
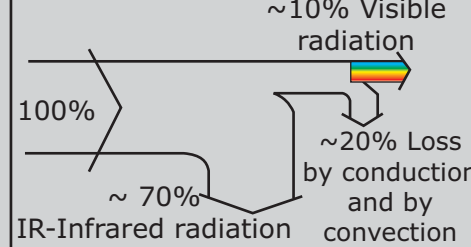

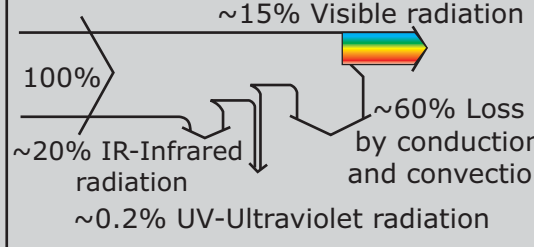

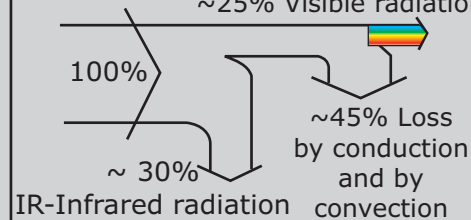

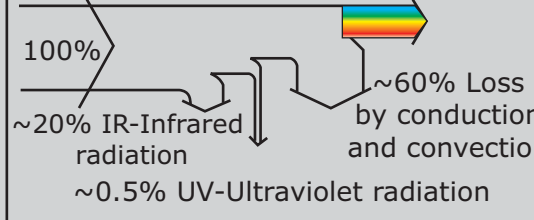



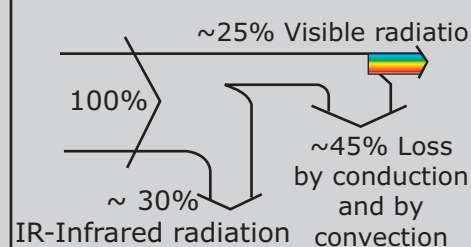
Comparison of Various Lighting Sources


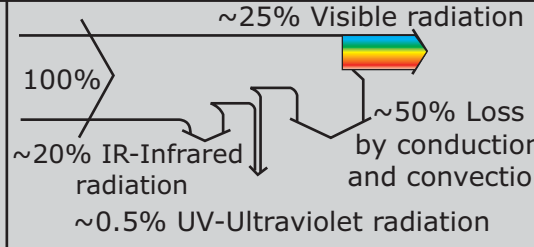
Type of lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Incandescent	Range	Avg.	Excellent	Home, Restaurants, General lighting, Emergency lighting	5000	
	8 - 18	14				


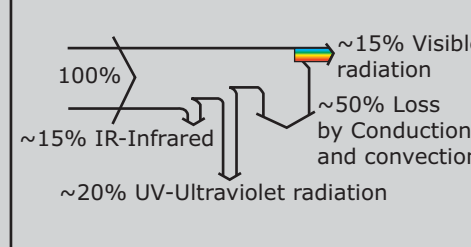
Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 High Pressure Sodium Vapour (HPSV) SON	Range	Avg.	Fair	General lighting in Factories, Ware houses, Street lighting	6000-12000	
	67-121	90				


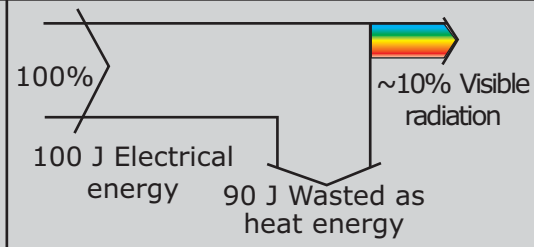
Type of lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Fluorescent	Range	Avg.	Good w.r.t coating	Offices, Shops, Hospitals, Homes	5000	
	46-60	50				


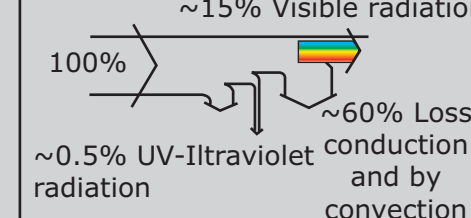
Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Low Pressure Sodium Vapour (LPSV) SOX	Range	Avg.	Poor	Roadways, Tunnels, Canals, Street lighting	6000-12000	
	101-175	150				

Type of lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Compact Fluorescent (CFL)	Range	Avg.	Very good	Hotels, Shops, Homes, Offices	8000 10000	
	40-70	60				

Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Metal Halide	Range	Avg.	Good 70	Industrial bays, Spot lighting, Flood lighting, Retails stores	8000	
	71-125	100				

Type of lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 High Pressure Mercury Vapour (HPMV)	Range	Avg.	Fair	General lighting in Factories, Garages, Car Parking Flood lighting	5000	
	44-57	50				

Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Light Emitting Diode (LED's)	Range	Avg.	Good 70	Reading lights, Desk Lamps, Night lights, Spotlights, Signage lighting etc.	25,000-50,000	
	60-130	95				

Type of lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life (Hours)	Energy Flow Diagram
 Halogen	Range	Avg.	Excellent	Display, Flood Lighting, Stadium Exhibition grounds, Construction areas	5000	
	18-24	20				

Source: Bureau of energy efficiency

Basic Parameters and Terms in Lighting System

Luminous Flux: The luminous flux describes the quantity of light emitted by a light. It is a measure of a lamp's economic efficiency: The most common measurement or unit of luminous flux is lumen (lm). The lumen rating of a lamp is a measure of the total light output of the lamp. Light sources of the distance (inverse square law)

Luminous Efficacy (lm/W): It is the ratio of luminous flux emitted by a lamp to the power consumed by the lamp. It is a reflection of efficiency of energy conversion from electricity to light form.

Colour Rendering Index (CRI): It is a measure of the effect of light on the perceived Colour of objects. To determine the CRI of a lamp, the Colour appearances of a set of standard Colour chips are measured with special equipment under a reference light source with the same correlated colour temperature as the lamp being evaluated. If the lamp renders the colour of the chips identical to the reference light source, its CRI is 100. If the Colour rendering differs from the reference light source, the CRI is less then 100. A low CRI indicates that some Colours may appear unnatural when illuminated by lamp.

