

Recessed Lighting at Air Barriers & Vapour Barriers

Guideline

Guideline ESP - 18

Purpose

The purpose of this Guideline is to provide education and clarify the Building Code requirements for the continuity of Air Barriers and Vapour Barriers at recessed lighting and other similar penetrations in heated buildings.



Code Reference

Current National Building Code – Alberta Edition (NBC-AE), Division B, Articles:

- 9.25.3.3. Continuity of the Air Barrier System,
- 9.25.4.1. Required Barrier to Vapour Diffusion,
- 9.25.4.2. Vapour Barrier Materials,
- 9.36.2.9. Air Tightness, and
- 9.36.2.10. Construction of Air Barrier Systems.



Summary

This document is specific to Part 9 buildings without professional involvement where unheated space is separated from heated space. Typically, the attic is an unheated space which is separated from the heated space within the building by an air barrier, vapour barrier and thermal insulation. This is required to achieve occupant comfort, energy efficiency and minimizing building damage and deterioration.



Interpretation

There are many types of recessed lights which have specific applications. Consult with the lighting manufacturer to ensure that the correct type of recessed light is selected for the intended application, and a Safety Codes Officer for compliance with applicable codes.

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1. **Definitions** – The following definitions are applicable to this Guideline and the requirements stated within.
 - a) Air barrier means the assembly installed to provide a continuous barrier to the movement of air. The building assembly shall have an air leakage rate not greater than $0.20 \text{ L}/(\text{s}\cdot\text{m}^2)$, 9.36.2.9. NBC-AE.
 - b) Can style recessed light has a metal frame with a metal cylinder which contains the light bulb which is located above the ceiling, with a separate decorative trim below the finished ceiling. See illustration.
 - c) Can-less style recessed light does not have a can housing; it has an electrical junction box connected to the light fixture. A mounting plate is typically included for new construction. See illustration.
 - d) Insulation Contact (IC) - Typically, IC rated recessed lights or housings can be installed with direct contact with insulation (not including spray foam), while non-IC rated recessed fixtures cannot.
 - e) Vapour barrier means the elements installed to control the diffusion of water vapour. Vapour barriers shall have a permeance not greater than $60 \text{ ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$, 9.25.4.2. NBC-AE.
2. **Installation** - A typical acceptable installation solution for the continuity of the air barrier and vapour barrier at an opening for a recessed light is achieved by installing a sheet of 6 MIL polyethylene or a poly hat above the fixture. The poly sheet or hat shall be sealed to the adjacent 6 MIL polyethylene at the ceiling with a non-hardening sealant, and requires solid backing at all joints. See illustrations for examples.

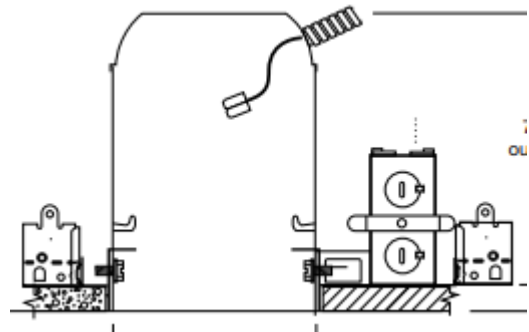
If an alternative method of providing an air barrier and vapour barrier at a recessed light is proposed then sufficient information shall be provided to quantify the method meets the requirements of the Building Code for air leakage rate, and vapour permeance.

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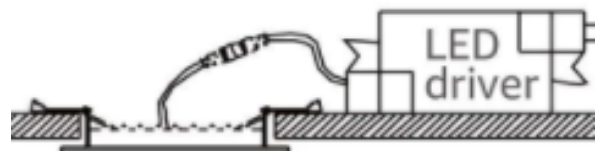
Illustrations



Example of a Can style IC rated recessed light housing installed in a ceiling with a poly hat, and sealed to the adjacent polyethylene.



Example of a mounting plate for a Can-less style recessed light installed in a ceiling with a polyethylene sheet cover, which will be sealed to the polyethylene at the ceiling





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Additional Information

Free electronic version of the [National Building Code – 2023 Alberta Edition - National Research Council Canada](#)



Reference

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- October 2024

Last Review Date

- October 2024