Welcome to Module 2 of the high-efficacy lighting for residential applications video series. This module will provide an overview of the high efficacy lighting requirements contained in the 2016 Energy Standards. In this module, we’ll go over:

- The types of light sources classified as high efficacy.
- The mandatory measures for high efficacy lighting.
- An overview of reference joint appendix JA8.
- Labeling for high efficacy light sources.
- And the appliance efficiency database.

To begin, let’s look at how light sources are classified with respect to the Energy Standard’s high efficacy regulations. If you recall, high efficacy lighting possesses high lumens per watt efficiency meaning greater light output while using less energy. Light sources can be classified as high efficacy under two categories—those that are automatically classified as high efficacy, or those that must meet performance requirements in Reference Joint Appendix JA8 and be certified to the Energy Commission. Table 150.0-A shows the types of lighting that make up these two high-efficacy lighting categories. Note, the only type of product that cannot be classified as high-efficacy, and therefore cannot be used in California homes moving forward, is a screw-base, ceiling recessed downlight. On the left, there are light sources which are automatically classified as high efficacy. These include:

- Pin-based linear fluorescents
- Pin-based compact fluorescents
- Pulse-start metal halide lamps
- High pressure sodium lamps
- Gu-24 sources other than LEDs
- Inseparable SSL luminaires installed outdoors
- And inseparable SSL luminaires with colored light sources for decorative lighting purposes.

The column on the right of table 150.0-A shows light sources which must meet JA8 requirements and be certified to the Energy Commission. These are any LED light installed for indoor use, excluding colored, decorative LED products: Gu24 LED lamps, any light source installed in a recessed ceiling downlight luminaire, any other type of source not listed in Table 150.0-A.

Now that we have discussed how light sources are classified under the new high efficacy requirements, let’s review the mandatory residential lighting measures contained in the 2016 Energy Standards. Indoor and outdoor luminaires for new homes must be high efficacy. This is specified in §150.0(k)1A of the Energy Standards. Any luminaire, except screw-based recessed downlights, can be classified as high efficacy if the installed light source meets the requirements in Table 150.0-A. Under the 2016 Energy Standards, luminaires that utilize a screw-based socket, excluding hard-wired ballasted HIDrs, must contain lamps that comply with JA8 high efficacy requirements. Remember, screw-based ceiling recessed downlights can no longer be installed in California’s residential buildings. Other types of recessed downlight luminaires and enclosed luminaires must contain a light source that complies with JA8, including the elevated temperature requirements. An enclosed luminaires is defined as having ventilation openings less than 3 inches squared per side. Light sources which are automatically qualified
as high efficacy must still meet JA8 requirements and be certified to CEC if they are used in a recessed downlight or enclosed luminaire. There are also mandatory control requirements for luminaires with JA8 compliant light sources. All luminaires with JA8 compliant light sources must be controlled by a vacancy sensor or manual dimming control.

Now that we’re familiar with the mandatory measures for high efficacy lighting contained in the 2016 Energy Standards, let’s turn our attention to the labeling requirements for high-efficacy light sources certified under JA8. For light sources to qualify as high efficacy under JA8, they must be certified to the Energy Commission and marked as either JA8-2016 or JA8-2016-E. These markings indicate that the light source meets the requirements of joint appendix JA8. The JA8-2016 marking indicates compliance with the JA8 criteria. JA8 compliance markings must be located on the lamp or luminaire. Light sources marked with JA8-2016-E have passed the elevated temperature life test; indicating that they comply with JA8 criteria and may be installed in elevated temperature applications such as in enclosed and recessed fixtures. Only JA8-2016-E light sources may be used in enclosed and recessed luminaires.

Last, let’s take a look at the appliance efficiency database. The California Energy Commission maintains the appliance efficiency database, which lists a variety of products that are certified as meeting the current appliance efficiency regulations and Energy Standards. Lighting products installed to comply with the Energy Standards, for instance certain lighting controls and JA8 compliant light sources, must meet minimum requirements contained in the appliance efficiency regulations and the Energy Standards. JA8 compliant, high efficacy, light sources must be listed in the appliance efficiency database. Manufacturers must test their products at an accredited test laboratory and submit the results to the Energy Commission to certify that their product meets the requirements of JA8. A list of JA8 compliant products may be found at www.cacertappliances.energy.ca.gov

Before we end this module let’s review what we’ve learned. We discussed the mandatory measures for high efficacy lighting. We learned which light sources are automatically classified as high efficacy and which light sources must be certified to CEC to be classified as high efficacy. We have reviewed labeling for JA8 compliant high efficacy light sources. All high-efficacy sources must be labeled with JA8-2016 or JA8-2016-E depending on their intended application.

- Only JA8-2016-E sources can be used in enclosed luminaires and recessed, ceiling downlights.
- No screw-base sockets can be used in recessed, ceiling downlights.
- And we have discussed the appliance efficiency database as it related to high-efficacy light sources.

This concludes Module 2. For more information on high efficacy lighting for residential applications, please visit the Energy Commission website at www.energy.ca.gov/title24/2016standards