

## Truck Accessory Group GLASS INSPECTION STANDARD

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Glass Specifications		Q40006	A

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### PURPOSE

This instruction documents specifications for glass appearance standards and for the method used to evaluate glass.

### SCOPE

This standard applies to surface quality of glass used in window and door assemblies.

### REFERENCES

ASTM C162-92 Standard Terminology of Glass and Glass Products  
 ASTM C1036-06 Standard Specification for Flat Glass  
 ASTM C 1048-04 Standard Specification for Heat Treated Flat Glass  
 ASTM C 1464-06 Standard Specification for Bent Glass  
 SAE J673  
 Ford WSS-M28P1-B1/B5

### DEFINITIONS

Blemish / Defect	Any discontinuity in the glass that affects the usability of the product (e.g. bubbles, chips, scratches, fingerprints that don't wipe off per standard glass cleaning methods)
Adhesion	Material or foreign objects attached to the surface of the glass sheet.
Bubble	A void area total enclosed in the material on the surface of the material. A bubble at the surface of the material open to the outside of the material may be called an <i>Open Bubble</i> or a <i>Pit</i> .
Chip	A concave area in the surface or edge of the part due to breakage of a small fragment out of an otherwise regular surface.
Crush	A lightly pitted condition with a dull gray appearance.
Dig	Deep, short scratch
Dirt	A foreign particle imbedded into the surface of the glass.
Rub	Fine scratches, running close together and parallel to each other
Tarnish	A discontinuity in the color of the surface of the material.
Scratch	Linear damage to the surface of the material as a result of sliding contact with another object.
Seed	A gaseous inclusion or bubble in the glass surface
Pinhole	circular void in the painted / silk screen surface
MMC	The largest allowed dimensions of a part across material and the smallest allowed dimensions across a hole (Maximum Material Condition).
Shiner / Skips	Area where grinding wheel skips edge giving the appearance of a raw edge.
Zebra Board	A vertical flat surface covered with alternating black and white one-inch stripes oriented 45 degrees from horizontal.

## BODY

1. All glass will conform to any and all standards mandated by DOT per the FMVSS 205, ANSI Z26.1 and SAE J673 and any other Federal Reg that may be required. In the event that the specifications in this document contradict specifications in mandated standards, glass will conform to the specifications in the mandated standards.
2. Identification - All tempered fabricated glass products will be identified with the appropriate trademark located in the position indicated on the engineering drawings.
3. Temper - The temper quality of the fabricated product will conform to the industry standard unless dictated otherwise by the engineering drawing. The supplier will conduct tests at intervals required by the appropriate standard and forward copies of the test results when requested by TAG.
4. Ceramic Silk Screen Paint Border - The border shall be uniform in appearance. Pinholes with a maximum 0.060" diameter are allowed. Groups of three pinholes in a six inch area are acceptable, no more than six pinholes per piece. Scratches and nonconforming pinholes may be repaired provided that the repair is not noticeable from the outside of the glass. Non-uniformity of coating, streaks and mottle finish not readily perceptible and not noticeable from the outside of glass are permissible.
5. Edge Finish:
  - 5.1. Edge #1 (Crown Edge, Semi – Satin Finish) - Fine grind along all exposed edges. Shiners or skips, glossy / non-uniform satin finish, are allowed with a maximum skip of 0.020" x 0.040" (0.5mm x 1.0mm) and no more than 3 allowable per piece. Micro chips no greater than 0.030" will be allowed.
    - 5.1.1. Skips outside the allowable dimension may be resurfaced with a grinding stone or fine sandpaper.
    - 5.1.2. Small chips on the edge backside of the glass may be smoothed with a grinding stone or fine sandpaper.
  - 5.2. Edge #2 (Crown Edge, Semi-satin Finish) – Finish is modified from edge #1 and not as fine. Skips are permissible in the center area of the crown up to 1.5" in length and no more than 5 per piece. Edge chips of up to 1/8 inch wide (into the glass face) by 1/8 inch long (along the edge) by 20% of the thickness are allowed per edge. Accumulated length of chips shall not exceed 1.5 inches.
  - 5.3. Edge #3 (Semi-crown Edge, Semi-satin Finish) - Center ¾ of thickness may be untouched by edging wheel allowing for skips down the entire center of edge. Shell chips of up to 1/8 inch wide (into the glass face) by 1/8 inch long (along the edge) by 20% of glass thickness are allowed per edge. Accumulated length of chips shall not exceed 1.5 inches. V ships are not allowed.
  - 5.4. Edge #4 (Seamed Edge) – Raw edge of glass is swiped on a seaming belt and 45 deg angle at approximately 0.020" width. Shell chips shall not exceed 1/8 inch wide (into the glass face) by 0.250" long (along the edge) and less than 50% of glass thickness provided there is a seam over the top. V chips are not acceptable.
6. Optical Distortion:
  - 6.1. Light Transmission – based on individual color requirements called out by TAG and as determined in the OEM glass color category.
7. Glass Thickness:
  - 3.125mm (1/8") ± 0.2mm (0.008")
  - 3.42mm ± 0.2mm
  - 4.7mm (3/16") ± 0.2mm (0.008")
  - 5.0mm +0.1mm / - 0.4mm

8. Standardized Method of Inspection: All glass has inherent characteristics that are apparent under peculiar lighting conditions and angles of observation. The inspection method is to simulate product visibility as it is intended for use.
  - 8.1. Lighting – Uniformed diffused background light that will simulate ambient daylight (without direct sunlight) such as florescent ceiling light with a minimum luminance of 1700 lux (160 foot-candles).
  - 8.2. Positioning of Glass (flat and bent) – Sample should be in the vertical position to simulate vehicle position at the distance of 1 meter / 39” (arms length). The viewer shall look through the sample (transmission) at an angle of 90deg or perpendicular to the pane of glass.
9. Visual Quality Criteria for Surface Blemishes / Scratches:
  - 9.1. Adhesions, Bubble, Crush, Crizzle, Dig, Dirt and Seed 0.060” maximum no more than six per piece with a minimum separation of six inches.
  - 9.2. Scratches:
    - 9.2.1. Hairline Scratch – fine scratch, can not be felt and can only be seen up close <12”; Acceptable.
    - 9.2.2. Light Scratch – fine scratch and can not be felt with a razor blade and can be seen from 12” – 39”. Maximum 6 inches in length, no more than four per part.
    - 9.2.3. Medium Scratch – Can be detected at arms length and felt with a razor blade and possibly with a finger nail. Maximum 0.25 inches and no more than two per 12” area and no more than 3 per part.
    - 9.2.4. Heavy Scratch – Can be easily felt with a finger nail and easily visible at arms length; None Allowed

**REVISION HISTORY**

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Rel	04/01/13	Jeff Hutchison	Release Level