Presentation Overview

- Advancements in the materials and systems used for glazing in areas that require fire ratings
- Updates to the 2012 version of the IBCs
- Testing Methodologies
- Fire Protective vs. Fire Resistive
- Labeling - New Labeling System for Fire-Rated Glass
- Non-Code Compliant Products
History of Technical Glass Products

• Company founded in 1980
• Worked with traditional wired glass among other materials
• Introduced “thin and wireless” products in 1988, based on our expertise with high temperature ceramics
• Have worked extensively with governing code bodies to develop acceptance of better performing products
Fire-Rated Glazing Definition

Specialized glass designed to prevent the spread of flames, gasses and smoke.

- Glass earns fire ratings through rigorous testing processes at independent laboratories such as Underwriters Laboratories, Inc.® (UL)
- Fire-rated glazing for door and window assemblies are rated from 20 minutes to 3 hours
- The rating reflects the amount of time the material has been tested to remain in place to help stop the spread of fire and smoke
- In addition to remaining in place, in most cases the glass must also pass a hose stream test, and may also be required to provide an impact rating for safety
Two Key Purposes of Fire-Rated Glass

- Allows visibility into a space
- Prevents fire from spreading
- Compartmentation
Key Testing Components for Fire and Human Impact Safety

**Fire Test** - Measures the amount of time, in minutes or hours, that fire rated glazing and framing can withstand fire exposure in a furnace.

**Hose Stream Test** - Heated glass and frames are subjected to water from a fire hose. The cooling, impact and erosion created by the hose stream tests the integrity of the glass and frames and eliminates inadequate materials.

**Impact Safety Test** - Measures the ability of glass to withstand impact. Ratings are given in levels based on the amount of force the glass can resist. Typically defined by CPSC Category 1 or 2 rating.
Click on video to play
Hose Stream Test

Click on video to play
Safety Glazing Classifications

CPSC 16 CFR 1201 (Category II)
- 400 ft. lbs. pressure
- Tempered Glass, typical laminated glass, filmed glass

CPSC 16 CFR 1201 (Category I)
- 150 ft. lbs. pressure
- Permitted up to 1,296 in$^2$

ANSI Z97.1 (Traditional Wired Glass Only)
- 100 ft. lbs. Pressure
- Permitted up to 1,296 in$^2$
Click on video to play
FIRE PROTECTIVE

- Stop flames & smoke
- “Openings”
- “Thin” glazing
- Traditional fire-rated material (wired glass, glass ceramic, hollow metal steel frames, etc.)

- Fire Windows: 45-90 Minutes
- Fire Doors: 20 minutes – 3 hrs
- May not exceed 25% of the area of a common wall
- May not exceed 156ft²
- May not exceed manufacturers tested sizes
**FIRE RESISTIVE**

- Stop flames, smoke, **AND** radiant heat (Both glass and frames)
- “Thick” glazing
- Classified as a “wall” rather than an opening (window)
- Both glass and frames must block passage of radiant heat
- Classified as Wall Construction, and may be used in multi story spans or floor to ceiling sizes
Why is Fire-Rated Glazing Labeled?

• Enables code officials to accurately inspect glazing
• Owner, architect, facility manager and installer can confirm they received correct product, and reject any materials that do not meet code
• Fire Officials can plan safe evacuation methods
• Firefighters will understand the type of glass present in a building
Labeling Requirements

Label Standards

- “W” indicates that the glass passes ASTM E119
  - This is the wall standard which includes temperature rise and hose stream

- “D” indicates that the glass passed NFPA 252
  - Door standard

- “O” indicates that the glass passed NFPA 257
  - Opening standard

**TABLE 716.3**

<table>
<thead>
<tr>
<th>FIRE TEST STANDARD</th>
<th>MARKING</th>
<th>DEFINITION OF MARKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM E 119 or UL 263</td>
<td>W</td>
<td>Meets wall assembly criteria.</td>
</tr>
<tr>
<td>NFPA 257 or UL 9</td>
<td>OH</td>
<td>Meets fire window assembly criteria including the hose stream test.</td>
</tr>
<tr>
<td>NFPA 252 or UL 10B or UL 10C</td>
<td>D</td>
<td>Meets fire door assembly criteria.</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>Meets fire door assembly “Hose Stream” test.</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>Meets 450°F temperature rise criteria for 30 minutes</td>
</tr>
<tr>
<td></td>
<td>XXX</td>
<td>The time in minutes of the fire resistance or fire protection rating of the glazing assembly</td>
</tr>
</tbody>
</table>

For SI: °C = [(°F) - 32]/1.8.
Labeling Requirements

Fire-Rated Glass Manufacturer Label

FireLite®

D-H-20
OH-20

UL

6259
R-13377
ANSI/UL9/10B/10C

Pilkington Pyrostop

120-104
16 CFR 1201 CAT II
ANSI Z97.1-2009 UA
LAMINATED
W-120
North America
TGP

2” wide x .75” tall
Labeling Requirements
Labeling Requirements

Fire-Rated Frame Manufacturer Label

Installers should not remove or paint over frame labels
Labeling Requirements

UL Online Certifications Directory

• Available online at database.ul.com
• Search for UL File Number found on label for more information on listing
## Search results

You may choose to **Refine Your Search**.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Category Name</th>
<th>Link to File</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECHNICAL GLASS PRODUCTS</td>
<td>Fire-protection-rated Glazing Materials</td>
<td>KCMZ.R13377</td>
</tr>
<tr>
<td>TECHNICAL GLASS PRODUCTS</td>
<td>Fire-protection-rated Glazing Materials Certified for Canada</td>
<td>KCMZ7.R13377</td>
</tr>
</tbody>
</table>

Model number information is not published for all product categories. If you require information about a specific model number, please contact [Customer Service](#) for further assistance.
Installation of Fire-rated assemblies

- Framing similar to typical storefront systems
- Any qualified glazing sub contractor can install
- Must follow manufacturer’s installation guidelines
Non-Code Compliance

Non-Code Compliance Situations

- Non-tested assemblies
  - All components must have a complete laboratory listing
  - Fire-rated skylights (systems tested vertically but installed sloped)

- Modified assemblies—must be installed EXACTLY as tested
  - Film on fire-rated glazing must be tested and approved
  - Wood trim or other combustibles on a fire-rated frame

- Improperly tested products
  - Non-accredited testing lab
  - Partial testing of a product…i.e. non hose stream over 20 minutes
  - Products that only provide impact or fire rating in one directions
Questions:

• What is the required fire-rating for the application?
• Does the glazing system need to block the transfer of radiant heat?
• Does the glazing meet impact safety standards?
• Should I select performance films or laminates?
• Are there any acoustic or thermal performance needs?
• Is the glazing being installed into the proper framing assembly (matched fire-ratings)?
• Once the glazing has been selected, did you confirm the material has been tested by a testing agency such as UL and can be validated through that testing agency?
Case Studies

Project: University Hospitals, Seidman Cancer Center
Location: Cleveland, OH
Architect: Cannon Design
Products: Fireframes® Designer Series steel doors and frames with FireLite Plus® glass ceramic
Project: MultiCare Good Samaritan Hospital, Dally Tower
Location: Puyallup, WA
Architect: Good Sam Design Collaborative, in conjunction with Clark/Kjos Architects and GBJ Architecture
Products: Fireframes® Curtainwall Series with Pilkington Pyrostop® glass firewall
When facing a decision that affects life safety, make sure the systems used meet all code requirements. Not all products are created equal.
Thank you!