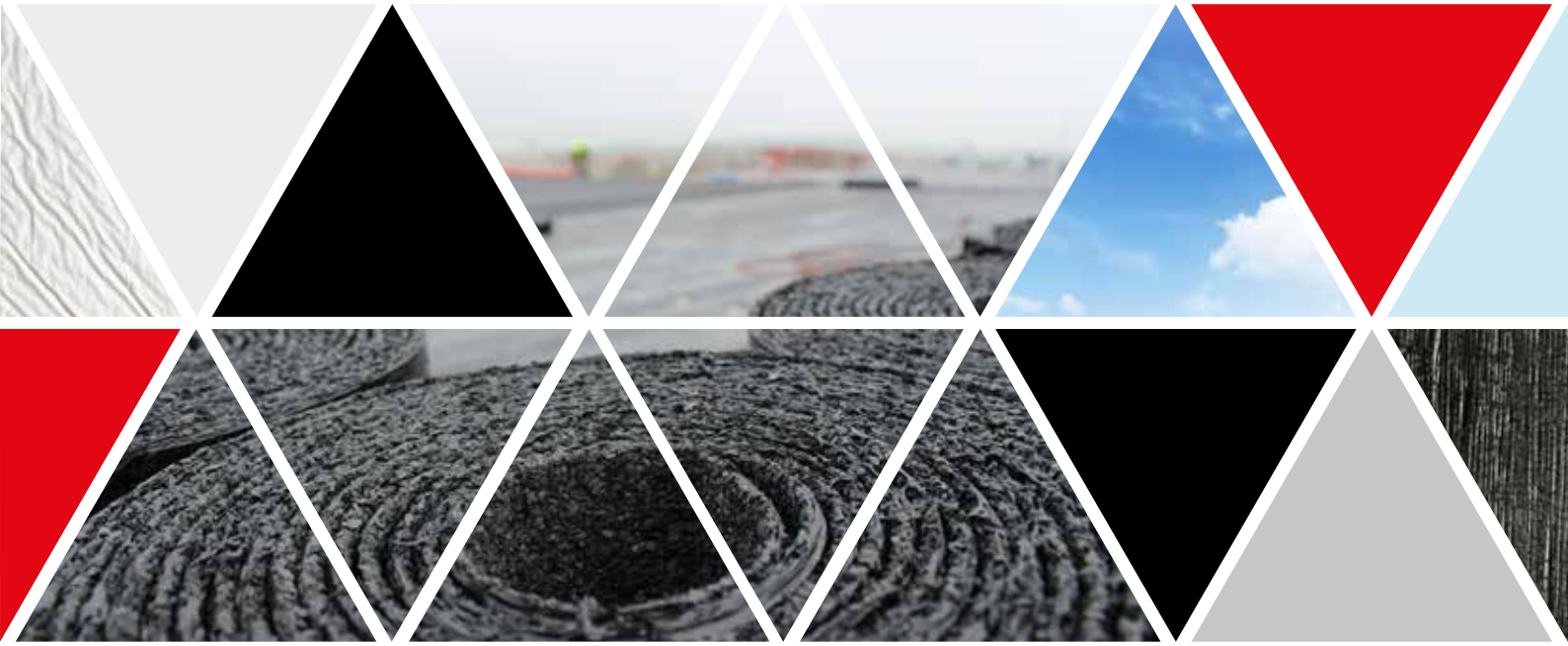
IKO GUIDE

# AVOID MOISTURE PROBLEMS WITH A VAPOR BARRIER

Installing a vapour barrier in the structure of your flat roof… is that really necessary? It most definitely is! The main purpose of the vapour barrier is to protect the insulation against penetration of humidity, thus preventing moisture spots, leaks, fungi and damage inside the roof structure.



# THE VAPOUR BARRIER

A damp-proof layer is applied in a roof structure on the warm side of the thermal insulation.

### Importance of the vapour barrier:

**The vapour barrier:**

- Makes the roof airtight
- Prevents water vapour to get into the thermal insulation
- Protects the (thermal) performance of the insulation
- Can function as a temporary waterproof layer

## Choice of vapour barrier

### 1 - Buildings with low or high moisture production

Technical Information Notes distinguishe four indoor climate classes and, based on those, four related types of vapour barriers can be defined.

| Indoor Climate Class | Description | Examples |
|---|---|---|
| I | Buildings with little or no permanent moisture production | - showroom<br>- storage depot for dry goods |
| II | Buildings with limited moisture production and good ventilation | - sports hall<br>- large houses<br>- shop |
| III | Buildings with substantial moisture production and moderate to sufficient ventilation | - buildings with RH < 60%<br>- small houses<br>- restaurant<br>- hospital<br>- buildings with little air conditioning |
| IV | Buildings with high moisture production | - buildings with RH > 60%<br>- swimming pools<br>- humid production and storage halls: laundry, brewery |

*RH: relative humidity - Source: TIN 215 Table 12

**In reality, however, the choice is easier. Indeed, good workmanship dictates that:**

- In order to provide maximum protection to your insulation against internal condensation, you need to 'wrap' it between two waterproof bituminous layers: The vapour barrier and the underlay must be attached to each other in a perfect and vapour tight manner (see execution details below).
- For a vapour barrier to be able to work properly, it should be possible to waterproof both the longitudinal and transverse overlaps.
- In the case of welded systems, the wind resistance of the entire roof structure is partly determined by the adhesion of the vapour barrier to the substrate. To take risks here is irresponsible. Therefore, when using bonded or torch-on systems, be sure to always have a vapour barrier which easily adheres to the substrate.

If you take this advice to heart, it will be easier to make your choice between a) a 3 mm reinforced bituminous roofing membranes for climate classes I through III or b) a vapour barriers with an aluminium coating as covering or inlay, suitable for climate class IV.

## 2 - ALU-enhanced vapour barriers or not?

**This choice, too, calls for some comments.**
**By consistently opting for an ALU vapour barrier, you proof-future yourself. Indeed:**

- As well as classifying the building according to a specific type, you also need to take account of the activities that will take place in the building. For example, the storage of temporarily humid goods (e.g. wet pallet boards) by itself will influence the climate class.
- You also need to make sure that the vapour barrier will not limit the building's use in the future. Indeed, buildings have different uses during their service life. Warehouses become trendy restaurants; sheds are turned into modern flats.
- Within the IKO range you can choose from five ALU-coated vapour barriers

| Self-Adhesive Vapour Barriers (E4) | |
|---|---|
| IKO shield ALU/SA | Low fire load, economical solution for industrial roofs |
| IKO shield PLUS ALU/SA | User-friendly solution for application on steel deck and timber cladding |
| IKO shield PRO ALU/SA | Robust and powerful all-round solution for heavy-duty application |

| Vapour Barriers for Torch-On Application (E4) | |
|---|---|
| IKO shield ALU3 T/F | User-friendly. Suitable for temporary waterproofing. |
| IKO shield ALU4 T/F | Heavy duty. Suitable for temporary waterproofing. |

## 3 - Polyester or glass fleece?

However, if you do opt for a vapour barrier without aluminium, when it comes to rough substrates or interrupted supports, be sure to always choose a vapour barrier that is fit for walking on.
IKO vapour barriers that are self-adhesive or have a polyester reinforcement are fit to walk on.

## 4 - Finally: Does the method of application ultimately determine the type of vapour barrier?

We provide a summary in the table below:

| Indoor Climate Class | Support | Recommended Method of application | IKO Vapour Barrier |
|---|---|---|---|
| I, II, III (E3) | Concrete | Torch | IKO base V3 - IKO base Turbo |
| | | Mechanical | IKO base P3 |
| | | Loose-laid and ballasted | IKO base V3 |
| | Steel | Self-adhesive | IKO base Stick T/SA |
| | | Mechanical | IKO base P3 |
| | | Loose-laid and ballasted | IKO base P3 |
| | Wood | Self-adhesive | IKO base Stick T/SA |
| | | Mechanical | IKO base P3 |
| | | Loose-laid and ballasted | IKO base V3 |

| Indoor Climate Class | Support | Recommended Method of application | IKO dampscherm |
|---|---|---|---|
| IV (E4) | Concrete | Torch | IKO shield ALU3 T/F - IKO shield ALU4 T/F |
| | | Loose-laid and ballasted | IKO shield ALU3 T/F - IKO shield ALU4 T/F |
| | Steel | Self-adhesive | IKO shield ALU/SA - IKO shield PLUS ALU/SA<br>IKO shield PRO ALU/SA |
| | | Loose-laid and ballasted | IKO shield ALU3 T/F - IKO shield ALU4 T/F |
| | Wood | Self-adhesive | IKO shield ALU/SA - IKO shield PLUS ALU/SA<br>IKO shield PRO ALU/SA |
| | | Loose-laid and ballasted | IKO shield ALU3 T/F - IKO shield ALU4 T/F |

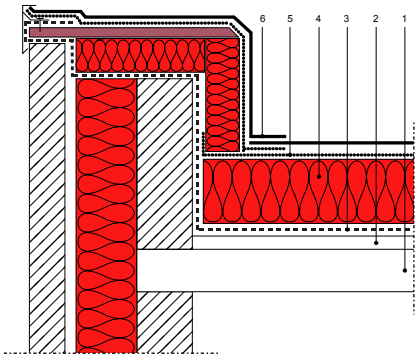
# Design

### Points of attention

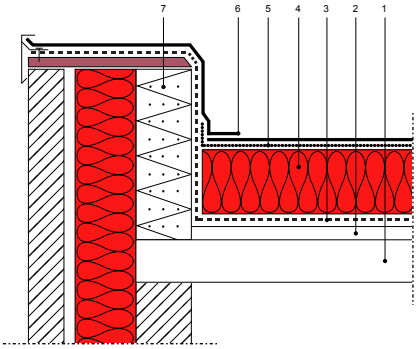
- In case of renovation, the existing bituminous waterproofing can serve as a vapour barrier.
- In the case of indoor climate class IV, the vapour barrier (with ALU inlay) must not be perforated and, therefore, mechanical fastening is not possible.
- When using aluminium-coated insulation boards, a vapour barrier must be fitted too.
  An ALU coating on an insulation board does NOT replace a vapour barrier.

# Execution

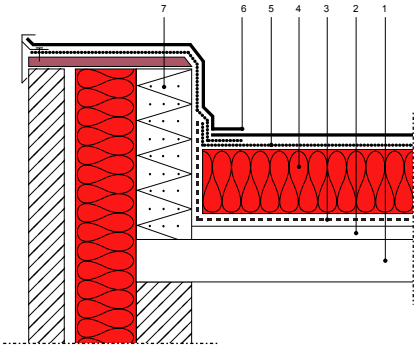
### Execution details




*Detail view of connection of vapour barrier with temporary waterproofing function in case of upstand with insulation.*




*Detail view of connection of vapour barrier with temporary waterproofing function in case of insulating masonry.*



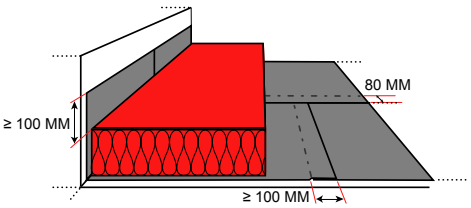

*Detail view of connection of vapour barrier with insulated masonry without temporary waterproofing function.*

***Drawings' legend***

*1. Supporting structure*
*2. Sloped layer*
*3. Vapour barrier*
*4. Insulation*
*5. Underlay*
*6. Top layer*
*7. Insulating masonry*
*8. Downpipe cover*

## Connection and Orientatione

| | | |
|---|---|---|
| Transversal overlap | ≥ | 10 cm |
| Longitudinal overlap | = | 8 cm |
| Height of vapour barrier | ≥ | 10 cm above the insulation layerg |




*Connection of vapour barrier*

## Points of Attention

- In case of renovation, an inspection and, if necessary, a repair of the waterproofing are necessary.
- Damage to the vapour barrier has to be repaired.
- Apply loose strips of vapour barrier to OSB, Multiplex, Betonplex, TT beams and hollow core slabs.
- If the vapour barrier is used as temporary waterproofing, the downpipe covers must be temporarily connected at the vapour barrier. During the further finishing of the roof, the downpipe covers will be removed and the vapour barrier repaired.
- As for self-adhesive vapour barriers, they must be stored at a minimum of 10°C for a minimum of 24 hours prior to placement.
- The substrate must be sufficiently dry before the vapour barrier is installed.
- In the case of a torch-on or bonded vapour barrier, the substrate must be fitted with a primer, except if it is applied to a painted steel deck. Be sure to read the IKO guide "Preparation of the roof and the use of a primer".

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**This Guide is a document in the IKO Guides series.**
With these documents IKO aims to highlight the various technical aspects of flat roofs that are important to Architects and Roofers.

We draw on both our expertise and manufacturing experience in relation to bituminous waterproofing, insulation and liquid waterproofing to produce this series of guides, and we are pleased to have this opportunity to share our flat roof knowledge with you. Above all, they seek to defend a pragmatic quality philosophy with attention to detail which will benefit clients and roof professionals alike.

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