



# DOWNLIGHTS, WET AREAS AND INSULATION

**The choice of downlight fittings cannot be left to the owner, particularly in wet areas or those that form part of the thermal envelope. The type of downlight must be specified when a building consent is applied for.**

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**R**ecessed downlights are recessed luminaires that are let into the ceiling. These are an extremely common feature in modern designs, but where they are installed incorrectly or the wrong type of fitting is used, they can:

- cause fires from insufficient clearance between the fitting and insulation
- seriously degrade the insulation value of a ceiling that is part of the thermal envelope
- cause bulbs to overheat and fail when heat is trapped around the fitting by insufficient ventilation
- affect the durability of the concealed ceiling cavity by allowing entry of moist air from the space below, particularly when installed in wet areas.

## CA type recommended in thermal envelope

Selecting the right fitting is crucial in many buildings, particularly housing where the ceiling forms part of the thermal envelope. The required R-value for the ceiling will not be achieved if there is a gap between the insulation and the light fitting, so only light fittings rated A (Abutted) can be installed. These allow the insulation to be abutted to the light fitting.

From NZECP 54:2001 *New Zealand electrical code of practice for the installation of recessed luminaires and auxiliary equipment*, a light fitting for a roof or ceiling that forms part of the thermal envelope must be either CA or RA type (see thermally insulated habitable spaces in NZECP 54 Table 2).

The recently published but not yet cited NZS 4218:2009 *Thermal insulation – Housing and small buildings* Section 3.1.2 restricts this further to only the use of CA type fittings with thermal insulation.

## Insulation abutted but not over

In a typical installation of a CA rated recessed light fitting into an insulated ceiling, the insulation is abutted to the light fitting but must not fit over it (see Figure 1). Where the insulation thickness is greater than the height of the fitting, consider installing a proprietary heat can over the light to ensure the insulation does not cover it.

## Other fittings if outside thermal envelope

Fittings that are not CA or RA rated may only be used where the:

- light fitting is installed into the mid-floor framing space

- ceiling does not form part of the thermal envelope
- space below is a dry area – not a bathroom, kitchen or laundry.

## Fully closed downlights in wet areas

Open downlights in wet areas, such as bathrooms, kitchens and laundries, are of concern. They can allow significant amounts of moisture-laden air into roof spaces and concealed areas of framing.

A surface mounted fitting is recommended in wet areas, particularly in cold climates, to restrict the passage of moist, potentially damaging air into roof spaces and concealed framing spaces such as the inter-floor structure. Even CA rated fittings, which can have up to 5% open air, will allow this moisture to be transferred.

## NZECP 54

All downlights must be installed in accordance with NZECP 54:2001 to ensure there is no heat build-up within the structure.

*NZECP 54:2001 can be downloaded free from [www.energysafety.govt.nz](http://www.energysafety.govt.nz), see 'For electricity industry'.* ◀

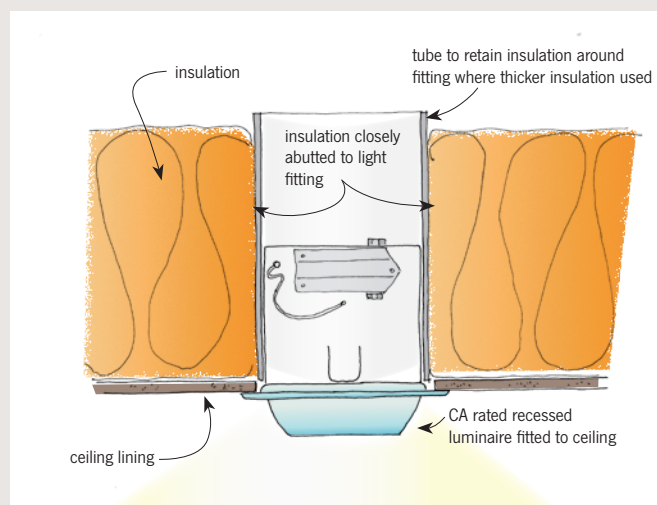


Figure 1. Recessed CA rated luminaire set into insulated ceiling.