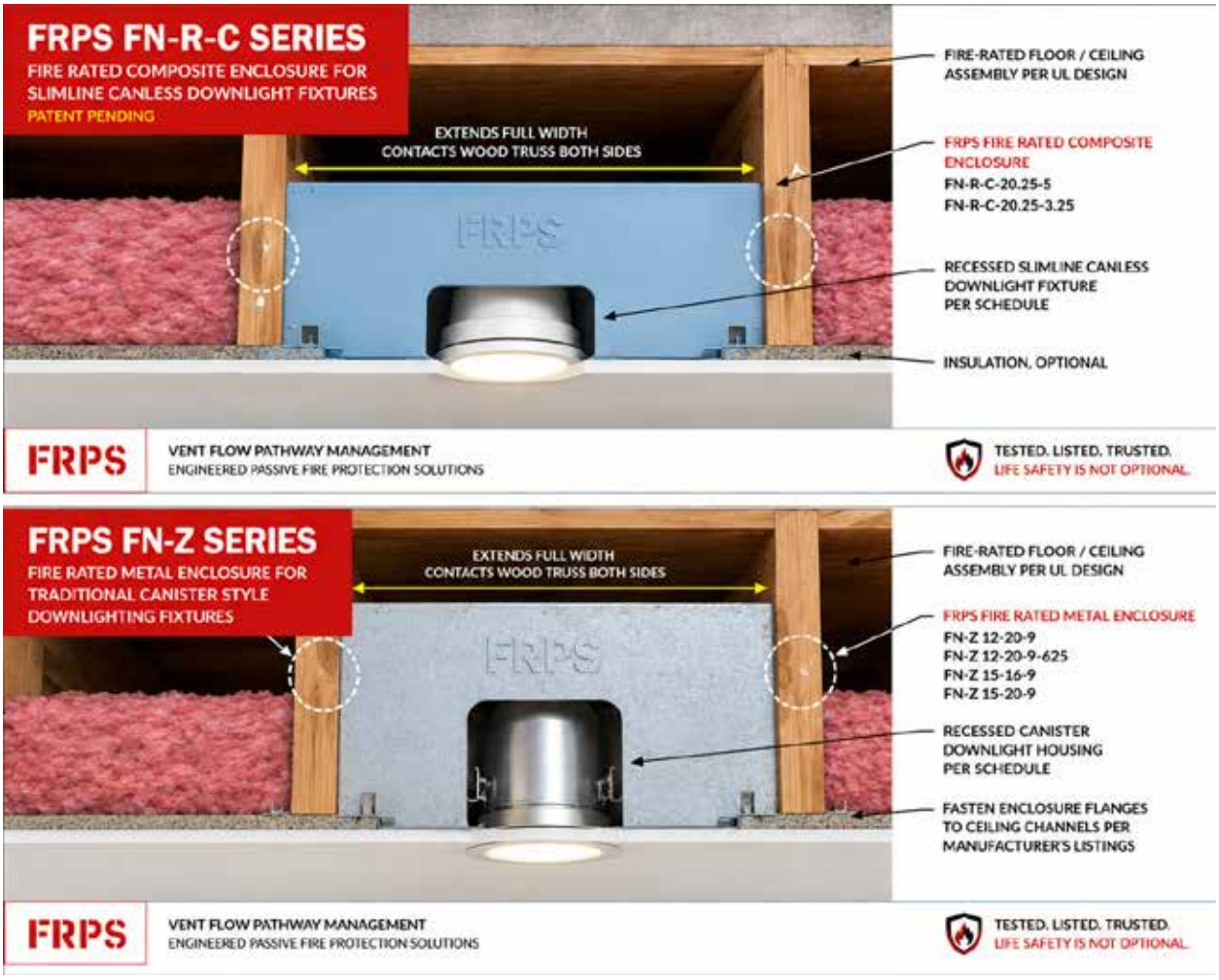
TECHNICAL WHITE PAPER | PROTECTING WHAT MATTERS MOST

IC Rated Does Not Mean Fire Rated

- The evolution of recessed downlighting, the difference between luminaire safety and assembly fire resistance, and the life-safety duty to protect membrane penetrations.

THE CENTRAL DESIGN QUESTION

When an IC-rated recessed or canless LED fixture interrupts a required fire-resistance-rated ceiling membrane, what evidence demonstrates that the installed condition still maintains the assembly's required hourly rating?



Traditional Canister	IC-Rated Housing	Integrated LED	Canless / Wafer
Large metal housings; incandescent/halogen heat management and clearances.	Thermally evaluated for insulation contact; still a recessed opening in the ceiling membrane.	Smaller LED housings and remote drivers reduce depth and operating temperature.	Ultra-thin LED discs clip directly into a circular cutout in the ceiling membrane.

Executive Summary

Recessed lighting has changed dramatically. Traditional incandescent and fluorescent canister housings evolved into insulation-contact (IC) housings, then compact integrated LED downlights, and now ultra-thin canless or wafer luminaires. The lighting technology became smaller, cooler and easier to install. The building-code question, however, did not change: when a required fire-resistance-rated membrane is penetrated, the installed condition must not reduce the required fire resistance.

An IC designation is a luminaire thermal-safety classification. It addresses whether a recessed luminaire is suitable for contact with thermal insulation under the conditions of its electrical listing. It does not, by itself, establish that the fixture preserves a one-hour or two-hour fire-resistance-rated floor/ceiling or roof/ceiling assembly.

UL Solutions states that recessed luminaires in fire-resistive ceilings should be either tested as part of the assembly, individually evaluated for their effect on the fire-resistance rating, or protected by a specifically certified enclosure or cover. UL further warns that unless a canless ultra-thin LED wafer luminaire has been fire tested in a full-scale assembly to UL 263/ASTM E119/ULC S101, installation without supplemental protection may jeopardize the assembly rating.

The practical implication is straightforward: product safety, operating temperature, energy efficiency, airtightness and electrical listing are not substitutes for evidence that the rated building assembly remains compliant after the membrane is opened. Existing conditions for which that evidence cannot be established should be reviewed and, where required by the adopted code and Authority Having Jurisdiction (AHJ), corrected through a listed luminaire, a listed protective enclosure, an assembly-specific tested detail, or another approved method.

THE CORE PRINCIPLE

IC-rated ≠ fire-resistance rated. The fixture may be safe next to insulation while the opening it creates can still compromise the tested ceiling membrane.

From Metal Canisters to Ultra-Thin LED Wafers

For decades, recessed downlighting generally meant a metal canister mounted between joists or framing members. Incandescent and halogen lamps produced significant heat, so installation instructions focused heavily on clearances, thermal protection and the relationship between the housing and surrounding insulation.

Type IC recessed luminaires emerged to address that thermal-installation condition. “IC” identifies a luminaire suitable for insulation contact when installed in accordance with its listing and instructions. That development improved installation flexibility, but it did not transform the luminaire into a replacement for the gypsum or other membrane that forms part of a tested fire-resistance-rated assembly.

LED technology then reduced fixture depth and heat output. Integrated LED downlights eliminated the traditional replaceable lamp, and remote-driver designs allowed the visible fixture body to become extremely thin. Today, many canless or wafer products require little more than a circular opening through the ceiling membrane, spring clips and a remote junction/driver box above the ceiling.

The visual simplicity of the wafer can create a false sense that the opening is inconsequential. From a fire-resistance perspective, however, the central issue is continuity of the tested assembly — not whether the luminaire is shallow, cool-running or electrically efficient.

What an IC Rating Actually Establishes

An IC rating is part of the luminaire’s safety evaluation for installation in contact with thermal insulation. It is highly relevant to electrical and thermal safety, but it answers a different question from fire-resistance compliance.

Classification	What it Addresses	What it Does Not Automatically Prove
Type IC / IC-Rated	Suitability for contact with thermal insulation under listing conditions.	That the ceiling opening preserves a 1- or 2-hour fire-resistance-rated assembly.
UL 1598 Luminaire Listing	Electrical, mechanical and thermal safety of the luminaire.	That the luminaire replaces the fire-resistive function of the removed ceiling membrane.
Airtight / Energy Claims	Normal-service air leakage or energy performance, where applicable.	Fire resistance or firestop performance.
UL 263 / ASTM E119	Fire-resistance performance of building construction and complete assemblies.	General electrical safety of the luminaire.
UL 1479 / ASTM E814	Performance of qualifying penetration firestop systems.	A universal approval for every recessed-luminaire condition.

Fire Resistance Belongs to the Assembly

UL Solutions emphasizes that individual recessed luminaires are not assigned the hourly fire-resistance rating of the complete floor/ceiling or roof/ceiling construction. The assembly earns its specified rating through fire testing. A component can therefore be fully listed for its own electrical purpose while still requiring separate evidence of suitability when it penetrates a rated membrane.

This distinction is fundamental to specification and inspection. “Listed,” “IC-rated,” “noncombustible,” “heat-resistant,” “fire-resistant material,” and similar terms describe different attributes. None should be interpreted as proof that the installed recessed opening maintains an assembly rating unless the applicable listing, tested design or approved method says so.

UL SOLUTIONS: THREE RECOGNIZED PATHS

1. The luminaire is included in the tested fire-resistance-rated assembly and installed exactly as specified.
2. The luminaire is specifically certified for use in identified fire-resistance-rated assemblies.
3. A separately certified enclosure or cover is installed over an otherwise unprotected recessed luminaire in the assemblies and configurations identified by the certification.

Building-Code Requirement: Do Not Reduce the Required Fire Resistance

The International Building Code has long addressed recessed fixtures as membrane penetrations. Earlier editions used Section 713; later editions use Section 714. The core requirement remains consistent: where walls, partitions or floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures must be installed so the required fire resistance is not reduced.

The code provides specific exceptions for certain limited penetration conditions, but those exceptions are prescriptive and bounded by material, area, spacing and annular-space limits. A recessed luminaire should not be assumed to qualify merely because its opening is small or because the fixture carries an electrical listing.

ASTM E119 / UL 263 and ASTM E814 / UL 1479 also serve different purposes. The first pair evaluates fire resistance of building construction and assemblies. The second pair evaluates penetration firestop systems. The applicable compliance path must match the actual assembly, orientation, opening, device and protection method.

Why Canless / Slimline LED Fixtures Require Particular Attention

UL Solutions specifically identifies the modern canless, ultra-thin LED wafer luminaire as a newer recessed-lighting type. These fixtures typically use a thin metal or plastic housing secured directly in a circular ceiling opening with spring clips.

UL warns that, unless the wafer luminaire has been evaluated in a full-scale, fully loaded UL 263/ASTM E119/ULC S101 fire test, installing it in a fire-resistance-rated ceiling without supplemental protection may jeopardize the rating. That conclusion is consistent with UL research on recessed troffers, where omitting required supplemental protection allowed significant heat transmission into the plenum and could reduce the effective performance of a nominal two-hour assembly to one hour or less.

The lesson is not that every wafer luminaire fails every rated assembly. The lesson is that acceptability cannot be inferred from shape, thickness, LED technology, low operating temperature, IC status or a standard luminaire listing. It must be established by the evidence applicable to the complete installed condition.

Existing Installations: Documentation Before Assumption

Existing buildings may contain traditional cans, retrofit LED modules, canless fixtures or wafer lights installed in ceilings that are part of required fire-resistance-rated assemblies. The appropriate response is a documented compliance review, not an unsupported assumption that every installation is acceptable or that every installation must automatically be removed.

Where the project team cannot establish that the installation is covered by the rated assembly, a specific luminaire fire-resistance certification, a listed protective enclosure, a tested supplemental-protection detail or another approved method, the condition should be referred to the responsible design professional and AHJ for determination. Corrective work may include adding listed protection, replacing the fixture, reconstructing the membrane, or using another approved assembly-specific solution.

This approach is particularly important in multifamily housing, senior living, student housing, hotels, healthcare, schools and other occupancies where rated floor/ceiling assemblies support compartmentation and safe egress strategies.

Recommended field-verification sequence

VERIFY	REQUIRED EVIDENCE / ACTION
Assembly	Identify the exact floor/ceiling or roof/ceiling construction, hourly rating and design number.
Fixture	Record manufacturer, model, IC status, opening size, driver/junction-box arrangement and installation instructions.
Fire Evidence	Locate the applicable assembly design, luminaire fire-resistance certification, enclosure listing or approved tested detail.
Installation	Verify clearances, spacing, fastening, enclosure coverage, penetrants and supplemental protection against the listed conditions.
Approval	Document the disposition through the design professional, special inspector and/or AHJ as required before concealment or closeout.

FRPS Position: Protect the Membrane, Not Just the Fixture

Fire Rated Product Specialties Corp. (FRPS) approaches recessed-lighting coordination from the assembly outward. The design question is not simply whether a luminaire is electrically safe. It is whether the complete fire-resistance-rated assembly remains protected after the opening, fixture, wiring and related services are installed.

FRPS engineered enclosure concepts are intended to provide project teams with purpose-designed passive fire-protection options for selected recessed-lighting conditions when used within their applicable tested/listed configurations. Product selection must always be coordinated with the exact rated assembly, luminaire geometry, opening limitations, installation instructions and AHJ requirements.

This is also part of FRPS Vent Flow Pathway Management: identifying openings and concealed pathways that can connect a fire compartment to ceiling plenums, truss spaces, floor cavities and adjacent construction, then coordinating tested/listed protection before those pathways are concealed.

ARCHITECT / SPECIFIER	MEP / LIGHTING ENGINEER	CONTRACTOR / INSPECTOR
Identify rated ceilings, coordinate reflected-ceiling plans and details, and require assembly-compatible recessed-fixture protection.	Select fixtures with documented fire-resistance compatibility or specify the required listed protective method.	Verify the installed opening, fixture and protection against the approved assembly before concealment and closeout.

CONCLUSION

IC Rated Does Not Mean Fire Rated

The transition from bulky canister housings to ultra-thin LED wafers has changed lighting design, installation speed and energy performance. It has not eliminated the need to preserve the continuity and tested performance of fire-resistance-rated construction.

IC status answers a thermal-installation question: may the luminaire contact insulation under its listing conditions? Fire-resistance compliance answers a building-assembly question: after the ceiling membrane is interrupted, does the complete installed construction still provide the required fire resistance?

Those questions must not be conflated. For new construction, renovation and existing-building review, the defensible practice is to identify the rated assembly, identify the recessed opening, establish the applicable tested/listed protection path, install it exactly as required and document acceptance before concealment. That is the level of coordination necessary to protect the rating that compartmentation, egress and life-safety strategies depend upon.

FRPS LIFE-SAFETY POSITION

Every recessed fixture in a required rated membrane should have a documented compliance path. Product safety claims are not a substitute for assembly-level fire-resistance evidence.

References & Technical Basis

- UL Solutions. “The Influence of Recessed Luminaires in Fire Resistive Assemblies.” The Code Authority / UL Solutions. Discusses traditional troffers, certified recessed luminaires, certified protective enclosures and canless ultra-thin LED wafer luminaires in fire-resistance-rated assemblies.
- International Code Council. International Building Code, Chapter 7, membrane-penetration provisions. Current and historical editions require recessed fixtures in rated walls and floor/ceiling assemblies to be installed so the required fire resistance is not reduced.
- ASTM International. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
- UL Solutions. UL 263, Fire Tests of Building Construction and Materials.
- ASTM International. ASTM E814, Standard Test Method for Fire Tests of Penetration Firestop Systems.
- UL Solutions. UL 1479, Fire Tests of Penetration Firestops.
- U.S. Department of Energy / Pacific Northwest National Laboratory, Building America Solution Center. Recessed Lighting Code Compliance Brief, including Type IC considerations and recessed-lighting code coordination.
- Project-specific compliance must be verified against the adopted code edition, applicable tested assembly, product certification/listing, manufacturer installation instructions, approved construction documents and requirements of the Authority Having Jurisdiction.
- Fire Rated Product Specialties Corp. Archived Intertek project documentation, Project No. 101127258SAT-002, revised June 27, 2013; and current FRPS/FME exhaust-fan enclosure listings. Verify current revision and certified application before publication or project use.

About Fire Rated Product Specialties

Fire Rated Product Specialties Corp. develops engineered passive fire-protection products and coordination resources for conditions where recessed fixtures, valves, fans, luminaires, mechanical systems, electrical devices and other building services interrupt fire-resistance-rated construction.

FRPS supports architects, engineers, contractors, inspectors, owners and Authorities Having Jurisdiction with application-specific product solutions, CAD details, specification language, installation resources and passive fire-protection coordination focused on maintaining rated assemblies and controlling concealed vent-flow pathways.