Fire-Rated Glazing & Framing
Presentation Overview

• Advancements in the materials and systems used for glazing in areas that require fire ratings
• Testing Methodologies
  • Furnace Test
  • Hose Stream Test
  • Impact Test
• Fire Protective vs. Fire Resistive
• Labeling - New Labeling System for Fire-Rated Glass
• Non-Code Compliant 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, smoke and gas
- 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
Fire-Rated Glazing Types

Wired Glass

Glass Ceramics

Transparent Walls
Key Purposes of Fire-Rated Glass

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

Fire Furnace 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.
Fire Test

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 in²

ANSI Z97.1 (Traditional Wired Glass Only)
- 100 ft. lbs. Pressure
- Permitted up to 1,296 in²
Impact Safety Test

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 156 ft²
• May not exceed manufacturers tested sizes

NOTE: All products rated more than 20 min. have to pass hose stream test.
FIRE RESISTIVE

- Stop flames, smoke, AND radiant heat (Both glass and frames)
- “Thick” glazing
- Subjected to Furnace and Hose Stream test, as well as impact
- 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
Labeling Requirements
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 are not part of the tested and listed system, which would result in a non-compliant installation
- Fire Officials can plan safe evacuation methods
- Firefighters will understand the type of glass present in a building
- Ensure proper fire-rated glazing is installed in renovated spaces
Labeling Requirements

Fire-Rated Glass Manufacturer Label

2” wide x .75” tall
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
- “H” indicates that the glass passed hose stream test

<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 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
Labeling Requirements

ONLINE CERTIFICATIONS DIRECTORY

BEGIN A BASIC SEARCH

To begin a search, please enter one or more search criteria in the parameters below.

- Company
- Name (options)
- City
- US State
- Select a state
- US Zip Code
- Country
- Select a country
- Region
- Select a region
- Postal Code (non-US)
- UL Category Code (options)
- UL File Number (help)
- r13377
- Keyword

SEARCH  CLEAR

TIPS FOR EFFECTIVE Searches

Select a search method:
- Match all words - type AND between words (i.e., display and nwgq)
- Match any word - type OR between words (i.e., hair dryer or blow dryer)
- Match phrase(s) - type exact phrase

ABOUT THE ONLINE CERTIFICATIONS DIRECTORY

You can use the UL Online Certification Directory to:
- Verify a UL Listing, Classification, or Recognition
- Verify a UL Listed product use
- Verify a UL Recognized component use
- Verify a product safety standard

Learn more with the Quick Guide to the Online Certifications Directory

SPECIFIC SEARCHES

(New! UL Evaluation Reports)

FEATURED LINKS

UL Alarm Services Search
UL Code Correlation Database

UL Anytime
We are ready to assist you at any time!

LINKS OF INTEREST
UL Environment Database
Labeling Requirements

Search results

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Category Name</th>
<th>Link to File</th>
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<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>
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</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.

Search Tips  Print this page  Terms of Use  iQ Family of Databases

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Installation of Fire-rated assemblies

- Framing similar to typical storefront systems
- Any qualified glazing subcontractor can install
- Must follow manufacturer’s installation guidelines, as well as tested and listed design from UL
Non-Code Compliance

Non-Code Compliant Situations

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

• 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
Selecting Fire-Rated Glazing

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?
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
Case Studies

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!