CRCA CANADIAN ROOFING CONTRACTORS ASSOCIATION

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# Polyisocyanurate Insulation

For many years the use of polyisocyanurate (polyiso) roof insulation has been widespread in the roofing industry across Canada and the United States. For the most part, roofing systems containing polyiso roof insulation have performed successfully. However, roofing contractors are reporting concerns with its use and these need to be addressed.

Much has been written in North American trade publications about the pros and cons of polyiso roof insulation usage for the roofing industry. Many issues have been debated and discussed relative to its proper manufacture, storage and application. Typically, PIMA (Polyisocyanurate Insulation Manufacturers Association) represents the insulation manufacturers and the CRCA (Canadian Roofing Contractors' Association) and NRCA (National Roofing Contractors Association - US) represent the roofing contractors in this debate [1,2]. NRCA has published a report that discusses considerations pertaining to the use of polyiso roof insulation in low-slope membrane roof assemblies which is available from their publications department.

When problems arise in the field, roofing crews need to recognize manufacturing, storage and application problems and make the necessary adjustment/correction to ensure that the roofing system is properly constructed. The correction of manufacturing deficiencies must be addressed and corrected by the insulation manufacturer. The purpose of this technical bulletin is to shed some light on the issues and misinformation surrounding polyiso roof insulation usage in roofing.

Polyiso roof insulation is a rigid closed-cell plastic thermoset insulation manufactured from liquid polyisocyanurate foam sandwiched between fibreglass reinforced organic felt, fibreglass mat (inorganic), or foil facers. Metered amounts of chemicals containing a blowing agent are permitted to react together under controlled temperatures after being introduced between the facers moving along a production line. The result of this controlled chemical reaction is that the liquid mixture solidifies and bonds to the facers to become a rigid lightweight thermal insulation. The production stock is then cut into boards of varying sizes that are allowed to cure for a period of time before they are shipped for distribution. In Canada, polyisocyanurate insulation is manufactured in compliance with the requirements of Canadian Standard CAN/CGSB 51.26-M86, *Thermal Insulation Urethane and Isocyanurate, Boards, Faced.* It should be noted that this Standard is under revision and will be replaced by CAN/ULC -S704. Insulation manufactured to CAN/CGSB 51.26-M86 should be labelled on each individual board or package to verify standard compliance. Unlabelled product should not be accepted at the job site as the insulation may not meet Canadian standards.

When stored outdoors the insulation must be kept dry. It should be protected by a waterproof, breathable covering such as a tarpaulin and be stacked above the roof or ground surface. The material is shipped from the manufacturers bundled and covered with clear plastic shrouds. This factory packaging is intended for the protection of the insulation boards during transit and should not be relied upon as job site protection from the elements. Manufacturers' recommendations may include slitting the wrapping on site prior to application to expel any condensation that may accumulate during transit and storage.

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When adhering membranes to polyiso roof insulation with hot asphalt, board size should not exceed 1200 mm x 1200 mm, as larger boards do not conform well to the irregularities in the substrate surface when adhered in asphalt. The polyiso manufacturers recommend that larger boards be mechanically fastened to the supporting substrate. For bitumen adhered low-slope roofing systems, the perforated side of the insulation board facer must be installed face up or be exposed when adhered and should not be reversed. CRCA recommends that for asphalt adhered systems a suitable cover board, such as fibreboard or perlite, completely cover the insulation prior to the application of the roof membrane.

Scheduling of the roofing operations to minimize repeated surface traffic or material storage over the installed insulation during system application will reduce the possibility of the crushing or pulverizing the insulation and/or delamination of the board facer. Polyiso insulation should be protected from damage by the temporary application of a high compressive strength working surface such as plywood or OSB sheathing when working over installed insulation boards.

Insulation boards that exhibit excessive edge cavitation or dimensional changes should be discarded and replaced with product of consistent dimensions. Finished board dimensions should be within the tolerances outlined in the material standard. If boards are found to fall out of the specifications for dimensions and size, the manufacturer should be notified and the material replaced.

Cupped or bowed polyiso boards should not be installed and wet insulation must be discarded at all times. Cupping or bowing may result from the wetting of the facers. As the facer dries, it shrinks creating tensile forces on the boards surface causing the board to cup. The cutting or scoring of the board facers to alleviate board cupping is not recommended.

Polyiso roof insulation, like other roof materials, requires a proper understanding of its manufacture, storage and application to result in well constructed and satisfactorily performing roofing systems. The Canadian Roofing Contractors' Association recommends that product performance or application concerns relative to the use of polyiso roof insulation be directed to the insulation manufacturer. A manufacturer's technical product brochure provides users with guidelines for the proper use, storage and application of this type of insulation. Adherence by all groups to the manufacturers' recommendations is paramount in ensuring the successful application and performance of roofing systems containing polyiso roof insulation.

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References


1. Polyisocyanurate Insulation Manufacturers Association (PIMA). 1331 F. Street N.W., Suite 975, Washington, D.C. 20004. (202) 628-3856.
2. National Roofing Contractors Association (NRCA). 10255 West Higgins Road, Suite 600, Rosemont, Ill, 60018-5607. (847) 299-9070.

*the roofing information contained herein or the consequences of any interpretation which the reader may take from such information.*