

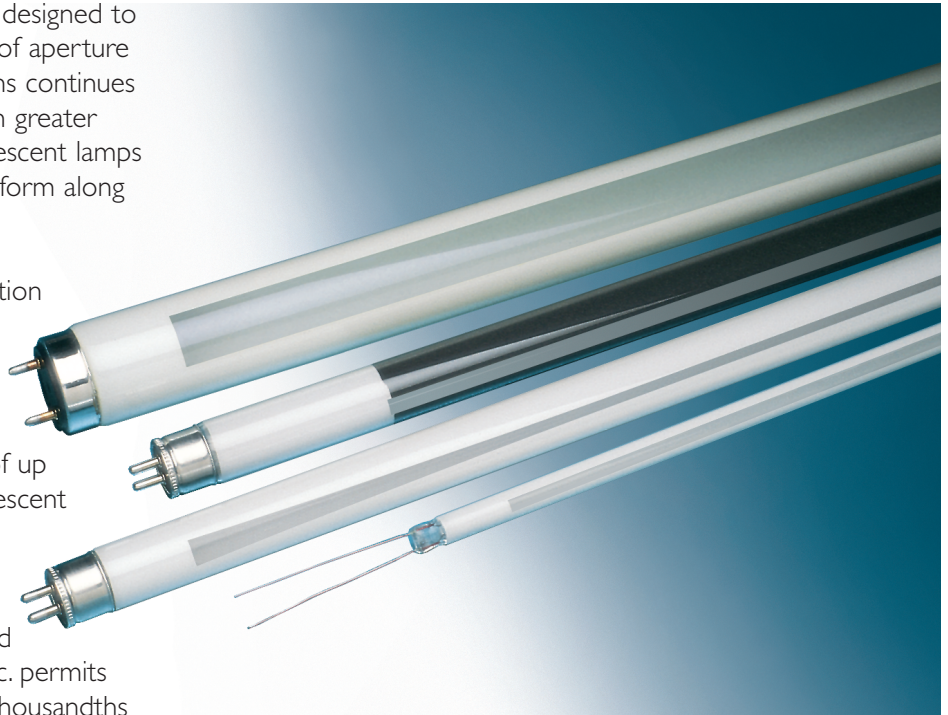
# LCDL Aperture and Reflector Lamps

*For scanners, facsimile machines, copiers and other imaging devices*

Both reflector and aperture lamps are designed to control the direction of light. The use of aperture lamps in scanning and other applications continues to multiply with increasing emphasis on greater precision. A particular feature of fluorescent lamps is that the light output is inherently uniform along the length of the tube.

Aperture lamps are similar in construction to reflector lamps except that there is a clear window instead of phosphor coating. A reflective coating underlies the phosphor in the rest of the lamp. This results in a high brightness lamp of up to three times that of a standard fluorescent lamp. The aperture window is usually specified in angular degrees for T-4 (1/2-inch) and larger diameter lamps. However, the precision of the advanced technology utilized by LCD Lighting, Inc. permits the aperture width to be specified in thousandths of an inch on smaller diameter lamps, in windows as small as 0.008 inches. Aperture widths can also be designed to vary in size and shape along the axis of the lamp.

Reflector lamps have an internal layer between the phosphor and the envelope glass. This coating reflects a high percentage of the visible radiation striking it. The major portion of the light is emitted through the reflector opening, which is coated only with the fluorescent phosphor along the axis of the lamp. The improvement in light output in the direction perpendicular to the reflector can be 180% of that of a reflectorless standard lamp. Reflector angles can be custom specified and manufactured to your requirements.



Both aperture and reflector lamps can be made in diameters as small as 3mm depending upon the design of the lamp. Apertures can be added to bent lamps. Readily available phosphors include: Cool White, Warm White, Daylight, Blue, Green, Red, Ultraviolet, Infrared and Tri-Band. Spectral Energy Distributions of the tri-component colors are shown on the previous page. These can be blended to produce your exact color requirements in a wide range within the visible spectrum.

Technical and performance specifications are printed on the other side of this sheet.

For more information or design assistance with your project, call or contact LCDL and visit our Web site.



*Manufacturers of miniature and sub-miniature fluorescent lamps.*

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## SPECIFICATIONS

# Aperture and Reflector Lamps

Outside Diameter Range: 3.0 – 38.1mm

Length: 50mm – 2,438.4mm

Reflector Angle: 15° to 300°

Aperture Window: 0.001 – 1.0" (dependent on lamp diameter)

Radius Bend: Consult LCDL Engineering

Shapes: "U", "L", circular, towel bar, and single bend angle from 5° to 175°

Colors: Virtually any, as required and specified by the customer

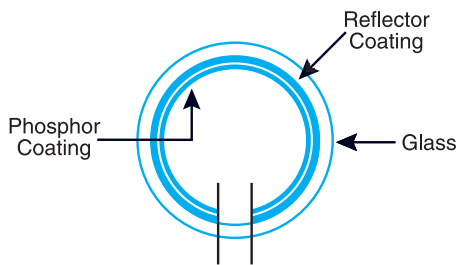
Technology: HCFL and CCFL lamps

Operating Lifetime: Tens of thousands of hours depending on driving current (amps)

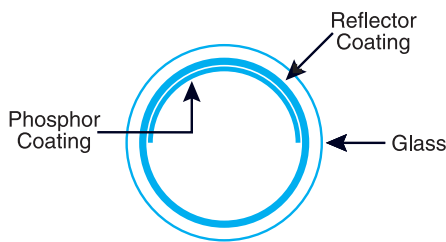
Operating Environment: All commercial and industrial environments

Manufacturing Process: LCDL proprietary

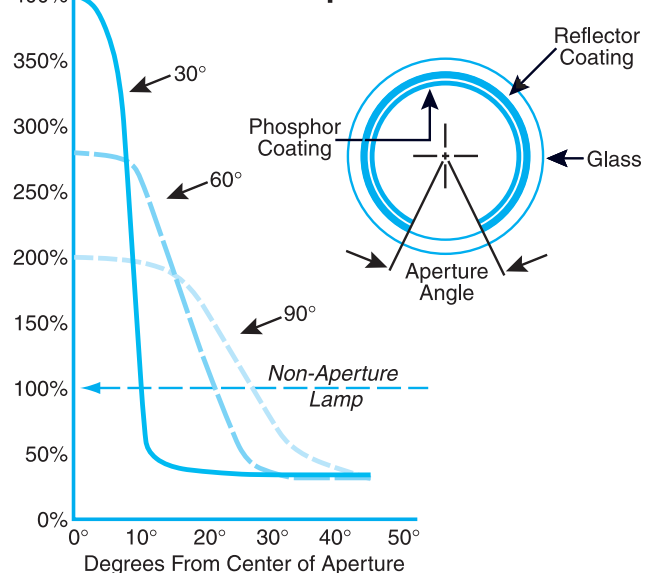
A cross sectional diagram of an aperture lamp is shown below. The aperture window is usually specified in angular degrees for T-4 (1/2-inch) and larger diameter lamps.



A cross-sectional diagram of a 180° reflector lamp is shown below. The improvement in light output in the direction perpendicular to the reflector can be 180% of that of a reflectorless standard lamp.



## Brightness vs. Degrees From Center of Aperture



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