

**1.0 Description**

This specification defines the quality and performance criteria for a thin film front surface mirror on glass substrates for use in rear projection display applications. The thin film front surface mirror is deposited on the glass substrates using magnetron sputtering or evaporative coating technology.

**2.0 Reference Documents**

ASTM C 1036-90 Standard Specification For Flat Glass The following OCLI documents form a part of this specification to the extent specified herein:

- 01062003 - R56Q-8SDU Constant Temperature Humidity Test**
- 08132001 - GOIG-LC5C Scotch Tape Adhesion Test**
- 08302001 - TPO5-6RMM Salt Spray (Fog) Test**
- 10222002 - TTPR-6GC6 Cheesecloth Rub Durability**
- 04032000- T14B-UU5G Packaging Standard**

**3.0 Performance/Operating Characteristics Required**

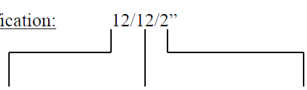
**3.1 Physical Characteristics**

**Substrate Thickness:**

Nominal Thickness	Normal Tolerance Range
3mm	2.92-3.10mm
4mm	3.78-3.99mm
5mm	4.80-5.00mm
6mm	5.79-6.20mm

**Flatness:**

Nominal Thickness	Standard Flatness Limit
3mm	12/12/ 2"
4mm	12/12/ 2"
5mm	12/12/ 2"
6mm	12/12/ 2"

Flatness Specification: 12/12/2"  
  
 Power (fringes)/Irregularity (fringes)/Aperture Diameter in Inches

Drawlines and distortion lines viewed by transmission using the “Zebra Board Test” or its equivalent shall meet the following requirements. (Ref.: ASTM C 1036-90 Standard Specification For Flat Glass)

Substrate Thickness	Distortion-free Viewing Angle
3mm, 4mm	57 degrees
5mm, 6mm	65 degrees

**3.2 Optical Performance:**

Spectral reflectance performance of the front surface mirror coating at a 45° angle of incidence shall meet the following minimum values:

Wavelength	Minimum % Reflectance
400nm	91.5 %
450nm	94.0 %
500nm	94.0 %
550nm	93.5 %
600nm	91.5 %
650nm	89.0 %
700nm	85.0 %

**3.3 Environmental Durability Characteristics:**

**Adhesion:** The coating shall show no damage after 3M Scotch Brand No.600 tape (or equivalent) is pressed firmly against the front surface mirror coating surface and removed quickly by a snap of the wrist. Reference OCLI document #08132001-GOIG-LC5C.

**Abrasion Resistance:** The coating shall show no damage after a 200-rub test with a cheesecloth pad approximately 9.525mm diameter by 12.7mm thick. The bearing force shall be one pound ± 0.114 kilograms (0.454 kilograms ± 0.114 kilograms). Reference OCLI document #10222002- TTPR-6GC6.

**Humidity Resistance:** The coating optical performance (Section 3.2) shall not deteriorate after exposure to 24-hour humidity test of 49° C @ 95% relative humidity. Reference OCLI document #01062003-R56Q-8SDU.

**Corrosion Resistance (Salt Fog):** The coating optical performance (Section 3.2) shall not deteriorate after exposure to a 24-hour salt fog test (5% NaCl by weight) at 35°C. Reference OCLI document #08302001-TPO5-6RMM.

**3.4 Dimensional Tolerances:**

All fabricated parts are sized with dimensional tolerances of  $\pm 1.0$  mm. Flares: No flares allowed that cause the part to be out of dimension. Edge Chips: Chips shall not exceed a depth of 1.0 mm.

<b>Chip Length</b> >5mm ≤5mm	<b>Qty. Allowed</b> None Allowed Disregard	<b>Chip Width</b> >2.5mm ≤ 2.5mm	<b>Qty. Allowed</b> None Allowed Disregard
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**Edge Finish:** All parts will have a standard safety seam consisting of a light sanding of the fabricated mirrors to remove the sharp edges.

**3.5 Surface Quality Characteristics:**

**Clear Aperture:** All surface area of the mirror will be inspected to a 100% usable surface area, except for a 10mm border around the entire perimeter of the fabricated part.

**Linear Defects:** These are scratches or other imperfections, which are long and narrow in nature and visible by reflection or transmission. Defects are evaluated at the widest point.

<b>Linear Defects (80)</b>	<b>Quantity Allowed</b>	<b>Maximum Accumulated Length</b>
> 0.080mm wide	None Allowed	N/A

**Circular Defects:** Circular defects visible by transmission or by reflection include: digs, seeds, bubbles, foreign material, and pinholes, or other imperfections that are round in nature.

<b>Circular Defects (50)</b>	<b>Quantity Allowed</b>	<b>Minimum Distance between Defects</b>
>0.50mm diameter	None Allowed	N/A

**Stains:** When viewed under normal non-directional overhead room lighting ( $\gg 75$  foot-candles), stains that have a uniform appearance and are free of any distinct color variations are acceptable.

**Fractures:** None allowed.



#### **4.0 Quality Assurance Provisions**

A Quality Assurance Sheet shall be provided with each shipment.

#### **5.0 Preparation for Delivery**

Approved protective film to be applied to the mirror's front surface. Mirror shipping labels will include the following information: customer name, customer part number, quantity, OCLI item number, barcode, crate number, and manufacture date. All products will be packaged using our standard packaging per Packaging Standards document. Reference OCLI document #04032000- T14B-UU5G.

#### **6.0 Definitions**

**Glass Defects:** For localized glass surface distortions, mirror acceptability will be based upon the visibility of the defect when viewed on the appropriate rear projection television. **Flare:** A thin layer of glass removed from the edge during the cutting-breakout operation leaving a smooth edge. **Front Surface Mirror:** Flat glass substrate vacuum coated on one surface designated as the front side with a thin film mirror coating.

#### **7.0 Notes**

OCLI reserves the right to make changes in processes, materials and packaging which do not affect the form, fit or function of the mirror in the intended application of micro-display based rear projection televisions. Variations, exceptions or clarifications to any of the specification requirements contained herein shall be noted in the applicable OCLI quotation.

#### **8.0 Safety Information**

Customers should be aware of the following potential hazards with our delivered product.

- Unsecured mirrors can fall forward. Therefore, crates/L-skids should always be tilted back, preferably on a cart, before removing the front of the crate/L-skid. Reference warning label on crate/L-skid.
- Stacking crates/L-skids can cause damage to mirrors or personal injury. The crates/L-skids should not be stacked on top of each other.
- The banding is metal and can be a cut hazard. Gloves are recommended. OCLI recommends the wearing of personal protective equipment when opening crates/Lskids or handling mirror product.