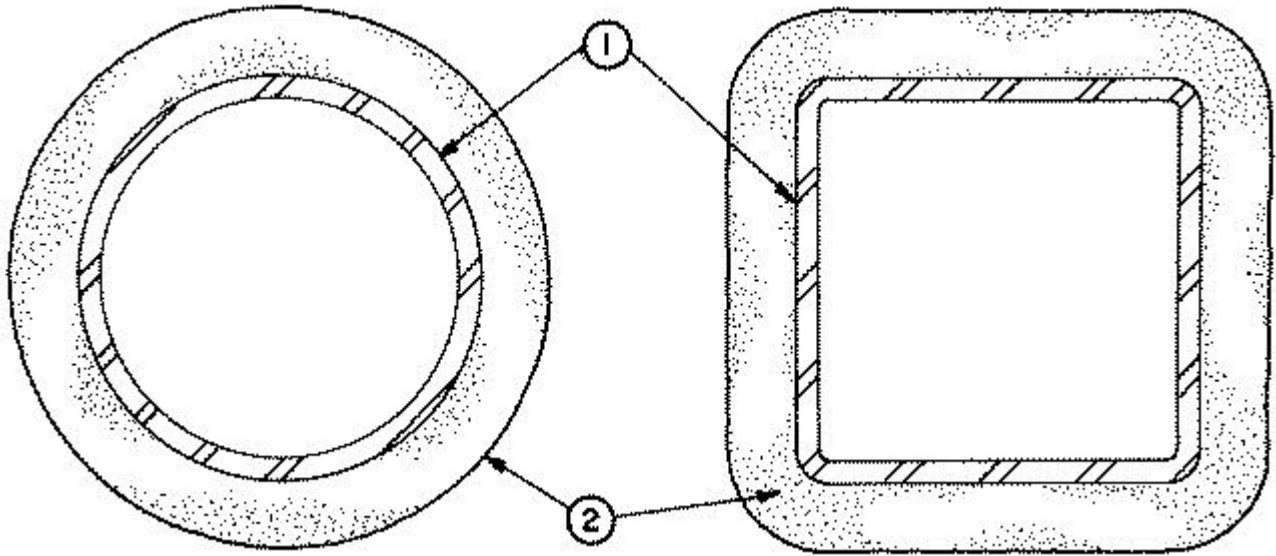
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. X827

May 03, 2018

Ratings — 1, 1-1/2, 2, 3 and 4 Hr.

*** 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 Pipe or Tube Column — Steel circular pipe (SP) with diameter (ID) ranging from a minimum of 3 in. to a maximum of 32 in. with a minimum wall thickness of 3/16 in.
 Steel square or rectangular tube (ST) with outside wall dimensions ranging from minimum 3 in. to a maximum of 36 in. and a minimum wall thickness of 3/16 in.

2. Spray-Applied Fire Resistive Materials* — Applied by spraying with water to the final thicknesses shown below. Crest areas shall be filled with Spray-Applied Fire Resistive Materials above the beam. Beam surfaces must be clean and free of dirt, loose scale and oil. Min average density of 13 pcf with min. ind density of 11 pcf for Types II, II HS, or DC/F. Min avg and min ind densities of 22 and 19 pcf, respectively, for Type HP. For method of density determination, refer to Design Information Section.
 The min thickness of Spray-Applied Fire Resistive Material required for various fire resistance ratings of contour sprayed steel pipes or tubes are shown in the tables below.

Tube Steel Columns, Min Thkns, In.

Min Column Size	A/P	Rating, Hr.				
		1	1-1/2	2	3	4
ST 3x3x0.188	0.18	1	1-3/4	2-9/16	—	—
ST 4x4x0.188	0.18	15/16	1-9/16	2-3/16	3-1/2	4-13/16
ST 4x4x0.25	0.24	3/4	1-5/16	1-15/16	3	4-13/16
ST 4x4x0.375	0.34	9/16	13/16	1-1/4	2-3/16	3
ST 4x4x0.5	0.44	7/16	3/4	1-1/16	1-11/16	2-5/16
ST 36x24x0.5	0.49	3/8	7/16	11/16	1-1/8	1-5/8

Pipe Columns, Min Thkns, In.

Min Column Size	A/P	Rating, Hr.				
		1	1-1/2	2	3	4
SP 3x0.188	0.18	1	3-3/4	2-9/16	—	—
SP 4x0.237	0.22	13/16	1-7/16	2-1/16	3-3/8	4-13/16

ISOLATEK INTERNATIONAL — Type HP, D-C/F, II, or II HS. Investigated for exterior use. Type EBS or Type X adhesive/sealer optional.

As an alternate to the above tables, the required thickness of Spray-Applied Fire Resistive Materials to be applied to all surfaces of the steel pipes or tubes for all rating periods may be determined from the following equation:

The thickness of sprayed for ratings of 1, 1-1/2, 2, 3, and 4 h of a steel pipe or tube may be determined by the equation:

$$R = 0.38$$

$$h = \frac{R}{3.58 (A/P)}$$

Where:

R = the hourly rating (hrs).

h = the thickness of protection material, min 0.35 - max 3.50 in.

A = the cross sectional area (sq in.)

P = the heated perimeter (in.)

The A/P ratio of the steel pipe or tube (see Item 2) shall range from 0.18 to 2.0.

The A/P ratio of a circular pipe is determined by:

$$A/P = \frac{t(d - t)}{d}$$

Where:

d = the outer diameter of the pipe (in.)

t = the wall thickness of the pipe (in.)

The A/P ratio of a rectangular tube is determined by:

$$A/P = \frac{t(a + b - 2t)}{a + b}$$

Where:

a = the outer width of the tube (in.)

b = the outer length of the tube (in.)

t = the wall thickness of the tube (in.)

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