



TECHNICAL BULLETIN

APRIL 2005

Medium density closed cell spray polyurethane foam insulation in cathedral ceilings, flat roofs and attics

The Canadian Urethane Foam Contractors Association does not feel that a ventilation space is required when installing medium density closed cell spray polyurethane foam insulation (SPF), that meets the CAN/ULC S705.1 standard in a cathedral ceiling or the underside of the roof decking.

As Canada moves toward an objective based code in 2003, each requirement is being considered to determine what is the objective of the requirement.

The requirement for air space has a main objective to allow the attic to vent so that any moisture that may get into the attic space can be vented out of the attic. It is now recognized that you should stop moisture from getting into the attic, whether it be a regular attic or a cathedral ceiling. The province of Ontario has published an exemption for using an air space above insulation in a cathedral ceiling when medium density closed cell spray polyurethane foam is used. The CAN/ULC S705.1 Material standard for spray polyurethane foam requires that the SPF material meet the requirements of a vapour barrier at a two-inch thickness. When the foam is sprayed, it completely adheres to the sides of the rafters providing an barrier for moisture to get into the attic or ventilation space. If no vapour gets into the attic/ ventilation space, then there is no need to allow it to vent.

Some people feel that the ventilation space is to cool the shingles and that there will not be a warranty on the shingles if there is no ventilation space. Studies done by both the US Department of Energy in Las Vegas and Canada Mortgage and Housing Corporation in Edmonton show that the shingle temperature does not change whether the attic or cathedral ceiling is vented or not. Building science also supports this in that the shingles are heated by radiated heat from the sun, which means the hottest part of the shingle is the surface with the second hottest part being the interface with the roof sheeting. There is only 2 or 3 degrees difference between top and bottom of the shingle whether the attic / ventilation space is there or not. A ventilated attic will have some impact on the underside of the sheeting temperature but not the shingles.

We have conducted a study with NRC and Scanada which showed that two inches of foam applied anywhere in Canada would result in the interior condensing surface being greater than the dew point of the building. If you do not get a dew point, you cannot get water vapour to condense.

I hope that this provides the information that you need. If you do need more information, please contact myself at toll-free 866-467-7729

Supporting Documentation:

- a. Ontario Building Code – Branch Opinion
- b. Scanada Report
- c. Ventilation for Roof Spaces_Technical Paper
- d. Solplan Review_January 2004
- e. ASHRAE Journal_October 1999
- f. National Building Code – 9.19
- g. National Building Code – A-9.19.1.1.(1)