UL Product iQ™

BXUV.S721 - 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. S721

November 17, 2014

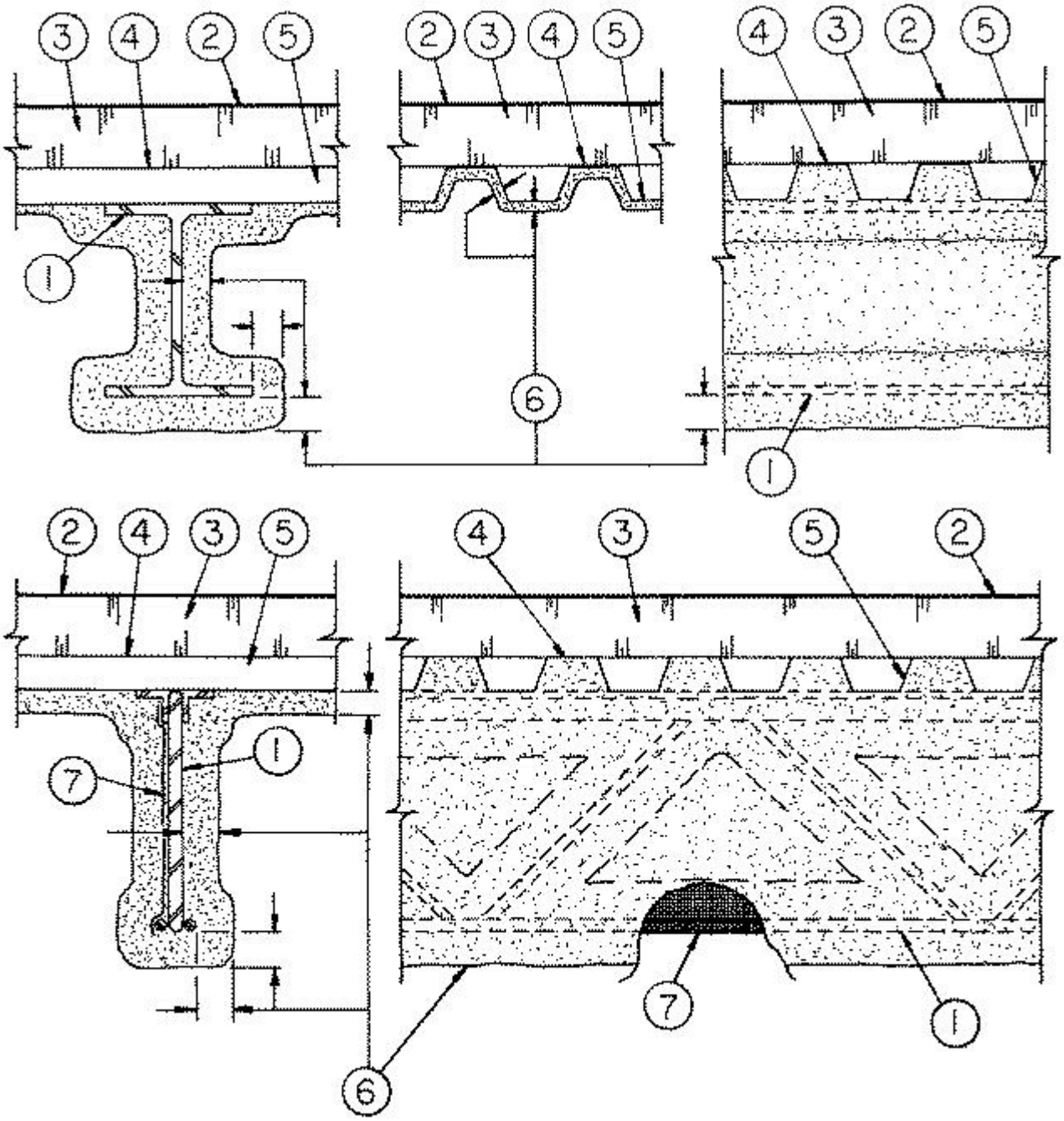
Restrained Beam Ratings — 1, 1-1/2, 2, 3 or 4 Hr (See Item 6)

Unrestrained Beam Ratings — 1, 1-1/2, 2, 3 or 4 Hr (See Item 6)

Restricted Load Condition — See Item 1

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** 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 Supports —** W6x16 min size steel beam, 10K1, 12K3 or 14K1 min size steel joists. Note: When 10K1 or 12K1 joists are used, they will be limited to a max tensile stress of 26,000 psi.

2. **Roof Covering* —** Consisting of hot mopped, cold application or single-ply materials, compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).

3. **Roof Insulation* —** Consisting of building units, foamed plastic or mineral and fiber boards, applied in one or more layers. When multiple layers are used, end and side joints shall be offset a min of 12 in. in both directions in order to lap all joints. See category for names of companies providing Classified products — Building Units (BZXX), Foamed Plastic (CCVW) or Mineral and Fiber Boards (CERZ). Roof insulation shall be compatible with roof covering materials Class A, B or C system. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).

4. **Adhesive —** (Optional) — May be applied to steel roof deck units or between insulation layers at a max application rate of 0.4 gal per 100 sq ft. See **Adhesives** (BYWR) category for names of manufacturers.

5. **Steel Roof Deck —** (Unclassified) — Fluted, No. 22 MSG min galv 1-1/2 in. deep with 3-1/2 in. wide flutes spaced 6 in. OC. Ends overlapped a min 1-1/2 in. and welded to supports, 12 in. OC max. Adjacent units button-punched, welded or fastened with No. 12 by 1/2 in. long self-drilling, self-tapping steel screws.

6. **Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying to the beam (or joist) and deck surfaces in one or more coats to the final min thicknesses shown below. Crest areas above the beam (or joist) shall be filled with the Spray-Applied Fire Resistive Materials. Surfaces must be clean and free of dirt, loose scale and oil. Min average and min individual density of 15 and 14 pcf, respectively, for Types 300, 300AC, 300ES, 300HS, 300N, 3000, 3000ES and SB. For Types 400AC and 400ES min average and min individual density of 22 and 19 pcf, respectively. For method of density determination see Design Information Section.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

	Unrestrained Beam Rating Hr			Restrained Beam Rating Hr			
		Joists			Joists		
Rating Hr	Beam W6x16	(a)	(b)	Beam W6x16	(a)	(b)	Steel Roof Deck
1	7/16	3/4	3/4	7/16	3/4	3/4	13/16
1-1/2	9/16	15/16	1-3/16	7/16	3/4	1-1/16	15/16
2	13/16	1-3/16	1-7/16	11/16	1-1/8	1-5/16	1-7/16
3	1-1/4	1-13/16	2-5/16	1-3/16	1-13/16	2-1/8	1-7/8
4	1-1/2	—	—	1-1/2	—	—	1-7/16

(a) Metal lath or nonmetallic fabric mesh secured to one side of open web joist. Spray-Applied Fire Resistive Materials thickness applied to each side of lath or mesh shall be equal to thickness required on steel joist.

(b) Spray-Applied Fire Resistive Materials directly applied to joist contours. As an alternate, metal lath or nonmetallic fabric mesh secured to one side of joist to catch overspray when spraying following joist contours. Metal lath to be fully covered with Spray-Applied Fire Resistive Materials but with no min thickness requirements.
As an alternate to the thickness shown above for the steel beam, the thicknesses shown in the following table are applicable when the thickness applied to the beam's lower flange edges is reduced by one-half. The min thickness applied to the lower flange edges is 1/4 in.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

Rating Hr	Unrestrained Beam Rating Hr	Restrained Beam Rating Hr
1	1/2	1/2
1-1/2	11/16	9/16
2	15/16	13/16
3	1-7/16	1-3/8
4	1-13/16	1-13/16

BERLIN CO LTD — Types 300, 300ES, 300N or SB.

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Types 300, 300AC, or 400AC.

ISOLATEK INTERNATIONAL — Types 300, 300AC, 300ES, 300HS, 300N, SB, 400AC, 400ES, 3000 or 3000ES.

NEWKEM PRODUCTS CORP — Types 300, 300ES, 300N, or SB.

6A. **(As an alternate to Item 6) Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying to the beam (or joist) and deck surfaces in one or more coats to the final min thicknesses shown below. Crest areas above the beam (or joist) shall be filled with the Spray-Applied Fire Resistive Materials. Surfaces must be clean and free of dirt, loose scale and oil. Min average and min individual

density of 17.5 and 16 pcf, respectively, for Type 300TW. Min average and min individual density of 22 and 19 pcf, respectively, for Type 400. For method of density determination see Design Information Section.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

	Unrestrained Beam Rating Hr			Restrained Beam Rating Hr			
		Joists			Joists		
Rating Hr	Beam W6x16	(a)	(b)	Beam W6x16	(a)	(b)	Steel Roof Deck
1	7/16	3/4	3/4	7/16	3/4	3/4	13/16
1-1/2	9/16	15/16	1-3/16	7/16	3/4	1-1/16	15/16
2	13/16	1-3/16	1-7/16	11/16	1-1/8	1-5/16	1-7/16
3	1-1/4	1-13/16	2-5/16	1-3/16	1-13/16	2-1/8	1-7/8
4	1-1/2	—	—	1-1/2	—	—	1-7/16

(a) Metal lath or nonmetallic fabric mesh secured to one side of open web joist. Spray-Applied Fire Resistive Materials thickness applied to each side of lath or mesh shall be equal to thickness required on steel joist.

(b) Spray-Applied Fire Resistive Materials directly applied to joist contours. As an alternate, metal lath or nonmetallic fabric mesh secured to one side of joist to catch overspray when spraying following joist contours. Metal lath to be fully covered with Spray-Applied Fire Resistive Materials but with no min thickness requirements.
As an alternate to the thickness shown above for the steel beam, the thicknesses shown in the following table are applicable when the thickness applied to the beam's lower flange edges is reduced by one-half. The min thickness applied to the lower flange edges is 1/4 in.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

Rating Hr	Unrestrained Beam Rating Hr	Restrained Beam Rating Hr
1	1/2	1/2
1-1/2	11/16	9/16
2	15/16	13/16
3	1-7/16	1-3/8
4	1-13/16	1-13/16

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Type 400.

ISOLATEK INTERNATIONAL — Types 300TW, 400.

NEWKEM PRODUCTS CORP — Type 400.

7. **Glass Fiber Mesh —** (Optional) — Min 3/32 in. square mesh, coated fiberglass scrim fabric, weighing a min of 1.9 oz per sq yd shall be attached to one side of each joist web member. The method of attachment must be sufficient to hold the mesh and Spray-Applied Fire Resistive Materials during application and curing of the material. An acceptable method of attaching the mesh is by embedding the mesh in min 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced min 12 in. OC along the top chord of the bar joists. Another method of attachment is the use of 1-1/4 in. long, 1/2 in. wide hairpin clips formed from 0.064 in. diam steel wire, alternating from top to bottom of the joist web member.

8. **Metal Lath —** (Optional-Not shown) — Diamond mesh, 3/8 in. expanded steel, min 1.7 lb per sq yd fastened to one side of joists using No. 18 SWG steel tie wire, located at the midheight of every other web member or 18 in. O.C. whichever is less. Both sides of lath must be completely coated with Spray-Applied Fire Resistive Materials.

9. **Bridging —** (Not shown) — Min 1-1/4 by 1-1/4 by 1/8 in. thick steel angles welded to top and bottom chords of each joist. Number and spacing of bridging angles per Steel Joist Institute specification. Bridging coated with the same thickness of Spray-Applied Fire Resistive Materials (Item 6) as the joist.

* 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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