

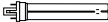








## GENERAL TECHNICAL DETAILS – LAMP CHARACTERISTICS

Characteristics of eight principal light sources-incandescent, fluorescent, compact fluorescent, quartz (a type of incandescent), four high intensity discharge (H.I.D.) types, mercury, metal halide, high pressure sodium, and low pressure sodium are described below.

Lamp		Advantages*	Disadvantages*
<b>Incandescent</b>		Makes colors look natural. Compact source. Good beam control. Low initial cost.	Low light output (lumens per watt). Short lamp life (500-2000 hours). Very high operating cost.
<b>Fluorescent</b>		Long lamp life (36,000 hours). High lumens/watt light output. Broad selection of color spectrums. Variety of lamp wattages and lengths. A proven, economical workhorse. Low initial cost.	Not applicable for high mounting heights. Can't be "beamed" as effectively as H.I.D. point sources. More sensitive to temperature. Long length hard to handle.
<b>Compact Fluorescent</b>		Long lamp life (15-20,000 hours). High lumens/watt light output. Good selection of color spectrums. Variety of wattages. Small size.	Can't be "beamed" as effectively as a point source.
<b>Quartz</b>		Makes colors look natural. Some are compact for good beam control. Good lumen maintenance (light output remains almost the same throughout life.)	Low light output (lumens per watt). Medium lamp life (2000-4000 hours). Very high operating cost.
<b>Mercury (Color Improved)</b>		Long lamp life (24,000+ hours)	Low light output (lumens per watt). Limited beam control. High lumen depreciation.
<b>Metal Halide</b>		Moderately long lamp life (10-30,000 hours). High light output (lumens per watt). Makes colors look close to natural. Low operating cost. Good to excellent beam control.	Does not restart immediately after power failure. High lumen depreciation.
<b>High Pressure Sodium</b>		Long lamp life (24,000+ hours). Very high light output (lumens per watt). Lowest operating cost. Restrikes in 1 minute after power failure. High lumen maintenance.	Fair color rendition.
<b>Low Pressure Sodium</b>		Long lamp life (18,000 hours). Exceptionally high light output (lumens per watt). Lowest operating cost. Very good lumen maintenance.	Monochromatic orange color provides no color rendition. Disposal may be a problem. Lamp requires long time to reach full output.
<b>Induction</b>		Exceptionally long lamp life (100,000 hrs.) High light output (lumens per watt). Instant start down to -40°F. Good lumen maintenance.	High initial cost.

\*All comparisons are relative to one another, and are based on existing products.

## GENERAL TECHNICAL DETAILS – LIGHT SOURCE

If a single requirement must be met on a lighting job, simply select the lamp best suited from the table below. Where there is no clear-cut requirement, compare the various lamp characteristics and weigh

the importance of each. If more than one light source is suitable for an application, an economic study can help determine which would be the least expensive over a number of years.

Characteristics	Incandescent	Quartz	Mercury Coated	Metal Halide	High Pressure Sodium	Low Pressure Sodium	Fluorescent	Compact Fluorescent
<b>Lamp Cost</b>	Low	Low	Medium	High	High	High	Low	Medium
<b>Initial Lumens/Watt</b>	15-24	15-24	30-60	69-115	79-130	62-150	25-100	25-80
<b>Annual Operating Cost</b>	Very High	Very High	Medium	Low	Low	Low	Low	Low
<b>Fixture Size</b>	Medium	Small	Medium	Medium	Medium	Large	Medium	Small
<b>Long Burning Hrs. – Per-year (over 1000)</b>	Poor	Poor	Very Good	Very Good	Excellent	Very Good	Excellent	Very Good
<b>Short Burning Hrs. – Per-year (under 1000)</b>	Good	Good	Good	Good	Good	Good	Good	Good
<b>Color Acceptability</b>	Excellent	Excellent	Good	Very Good	Fair	Very Poor	Very Good	Very Good
<b>Degree of Light Control</b>	Good	Very Good	Fair	Very Good	Very Good	Good	Good	Good
<b>Maintenance Of Lumen Output</b>	Good	Very Good	Fair	Fair	Very Good	Very Good	Very Good	Very Good
<b>Long Range Projection (Narrow Beam)</b>	Good	Good	Poor	Very Good	Very Good	Poor	Fair	Fair
<b>Medium Range Projection</b>	Good	Good	Good	Very Good	Very Good	Poor	Good	Good

### FIXTURE TEMPERATURE LISTING

During the certification process the UL standard requires that the lens, socket, lamp base, ballast case, ballast core, capacitor, starter and any other sensitive components have their temperature recorded at the ambient level that the fixture is certified for. Every component must operate at less than its maximum temperature except electronic fluorescent ballasts with internal fusing. These ballasts may operate up to a 90°C case temperature regardless of the maximum listing posted on the case. UL does not care if the life is shortened as long as the ballast fails in a safe way.

Standard fixture temperature ratings are 25°C, 40°C and 55°C. Most fluorescent fixtures are rated for 25°C operation. The listing label states any temperature above 25°C.

It is the responsibility of the consultant engineer that the fixture approved is rated for the ambient temperature in the space.

Many specifiers assume that an air-conditioned space is uniformly conditioned. This is untrue in almost all cases. Anyone who has painted a ceiling in an air-conditioned house knows that heat rises. A consultant engineering firm, hired by Guth, stated that temperature increases at about 1°F a foot. If it is 75°F at 5' it is probably 95°F at 25'.

Guth temperature rates its fixtures to be suitable for likely applications. For example the 12", 16", 22" and 25" fluorescent Enviroguards are listed for a 40°C ambient temperature.