

Insulation and Ventilation to Limit Ice Dam Formation

Technical Letter 1

Design of roof structures should incorporate building materials to limit the formation of ice dams and use materials that help prevent leakage caused by ice dams. GCP's self-adhered underlayments (GRACE ICE & WATER SHIELD®, GRACE ICE & WATER SHIELD®HT, GRACE ULTRA™, GRACE SELECT™, GRACE BASIK® and GRACE ROOF DETAIL MEMBRANE™) provide protection to roof structures from leaks caused by ice dams but do not prevent ice dams from forming. Ice dams can cause devastating results if the standing water behind the dam gets underneath the roof coverings and into the attic and walls. The damage can be severe, as well as difficult and expensive to repair. In addition to water leakage, ice dams can severely damage roof coverings and other roof components.

Roofs designed with proper insulation and ventilation will help limit the formation of ice dams by minimizing the heat transfer from the building interior to the air in the attic space and removing any warmed air efficiently. The combination of insulation and ventilation is critical since ice dams can form even in buildings that are well insulated. Even small amounts of warmed air in the attic space may cause snow on the roof to melt. The water flows down the slope of the roof toward the eave where it re-freezes, since the eave overhangs unheated space. As the process continues, ice builds up at the eave forming a dam. Standing water becomes trapped behind the ice dam, usually right over the interior wall.

In a properly ventilated attic space, ventilation occurs when air in the attic space is warmed from heat that escapes from the building through the attic insulation. Warmed air rises toward the ridge vent where it can escape to the outside. Cold air is pulled into the attic space through the soffit vents, replacing the air that leaves through the ridge vent. The flow of cold air, that moves upward toward the ridge along the underside of the roof deck, is called a convection current. The convection current helps keep the roof deck cool and slows the melting process on the roof surface.

Proper roof ventilation and insulation design should be left to a qualified design professional and care should be taken to comply with local building codes. However, standard roofing practice is to use 1 ft² (0.093 m²) of net free ventilation area per 150 ft² (14 m²) of attic space, split evenly between the ridge and soffit vents. Soffit, ridge, gable, or roof deck vents may be used alone or in combination depending on the specific roof design. Soffit and ridge vents used together provide the most complete ventilation and is the preferred ventilation configuration. Gable vents are sometimes used but are not usually as effective as ridge vents.

It is easy to tell which buildings have well insulated and ventilated roofs. After a snowfall, if the snow is melted from only the top half of the roof, and an ice dam is forming, it is likely that the roof is poorly insulated or ventilated. If the snow does not melt, or melts evenly over the entire slope of the roof, the roof likely has adequate insulation and ventilation to limit ice dam formation.

ca.gcpat.com | North America customer service: 1-877-4AD-MIX (1-877-423-6491)

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

Ice & Water Shield, Grace Basik, Grace Ultra, Grace Select and Grace Roof Detail Membrane are trademarks, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2017 GCP Applied Technologies Inc.

All rights reserved.

GCP Applied Technologies Inc., 2325 Lakeview Parkway, Suite 450, Alpharetta, GA 30009, USA

GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This document is only current as of the last updated date stated below and is valid only for use in the Canada. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2023-06-29

ca.gcpat.com/solutions/products/grace-ice-water-shield-roofing-underlayment/insulation-and-ventilation-limit-ice