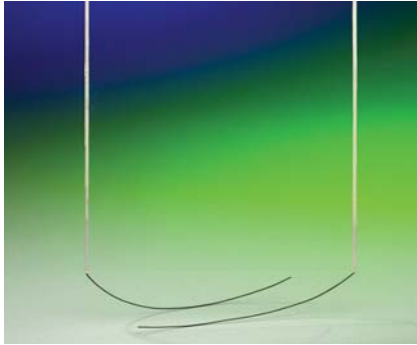


## Thin-Film LCD Heater Panels



### Key Features

- High optical transparency and improved contrast
- Precise electrical resistivity
- Low reflectance
- Environmental stability
- Resists thermal shock
- Optional termination methods
  - Attached lead wire
  - Indium solder bus bar
- Rapid system startup without loss of display viewability
- Low power consumption
- Design flexibility

### Applications

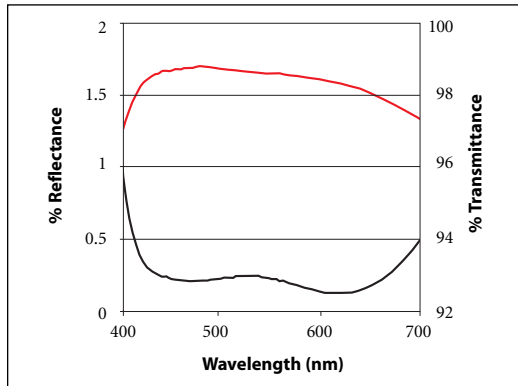
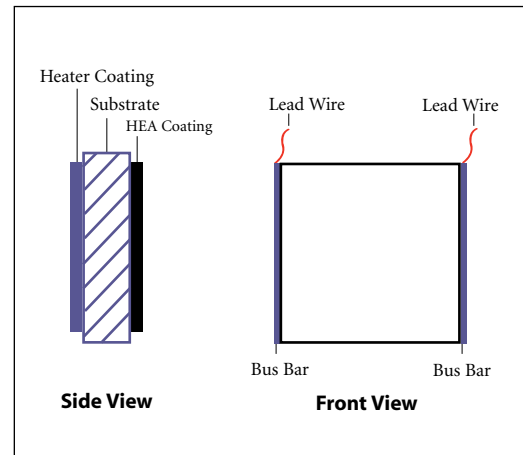
- Avionics displays
- Temperature-controlled LCD displays
- Industrial displays
- Medical instrumentation

### High Transmission Thin-Film LCD Heater Panel

JDSU provides industry-leading low reflectance, high transmittance thin-film heater panels for use in temperature-controlled LCD displays.

The heater coating utilizes a precisely controlled Indium Tin Oxide (ITO) layer as the transparent conducting medium. The surrounding dielectric layers are index matched for optimal performance in the customer-specified design medium.

Our complete manufacturing facilities can provide the right heater panel to meet your requirements through design, prototype and OEM production volumes. Our exacting manufacturing techniques assure repeatable performance and tight tolerance compliance.

**Optical Performance**

**Heater Panel Configuration**

**Specifications**
**Material**

- Corning Glass: Code 1737E, soda lime, and Borofloat (standard substrates). Other substrates available upon request.

**Product Configuration**

- Substrate Thickness: 0.71 mm to 4 mm
- Tolerancing:  $\pm 0.4$  mm L x W  
Other thickness and tolerance configurations available upon request

**Power Dissipation**

- Example: 20  $\Omega$ /sq nominal resistance on 7" x 7" panel with Indium-based solder bus bar and lead wires  
Result: 115° C measured at center of panel in open air in steady state operation  
Condition: 30 volts, 1.75 amps (52.5 watts)

**Spectral Characteristics**

Standard ITO Heater Coating – Nominal: 12-20  $\Omega$ /sq  
Tolerance:  $\pm 20\%$

- Reflectance:  $\leq 0.75\%$  average from 425 to 675 nm at 10° incidence
- Transmittance:  $\geq 97\%$  average from 425 to 675 nm at normal incidence, exclusive of substrate absorption and second surface reflectance
- Overall Transmittance:  $\geq 95\%$  average from 425 to 675nm with second side AR (HEA®) coated  
 $\geq 91\%$  average from 425 to 675nm with second side uncoated

**Optional HEA® Coating on Second Side**

- Reflectance:  $\leq 0.6\%$  absolute from 430 to 650nm at 10° incidence  
 $\leq 0.3\%$  average at 10° incidence

**Durability**

- Humidity Resistance: > 24 hours (MIL-C-675)
- Adhesion: Quick tape test (MIL-M-13508)
- Abrasion Resistance: > 40-rub eraser test (MIL-C-675)
- Solubility Resistance: > 24 hours immersion in NaCl solution (MIL-C-675)
- Temperature Resistance: > 4 hours at -65° F and +160° F (MIL-C-14806)

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