



Can a Luminaire Be Used in A Fire-Resistive Ceiling Assembly?

by UL Solutions

Q How do I know if a luminaire can be used in a fire-resistive ceiling assembly? I see several recessed LED wafer lights that claim to have a 2-hour fire rating. What should I look for with these luminaires?

A Throughout North America and in many other regions, fire resistance assembly ratings are based on the results of fire tests of full-scale floor-ceiling or roof-ceiling assemblies (approximately 14 ft by 17-1/2 ft) conducted in accordance with UL 263, the *Standard for Fire Tests of Building Construction and Materials* (ASTM E119/ULC S101). The test assemblies are installed in large test frames representing actual building installation. During a fire test, a load is applied to the top side of the assembly to stress the structural elements of the assembly in a manner that represents design limits. The assembly's underside, i.e., the ceiling side, is exposed to fire, with temperatures controlled according to the time-temperature curve from UL 263/ASTM E119/ULC S101.

The test rating criteria require that an assembly supports the superimposed load during the targeted hourly rating period without resulting in unexposed surface conditions that would ignite combustible materials. In addition, temperature limits are specified on structural members of the assembly and the unexposed surface of the floor or roof, i.e., the top side, during the rating period. More detailed information on the test assembly requirements and the rating criteria is provided in UL 263/ASTM E119/ULC S101.

Any type of penetration in the ceiling of a fire-resistance-rated assembly can potentially compromise its fire-resistance rating. Recessed luminaires should only be installed

in a fire-resistive ceiling if the installation complies with one of the following three Certification methods.

Method one: UL-Certified (Listed) luminaires were tested as part of the UL-Certified (Classified) fire resistive assembly and installed with the specified supplemental protection. This protection consists of field-installed ceiling membrane tenting or boxing over the luminaire in accordance with the fire-resistive assembly design that details the assembly construction and the luminaire area and spacing limitations to maintain the hourly fire rating of the assembly. For UL Solutions-rated designs, this suitability can be determined by referencing the individual fire resistance-rated assemblies under the product category Fire-resistance Ratings - ANSI/UL 263 ([BXUV](#)). To view the guide information for [BXUV](#) and Certified (Classified) fire resistive assembly designs, visit UL Product iQ® at www.UL.com/piq; enter [BXUV](#) or the specific fire resistive assembly number, e.g., [G548](#), in the search field.

The second method involves recessed luminaires, specifically UL Certified (Classified), for use in fire-resistance-rated assemblies. These special luminaires typically feature built-in protection and have been shown to provide a degree of fire resistance for the floor-ceiling or roof-ceiling assemblies with which they have been tested. These luminaires are UL Certified (Classified) under Luminaires, Luminaire Assemblies and Luminaire Enclosures Certified for Fire Resistance ([CDHW](#)), and ([CDHW7](#)) for Canada. To see a list, access Product iQ at www.UL.com/piq; enter [CDHW](#) or [CDHW7](#) in the search field. The luminaires will be marked with a UL Certification (Classification) Mark and additionally marked



as to the fire resistance designs for which they were Certified (Classified). The UL Fire Resistance Design Numbers for each luminaire are UL Certified (Classified) and will also appear on a manufacturer's Product iQ page along with the luminaire area and spacing limitations.

The third method involves individual enclosures or covers that have been specifically UL Certified (Classified) for field installation over Certified (Listed) recessed luminaires that do not have built-in fire protection. The enclosures are typically constructed of fire-resistant and heat-resistant materials such as mineral wool or intumescent material. These have been shown to provide a degree of fire resistance for an unprotected recessed luminaire with the floor-ceiling or roof-ceiling assemblies with which the enclosure has been tested. These enclosures are also UL Certified (Classified) under the CDHW/CDHW7 categories. The luminaire enclosures will be marked with a UL Certification (Classified) Mark. The Certification (Classification) file for a manufacturer in UL Product iQ indicates the UL Fire Resistance Design Numbers and the types of luminaires with which they are certified for use, along with the luminaire area and spacing limitations.

Canless, ultra-thin LED wafer luminaires are a newer type of recessed luminaire. This type of luminaire has a thin wafer metal or plastic housing that is typically secured in a circular opening of the ceiling membrane with spring clips. Unless a wafer luminaire has been fire tested to UL 263/ASTM E119/ULC S101 in a full-scale, loaded assembly, installing it in the ceiling membrane of a fire-resistance-rated floor-ceiling or roof-ceiling assembly without supplemental protection over the top side may jeopardize the fire resistance rating of an assembly. This is based on test experience and was supported by research testing for troffer luminaires that

showed omitting supplemental protection and a non-continuous ceiling membrane can drastically reduce the fire resistance rating of an assembly. It is also important to verify the floor and ceiling components tested are representative of the actual assembly, e.g., wood flooring and gypsum board ceiling, if to be installed in a wood flooring and gypsum board floor-ceiling assembly.

If the wafer luminaire was not evaluated in a full-scale, fully loaded fire test per UL 263/ASTM E119/ULC S101, and if it does not have field-installed supplemental protection, then any fire rated claims may be a manufacturer's self-declaration. The building safety stakeholder needs to carefully consider acceptability for use in a fire-resistance-rated floor-ceiling or roof-ceiling assembly.

Recessed luminaires alone, or any other component or part of an assembly, are not assigned a fire-resistance rating. Rather, the entire assembly qualifies for a specified rating as a result of fire testing.

For more information on the research testing referenced above and the influence of recessed luminaires in fire resistive assemblies, visit <https://www.ul.com/insights/influence-recessed-luminaires-fire-resistive-assemblies>. ¹

UL Solutions helps create a better world by applying science to solve safety, security and sustainability challenges. We empower trust by enabling the safe adoption of innovative new products and technologies. Everyone at UL shares a passion to make the world a safer place. All of our work, from independent research and standards development, to testing and certification, to providing analytical and digital solutions, helps improve global well-being. Businesses, industries, governments, regulatory authorities and the public put their trust in us so they can make smarter decisions. To learn more, visit [UL.com](https://www.ul.com).