FOCUS on FACILITIES
Diocese of Cleveland Facilities Services Corporation

Lights & Light Fixtures—Replace or New

By Howard McKew, P.E., C.P.E.

After reading this month's *Focus on Facilities – Facility Management* column on preventive maintenance of light bulbs and light fixtures there will come a time that the type of light bulb and the light fixture that holds the lamp will need to be replaced or new fixtures purchased for a space renovation or new construction. To do this, it is important to note for many years researchers have been working on new lighting options that produce the same light, with less energy. Many of those designs are now on the market. ENERGY STAR-qualified compact fluorescent lights (CFLs) and light emitting diodes (LEDs), as well as halogen incandescent bulbs provide the range of choices consumers expect from more traditional bulbs, including a variety of colors, bulb types, and light levels -- all while using less energy, reducing electricity costs, and significantly long lamination hours.

So, acknowledging that lighting technology continues to advance and improve, let's start the discussion by identifying the building owner options which are: replace or add light fixtures. We start with some basic bulb/fixture types which are incandescent, halogen, fluorescent, and light-emitting diode (LED) lamps:

- Incandescent light bulb consumes 75% more electrical energy than an equivalent CFL and 80% more energy than a LED bulb. Increasing electrical energy consumption creates higher levels of greenhouse gas emissions back at the utility plant.

- Halogen, like incandescent are less efficient than CFL and LED bulbs.

- CFL have had to be redesigned to be at least 25% more energy efficient than previous CFL designs with the disadvantage that, when disposing of this type of bulb, they cannot be put in with general trash because of their contaminates.

- LED popularity continues to grow with significantly less energy consumption and longer lighting life. Like CFL, LED bulbs need to be disposed of properly due to the environmental hazards.

Here are some light bulb basics:

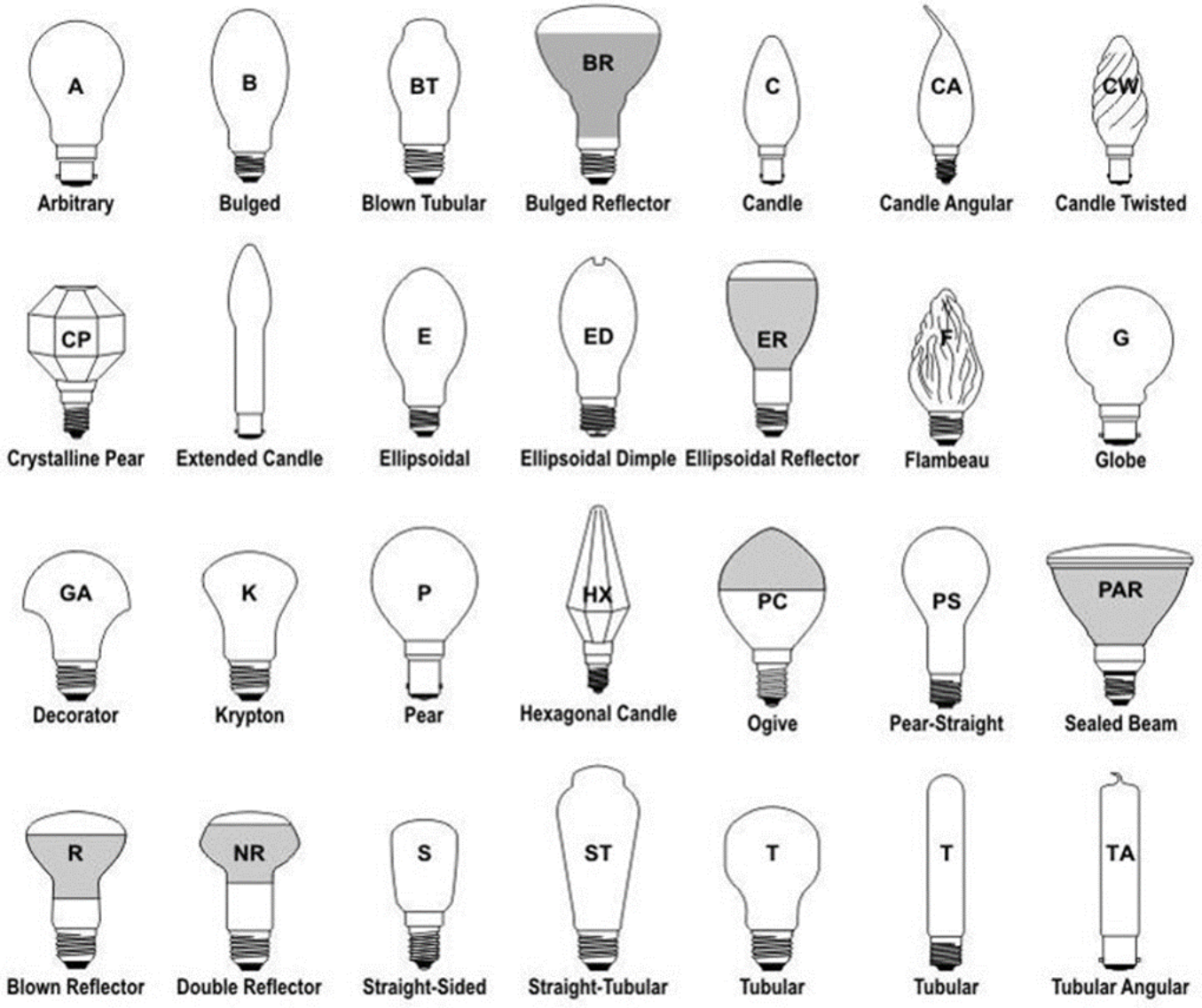
1. When selecting fixtures, appearance can over-rule application and first cost.

2. More often, when purchasing light fixtures, it is

often done with a focus toward inexpensive fixtures and these fixtures usually use inexpensive bulbs although LEDs are beginning to be an integral part of these fixtures.

3. Seldom is there a need for special fixtures to be used to maximize the benefit of the light bulb or the special fixture just isn't taken into consideration, e.g., track lighting can direct the light from each bulb to a specific spot.

4. Light bulbs come in different sizes and shapes:



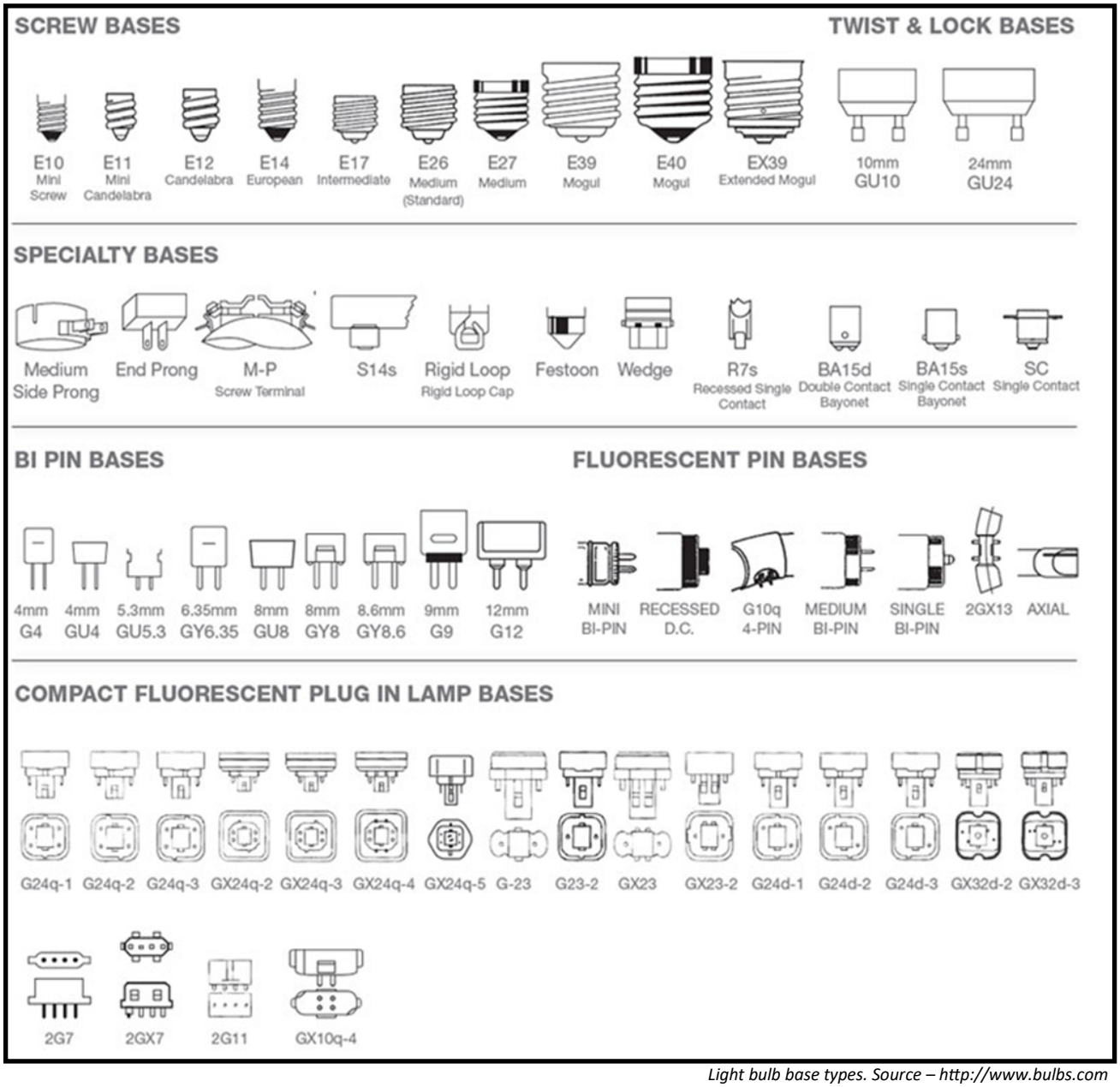
Light bulb shapes. Source – http://greenlivingideas.com

When selecting light bulbs, one should focus on "lumens" and not "watts. In the past, light bulbs were purchased based on how much energy or watts, they use. Today it makes more sense to buy light bulbs based on how much light they provide. Shopping for light bulbs, one should think about the desired brightness by comparing lumens instead of watts. A lumen is a measure of the amount of brightness of a light bulb. The higher the number of lumens, the brighter the light bulb.

With the latest lighting technology, these more efficient lamps have up to ten times longer service light hours. ENERGY STAR-qualified LED bulbs will last as much as 25 times longer than a comparable traditional incandescent bulb. At the same time, according to the Certified Ballast Manufacturers Association, it should be noted that fixtures with ballast have an average magnetic ballast life of about 75,000 hours, or 12 to 15 years with normal use.

When planning to replace or add light fixtures consideration towards color temperature, color rendering, foot candles, lumens, and direction of light should be taken. If these features are to be considered it is suggested that the asset manager and/or facility manager contract the services of a lighting consultant to assist in providing the illumination goals and creativity that is often needed depending on the application, e.g., art museum, special lighting within a church, etc.

Light bulb bases come in different configurations however, just two of these base types can be considered as the main ones, namely, screw bases and pin bases:



Light bulb base types. Source – http://www.bulbs.com

Summary

Choosing the optimum light bulb and fixture when replacing or adding new for the application, whether the project is an existing light fixture, the replacement of existing with a new type of fixture, or planning a building renovation or new construction, there are several factors to consider. When it comes to creative lighting solutions a lighting expert can be a wise investment to achieve the optimum lighting.

Sources

https://www.energy.gov/energysaver/frequently-asked-questions-lighting-choices-save-you-money

https://www.ledwatcher.com/light-bulb-shapes-sizes-and-base-types-explained/

https://www.energy.gov/energysaver/lighting-choices-save-you-money

Howard McKew is a registered engineer and president of Building Smart Software. Howie has a ton of experience to draw from the various industry jobs he's held and often writes about that experience in his columns in Engineered Systems Magazine. He is the author of 3-books, contributor to other author's books, lectures, and is an active member and Fellow in ASHRAE.

www.buildingsmartsoftware.com

hmckew@bss-consultant.com

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For more information:
facilities@dioceseofcleveland.org

Facilities Services Corporation
Catholic Diocese of Cleveland