

(R) AUTOMOTIVE SAFETY GLASSES

Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

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.

2. **References**

2.1 **Applicable Publication**—The following publication forms a part of this specification to the extent specified herein. 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

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.

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

4. **Typical Commercial Tolerance Information**

4.1 **Thickness**—Commercially available flat or curved safety glass ordinarily has a thickness tolerance of ± 0.2 n-mm ('n' being the number of layers of glass). (See Table 1.)

4.2 **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).

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

QUESTIONS REGARDING THIS DOCUMENT: (412) 772-8512 FAX: (412) 776-0243
TO PLACE A DOCUMENT ORDER; (412) 776-4970 FAX: (412) 776-0790
SAE WEB ADDRESS <http://www.sae.org>

TABLE 1—NOMINAL THICKNESSES

Type of Safety Glass	Typical Nominal Thickness ⁽¹⁾	
	mm	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.

4.3 Specifying Dimensional Tolerances for Curved Automotive Safety Glass

4.3.1 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.

4.3.2 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.

4.3.3 Peripheral or edge contour is usually checked by inserting a thickness feeler gauge (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.

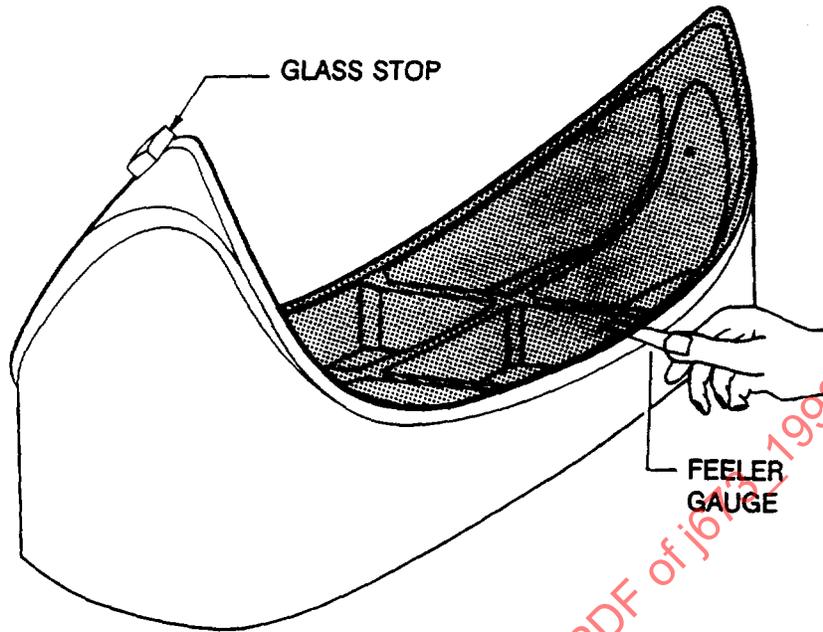


FIGURE 1—CONCAVE-TYPE CHECKING GAUGE

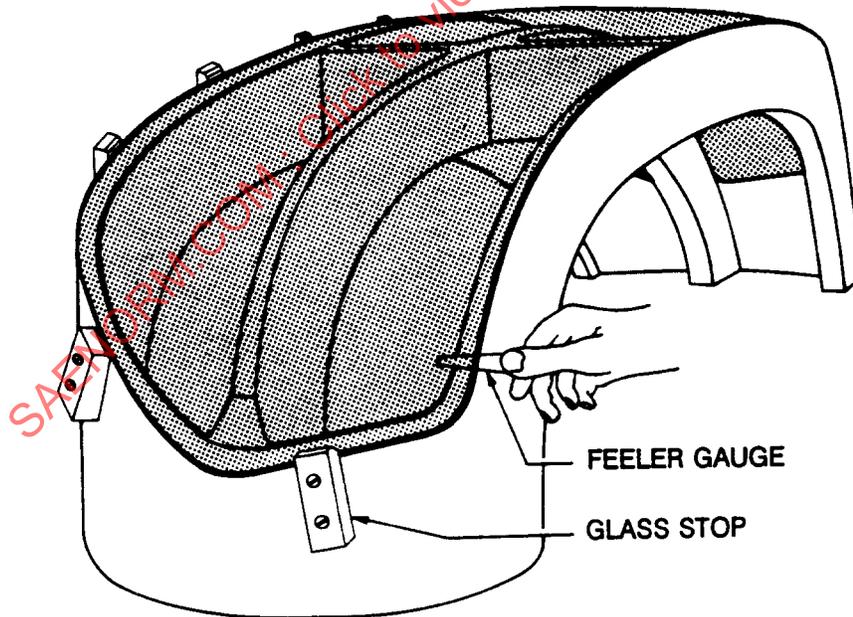


FIGURE 2—CONVEX-TYPE CHECKING GAUGE

4.3.4 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.

SAE J673 Revised APR93

- 4.4 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.
- 4.4.1 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.
- 4.5 Overlap**—For laminated safety glass, an overlap 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.
- 4.6 Tong Marks**—Center of tong marks may be located 8 mm (0.3 in) maximum from edge of glass, unless otherwise specified.
- 4.7 Mold Marks**—Mold marks may extend to 6.4 mm (0.25 in) maximum from edge of glass depending on the size and complexity of the curved part, unless otherwise specified.
- 4.8 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.
- 5. Edges**—For various applications and locations, Figure 3 to Figure 5.
- 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.
- 5.1 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.
- 5.2 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.
- 5.3 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.
- 5.4 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.
- 5.5 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.
- 6. Markings**—Markings should be in accordance with the requirements of all applicable laws, regulations, codes, and practices to which automotive safety glasses are required to conform at the time of manufacture.

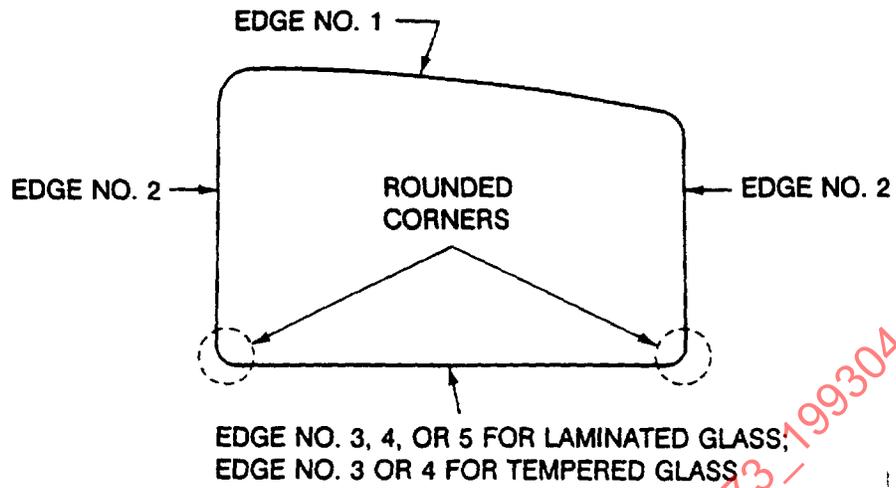


FIGURE 3—ILLUSTRATIVE VERTICALLY SLIDING DOOR OR QUARTER WINDOW

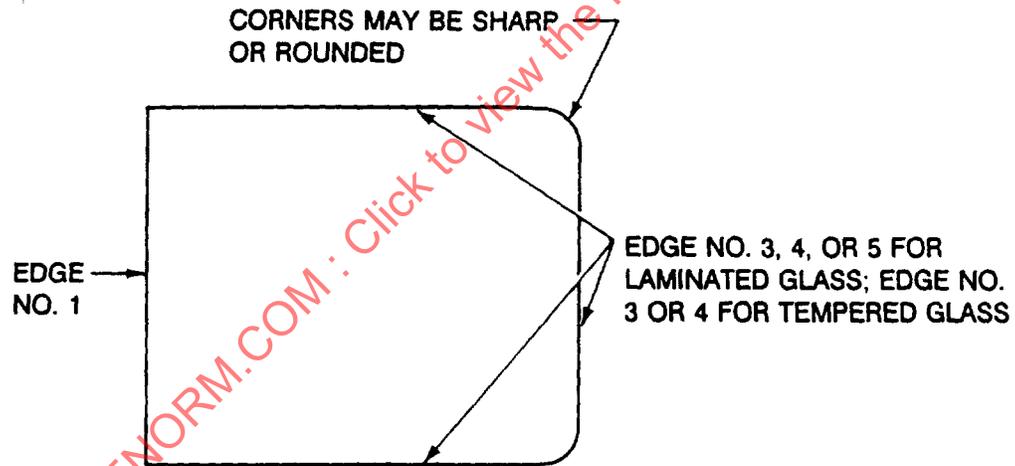


FIGURE 4—ILLUSTRATIVE SLIDING WINDOW WITH CHANNEL ON THREE SIDES

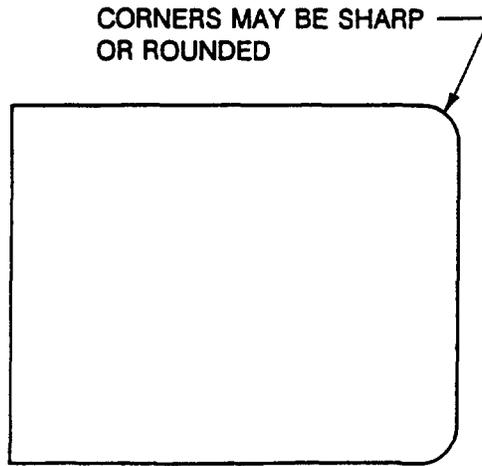


FIGURE 5—ILLUSTRATIVE SLIDING WINDOW WITH CHANNEL ON FOUR SIDES—EDGE NO. 3, 4, OR 5 FOR LAMINATED GLASS ALL AROUND; EDGE NO. 3 OR 4 FOR TEMPERED GLASS ALL AROUND.

NOTES FOR FIGURES 6A TO 6E

NOTE 1: L = LAMINATED GLASS; T = TEMPERED GLASS

NOTE 2: GLASS MANUFACTURER IS NOT REQUIRED TO FURNISH A TRUE RADIUS ON ANY EDGE WHERE A RADIUS IS SPECIFIED

MIN RADIUS 1/2 GLASS THICKNESS MAX RADIUS
6.73 MM (0.265 IN)

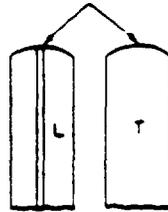


FIGURE 6—EDGE NO. 1, CROWN EDGE, SATIN FINISH FOR ALL EXPOSED EDGES

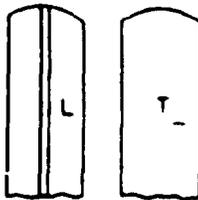


FIGURE 7—EDGE NO. 2, CROWN EDGE, SEMISATIN FINISH FOR UNEXPOSED EDGES SLIDING IN CHANNELS

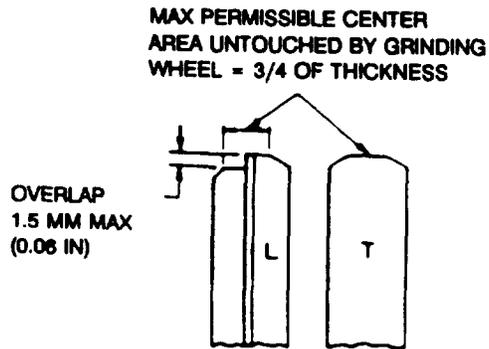


FIGURE 8—EDGE NO. 3, SEMICROWN EDGE, SEMISATIN FINISH FOR EDGES ENCLOSED IN FIXED CHANNELS OR STATIONARY INSTALLATIONS

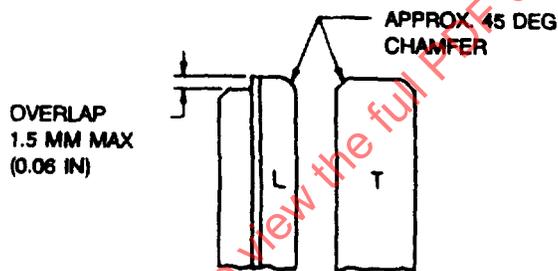


FIGURE 9—EDGE NO. 4, SEAMED EDGE FOR EDGES ENCLOSED IN FIXED CHANNELS OR STATIONARY INSTALLATIONS

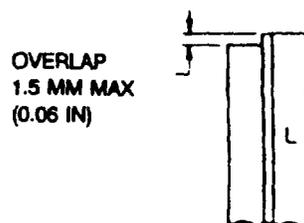


FIGURE 10—EDGE NO. 5, PLAIN EDGE FOR EDGES ENCLOSED IN FIXED CHANNELS