SINGLE PLY

TGN 24.1 [Technical Guidance Note]
Cold Weather Working

Specific System Advice:
The installation of single-ply roof systems in cold weather requires additional care and consideration compared to installs during optimal weather conditions. Cold temperatures impact the physical properties of adhesives, primers, and roll products which can cause installation of the roof system to be more challenging. Therefore, it is imperative to acknowledge the following precautions to ensure the successful installation of the finished roof system.

- Maintaining correct material storage & temperature conditions
- Remove from storage only enough adhesive for daily production
- Extra time for the membrane to visually relax prior to installation
- Curing rate of solvent-based & water-borne adhesives is reduced
- Recommend use of solvent-based adhesives and cold application adhesives
- Take special care that water-borne adhesives do not freeze
- Membranes become less flexible at low temperatures
- Adhesive coverage will vary according to ambient & surface temperature
- Do not apply adhesives to damp, wet, frosted or frozen surfaces
- Take special care of seam welds

Test welds: In cold weather, test welds are even more essential than in optimum weather conditions. Standard practice dictates that the correct speed and temperature settings for automatic welders are determined by regular test welds at various settings.

Many factors will affect the welding equipment settings, including overcast skies and lower temperatures.

This will generally require a slower speed that will provide the additional heat energy to compensate for heat-draining conditions.

It is highly recommended that test welds should be conducted:

- Each morning
- After any extended break
- After significant change in weather, etc.

Self-adhesive membranes should only be used in temperatures above 10°C, with optimal application temperatures being +15°C.

General Advice:
Products & Materials: Colder weather, presents special concerns to many roofing products and materials. Consider all products being used and evaluate which may be affected when working in colder conditions, such as primers, adhesives, sealants, liquid coatings, thermal insulation, reinforced bitumen, synthetic and self-adhesive membrane products. All of these are likely to have minimum allowable temperatures in which they can be utilised.

Assess the temperature: Before starting the defrosting process, it's important to ensure that the temperature is suitable for defrosting. Bitumen and synthetic roofing membranes typically require a temperature above freezing for proper defrosting.

Evaluate the situation: Before starting the de-icing process, assess the severity of the ice build-up on the roofing membranes. Determine if it's a minor ice accumulation or a more significant issue that requires professional assistance. All necessary Method Statements and Risk Assessments must be carried out and where additional risks are identified, appropriate procedures must be strictly observed when carrying out any roofing works, to mitigate the risk.

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Storage of Materials & Temperature Considerations:
Primers, adhesives, bitumen and synthetic membranes should all be stored on site, in containers or tents to prevent the product core temperature dropping below 5°C. In some cases, a frost protection heater may be needed to hold temperatures up within the storage unit. At the beginning of each working day and periodically during each day, move membrane to the roof so that it does not become cold while awaiting installation. Do not leave membrane on the roof overnight.

Any membrane which is inadvertently left on the roof surface overnight should be moved to the storage container for 24 hours before being installed.

Thermal Insulation may be stored up on the roof in sub-zero temperatures. The package wrapping should not be removed until it is ready for installation. Where snow or rainfall are forecast, the insulation bundles should be over-covered with a tarpaulin or similar.

Application Advice:
Surface preparation: There are higher instances of moisture, such as condensation or frost, occurring on surfaces in colder winter months. Substrates need to be prepared appropriately, ensuring they are clean, dry and free from any contamination before work can commence.

Primers should be applied at 5°C and rising to achieve optimal adhesion.

Installing liquid systems below 5°C, or at or below the dew point, will impair the adhesion of the product to the support structure and could result in problems arising in the future.

The support structure must be at least 5°C and rising during installation. It is best practice to calculate the exact dew point at the time of installation, and installation should only proceed when the air temperature is at least 3°C above the dew point.

Installation during high humidity conditions should also be avoided and must not be completed whenever moisture is present on the surface of the support structure.

Application tests should always be completed on a project specific basis and prior to installation to establish adhesion quality, accurate coverage rates and cure times.

Drying of surfaces: Wherever possible, allow surfaces to dry naturally. If necessary, a mop or squeegee may be used to remove water droplets or snow. In some circumstances, a leaf blower may assist in clearing and drying surfaces, where it is safe to do so.

Gas torches or other heat generating appliances may be used to dry some surfaces as appropriate, however doing so can cause overheating of the substrate, or any surrounding materials leading to a heightened risk of fire occurring. Do not allow the flame to come into contact with flammable materials and follow all relevant hot work guidance (Safe2Torch).

Waterproofing membranes and insulation board facers may be damaged if subjected to excessive heating.

Laying a tarp or equivalent temporary waterproofing sheet on the area you intend to work on the following day saves a lot of time and energy as the ice or water forms on top of the tarp and you can remove it prior to commencing works. As the temporary waterproofing sheets tend to be lightweight, ballast should be used to keep it in place.

Snow & Ice:
Remove any snow or ice: Use a snow brush or a plastic shovel to carefully remove any snow or ice from the surface of the roofing membrane. Take caution not to damage the membrane during this step.

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Apply heat: One way to defrost some surfaces, where applicable, is by applying heat. You can use an appropriate heat source such as a heat gun. However, be extremely cautious while using intense heat sources to prevent any material damage or accidents. Keep the heat source moving to ensure even heating and avoid overheating the materials. Also see above 'Drying of Surfaces'.

Such work must be undertaken by trained and qualified professionals only, no claim will be considered from Moy Materials for damage to the membrane from overheating due to improper use.

Apply ice melt products: Ice melting products can be used to help melt the ice on bitumen and synthetic roofing membranes. Only choose a product that is safe for use on the specific type of membrane and strictly follow the manufacturer's instructions. Spread the ice melt evenly over the affected areas, avoiding excessive application that could potentially damage the membrane.

De-icing agents: Typical industrial de-icing salts such as calcium chloride (table salts) will not cause any deterioration to the waterproofing and is regarded as safe to use on Moy Materials products. Avoid the use of rock salt as this could damage the membrane.

Avoid use of organic chemicals such as Glycols as these may cause harm to the membranes.

The run-off water may cause some staining to the roof depending on contact time and concentration and the run-off water may be harmful to steel rainwater pipes.

Specific advice should be sought from the suppliers of any de-icing products with respect to potential harm to humans, the environment and the roof system.

Any de-icing products should be fully removed from the roof before applying further adhesives, primers or membranes over the area.

Gentle removal: Once the ice begins to melt, use a soft broom or a plastic shovel to gently remove the slush or remaining ice from the roofing membranes. Take care not to apply excessive force or use sharp objects that could puncture or damage the membrane.

Future freezing: To prevent future freezing, ensure proper drainage on the roof to prevent water from accumulating and freezing. Additionally, consider using de-icing systems.

Please note that the specific instructions may vary depending on the type and of roofing membrane. It's always important to consult the product documentation or seek professional advice when in doubt.

Damage:
Inspect for damage: After thawing the membrane, carefully examine it for any signs of damage or cracks caused by the freezing temperatures. If damage is detected, it's recommended to contact a professional roofer, preferably the original installer, for repairs to avoid any issues with existing warranties that may be in place.

Tools & Equipment:
Avoid sharp objects or abrasive materials: During the defrosting process, avoid using sharp objects or abrasive materials that may puncture or damage the roofing membrane. This includes ice picks, metal scrapers, or hard-bristled brushes.

Snow blowers and shovels: Care must be taken to avoid setting the level of the scraper blades and auger as they must not be allowed to come into contact the roof surface. Where snow shovels are used the operative must avoid impinging the roof surface while working.

Builders spades and shovels should not be used to remove snow. Avoid making piles of snow, which may overload the roof deck. Ensure roof drains are kept clear.

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Gas Equipment: Gas bottles will freeze over quicker in lower temperatures and the gas pressure will be reduced by this. It is good practice to keep changing gas bottles during use when they begin to freeze over. This will ensure the gas torch has optimum pressure resulting in the ability to be more productive and a more even and consistent heating of the bitumen.

Applying Pressure: For adhered membranes, water filled rollers should be used to ensure an even pressure is applied across the full roll to maximise adhesion. Minimum weight of approx. 50kgs.

For bitumen, roll bars should be used to ensure even pressure is applied across the full roll to maximise adhesion and encourage good bead extrusion.

Heat Guns: For electrical heat guns, the temperature output should be increased as ambient temperatures decrease. Test welding of membranes should be carried out to ensure the heat gun is working effectively.

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