

Qualifying Materials as Thermal Barriers for Foamed Plastic Insulation Using Standards CAN/ULC-S124 and CAN/ULC-S101

Introduction

The National Building Code of Canada specifically allows certain materials to be used as thermal barriers for foamed plastic insulation. For materials that are not specifically identified, the National Building Code of Canada stipulates testing requirements to determine if the material may be used as a thermal barrier.

This technical bulletin provides information on the testing requirements of CAN/ULC-S124 and CAN/ULC-S101 for determining if a material can be used as a thermal barrier for foamed plastic.

For more detailed information on thermal barriers for foamed plastic, please consult the Technical Bulletin titled, "Protection of Foamed Plastic Insulation".

CAN/ULC S124

Clause 3.1.5.12.2.(e) specifies that materials meeting the requirements of Classification B, when tested in conformance with standard CAN/ULC-S124, are permitted as thermal barriers for foamed plastic insulation. This test exposes the material to a furnace that follows the time-temperature curve of standard CAN/ULC-S101, reaching over 700 °C after 10 minutes. Thermocouples are used to measure the temperature at the interface between the material deemed the thermal barrier and the foamed plastic insulation. This interface is the unexposed side of the thermal barrier material (see Figure 1). For a Classification B rating, the temperature rise at the interface of the deemed thermal barrier material and the foamed plastic insulation cannot exceed an average of 140 °C for all the thermocouples or a maximum rise of 180 °C at any single thermocouple for 10 minutes.

Listings issued by organizations such as ULC, Intertek or QAI can confirm if a material has a Classification B rating based on standard CAN/ULC-S124 to be a thermal barrier for foamed plastic insulations.

CAN/ULC-S101- For Materials

Clause 3.1.5.12.(3) (d) allows for the testing of materials in conformance with standard CAN/ULC-S101 to determine if they can be used as a thermal barrier for foamed plastic insulation in exterior walls of a building required to be of noncombustible construction. As in standard CAN/ULC S-124 thermocouples are used to measure the temperature at the interface between the material deemed the thermal barrier and the foamed plastic insulation

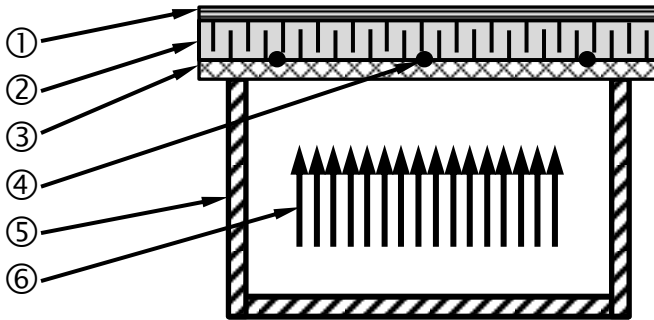
(see Figure 2). The temperature rise at the interface of the deemed thermal barrier material and the foamed plastic insulation cannot exceed an average of 140 °C for all the thermocouples or a maximum rise of 180 °C at any single thermocouple for 10 minutes.

Clause 3.1.5.12.(4) (d) allows for the testing of materials in conformance with standard CAN/ULC-S101 to determine if they can be used as a thermal barrier for foamed plastic insulation in interior walls, within ceilings and within roof assemblies. The temperature rise at the interface of the deemed thermal barrier material and the foamed plastic insulation cannot exceed an average of 140 °C for all the thermocouples or a maximum rise of 180 °C at any single thermocouple for 20 minutes. In addition the material must stay in place for at least 40 minutes.

CAN/ULC-S101- For Assemblies

Standard CAN/ULC-S101 is also used to measure the fire resistance rating of assemblies. For this type of testing, the thermocouples and temperature measurements are on the unexposed side of the assembly (see Figure 3). This approach is different than what is used to assess the thermal barrier performance of materials.

Fire resistance ratings for assemblies based on standard CAN/ULC-S101 can be found in listings issued by organizations such as ULC, Intertek and QAI. These types of listings are not used to confirm that a material meets the requirements of a thermal barrier for foamed plastic insulation.



- ① Supporting material
- ② Foam plastic insulation
- ③ Thermal barrier (product / material)
- ④ Thermocouples (position)
- ⑤ Furnace
- ⑥ Flames

Figure 1 – CAN/ULC-S124 - Test for thermal barrier material

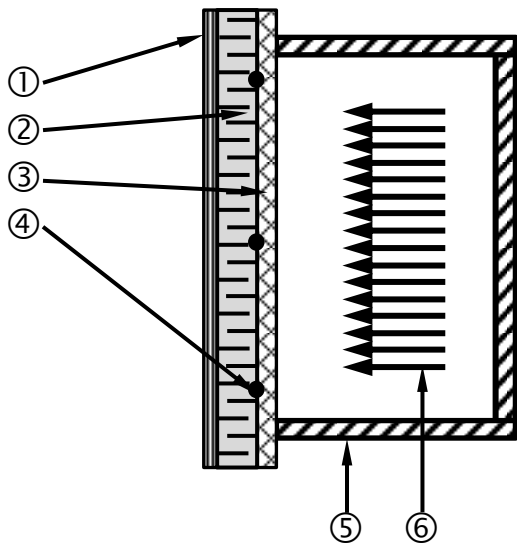


Figure 2 – CAN/ULC-S101 - Thermocouple position for thermal barrier material test

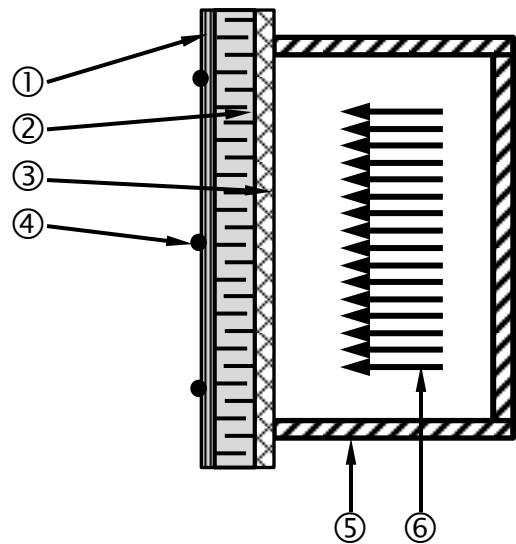


Figure 3 – CAN/ULC-S101 - Thermocouple position for fire resistance of assembly test