

SURFACE VEHICLE RECOMMENDED PRACTICE

an American National Standard

SAE J673

**REV.
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AUTOMOTIVE SAFETY GLAZING

1. SCOPE:

This SAE Recommended Practice is intended to cover current safety glazing practice and usage of safety glazing materials in motor vehicles. Nominal specifications for thickness, flatness, curvature, size, and fabrication details are included principally for the guidance of body engineers and designers. Because of the limited usage and experience with plastic safety glazing materials in motor vehicles, this recommended practice has been confined to safety glass glazing. For additional information on safety glazing materials for motor vehicles, see SAE J674.

2. GLASS SIZES:

There are no standard sizes in automotive glass. Maximum sizes must be determined between the automotive engineering department and the glass manufacturer.

The various types of safety glass (flat or curved) are as follows: laminated plate, float, or sheet glass; tempered plate, float, or sheet glass; polished wired glass.

3. TYPICAL COMMERCIAL TOLERANCE INFORMATION:

- 3.1 Thickness: Commercially available flat or curved safety glass ordinarily (R) has a thickness tolerance of plus or minus 0.03 in (0.7 mm).

NOTE: Other glass thicknesses may become available, and are acceptable providing they meet the applicable test requirements of ANSI Standard Z26.1-1966 (R. 1973), Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways.

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3.1 (Continued)

Type of Safety Glass	Typical Nominal Thickness, in (mm)
Laminated plate or float	0.285 (7.24), 0.265 (6.73), 0.250 (6.35)
Laminated sheet ^a	0.230 (5.84), 0.219 (5.56), 0.210 (5.33)
(R) Tempered plate or float	0.230 (5.84)
Tempered sheet	0.250 (6.35), 0.235 (5.97), 0.219 (5.56)
Polished wired glass	0.187 (4.75), 0.156 (3.96), 0.125 (3.18)
	0.250 (6.35), 0.219 (5.56), 0.193 (4.90)
	0.156 (3.96), 0.125 (3.18), 0.090 (2.29)
	0.250 (6.35)

^aMade using two pieces of sheet glass of approximately equal thickness, or with one piece of single strength and one of double strength.

3.2 Flatness: Flat safety glass of the above types may have 0.03 in (0.7 mm) (R) max. total bow per each lineal foot (305 mm), and each part may have a maximum overall bow in inches of 0.03 times the length of the part in feet.

3.3 Specifying Dimensional Tolerances for Curved Automotive Safety Glass:

3.3.1 Tolerances on the physical dimensions of curved automotive safety glass parts shall be specified as follows, with reference to the master die model supplied by the automobile 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.

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

3.3.3 Peripheral or edge contour is usually checked by inserting a thickness feeler gage (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.

- 3.3.4 The central area of the checking gage is undercut, with a spring pin or other means of checking the surface contour at the specified area.
- 3.4 Overall Size: Tolerance for flat laminated glass, flat tempered glass, and (R) polished wired glass is plus or minus 0.03 in (0.7 mm), except for vertically sliding door glass where the height dimension may be plus or minus 0.06 in (1.5 mm), unless otherwise specified.
- 3.4.1 Size tolerances for curved laminated or tempered safety glass are affected by pattern and degree of curvature, and should be checked with the glass manufacturer.
- 3.5 Overlap: For laminated safety glass, an overlap of 0.06 in (1.5 mm) of one (R) piece over the other on all edges, except crown edge finishes No. 1 and 2, is permissible, unless otherwise specified, provided the overall dimension is within tolerance.
- 3.6 Tong Marks: Center of tong marks may be located 0.3 in (8 mm) maximum from edge of glass, unless otherwise specified.
- 3.7 Mold Marks: Mold marks may extend to 0.5 in (13 mm) maximum from edge of glass depending on the size and complexity of the curved part, unless otherwise specified.
- 3.8 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 established by conference.

4. EDGES:

For various applications and locations, see Figures 4-6.

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

- 4.1 Edge No. 1: Crown Edge, Satin Finish (such as diamond wheel) (Figure 3A) indicates an approximate radius fine grind along the edge; for all exposed edges.
- 4.2 Edge No. 2: Crown Edge, Semisatin Finish (Figure 3B) 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.
- 4.3 Edge No. 3: Semicrown Edge, Semisatin Finish (Figure 3C) 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.

- 4.4 Edge No. 4: Seamed Edge (Figure 3D) indicates that the original cut edge of (R) the glass is ground off to an angle of approximately 45 deg. Usually, the width of the seam is approximately 0.03 in (0.7 mm). A seamed edge is the minimum type of edge work acceptable for tempered safety glass; for edges enclosed in fixed channels, or stationary installations.
- 4.5 Edge No. 5: Plain Edge (Figure 3E) 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 edge enclosed in fixed channels; not acceptable for tempered safety glass.

5. MARKINGS:

Markings are to be in accordance with current ANSI Standard Z26.1-1966 (R. 1973) and FMVSS 205. Location of these markings must be visible for identification after installation. Any other special identifying marks required must be specified and located on the drawing, and must be apart from the glass manufacturer's distinctive trademark, or other markings required by law, ordinance, or regulation.

The (R) is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

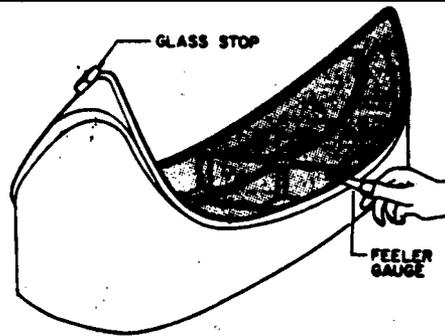


FIGURE 1 - Concave Type Checking Gage

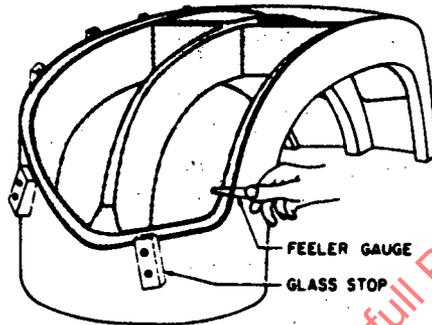


FIGURE 2 - Convex Type Checking Gage

NOTES FOR FIGS. 3A-3E
 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
 0.285 in. (6.73 mm)

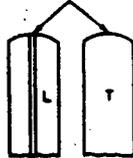


FIGURE 3A - Edge No. 1, Crown Edge, Satin Finish for All
 Exposed Edges

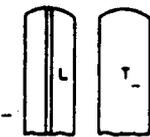
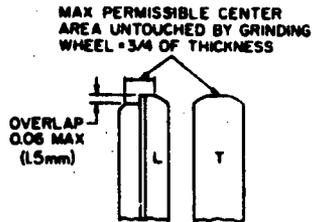
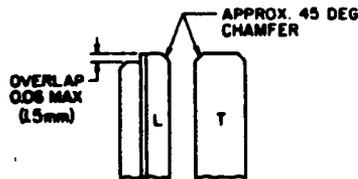


FIGURE 3B - Edge No. 2, Crown Edge, Semisatin Finish for
 Unexposed Edges Sliding in Channels



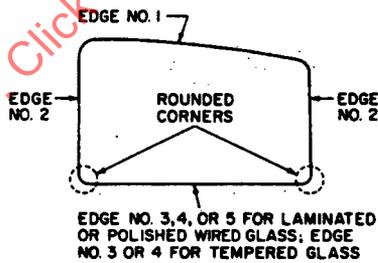
(R) FIGURE 3C - Edge No. 3, Semicrown Edge, Semisatin Finish for Edges Enclosed in Fixed Channels or Stationary Installations



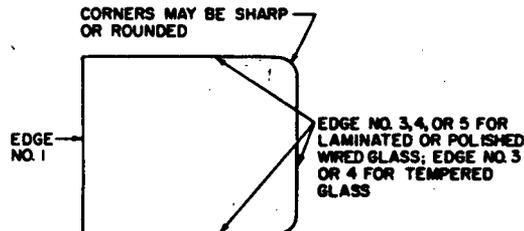
(R) FIGURE 3D - Edge No. 4, Seamed Edge for Edges Enclosed in Fixed Channels or Stationary Installations



(R) FIGURE 3E - Edge No. 5, Plain Edge for Edges Enclosed in Fixed Channels



(R) FIGURE 4 - Illustrative Vertically Sliding Door or Quarter Window



(R) FIGURE 5 - Illustrative Sliding Window with Channel on Three Sides

CORNERS MAY BE SHARP
OR ROUNDED



(R) FIGURE 6 - Illustrative Sliding Window with Channel
on Four Sides - Edge No. 3, 4, or 5 for Laminated
or Polished Wired Glass All Around; Edge No. 3
or 4 for Tempered Glass All Around

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