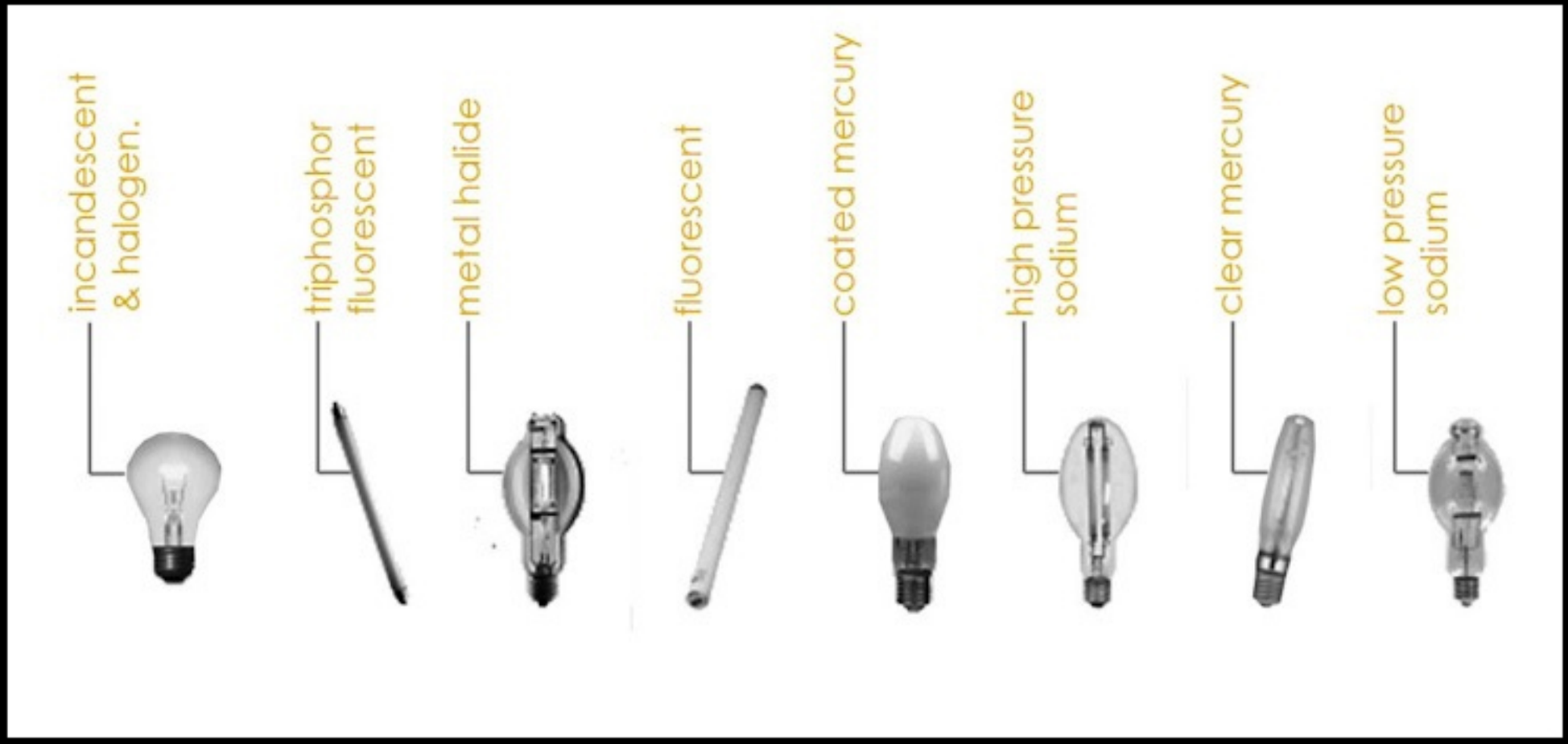
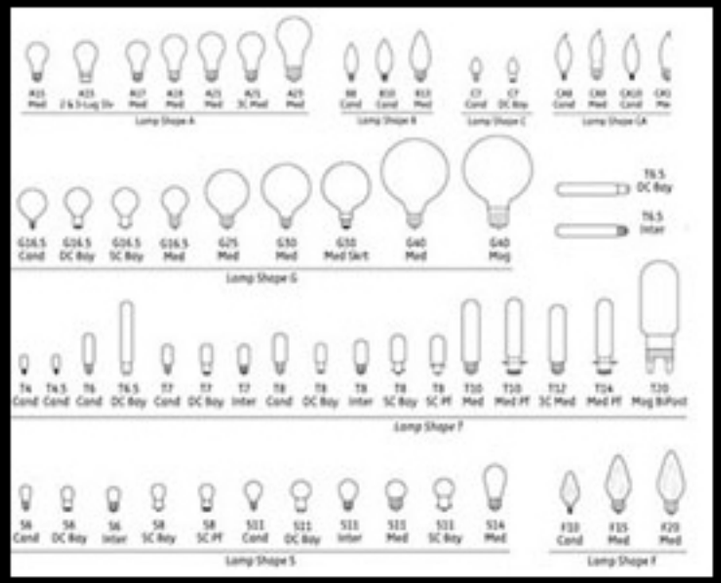

incandescent & halogen.
triphosphor fluorescent
metal halide
fluorescent
coated mercury
high pressure sodium
clear mercury
low pressure sodium

LAMP TYPE



(click image to enlarge)

incandescent

Incandescent lamps are categorized by shape, base type and watts. They are found more frequently in residential environments and are used in a variety of accent, decorative and portable fixtures. They produce a **WARMER** light and are available in multiple bulb shapes. Both of these attributes make incandescent lamps appealing. The down side is that they are less efficient than other lamp technologies; they release as much as 90% of their energy as heat [infrared energy] rather than visible light.

The more inefficient incandescent lamps are being phased out of production because of energy conservation legislation such as the U.S. Energy Independence and Security Act [EISA 2007]. EISA provides guidelines for efficiency levels or lumens per watt requirements that will essentially eliminate less efficient incandescent lamps including the 40W, 60W, 75W, and 100W medium screw base A shape bulbs and many non-halogen PAR directional bulb types. Other incandescent lamps are NOT affected by the current legislation, for example, G shape lamps with a diameter of 5 inches or more, T shape lamps that use no more than 40W or are longer than 10 inches, and other lamp shapes of 40W or less (B, BA, CA, F, G16-1/2, G-25, G-30, M-14, and S).

Halogen PAR Lamp, Line Voltage [GElighting.com]

Line Voltage on Suspended Track [nicorlighting.com]

halogen

Tungsten halogen lamps are more efficient incandescent lamps because of the halogen gas that is encased within the lamp. Like regular incandescent lamps, halogens include a tungsten filament; they produce a **BRIGHT WHITE LIGHT** and can be used for general or directional lighting.

They may have an infrared reflective [IR] coating. This coating makes the lamp more efficient by redirecting energy to the filament. Halogen lamps are available in line voltage [120 volts] or low voltage [12 volts]. Low voltage halogen lamps tend to be mostly PAR lamps, but can also be tubular shaped. PAR lamps operate at very high temperatures and therefore require heat resistant glass, usually quartz. They can be spot or flood, and can be installed in cans, pendant light fixtures, or on a track.

halogen

Low voltage halogen lamps are smaller in size and can create a more precise beam of light, for more specific spotting of light in space.

Halogen lamps are used in residential and commercial applications in decorative, track and recessed fixtures. They are good substitute for standard incandescent lamps because of their improved efficacy as well as their range of color and CRI values.

Low Voltage Halogen Spot
[ylighting.com]

Low Voltage Halogen Track Light
[www.archiexpo.com]

fluorescent

When first created, lamps had a very cool temperature and were called "daylight" lamps. Now fluorescent lamps have temperature range of 2700K-6500K. In most instances, fluorescent lamps are more efficient than incandescent and halogen, but have lower CRI values.

linear fluorescent

Linear (T-shaped) fluorescent lamps are often found in commercial applications because of general, or ambient light. The linear form is also well-suited for use in cove lighting applications.

compact fluorescent

Compact fluorescent lamps were first created to serve as a more efficient alternative to incandescent lamps.

Metal Halide Fixtures at Berry Events Center, Northern Michigan University. [www.holophane.com]

high intensity discharge [HID]

- Used to direct intense light across a long distance.
- Various types: Metal Halide. Ceramic Metal Halide [best color appearance], High Pressure Sodium [poor CRI but most efficient lamp].
- HIDs often used in atriums, warehouses, airports, and gymnasiums.

Light-emitting Diode [LED]

- Uses light and energy in a more efficient way than other lamps.
- Only a small amount of heat is produced, so it feels cool, not warm like other lamps.
- Each LED is called a DIE.
- LED luminaires are produced to mimic the shape of incandescent, halogen, and fluorescent lamps.
- Higher lamp purchase costs are offset by energy savings over time.
- LED's are available in a wide range of colors and both cool white and warm white color temperature.

[www.diodeled.com]

LED

LED "Blaze" light strip installed.

Lighting Type	Efficacy (lumens/watt)	Lifetime (hours)	Color Rendition Index (CRI)	Color Temperature (K)
Incandescent				
Standard "A" bulb	10–17	750–2500	98–100 (excellent)	2700–2800 (warm)
Energy-Saving Incandescent (or Halogen)	12–22	1,000–4,000	98–100 (excellent)	2900–3200 (warm to neutral)
Reflector	12–19	2000–3000	98–100 (excellent)	2800 (warm)
Fluorescent				
Straight tube	30–110	7000–24,000	50–90 (fair to good)	2700–6500 (warm to cold)
Compact fluorescent lamp (CFL)	50–70	10,000	65–88 (good)	2700–6500 (warm to cold)
Circline	40–50	12,000		
High-Intensity Discharge				
Mercury vapor	25–60	16,000–24,000	50 (poor to fair)	3200–7000 (warm to cold)
Metal halide	70–115	5000–20,000	70 (fair)	3700 (cold)
High-pressure sodium	50–140	16,000–24,000	25 (poor)	2100 (warm)
Light-Emitting Diodes				
Cool White LEDs	60–92	25,000–50,000	70–90 (fair to good)	5000 (cold)
Warm White LEDs	27–54	25,000–50,000	70–90 (fair to good)	3300 (neutral)

Lamp Comparison