SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J673

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Superseding J673 APR1993

(R) Automotive Safety Glasses

1. Scope

This SAE Recommended Practice is intended to cover current safety glazing practice applicable to safety glasses for use in motor vehicles and motor vehicle equipment. Nominal specifications for thickness, flatness, curvature, size, and fabrication details are included principally for the guidance of body engineers and designers. For additional information on safety glazing materials for use in motor vehicles and motor vehicle equipment, see SAE J674.

1.1 Rationale

This document was revised in accordance to the harmonization of Z26 and ISO regulations.

2. References

2.1 Applicable Publication

The following publication forms a part of this Recommend Practice to the extent specified herein. Unless otherwise indicated the latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J674—Safety Glazing Materials—Motor Vehicles and Motor Vehicle Equipment

3. Glass Sizes

There are no standard sizes applicable to safety glasses for use in motor vehicles and motor vehicle equipment. The feasibility of proposed safety glass sizes developed by the motor vehicle/motor vehicle equipment manufacturer must be determined by conference with the glass fabricator.

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4. Safety Glass

Means safety glazing materials predominantly ceramic in character, including (but not limited to) laminated glass and tempered glass.

4.1 The various types of safety glass (flat or curved) are as follows: laminated float glass and tempered float glass.

4.1.1 LAMINATED GLASS

Means two or more pieces of float glass bonded together by an intervening layer or layers of plastic material. It will crack or break under sufficient impact, but the pieces of glass tend to adhere to the plastic. If a hole is produced, the edges are likely to be less jagged than would be the case with ordinary annealed glass.

4.1.2 TEMPERED GLASS

(Other terms such as “heat treated glass,” “toughened glass,” “case-hardened glass,” and “chemically tempered glass” are used also.) Means a single piece of specially treated float glass possessing mechanical strength substantially higher than annealed glass. When broken at any point, the entire piece breaks into small pieces that have relatively dull edges as compared to those of broken pieces of annealed glass.

All fabrication, such as cutting to overall dimensions, edgework, drilled holes, notching, grinding, sand-blasting, and etching, shall be performed before tempering.

5. Typical Commercial Tolerance Information

5.1 Thickness

Commercially available flat or curved safety glass ordinarily has a thickness tolerance of ±0. 1 x (n)·mm ('n' being the number of layers of glass). (See Table 1.)

5.2 Flatness

Flat safety glass of the previous types may have 0.8 mm (0.03 in) maximum total bow per each lineal 305 mm (12 in) and each part may have a maximum overall bow in millimeters of 0.03 times the length of the part in millimeters (0.03 times the length of the part in feet).

TABLE 1—NOMINAL THICKNESSES

Type of Safety Glass	Typical Nominal Thickness[1] mm	Typical Nominal Thickness[1] In
Laminated float	8.0	0.315
	7.0	0.276
	6.5	0.256
	6.0	0.236
	5.5	0.216
	5.0	0.197
	4.5	0.177
Tempered float	6.5	0.256
	6.0	0.236
	5.0	0.197
	4.5	0.177
	4.0	0.157
	3.5	0.138
	3.0	0.118

1. Other glass thicknesses may become available, and would be acceptable for use in motor vehicles and motor vehicle equipment provided they meet the requirements of all applicable laws, regulations, codes, and practices in effect at the time an automotive safety glass is manufactured.

5.3 Specifying Dimensional Tolerances for Curved Automotive Safety Glass

5.3.1 Tolerances on the physical dimensions of curved automotive safety glass parts shall be specified as follows, with reference to the numeric design data, or to a master die model derived from numeric data supplied by the motor vehicle and motor vehicle equipment manufacturer:

a. Size—Maximum size (plus zero), with specified minimum size.
b. Thickness—Nominal thickness, with acceptable commercial ranges above and below nominal.
c. Curvature—Peripheral or edge contour may be specified in terms of maximum departure from the peripheral face of the desired surface. Central area surface contour may be specified in terms of permissible deviations of curvature from the designed contour. For example, this contour may be measured from the vertical centerline chord of the glass, taken at the point of maximum designed depth of curvature.

NOTE—Manufacturing tolerances on size and curvature will vary with design and should be established by conference. Designs for complex curved parts should recognize and accommodate necessary tolerances on size and shape.

5.3.2 Curved safety glass parts are generally checked for size and curvature on a checking gauge made to receive the desired surfaces of the glass, as illustrated in Figures 1 and 2. The checking gauge should be accurate, rigid, and permanent. Size is checked using maximum and minimum lines, stops, or notches on the gauge.

5.3.3 Peripheral or edge contour is usually checked by inserting a thickness feeler gauge, taper gage, or dial indicator (where possible) between the face of the checking ledge and the glass. The width of the face of the checking ledge can vary with design, and should be established by conference.

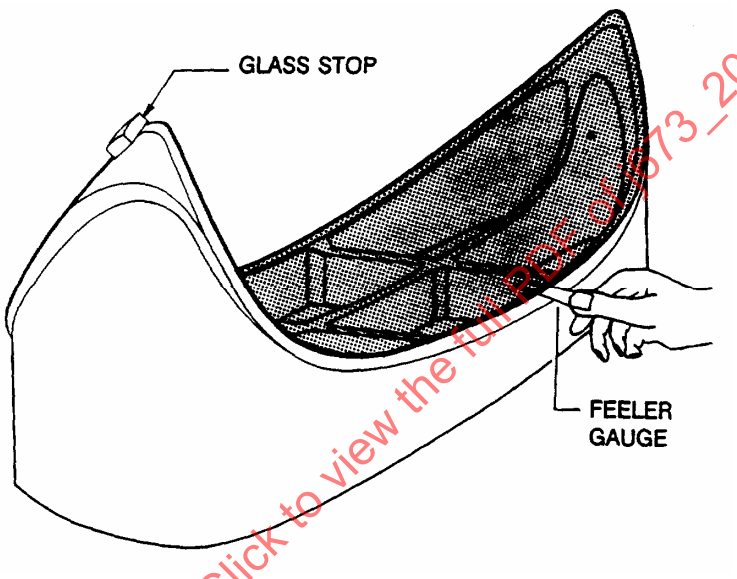

FIGURE 1—CONCAVE-TYPE CHECKING GAUGE

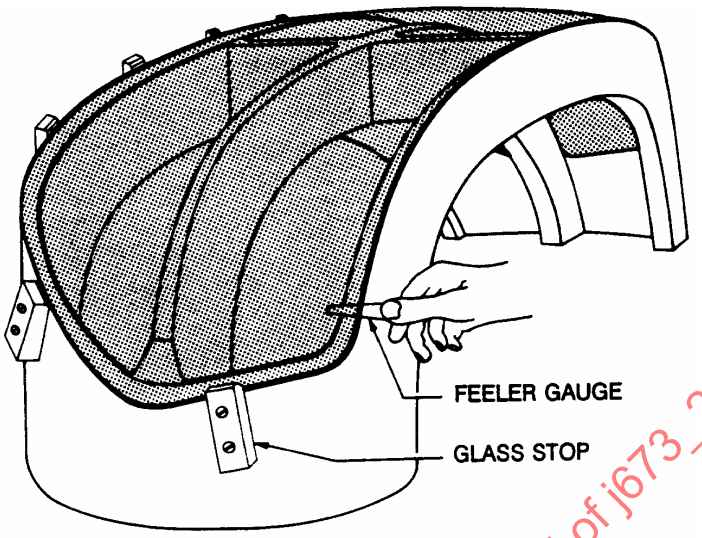

FIGURE 2—CONVEX-TYPE CHECKING GAUGE

5.3.4 The central area of the checking gauge is undercut, with a spring pin or other means of checking the surface contour at the specified area.

5.4 Overall Size

Tolerance for flat laminated safety glass and flat tempered safety glass is ±0.8 mm (±0.03 in), except for vertically sliding door glass where the height dimension may be ±1.5 mm (±0.06 in), unless otherwise specified.

5.4.1 Size tolerances for curved laminated safety glass and curved tempered safety glass are affected by pattern and degree of curvature, and should be checked with the glass fabricator.

5.5 Overlap

For laminated safety glass, an overlap, offset or slip of 1.5 mm maximum (0.06 in) of one piece over the other on all edges, except Crown Edge finishes No. 1 and 2, is permissible unless otherwise specified and provided the overall dimension is within tolerance. On Crown Edge finishes No. 1 and 2, a maximum overlap, offset or slip of 1.1 mm (0.04 in) is permissible, unless otherwise specified and provided the overall dimension is within tolerance, on laminates with the plies individually ground.

5.6 Tong Marks

Center of tong marks may be located 8 mm (0.3 in) maximum from edge of glass, unless otherwise specified.

5.7 Mold Marks

Mold marks may extend 8.0 mm (0.315 in) maximum from edge of glass depending on the size and complexity of the curved part, unless otherwise specified.

5.8 Drilled Holes

For tempered safety glass, the dimensions and tolerances for the size and location of drilled holes will vary with design and glass thickness and should be determined by conference with the glass fabricator.

6. Edges

For various applications and locations, Figure 3 to Figure 6E.

NOTE—Flake (shell) chips 2.3 mm (0.09 in) and small shiners (wheel skips) 3.1 mm (0.12 in) diameter or 1.5 mm (0.06 in) wide by 13 mm (0.5 in) long, to an accumulated length of 38 mm (1.5 in), are allowed on Edge No. 1. Larger chips are allowed on other type edges as long as the proper function of the glass is not impaired.

6.1 Edge No. 1

Crown Edge, Satin Finish (such as diamond wheel) (Figure 6A) indicates an approximate radius fine grind along the edges; for all exposed edges.

6.2 Edge No. 2

Crown Edge, Semisatin Finish (Figure 6B) indicates a modification of Edge No. 1 where the finish is not so fine, and larger shiners (wheel skips) are permissible in center area of the crown; for unexposed edges sliding in channels.

6.3 Edge No. 3

Semicrown Edge, Semisatin Finish (Figure 6C) indicates a modification of Edge No. 2 where the central part of the edge need not be touched with the edging wheel; for edges enclosed in fixed channels, or stationary installations.

6.4 Edge No. 4

Seamed Edge (Figure 6D) indicates that the original cut edge of the glass is ground off to an angle of approximately 45 degrees. Usually, the width of the seam is approximately 0.8 mm (0.03 in). A seamed edge is the minimum type of edge work acceptable for tempered safety glass; for edges enclosed in fixed channels or stationary installations.

6.5 Edge No. 5

Plain Edge (Figure 6E) indicates that the glass part has no further work done upon the original cut edges, except that the sharp edges may be removed if desired; for edges enclosed in fixed channels, not acceptable for tempered safety glass.

7. Markings

Markings should be in accordance with the requirements of all applicable laws, regulations, codes, copyrights and practices to which automotive safety glasses are required to conform at the time of manufacture.

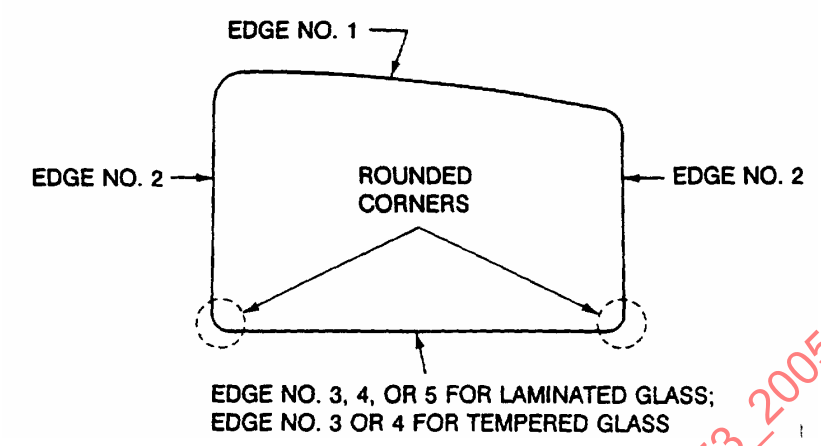

FIGURE 3—ILLUSTRATIVE VERTICALLY SLIDING DOOR OR QUARTER WINDOW

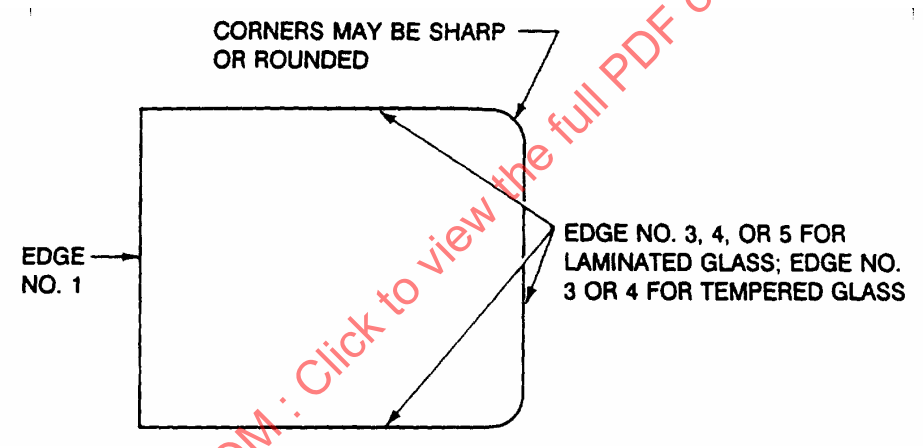

FIGURE 4—ILLUSTRATIVE SLIDING WINDOW WITH CHANNEL ON THREE SIDES