

WEATHER CONDITIONS AND MATERIAL STORAGE GUIDANCE

Introduction

The following guidelines outline recommendations that should be followed for the storage, installation and maintenance of IKO roofing systems.

A contractor should follow guidelines within HSG33 Health and Safety in Roof Work and anticipate adverse weather conditions and take suitable precautions. The Work at Height Regulations 2005 specifically requires that weather conditions be considered when planning any work at height. A roof should always be inspected before works start to see if the conditions have changed and to see if it is safe to work.

Generally works should be suspended in severe wintry and icy conditions.

Ambient temperature below 5°C and climatic conditions can impact on the installation characteristics of the components used within the roofing application. Factors such as temperature, humidity and wind also have an impact. For further guidance please refer to HSG33 Health and Safety in Roof Work and NFRC Technical bulletins.

Plan Carefully

Acceptable weather conditions are based not only on the actual ambient temperature, but also the total combination of nature's elements (e.g., wind, humidity, dew point temperature, sun, cloud cover, shade, snow, sleet, etc.). Careful planning of work during cold weather can greatly improve the quality of the installation. Laying out the roof area and placing materials where they will be needed prior to application will minimize problems associated with cold weather application.

Material storage

All materials must be adequately stored in accordance with the manufacturer's guidelines prior to their use. All materials must be protected against extreme weather conditions, including wind, rain as well as cold and hot weather conditions.

Materials should be:

(a) Overnight protection

During cold weather, the use of covers will assist with protecting materials from overnight snow, ice and frost. They will also reduce the effects of longer term frosts,

and permit an earlier resumption of work. Frozen materials should not be used.

(b) Inclement weather conditions

All materials should be protected prior to their installation to prevent damage from snow, ice, frost, damp or high temperature from direct sunlight.

Materials should be stored and kept in a dry warm place and protected using appropriate covers to prevent damage.

(c) Longer periods of inclement weather

If it is necessary to continue building during longer periods of inclement weather, it is imperative that materials should not be stored on a roof without suitable protection from the elements.

Consideration to storage units and heaters may reduce the potential for materials to become frozen and prevent frost damage.

Inclement weather

The guidelines highlighted below are not absolute and IKO should be contacted by the installing roofing contractor for any specific requirement or recommendation. For further guidance, datasheets and Health safety datasheets relating to each component these may be obtained from www.ikogroup.co.uk

Work should be planned in advance and take into account of site and climatic conditions either by:

- Stop working
- Take adequate precautions

Where air temperature is below, or is likely to fall below 5°C, work should not proceed unless precautions detailed in this guidance are adopted.

A thermometer should be sited in the shade and used to indicate if temperatures are rising.



Adverse weather conditions need to be anticipated and adequate precautions planned.

A roof should always be inspected prior to accessing and any works commencing to determine whether conditions have changed and to enable safe working. When deciding whether to continue or suspend work consideration should be given to:

- **Weather forecast and wind speeds**

Plan ahead and take account of weather forecasting services, by either stopping work or taking adequate precautions. The use of weather forecasting APPs specific for the location is readily available on most mobile devices.

- **Wind chill**

The Meteorological Office can advise on the wind chill factor. Strong winds can reduce the temperature more quickly than still conditions. Work is more likely to be affected by frost in windy freezing conditions.

- **The type of work being undertaken.**

Whether it is hot works or cold applied roofing products, each roofing build up component will need to be considered in terms of its handling and storage.

- **The location and height of the roof** in respect of any material being handled and storage requirements.

Do not work on roofs in icy, wet or windy conditions. Avoid excessive exposure to sunlight by wearing the appropriate clothing, sun creams and sun glasses to avoid excessive reflective glare.

Operatives

Although British Winters aren't famous for heavy snow, inclement weather is still likely, from heavy frosts to cold winds which can introduce a whole range of new and additional risks into an already high-risk environment. It is essential that these risks be dealt with, and clients and principal contractors must take positive action to keep people on site safe during spells of cold weather.

There is no minimum temperature stipulated for outdoor working but the Management of Health and Safety at Work Regulations require employers to assess the risk to health and safety of their employees arising out of their work activity. Employers should carry out thermal risk assessments for all outdoor activities and workers are particularly at risk from cold when:

- The ambient temperature is below 10°C.
- When the air temperature is 10°C, and the wind speed is 20 miles per hour, the effective temperature, so far as the body is concerned, drops to 0°C.
- A temperature of about -1°C drops to about -9°C with a wind speed of 10 miles per hour.

Additional hazards caused by winter weather conditions include:

- Workers with cardiovascular problems, respiratory diseases or on certain medication need to be especially careful in cold temperatures.
- Nose and ears, fingers and toes are most likely to be affected by the cold, with the first symptoms often manifested as chilblains (itchy swellings on the skin).
- Employees may suffer from more colds, attacks of bronchitis and asthma, or painful, stiff joints and fatigue as they use more energy in an attempt to keep warm.
- Cold workers are also more likely to develop hand-arm vibration syndrome when using pneumatic or vibrating tools.
- There is evidence that cold weather conditions can affect manual handling operations.

Workers should be aware of the potential for unexpected hazards due to the weather conditions, for example, layers of ice can form as the environmental temperature drops, making surfaces even more slippery and the likelihood of slips, trips and falls increases in winter.



Follow Good Housekeeping Practices

“Good housekeeping” is always an important safety factor and is an especially critical factor in the winter. Applicators wearing heavy clothes and bulky jackets are less nimble and agile, and their clothes can be easily snagged by ladders and equipment. Be sure crews are alerted to the dangers presented by snow, ice, and wind.

Debris may become hidden by snow if daily cleanups are neglected. Falls caused by these hidden objects may result in serious injuries. Additionally, it may be necessary for crews to return to the job site after the winter season to clean up what would already have been removed had proper housekeeping procedures been followed.

- Ensure materials and substrates are dry and at the temperature and conditions recommended by the manufacturer during the application of built-up roofing.
- Do not overload the roof deck with roofing materials as this could cause snow accumulation, water ponding, and deck fatigue or failure.
- Finish roof sections daily, and apply proper watertight day/night joints
- Maintain “good housekeeping” on roof deck at all times.
- If proper point of application temperatures cannot be maintained, the roofing system should be sealed and roofing system application should be shut down until weather conditions improve.

Storage of roofing membranes:

Application of any type of bituminous roofing system in cold weather can be achieved successfully if precautions are taken.

When roof systems are installed in outdoor temperatures below 50°F, the installer can expect difficulties including but not limited to:

- a) Maintaining the proper bitumen temperature at the point of application,
- b) Slower cure time of cold-applied adhesives,
- c) Increased stiffness of roofing materials that become less flexible in cold weather temperatures.

With most reinforced bitumen membranes it is paramount that storage of the material is key to providing ease of installation.

Some membranes such as self-adhesive are more susceptible to the cold and heat, so their storage is a critical part that would assist in the ease of installation.

SBS modified Torch applied and self-adhesive membranes should not be installed where the temperatures exceed 26°C, this makes them very difficult to install and makes them more susceptible to foot marking.

Installation

Membranes should be unrolled and allow them to relax, prior to their installation. Some membranes may be more prone to shrinkage than others due to any temperature changes throughout the installation process.

Regardless of the season or the type of roofing system, it is very important that all materials are delivered dry and stored in a manner that assures they remain dry. It is recommended that, whenever possible, roofing materials are delivered to the job site just prior to their installation.

- Keep all materials dry.
- When materials are stored outside, they should be placed on platforms that are raised off the ground or roof deck, and they should be covered with breathable water-resistant coverings (such as canvas or tarpaulin) that are properly secured.
- All roll materials should be stored on end. Rolls with a selvage edge should be stored with the selvage edge facing up to prevent damage. Single stacking of roll materials is recommended.
- Caution should be taken when loading and storing materials on the roof. Overloading the deck can cause deflection, ponding, and even roof collapse.

Stockpiles of materials can also allow for excessive snow build-up, including snowdrifts, adding to the load on the deck.

- Roofing membranes should always be protected from the weather. Moisture, dirt, snow, and ice must be removed from roofing membrane before it is heated.
- Do not store in direct sunlight where temperature are in excess of 25°C
- Store materials in a heated container at room temperature.
- Store rolls in areas heated to at least 10°C for a minimum 24 hours prior to their application.
- Allow the sun to warm the substrate prior to application of the membrane.
- Consideration should be undertaken on product temperature, air temperature and substrate temperature as all may influence the ease of use of the membrane.
- Never throw or drop rolls of material.



Liquids and compounds: (including Primers, adhesives and mastics)



Liquids and adhesives should be kept in a lockable container.

The PU adhesives can be temporarily placed in warm water filled container being kept at a moderate temperature (15°C) and monitored, ensuring the water does not become overheated. A suitable risk assessment should be undertaken when undertaking such an operation.

Substrates and surfaces should be dry prior to the application of any waterproofing component.

Other component product requirements

As with many roofing products, they may be required to be used with other ancillary components that are also subject to adequate storage in cold weather conditions, such items as:

- Gas bottles
- Reinforcing membranes
- Catalyst and activators
- Fillers and mastics
- Adhesive tapes

With liquid applied products that also use compounds that are added to the liquid resin and reinforcing fleece membranes, it is critical that these components are kept dry during the storage and installation process.



- Store all waterproofing materials in a dry well ventilated area, remove materials only when need for daily work.
- Do not overload the roof structure; avoid stockpiling of material on the roof without obtaining permission to do so.
- Store and use adhesives, sealers, primers, and coatings at the temperature and conditions recommended by the manufacturer; make sure products are stored with tight-fitting lids to prevent drying out, moisture intrusion, or other contamination.
- Store water-based products at an appropriate temperature to prevent freezing.
 - Generally adhesives should not be applied if the temperature is below 5°C.
 - Storage temperature should be around +15°C with application temperatures between +5°C and 25°C. However application temperatures of each product must be referred to their relevant technical datasheet.
 - Storage of such adhesives is critical when the weather conditions reach below this temperature.
 - Storage of the adhesives on the roof overnight should be avoided.
 - Colder temperatures will affect the application rates and coverage of the adhesive, monitor coverage rates during the application.
 - Some liquids and compounds may be highly flammable and should be stored away from sources of ignition in original sealed containers at a temperature between 5°C and 30°C.
 - Do not use a torch or open flame to warm containers of adhesives or coatings.

Insulation

Flat Roof insulation materials should be handled with care and stored in accordance with the manufacturer's instructions.

Roof insulation must be installed sound and dry; therefore storage of insulation is highly critical as storage without adequate protection against the elements can result in moisture being incorporated into the roofing system. Eventually, this could lead to roof defects and/or roof failures.

Insulation board are supplied protected by a plastic stretch wrap. This factory packaging is intended for handling during manufacturing and during transit. It must not be relied upon as site protection from the elements. IKO recommend slitting the wrapping on site prior to application to expel any moisture or condensation that may accumulate during transit and storage on the site.

The insulation must be protected by a waterproof, breathable covering such as a tarpaulin and raised off the ground during onsite storage.



The board should be stored off the ground, ideally on a pallet and cover during non-operational times and protected from the elements.



Note: Board supported off the ground. Tarpaulin should provide coverage to all side of the insulation.

Handling

All surfaces to which the roof membrane is to be applied must be dry, firm, smooth, and free of dirt and loose material.

Some insulations and specifically foil faced insulation may reflect light as well as heat, including UV.

Therefore where these products are being used on bright sunny days, it would be advisable to wear protective sun glasses and to protect the bare skin with sun block.

The surface of some foil faced insulation could become slippery under foot

Do not stand on or load an unsupported insulation board, as it is unlikely it would support heavy loads. They should be stored on a fully supported base.

Some insulation materials are extremely light and must be weighted and/or secured to avoid damage initiated by the wind.

Take care during handling and application to prevent breaking, crushing or damage of the edges and surface. Wet, bowed or damaged boards must not be used

Enertherm PIR insulation board must not come into contact with a naked flame or any source of ignition.



Poor storage: sitting in standing water and insufficient cover by a tarpaulin.

Substrate preparation

For all types of substrates it is paramount that the substrate is dry, sound and suitable for the waterproofing being applied. It is the installing contractor's responsibility to undertake adequate checks to ensure the substrate suitable.

For this they should undertake the following prior to apply any waterproofing components.

- Adhesion test
- Moisture testing

For further guidance on this, please refer to the IKO adhesion and moisture testing briefing document.



Protection of substrate

Where a temporary roof has not been providing considerations on how to protect the building from water ingress during inclement weather



Temporary roofs:

Consideration of the provision of a temporary roof may provide protection from snow, wind and rain.

The installing contractor must make themselves aware of weather forecast during the installation process and allow for any inclement weather that may inhibit the installation process.

- Night time drop in temperature
- Inclement weather forecast
- Protection during non-working hours
- Tarpaulin will help reduce the amount of time to dry a roof the following day after a heavy frost or downpour

Drying up

Wherever possible any newly installed roof deck should be protected, and covered from weather to ensure drying out is not necessary. However, in the event of a roof becoming wet it is important to ensure drying out is undertaken safely.

There are several methods of drying a roof that can be employed by the installing roofing contractor, but the most common method due to speed and effectiveness is still by the use of a gas torch. When a gas torch is to be used for drying a roof a thorough inspection of the roof and all fire risks identified.

Where these risks are identified, the operative must adopt a torch free area in line with the contractor's public liability insurance. However it is recommended that this should be no less than 900mm.

Methods of drying out within restricted areas will vary from wiping with dry rags, mops etc. and then allowing natural weather conditions to finish the drying.

Further guidance is available LRWA guidance document No 13

Drying a roof where naked flame is prohibited

Drying a roof off is probably the most debated topic for all roofing disciplines, as the most effective way has always been seen as being using a gas torch. However as a result of the safe2Torch guidelines and more specifiers specifying flame free applications the use of a gas torch is becoming more prohibitive.

The Etorch manufactured by Imperial Thermal Engineering allow a method of drying up a roof without the need for naked flames. It also allows a method of installing IKO Ultra S-A, H-A and T-F membranes at lower temperatures.



The powerful electric torch is designed to perform like a traditional gas torch. It can deliver heated dry air at speed with temperatures up to 650°C.

It's cheaper to run than a gas torch, no requirement to store gas bottles on site, no naked flames involved.

However it does require a 3 phase power supply. It is clean and environmentally friendly to use. A gas torch will typically use 75Kw of energy and the Etorch only 22Kw; there are no noxious emissions such as CO₂ and CO. Consideration of the contractor would be the benefit of potential reduced insurance cover where the use of gas may have been restrictive.

The new Etorch design includes a full carbon fibre body, carbon fibre blade, rust and kink free umbilical cord, 3x 240v plug sockets and our new patented innovative vein axial fan. With no backpack. Reduced the weight significantly to 4.5kg. Comfort, flexibility and agility are key features.



Designed, engineered and built in the UK, the Etorch MKII is an electrically powered, computer controlled, high speed torch. Using a 415v, 3-phase 32amp supply with a simple 'plug and play' logic system, the equipment heats the air quickly and efficiently to the desired temperature. The control software maintains the pre-determined temperature throughout the operation duration using mirroring thermocouple censoring. The control systems ensure the equipment operates at the selected temperature and with no naked flame the risk of fire is reduced to a minimum. The burn risk to operatives is also reduced significantly with the equipment shrouded to provide cool surfaces. Works on or adjacent to existing buildings are also made safer as the torch emits hot air and not a naked flame. The hot air is focused onto the work face using a unique set of adjustable nozzles which can rotate around the central axis of the torch body allowing the correct position to be achieved with minimal movement by the operative.

The Etorch is a complete unit comprising a torch, nozzle attachments, control panel and cable, all mounted on an easy to move trolley. Safety is a paramount factor. Current sensing detects any grounding issues which lock out the machine in milliseconds protecting the operative from the risk of shock.

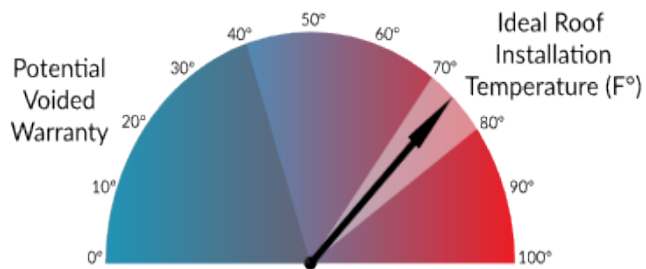


Etorch mark 11

Waterproofing coverings application:

Each waterproofing component will behave differently under cold weather conditions or where the air temperature is high, it is paramount that the installing contractor is aware of weather characteristics of each waterproofing component to ensure the application requirements are met and that waterproofing integrity is ensured at all times.

Only operatives familiar with and competent with the installation process required should be allowed to install the waterproofing component.



Application:

- Read and following the guidance provided on the product technical datasheet.
- Refer to IKO guidance document on the installation of self-adhesive membranes
- Refer to any specific condition within any issued IKO specification document.
- Ensure any waterproofing membranes are warm enough for satisfactory laying.
- Unroll the membrane and allow to relax and lay flat prior to their installation.
- Make regular visual checks to ensure the waterproofing is lying satisfactorily without evidence of blistering, cracking, ridging. Stop work if these effects are being observed.
- Do not overheat any bitumen compounds to compensate for the lower ambient temperature.

Protection of the waterproofing:

- Upon completion of the waterproofing, each element should be protected against mechanical damage.
- Allowance should be made to provide adequate protection of the waterproofing from follow on trades.
- Consideration should be given to the provision of designated walkways, using slip resistant materials.
- Prevent access to areas where liquid applied waterproofing has been applied during the curing process.

De-icers and agents:

The use of de-icers and rock salts on roof should be avoided; should such products be used, this may result in contamination of the surfaces that must be removed completely without leaving any residue prior to installing any subsequent layers of the waterproofing.

Guidance

The installing roofing contractor should seek the advice of IKO Technical Department before applying any products or materials onto the surface of IKO waterproofing systems.



The guidelines highlighted below are not absolute and IKO should be contacted by the installing roofing contractor for any specific requirement or recommendation. For further guidance, datasheets and Health safety datasheets relating to each component these may be obtained from www.ikogroup.co.uk

The above recommendations are general guidelines only. The quality of the application should be the determining factor in whether roofing in cold or hot weather should be continued by the roofing contractor.

Disclaimer

Whilst every precaution is taken to ensure that the information given in this literature is correct and up to date it is not intended to form part of any contract or give rise to any collateral liability, which is hereby specifically excluded.

IKO reserve the right to amend and/or withdraw this document without notice.

Users of published guidance for the installation of IKO materials should therefore verify with the company whether any changes in our specification, application details, withdrawals or otherwise have taken place since this literature was issued.