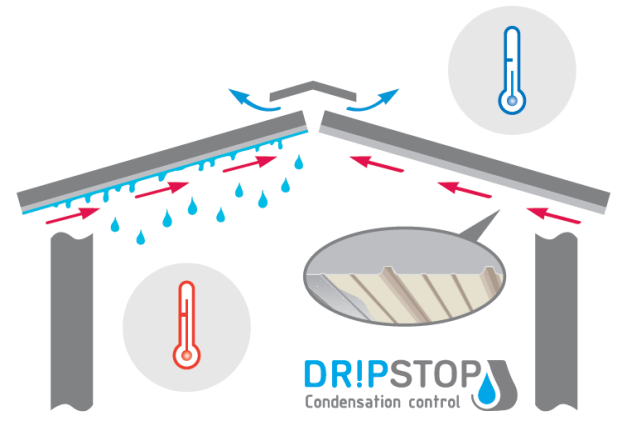
DR!PSTOP Condensation control

DR!PSTOP is a special membrane that solves condensation problem inside buildings with uninsulated roof. When the condensation process starts, water drops start to form on the underside of the roof. DR!PSTOP absorbs around 1.000 g/m^2 of water which is stored in tiny places in the membrane. When it becomes warmer, water starts to evaporate back to air and DR!PSTOP membrane gets dry again.

CONDENSATION ON METAL ROOF PANELS

When outside temperature falls below the temperature inside a room, non-insulated metal roof panels become colder then the inside a room temperature. When warm air inside the room gets in contact with the cold roof panel, it suddenly cools down which immediately increases the relative humidity of the air. When it reaches the dew point, condensation occurs. Now at this point the question is, if DR!PSTOP is applied to the roof or not. If yes, then the condensate will be absorbed in the membrane and if no, drops of water would start to fall from the roof (see the right part of the figure below).



CONDENSATION CAN...

- couse damage to stored goods and materials
- worsen insulation capabilities
- disturbes activities inside the building
- damage the roof (frost, accelerates rusting)

HOW DOES DR!PSTOP WORK?

DR!PSTOP is made of a large number of interlaced PES fibres among which there is enough space to store water drops. DR!PSTOP serves as a medium for absorbing condensed water drops which evaporate back into the air when the temperature rises. For this process it is important, that there is some air circulation (ventilation) present.

ABOUT CONDENSATION

Condensation is the change in matter of a substance to a denser phase, such as a gas (or vapor) to a liquid. Condensation commonly occurs when a vapor is cooled to a liquid, but can also occur if a vapor is compressed (i.e., pressure on it increased) into a liquid, or undergoes a combination of cooling and compression. Liquid which has been condensed from a vapor is called condensate.

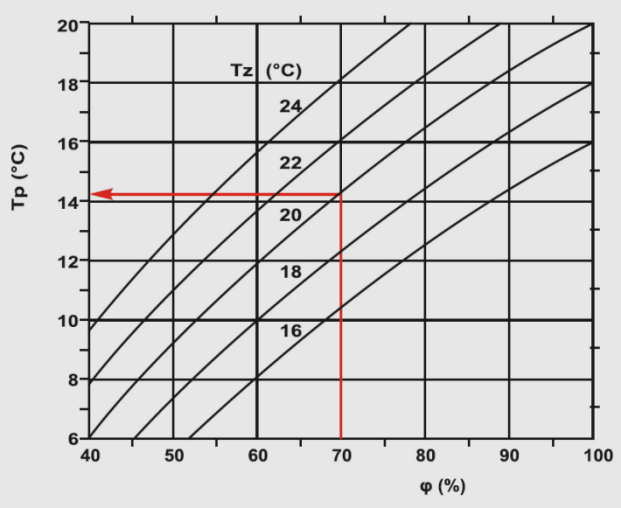
Water vapor from air which naturally condenses on cold surfaces into liquid water is called dew. Water vapor will only condense onto another surface when that surface is cooler than the temperature of the water vapor, or when the water vapor equilibrium in air, i. e. saturation humidity, has been exceeded. When water vapor condenses onto a surface, a net warming occurs on that surface.

Condensation is the most common form of dampness encountered in buildings. In buildings the internal air can have a high level of relative humidity due to the activity of the occupants (e.g. cooking, drying clothes, breathing etc.). When this air comes into contact with cold surfaces such as windows and cold walls it can condense, causing dampness.

Relative humidity is a ratio between the amount of water vapor present and the amount the air can hold at a given temperature. Because warm air is able to hold more water vapor than cold air before becoming saturated (100% relative humidity), the humidity will fall as the temperature increases unless the moisture content of the air is changed. Conversely, humidity will rise as the temperature falls.

If air coming in contact with a cold surface causes the air temperature to fall to the point where relative humidity becomes 100%, the water vapor in the air condenses (becomes liquid), resulting in morning dew, nighttime condensation inside the building etc.

The graph on the right shows that at the temperature of 20°C and relative humidity of 70%, the air holds the dew point temperature at 14.2°C.



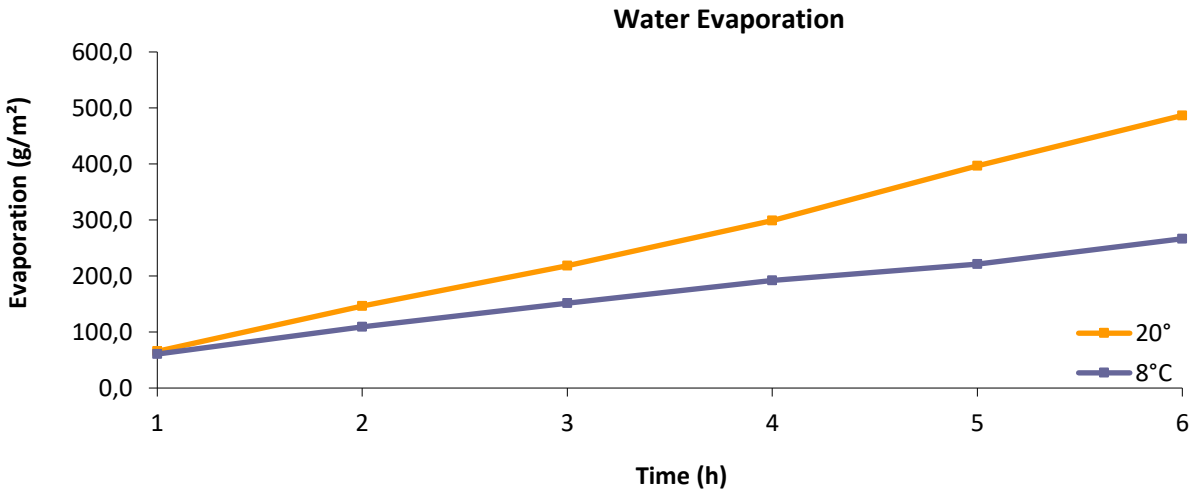
- **Tp** - dew point temperature in °C
- **Tz** - air temperature in °C
- **φ** - relative humidity of the air in terms of %

The basic function of DR!PSTOP is to absorb condensed water drops and letting the water evaporate back into the air, when the inside temperature rises. Its performance is different depending on the material grammature and roof inclination. See the following table for details:

Table: Water absorption in g/m² depending on roof angle and DR!PSTOP membrane grammature

DR!PSTOP / ANGLE	95g	110g
0 °	900	1000
45 °	700	800
90 °	500	600

Graph: Water evaporation depending on room temperature and time



PROFILING PROCESS

DR!PSTOP product is self-adhesive and before the profiling process the siliconised foil has to be removed from the membrane. Application device, situated after decoiler and immediately before the profiling line, servers to continuously apply the membrane to the metal sheet. It is important that the metal sheet is free of rust, dust and oil or silicon stains. The glue between the metal sheet and the membrane is very resistant and with time does not lose its strength.

DR!PSTOP - TECHNICAL DEMANDS

- Please take care when installing roof panels so that you do not damage the membrane.
- Roof and all its parts have to be made, constructed and mounted in accordance to applicable construction standards. In this context some ventilation has to be assured.
- If a building with completed roof is build on a concrete platform and the concrete is not dry yet, this represents additional source of humidity.
- If a roof of a building is beeing built in time when there is danger of frost, this leads to additional source of humidity when the building will be warmed up. This could cause dripping. To prevent this, it is necessary that before mounting roof panels are appropriately stored or that after mounting there is adequate ventilation.
- If it is possible, try to assure that temperature in the building does not reach 0°C. If frost is commonplace in your building it is important, how the place is beeing heated up. In this case faster heating helps to reduce possible dripping.

We can supply you also with narrow rolls of DR!PSTOP, which can be used to cover other parts of the roof structure or similar where condensation occurs, (e.g. thermal bridges, uninsulated pipes etc.).



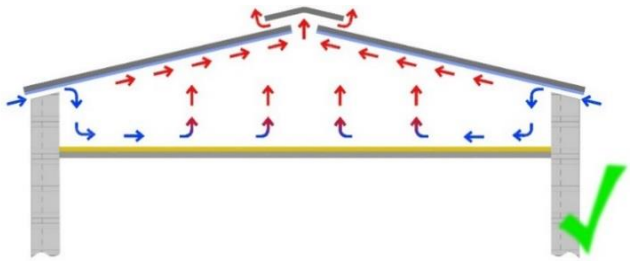
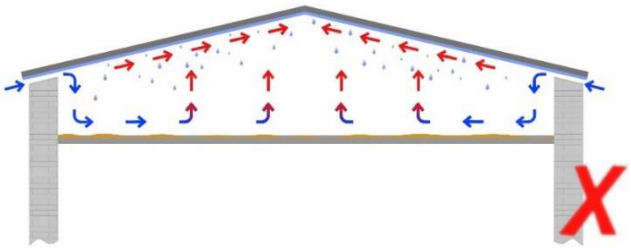
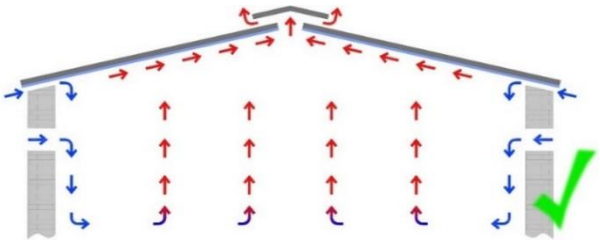
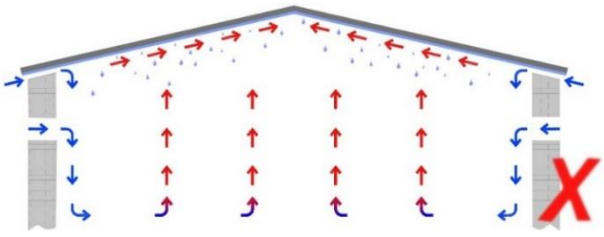
PRODUCT TECHNICAL HIGHLIGHTS

- Easy to apply
- Durability
- Combustibility A2 - s1; d0 (EN 13501-1)
- Bacteria resistant
- Additional sound insulation
- Rainfall noise reduction

VENTILATION

DR!PSTOP anti-condensation membrane control the condensation in an environment, where condensation is likely to occur. The membrane serves as an absorbing medium, preventing that drops of water would fall from the roof.
In spite of high water absorption capacity (for details check technical data sheet), DR!PSTOP can get saturated if it has no possibility to dry out. In order to work properly, the membrane needs to get dry during the day. For that reason adequate ventilation inside a building is necessary.

Please keep in mind that humid air is lighter then dry air, therefore it tends to go up. This has to be taken into account when planning the ventilation system of a building. The following situations clearly demonstrate the difference between adequate and inadequate ventilation inside a building.

SITUATION 1	SITUATION 2
Adequate ventilation in an insulated building with air inflow at the sides and air outflow through a roof ridge.	*Inadequate ventilation in an insulated building with air inflow at the sides, but no openings on the ridge, which gives humid air no possibility to escape. The result is dripping from the roof which damages the insulation layer.*
	
SITUATION 3	**SITUATION 4**
Adequate ventilation in an un-insulated building with air inflow at the sides and air outflow through a roof ridge.	*Inadequate ventilation in an un-insulated building with air inflow at the sides, but no openings on the ridge, which gives humid air no possibility to escape. The result is dripping from the roof which damages the insulation layer.*
	

Obligatory ventilation is described in national construction standards e.g. French construction standard NF P 34-205-1 or German directive IFBS. When planning roof ventilation also other factors should be considered, e.g. type of the building, location, climatic conditions, etc. Knowledge of good construction practice should be respected.

The information contained in this document is based to the best of our knowledge and many years of practical experience. It is believed to be correct as of the date issued. However, we cannot provide any guarantee that the information and recommendations published here are correct and complete. We accept no liability for damage or losses resulting directly or indirectly from utilization of the information and recommendations. Any reliance you place on such information is therefore strictly at your own risk. All information contained herein is subject to change without prior notice. The customers should obtain and verify the latest relevant information.