cid:image003.jpg@01D030AA.9208D3D0INSTRUCTION 2.

REQUIREMENTS CONCERNING VENTILATION GAPS OVER INITIAL COVERING MEMBRANES (ICM) MANUFACTURED BY MARMA POLSKIE FOLIE.

This instruction concerns most important rules of performing ventilation gaps over all types of initial covering membranes, referred to as “ICM” manufactured by Marma Polskie Folie.

1. **ICM** lets water vapour through in huge amounts which enables its installation directly onto thermal insulation. However, itsproper functioning consisting of letting vapour out of roof construction and thermal insulation demands ensuring constant reception of this vapour from the space over the membrane. Air flowing along the membrane’s surface is the natural carrier of the vapour intended to its constant removal from the roof. **That is why, the basic condition of proper functioning of all ICM is constant airflow over their surface.**
2. Still air is an obstacle for water vapour and because of that, if there is no airflow, penetration of water vapour through **ICM** from thermal insulation will be blocked. In consequence, the space over ICM will become supersaturated with water vapour and the partial pressure on both sides of ICM will be equalized. To ensure airflow along membrane, a ventilation gap with **inlet and outlet, permeable along the entire length** should be constructed under final roofing and over the membrane. Under roofing laid on battens, such gap is created by counter-battens fixed along the rafters (perpendicularly to the eaves). The dimensions of the gap should be set in roof project. If the project does not set those dimensions, Marma Polskie Folie Sp. z o.o. as the manufacturer of ICM advises their basic size in the tables below which have been prepared according to the norm DIN 4108 part 3 (from 1996) with minor modifications taking into consideration the specifics of Polish climate compatible with Guidelines of Polish Association of Roofers created according to the recommendations of IFD (International Federation For The Roofing Trade). In countries and regions with more stable weather conditions in roofs with lower slope, a lower gap can be made.

rys. 2 - 5.tifrys. 1 - 2.tif

Pic..2

Pic.1

# **Definitions and explanations**

This instruction specifies ventilation gap over **ICM** in different roofing systems depending on the kind of final covering. The rules for construction of such gaps are the same in roofs where:

a) **ICM** is laid on thermal insulation placed between beams of roof truss in usable attics - pic. 1 and 2;

b) **ICM** is laid on beams of roof truss in unused attics with thermal insulation laid on ceilings.

Scheme from picture no. 1 shows a nonventilated roof with ventilated covering. Whereas scheme from picture no. 2 shows a ventilated roof with nonventilated covering. In both cases **ICM** works in the same way and requires ventilation gap constructed according to the same rules over it. The rules presented in the table no. 1 and 2 are valid also when **ICM** are laid on sheathings having the function of sliding layer (Instruction no. 10) under metal coverings. In such roofs, ventilation gaps necessary under sheathing (pic. 3) also have to be constructed according to those tables.

# **Table 1**

# **LOWEST REQUIRED CROSS-SECTIONS FOR THE VENTILATION GAP (SPACE) NECESSARY BETWEEN COVERING AND MEMBRANE IN SLOPING ROOFS WITH**

# **20º - 80º ( 36% - 600%) SLOPE**

|  |  |  |  |
| --- | --- | --- | --- |
| Gap length | Gap inlet | Gap height | Gap outlet |
| Rafter length | Minimal, active surface area in the eaves | Minimal counter-batten height | Minimal, active surface area on the ridge or on the corner (attributable to one roof surface) |
| [ m ] | [ cm2 / mb of the eaves ] | [ cm ] | [ cm2 / m of the ridge / corner ] |
| **5**  **6**  **7**  **8**  **9**  **10**  **11**  **12**  **13**  **14**  **15**  **16**  **17**  **18**  **19**  **20**  **21**  **22**  **23**  **24**  **25** | 200  200  200  200  200  200  220  240  260  280  300  320  340  360  380  400  420  440  460  480  500 | 3,5  3,5  3,5  3,5  3,5  3,5  3,5  4,0  4,0  4,0  4,5  5,0  5,0  5,5  5,5  6,0  6,0  6,0  6,5  6,5  7,0 | 50  50  55  50  50  50  55  60  65  70  75  80  85  90  95  100  105  110  115  120  125 |

Under metal coverings (sheet, profiled, plate) in roofs with slope smaller than **25º** it is necessary to construct increased outlet (so-called high ridge)because of the possibility of snow retention on the ridges and on the corners to prevent closing the gap by the snow. The height of increase depends on the region and its rules of roof construction. However, the height of the outlet should not be smaller than 15 cm over the covering surface.

# **Table 2**

# **LOWEST REQUIRED CROSS-SECTIONS FOR THE VENTILATION GAP (SPACE) NECESSARY BETWEEN COVERING AND MEMBRANE IN SLOPING ROOFS WITH 5º - 19º (18% - 35%) SLOPE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gap length | Gap inlet | Gap height | | Gap outlet |
| Rafter length | Minimal, active surface area in the eaves | Minimal counter-batten height | | Minimal, active surface area on the ridge or on the corner (attributable to one roof surface) |
| 11º - 15 º  18% – 26 % | 16 º - 19 º  27% – 35 % |
| [ m ] | [ cm2 / m of the eaves ] | [ cm ] | | [cm2 / m of the ridge / corner] |
| **5**  **6**  **7**  **8**  **9**  **10**  **11**  **12**  **13**  **14**  **15**  **16**  **17**  **18**  **19**  **20** | 200  200  200  200  200  200  220  240  260  280  300  320  340  360  380  400 | **7**  **7**  **7**  **8**  **8**  **9**  **9**  **9**  **10**  **10**  **11**  **11**  **11**  **13**  **13**  **13** | **5**  **5**  **5**  **6**  **6**  **7**  **7**  **7**  **8**  **8**  **9**  **9**  **9**  **11**  **11**  **11** | 50  50  55  50  50  50  55  60  65  70  75  80  85  90  95  100 |

**Table 3.**

**Size of the tape protecting the inlet to the gap**

|  |  |  |
| --- | --- | --- |
| Minimum size of the inlet to the ventilation gap according to table 1 (exemplary sizes) | Percentage of the passage area to total area of the tape protecting the inlet | Surface of the tape corresponding to minimal flows by area recommended from column 1 |
| [ cm2 / mb of the eaves ] | [ % ] | [cm2 / mb of the eaves ] |
| 200  ( 10 m length of the ventilation gap – rafter length) | 40  50  60  70 | 500  400  335  285 |
| 300  (15 m length of the ventilation gap – rafter length) | 40  50  60  70 | 750  600  500  430 |

rys. 4 - 2a.tifrys. 3 - 2.tif

Pic.3

Pic.4

**Comments**

1. This instruction concerns also installation of low vapour-permeable initial covering foils (ICF) manufactured by Marma Polskie Folie and Lenko. ICF in roofs with usable attic work as sealings of coverings laid on battens in material system requiring two ventilation gaps in the roof (pic. 4).
2. There are other possible solutions correctly realizing ventilation of the roofs and its coverings adapted to regional regulations and climatic requirements.
3. In difficult roofs with complicated shapes, a separate project of ventilation ensuring suitable ventilating airflow over ICM should be prepared. In some cases, especially in big roofs, forced (mechanical) ventilation should be made.
4. The amount of water vapour which can be taken from the roof construction by ventilation gap described above is limited. Because of that, total resistance to water vapour of all the materials placed under the gap (e.g. ICM, thermal insulation, vapour-insulation film) should be selected according to table no. 4 (or according to DIN 4108-3). Eventually, this resistance in decided by vapour-insulation film.

**Table 4.**

**Total diffusion resistance of the layers below ventilation gap expressed as diffusion-equivalent air thickness**

|  |  |
| --- | --- |
| **Rafter length** | **Sd** |
| up to 10 m | ≥ 2 m |
| from 10 to 15 m | ≥ 5 m |
| from 15 m | ≥ 10 m |



**Instruction was written according to the state of knowledge from May 2019.**

Additional information on webpages :

[www.marma.com.pl](http://www.marma.com.pl) i [www.dachowa.com.pl](http://www.dachowa.com.pl) .