Agenda

- Introduction
- History
- Codes, Standards, & Testing
- Listings & Judgements
- Installation & Field Issues
- FAQ’s / Q&A

INTRODUCTION
Construction Specialties

A Brief History

- Formed in 1948
- Privately owned US Co.
- Companies & plants throughout the world
- Core competencies include problem solving & customer service
- Innovators & market leaders
- Over 50 LEED Accredited Professionals + Green Associates
- Currently manufacturing 10 product lines

THE C/S Portfolio

Acrovyn® Wall & Door Protection
Acrovyn® Wall Covering & Panels
Acrovyn® Doors
Cubicle Track / Curtains
Entrance Flooring - Pedisystem®
Floorometry®

Expansion Joint Covers
Louvres
Grilles
Sun Controls
Solarmotion™
Specialty Venting - Explovent®

HISTORY
WHAT IS AN EXPANSION JOINT FIRE BARRIER?

WHY DOES IT EXIST?
Life safety issues

• Maintain integrity of fire
• Meet code compliance
• Life safety issues
  – Reduce the catastrophic
    “chimney effect” of fire
  – spread to the top floor

The Report

“While the fire primarily damaged the second floor casino
and adjacent restaurants, most of the deaths were on the
upper floors of the hotel, and were caused by smoke
inhalation. Openings in vertical shafts (elevators and
stairwells) and seismic joints allowed toxic smoke to
spread to the top floor”
CODES, STANDARDS, & TESTING

Section 702.1: FIRE RESISTANT JOINT SYSTEM
“An assemblage of specific materials or products that are designed, tested and fire resistance rated in accordance with either ASTM E1966 or UL 2079 to resist for a prescribed period of time the passage of fire through joints made in or between fire-resistance-rated assemblies.”

IBC - 2015

Section 715 – Fire Resistive Joint Systems

715.3 Fire test criteria. Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E 1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.
715.4 Exterior curtain wall/floor intersection.

Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with fire-resistance-rated joint systems to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an F rating for a time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall interconnections shall comply with Section 705.8.5.

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715.6 Fire-resistant joint systems in smoke barriers.

Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal smoke barrier and an exterior curtainwall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The L rating of the joint system shall not exceed 5 cfm per linear foot (0.0077 m³/s-m) of joint at 0.30 inch (7.62 Pa) of water for both the normal and elevated temperature tests.

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System No. FF-D-0045

July 07, 2011

Assembly Rating — 2 hr

L Rating at Ambient: Less Than 1 CFM/Line Ft

L Rating at 400°F: Less Than 1 CFM/Line Ft

Inside Joint Width — 3 in.
IBC 2015

- \( a = 0.1 \)
- \( q = 3 \text{ cfm} (54 \text{ m}^3/\text{h}) \)
- \( a = 0.3 \text{ ft} \text{ per foot of joint} \)

This proves that the air leakage rate of 2 in. (500) stainless steel foil with a 3" x 3" meshed gasket does not exceed 5 cfm per linear foot of joint at 5.30 in. of water as specified in section 114.2 of the 2000 IBC.

ASTM E1966 & UL 2079

Standard Test Method for Fire-Resistive Joint Systems
Tests for Fire Resistance of Building Joint Systems

CYCLING  FIRE  HOSE STREAM  AIR LEAKAGE

FIRE BARRIER CYCLE TESTING

- Cycled 500 times prior to installation
- Seismic cycling at 30 cycles per minute for 100 cycles
- Thermal wind/sway cycling at 10 cycles per minute for 400 cycles
ASTM 1399 Cycle Test

<table>
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<th>Time (min)</th>
<th>Temp (Deg. F)</th>
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Fire Testing

![Graph of Time-Temperature Curve]
Fire Testing

- Performed at max open of joint
- Preformed with linear splice
- TC's at center, joint edge, and substrate
- Failure Points
  - TC's @ ambient + 250 deg. avg.
  - TC @ ambient + 325 deg. single point
- Cotton Pad

Wall (Vertical) Fire Test

Floor (Horizontal) Fire Test
Listings & Judgments

UL Listing Classification

- **“S” designation**
  - "FF-S-0000"
  - Static
  - Not cycle tested
  - ASTM E 119, UL 263

- **“D” designation**
  - "FF-D-0000"
  - Dynamic
  - Cycle tested
  - ASTM E 1966, UL 2079

Listings & Judgments

- Substrate
- Joint Assembly
- Cover

TESTED ASSEMBLY
Listings & Judgments

Limitations
- Substrates
- Ceiling Assemblies
- Steel Deck & Pourstops
- Transitions
- Test Standard

Listings & Judgments

Engineering Judgments
- Non-Tested/Listed Conditions

Listings & Judgments

Common Conditions
- Less than Minimum slab depth
- Attachment to steel framing / steel pour stops
- Rated Roof Construction
- Floor to Wall w/ different substrates
- Ceiling / Soffit Conditions
Installation and Field Issues

Installation and Field Issues

Installation and Field Issues
FAQ’S / Q&A

- Can this fire barrier close to 0”?
- Can we transition to existing fire barrier?
- My fire barrier won’t fit can I take a Layer of material out?
- Don’t two 2-hour rated fire barriers put together make a 4-hour barrier?
- Can I use 2-hour rated barrier in a one hour rated condition?
Kevin Smith, PE
Engineering Manager
Expansion Joint Cover Systems
ksmith@c-sgroup.com
570.546.4670

C/S Muncy EJC: FB-97 Optimization