



ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

GLASS, SAFETY - HEAT TREATED FLOAT - CLEAR

DELTA WSK-M28G21-A

GLASS, SAFETY - HEAT TREATED FLOAT - TINTED

DELTA WSK-M28G22-A

1. SCOPE

The materials defined by this specification are grades of heat treated float safety glasses which meet the requirements of the government standards for the country of use.

2. APPLICATION

This specification was released originally for materials used for flat or curved automotive glazing except windshields.

3. REQUIREMENTS

3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

3.2 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

3.2.1 Physical and Optical Requirements

The glass must meet all requirements of the following test standards in the European market.

ECE R-43
BS AU 178
SVZO 22a

The above standards are equivalent to each other.

The glass must meet the requirements of the following standards for the North American market.

ANSI Z 26.1 - 1977. ANSI Z 26.1a - 1980
FMVSS 205

Date	Release No.	Release/Revision		
1991 10 01	EP00E01089489000	Revised	W. Scholz	Conc. J. Schult
1990 09 03	EP00E01031539000	Released	W. Scholz	Conc. J. Schult

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Compliance shall be demonstrated by conformance to a control plan developed by the glass manufacturer and approved by Body Engineering Vehicle Operations.

3.3 MATERIAL DESIGNATION

Clear and/or heat absorbing glass shall be as specified on the Engineering drawings.

3.3.1 Thickness Ranges, mm

Nominal	NAAO	EA0
6.4, nominal	5.56 - 6.48	As specified on Engineering drawing
5.6, nominal	5.46 - 6.10	
4.8, nominal	4.62 - 6.10	
3.2, nominal	2.54 - 3.51	

3.4 TERMINOLOGY

3.4.1 Lift from Fixture (Warp)

Maximum warp permitted along edge as specified on Engineering Drawing.

3.4.2 Cross Curvature

Height of cord of vertical curve measured at center line of glass (back window), and height of horizontal curve (side windows) as specified on Engineering Drawing.

3.4.3 Sag

Height of cord of horizontal curve measured at center line of glass (back window) and height of cord of vertical curve (side windows) as specified on Engineering Drawing.

3.5 GLASS GRADING AREAS

3.5.1 Back Windows

For purposes of inspection to this specification, back windows are divided into two grading areas. These areas are designated "B", the entire exposed glass area, and "C", the covered or concealed border area.

Unless otherwise specified, any of the below mentioned glass imperfections are permitted in area "C", provided they do not affect the function of the glass.



3.5.2 Body Glasses

For the purpose of inspection, these parts are divided into two grading areas. Area "B", the entire exposed glass area, and area "C", the concealed area around area "B".

Unless otherwise specified, any of the below mentioned glass imperfections are permitted in area "C", provided they do not affect the function of the glass.

3.6 GLASS IMPERFECTIONS

Those listed below are maximum permissible unless otherwise specified. No one piece of glass shall contain all of these imperfections and those present shall be scattered so there is no appreciable interference with normal vision.

The glass shall be examined by an approved method equivalent to looking through the glass into the diffused light of a clear sky without any direct sun or close background. The observer's eye shall be on a level with the center, and looking perpendicular through the glass at arm's length.

3.6.1 Definition of Imperfections

Batter:

Non-direction undulations in the surface of the glass.

Blisters:

Gas inclusions in the glass, appearing as elongated bubbles usually ellipsoidal in shape, over 6.35 mm long.

Bloom:

An iridescence which sometimes appears on the surface of the glass.

Bow:

A departure from a flat plane to form a curve.

Bubble:

Clear, round or elliptical shaped gaseous inclusion.

Bubble, Open:

A bubble on the surface of the glass, which has been broken into during handling or fabrication.

Bull's Eye:

Hollow spots in the glass surface caused by excessive scratch polishing or indentations from bending operations.

Chips, Cullet:

Glass particles fused to the glass surface.

**Chips, Flake:**

Shell-like chips which may flake off the edges of faces of a piece of glass.

Chips, Vee:

Chips from the glass edge which have the approximate shape of the letter "v". Vee chips might also be described as "nicks".

Crayon Marks:

The remains of crayon markings which are not entirely removed in the glass cleaning operations before laminating.

Crush:

A dull gray appearance over an area resulting from light pitting.

Digs:

Deep, short scratches.

Dirt:

Inclusions of extraneous material between the laminates of glass.

Draw Lines:

Slight linear optical distortions which may appear in float glass which are oriented in a direction parallel to the line of draw in the float glass process.

Hair/Chill Cracks:

Small surface cracks, caused by local temperature differentials and by contact with cool objects.

Mold Marks:

Slight indentations, extending inboard of the entire periphery of the glass, imprinted in the glass during the bending or tempering operation.

Mottling:

A general overall waviness which appears only when viewed by reflected light.

Ream:

Regions of different chemical composition within any glass mass resulting in variation in the index of refraction of the glass.

Ridge:

Variation in the thickness and surface contour in float glass which result in fairly broad distortions in the direction of draw.

Ripple:

A broken or continuous fine line distortion in the direction of draw of float glass.