

## FAQ'S FREQUENTLY ASKED QUESTIONS ABOUT FIRE AND IMPACT/SAFETY RATED GLAZING PRODUCTS

### 1. What are my primary options in fire-rated glass?

The glass product most often associated with fire rating is polished wired glass. It has provided fire protection for more than 100 years, and is frequently seen in schools, hospitals, and other high occupancy facilities. In North America, wired glass is typically rated for 45 minutes in light sizes up to 9 square feet (1,296 square inches), with a 60 and 90 minute ratings restricted to 100 square inches for use in fire doors. The biggest advantage of wired glass has been its low cost. However, its relatively low impact safety resistance and institutional look of the wire are sometimes considered drawbacks and with new building codes being adopted such as IBC 2006/2009, traditional wired glass usage will be severely limited.

A second type of fire-rated glazing is **glass ceramic**. Once installed, this wireless product looks similar to window glass. Glass ceramic products, such as those in the FireLite family, provide fire ratings from 20 minutes to 3 hours, and in sizes ranging up to 24 square feet per light. Like wired glass, the glass ceramics are able to withstand the thermal shock of water thrown by sprinklers or fire hose. Glass ceramic products offer great design flexibility. Where impact safety is required, products are available that offer at least four times the impact resistance of wired glass, thus meeting Federal Standards 16CFR1201 - Category II. Products can also have beveled edges and be sandblasted for artistic effect.

Glass ceramic is also available as insulated glass units (IGU). The IGU are made of two layers of glass with an air space in between. They can incorporate many types of float glass - clear, tinted, Low-E, mirrored, etc. Depending on which components are used, they provide not only fire protection but can comply with energy and safety codes as well. The IGU's are sometimes used for interior applications where sound reduction is desired.

Another emerging category of fire-rated glass could be called **transparent wall units**. Although widely used in Europe for a number of years, they are just now becoming popular in North America. These units are special, multi-product assemblies that block the transfer of heat usually by means of incorporating layers of intumescent between the layers of glass. While appearing to be regular glass, the thicker composition of the units allows them to perform similar to a fire-rated masonry wall. Having been tested as walls, products such as Pyrostop and SuperLite II could be installed with proper framing from wall to wall and floor to ceiling. Incredibly, these large expanses of glass have obtained fire ratings up to 2 hours. They are typically used where architects desire (or building codes require) the blockage of heat transfer through the glass. Designers can thus provide clear, fire-rated glass "walls" that allow visibility, light, and security. These products, like wired glass and glass ceramics, withstand thermal shock. In addition, they meet high levels of impact safety as well.

A final category of fire-rated glazing is **specially tempered glass**. Products such as Fireglass20, Pyroswiss, SuperLite I, and Pyroedge 20 only carry ratings such as 20 or 30 minutes and -- extremely important -- they cannot withstand the thermal shock of water thrown from sprinklers or fire hose. Such products are used in 20 minute rated doors, and per the US codes are not required to pass the hose stream portion of the fire test in the US.

**2. What is FireLite glazing?**

FireLite is a 3/16" clear ceramic material that resembles glass and will withstand very high temperatures and thermal shock. It is a fire rated glazing material and is listed for use in non-impact safety-rated locations, such as transoms or borrowed lites with fire ratings. Under the IBC 2009 code regulations, the use of this product ( like wired glass) is no longer allowed in fire rated doors.

**3. What is FireLite NT?**

It is 3/16" FireLite Standard (Unpolished) or Premium (Polished) with a surface-applied Safety film. It is fire rated and impact/safety rated (category II) for use in doors, sidelights, and transoms.

**4. What is FireLite Plus?**

It is two layers of FireLite (Standard or Premium) laminated together with an interlayer for an overall nominal thickness of 5/16". It is fire rated and impact/safety rated (category II) for use in doors, sidelights, transoms and other hazardous locations.

**5. What then are the basic differences when choosing to use FireLite NT or FireLite Plus?**

Since the fire and impact/safety ratings are virtually the same on FireLite NT and Plus, it basically boils down to a Good (FireLite NT-Standard), Better (FireLite NT-Premium), or Best (FireLite Plus) scenario based on economics. NT Premium and NT Standard have film on one side that should be installed to the interior building side. NT should only be used in "adult" installations, where vandalism or abuse of the surface-applied film is not likely. Firelite Plus Standard and Premium is a laminated product with the safety interlayer sandwiched between two pieces of Firelite, the best choice for K-12 and "abusive environment" applications.

**6. Generally speaking, the "wireless" fire-rated glazing materials are more expensive than polished wired glass. How can I persuade my building owner that those products are worth the extra cost?**

We generally see architects and designers using the more expensive products for reasons of aesthetics and/or higher performance. The manufacturing process for the high performance wireless products are complicated, and frequently make use of expensive materials. While costs are coming down as production volumes increase, we suspect they will never reach the levels of wired glass. Interestingly, we often find the wireless products are in line with the architectural construction costs - they are just more expensive than traditional wired glass. With the escalating cost of wired glass, due to supply issues related to the 2011 earthquake in Japan, the cost differential has been narrowed as well.

In addition, the amount of fire-rated glazing used in most projects is rather small as a percentage of overall building costs. Increasingly, we see architects and designers willing to use the newer products for aesthetics reasons, such as opening up entire glass walls that have high performance ratings. Characteristics such as higher fire ratings, larger glass sizes, higher impact ratings, meeting energy codes, etching and beveling, etc., are also issues. As our parents told us, "...you get what you pay for...". Code compliance will now dictate the use of fire and safety rated glazing in many cases.

**7. My area of the country is now requiring fire-rated glazing materials to have a permanent label. That seems like a bother. Is it important?**

Yes, according to the, N.F.P.A – 80, section 1-7.5 (fire doors), section 17.2.3.2 states: “The label or other identification shall be permanently applied and shall be visible after installation.” And section 13-2.1 says; “Only labeled fire protection-rated glazing material shall be used in fire windows.” (see Glossary “Labeled”)

Most building codes in North America now require such a label, although enforcement of such requirements lags in some areas. Fire-rated glazing materials do not all perform in a similar manner. Thus, it is important that products be supplied to the jobsite in conditions covered by their test listings. With the newer "wireless" glazing products now available, it becomes more important than ever to identify the glass as a fire-rated product, even though it may appear to be regular window glass. Most manufacturers are not only labeling the fire-rated product, they are also including information as to their fire duration listing in minutes or hours, their impact safety rating when appropriate, and so forth. New UL labeling requirements also dictate the use of letters indicating individual characteristics of the glazing material, i.e. “H” for Hose stream, “W” for wall or “D” for door etc. (see GANA insert)

**8. If the Anemostat literature says a specific visible lite size and minute rating (i.e. 1296 sq. in. at 90 minutes with FireLite), can I use that in any brand of wood or metal door?**

No, any fire ratings over the accepted standard of 1296 sq. in. at 20 or 45 minutes, and 60 or 90 minutes at 100 sq. in., must be used in a wood or metal door that has been approved for such rating. Again, you must consult with the door manufacturers procedures and see if he has tested for a similar visible lite size and the minute rating. It may also be allowed in only certain metal door or wood door applications. It’s a good argument for buying from those door manufacturers who do a variety of testing and can accommodate many different sizes and types of glazing material.

**9. What is all the talk I’m hearing about Fire AND Safety Rated Glazing?**

Until recently there have been 3 recognized levels of safety glazing in North America: ANSI Z97.1= 100 ft/lbs (about the weight of a 5 year old child), CPSC Cat I= 150 ft/lbs= (about the weight of a young child), and CPSC Cat II which is 400ft/lbs (which is about the weight of an adult- full body impact). For over 25 years the CPSC (Consumers Product Safety Commission) granted Wire Glass an exemption from complying with higher standards of impact / safety in hazardous locations. Under IBC 2006, this exemption has been deleted, and is continued under the current code, IBC 2009.

“Category I” glazing materials are subjected to impact of 100 lb. Bag swung from 18” drop height (approx. 150 ft/lb impact), with no single piece of glazing material greater than 9 square feet surface area. This resembles an 85 lb. child running into the glazing material. “Category II” are subjected to the same test but the 100lb bag is swung from 48” drop height (approx. 400 ft/lb impact) with any piece of glazing material greater than 9 square feet in surface area. This resembles a full-grown adult running into the glazing material.



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**10. Does the fire rated glazing used in doors also have to be safety rated?**

Yes, according N.F.P.A – 80 section 1-7.1, “Only labeled fire resistance-rated glazing material meeting applicable safety standards shall be used in fire door assemblies. Exception is where fire door assemblies are exempt from safety standards. (see Glossary “Category I and Category II, and Impact/Safety Rating”). The International Building Code of 2009 also requires a fire and safety rated glazing for use in doors.

In addition, 4.4.3.1 reads: For new wood doors, glazing materials in vision panels shall be installed in labeled glass light kits or in accordance with the fire door listing and shall be installed in accordance with the manufacturer’s installation instructions.

What this means is that all glass in new wood doors must be installed either by the door manufacturer, or in a licensed door shop, following the procedures and instructions of both the door manufacturer and light kit manufacturer.

**PLEASE NOTE:** This does not apply to Steel Doors.

**11. Is wire glass safety rated?**

No, it does not meet the requirements for safety glazing, based on CPSC 16 CFR Part 1201, U.S. Consumer Product Safety Commission Safety Standard for Architectural Glazing. However, wired glass used in fire-rated assemblies was exempt from this CPSC standard for many years. Wire glass was required by the model building codes to meet the performance criteria of ANZI Z97.1, with a 12” drop height. However, the whole issue of wired glass in any safety applications has been reviewed for the new International Building Code (IBC) and (see Glossary “ANSI, CPSC, Impact/Safety Rating”). The revised 2006 International Building Code did not allow “conventional” wired glass to be installed in “hazardous” locations. Hazardous locations are defined by those locations where safety glass is required. The code requires that the glazing materials in these locations meet the associated fire rating, hose stream test, (except for 20 minute ratings in doors), a minimum Category I impact resistance for lite sizes of 9 square feet or less, and/or Category II for lite sizes greater than 9 square feet. Because wired glass does not meet the minimum Category I safety standard, it is no longer allowed in fire doors, under IBC 2006, or IBC 2009.

In response to these code changes, Anemostat has added SAFE Wire, a safety-filmed wired glass product that meets 16 CFR 1201, Category II Impact standards. SAFE- Wire is UL listed to 45 minutes, with hose stream in lite sizes up to 1296 square inches and up to 90 minutes with hose stream, in lite sizes of 100 square inches or less. SAFE-Wire is a low cost solution for fire and safety rated doors under the current IBC 2009 standard.

**12. What is SAFE-Wire Glass?**

SAFE Wire Glass is a ¼” (6 mm) fire and safety rated wired glass with a special impact resistant film applied to one side. It is non-directional, carries a Category II safety rating and is fire rated up to 90 minutes.

**13. What is FireSAFE 20?**

It is ¼”(6 mm) clear (no wire), specially tempered, and fire rated for 20 minutes only. It is also Cat II impact/safety rated. No Hose Stream test. This product must be ordered to size, it cannot be cut.

**14. If 20-minute rated specially tempered glass cannot pass the fire hose stream test, are there special issues I should address?**

While we supply such a product, we are concerned that such products are frequently misused, or used in a way that will not allow them to perform properly. One need only walk through a number of commercial building projects to see that fire sprinklers are widely used as a method to suppress fires. That is good. However, one can easily imagine what will happen if water from the sprinklers impacts hot glass (fire-rated or not), that cannot withstand the thermal shock of the fire hose stream test. According to NFPA-80 (Fire doors and windows), and the 2003 IBC Section 715.3.3 (Door assemblies in corridors and smoke barriers) and Section 715.4 (Fire protection rated glazing), all glass in locations other than the 20 minute door itself, (transoms, sidelights. Window assemblies, etc.) require at least 45-minute ratings that can withstand the hose stream test.

**15. Why is the "fire hose stream" (thermal shock) test so important?**

The fire hose stream test shows how hot glass will react when hit by water from a fire hose, or perhaps from just a sprinkler. At the same time, the test proves the durability of the window frames and other components. Most types of glazing products are unable to withstand the thermal shock of fire and water. If nearby sprinklers activate during a fire, the "shocked" glass can shatter and vacate the frame within a very few minutes, thus allowing the spread of the deadly flames and smoke. For this reason, and others, national building standards require glass in fire-rated areas to have a fire rating. All glass having a fire listing for 45 minutes or more is required to pass the fire and hose stream test.

**16. Is fire-rated glass really necessary if I use sprinklers? Can't I just use tempered or heat strengthened glass with a water "deluge" system?**

Theoretically, it is possible, and one sprinkler company even promotes such a special sprinkler product. However, the likelihood of such a system working properly is questionable and is not recommended. In order for a sprinkler system to protect non fire-rated glass, it would have to activate early, bathing every inch of the glass completely and continuously. While tests at Underwriters Labs showed this could be accomplished under very specific conditions (fire starts away from the glass surface, no horizontal frame members, etc), it also proved that when conditions were not perfect, the glass can shatter and fall from the frame in less than five minutes.

There are additional "real world" issues that need to be addressed with such an installation. For example, the sprinkler manufacturer's literature indicates that drapes, blinds, shutters, etc., are not allowed in front of the glass as that would prevent water from the sprinkler covering the glass. However, a stroll through most commercial structures clearly shows the use of such window covering materials is widespread. An additional problem with the "deluge" system is that it totally relies on the perfect operation of the sprinkler system. In fact, there have been several stories in the news the last few years regarding sprinkler failures; one brand had to recall several million sprinkler heads. While sprinklers do much to save lives and protect property, they are no substitute for the use of fire-rated glazing materials. If sprinklers do not activate due to faulty manufacture, loss of water pressure, or other reasons, fire-rated glass will perform its critical function of compartmentation - with or without water from the sprinklers.

**17. What if a client request that I supply tempered or heat strengthened glass lieu of fire rated glazing because sprinklers are being used?**

Ask your client the following questions:

- What carries the listing, the sprinkler and glass "system" or only the sprinkler head?
- Can the risk of fire starting near the glass surface (tempered glass) be eliminated?
- If the sprinklers fail, will the glazing offer any type of fire protection?
- Can the glass withstand thermal shock if the sprinklers come on after a fire starts?

When it comes to fire protection and life safety, too much is at stake to rely exclusively on a single method of sprinklers only. The best way to provide proper protection is to use sprinklers in conjunction with listed fire-rated glazing materials that have passed the hose stream test.

**18. I recently received product information for a fire-rated glass that indicated several limitations on use. Should this be of concern?**

Architects and designers should always be wary of product "listings" that carry what appear to be unusual limitations. For example, one fire-rated glazing material on the market indicates a fire rating of "60 minutes", but then goes on to say, "This product does not meet the hose stream requirements of the test standards". Further, "This product protects from fire from one direction only. The identified face MUST be installed facing the direction of expected fire attack." Such limitations should raise red flags, and prove how important it is to thoroughly read manufacturers literature. This clearly indicates how a laboratory "listed" product may not be exactly what you thought it might be.

**19. Who is responsible if I've specified the wrong glass or framing, and it gets installed?**

Potentially, everyone involved in the selection, specification, approval, or installation of products may be held liable. The building owner may look to the architect, who might point to the code officials and the glazing contractor. Code officials will say their approval has the disclaimer that it is "subject to errors and omissions".

Glaziers are the glass experts, and architects rely on them for advice. If a glazier sees a problem, he needs to alert the architect about suitable alternatives. Using the excuse, "I just bid what the architect specified...", may not go far in a court of law.

When it comes to life safety in a building, everyone involved bears some responsibility to avoid making costly or dangerous mistakes. After examining the application and narrowing the option for glazing and framing materials, review an individuals product's literature in detail. Look for any special requirements, limitations or exclusions. It is important to gather all the details.

**20. Can I use a vision kit in a Heat Rise Door (Temperature Rise)?**

Yes, When used with SAFE-Wire, FireLite NT, FireLite Plus or Pyrostop (for larger allowable sizes) with fire rated glazing tape and a maximum of 100 sq. in. visible lite.

**21. What is a barrier to radiant heat?**

A barrier to radiant heat is a fire resistive glazing product that blocks heat transfer from one side of the glazing to the other. Typical applications of this type of glazing would be transparent fire rated wall units, or oversized (over 100 square inch) vision frames in temperature rise doors.

**22. What is Tempered glass?**

It is a heat treated flat or bent glass. Fully Tempered glass, if broken, will fracture into many small pieces, which are more or less cubical. Fully Tempered glass is approximately four times stronger than annealed glass of the same thickness. (Outside of North America it is sometimes called, “toughened glass”).

**23. Is Tempered glass impact/safety rated?**

Yes, the impact/safety rating measures the ability of the glass to withstand impact. Ratings are given in levels, based on the amount of force the glass can resist. Impact/Safety ratings are most commonly required where glass is regularly exposed to contact by people or objects. (see Glossary, “Impact/Safety Rating, Tempered Glass, Category I & II”)

**24. Is Tempered glass fire rated?**

No. It is for use in impact/safety applications only. However, there are products on the market (i.e. FireSAFE 20) that are tempered type products that are fire rated for 20 minutes only, and also have an impact/safety rating. These products cannot withstand the thermal shock of water when hot and will break during a fire when exposed to any amount of water (i.e. sprinklers or hose stream) and therefore, if sprinklers are nearby its probably best to install fire-rated glass that can pass the hose stream test.

**25. Can we cut tempered glass to size?**

No, Tempered glass is a heat-treated product that cannot be cut after it’s manufactured. Therefore, it must be ordered to a specific size.

**26. What is laminated glass?**

Two or more lites of glass permanently bonded together with one or more interlayers. Product can be cut to size with standard cutting tool. It is safety rated, but not fire rated.

**27. Does Anemostat make Acoustical (STC Rated) vision kits?**

Yes, we have a Sound Transmission Class (STC) test assembly called LoPro-STC with ratings from STC-35 through STC-42, in both fire and non-fire rated versions.

**28. Does Anemostat supply glazing tape with the glass?**

Yes, all glass from Anemostat is supplied with the correct type, amount and thickness of glazing tape to fit our vision frames or the window frame.

**29. Can I buy the fire rated glass with fire rated glazing tape already applied to the glass?**

Yes, it is available applied to any fire rated glass product we sell using either the Anemostat closed cell foam tape or the Pemko intumescent tape, depending on the fire rating required. The Anemostat tape is also available applied to tempered glass and IGU’s.

**30. Do I have to use an intumescent glazing tape in order to have the vision frame and glass fire rated?**

No, Anemostat has successfully passed positive pressure fire tests UL-10C or UBC 7.2-97) using our own closed cell foam tape for 20/45 minutes (1296 sq. in.), and 60/90 minutes (100 sq. in.). We have also tested and been approved for use with Pemko’s intumescent glazing tape (FG3000) on sizes of wired glass and SAFE-Wire that can exceed the standard 20/45 minute at 1296 sq. in. and the 60/90 minute at 100 sq. in. When in doubt, check with the wood or metal door manufacturers procedures, to insure the correct installation, because some do require its use.



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**31. Can I buy the vision frame complete with the type of glazing product I require with the tape already applied to the glass?**

Yes, “LoPro Complete” is available in a variety of sizes, and types of fire and/or safety rated glazing material, with the glazing tape applied at the factory.

**32. Can I order the LoPro Complete to ship direct to my jobsite, and coordinate the ship dates with my wood or metal door order already prepped with the door cut-outs only?**

Yes, just let us know the lite kit sizes, paint color, and glazing material required for each vision frame, and we can schedule it to arrive when your doors arrive.

**33. Should I inventory glazing material?**

If you are a distributor who furnishes doors, frames and hardware, you can sell glass products. The contractor you sell small jobs to, or any negotiated work you furnish, are excellent opportunities to sell the glass, along with the door, vision frame and fire rated glazing tape. It’s a convenience item you can provide on fire rated or impact/safety rated doors and lite kits.