

**Technical data sheet №1.02**

04.2016

**PIR boards PirroMembrane**

TS 5768-001-09151858-2015

**Product description:**

PirroMembrane are insulation boards made of rigid polyisocyanurate (PIR), with both side faced with embossed foil of 50mkm.

PIR has the lowest thermal conductivity compared to traditional insulation, which significantly reduce the required insulation thickness.

PIR consists of a rigid closed cell, which together with the foil embossing provides PirroMembrane boards with high mechanical strength. Board is intended for moving people on it during the installing process.

The low density of material combined with high compressive strength reduces the load on the building frame and metal consumption for designed bearing structures.

The best ratio of weight to overlapping areas gives significant savings on the cost and timing of work; less required thickness reduces the amount of product to transport and costs for installation and fasteners.

PIR boards PirroMembrane has a high fire-resistant properties: exposed to the flame, polyisocyanurate becomes charred and forms a crust that protects intact polymer layers. PIR does not support combustion, does not extend the flame, does not melt and doesn't form burning drops of the melt.

You do not need a protective separation layer of glass fiber between the insulation and the membrane, because the facing of the boards performs this function.

The product is recommended for use in raw season (the rainfall is easily removed from the board surface).

Mechanical method of attachment is used when PIR boards are installing on profiled steel sheet.

PirroBitum comes with "quarter" end face, "male-female" or straight ends.

**FIELD OF APPLICATION:**

PirroMembrane boards are designed for roofs of industrial and public buildings, warehouses with roof cladding of polymeric PVC membranes, membranes based on EPDM and TPO, as well as to create a thermal insulation loop (coating, walls) in cold stores.

Suitable for roofs larger than 10 000 m<sup>2</sup> without fire-prevention separation zones.

PirroMembrane board is efficient for buildings coated with sheeting and is a part of the system PIR- roof Expert.

PirroMembrane board is also applied to objects of private housing in the pitched roofs, layered masonry, walls with ventilated layer.

**PRODUCT CHARACTERISTICS:**

| Characteristic           | Description   | Units             | Value  | Test method/ Standard                       |
|--------------------------|---|-------------------|--|---|
| Facings                  | Upper facing: aluminum foil 50mkm<br>Lower facing: aluminum foil 50 mkm | -                 | -  | TS 5768-001-09151858-2015                   |
| End face profiling       | "Male-female" perimeter profiling (for ≥50mm thickness)                 | mm                | 10 (depth)   | TS 5768-001-09151858-2015                   |
|                          | "Quarter" perimeter profiling (for ≥30mm thickness)                     | mm                | 15 (depth)   |   |
|                          | Without profiling   | -                 | -  |   |
| Dimensions of the boards | width x length  | mm                | 1200x600,<br>1200x1200,<br>1200x2400,<br>1200x3000 | GOST 17177-94,<br>TS 5768-001-09151858-2015 |
|                          | width x length  |                   |  | GOST 17177-94,<br>TS 5768-001-09151858-2015 |
|                          | thickness   | mm                | 30..250  | TS 5768-001-09151858-2015                   |
|                          | Thickness discrete values   | mm                | 10   | TS 5768-001-09151858-2015                   |
| Density                  | Isocyanurate without facings, ρ   | kg/m <sup>3</sup> | 31±2   | GOST 17177-94                               |
| Water absorption         | Complete immersion, W   | %                 | <1,0   | GOST 17177-94                               |
| Coefficient of thermal   | Isocyanurate without facings, λ <sub>25</sub>                           | W/m·K             | 0,023  | GOST 7076-99                                |

|  |  |      |      |      |                           |            |   |      |      |      |      |      |      |
|--|--|------|------|------|---------------------------|------------|---|------|------|------|------|------|------|
| conductivity   | Isocyanurate without facings, $\lambda_A$              |      |      |      | W/m·K                     | 0,024      | GOST 7076-99,<br>GOST 24816-81,<br>Set of rules 23-101-2004 |      |      |      |      |      |      |
|  | Isocyanurate without facings, $\lambda_B$              |      |      |      | W/m·K                     | 0,025      |   |      |      |      |      |      |      |
| Calculation data for application conditions A          |  |      |      |      |                           |            |   |      |      |      |      |      |      |
| Board thickness, mm                                    | 30   | 40   | 50   | 60   | 70                        | 80         | 90  | 100  | 110  | 120  | 130  | 140  | 150  |
| Thermal resistance<br>$R_T=d/\lambda_A, m^2 \cdot K/W$ | 1,25   | 1,67 | 2,08 | 2,50 | 2,92                      | 3,33       | 3,75  | 4,17 | 4,58 | 5,00 | 5,42 | 5,83 | 6,25 |
| Heat transfer coefficient<br>$K=1/R_T, W/M^2 \cdot K$  | 0,8  | 0,6  | 0,48 | 0,40 | 0,34                      | 0,30       | 0,27  | 0,24 | 0,22 | 0,20 | 0,18 | 0,17 | 0,16 |
| Calculation data for application conditions B          |  |      |      |      |                           |            |   |      |      |      |      |      |      |
| Board thickness, mm                                    | 30   | 40   | 50   | 60   | 70                        | 80         | 90  | 100  | 110  | 120  | 130  | 140  | 150  |
| Thermal resistance<br>$R_T=d/\lambda_B, m^2 \cdot K/W$ | 1,20   | 1,60 | 2,00 | 2,40 | 2,80                      | 3,20       | 3,6   | 4,00 | 4,40 | 4,80 | 5,20 | 5,60 | 6,00 |
| Heat transfer coefficient<br>$K=1/R_T, W/M^2 \cdot K$  | 0,83   | 0,63 | 0,50 | 0,42 | 0,36                      | 0,31       | 0,28  | 0,25 | 0,23 | 0,21 | 0,19 | 0,18 | 0,17 |
| Vapor permeability coefficient                         | Isocyanurate without facings, $\mu$                    |      |      |      | mg/(m·h·Pa)               | 0,026      | GOST 25898-2012   |      |      |      |      |      |      |
| Vapor permeability resistance                          | For facing, R  |      |      |      | (m <sup>2</sup> ·h·Pa)/mg | ≥123       | GOST 25898-2012   |      |      |      |      |      |      |
| Strength of the board                                  | Compressive strength at 10% deformation, $\sigma_{10}$ |      |      |      | kPa (kg/cm <sup>2</sup> ) | ≥120 (1,2) | GOST 17177-94   |      |      |      |      |      |      |
|  | At bending, $\sigma_{II}$                              |      |      |      | kPa (kg/cm <sup>2</sup> ) | ≥350 (3,5) | GOST 17177-94   |      |      |      |      |      |      |
|  | At tension transversely to face surface, $\sigma_p$    |      |      |      | kPa (kg/cm <sup>2</sup> ) | ≥100 (1,0) | GOST EN 1607-2011   |      |      |      |      |      |      |
| Flammability index                                     | Class of flammability                                  |      |      |      | -                         | Г1 (KM4)   | GOST 30244-94 (Federal law №123)                            |      |      |      |      |      |      |
| Temperature range of application                       |  |      |      |      | °C                        | -70..+120  |   |      |      |      |      |      |      |

**PACKAGE:**

Boards are packed in bundles of up to 600mm in height and covered with shrink film.

The bundles are formed in pallets up to 2400mm height. At the bottom of each pallet there are the support for the forklift. Each bundle and pallet is provided with the label.

**TRANSPORTATION:**

In covered vehicles in a horizontal position. Pack sizes are optimal for standard internal dimensions of road transport. Loading and transportation should comply with current shipping rules for the corresponding kinds of transport.

**STORAGE:**

Boards are stored on horizontal surface, closed from rain and direct sun exposure. It is necessary to ensure fire safety requirements. Boards should be stored in their original packaging.

When bundles are stored without the support bars, it is recommended to check the absence of sharp edges on the support surface.

**WORKS:**

According to the "Album of technical solutions for the use of PIR boards in the flat roof with the use of polymer membranes," "Technological card for installing PIR Roofing expert system", guidance on the application of polymer waterproofing PLASTFOIL® and EKSTRARUF® and technical documentation of other manufacturers polymer membranes.