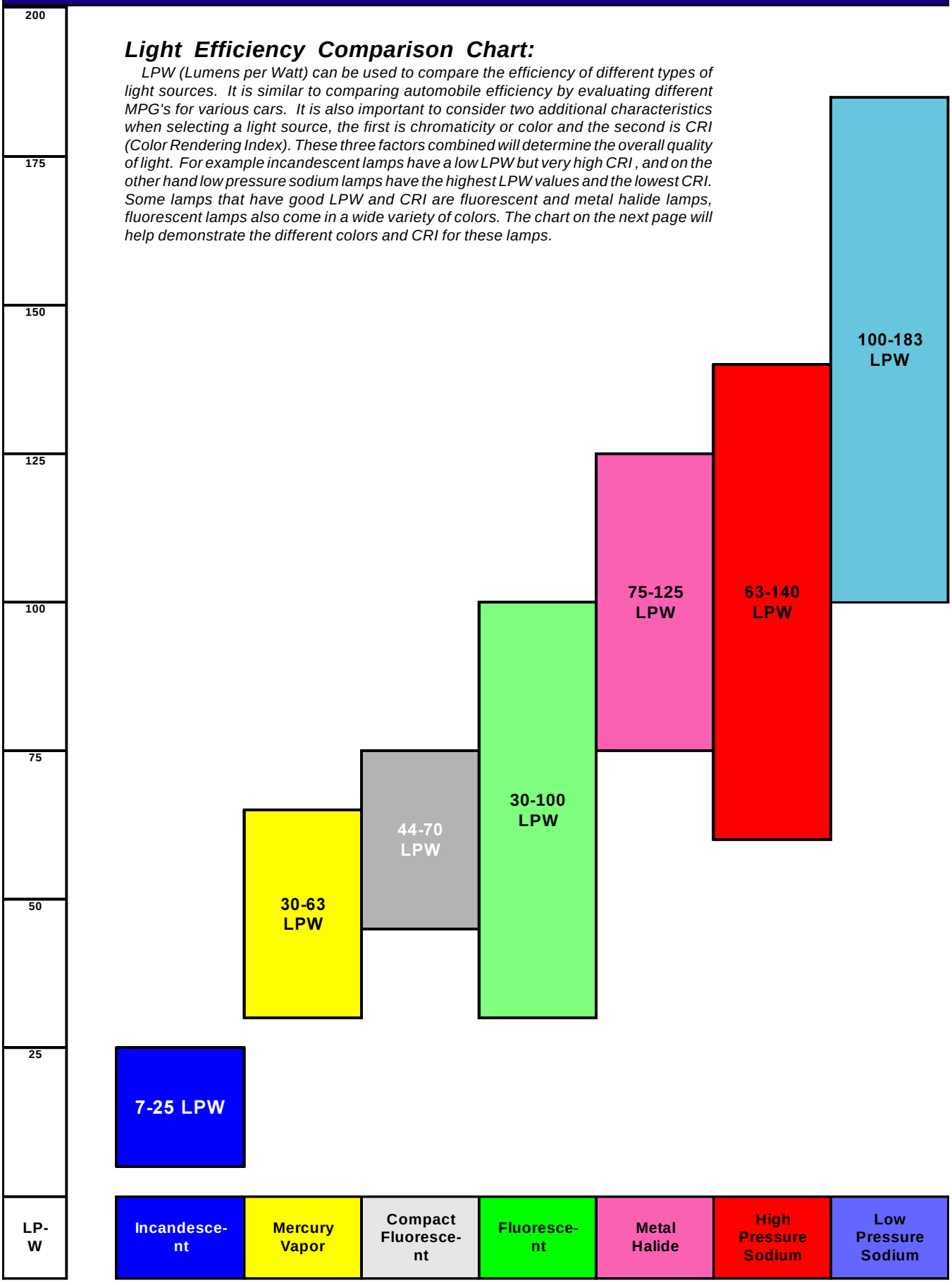
General Lighting Information

Light Efficiency Comparison Chart:

LPW (Lumens per Watt) can be used to compare the efficiency of different types of light sources. It is similar to comparing automobile efficiency by evaluating different MPG's for various cars. It is also important to consider two additional characteristics when selecting a light source, the first is chromaticity or color and the second is CRI (Color Rendering Index). These three factors combined will determine the overall quality of light. For example incandescent lamps have a low LPW but very high CRI , and on the other hand low pressure sodium lamps have the highest LPW values and the lowest CRI. Some lamps that have good LPW and CRI are fluorescent and metal halide lamps, fluorescent lamps also come in a wide variety of colors. The chart on the next page will help demonstrate the different colors and CRI for these lamps.



General Lighting Information

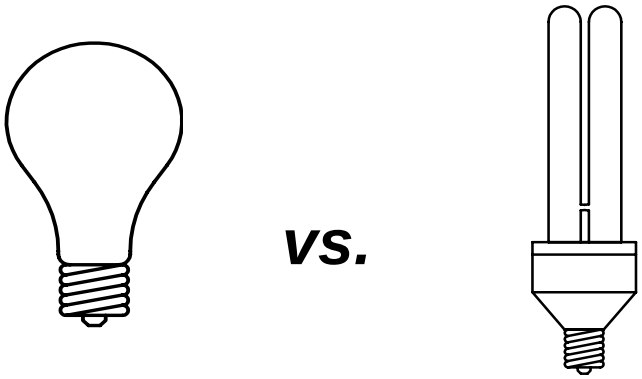
Chromaticity and CRI (Color Rendering Index) Comparison Chart:

Chromaticity describes the color of light emitted from the lamp. This characteristic is usually rated in Kelvin (K) or by standard terms such as cool white, warm white, etc. Color Rendering Index (CRI) indicates the lamp's ability to show colors naturally. In applications where natural color appearance is important lamps such as incandescent, fluorescent and metal halide, which have high to moderately high values of CRI, should be considered. Choices of lamp color will usually depend on the environment that is desired. In offices and other business environments cooler color lamps (those with kelvin ratings of 4000K or higher) are normally recommended. Some applications may require a warmer more inviting atmosphere, in these applications warmer colors (3000K or less) should be used. Neutral color lamps (3500K) are versatile and well suited to most any application.

Lamp Color	Appearance	Reference Light Source	Color Temp Kelvins (K)	Lamp Type, Color Rendering Index (CRI)
	Deep Blue	Blue Sky	10000	
			9500	
			9000	
Very Cool			8500	
		Blue Skies & Sun	8000	
	Blue		7500	
		Overcast Sky	7000	
Daylight			6500	Clear Mercury Vapor, CRI 15 Daylight Metal Halide, CRI 70
			6000	
			5500	
	Med Blue	Noon Light	5000	Deluxe White Mercury Vapor, CRI 32-50
Cool	Light Blue		4500	Cool White Fluorescent, CRI 65 Clear Metal Halide, CRI 65
			4000	4000K Fluorescent, CRI 70-80 Self-Ballasted Mercury Vapor, CRI 50
Neutral	White		3500	3000K Fluorescent, CRI 70-80 Warm White Metal Halide, CRI 65 Quartz Halogen, CRI 92,
Warm			3000	3000K & Warm White Fluorescent, CRI 70-80 & 52 Incandescent, CRI 99+, Incandescent Quality HPS, CRI 80
	Yellow		2500	Color Improved High Pressure Sodium, CRI 65 High Pressure Sodium, CRI 22
	Orange	Sunrise/Sunset	2000	Low Pressure Sodium, CRI 0 (-44)
	Red	Candlelight	1500	

General Lighting Information

How Much Can One Light Bulb Save?



60 watt Incandescent vs. 15 watt Compact Fluorescent

Replacing a common incandescent light bulb (left) with an energy-efficient compact fluorescent lamp (right) can save 45 watts and 157 kilowatt hours, 300 pounds of carbon dixoide, 1.4 pounds of sulfur dioxide, and 0.8 pounds of nitrogen oxides per year. It also realizes a 37.5% annual return on investment.

Excerpt from EPA Greenlights Brochure March 1991

How to Determine Energy Dollars Saved

$$\text{Energy Dollars Saved} = \frac{\text{Watts Saved} \times \text{Average Energy Rate} \times \text{Operating Hours}}{1{,}000}$$

Watts Saved = (Input Watts of Old System) - (Input Watts of New System)

Average Energy Rate **-** If unknown, divide the total amount of a utility bill by the total Kilowatt hour.

Operating Hours - Any period of time to demostrate Energy Dollars Saved
(i.e. Annual operating hours, average life of lamp)