# DANOPREN TR 100

DANOPREN TR 100 is a rigid extruded polystyrene (XPS) foam board with shiplap edges at various thicknesses. Manufactured without CFC's, HCFC's or HFC's.
Designation Code for CE Marking:
XPS-EN13164-T1-CS(10\Y)300-WL(T)0,7-DS(70)

## INTENDED USE

DANOPREN is a rigid extruded polystyrene (XPS) foam board with butt edges at various thicknesses. Manufactured without CFC's, HCFC's or HFC's.

## PACKAGING, CODING

| PRESENTATION | VALUE | UNIT |
|---|---|---|
| Length | 125 | cm |
| Width | 60 | cm |
| Total thickness | 100 | mm |
| $m^2$ per package | 3,00 | $m^2$ |
| Product Code | 484009 | - |

Shiplap edges

## TECHNICAL DATA

| TECHNICAL DATA | VALUE | UNIT | STANDARD |
|---|---|---|---|
| Thickness | 100 | mm | EN 823 |
| Thickness tolerance | -2/+3 | mm | EN 823 |
| Length | 125 | cm | EN 822 |
| Length tolerance | -8/+8 | mm | EN 822 |
| Width | 60 | cm | EN 822 |
| Width Tolerance | -8/+8 | mm | EN 822 |
| Flatness | 6 | mm/m | EN 825 |
| Squareness | 5 | mm/m | EN 824 |
| Thermal conductivity (1) | 0,037 | W/mK | EN 12667 |
| Thermal Resistance | 2,75 | $m^2K/W$ | EN 12667 |
| Compression strength (2) | ≥ 300 | kPa | EN 826 |
| Compressive creep max 2% deflection after 50 years(3) | ≥ 95 | kPa | EN 1606 |
| Long-term water absorption by total immersion | ≤ 0.7 | Vol.% | EN 12087 |
| Long-term water absorption by diffusion | ≤ 3 | Vol.% | EN 12088 |
| Water absorption by freeze-thaw cycling | ≤ 1 | Vol.% | EN 12091 |
| Water vapour diffusion resistance factor (μ) (4) | ≥ 80 | - | EN 12086 |
| Dimensional Stability | ≤ 5 | % | EN 1604 |
| Reaction to fire | E | Euroclase | EN 13501-01 |
| Coefficient of linear thermal expansion | 0,07 | mm/m·K | - |
| Working temperature range (Celsius degrees) | -50 / +75 | $^oC$ | - |
| Specific heat | 1.450 | J/kg·K | - |
| Nominal density | 32 | $kg/m^3$ | EN 1602 |
| Capillarity | Null | - | - |
| Edge treatment | Shiplap | - | - |
| Surface | Skinned | - | - |

(1) Declared thermal conductivity $\lambda_D$ according to EN 13164 (§ 4.2.1; Annex A; Annexes C.2 y C.4.1)
EN 13164. Harmonized Technical Specification for factory made thermal insulation XPS foam products. Valid for CE marking and voluntary quality marks purposes.
(2) Short-term (instant) test method; value reached at yield point or 10% deformation, whatever it comes first.
(3) Creep: long-term deformation under constant loading
(4) For skinned products it depends on thickness: the higher the thickness, the lesser the m-value

## TECHNICAL SPECIFICATION DESCRIPTION

___ $m^2$ of conventional warm roof or inverted roof thermal insulation, by means of DANOPREN TR extruded polystyrene (XPS) rigid foam boards of ___ mm thickness, with a declared thermal conductivity $\lambda_D$ = ___ W/m·K; declared thermal resistance $R_D$ = ___ $m^2$·K/W; Euroclass E fire reaction classification, according to EN 13501-1 and designation code XPS-EN13164-T1-CS (10\Y) 300-WL (T) 0,7-DS (70), according to EN 13164 harmonized technical specifications.

___ $m^2$ of residential or commercial floor thermal insulation, by means of DANOPREN TR extruded polystyrene (XPS) rigid foam boards of ___ mm thickness, with a declared thermal conductivity $\lambda_D$ = ___ W/m·K; declared thermal resistance RD = ___ $m^2$·K/W; Euroclass E fire reaction classification, according to EN 13501-1 and designation code XPS-EN13164-T1-CS (10\Y) 300-WL (T) 0,7-DS (70), according to EN 13164 harmonized technical specifications.

## STANDARDS & CERTIFICATION

Main regulatory/standardization references
- EPBD Recast 2010/31/EU. Energy Performance of Buildings
- UK: Building Regulations 2010 (SI 2010/2214) amended in 2012 and 2013. Approved Documents (2013) - L1A, L1B, L2A, L2B. Standard Assessment Procedure - SAP 2012
- Construction Products Regulation (UE) 305/2011 laying down the harmonised conditions for the marketing of construction products.
- EN 13164. Thermal insulation products for buildings – Factory made extruded polystyrene foam (XPS) products – Specification

CE marking
Conformity according to EN 13164 for all DANOSA factory made XPS products in Europe.

Voluntary quality mark certificate.
French ACERMI Certificate granted to DANOPREN TR, in compliance with EN 13164 and own ACERMI rules.
Spanish AENOR Certificate granted to DANOPREN TR, in compliance with EN 13164.

Quality management
Registered Firm in compliance with EN ISO 9001, granted by BUREAU VERITAS to DANOSA XPS manufacturing site at Tudela (Navarra-Spain)
Registered Firm in compliance with EN ISO 9001, granted by BUREAU VERITAS to DANOSA XPS manufacturing site at Leiria (Portugal) .

## ADVANTAGES AND BENEFITS

- Easy and safe handling of the DANOPREN TR XPS boards: they are light, do not irritate the skin, do not give off dust, maintain their physical integrity. Consequence: easier storage and installation job on-site.
- Negligible long-term water absorption. Two consequences: 1. Storage and installation job can be done even under adverse weather conditions; 2. Thermal performance is not degradated by long-term water absorption.
- Long-term high compressive and mechanical strength. Two consequences: 1. The XPS boards are robust enough to withstand rough handling during transport and installation without losing their physical integrity or their performance as thermal insulation; 2. Where placed under permanent load, the thickness and, therefore, the Thermal Resistance (obviously proportional to the thickness), will be maintained at long-term.
- Thanks to its water absorption and mechanical resistance, the DANOPREN TR XPS boards, properly installed, show a durability equal to the service life of the building in which they are incorporated. Three consequences: 1. Continuous energy saving; 2. Equivalent continuous reduction of CO2 emissions, and 3. Maintenance costs (repair, replacement) null.
- Besides, due to these water absorption and mechanical long-term resistances, the DANOPREN TR XPS boards can be installed on the waterproofing membrane, protecting it from mechanical damage and thermal shock, as per the well-known "inverted roof" concept.
- Eventually, and depending on the installation system, it may be feasible to re-use the DANOPREN TR XPS boards. As a consequence, a maximum level of environmental sustainability can be obtained, closing the product life-cycle by opening a new life-cycle within the concept "from cradle to cradle".

## INSTALLATION

### INVERTED ROOF

- The roof structure load-bearing capacity will be checked.
- Before installing DANOPREN TR XPS boards it is recommended to run a leakage test.
- DANOPREN TR XPS boards are part of a waterproofing system, therefore the systems and indications reflected in the Danosa solutions technical manual, product/systems specifications and other technical documentation should be taken into account.
- A suitable separation layer (for instance a fabric like DANOFELT PY 150) shall be installed between the DANOPREN TR XPS boards and the waterproofing membrane, especially in case where it might arise any chemical incompatibility, such as in the case of PVC membranes (in this case, a fabric like DANOFELT PY 300).
- DANOPREN TR XPS boards shall be installed loose-laid. Otherwise, a justification why not must be provided.
- DANOPREN TR XPS boards shall be installed with staggered joints between successive rows.- DANOPREN TR XPS boards shall be installed with all their joints tight.- When close to every detailing, the DANOPREN TR XPS boards will form the joint with at least a 5 mm tolerance.
- A suitable separation layer (for instance a fabric like DANOFELT PY 200) shall be installed between the DANOPREN TR XPS boards and the ballast (gravel or paving).- A suitable ballast in conditions, weight and distribution will be immediately installed, in order to avoid possible wind uplift. For a non-accessible roof, gravel ballast (rounded low fines of nominal size 16 mm to 32 mm) should be washed and laid to a minimum thickness of 50 mm
- It shall be avoided any ballast that may form a tight vapor diffusion layer on top of the DANOPREN TR XPS boards.
- When close to every detailing, the DANOPREN TR XPS boards will form the joint with at least a 5 mm tolerance.

### RESIDENTIAL AND COMMERCIAL FLOORS

- The structural deck must show proper leveling and flatness (checked with a 2 m rule level). Otherwise it may be necessary to form a sand layer for proper leveling. This sand layer may also allow for horizontal pipes installation. If the structural deck shows proper leveling, the sand layer may go above the insulation boards. In this case it can incorporate a heating floor system.
- DANOPREN TR XPS boards must be installed loose-laid, with tight and staggered joints between successive rows.
- In the case of slab insulation, DANOPREN TR boards may be placed directly onto the ground, once the soil is properly compacted. Then the boards can be placed, as indicated in the previous bullets. If a plastic film is installed as a watertight barrier, it is recommended to place it above the DANOPREN TR boards, i.e., by their "warm" side.
- A screed of at least 40 mm thickness will be installed, as a bed layer for the pavement, above the DANOPREN TR boards. For light or adhered flooring finishings, a minimum 30 mm screed is recommended, reinforced at least with a 220 g/m$^2$ mesh.
- In the case of heating floor systems, the DANOPREN TR boards must be placed below the heating system. Thus the "heat theft" between homes with heated flooring systems is avoided. The floor heating will form joints -for example, with DANOPREN CH shavings- in all junctions with walls and partitions.

## INDICATIONS AND IMPORTANT RECOMMENDATIONS

- Check that the product has arrived on-site within the original packaging, properly labeled and in perfect condition.
- Check the presence of CE marking and DoP (Declaration of Performance).
- Check, if specified in the project, the presence of a voluntary quality mark.
- Check that the thermal insulation is the one specified in the project.
- Check that the project technical specifications are followed, particularly in terms of dimensions, thickness, declared thermal conductivity, declared thermal resistance, water vapour diffusion resistance factor and fire reaction.
- Check that the installation follows what specified in the project, particularly the order of layers in the roof and the correct position of the thermal insulation layer with respect to the rest.
- Check the continuity of the thermal insulation layer, avoiding the presence of thermal bridges, particularly where close to every detailing. Examples: windows lintels, jambs and sills; perforations; roof parapets; floors; pillars.

## HANDLING, STORAGE AND PRESERVATION

- DANOPREN XPS boards suffer irreversible dimensional changes if exposed for a long time at high temperatures. The maximum working service temperature is 75°C.
- DANOPREN XPS boards, in direct contact with substances or materials containing volatile compounds, are exposed to solvents attack. The adhesive manufacturer's recommendations concerning its compatibility with polystyrene foam should be taken into account.
- DANOPREN XPS boards can be stored outdoors. They are unaffected by rain, snow or ice. Accumulated dirt can be easily washed. Stored for an extended period of time, the boards should be protected from direct sunlight, preferably in their original packaging. When kept indoors, it should be properly ventilated.
- The XPS boards must be kept away from heat or flames sources. DANOPREN products contain a flame retardant additive to inhibit accidental ignition from a small fire source, but the boards are combustible and, if exposed to an intensive fire, may burn rapidly. Fire classification is based on small scale tests, which may not reflect the reaction of the products in its end use state under actual fire conditions.
- For more information, refer to the product SDS.

## WARNING

The information contained in this document and any other advice provided, are given in good faith, based on TIKIDAN's current knowledge and experience when products are properly stored, handled and applied, in normal situations and in accordance with the recommendations of TIKIDAN. The information applies only to the application (s) and the product (s) to which reference is expressly made. In case of changes in the parameters of the application, or in case of a different application, consult the TIKIDAN Technical Service before using the TIKIDAN products. The information contained herein does not exonerate the responsibility of the building agents to test the products for the application and intended use, as well as their correct application in accordance with current legal regulations.

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TIKITAR DANOSA (INDIA) PRIVATE LIMITED
Tiki Tar Estate, Village Road, Bhandup (W), Mumbai - 400 078,
Maharashtra, India. T: +91 22 4126 6699; E: info@tikidan.in | W: www.tikidan.in