



TECHNICAL DATA AND APPLICATIONS

FIBRAN^{xps}
extruded polystyrene thermal insulation

FIBRANxps turquoise thermal insulation

A high quality and sustainable energy shield for the complete building envelope!

Extruded polystyrene thermal insulation, marked with the international abbreviation XPS, is generally implemented in applications where installing other types of insulations would be useless - under extreme loads, in humid environments and even below groundwater level.

While FIBRANxps panels are manufactured with lightweight thermal insulating foam, they are extremely solid and water non-absorbent. **Their different forms and surfaces are specially designed for different applications.**

- 
Smooth surfaced panels are intended for applications where thermal insulation is in contact with soil, moisture and even below groundwater level. Additional protection against water, moisture and soil is not necessary.
- 
Rough surfaced panels are used in applications requiring good adhesion for further plaster finishing or concrete pouring.
- 
Grooved surfaced panels are intended for better adhesion of heavier cladding.

Special Characteristics of FIBRANxps

Due to the special cellular structure!

- FIBRANxps thermal insulation is made of hard polystyrene foam that consists of extremely small - only a few microns large - cells. **Its cellular structure is more than 97% closed.** This makes the foam nearly non-absorbent and enables it to be applied at the outer side of the waterproofing: within inverted flat roof systems as well as underground, below the foundation slab, and even fully submerged in groundwater.
- Each cell contains dry air, which provides excellent thermal behaviour that enables FIBRANxps to maintain its thermal properties for not only 25 years, as required by the recent product standards. The thermal conductivity, lambda, remains unchanged over a period of **50 years**. This is equivalent to the expected life span of a building.
- Compressive strength of the FIBRANxps panels is stable over time, even under heavy loads. **This makes the panels suitable for use under permanent static as well as dynamic loads** under foundations of heavier buildings.

Easy implementation for comfortable living

We think of the future!

Durable insulation is extremely important in both the construction of nearly zero-energy buildings (nZEB) and in sustainable construction. During a building's entire life cycle, it ensures permanent and unchanged comfort of living and significantly impacts both building life cycle analyses - LCA and life cycle costs - LCC. Durable insulations extend the life span of buildings and reduce investment costs.

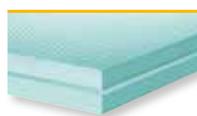
FIBRANxps 300-L



FIBRANxps INCLINE



FIBRANxps ETICS GF



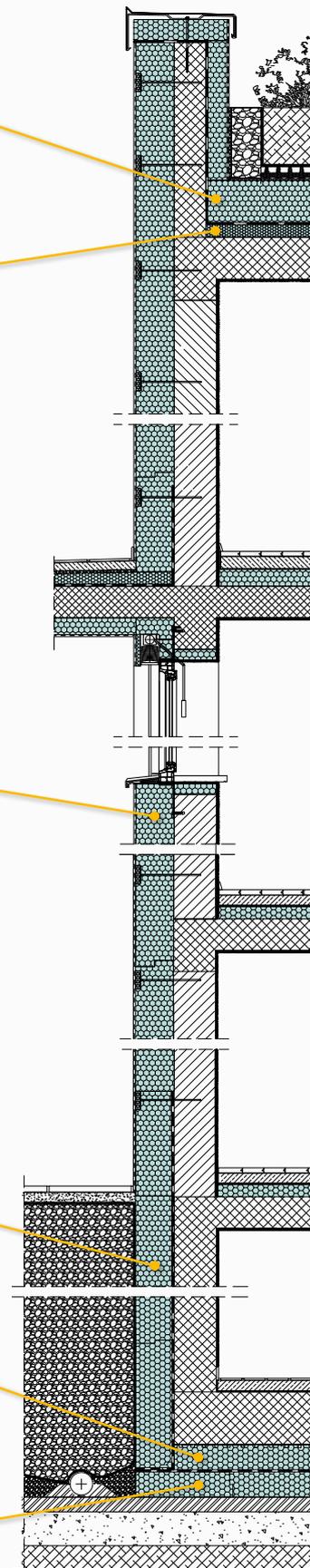
FIBRANxps 300-L



FIBRANxps SEISMIC



FIBRANxps 400-L





Monitored and confirmed constant quality level

For a period of 50 years!

FIBRANxps products fully comply with Regulation 305/2011/EU (laying down harmonised conditions for the marketing of construction products and periodic verification of product quality) and are certified for:

- CE marking of the entire product range,
- **Conformity system 3** in accordance with AVCP that regulates quality control of products, evaluation and marking of construction products, as required by the European harmonized system of assessment and verification of continuous quality,
- in demanding construction assemblies which require special testing of their characteristics in accordance with the AVCP system 1+. On this basis, FIBRANxps products have been issued the European Technical Assessment ETA-17/0910. Also, the DIBt, the German institute for civil engineering, has issued various technical approvals for the use of FIBRANxps products in inverted flat roofs (Z-23.31-1805), in the perimeter area (Z-23.33-1806) as well as below the foundation slab (Z-23.34-1807).

The ETA is required for applications of thermal insulation in demanding construction assemblies:

- under the foundation slab, also in case of high groundwater,
- below grade along the perimeter,
- in the flat inverted roof assembly, also in green roofs and below parking lots.

FIBRANxps panels are constantly monitored by several institutes:



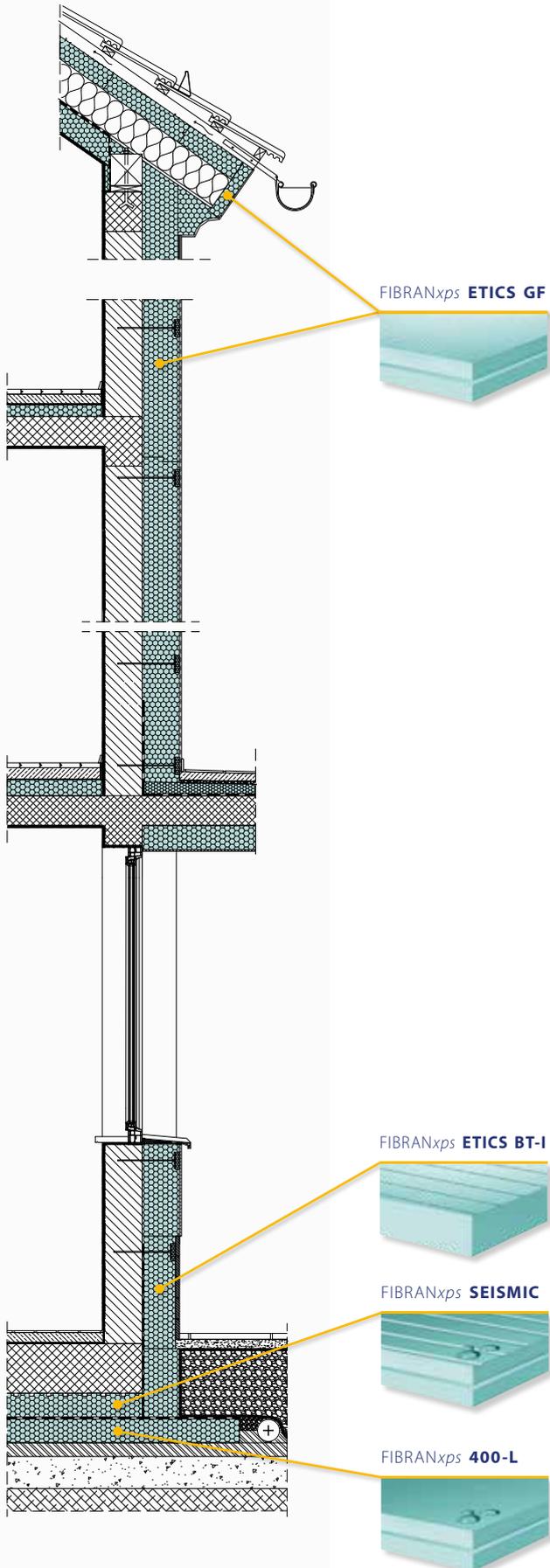
Production is harmless to health and the environment

... by using environmentally friendly raw materials!

From the very beginning of the FIBRANxps production, we considered ecological principles. Due to the eco-policy of the raw materials, our XPS boards are:

- HBCD **free** (no Hexabromocyclododecan),
- HFC **free** (no Hydrofluorocarbon).

FIBRANxps products are manufactured using the so-called CO₂ technology and have an extremely low impact on global warming- **Global Warming Potential, GWP<5** as well as zero effect on ozone depletion- **Ozone depletion potential, ODP=0**.



Recommended applications

		300-I	300-L	400-L	500-L	700-L	INCLINE	SEISMIC	MAESTRO	ETICS	FABRIC
FLOORS and FOUNDATIONS ^{1, 4, 5}											
Floors	Interior floors	•									
	Basement floors	•	•								
	Floors with underfloor heating	•	•								
	Extra loaded floors (parking lots, cold storages)				•	•					
Underground	Insulation under foundation slab, SEISMIC foundation pillow		•	•	•	•		•			
	Insulation under traffic areas (bridges, roads, railways)				•	•					
	Swimming pools		•	•	•						
	Airport runways and hangars					•					
ROOFS ^{2, 4}											
Flat roofs	Inverted flat roofs		•	•	•	•	•				
	Conventional flat roofs		•	•	•	•	•				
	DUO roofs (nZEB, Passive houses)		•	•	•	•	•				
	PLUS roofs (reconstructions, upgrades)		•	•	•	•	•				
	Green roofs		•	•	•	•	•				
	Terraces		•	•	•	•	•				
Pitched roof	Pitched roof reconstruction from the inside, eaves									•	
	Massive and classical lightweight pitched roofs	•							•	•	
	Inner soffit insulation								•		
WALLS ^{3, 1, 4}											
Underground	Perimeter (outside the cellar walls also in case of groundwater)		•		•	•					
	Vertical insulation of foundations		•								
External walls	Façade plinth									•	
	ETICS rendered façades									•	
	Façade with stone cladding									•	
	Visible concrete (inner or sandwich insulation)									•	
	Cavity walls									•	
	Internal walls adjacent to unheated space									•	
	Thermal bridges (balconies, windows and doorjamb, concrete columns and tie-beams)									•	
INDUSTRIAL USE ⁴											
	Panels, window/door frames, door leaves, containers, tailor made products, ...										•

¹ See brochure: **0100 PRODUCTS CATALOG**

² See brochure: **0111 INVERTED FLAT ROOFS**

³ See brochure: **0130 FAÇADE**

⁴ See brochure: **0150 BELOW GRADE**

⁵ See brochure: **0151 SEISMIC FOUNDATION PILLOW**

Specific board surfaces and edges are designed for specific applications

FIBRANxps **300-L, 400-L, 500-L, 700-L**

boards are designed for constructions in contact with soil and in inverted flat roof assemblies. Depending on the expected loads, you can choose the adequate compressive strength ranging from 300 to 700 kPa.

FIBRANxps **INCLINE**

boards allow a precise execution of slopes. They are a substitute for inclined concrete, reducing the total weight and increasing the thermal properties of construction assemblies. Sloping board are available starting from 1 cm board thickness.

FIBRANxps **SEISMIC**

boards are a key component of the SEISMIC foundation pillow system solution. They have a smooth bottom surface, while grooves are cut into the top panel surface to provide good concrete adhesion.

FIBRANxps **MAESTRO**

due to their smooth surface, MAESTRO boards are designed for applications where finishing is not required. Often, they are used as visible thermal insulation in large farm buildings.

FIBRANxps **ETICS GF ETICS BT-I**

boards with rough (waffle) structured surface that enable good adhesion are designed for construction assemblies with a finishing layer (ETICS and ITICS system). A further and important advantage of the ETICS boards is its T3 highest class thickness tolerance, ensuring high-quality façade construction. Based on the weight of the finishing layer (plastered façade / stone cladding), we choose between ETICS GF and BT.

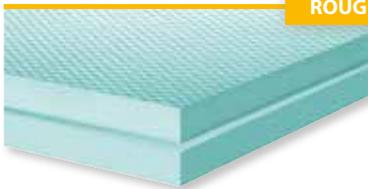
FIBRANxps **FABRIC**

boards are designed for industrial use and further processing.

Surface

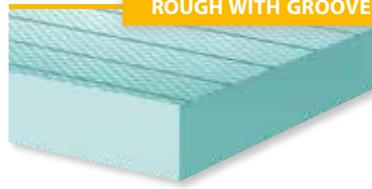
FIBRANxps **ETICS GF**

ROUGH



FIBRANxps **ETICS BT-I**

ROUGH WITH GROOVES



FIBRANxps **INCLINE**

HOT WIRE CUT



FIBRANxps **300-L, 400-L, 500-L, 700-L**

SMOOTH



FIBRANxps **SEISMIC 400-L (500-L, 700-L)**

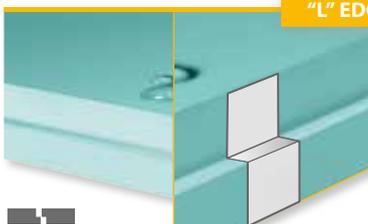
SMOOTH WITH GROOVES



Edge

FIBRANxps **300-L, 400-L, 500-L, 700-L**

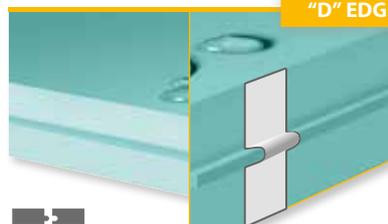
"L" EDGE



Shiplap edged joints prevent thermal bridges formation in single layer installation applications.

FIBRANxps **MAESTRO**

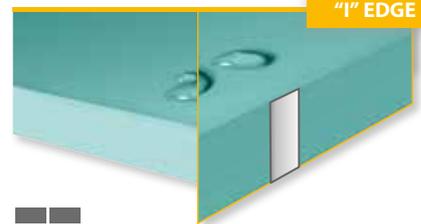
"D" EDGE



Tongue and groove edged joints prevent linear thermal bridges formation and enable smooth roof and ceiling applications.

FIBRANxps **300-I**

"I" EDGE



Straight edge boards are used in multilayer applications with staggered (brickwork) joints.

Technical data

TECHNICAL DATA FIBRANxps		Units	Designation code EN 13164	300-I	300-L	400-L	500-L	700-L	SEISMIC 400-L	SEISMIC 500-L	SEISMIC 700-L	MAESTRO	ETICS GF/GF-I	ETICS BT-I	Standard
Edge shape	-	-	-												
Surface	-	-	Smooth					Smooth with channels			Smooth	Rough with or channels			
Board's dimensions	mm	-	1250/ 600	1250/ 600	2500/ 600	1250/ 600	1250/ 600		2500/ 600			2800/ 600	1250/ 600	1250/ 600	EN 822
Thickness tolerance	-	Ti	T1									T3		EN 823	
Declared compressive strength at 10% deformation	kPa	CS(10\Y)i	300*	300*	400	500	700	400	500	700	300	300*	300		EN 826
Declared compressive modulus of elasticity	MPa	E	20	20	25	30	40	25	30	40	20	15	15		EN 826
Shear strength τ	MPa		-	-	-	-	-	-	-	-	-	0,15	0,15		EN 12090
Shear modul G	MPa		-	-	-	-	-	-	-	-	-	2,6	2,6		EN 12090
Compressive creep over 50 years at < 2% deformation	kPa	IMPROVED! CC (2/1,5/50)	130	130	155	180	235**	155	180	235**	130	-	-		EN 1606
Compressive strength design value under foundation slab	50-120 mm	IMPROVED! f_{cd}	185	185	200***	215	305**	200***	215	305**	-	-	-		Dibt Z-23.34- 1807
	140-200 mm		160	160	185***	215	-	185***	215	-	-	-	-		
Tensile strength perpendicular to surface σ_{mt}	kPa	TRi						400					EN 1607		
Dimensional stability at 70°C and 90% relative humidity	%	DS(70,90)						≤ 5					EN 1604		
Deformation behaviour load 40 kPa and temperature 70°C	%	DLT(2)5						≤ 5					EN 1605		
Linear coefficient of thermal expansion $\alpha_{+20/+70\text{ °C}}$	mm/mK	-						0,075							
Freeze-thaw resistance	-	FTCDi						1					EN 12091		
Temperature range for use	°C	-						od -50 do +75					EN 14706		
Reaction to fire	-	Class						E					EN 13501-1		
Long-term water absorption by total immersion	Smooth surface	IMPROVED! WL(T)	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	-	-		EN 12087
	Waffle surface	IMPROVED! WL(T)	-	-	-	-	-	-	-	-	-	1,5	1,5		
Water absorption by diffusion	20-30 mm	IMPROVED! WD(V)	3	3	3	3	3	3	3	3	3	-	-		EN 12088
	40-60 mm	IMPROVED! WD(V)	2	2	2	2	2	2	2	2	2	-	-		
	80-200 mm	IMPROVED! WD(V)	1	1	1	1	1	1	1	1	1	-	-		
Water absorption by diffusion	-	MUi	50								50	50	50	EN 12086	

*Declared compressive strength at 10% deformation is 250kPa for 20 mm and 30 mm thick panels.

**From thickness 80 to 120 mm.

***Defined by linear interpolation.

Thermal conductivity

		300	400	500	700	MAESTRO	ETICS
Declared thermal conductivity¹		λ_{D25}	λ_{D25}	λ_{D25}	λ_{D25}	λ_{D25}	λ_{D25}
20 mm	W/mK	0,032					0,032
30 mm		0,032					0,032
40 mm		0,032					0,032
50 mm		0,033		0,033		0,033	0,033
60 mm		0,033	0,033	0,033	0,033	0,033	0,033
80 mm		0,034	0,034	0,034	0,034	0,034	0,034
100 mm		0,035	0,035	0,035	0,035	0,035	0,035
120 mm		0,035	0,035	0,035	0,035	0,035	0,035
140 mm		0,035	0,035	0,035		0,035	0,035
160 mm		0,036	0,036	0,036		0,036	0,036
180 mm		0,036	0,036	0,036			0,036
200 mm		0,036	0,036	0,036			0,036

¹ conforming to EN 13164 for 25 years period

Declared 50-years thermal conductivity		300	400	500	700	MAESTRO	ETICS
20 mm	W/mK	0,032					0,032
30 mm		0,032					0,032
40 mm		0,032					0,032
50 mm		0,033		0,033		0,033	0,033
60 mm		0,033	0,033	0,033	0,033	0,033	0,033
80 mm		0,034	0,034	0,034	0,034	0,034	0,034
100 mm		0,035	0,035	0,035	0,035	0,035	0,035
120 mm		0,035	0,035	0,035	0,035	0,035	0,035
140 mm		0,035	0,035	0,035		0,035	0,035
160 mm		0,037	0,037	0,037		0,037	0,037
180 mm		0,037	0,037	0,037			0,037
200 mm		0,037	0,037	0,037			0,037

0100 PRODUCTS CATALOG

0101 TECHNICAL DATA AND APPLICATIONS

0111 INVERTED FLAT ROOFS

0130 FAÇADE

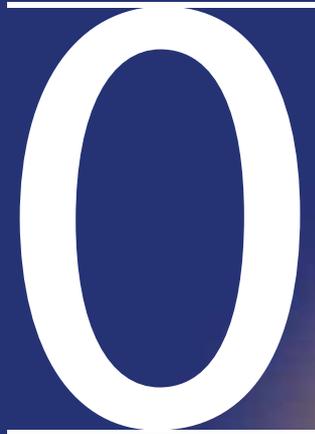
0150 BELOW GRADE

0151 SEISMIC FOUNDATION PILLOW



07

The quality of FIBRAN[®] products is assured by EN 13164 and EN 13172 standards. These standards establish the type and frequency of measurements executed by accredited and independent institutes, as well as by FIBRAN laboratories. Since FIBRAN sells its products throughout Europe and outside its borders, the quality of products is also verified according to local standards of certain countries including some highly developed and specially demanding construction markets.



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