LOGICPIR THERMAL INSULATION BOARD

A NEW GENERATION OF CONSTRUCTION MATERIALS

KNOWLEDGE. EXPERIENCE. CRAFTSMANSHIP.

WWW.TECHNONICOL.IN
The discovery of Polyurethane Foam is attributed to Otto Bayer (founder of the group BAYER), who invented this new material for the first time in 1937, while he was trying to obtain a new polymer in the Bayer laboratories in Germany. That was a true revolution in the sphere of materials!

Thanks to its extraordinary mix of lightness, softness, elasticity, pleasantness at touch and resistance to strain, the flexible polyurethane foam soon became the material that finds a great purpose in several productive sectors, from furniture upholstery and sporting goods to the construction industry.
Polyurethane insulation was already used in Space Shuttles, USA (1971) and the spacecraft Buran, USSR (1976).
Polyisocyanurate, or simply PIR, is a modified and improved polyurethane foam, which is known in the world since 1968. Nowadays, in the context of constantly rising energy prices, energy-saving materials like PIR are becoming extremely popular in various industries.
According to the research of National Roofing Contractors Association (NRCA) and IAL Consultants, PIR insulation is the market leader in roofing segment in the USA:

- **75%** of all new flat roofs are being constructed using PIR
- **70%** of all renovation projects are carried out with PIR
LOGIPIR BOARD BY TECHNONICOL
In 2016, TECHNONICOL launched a PIR factory in Ryazan. The production capacity of the line is **30 million m²** per year!
Thermal insulation LOGICPIR by TECHNONICOL is a polymer framework of many closed and gas-filled cells, which form a rigid homogeneous structure with high strength. The molecular ring structure of the polymer with strong chemical bonds and the high density of these bonds between the elements makes their destruction difficult. Closed rigid cells make up more than 95% of the volume of the material and provide it with:

- Record-low thermal conductivity
- Mechanical strength
- Minimal water absorption
- High fire resistance

Thus, thanks to its' chemical continuity, PIR boards by TECHNONICOL retain all the positive properties of polyurethane.
ADVANTAGES OF LOGICPIR

- RECORD-LOW THERMAL CONDUCTIVITY
- RELIABILITY AND DURABILITY
- HIGH FIRE RESISTANCE
- DYNAMIC LOAD RESISTANCE
- MINIMAL WATER ABSORPTION
- LIGHTWEIGHT
- SMALL THICKNESS
- EASY TO INSTALL
- ECOLOGICAL COMPATIBILITY

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RECORD-LOW THERMAL CONDUCTIVITY

Being an energy-saving material with closed cellular structure, LOGICPIR boards by TECHNONICOL have a record-low thermal conductivity starting from 0.022 W/m*K. That allows less thickness of the thermal insulation layer to achieve the required level of thermal resistance.

Boards are available with L-shaped edges, so they fit tightly together and thus prevent thermal bridges.
LOGICPIR insulation boards:

- Are resistant to temperature changes
- Retain their shape without deformation over time
- Do not contain fibers capable to eroding
- Are resistant to microorganisms, fungus, insects and rodents

The stability of the material provides a service life of more than 50 years. Over the lifetime material does not change the thermal characteristics and dimensions.
HIGH FIRE RESISTANCE

PIR boards by TECHNONICOL are a non-flammable material. When in contact with an open flame, polymer burns on the surface only. This creates a charcoal skin, which is an effective defence against further polymer damaging.
The durable and rigid frame of each cell grants an excellent strength to the material. Due to the high compressive strength, it is possible to walk on boards during the construction of the building or at regular service of the equipment installed on the roof. Unlike other insulation materials, LOGICPIR boards are not sensitive to foot traffic and loads provided during operation.

During the walkability test in Europe, special equipment creates, an imitation of a walking person weighing 75 kg. LOGICPIR boards with the compressive strength of 150 kPa provide high resistance against deformation due to operation loads and comply with class 2 for the dynamic load (EN 826).
MINIMAL WATER ABSORPTION

Small cells practically do not absorb water and do not pass it through: water absorption is less than 1%! That grants high bio-stability and the possibility of material installation in severe weather conditions.
The use of PIR boards by TECHNONICOL minimizes an additional load on the supporting base and allows the installation of thermal insulation without reinforcing the supporting structures, which is especially important for roofs renovation. Transportation costs are substantially reduced as well.
Due to the record-low thermal conductivity of LOGICPIR boards by TECHNONICOL, a smaller thickness of the insulation layer is used to achieve the required level of thermal resistance. The minimum thickness allows saving the maximum space.
Thanks to the light weight and minimum thickness of LOGICPIR boards, even one person can easily perform the installation of the insulation layer. In addition, the availability of special prefabricated slope shaped boards significantly reduces the time of installation of the whole roofing system as well.
Polyurethanes are widely used in the manufacture of heart valves, car parts, sports equipment, furniture, children toys, mattresses and pillows, shoes and clothes, adhesives and sealants, as well as many other usual things around us.

The material does not emit any dangerous substances, therefore it is considered one of the safest for the health of people, animals and the environment.
ECOLOGICAL COMPATIBILITY

Thermal insulation LOGICPIR by TECHNONICOL is a new generation of polyurethanes that is absolutely environmentally friendly and safe for human health and approved for use in children and medical institutions.

LOGICPIR does not emit volatile organic compounds (VOC), ammonia, formaldehyde, carcinogenic and other harmful substances, as evidenced by the certificate for M1 emission class issued by the prestigious laboratory of Eurofins Expert Services (Finland).
CERTIFICATES AND TEST REPORTS

Class E, EN 13501-1 (test method EN ISO 11925-2),
ITC, the Czech Republic

Basic properties, EN 13165,
VGTU, Lithuania
CERTIFICATES AND TEST REPORTS

BDA testing, EN 13165, Kiwa, the Netherlands

Resistance to insects, FBIS SRDI of Rospotrebnadzor, Russia
PRODUCT RANGE
LOGICPIR is available with 2 types of the surface: aluminium foil or glass fiber mat. Can be supplied with flat or L-shaped edges. A variation with the slope shape is available for the creation of the slope of 1.7 or 3.4% in order to drain water on the roof to funnels.

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Mechanically fixed and ballasted roofing systems</th>
<th>Adhered roofing systems (including self-adhesive single-ply waterproofing layer)</th>
<th>Slope arrangement in any roofing systems</th>
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</thead>
<tbody>
<tr>
<td>Aluminium foil (F)</td>
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<td>Glass tissue with mineral coating (GTM)</td>
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<td>Slope-shaped elements (1.7 or 3.4%)</td>
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<tr>
<td>PROPERTIES</td>
<td>LOGICPIR</td>
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<tr>
<td>Thermal conductivity, $\lambda_D$, W/m*K</td>
<td>0.022 (aluminium foil covering), 0.026 (glass fiber covering)</td>
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<td>Compressive stress at 10 % deformation, kPa</td>
<td>$\geq 150$</td>
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<tr>
<td>Long term water absorption by immersion, %</td>
<td>$\leq 1$</td>
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<tr>
<td>Reaction to fire – ignitability, Euroclass</td>
<td>E</td>
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<tr>
<td>Board sizes, mm</td>
<td>1200x600, 2400x1200</td>
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<tr>
<td>Thickness (increments 10 mm), mm</td>
<td>30-150</td>
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<tr>
<td>Surface type</td>
<td>aluminium foil or glass fiber mat</td>
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Areas of Application
In Europe, the biggest part of the PIR market is occupied by flat roofs (45%). This number includes insulation on concrete flat roofs (residential and non-residential buildings) as well as on large scale steel deck roofs (commercial, infrastructure and production facilities). Pitched roofs come second and account to 25% of sales – the material is used for the new construction and reconstructions (improving the insulation of existing roofs from the outside by installing PIR thermal insulation boards on rafters). Then other areas of application follow: floor insulation, agricultural buildings and others (including wall insulation).
MAIN AREAS OF APPLICATION IN EUROPE
KNOWLEDGE. EXPERIENCE. CRAFTSMANSHIP.

ROOFING SYSTEMS
WITH LOGICPIR
ROOFING SYSTEMS WITH LOGICPIR

LOGICPIR thermal insulation boards are the great solution for use in different constructions of roofs: pitched and flat, exposed and ballasted (including green roof), operated and non-operated. They are also recommended for use on roofs intended for frequent attendance of personnel, for example, for adjustment of the equipment installed on the roof.

The material can be used with various types of the substrate, e.g. profiled metal deck, reinforced concrete, wood, OSB-3 boards, old roof covering, etc. The application of prefabricated slope shaped boards allows creating the slope for water draining fast and convenient.
MECHANICALLY FIXED ROOFING SYSTEMS
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Mechanically fixed roofing system:

1. PVC membrane LOGICROOF V-RP
2. Telescopic fastener (anchor)
3. Thermal insulation board LOGICPIR
4. Thermal insulation board LOGICPIR Slope
5. Thermal insulation board LOGICPIR
6. Vapor barrier VAPORSTOP CA 500
7. Corrugated steel sheet
BALLASTED ROOFING SYSTEMS
Ballasted roofing system:

1. Ballast
2. Geotextile 300 g/m²
3. PVC membrane LOGICROOF V-GR
4. Thermal insulation board LOGICPIR
5. Thermal insulation board LOGICPIR Slope
6. Thermal insulation board LOGICPIR
7. Vapor barrier VAPORSTOP CA 500
8. Reinforced concrete base
ADHERED ROOFING SYSTEM
Adhered roofing system:

1. PVC membrane LOGICROOF V-GR FB
2. LOGICROOF adhesive compound
3. Thermal insulation board LOGICPIR Slope with glass fiber mat surface
4. Thermal insulation board LOGICPIR with glass fiber mat surface
5. Adhesive foam TECHNONICOL 500 PROFESSIONAL
6. Bitumen vapor barrier VAPORSTOP CA 500 / ULTRAFLEX SA
7. Bitumen prime coating
8. Reinforced concrete base
PITCHED ROOFING SYSTEMS
PITCHED ROOFING SYSTEMS

Pitched roofing system:

1. Roofing shingles by TECHNONICOL
2. Underlay bitumen membrane
3. Wood decking (OSB-3, plywood, tongue or groove planks)
4. Counter battens
5. Ventilation space battens
6. NICOBAND self-adhesive sealant tape
7. LOGICPIR thermal insulation boards
8. TECHNONICOL vapor barrier film
9. Wooden boarding
10. Rafter system
IKEA, RUSSIA – MORE THAN 1,000,000 M² OF LOGICPIR SUPPLIED!
PLANT NEXEN TIRE, ŽATEC, THE CZECH REPUBLIC
THANK YOU FOR ATTENTION!

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