

WHY DO ROOFS SPLIT? | JUL. 2024

The definition of a split is simple. A split is a crack completely through a waterproofing membrane. The movement at the split exceeds the ability of the roof system to resist or accommodate it. The causes for splits, however, are not so simple. The following are the most common potential causes for splits in any type of roof system.

Board Movement

If insulation boards are not installed with staggered and offset insulation joints, the roof membrane may be unable to accommodate the compounded stress from boards with aligned joints.

How can you avoid this? Always stagger and offset insulation joints a minimum of 6". This allows any movement in the insulation boards to be evenly distributed throughout the roof system and substrate.



Stress Concentrations at Deck-Span Change

When two adjacent deck sections are supported by the same joist and travel in different directions, a stress concentration line can be formed. This line represents an area of potential tension or shearing stress that may transmit up through the roof system and fracture the membrane.

How can you avoid this? Install an expansion or control joint that can accommodate this movement.

Cantilevered Insulation Boards

If the edges of insulation boards are installed over a steel deck flute, the movement of the roof system or boards may not be able to be transferred to the deck. This movement may transmit up through the system and fracture the membrane.

How can you avoid this? Always make sure board joints are installed over steel deck flanges.

Widening of Insulation Board Joints

Openings in insulation board joints provide an area of stress concentration where movement may transmit through the system and fracture the membrane. Another cause that is often ignored is excessive moisture in the installed boards. Moisture in the boards may cause them to cup and lead to widening gaps in the joints.

How can you avoid this? Always ensure boards are installed with no gaps at all or gaps no wider than 1/8". Ensure insulation is properly stored at the job site to protect it from the weather.

Board Movement through Insufficient Attachment

There are many different options used to secure insulation boards. However, if the appropriate coverage rate for the material or number of fasteners is not achieved, the boards tend to experience more movement than normal. Therefore, if boards are not properly secured, the board joint provides an area of stress concentration where movement may transmit up through the system and fracture the membrane (Similar to the Widening of Insulation Board Joints above).



How can you avoid this? Use a product to achieve a bead size of 1/2" to 3/4" within 2" of the edge of each board. This allows the boards to be properly secure and lessens the chances of above-normal movement.

Regardless of the method of attachment used, be sure to read the specification pages to ensure the proper coverage rates or fasteners are used to secure the boards.

Refrigerated Interiors

A refrigerated interior with insulation on top of the structural deck must be specified and installed correctly. The thicker insulation required for a refrigerated space creates a less stable substrate for the membrane. Wider joints and greater movement in a thickened substrate magnify the hazard of membrane splitting.

How can you avoid this? When multiple layers of thick insulation are required, specify a multi-ply roof system that may accommodate rapid expansion and contraction.

Other Causes

Other causes of splits may include thermal shock. This occurs when the temperature of a membrane has risen from being in the sun all day. A cool ray may then fall on the roof, causing the temperature to drop. The strength of the membrane may not be able to withstand this rapid expansion and contracting, causing it to split.

How can you avoid this? This cause is closely related to the widening of insulation board joints. Always ensure boards are installed with no gaps at all or gaps no wider than 1/8".

It is impossible to eliminate and avoid all causes of roof membrane splitting. However, understanding and avoiding common causes will help us specify a quality roof system.

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At Tremco Roofing and Building Maintenance, we recommend having roof inspections and preventive maintenance performed twice a year by qualified experts for your roof system type. Repairing ridges and open laps (and other defects) early will not only save money but will also reduce the occurrence of surprise roof leaks. Our service division, Weatherproofing Technologies Canada, has teams across Canada to provide consistent maintenance and reporting for your facilities and keep your roofs in the best condition possible. We provide an asset management plan and an online portal to help you prepare and budget for your facility's future needs.