

Tempered Glass Breakage

1. There is frequently a misconception that tempered glass is "unbreakable" or "nearly unbreakable". This is NOT true. Tempered glass is definitely breakable and many of the things that can break annealed glass can also break tempered glass.
2. Fully tempered glass as supplied for shower door, patio doors, etc., is four to five times as strong as annealed glass of the same type and thickness and can meet CPSC break-safe requirements for Category I or II safety glazing.
3. Fully tempered glass, when broken, fractures into hundreds of small particles. This is by design and is excellent proof of a well tempered product, not of a defective product. It is this fail-safe characteristic of tempered glass that makes it an excellent product for safety glazing applications.
4. Breakage of annealed glass is usually a simple one or two line fracture attracting little attention or comment (unless the glass has been smashed by a severe impact). Cracked lights of annealed glass have been seen by most everyone a number of times and cause no great surprise. Conversely, breakage of fully tempered glass is spectacular. Infrequently seen or experienced by the public, and attracts considerable surprise, attention, comment, and question.
5. Annealed glass is easily broken by mechanical stress, impact, and moderate thermal stress. Fully tempered glass will withstand much greater stresses than annealed glass before failure. However, it is the nature of fully tempered glass that it CANNOT break in the simple fashion of annealed glass but the entire light must "release" completely into small fragments even for a very small initial fracture.
6. Another characteristic of tempered glass is that occasionally a light will not release immediately at the time of damage, but at sometime, perhaps many weeks, later. This adds to the surprise and amazement of by-standers since no apparent cause is immediately evident. This type of behavior is one of the factors leading to the so called "spontaneous or delayed breakage" of tempered glass.
7. Spontaneous or delayed release can occur if the light has been damaged during its manufacture, shipping, subsequent installation handling or use, or there is an inherent weak spot or stress concentration within the glass body. Most all damaged lights or lights with inclusions that cause excessive stress concentrations will not survive the thermal rigors of the tempering operation. Of those few that do survive, most will release within a day or so, leaving a small percentage that may not release until even weeks later. These few lights can be expected to be a small portion of unexplained breakage.
8. Although some spontaneous breakage will occur as noted in #6 and #7 above, much breakage is erroneously called "spontaneous" only because there was no easily visible cause. Frequently, inspection of the surround will reveal damage done to the framing thru installation or abuse so that the glass is stressed near its breaking point and a subsequent movement, or temperature change forces that glass to yield.
9. Accidental or deliberate vandalism can be another cause of unexplained breakage.

SUMMARY: Since glass (including tempered glass) can be broken and because most unexplained breakage is beyond the manufacturer's control, it is unreasonable and impractical for anyone to effectively warrant against glass breakage.