Fire Barriers for Expansion and Seismic Joint Systems
Fire Resistance

• Code requires joints in fire rated construction to continue the rating across the joint

• Rating must be at least equal to the fire rating of the wall, floor, or ceiling materials adjacent to the joint system

• Achieved by adding appropriate fire barrier system below the joint cover
UL 2079 & ASTM E 1966

- IBC 715.3 - *fire-resistant joint systems* shall be tested in accordance with the requirements of either **ASTM E1966** or **UL 2079**
- ASTM is a committee-based standards organization comprised of volunteer members from across the industry
- UL (Underwriters Laboratories) is an independent test lab that also develops test standards
UL 2079 & ASTM E1966

• Assembly is preconditioned by cycling to simulate movement of expansion joint (ASTM E-1399)
  • Class I  500 cycles  1 c/min.
  • Class II  500 cycles  10 c/min.
  • Class III 100 cycles  30 c/min.
  • Class IV 100 cycles  30 c/min.
  400 cycles  10 c/min.

• Tested with a field splice
• Wall systems are then subjected to hose stream
• UL 2079 offers optional air leakage test ("L" rating)
  • An "L" rating is the cfm/lf of air able to penetrate the barrier at ambient temperature and 400F
Expansion Joint Assemblies

Movement is the distance between maximum and minimum joint widths and also acceleration.
Expressed as either a numerical value or a percentage of nominal width.
Typically joint systems are described as:

+/- 25%, +/- 50%, +/- 100% Movement

Nominal = 50 mm           Maximum = 150 mm              Minimum = 25 mm

50% plus and minus model
Horizontal Shear Movement
Test Laboratories

Testing with:

Intertek (ETL)

Underwriters Laboratories (UL)
UL 2079 & ASTM E1966

- Establishes the length of time a joint system will contain a fire during a predetermined test exposure
- F Rating – Time the system contains flame
- T Rating – Time cold face temperatures remained below established points

FIG. 1 Time-Temperature Curve
UL 2079 & ASTM E1966

Tested As an Assembly
Intumescent reaction to heat
Floor Intumescent

Attributes

• Thin, lightweight intumescent sheet
• No caulk required
• Joint sizes up to 150mm max.
• Tested with metal and elastomeric joint covers
• 2 hour rating
• Up to 25 meter long rolls

IDEAL FOR

• Small joints where blankets systems are difficult to install
Wall Intumescent

Attributes

• Thin, lightweight intumescent sheet
• No caulk required
• Joint sizes up to 150mm max.
• Tested with metal and elastomeric joint covers
• Does not require gyp in the joint
• 2 hour rating
• 1 package on each side of wall
• Up to 25 meter long rolls

IDEAL FOR

• Small joints where blankets systems are difficult to install
Intumescent Foam
Floor and Wall

Attributes
• Intumescent sheet and foam
• No fasteners required
• No caulk required
• Joint sizes up to 150mm max.
• Tested with metal and elastomeric joint covers
• Requires gyp in the joint
• 1.2 meter lengths
• 2, 3, & 4 hour rating

IDEAL FOR
• Quick installation into small joints
• Use with expansion joint seals
2 Hour Rated Pre-Compressed Foam Floor and Wall

Attributes
- Complete fire rated expansion joint system
- Watertight
- UV stable
- Silicone comes in many colors

Ideal For
- Where watertight seal is required
- Where anchors are not permissible
<table>
<thead>
<tr>
<th>Joint Width (Max)</th>
<th>2 Hour Floor</th>
<th>2 Hour Floor Shear</th>
<th>2 Hour Floor Under Mount</th>
<th>3 Hour Floor</th>
<th>2 Hour Wall</th>
<th>3 Hour Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1”-6”</td>
<td>Metamat &amp; Metablock</td>
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<td>Metaflex Pro Undermount</td>
<td>Metaflex Pro</td>
<td>1pkg No Caulk</td>
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<tr>
<td>20”-36”</td>
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<td>Metaflex Pro Undermount</td>
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<tr>
<td>36”-72”</td>
<td>Metaflex Pro</td>
<td>Metaflex Pro</td>
<td>Metaflex Pro Undermount</td>
<td>Metaflex Pro</td>
<td>Metaflex Pro</td>
<td>Metaflex</td>
</tr>
</tbody>
</table>
2 Hour Horizontal Blanket Barrier

Attributes
• Ceramic fiber blankets
• Requires min. 20ga galvanized cover or 3mm aluminum
• 2 rated
• 3 and 4 hour also available
• Min. 112mm thick slab

IDEAL FOR
• Large seismic joints
• 200mm to 900mm max. opening
• 50% to 100% movement
2000 Series Wall

Attributes

- Ceramic fiber blanket
- Intumescent sealant (Metacaulk 990) at edges
- No cover required
- 2 rated
- 3 and 4 hour also available
- No gyp in the joint
- 1 package on each side of wall

IDEAL FOR

- Large seismic joints
- 200mm to 900mm max. opening
2 Hour Horizontal Blanket Barrier
Up to 1.8 meter max

**Fire Resistance Rated**
Meets IBC 715.3 fire resistance test requirements (UL 2079 and ASTM E1966)

**Smoke Leakage Rated**
Meets IBC 715.6 requirements for use in smoke barriers
Rigid Top Mount Flanges
Intumescent Strip Seals to Floor Slab
Single Package

Drop-in Fire Barrier for 2 and 3 Hour Floor Joints

Stainless steel foil cover may be used in chase wall applications
Factory Male and Female Ends for Simple Transitioning

Bead of Caulk

Peel and Stick Seam
Floor to Floor  

Floor to Wall
Top-Mounted Solution for 2 Hour Rated Joints Requiring 100% Horizontal (Lateral) Shear Applications
Solution for 2 Hour Rated Joints Where There is no Access from Above

Requires Min. 4 ½” Thick Slab
Chase Walls

How many packages?
Two packages of fire barrier required at each end.
One package of fire barrier required at each end
No fire barrier required
2000 SERIES FIRE BARRIER TRANSITIONS

1. EXTEND RECEIVING FIRE BARRIER INTO CAVITY
2. NEST TERMINATING FIRE BARRIER INTO RECEIVING FIRE BARRIER
3. ENSURE FIRE BARRIERS ARE TIGHTLY NESTED TOGETHER WITH NO GAPS.

X = 1/2 VERTICAL BLANKET WIDTH + 2" (51mm)

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2HWF8 TO 2HFF8 ABOVE

1. INSTALL HORIZONTAL FIRE BARRIER
2. SELECT A SCRAP PIECE OF WALL FIRE BARRIER TO USE AS A TEMPLATE
3. FOLD FIRE BARRIER AND INSERT INTO INSTALLED POSITION
4. CAREFULLY CUT WALL FIRE BARRIER TO FIT AROUND FLOOR BARRIER ABOVE TO FORM TEMPLATE
5. CHECK FIT BY FITTING WALL FIRE BARRIER AROUND FLOOR FIRE BARRIER. ENSURE BARRIERS ARE TIGHTLY NESTED TOGETHER WITH NO GAPS
6. REMOVE TEMPLATE AND LAY FLAT OVER WALL FIRE BARRIER THAT IS TO BE INSTALLED AT THIS LOCATION
7. TRACK THE TEMPLATE ONTO THE WALL BARRIER AND CUT ALL FIRE BARRIER TO FIT AROUND FLOOR BARRIER
8. CHECK FIT BY FITTING WALL FIRE BARRIER AROUND FLOOR FIRE BARRIER. ENSURE BARRIERS ARE TIGHTLY NESTED TOGETHER WITH NO GAPS
9. INSTALL WALL FIRE BARRIER

\[ X = \frac{1}{2} \text{VERTICAL BLANKET WIDTH} + 2" (51mm) \]
2HFFB HORIZONTAL 90° CORNER

1. Place one side of fire barrier bottom package into the joint.
2. Lay a level across the joint opening at a 45° angle.
3. Use a plumb bob and a marker to mark the path of the 45° angle on the fire barrier.
4. Remove the fire barrier from the joint and connect the marks until a cohesive line is formed.
5. Cut the fire barrier 1/2" outside the line to provide extra length for compression at the joint.
6. Flip the fire barrier over and transfer the line to the mating fire barrier package.
7. Cut the fire barrier package along the line.
8. Install both sides of the fire barrier package.
9. Check fit by fitting both sides of fire barrier together. Ensure barriers are tightly butted together with no gaps.
10. Repeat steps 1-9 for the top package.

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Scene:
Date:
Page of Scale: NTS

Drawn By: [Signature]
REV. 07/05/17
Chase Wall With Non-rated Wall
Chase Wall With Non-rated Wall
Smoke

- **SMOKE BARRIER (IBC 709)**
  - Carries a minimum 1 hour fire rating, often more (709.3)
  - IBC 715.6 *Fire resistant joint systems in smoke barriers* shall have an “L” rating of <5cfm/lf per UL 2079

- **SMOKE PARTITION (IBC 710)**
  - Also a wall, floor, or ceiling assembly that is designed and constructed to restrict the movement of smoke
  - Does not require a fire rating unless noted otherwise
  - IBC 710.7 Joints shall be filled with an approved material to limit the free passage of smoke
SmokeBlock

- Meets IBC 715.6 (<1CFM/LF per UL 2079)
- Tested in concrete and drywall assemblies
- Can be installed alone or in conjunction with a cover or fire barrier
- Water tight when applied over mastic setting bed