

## California Energy Commission Comments on ENERGY STAR Program Requirements for Residential Light Fixtures Draft 1 Eligibility Criteria – Version 4.0

Overall, the criteria are more compatible with the 2005 California Building Energy Efficiency Standards. There has obviously been a lot of thought in the development of these improved criteria. Many thanks to the Energy Star folks for working with us.

I have a question and recommendation about the “Non Edison base Fluorescent Adapters.” Is this “base adapter” referring to the recently developed Energy Star replaceable ballast assembly that plugs into a line voltage socket with a bayonet base? If so, I recommend that an ANSI standard be developed for this socket format that specifically prohibits anyone from creating an incandescent adaptor to plug into the line-voltage socket of this assembly. If an incandescent adaptor is created by a 3rd party for this format, energy Standards will have to start considering this an incandescent system.

I have (mild) concerns about encouraging manufacturers to include lamps packaged with their luminaires because it may discourage end users from selecting varying CCT lamps. It may result in consumer confusion.

I think it is implied in the Indoor Fixture, Energy Star specifications that only pin based sockets are allowed. However, it might be clearer to specifically say, “...shall not contain screw base sockets.” Furthermore, it might be good to state that 4-pin sockets should be used for all CFL fixtures, since current practice requires 4-pin bases for electronic ballasted CFLs.

Regarding outdoor HID fixtures for residential applications, in the draft 2005 Residential Manual we further explain that an HID fixture must contain an **HID rated socket**, factory installed HID ballast, as well as meet the minimum efficacy in order to be considered a high efficacy fixture.

For Air Tight fixtures, the Energy Star specifications state, “...shall be sealed with a gasket or caulk between the housing and ceiling.” This is similar to the language used in Title 24. Since the adoption of the 2005 Title 24, I was involved in a significant discussion with representatives from the lighting industry about the appropriate installation of fixtures that are certified Air Tight according to ASTM E283. Some of the folks who helped developed the original AT language for the State of Washington were involved in this discussion. First, it became apparent that even though ASTM E283 is probably the best existing standard to use for this purpose, it was actually developed for window and door applications. There needs to be an effort to develop a sub-element of ASTM E283 that specifically addresses the installation of AT fixtures. Next, those who participated in this discussion helped me develop the attached inspection protocol in an effort to deal with issues many of them found in the application of Air Tight Standards. This protocol is in the California draft 2005 Residential Manual. Perhaps, until ASTM

E283 is adapted to address the installation of AT fixtures, some of the attached language can be used by Energy Star.

Thanks for the opportunity to comment.

Regards

Gary Flamm  
California Energy Commission

Attached Document:

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## **1.1 Inspection Protocol for Recessed Luminaires in Insulated Ceilings**

§150(k)5.

Luminaires recessed in insulated ceilings must be IC rated and have a gasket or caulking between the housing and ceiling to prevent the flow of heated or cooled air between conditioned and unconditioned spaces. The luminaire must include a label certifying airtight or similar designation to show air leakage less than 2.0 CFM at 75 Pascals when tested in accordance with ASTM E283. The label must be clearly visible for the building inspector.

The ASTM E283 certification is a laboratory procedure intended to measure only leakage of the luminaire housing or, if applicable, of an airtight trim kit, and not the installation. Luminaire housings labeled as airtight, airtight ready or other airtight designation do not establish that the luminaire has been installed airtight. The luminaire manufacturer must provide instructions that explain the entire assembly required to achieve an airtight installation.

There are several different methods used by manufacturers to meet the airtight standards. The Energy Commission does not recommend one airtight method over another.

The primary intent is to install a certified airtight luminaire so that it is sufficiently airtight to prevent the flow of heated or cooled air between conditioned and unconditioned spaces. All air leak paths through the luminaire assembly or through the ceiling opening must be sealed. Leak paths in the installation assembly that are not part of the ASTM E283 testing must be sealed with either a gasket or caulk. One example may apply for assemblies where a certified airtight luminaire housing is installed in an adjustable mounting frame; all air leak paths between the certified airtight luminaire housing and the adjustable mounting frame must be sealed, either with a gasket or caulk.

Following is the process for verifying that the requirements for an airtight installation are met.

- Manufacturer specifications (a "cut sheet") of the certified airtight luminaire housing(s) and installation instructions must be submitted on the plans to show all components of the assembly that will be necessary to insure an airtight installation consistent with §150 (k) 5 of the Standards. This allows the building inspector to know what method the luminaire manufacturer specifies to achieve airtight installation, and therefore, at what phase of construction the building inspector must inspect the luminaire for airtight compliance.
- One of the following primary methods is specified by the luminaire manufacturer to insure an airtight seal of the certified airtight housing to the ceiling:
  1. A gasket is attached to the bottom of the certified airtight housing prior to the installation of the ceiling (i.e. drywall or other ceiling materials) to create an airtight seal. The gasket may be preinstalled at the factory, or may need to be field installed. For field installed gaskets, instructions on how the gasket is to be attached must be provided by the manufacturer.

The luminaire must be installed so that the gasket will be sufficiently compressed by the ceiling when the ceiling is installed.

2. A gasket is applied between the certified airtight housing and the ceiling opening after the ceiling has been installed. The gasket creates the airtight seal. The cut sheet and installation instructions for achieving the airtight conditions must show how the gasket is to be attached.
3. Caulk is applied between the certified airtight housing and the ceiling after the ceiling has been installed. The caulk creates the airtight seal. The cut sheet or installation instructions for achieving the airtight conditions must specify the type of caulk that must be used and how the caulk must be applied.
4. A certified airtight trim kit is attached to the housing after the ceiling has been installed. The certified airtight trim kit in combination with the luminaire housing makes the manufactured luminaire airtight. Note that a decorative luminaire trim that is not ASTM E283 certified does not make the manufactured luminaire airtight. Most decorative luminaire trims are not designed to make a luminaire airtight. Rather, these trims are used to provide a finished look between the ceiling and luminaire housing, and may include a reflector, baffle, and/or lens. However, some trim kits are specifically designed to be a critical component used to make a luminaire installation airtight. These trim kits must be certified airtight in accordance with ASTM E283. Certified airtight trim kits typically consist of a one-piece lamp-holder, reflector cone, and baffle.

The cut sheet and installation instructions for achieving the airtight conditions must show which certified airtight trim kits are designed to be installed with the luminaire housing, and how the certified airtight trim kits must be attached. A gasket must be installed between the certified airtight trim kit and the ceiling.

- The following methods for insuring an airtight seal between the certified airtight housing or certified airtight trim and the ceiling must be field verified at different phases during construction.
  1. Gasket attached to the bottom of the certified airtight housing must be inspected prior to the installation of the ceiling when the rough-in electrical work is visible. The inspector must review the cut sheet or installation instructions to make sure the housing and gasket have been installed correctly. All gaskets shall be permanently in place at the time of inspection. It is important that once the ceiling material is installed the gasket will be in continuous, compressed contact with the backside of the ceiling and that the housing is attached securely to avoid vertical movement. The housing must be installed on a plane that is parallel to the ceiling plane to assure continuous compression of the gasket.
  2. Gasket applied between the certified airtight housing and the ceiling after the ceiling has been installed must be inspected after the installation of the ceiling. The inspector must review the cut sheet or installation instructions to make sure the housing and gasket have been installed correctly. The gasket shall be permanently in place at the time of inspection. It is important that the gasket is in continuous, compressed

contact with the ceiling, and that the housing is attached securely to avoid vertical movement.

3. Caulk applied between the certified airtight housing and the ceiling after the ceiling has been installed must be inspected after the installation of the ceiling. The inspector must review the cut sheet or installation instructions to make sure the housing has been installed correctly and the caulk has been applied correctly. It is important and that the housing is attached securely to avoid vertical movement.
4. Certified airtight trim kit must be inspected after the installation of the ceiling and the installation of the trim. The inspector must review the cut sheet or installation instructions to make sure the luminaire housing and the certified airtight trim kit have been installed correctly. It is important that the housing and the certified airtight trim kit are attached securely to avoid vertical movement. The ASTM E283 certification is a laboratory procedure where the trim kit is tested on a smooth mounting surface. However, it is common for certified airtight trim kits to be installed against a textured ceiling or other irregular ceiling surface. It is important that the gasket is in continuous, compressed contact with the ceiling and the certified airtight trim kit. Therefore, it is important to visually inspect the certified airtight trim kit and gasket next to the ceiling to assure that a continuous seal has been produced.

Certified airtight trim kits may be installed on luminaire housings that may or may not be certified airtight. If the trim kit is certified airtight, it must also have a sealed gasket between the trim kit and ceiling.