2012 FCIA Annual Conference
Equal F- and T-Ratings

Presented by: Clay Booth
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Agenda

• T-Rating Code Language
• UL1479 / ASTM E814 what is a T-Rating
• Thermal Ceramics T-Rating Inquiries
• T-Rating Listings / Engineered Systems
711.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707. Penetrations permitted by Exceptions 3 and 4 of Section 707.2 shall comply with Sections 711.4.1 through 711.4.4

711.4.1 Through penetrations. Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 711.4.1.1 or 711.4.1.2.

Exceptions: ....

711.4.1.1 Fire-resistance-rated assemblies. Penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

711.4.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water. The system shall have an F rating and a T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall do not require a T rating.
712.4 **Horizontal assemblies.** Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707. Penetrations permitted by Exceptions 3 and 4 of Section 707.2 shall comply with Sections 712.4.1 through 712.4.4.

**Exception:** Penetrations located within the same room or undivided area as floor openings are not required to have a shaft enclosure in accordance with Exceptions 1, 2, 5, 7, 8 or 9 in Section 707.2.

712.4.1 **Through penetrations.** Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 712.4.1.1 or 712.4.1.2.

**Exceptions:** …

712.4.1.1 **Fire-resistance-rated assemblies.** Penetrations shall be installed as tested in an approved fire-resistance-rated assembly.

712.4.1.2 **Through-penetration firestop system.** Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water. The system shall have an F rating and a T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

**Exception:** Floor penetrations contained and located within the cavity of a wall do not require a T rating.
712.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707.

712.4.1 Fire-resistance rated assemblies. Penetrations of the fire-resistance rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections 712.4.1.1 through 712.4.1.4.

712.4.1.1 Through penetrations. Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 712.4.1.1.1 or 712.4.1.1.2.

Exceptions...

712.4.1.1.1 Installation ...

712.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F-rating and a T-rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall do not require a T-rating.
713.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 708.2 shall be protected in accordance with Sections 713.4.1 through 713.4.2.2.  
713.4.1 Fire-resistance-rated assemblies. Penetrations...shall comply with Sections 713.4.1.1 through 713.4.1.4. Penetrations in horizontal smoke barriers shall also comply with 713.5.  
713.4.1.1 Through penetrations. Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 713.4.1.1.1 or 713.4.1.1.2.  
Exceptions: ...  
713.4.1.1.1 Installation. Through penetrations shall be installed as tested in the approved fire-resistance-rated assembly.  
713.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.  
Exception: Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
714.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 712.1 shall be protected in accordance with Sections 714.4.1 through 714.4.2.2.

714.4.1 Fire-resistance-rated assemblies. Penetrations …comply with Sections 714.4.1.1 through 714.4.1.4. Penetrations in horizontal smoke barriers shall also comply with 714.5.

714.4.1.1 Through penetrations…comply with Section 714.4.1.1.1 or 714.4.1.1.2.

Exceptions: …

714.4.1.1.1 Installation…installed as tested in the approved fire-resistance-rated assembly.

714.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:
1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating.
Agenda

• T-Rating Code Language
• UL1479 / ASTM E814 what is a T-Rating
• Thermal Ceramics T-Rating Inquiries
• T-Rating Listings / Engineered Systems
ASTM E814

Standard Test Method for
Fire Tests of Through-Penetration Fire Stops

Legend:
A—At a point on the surface of the fire stop 1 in. (25 mm) from one through-penetrating item for each type of penetrating item employed in the field of the fire stop. If the grouping of penetrating items through the test sample prohibits placement of the thermocouple pad, the thermocouple shall not be required.
B—At a point on the fire stop surface at the periphery of the fire stop.
C—At a minimum of three points on the fire stop surface approximately equidistant from a penetrating item or group of penetrating items in the field of the fire stop and the periphery.
D—At one point on any frame that is installed about the perimeter of the opening.
E—At one point on the unexposed surface of the wall or floor that is a minimum of 12 in. (305 mm) from any opening.
F—At one point on each type of through-penetrating item. If the through-penetrating item is insulated or coated on the unexposed side, the thermocouple shall be located on the exterior surface of the insulation or coating. If the coating or insulation does not extend the full length of the penetrating item on the unexposed side, an additional thermocouple shall be installed on the penetrating item 1.0 in. (25.4 mm) beyond the termination of the insulation or coating.

FIG. 2 Temperature Measurement Locations
6.1 *Time-Temperature Curve*—The fire environment within the furnace shall be in accordance with the standard time-temperature curve shown in Fig. 1. The points on the curve that determine its character are:

Furnace Exposure
10.2 T Rating:

10.2.1 A fire stop shall have met the requirements for the T rating when it remains in the opening during the fire test and hose stream test and the following conditions are met.

10.2.1.1 The transmission of heat through the fire stops during the rating period shall not have been such as to raise the temperature of any thermocouple on the unexposed surface of the fire stop or on any penetrating item more than 325°F (181°C) above its initial temperature. Also, the fire stops shall have withstood the fire test during the rating period by preventing the passage of flame through openings, or the occurrence of flaming on any element of the unexposed side of the fire stops.

10.2.1.2 During the hose stream test, the fire stop shall not develop any opening that allows a projection of water from the stream beyond the unexposed side.
FireMaster Putty, 3-hr F-Ratings for cables, copper pipes, joints, ducts
C-AJ-0023; C-AJ-1077; C-AJ-1078; C-AJ-3313;
Agenda

- T-Rating Code Language
- UL1479 / ASTM E814 what is a T-Rating
- Thermal Ceramics T-Rating Inquiries
- T-Rating Listings / Engineered Systems
Inquiries for T-Ratings

T-Rating Inquiries

- Hospital 49%
- Hospital 58%

- CA&NV
- Total

- 2007
- 2008
- 2009
- 2010
- 2011
- 2012P
# Inquiries for T-Ratings

<table>
<thead>
<tr>
<th>State</th>
<th>2011</th>
<th>2012 YTD</th>
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<td>California</td>
<td>99</td>
<td>77 mainly hospitals</td>
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<td>Virginia</td>
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<td>4</td>
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<td>9</td>
<td>7 1 each</td>
</tr>
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*YTD through October*
Inquiries for T-Ratings

*2011 Summary
What changed in 2007?

California
- Home of the ICBO
- Traditionally follows Uniform Building Code
- August 2007, adopts the 2006 IBC
- 2007 California Building Standards Code
- Jan 1, 2008 effective date for 2007 CBSC

Nevada – Clark County
- Adopts the 2006 IBC
Agenda

• T-Rating Code Language
• UL1479 / ASTM E814 what is a T-Rating
• Thermal Ceramics T-Rating Inquiries
• T-Rating Listings / Engineered Systems
F = T-Ratings, Listings using insulation

**System No. C-AJ-1562**

3-Hour F- and T-Rating

2. Through-Penetrant —
   
   **A. Steel Pipe** — Max 10 in. diam, Min Schedule 10
   
   **B. Iron Pipe** — Max 10 in. diam cast or ductile iron pipe.
   
   **C. Copper Tubing** — Max 4 in. diam, Type L (or heavier)
   
   **D. Copper Pipe** — Max 4 in. diam Regular (or heavier)
   
   **E. Conduit** — Max 6 in. diam steel conduit, or Max 4 in. diam EMT, or Max 1 in. diam flexible steel conduit.

3A. Packing Material, 4PCF Mineral Wool

3B. **Firestop Sealant**, Min ½ in. thickness Specified Technologies Inc. Sealant, Specseal SSS, LCI, Putty, Pensil 300…

3C. **Insulation**, Thermal Ceramics FireMaster FastWrap XL, 36 in. above and 12 in. below floor
F = T-Ratings, Listings using endothermic devices

System No. C-AJ-1573
3-Hour F- and 2-Hour T-Rating

2. Through-Penetrant —
A. Steel Pipe — Max 4 in. diam, Min Schedule 10
B. Iron Pipe — Max 4 in. diam cast or ductile iron pipe.
C. Steel Conduit — Max 4 in. diam steel conduit or EMT

3A. Packing Material, 4PCF Mineral Wool
3B. Firestop Sealant, Min ½ in. thickness Specified Technologies Inc. Sealant Specseal LCI
3C. Firestop Device, Fire Trak Corp – T-Collar

ONLINE CERTIFICATIONS DIRECTORY
F = T-Ratings, Listings using intumescent devices

2. Through-Penetrant —
   A. PVC Pipe — Max 4 in. diam, Schedule 40
   B. CPVC Pipe — Max 4 in. diam, Schedule 40
   C. ABS Pipe — Max 4 in. diam, Schedule 40
   D. Rigid Nonmetallic Conduit+ - Max 4 in diam., Schedule 40 PVC

3A. Firestop Sealant, Min 1/4 in. thickness Specified Technologies Inc. Sealant Specseal LCI
3B. Firestop Device, Specified Technologies Inc. Specseal LCC Collar

ONLINE CERTIFICATIONS DIRECTORY
F = T-Ratings, Engineered Systems

1) Project Specific
2) Referenced to Tested and Listed Systems
3) Materials may not be substituted
4) Subject to approval by AHJ

Diagram:
- Rated Concrete Floor Assembly
- Steel or Iron Floor Sinks or Drains
- FastWrap XL to Butt Tightly Against Bottom of Assembly
- FastWrap XL Filler Blanket Tightly Packed into Space Between Sink and Deck
- Drains or Sinks Without Drain Pipes to be Covered with 2-Layers of FastWrap XL Anchored to Underside of Deck with Steel Fasteners and Bar Stock, Steel Angle, or Unistrut
- Penetration to be Sealed Per STI NS161002FH or NS181101L
- 2-Layers of FastWrap XL Installed on Drain Pipe A Min. of 36” Along Pipe or to the Nearest Assembly Penetrated
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<thead>
<tr>
<th>System No.</th>
<th>Description</th>
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<th>Wrap Height</th>
<th>Insulation</th>
<th>F &amp; T Rating(s)</th>
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<td>C-AJ-1562</td>
<td>10” steel or iron, 6” conduit, 4” copper or EMT</td>
<td>Top &amp; Bottom</td>
<td>12” bottom; 36” top</td>
<td>FireMaster</td>
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<td>C-AJ-3317</td>
<td>EZ-Path® Grid Fully Populated with Cables</td>
<td>Top</td>
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<td>EZ-Path® Single Device Full</td>
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## Hilti Firestop Solutions

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Any Burning Questions?