

## DANOPREN FS 40

DANOPREN FS 40 is a rigid extruded polystyrene (XPS) foam board with butt edges at various thicknesses. Manufactured without CFC's, HCFC's or HFC's.

Designation Code for CE Marking:

XPS-EN13164-T1-CS(10\Y)200-WL(T)1,5-DS(70)



### INTENDED USE

Thermal Insulation for Buildings (ThIB)

ETICS for façades. Thermal bridges.

### PACKAGING, CODING

PRESENTATION	VALUE	UNIT
Length	125	cm
Width	60	cm
Total thickness	40	mm
m <sup>2</sup> per package	7.50	m <sup>2</sup>
Product Code	481008	-



Perimeter cutting and surface

**TECHNICAL DATA**

TECHNICAL DATA	VALUE	UNIT	STANDARD
Thickness	40	mm	EN 823
Thickness tolerance	± 2	mm	EN 823
Length	125	cm	EN 822
Length tolerance	-8/+ 8	-8/+ 8	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 <sup>(1)</sup>	0,034	W/mK	EN 12667
Thermal Resistance	1.20	m <sup>2</sup> K/W	EN 12667
Compression strength <sup>(2)</sup>	> 200	kPa	EN 826
Tensile strength perpendicular to faces	≥ 200	kPa	EN 1604
Long-term water absorption by total immersion	≤ 1.5	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 ) <sup>(4)</sup>	≥ 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	°C	-
Specific heat	1.450	J/kg·K	-
Nominal density	32	kg/m <sup>3</sup>	EN 1602
Capillarity	Null	-	-
Edge treatment	Butt edge	-	-
Surface	Planed, without extrusión skin	-	-

(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.

(4) For skinned products it depends on thickness: the higher the thickness, the lesser the m-value

**TECHNICAL SPECIFICATION DESCRIPTION**

\_\_\_m<sup>2</sup> of ETICS or thermal bridge thermal insulation, by means of DANOPREN FS extruded polystyrene (XPS) rigid foam boards of \_\_\_mm thickness, with a declared thermal conductivity  $\lambda_D$  = \_\_\_W/m·K; declared thermal resistance  $RD$  = \_\_\_m<sup>2</sup>·K/W; Euroclass E fire reaction classification, according to EN 13501-1 and designation code XPS-EN13164-T1-CS (10Y)200-WL(T)1,5-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 FS, in compliance with EN 13164 and own ACERMI rules.

Spanish Marca AENOR granted to DANOPREN FS, 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 Fontanar (Guadalajara- 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 FS 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 degraded 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 FS 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.
- Eventually, and depending on the installation system, it may be feasible to re-use the DANOPREN FS 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

### ETICS.

- DANOPREN FS XPS boards are the only ones suitable, within the DANOSA XPS product range, when they have to be adhered to the substrate wall, and then rendered with ETICS mortars. Due to their rough planed surfaces, without extrusion skin, a firm attachment and compatibility with other products of the ETICS kit is easily got.
  - Thanks to the DANOPREN FS boards high water vapour diffusion resistance factor ( $m$ ), it is not necessary to install vapor barrier. The boards themselves show a performance strong enough as barrier, for the usual applications and climates, to avoid interstitial condensation. In fact, thanks to this so high performance with respect to vapor diffusion, compatibility is favored with all types of renderings, since it is not critical, as it may be with other insulating materials, the fact that the ETICS rendering might eventually be little "breathable".
  - The compatibility of all materials involved in the system must be checked. The Guidance document "ETAG 004" developed by EOTA (European Organization for Technical Assessments) may be followed. This guidance document serves as a basis to issue ETE's (European Technical Evaluations).
  - In any case, it must be checked that the substrate wall shows an even surface, and that there is no mortar projection from bricks joints.
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- It must be checked that the DANOPREN FS boards have been properly fixed to the substrate wall, be it with adhesive more on more than 80% of the surface, be it with mechanical fasteners and adhesive, following the recommendations contained in "ETAG 004".
  - DANOPREN FS boards are installed from the bottom to the top of the wall, in horizontal rows and staggered in successive rows.
  - DANOPREN FS boards must show a surface with good flatness, what can be checked with a rule level.
  - DANOPREN FS boards must show tight joints, avoiding they may get filled with adhesive.
  - The edges of the DANOPREN FS boards should not be aligned with the windows edges.
  - By the corners of every wall section forming the building façades, complete or half-sized DANOPREN FS boards must be installed, never smaller pieces.

## 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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