

# SAFETY-GLASS RULES & REGS



Following these guidelines will protect your customer from injury and protect you from liability

Although safety glass was originally developed for use in cars, in recent years it has become a standard feature in many homes and commercial buildings.

According to government estimates, about 190,000 people are injured in the U.S. each year from accidents involving architectural glass. For 30 years, consumers, the glass industry, and others have worked to establish uniform standards to reduce those grim statistics.

As a result, safety glazing is now required in doors, sidelites, shower enclosures, and other areas where shattered glass poses a safety hazard.

The standard for doors and shower/tub enclosures is enforced by federal regulations adopted by the Consumer Product Safety Commission (CPSC). The CPSC standard, plus additional requirements for sidelites and other hazardous locations, are included in the Model Safety Glazing Code (MSGC).

MSGC has been incorporated into all three major model building codes, and serves as the minimum requirement for architectural use of safety glazing. Stricter requirements have been adopted by some communities.

Even in jurisdictions with no local codes or inspections, courts have ruled that contractors are liable when death or injury results from an installation that fails to meet the minimum standards of the MSGC. Builders, architects, remodelers, and glazing contractors have a legal responsibility to understand the code provisions and comply with them.

The following information was compiled by the staff of the *Journal of Light Construction*, with source materials provided by the National Glass Association (NGA). It is intended only as an introduction to the subject. Additional, more detailed information can be obtained from the NGA and from local code enforcement officials.

## What is Safety Glazing?

There are three materials that are commonly accepted as safety glazing for most applications.

1. Fully tempered glass is accepted, because when it shatters, the broken edges are relatively dull, diminishing the prospect of serious injury or death.

2. Laminated glass, such as that used in automobile windshields, also qualifies. The minimum standard is 7/32-inch laminated glass with a plastic (0.03 PVB) interlayer.

3. Approved plastics are accepted as a substitute for glass when safety glazing is required.

Contrary to popular belief, wired glass is not accepted as safety glazing for most applications. The NGA notes that wired glass is only half as strong as plain, unwired, annealed glass. It not only breaks more easily, but also can act as a "spider web" that makes it more difficult for a victim to pass through an opening.

A major exception to the rule, however, exists for fire doors. Wired glass is accepted by the major model codes for fire-rated doors, in sizes ranging from 0 to 1,296 square inches, depending on the rating.

Wired glass is specifically prohibited in non-fire doors and in shower or tub enclosures. NGA notes that the model codes, at this point, do not prohibit the use of wired glass for sidelites or certain other applications, but efforts are being made to change and tighten these provisions (see "Safety Glass Politics," page 40).

## Standards for Doors

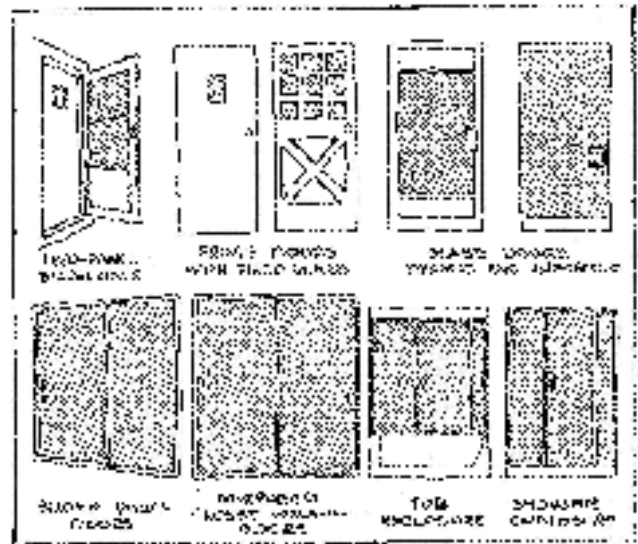
Safety glazing requirements apply to all doors that are designed for human passage. Among items specifically covered are storm and combination doors, bathtub and shower doors, doors with fixed glass, and sliding glass doors.

In the case of bathtub and shower doors, the definition of "door" includes the entire enclosure: All glazing in the structure must be approved safety glass.

The requirements also apply to mirrored doors for walk-in closets. In the case of a reach-in closet, a mirror with a safety film may be used, but these products do not meet the safety glazing standards for a walk-in closet. The key term to remember is that the strict standard applies to doors designed "for human passage."

There are, however, a number of exceptions. For example, a fire-rated door may make use of wired glass. Also, a "peep hole" smaller than 3 inches in diameter does not require safety glass. Jalousie louvered doors, and doors with decorative leaded glass, are also exempt.

Another exception applies to garage doors. If a garage door is used only for vehicles—that is, if people do not walk through it—safety glazing is not required.



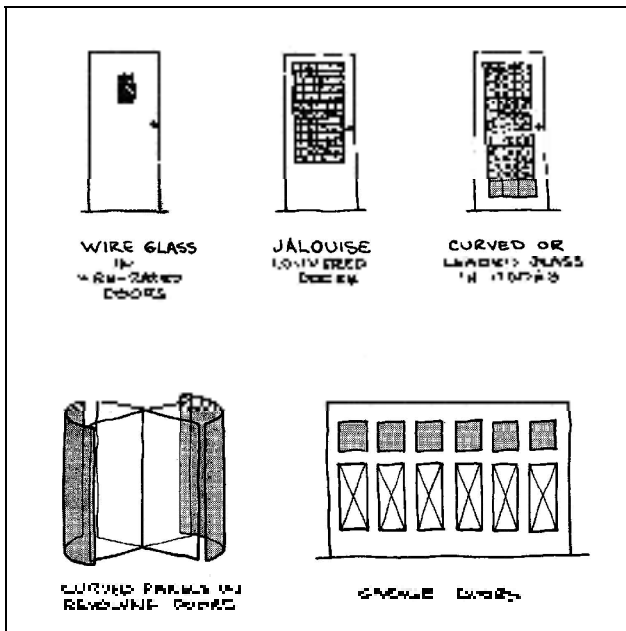


Figure 2. Safety glazing is not required in these situations.

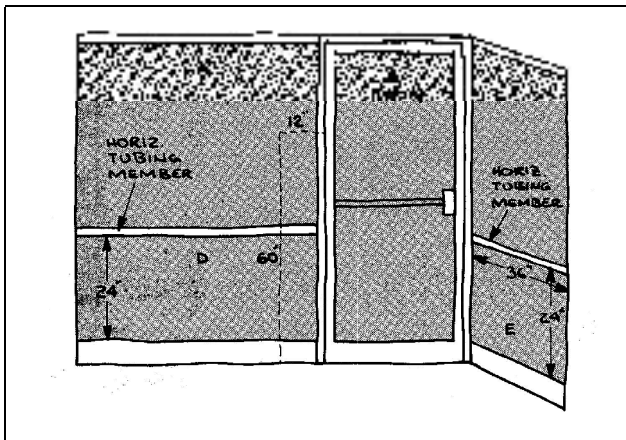


Figure 3. In this typical installation, panels A, B, and D must be safety glazed. Panel B is a door, and panels A and D are sidelites. Panels C and E do not require safety glazing because they are not in the same plane as the door, and are therefore not considered sidelites. In addition, Panel C is more than 9 square feet, but its lowest edge is more than 18 inches above the walking surface. Panel E is less than 9 square feet.

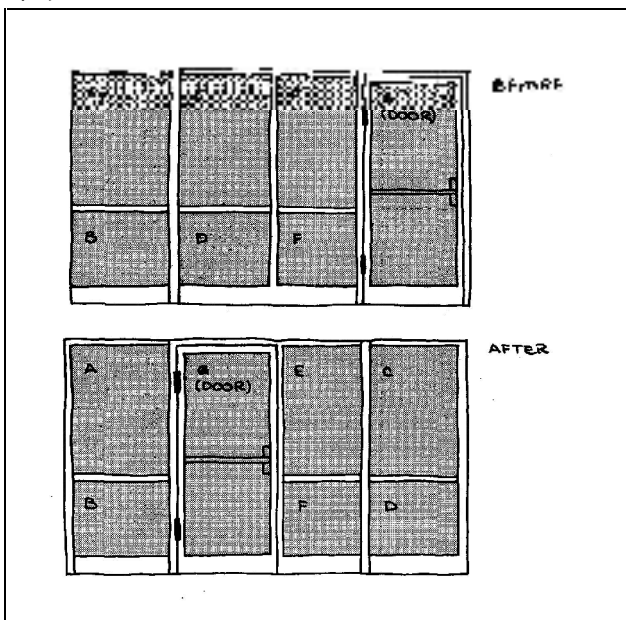


Figure 4. Remodeling can create sidelites, thus changing safety glazing requirements. In the "Before" drawing above, panels A and C do not require safety glazing. In the drawing just below it ("After"), the door (G) has been moved to replace C and D. A is now a sidelite, and must be safety glazed. (All panels here are considered to be more than 9 square feet, so safety glazing is required of the lower panels regardless of their proximity to the door.)

### Standards for Sidelites

A sidelite is a pane of glass next to a door. Under the model code, safety glazing is required if the sidelite is: (1) within 12 horizontal inches of the door opening; (2) within 60 vertical inches of the floor; and (3) in the same plane as the door in a closed position. If all three of those conditions exist, safety glazing must be used.

The exceptions are similar to those for doors. For example, glazing next to a door that is not used for human passage (such as an overhead garage door) is exempt. Other exemptions include jalousie louvered windows, decorative leaded windows, and curved panels in the sidelites of revolving door assemblies.

It is important to keep in mind that any glazing that falls within the definition is covered, even if it might not commonly be referred to as a sidelite. For example, the glass next to a door in a greenhouse or in the window wall on a solar home may be considered a sidelite.

A common error occurs in remodel-

ing. When a door is moved next to an existing glazed panel, the glazed panel becomes a sidelite, and safety glass must be installed. The customer may balk at the expense, but the remodeler is responsible for assuring that the code provision is met.

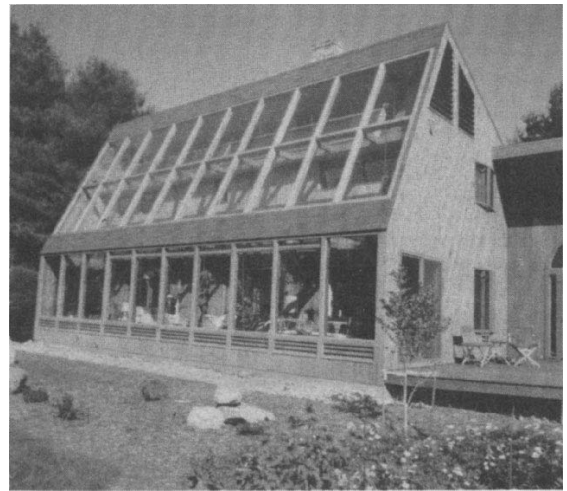
### Standards for Other Glazed Panels

In addition to sidelites, safety glazing is required for panels in other "hazardous locations."

This standard applies if: (1) the lowest edge of the glass is less than 18 inches above a walking surface; (2) there is a walking surface within 36 horizontal inches of the glazing, and; (3) the glazed panel is greater than 9 square feet. If all three conditions exist, safety glazing is required.

There is an alternative remedy, however, for "other glazed panels." Instead of safety glazing, it is acceptable to attach a bar across the window opening. The bar, officially called a "horizontal member," must be at least 1½ inches wide, and firmly attached at a location

## Overhead Glazing: No One Standard



Skylights and other overhead glazing are not covered by the uniform MSGC code described in the accompanying article.

Overhead glazing is addressed in the three national model codes and virtually all local codes, but the requirements are not uniform. Therefore it is especially important to check with a local code official prior to installation.

Several efforts have been made by the Council of American Building Officials (CABO) to develop a compromise standard for adoption by the three model codes, but controversy has been evoked every step of the way. The major question is whether tempered or annealed glass should be allowed in some installations without protective wire mesh screening.

The screening is designed to protect occupants from falling glass if the panel shatters. The problem with screening, as one glass industry spokesman commented, is that "it's really ugly."

Last year, CABO voted to outlaw all unscreened, non-laminated glass in overhead applications. After protests from tempered glass manufacturers, CARO quickly reconsidered its action.

A compromise was reached. Under the new CABO rule, non-laminated tempered glass is allowed in residential overhead panels that are less than 16 square feet in size and less than 12 feet from the floor. Tempered panels must be screened if they are larger, higher, or installed in commercial buildings.

The revised CABO provision was approved this year by the Building Officials and Code Administrators (BOCA) for inclusion in the 1988-89 supplement to the Basic National Building Code. It has been proposed for adoption by both the Southern Building Code Congress International (SBCCI) in its Standard Building Code, and the International Conference of Building Officials (ICBO) in its Uniform Building Code.

Debate is continuing, and even if the compromise is adopted by all three model codes, it could take years for the provisions to filter down to local building codes.

Meanwhile, James Crisci of the National Glass Association acknowledges that an ever-growing share of the skylight market is going to "the one material that all code officials love -- plastic."

— Steve Carlson

## Safety Glazing Politics

Safety concerns have accompanied the introduction of several new architectural uses of glass, particularly the development of shower/tub enclosures in the late 1930s and patio doors in the early 1950s.

In the early 1960s the National Safety Council formed a study group to work with other federal, state, and local agencies to explore the idea of uniform safety-glazing regulations.

At about the same time, industry groups, including the Architectural Aluminum Manufacturers Association, began promoting adoption of uniform safety-glazing standards in the three model codes.

In 1967, the International Conference of Building Officials (ICBO) added safety glazing requirements to its Uniform Building Code. Similar provisions were later adopted by Building Officials and Code Administrators (BOCA) in its Basic/National Building Code and by Southern Building Code Congress International (SBCCI) in its Standard Building Code.

The glass industry formed its own group, the Consumer Safety Glazing Committee (CSGC), to lobby for separate but uniform laws in each state. The results were spotty, and in 1973, the CSGC petitioned the newly-formed federal Consumer Product Safety Commission (CPSC) to establish uniform national standards.

The new agency acted quickly, conducting tests of different glazings with anthropomorphic dummies and professional football players.

The new Federal Safety Glazing Standard was adopted in 1977. It was tough, and included provisions

that brought protests from the glass industry and from local code officials.

The new standard for sidelites and other hazardous areas was stricter than the existing model codes, which had been adopted in communities throughout the U.S. Since the federal standard preempts local codes, local officials could not legally enforce their codes, without bringing them into conformance with the federal regulation. They balked, and the CPSC was without an effective enforcement mechanism.

Meanwhile, the new federal standard effectively ruled out viewing areas in fire doors. Wired glass was eliminated as a safety glazing, and the approved materials did not qualify for a fire rating. After a court challenge, the standard was modified to allow limited use of wired glass in fire-rated doors.

After a long series of negotiations with the glass industry and code officials, the CPSC arrived at a compromise. Under the agreement, the federal standard for doors and shower/tub enclosures, would be adopted by the model code organizations to help with enforcement. The federal standard for sidelites and other hazardous locations would be dropped, but an acceptable substitute would be incorporated into the model codes.

This compromise went into effect in 1980, the MSGC, which contains the remaining federal standard plus the additional compromise provisions, had been adopted by the three model codes and by virtually all U.S. communities that have building codes.

—Steve Carlson

between 24 and 36 inches above the walking surface.

The bar must offer as much deflection resistance as a chair rail. If there is a walking surface on both sides of the opening, bars must be attached on both sides.

The bar is only an alternative for "other glazed panels." It cannot be used as a substitute for safety glass in a sidelite.

### Code Compliance

The CPSC standard for doors and shower/tub enclosures is federal law, even where there are no local codes.

The MSGC for sidelites and other glazed panels is law throughout most of the U.S., because most local codes are based on the three national model codes. Regardless of local code requirements, however, contractors can be held liable by the courts if they do not comply with the safest current, professional glazing practices.

In minor remodeling jobs, strict compliance can sometimes cause friction with customers. For example, if non-safety glass is removed from an area that needs safety glass, even to make an adjustment, by law it must be replaced with safety glass. If one panel of a pair is replaced, the other panel should be replaced as well. If a large panel of annealed glass is removed from a hazardous location for the passage of equipment or furniture, it must be replaced with safety glass rather than re-

installed.

A minor repair—such as adjusting the lockset on a door without removing it—does not necessarily require replacement of the glass panel. But the person doing the work must inform the customer and recommend that the door be safety glazed. This should be done in writing, and a copy should be signed by the customer and kept on file.

### Additional Information

For the safety of the customer as well as protection from legal liability, professionals who install or specify architectural glass should be intimately familiar with the code requirements for safety glazing.

Specific information should be obtained from a local code enforcement official. Another excellent source of information is a pamphlet that provided much source material for this article: *Guide to the Federal Glazing Laws and the Model Safety Glazing Code 1988*.

The pamphlet is published by the National Glass Association, and may be obtained (\$12.95; \$9.95 for members) from NGA, 8200 Greensboro Drive #302, McLean, VA 22102; 703/442-4890. ■

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