

BXUV.N873 - 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. N873

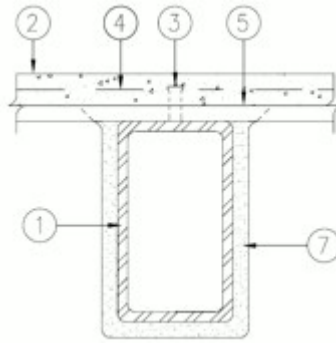
September 11, 2018

Restrained Beam Rating — 1, 1-1/2, 2, 3 and 4 Hr. (See Item 7)

Unrestrained Beam Rating — 1, 1-1/2, 2, 3 and 4 Hr. (See Item 7)

This design was evaluated using loading determined by Allowable Stress Design Method (ASD) and Load and Resistance Factor Design Method (LRFD). 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 Tube Beam** — ASTM A500 tube beams (46 or 50 ksi) having an A/P between 0.267 and 0.616. The minimum tube dimension shall be 4 in. and the maximum tube dimension shall be 12 in. Both square and rectangular sections permitted. When rectangular sections are used, tubes shall be installed vertically with one narrow face secured to the steel floor and form units (Item 5).
2. **Normal Weight or Lightweight Concrete** — Normal weight or lightweight concrete, 2-1/2 in. min thickness over the steel floor and form unit crests. Normal weight concrete: carbonate or siliceous aggregate, 4000 psi compressive strength, unit weight 145 ± 3 pcf. Lightweight concrete: expanded shale, clay, or slate aggregate by rotary-kiln method, 4500 psi compressive strength, unit weight 110 ± 3 pcf.
3. **Shear Connector** — Studs, 1/2, 5/8 or 3/4 in. diam headed type or equivalent per AISC specification. Welded to the top flange of beam through the steel floor units. Studs shall provide nominal 50% composite action between the beam and concrete.
4. **Welded Wire Fabric** — (Optional) 6x6, W1.4 x W1.4 or 6x6-10/10 SW.
5. **Steel Floor and Form Units** — 1-1/2 to 3 in. deep fluted units welded to beam.
6. **Mesh Reinforcement** — (Not shown) - When the required thickness of Spray-Applied Fire Resistive Material (Item 7) exceeds 3/4 in., 20 gauge poultry netting with 2" hexagonal openings shall be installed around the beam prior to starting the spray application. Netting shall be installed at approximately three quarters of the final depth from the tube surface. Netting secured to deck flutes with 3/4" powder actuated fasteners with 7/8" washers. Fasteners staggered every other valley on opposite sides of beams.
7. **Spray-Applied Fire Resistive Materials*** — Prepared by mixing with water. Spray-Applied in one or more coats to beam surfaces to a min final thickness as shown in the tables below. Beam surfaces must be clean and free of dirt, loose scale, and oil. Crest areas of deck above the beams shall be filled with spray-Applied Fire Resistive Materials. Min average and min individual density of 15 pcf, and 14 pcf respectively for types 300, 300AC, 300ES, 300HS, 300N, 3000, 3000 ES and SB. For types 400, 400AC, and 400ES min average density and individual density of 22 pcf and 19 pcf respectively. For method of density determination, see Design Information Section, Sprayed Material.

Unrestrained Beam Ratings

| Size (in x in x in) | A/P | Unrestrained Fire Resistance Rating (min) | | | | | | |
|---------------------|-------|---|------|-------|--------|----------|-----------|-----------|
| | | 60 | 90 | 120 | 150 | 180 | 210 | 240 |
| 6x4x1/4 | 0.267 | 7/16 | 5/8 | 3/4 | 1-3/16 | 1 - 9/16 | 2 | 2 - 3/8 |
| 10x10x1/4 | 0.297 | 3/8 | 9/16 | 11/16 | 1-1/16 | 1 - 7/16 | 1 - 13/16 | 2 - 1/8 |
| 7x4x5/16 | 0.322 | 3/8 | 1/2 | 5/8 | 1 | 1 - 5/16 | 1 - 5/8 | 2 |
| 10x8x5/16 | 0.352 | 3/8 | 1/2 | 9/16 | 7/8 | 1 - 3/16 | 1 - 1/2 | 1 - 13/16 |
| 6x4x3/8 | 0.381 | 3/8 | 7/16 | 9/16 | 13/16 | 1 - 1/8 | 1 - 3/8 | 1 - 11/16 |
| 9x7x3/8 | 0.411 | 3/8 | 7/16 | 1/2 | 3/4 | 1 - 1/16 | 1 - 5/16 | 1 - 9/16 |
| 12x12x3/8 | 0.441 | 3/8 | 3/8 | 1/2 | 3/4 | 15/16 | 1 - 3/16 | 1 - 7/16 |
| 12x4x1/2 | 0.476 | 3/8 | 3/8 | 7/16 | 11/16 | 7/8 | 1 - 1/8 | 1 - 3/8 |
| 5x5x1/2 | 0.516 | 3/8 | 3/8 | 7/16 | 5/8 | 13/16 | 1 - 1/16 | 1 - 1/4 |
| 7x7x1/2 | 0.545 | 3/8 | 3/8 | 3/8 | 9/16 | 13/16 | 1 | 1 - 3/16 |

| | | | | | | | | |
|----------|-------|-----|-----|-----|------|-------|-------|----------|
| 10x4x5/8 | 0.577 | 3/8 | 3/8 | 3/8 | 9/16 | 3/4 | 15/16 | 1 - 1/8 |
| 12x6x5/8 | 0.616 | 3/8 | 3/8 | 3/8 | 1/2 | 11/16 | 7/8 | 1 - 1/16 |

Restrained Beam Ratings

| Size (in x in x in) | A/P | Restrained Fire Resistance Rating (min) | | | | | | |
|---------------------|-------|---|------|-------|-------|----------|-----------|-----------|
| | | 60 | 90 | 120 | 150 | 180 | 210 | 240 |
| 6x4x1/4 | 0.267 | 7/16 | 5/8 | 3/4 | 15/16 | 1 - 3/8 | 1 - 7/8 | 2 - 5/16 |
| 10x10x1/4 | 0.297 | 3/8 | 9/16 | 11/16 | 7/8 | 1 - 1/4 | 1 - 11/16 | 2 - 1/16 |
| 7x4x5/16 | 0.322 | 3/8 | 1/2 | 5/8 | 13/16 | 1 - 3/16 | 1 - 9/16 | 1 - 15/16 |
| 10x8x5/16 | 0.352 | 3/8 | 1/2 | 9/16 | 3/4 | 1 - 1/16 | 1 - 7/16 | 1 - 3/4 |
| 6x4x3/8 | 0.381 | 3/8 | 7/16 | 9/16 | 11/16 | 1 | 1 - 5/16 | 1 - 5/8 |
| 9x7x3/8 | 0.411 | 3/8 | 7/16 | 1/2 | 5/8 | 15/16 | 1 - 3/16 | 1 - 1/2 |
| 12x12x3/8 | 0.441 | 3/8 | 3/8 | 1/2 | 9/16 | 7/8 | 1 - 1/8 | 1 - 3/8 |
| 12x4x1/2 | 0.476 | 3/8 | 3/8 | 7/16 | 9/16 | 13/16 | 1 - 1/16 | 1 - 5/16 |
| 5x5x1/2 | 0.516 | 3/8 | 3/8 | 7/16 | 1/2 | 3/4 | 1 | 1 - 3/16 |
| 7x7x1/2 | 0.545 | 3/8 | 3/8 | 3/8 | 1/2 | 11/16 | 15/16 | 1 1/8 |
| 10x4x5/8 | 0.577 | 3/8 | 3/8 | 3/8 | 7/16 | 11/16 | 7/8 | 1 - 1/16 |
| 12x6x5/8 | 0.616 | 3/8 | 3/8 | 3/8 | 7/16 | 5/8 | 13/16 | 1 |

BERLIN CO LTD — Types 300, 300ES, 300N, SB, or 400

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

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

NEWKEM PRODUCTS CORP — Types 300, 300ES, 300N, 400, or SB

*** 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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