

Light Sources

Things to Know

We believe that the best way of choosing lighting fixtures is to firstly decide upon what kind of lighting effect you want to create. The lighting effect is determined by what kind of bulb you use and then by whether the lighting fixture diffuses or directs light in a certain manner, etc. We have provided you with some points and data to help you make a better informed decision.

Effects of Light Source	Colour Rendered Ability	Appearance of Light
Incandescent	100%	Very Warm
Halogen	100%	Warm
Fluorescent	80%	Warm/Intermediate/Cool
Metal Halide	80%	Intermediate/Cool
LED	Wide Range	Wide Range

Costs	Efficiency	Lamp Cost	Average Lamp Life
Incandescent	11 Lumens Watt	Very Low	1,000 hours
Halogen	12-16 Lumens Watt	Low	3,000 hours
Fluorescent	70 Lumens Watt	Expensive	10,000 hours
Metal Halide	80 Lumens Watt	Very Expensive	8,000 hours
LED	70 Lumens Watt	Expensive	30,000 hours

Beam Angle and Brightness

AS/NZS1680 provides recommended LUX levels for various environments and activities.

- Cone diagrams are available for reflector lamps, these indicate LUX levels achieved on a horizontal surface at various distances.
- A flood type (wide beam) reflector lamp will provide lower LUX levels, but wider coverage than a spot type (narrow beam) reflector lamp.
- Globes and Capsules on the other hand rely on the fixtures reflector to achieve optimum photometrics.

This Data is a general guide only. Consult lamp manufacturer's technical Literature for precise data.

Halogen Lamps

Advantages:

- At least 10% more efficient than incandescent
- Small lamps allow for smaller lighting fixture designs
- Longer life than incandescent
- Constant light output throughout lamp life as lamps don't become blackened.

Voltage:

- Supply voltage is critical for lamp life. It is preferable that the supply voltage is slightly less than the lamp nominal voltage.

Dimming:

- Lamp life is reduced when operated with a dimmer as the filament regeneration process fails (Halogen Cycle) causing early failure of the filament and blackening of the lamp.

- Dimmers cut the AC wave form. Leading edge dimmers are made for electromagnetic transformers and trailing edge dimmers for electronic transformers.
- There are some electronic transformers which allow both leading and trailing edge dimming, however to avoid poor harmonics trailing edge are highly recommended.

LED Replacement Lamps

- Important: When using LED lamps to replace other technology you have to consider the operating systems above. Even when a lamp is designed to be compatible with a number of different power supplies, there can be issues due to, for example, the variations of differently designed halogen transformers and the way in which they are installed.

LED lamps should be sampled and trialed in an installation before the whole job is undertaken.

Switching

Lamp Type	Frequent Switching	Dimming Ability	Heat Output
Incandescent	OK	Easy	High
Halogen	OK	Easy	Very High
Fluorescent	Undersirable	Very Few Types	Low
Metal Halide	Not Possible	Very Few Types	Very High
LED	OK	Some Possible	Very Low

Factors

Once the lamp preference has been considered, other factors will effect your choice of lighting fixture including:

- Aesthetic design of fixtures
- Adjustability
- Accessibility of fixtures for lamp replacements
- Need for Control Gear
- Glare effect, shielding, diffusion, refraction
- Number of fixtures required
- Heat effect and with Halogen the choice of Dichroic (cool beam) versus Aluminised
- Mains voltage or 12-volt, ease of installation



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