



ENERGYSHIELD.

FIBRAN

Prezantim mbi anen teknike



FIBRAN Group

Kompani Greke Prodhimi

- 9 linja prodhimi per polistiren te presuar FIBRANxps
- 2 linja – 3 furra elektrike per prodhimin e leshit te gurit FIBRANgeo
- 1 linje prodhimi per pllake gipsi + aksesore
- 1 linje prodhimi per polisterol FIBRANeps



ENERGY SHIELD.

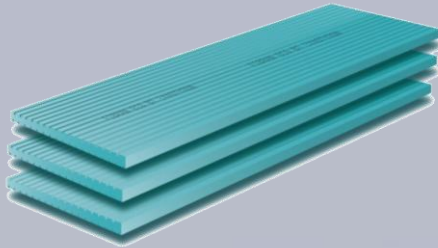
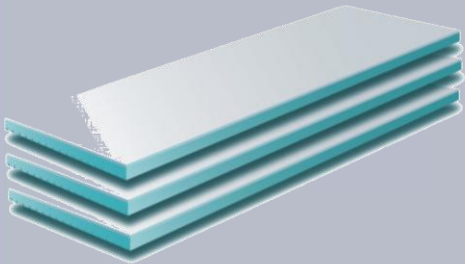
fibran[®]



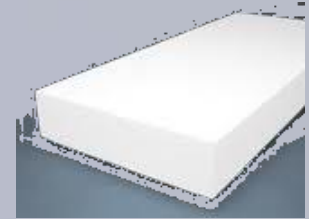
fibran[®]

ENERGYSHIELD.

fibran[®]XPS



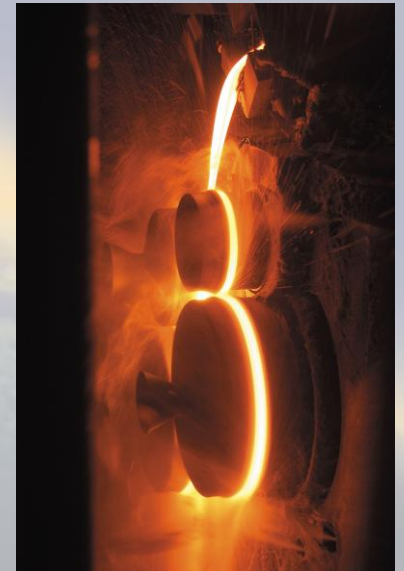
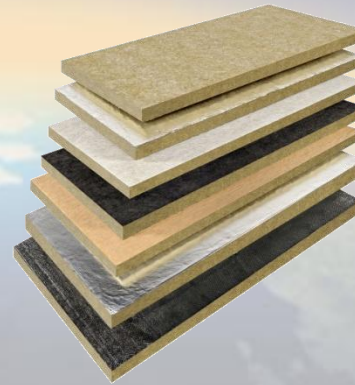
fibran[®]EPS



fibran[®]GYPS



fibran[®]GEO



Bashkepunim me Institute



Bashkepunim me Organizata

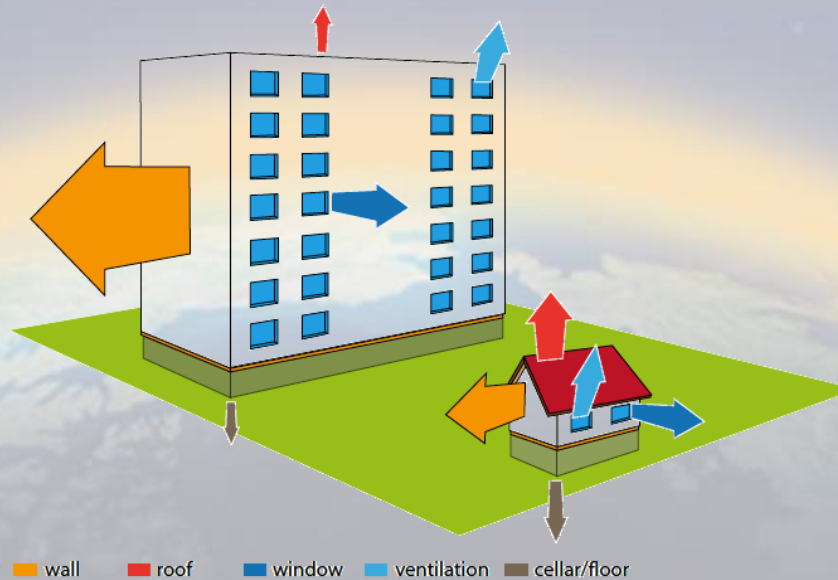


Pjesemarrje aktive nga FIBRAN:

- Ne komitetet teknike
- Ne komitetet ambientale
- Ne komitetet mjekstore dhe te sigurise

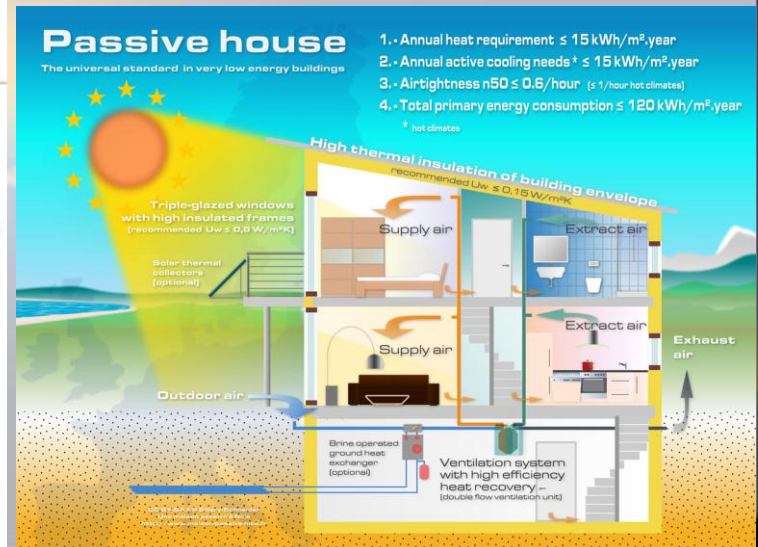
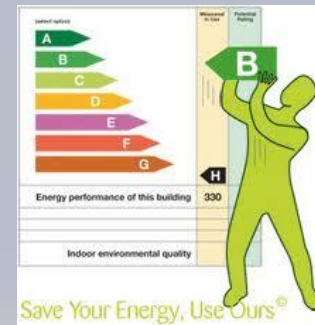
Mesazh I ri

ENERGYSHIELD.

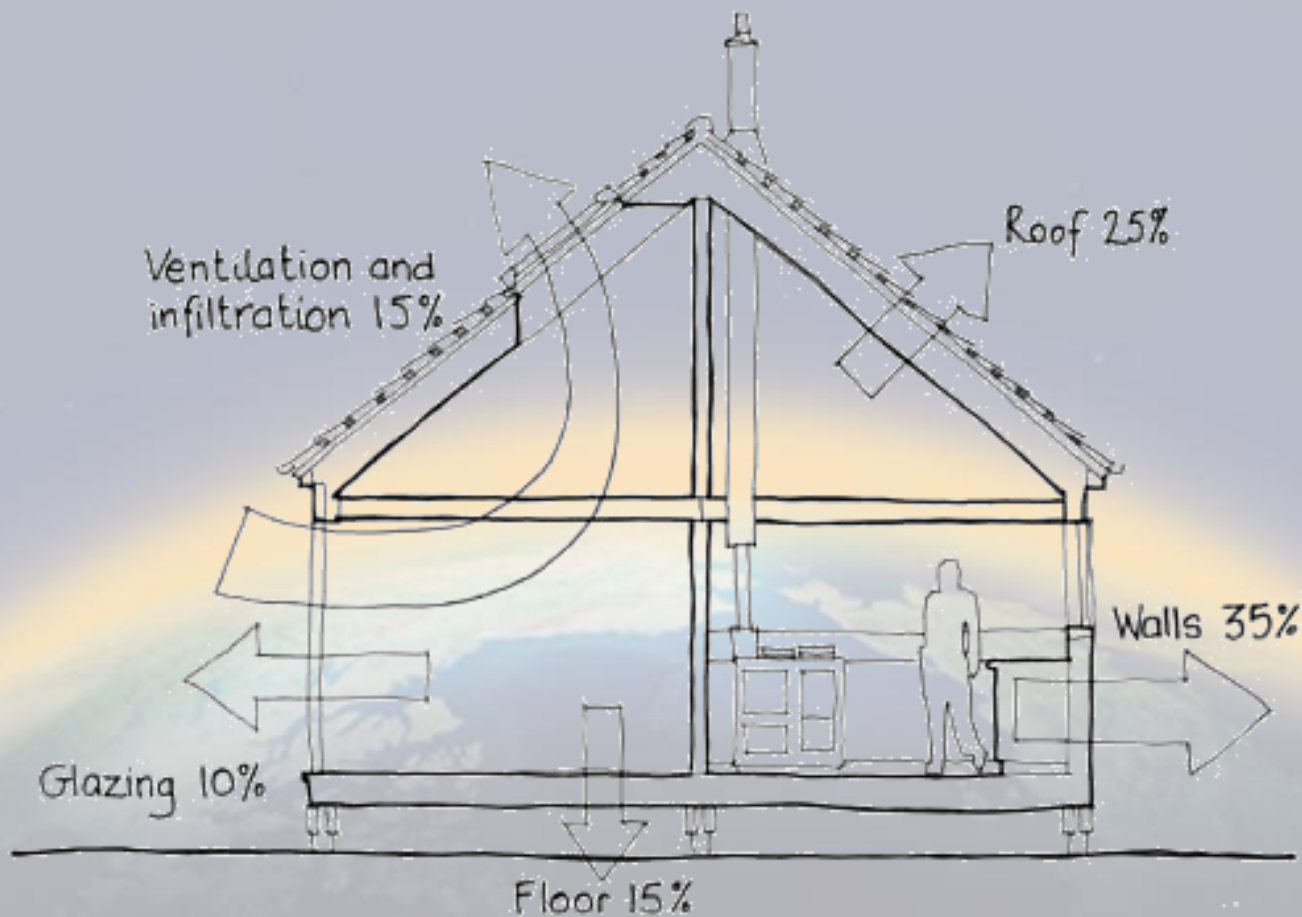


Banesa Pasive

0



Humbjet e nxehtesise ne banesa ...



$$R = (m^2 \cdot K) / W \text{ ή } (m^2 \cdot h \cdot ^\circ C) / kcal$$



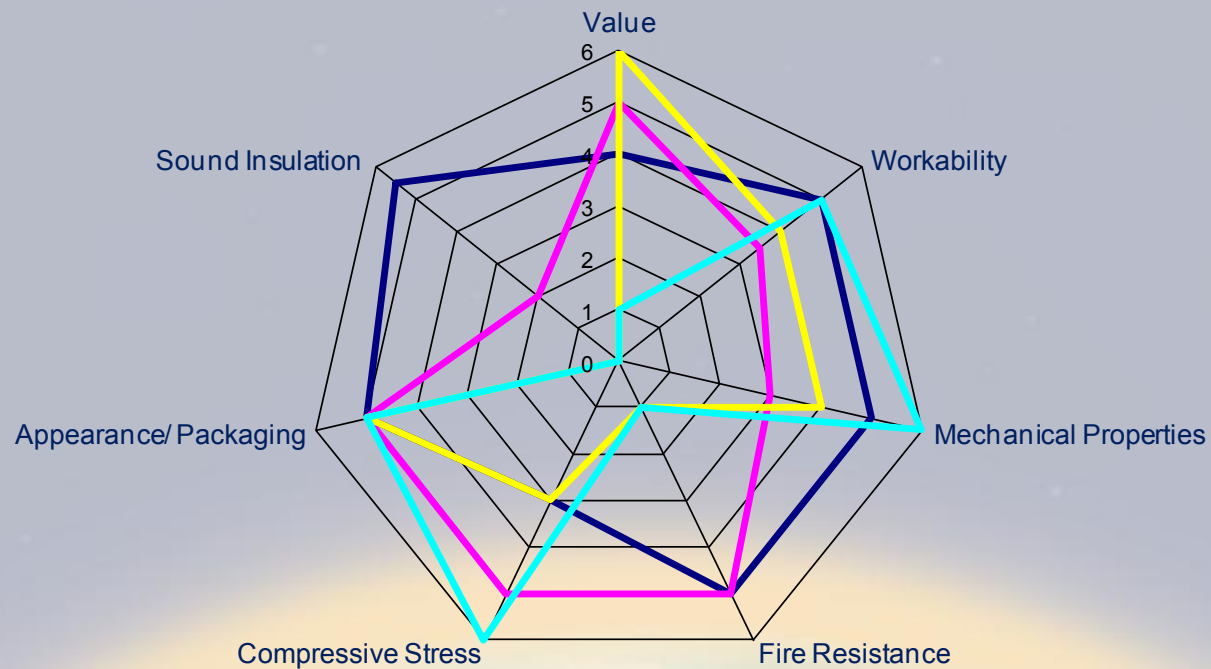
ENERGYSHIELD.

Materialet Izoluese



Materialle Izolimi Termik

Materiali	Dendësia ρ [kg/m ³]	Percjellshmeria Termike λ [W/m K]
Polisterol Ekspans EPS	15 - 30	0,040
Polistiren I presuar XPS	25 - 35	0,028 – 0,032
PIR	30 - 35	0,025 – 0,030
PUR	35 - 50	0,030 – 0,035
Lesh Xhami	18 - 40	0,035 – 0,050
Lesh Guri	30 - 200	0,032 – 0,025



— Stonewool — Glasswool — EPS — XPS

Materiali	Organik			Inorganik	
	EPS	XPS	PIR	Lesh Guri	Lesh Xhami
Percjellshmeria Termike (W/mK)	0,040 – 0,048	0,033 – 0,038	0,040	0,033 – 0,035	0,035 – 0,040
Klasifikimi ndaj Zjarrit	F	E	F	A1	A1
Fortesia ne Shtypje	E mire	Shume e mire	J.A.	E mire *	E dobet
Absorbimi ndaj ujit	I mire	Shume I mire	J.A.	I mire	I dobet
Ulja e zhurmave	0	0	0	Shume e mire	Shume e mire
Veti Mekanike	E mire	Shume e mire	J.A.	E mire *	E dobet
Ventilimi Pasiv	0	0	J.A.	Shume I mire	I mire

J.A. = Jo I Aplikueshem

*= Varet nga orientimi I fibrave

Rendesia e markimit "CE"

Karakteristikat Teknike	Vlera	Standarti EN
Klasifikimi ndaj zjarrit	A1, A2 B,C,D,E,F	EN 13501-2
Percjellshmeria Termike	Maksimum (W/mK) (pas vjetersimit per materialet "shkume")	EN 12667 & EN 12939
Sforcimi ne Shtypje	Min (kPa)	EN 826
Absorbimi I Ujit	% v.v.	EN 12087 –EN 1609 – EN 12088
Vetite Mekanike	Min (kPa) or N	EN 1608 – EN 1607 – EN 12430 – EN 12431

Testet e mesiperme jane te detyrueshme. Ka dhe teste te tjera qe nuk jane te detyrueshme por qe mund te behen nga prodhuesi.

The logo for Fibran, featuring the word "fibran" in a bold, italicized, white sans-serif font. A horizontal orange bar is positioned above the letters "i" and "b". A registered trademark symbol (®) is located at the top right of the word.

fibran®

ENERGY**SHIELD**.

Çertifikimi

Çertifikimi



All FIBRANgeo stonewool insulation products conform to the European Directive 89/106/EEC since 2004. In compliance with the above Construction Products Directive, all types of FIBRANgeo stonewool products hold the CE marking and are in conformity with the European Norm EN 13162, which refers to mineral wool insulation products used in building applications. In accordance with the aforementioned European Standard, every insulation product acquires a designation code which declares its technical characteristics.

Te gjitha produktet e leshit te gurit FIBRANgeo jane konform Direktives Europiane 89/106/EEC qe prej 2004.

For example:

MW - EN 13162 – Ti - CS(10)i – TRi - PL(5)i – CPi – WS - WL(P) – MUi – SDi - AFri – AWi

- MW – Factory made mineral wool insulation material, industrially manufactured from molten rock, slag or glass.
- EN 13162 – The European Standard number.
- Ti – Thickness Tolerances. Classes for thickness tolerances from the nominal thickness (e.g. Class T4 : - 3mm + 5mm).
- CS(10)i – Minimum compressive stress at 10% thickness deformation (kPa).
- TRi – Minimum tensile strength perpendicular to faces (kPa).
- PL (5)i – Point Load (N). Minimum compressive load (applied on a small area of 50 cm²) at 5 mm thickness deformation.
- CPi – Compressibility (mm). The max. difference between the thickness dL, under a light load of 0.25 kPa, and the thickness dB, under a load of 2 kPa (+ - 48 kPa).
- WS – Short Term Water Absorption (kg/m²) with partial immersion in water for 24 hours <1 kg/m².
- WL(P) – Long Term Water Absorption (kg/m²) with partial immersion in water for 28 days <3 kg/m².
- MUi – Water Vapour Transmission. The maximum ratio (factor μ) of water vapour diffusion resistance of the material to the resistance of an equal thickness of air.
- SDi – Dynamic Stiffness (MN/m³). The maximum ratio (factor s') of dynamic compressive stress to dynamic change in thickness.
- AFri – Air flow resistivity (kPa s/m²). The minimum air flow resistance coefficient of 1m thickness material >5 kPa s/m².
- AWi -Weighted Sound Absorption Coefficient. The value of the sound absorption coefficient α_w in the frequency of 500Hz, measured on the standard weighted sound absorption curve.



Gesellschaft



Forschungsinstitut für Wärmeschutz e.V.
München



EC Certificate of Conformity

Reg.-No.: K1-0751-CPD-223.0-01-01/13

In compliance with the Directive 89/100/EEC of the Council of European Communities of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to the construction products (Construction Products Directive - CPD), amended by the Directive 93/68/EEC of the Council of European Communities of 28 April 1998, it has been stated that the

construction product **FIBRANgeo**
mineral wool products according to EN 13162
(details see annex)

placed on the market by **FIBRAN S.A. Insulating Materials Industry**
56010 Thessaloniki
GREECE

and produced in the factory **Terpni Serres / Greece**

is submitted by the manufacturer to a factory production control and to the further testing of samples taken at the factory in accordance with a prescribed test plan and that the approved bodies:

**Forschungsinstitut für Wärmeschutz e.V. München - Identification No. 0751 and
Materialprüfanstalt für das Bauwesen Hannover - Identification No. 0764**

performed the initial type testing for the relevant characteristics of the product, the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control and an audit-testing of samples taken at the factory, on the market or at the construction site.

This certificate attests that all provisions concerning the attestation of conformity and the performances described in Annex ZA of the standard

EN 13162:2008

were applied and that the product fulfils all the prescribed requirements.

This certificate was first issued on 30 March 2011 and remains valid as long as the conditions laid down in the harmonised technical specification in reference or the manufacturing conditions in the factory or the FPC itself are not modified significantly.

Gräfelling, 24 January 2013

Head of Certification Body



W. Albrecht

Dipl.-Ing. (FH) Wolfgang Albrecht

CE - FIBRANgeo

label

fibran[®]GEO		Product Code BP-70 21-62-6236-031	
CE 0751	ΠΑΧΟΣ - THICKNESS [mm] 80	ΜΗΚΟΣ - LENGTH [mm] 1200	
		ΠΛΑΤΟΣ - WIDTH [mm] 600	
LOT NUMBER 521281088C	ΤΕΜ.ΣΥΣΚΕΥΑΣΙΑ - PIECES/PACKAGING 60	ΣΥΣΚΕΥΑΣΙΑ - PACKAGING [m ²] 43,2	
SSCC: 152053810002708808			
			
EN 13162	REACTION TO FIRE - ΑΚΑΥΣΤΟΤΗΤΑ (EN 13501):	A1	
	THERMAL CONDUCTIVITY - ΣΥΝΤΕΛΕΣΤΗΣ ΑΓΩΓΙΜΟΤΗΤΑΣ (λ _D):	0,039 W/(m·K)	
	THERMAL RESISTANCE - ΑΝΤΙΣΤΑΣΗ ΘΕΡΜΟΠΕΡΑΤΟΤΗΤΑΣ (R _D):	2 (m²·K)/W	
MW-EN 13162-T7-CS(10)70-TR20-PL(5)700-WS-WL(P)-MU1-SD35-CP2-AW095-AFr60			
ΠΑΡΑΓΕΤΑΙ ΑΠΟ ΤΗΝ FIBRAN Α.Ε., ΤΕΡΠΙΝΗ ΖΕΡΡΩΝ PRODUCED BY FIBRAN SA, TERPNI SERRES, GREECE www.fibran.gr e-mail: fibran@fibran.gr			
fibran	12	K1-0751-CPD-223.0-01-01/12	

Forschungsinstitut für Wärmeschutz e.V.
München



Annex to EC Certificate of Conformity

Reg.-No.: K1-0751-CPD-223.0-01-01/13

construction product **FIBRANgeo**
mineral wool products according to EN 13162

placed on the market by **FIBRAN S.A. Insulating Materials Industry**
56010 Thessaloniki

and produced in the factory **Terpni Serres / Greece**

At the date of issue of the annex, the attestation of conformity relates on the following products without facings:

TYPES	FACINGS	THICK- NESS	THICK- NESS TOLER- ANCES	THERMAL CONDUCT- IVITY λ_0	REACTION TO FIRE	SHORT WATER ABSORP- TION	LONG WATER ABSORP- TION	AIR FLOW RESIS- TIVITY	COMP- RESSIVE STRESS	SHEAR STRENGTH	TENSILE STRENGTH PERP. TO FACES	TENSILE STRENGTH PARALEL TO FACES	COMP- RESSI- BILITY	POINT LOAD	DYNAMIC STIFFNESS	WEIGHTED SOUND ABSORPTION COEFFICIENT α_w				
		[mm]		[W/(m·K)]	EN 13501-1 [-]	EN 1609 [kg/m²]	EN 12087 [kg/m²]	EN 29053 [(kPa s)/m²]	EN 826 [kPa]	EN 12090 [kPa]	EN 1607 [kPa]	EN 1608 [kPa]	EN 12431 [mm]	EN 12430 [N]	EN 29052-1 [MN/m³]	ISO 11654 [-]				
B-030	AX, AL, YM, YA, XA	40-160	T4	0,035	A1	< 1	< 3	10				10				1 [50mm]				
B-040		40-160	T4					15				12				1 [50mm]				
B-050		40-160	T4					30				14				1 [50mm]				
B-060		30-160	T4					35				16				1 [50mm]				
R-040	AX, AL	30-80	T4	0,033				15				5			1 [50mm]					
R-050		30-80	T4					30				5				1 [50mm]				
B-570	AX, AL, YM, YA, XA	30-160	T4					50								1 [50mm]				
B-080		20-160	T4					55								1 [50mm]				
B-090		20-160	T4					60	5							1 [50mm]				
B-001		70-160	T4						10						5 [80 mm]	1 [50mm]				
B-021		20-160	T4						10											
														150	10 [50 mm]	0,95 [50mm]				

Forschungsinstitut für Wärmeschutz e.V.
München



TYPES	FACINGS	THICK- NESS	THICK- NESS TOLER- ANCES	THERMAL CONDUCT- IVITY λ_D	REACTION TO FIRE	SHORT WATER ABSORP- TION	LONG WATER ABSORP- TION	AIR FLOW RESIS- TIVITY	COMP- RESSIVE STRESS	SHEAR STRENGTH	TENSILE STRENGTH PERP. TO FACES	TENSILE STRENGTH PARALLEL TO FACES	COMP- RESSI- BILITY	POINT LOAD	DYNAMIC STIFF- NESS	WEIGHTED SOUND ABSORPTION COEFFICIENT α
		[mm]		[W/(m·K)]	EN 13501-1 [-]	EN 1609 [kg/m²]	EN 12087 [kg/m²]	EN 29053 [(kPa·s)/m²]	EN 826 [kPa]	EN 12090 [kPa]	EN 1607 [kPa]	EN 1608 [kPa]	EN 12431 [mm]	EN 12430 [N]	EN 29052-1 [MN/m²]	ISO 11654 [-]
B-051	AX, AL, YM, YA, XA	20-120	T6	0,035	A1	< 1	< 3	60	20				CP2	200	10 [50mm]	0,95 [50mm]
B-571		20-120							25				CP2	350	9 [80mm]	0,95 [50mm]
B-002		20-120							50				CP2	550	23 [50 mm]	0,95 [50mm]
BP-001		40-160	T7	0,036					20		7,5		CP2	250	18 [50 mm]	0,95 [50mm]
BP-021		40-160							30	20	10		CP2	400	20 [50mm]	0,95 [50mm]
BP 30		40-160							30	20	10		CP2	400	20 [50mm]	0,95 [50mm]
BP-051		40-160							40	20	15		CP2	550	27 [50mm]	0,95 [50mm]
BP 40		40-160							40		15		CP2	550	27 [50mm]	0,95 [50mm]
BP 50		40-160							50		15		CP2	600	32 [40mm]	0,95 [50mm]
BP 70		40-160							70				CP2	700	35 [50mm]	0,95 [50mm]
BP HD		40-60							60		20		CP2	600	30 [50 mm]	0,95 [50mm]
		70-100											CP2		25 [80 mm]	0,95 [50mm]
		110-160											CP2		15 [140mm]	0,95 [50mm]
													CP2			

Facings:

AX	Aluminium craft
AL	Aluminium foil
YM	Black glass tissue
YA	White glass tissue
XA	Craft paper

Gräfelfing, 24 January 2013

Head of Certification Body



W. Albrecht

Dipl.-Ing. (FH) Wolfgang Albrecht

Declaration of Performance



DoP Number

- 1 Unique identification code of the product type
- 2 Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR
- 3 Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer
- 4 Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5)
- 5 Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2)
- 6 System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V.
- 7 In case of the declaration of performance concerning a construction product covered by a harmonised standard (Name and identification number of the notified body, if relevant).

QR-2025-001

FIBRANtype B-570
B-570

Thermal insulation for buildings (TIB)

FIBRAN S.A. 56010, Thessaloniki, Greece

not relevant

AVCP - System 1

FW No. 0751

FW No. 0751 performed the determination of the product type, the initial inspection of the manufacturing plant and of factory production control under system (description of the third party tasks as set out in Annex V). The continuous surveillance, assessment and evaluation of factory production control issued (certificate of constancy of performance, certificate of conformity of the factory production control, test/calculation reports - as relevant). Notified certification body No. 0751 issued the certificate of constancy of performance for reaction to fire. Notified testing laboratory No. 7456 performed the test reports for the other relevant declared characteristics.

Harmonised standard

EN 13162:2012

8 Declared performance

Essential characteristics	Performance	Abbreviation	Unit	Declared performance
Reaction to fire	Reaction to fire	RF	Euroclass	A1
Release of Dangerous Substances	Release of Dangerous Substances			NPD
Acoustic absorption index	Sound absorption	α'	MN/m ²	NPD
	Dynamic stiffness	Δ	mm	NPD
	Thickness	d_a	mm	NPD
Impact Noise Transmission Index	Compressibility	c	mm	NPD
	Air flow resistivity	AF_1	kPa.s/m ²	50
Direct airborne sound insulation index	Air flow resistivity	AF_1	kPa.s/m ²	50
Continuous glowing combustion	Continuous glowing combustion			NPD
Thermal Resistance	Thermal Resistance	R_{s0}	m ² K/W	see attached table
	Thermal Conductivity	λ_0	W/m K	0,033
	Thickness	d_0	mm	30-160
	Thickness Class	T	Class	T4
Water Permeability	Short term Water absorption	W_{s0}	kg/m ²	<1
	Long term water absorption	W_{l0}	kg/m ²	<3
Water vapour permeability	Water vapour transmission	t or Z	m ² h.Pa/mg	1
Compressive strength	Compressive stress or compressive	CS	kPa	NPD
	Point Load	F_p	N	NPD
Duration of reaction to fire against heat, weathering, ageing/degradation	Reaction to fire	RF	Euroclass	A1
Duration of thermal resistance against heat, weathering, ageing/degradation	Thermal Resistance	R	m ² K/W	see attached table
	Thermal Conductivity	λ	W/m K	0,033
	Duration Characteristics	d	mm	30-160
Tensile/Flexural strength	Tensile Strength perpendicular to faces	TR	kPa	NPD
Duration of compressive strength against heat, weathering, ageing/degradation	Compressive creep	Xct, Xt	mm	NPD

The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

Thickness	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
R (m ² K/W)	0,4	0,56	0,72	0,88	1,04	1,20	1,36	1,52	1,68	1,84	2,00	2,16	2,32	2,48	2,64

Name
Function

Stella Chadiankou
R&D - Quality Assurance Manager

Place
Date
Signature

Thessaloniki
01/07/2013

Declaration of Performance



DoP Number

- 1 Unique identification code of the product type
- 2 Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR
- 3 Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer
- 4 Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5)
- 5 Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2)
- 6 System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V.
- 7 In case of the declaration of performance concerning a construction product covered by a harmonised standard (Name and identification number of the notified body, if relevant).

GR-1010-001

FIBRANtype ETICS GF
ETICS GF 50-60

Thermal insulation for buildings, External Thermal Insulation Systems

XPS-EN 13164-T3-CS (10Y)300-D5(T4)-TR400-WL(T)1,5
FIBRAN S.A. 56010, Thessaloniki, Greece

not relevant

AVCP - System 3, System 2+

FW No. 0751, TÜV HELLAS No. 0655

Harmonised standard

EN 13164:2008, ETAG005

8 Declared performance

Essential characteristics	Performance	Unit	Declared performance
Thickness	d_0 (mm)	mm	50 - 60
Thickness Class	T		T3
Thermal Resistance	R_{s0} (m ² K/W)		see below table
Thermal Conductivity	λ_0 (W/m K)		0,033
Reaction to fire	Reaction to fire		Euroclass
Release of Dangerous Substances	Release of Dangerous Substances		NPD
Acoustic absorption index	Sound absorption		NPD
Continuous glowing combustion	Continuous glowing combustion		NPD
Water Permeability	long term water absorption by total immersion	WL(T) (vol. %)	1
	long term water absorption by diffusion	WD(V) (vol. %)	NPD
Water vapour permeability	Water vapor diffusion resistance factor	MU	50
Compressive strength	Compressive stress or compressive strength	CS (10Y) (kPa)	300
Tensile/Flexural strength	Tensile Strength perpendicular to faces	TR (kPa)	500
Duration of reaction to fire against heat, weathering, ageing/degradation	Reaction to fire	Euroclass	E
Duration of thermal resistance against heat, weathering, ageing/degradation	Thermal Resistance	R_{s0} (m ² K/W)	see below table
	Thermal Conductivity	λ_0 (W/m K)	0,033
	freeze-thaw resistance after long term water diffusion test	FTCD	NPD
	freeze-thaw resistance after long term water absorption by total immersion	FTCI	NPD
	dimensional stability under specified temperature and humidity conditions	DS	NPD
	Deformation under specified compressive load and temperature conditions	DLT	NPD
Duration of compressive strength against heat, weathering, ageing/degradation	Compressive creep	CC (21,5/50)	NPD

Thickness	30	60
R_{s0} (m ² K/W)	1,5	1,8

Name
Function

Stella Chadiankou
R&D - Quality Assurance Manager

Place
Date
Signature

Thessaloniki
01/07/2013

This product contains Hexabromocyclopentadiene (declaration according to CPR requirement Article 6 Paragraph 5)



ENERGY**SHIELD.**

Produktet dhe Aplikimi



Llojet e Çative Metalike

Me çati perkufizohet cdo element fundor I ndertesen me pjerresi mbi 2%.

Aplikimi I Çatise percaktohet nga

- Pozicioni I materialit izolues
- Lloji I nenshtreses (struktures se çatise)

MATERIALI IZOLUES

- Mbi strukture (Çati e ngrohte)-
the insulation is taking advantage of the thermal conductance of the structure
- Nen/ne strukture (Çati e ftohte)–
the insulation do not take advantage the thermal conductance of the structure

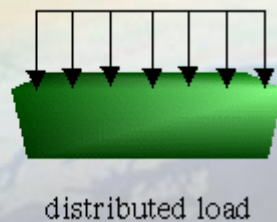
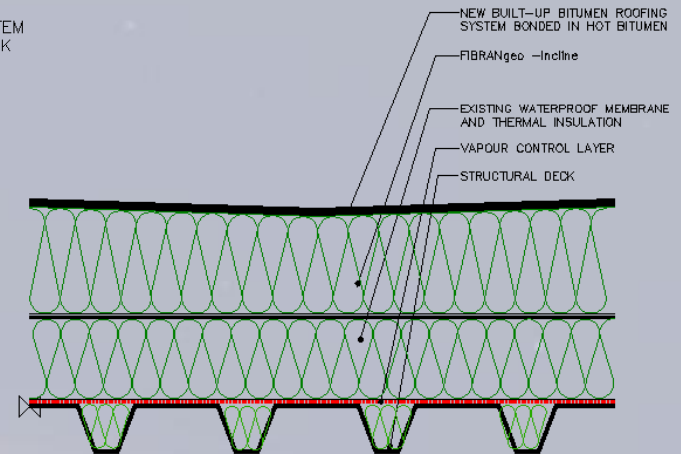
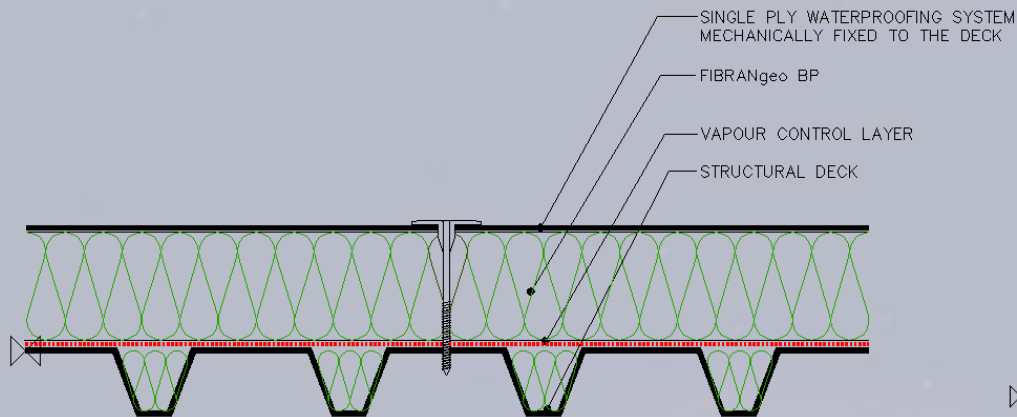
LLOJI I STRUKTURES

- Konstruksion Metalik
- Konstruksion Beton arme
- Konstruksion Druri

Aplikimi – Perzgjedhja e Materialit

	BP 50	BP70	BP-BIT	BPHD	BP40	BP30
Izolim I jashtem I çative te betonit ose metalike me membrane polimeri hidroizoluese mbi izolim	✓	✓		✓	✓	✓
Izolim i jashtem i cative te betonit ose metalike me membrane bituminoze hidroizoluese mbi izolim			✓			
Izolim ne çati me shtrese notuese betoni	✓	✓		✓	✓	✓
Izolim I brendshem I ekspozuar I çative metalike	✓	✓		✓	✓	✓

Disa pika per ti patur parasysh



Produkte te veçante

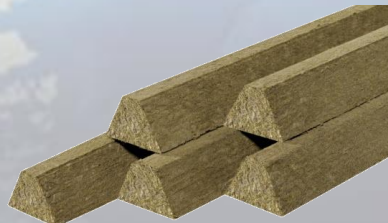
- Pllaka te pjerreta



Me nje ose dy pjerresi

Kjo eshte nje zgjidhje e gatshme duke u bazuar te dimensionet e konstruksionit.

- Shirita trapezoidal FIBRANgeo SI-080



Krahasim I Produkteve

PRODUKTI	λ (W/mk)	CS (10/Y)	PL (5)	Ngjeshmeria	Rezi. ne Terheqje
FIBRANgeo BP 70	0.039	70 kPa	700 N	CP2	20 kPa
Knauf DDP	0.039	70 kPa	600 N	CP5	10 kPa
FIBRANgeo BP 50	0.038	50 kPa	600 N	CP2	15 kPa
Knauf DDP RT	0.038	50 kPa	500 N	CP5	10 kPa
MONROCKMAX E	0.038	40 kPa	600 N		10 kPa
FIBRANgeo BP 40	0.039 ?	40 kPa	550 N	CP2	15 kPa
Knauf DDP N	0.038	40 kPa	350 N	CP5	7.5 kPa
HARDROCK ENERGY	0.036	30 kPa	500 N		10 kPa
Knauf DDP K	0.037	30 kPa	300 N	CP5	7.5 kPa
FIBRANgeo BP 30	0.036	30 kPa	400 N	CP2	10 kPa
knauf DDP U	0.039	60 kPa	550 N	CP5	10 kPa
FIBRANgeo BP HD	0.037/0.038 0.039	60 kPa	600 N	CP2	20 kPa

Nje shtrese apo Doping shtrese

Ne aplikimin me **DY** shtresa:

- * Nevojitet kontroll I lageshtires midis dy shtresave.
- * Rritet toleranca e gabimit te trashesise perfundimtare te shtreses, pasi tolerancat e trashesise se dy shtresave mblidhen bashke.

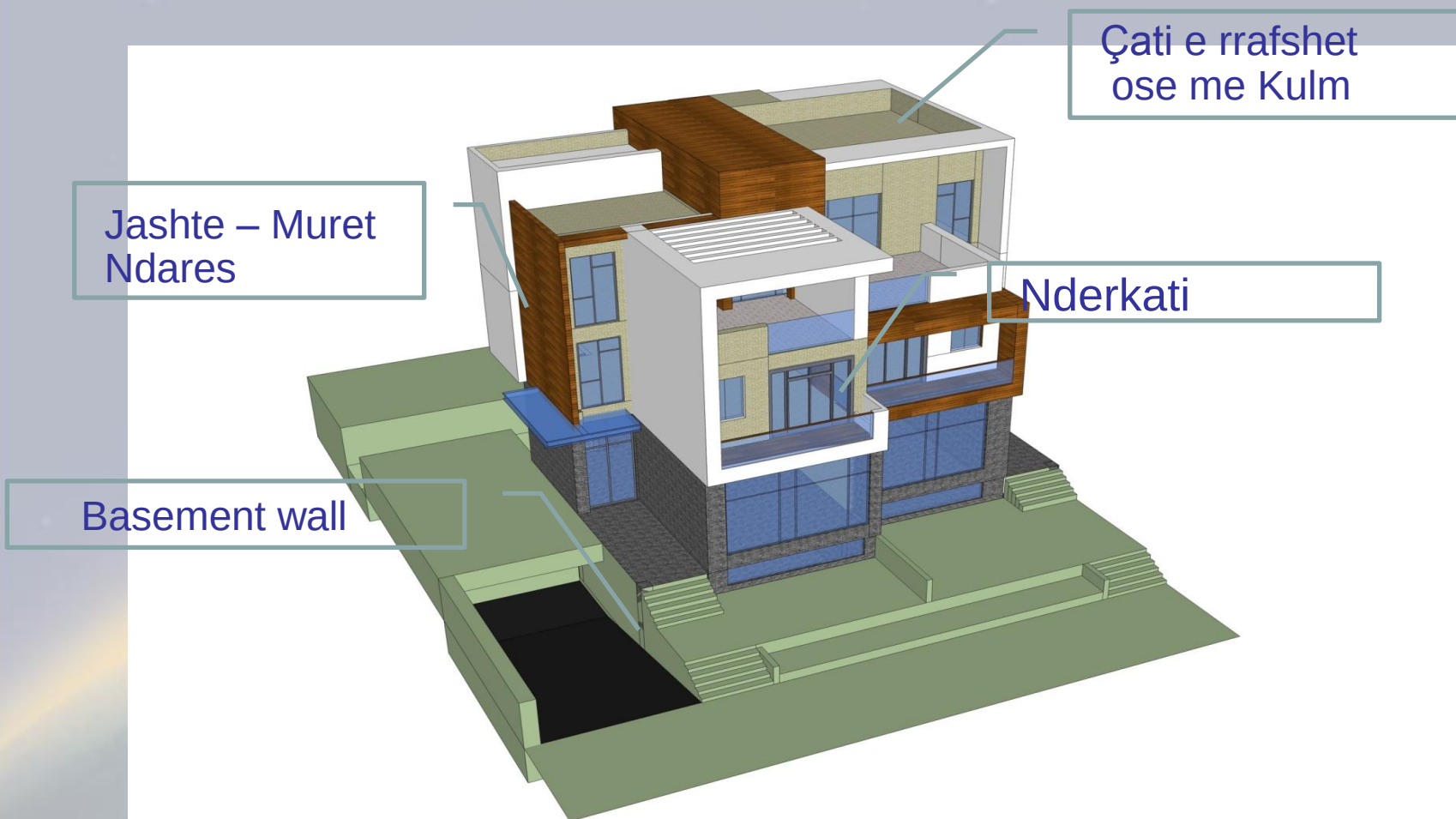
Argumenti per vendosjen kryq te dy shtresave per te shmangur urat termike nuk eshte I vlefshem:

- Urat termike pergjithesisht ndodhin ne kontaktet e dy materialeve te ndryshem, ne kende ose nderprerje te siperfaqes, por asnje nga keto nuk ndodh ne çatite e rrafsheta.
- Nga llogaritjet qe jane kryer me programe simuluese si "HEAT2" rezulton se humbjet ne keto zona jane thuajse zero (ne kemi shembuj nga projekte specifike).

Ne aplikimin me **NJE** shtrese:

- * Eshte nje trup me densitet dhe veti uniforme ne te gjithe masen.
- * Eshte nje shtrese me ngarkese pikesore 700N dhe rezistence 70kPa (avantazh ne perballimin e ngarkesave).

Izolimi I Ndertesave



Characteristics of the elements

Walls

Thermal Resistance (↑)
Fire Resistance (↑)
Sound Insulation (↑)

Roof – Flat Roof

Water absorption (↓)
Mechanical Properties (↑)
Thermal Resistance (↑)
Sound Insulation (↑)

- Floor

Water absorption (↓)
Mechanical Properties (↑)
Sound Insulation (↑)

- Basement

Water absorption (↓)
Mechanical Properties (↑)
Thermal Resistance (↑)

Vertical Building Elements

- **Basement**

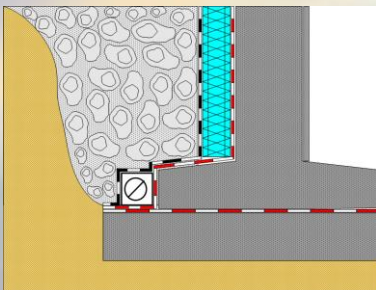
Water absorption (↓)

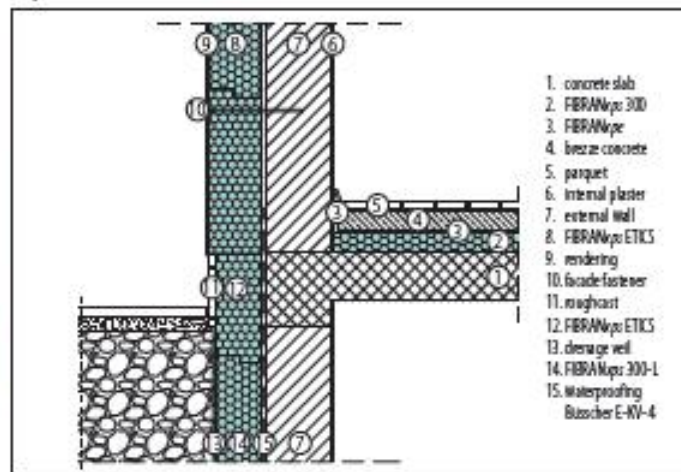
Mechanical Properties (↑)

Thermal Resistance (↑)

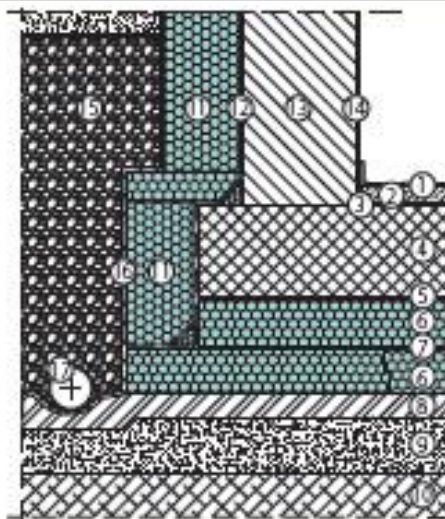
- **Proposed Material**

FIBRANxps 300L

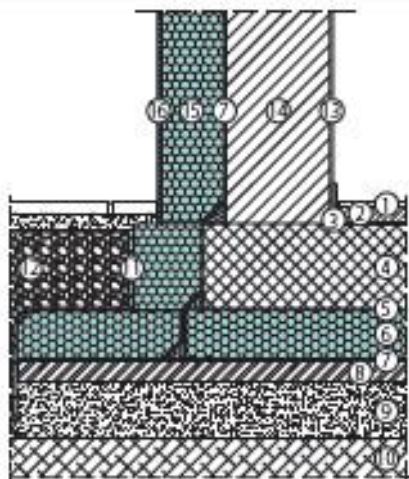




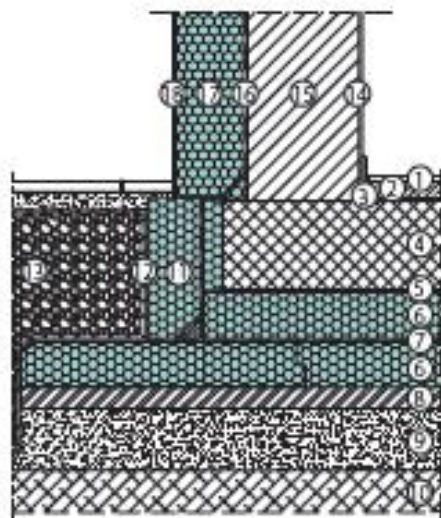
1. ceramic tiles
2. breeze concrete
3. FIBRANape
4. foundation slab
5. PE foil
6. FIBRANaps 400-L
7. Waterproofing Blüschner E-4 sk
8. levelling concrete
9. stone fill
10. soil
11. FIBRANaps 300-L
12. Waterproofing Blüschner E-KV-4
13. external wall
14. internal plaster
15. gravel
16. drainage veil
17. drainage tube



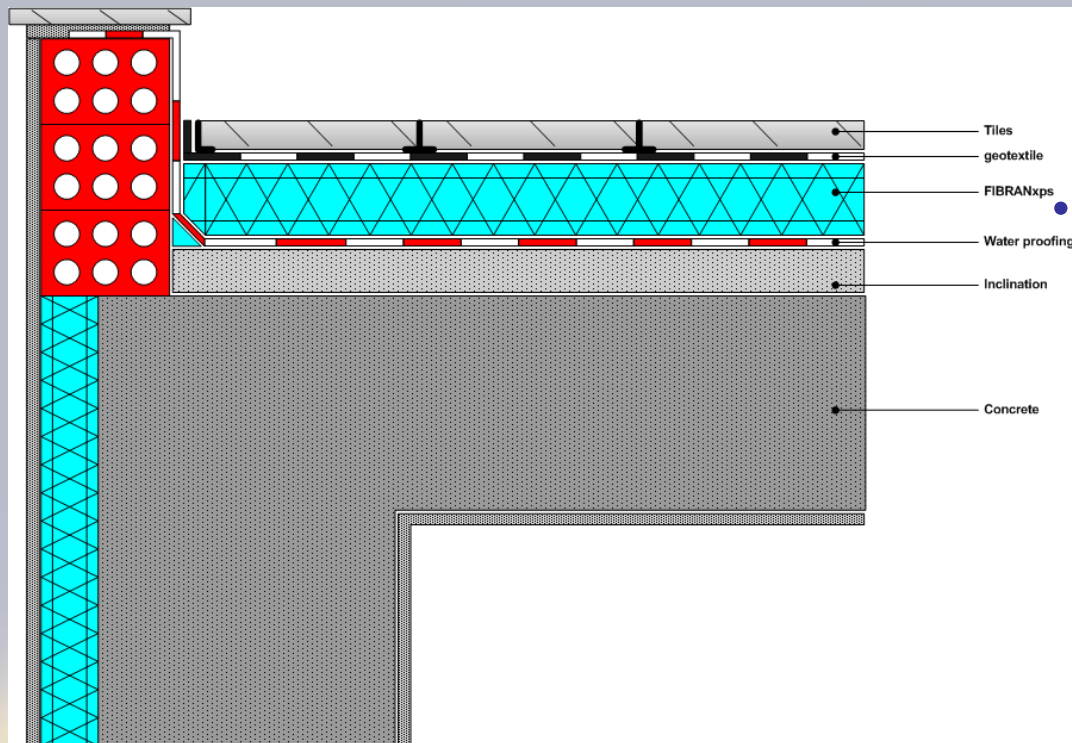
1. ceramic tiles
2. breeze concrete
3. FIBRANups sound insulation and tide up foil
4. foundation slab
5. PE foil
6. FIBRANups 400-L
7. Waterproofing Blöcher E-KV-4
8. levelling concrete
9. stone fill
10. soil
11. drainage veil
12. gravel
13. internal plaster
14. external wall
15. FIBRANups ETICS
16. rendering



1. ceramic tiles
2. breeze concrete
3. FIBRANups sound insulation and tide up foil
4. foundation slab
5. PE foil
6. FIBRANups 400-L
7. Waterproofing Blöcher E-4 sk
8. levelling concrete
9. stone fill
10. soil
11. FIBRANups 300-L
12. drainage veil
13. gravel
14. internal plaster
15. external wall
16. Waterproofing Blöcher E-KV-4
17. FIBRANups ETICS
18. rendering



Flat Roof



- **Flat Roof**

Water absorption (↓)

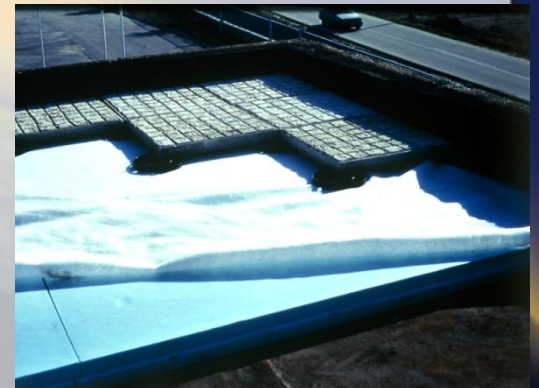
Mechanical Properties
(↑)

Thermal Resistance (↑)

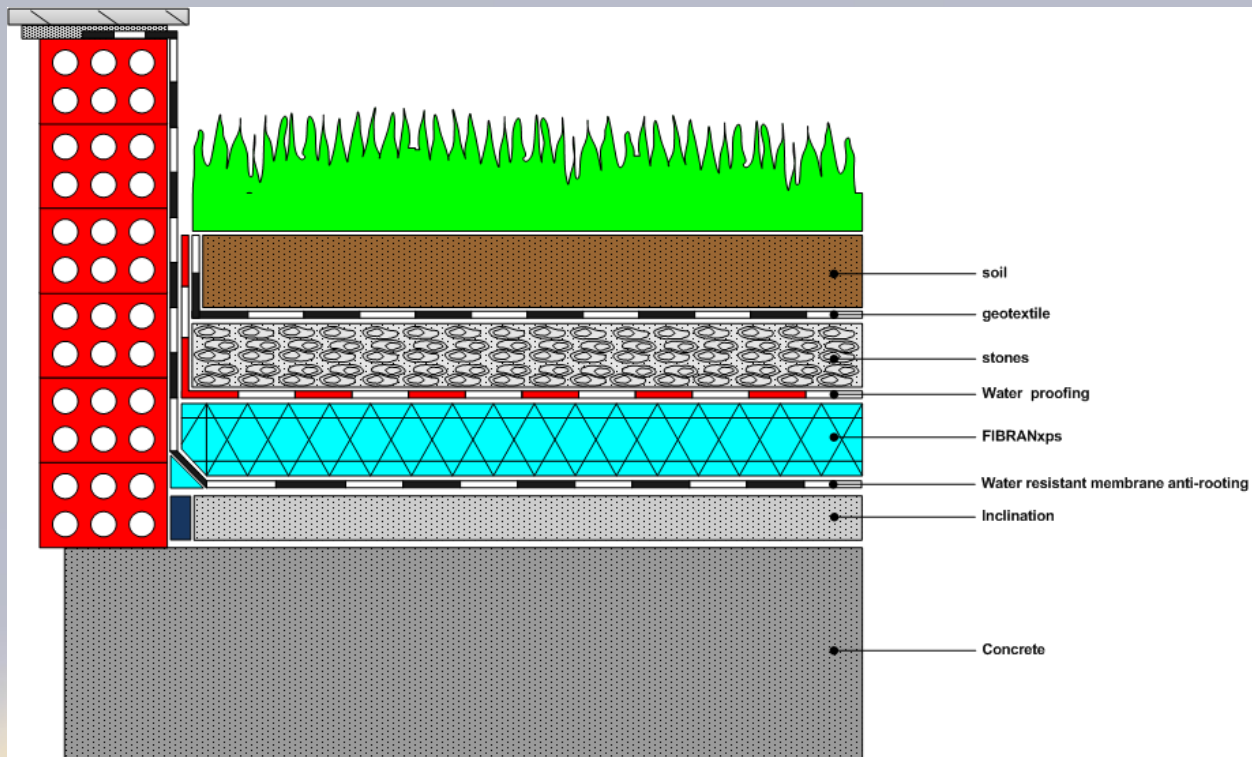
- **Proposed Material**

FIBRANxps 300 – 400 –
500 – 600 L

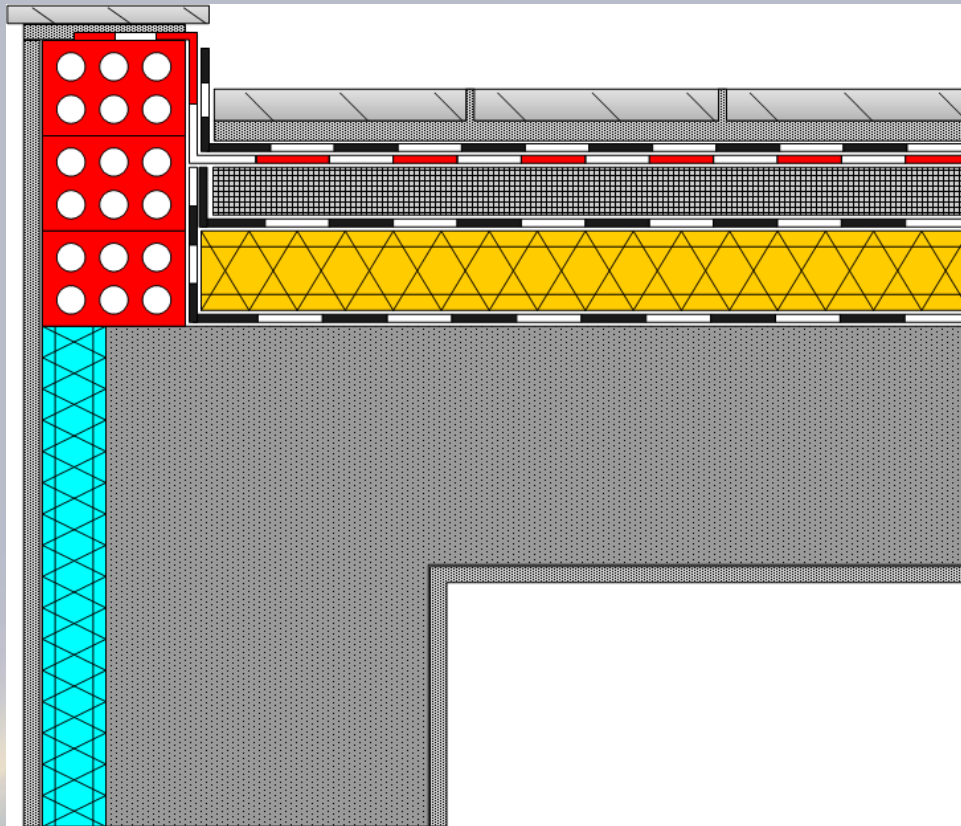
FIBRANxps Incline



Flat Roof

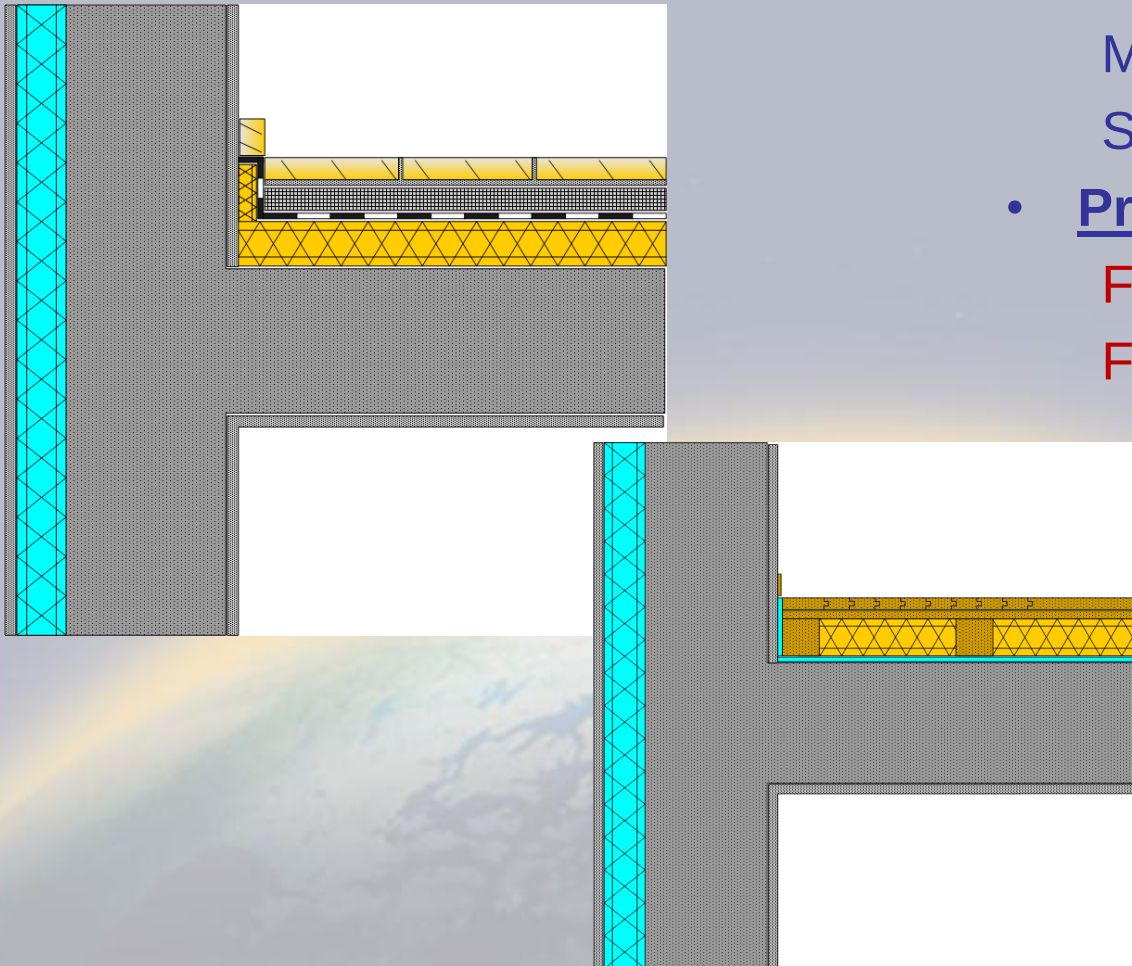


Flat Roof



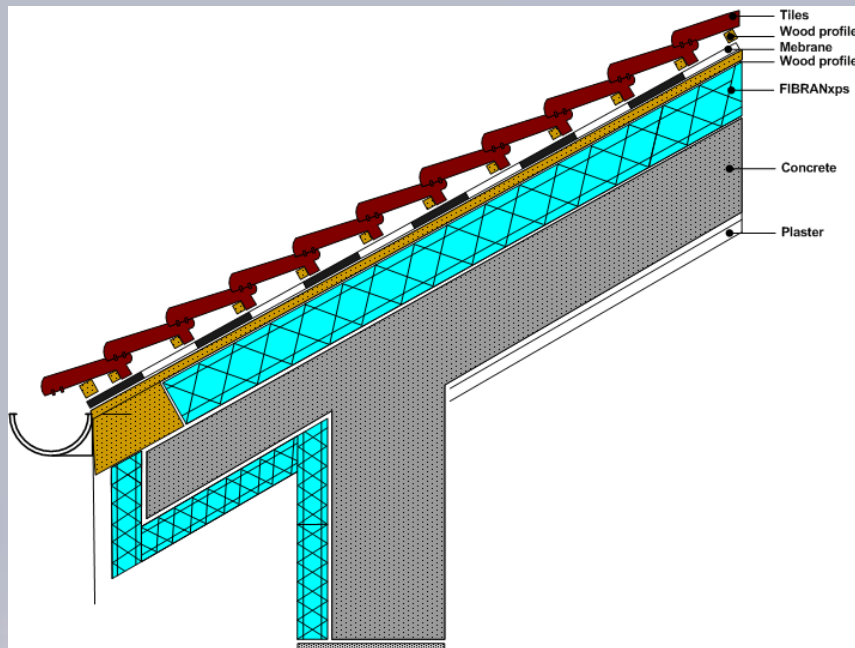
- **Flat Roof**
Water absorption (↓)
Mechanical Properties (↑)
Thermal Resistance (↑)
- **Proposed Material**
FIBRANgeo BP 50 – BIT
FIBRANgeo BP 70 – BIT

Floor Insulation



- Floor
 - Water absorption (↓)
 - Mechanical Properties (↑)
 - Sound Insulation (↑)
- Proposed Material
 - FIBRANgeo B-571
 - FIBRANgeo B-050

Pitch Roof



- Pitch Roof

Water absorption (↓)

Mechanical Properties (↑)

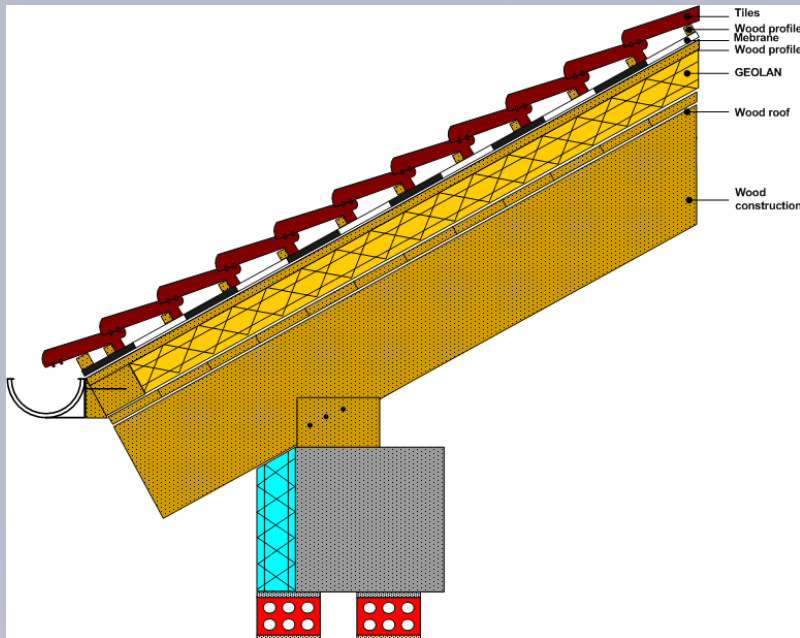
Thermal Resistance (↑)

Sound Insulation (↑)

- Proposed Material

FIBRANxps 300 I/L

Pitch Roof



- **Pitch Roof**

Water absorption (↓)

Mechanical Properties (↑)

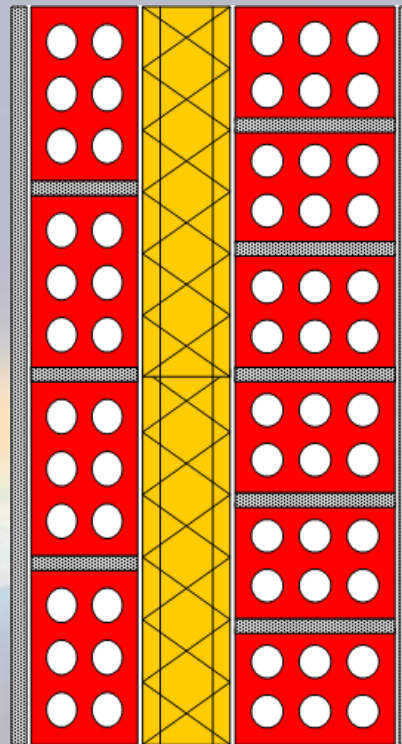
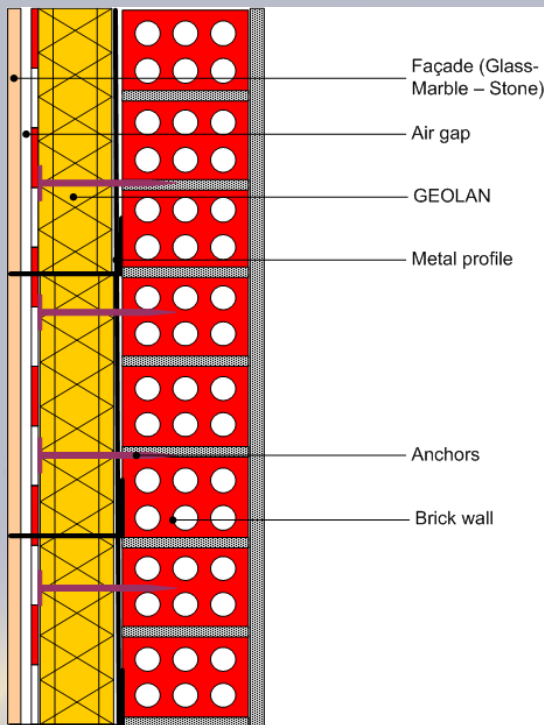
Thermal Resistance (↑)

Sound Insulation (↑)

- **Proposed Material**

FIBRANgeo B-001

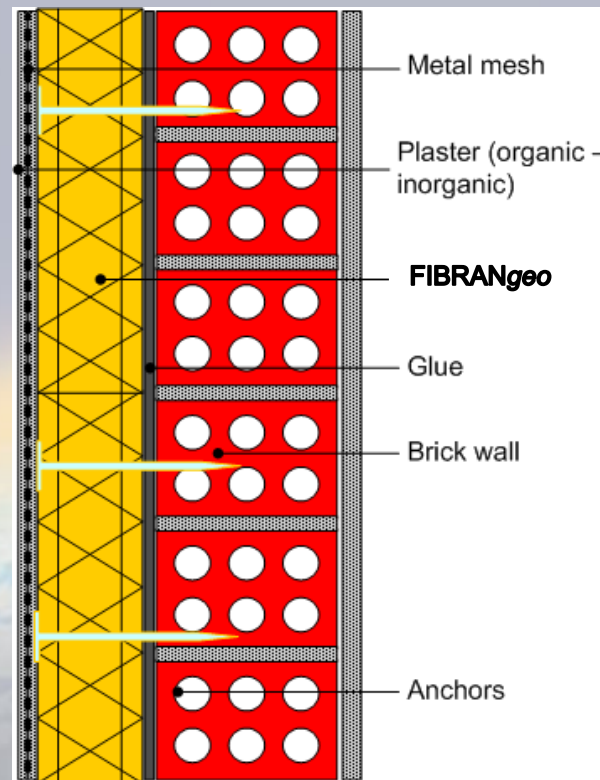
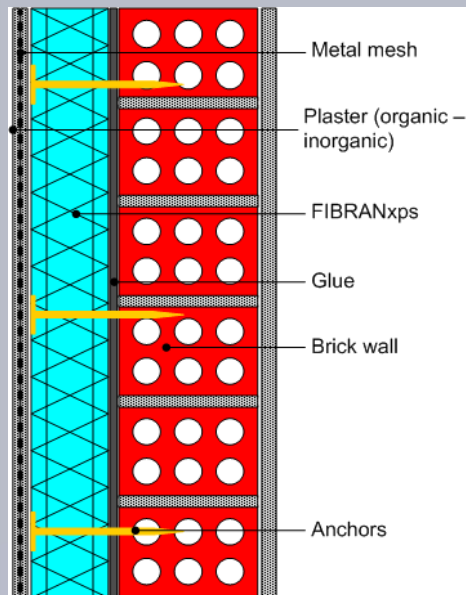
Vertical Building Elements



- Walls
 - Thermal Resistance (↑)
 - Fire Resistance (↑)
 - Sound Insulation (↑)
- Proposed Material
 - FIBRANgeo B-570- YM
 - FIBRANgeo B-050
 - FIBRANgeo B-001



Façade



- Facade

Thermal Resistance (↑)

Tensile Strength (↑)

Delamination Strength (↑)

- Proposed Material

FIBRANgeo BP-021

FIBRANxps ETICS GF

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ENERGYSHIELD.



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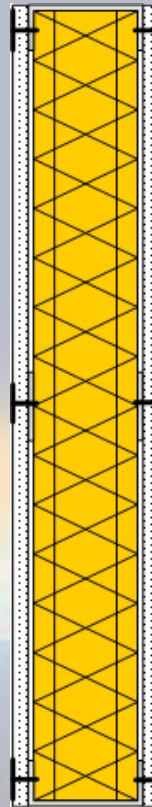
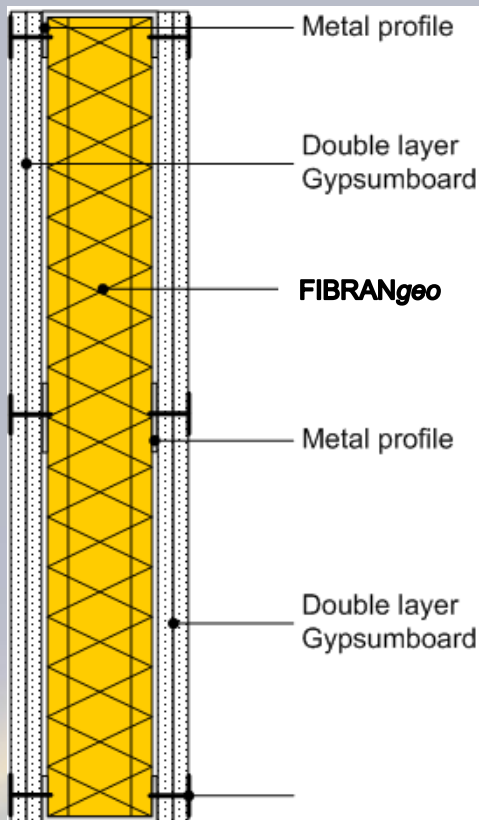


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Vertical Building Elements



- Walls
 - Thermal Resistance (↑)
 - Fire Resistance (↑)
 - Sound Insulation (↑)
- Proposed Material
 - FIBRANgeo B-050 (YM)
 - FIBRANgeo B-570

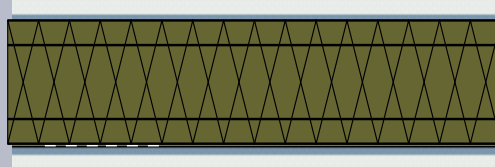
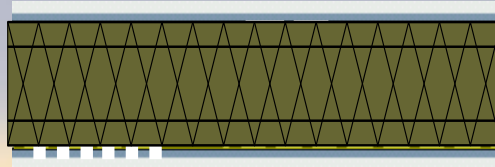
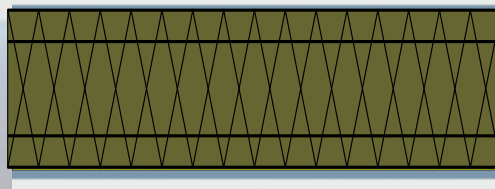


ENERGY **SHIELD.**

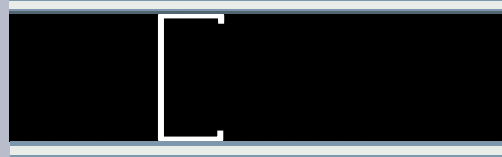
Sound Insulation



Dry Construstion

50mm **$R_w = 41 \text{ dB}$** **75mm** **$R_w = 44 \text{ dB}$** **100mm** **$R_w = 47 \text{ dB}$**

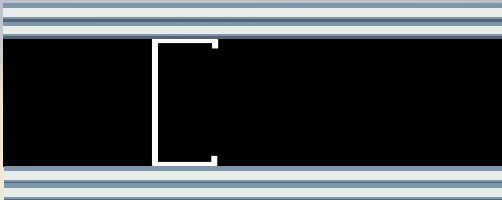
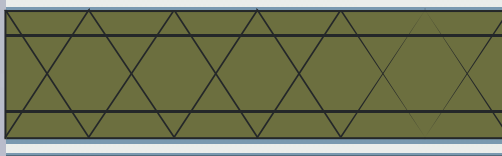
Dry Construction: With and Without insulation



$$R_w = 38 \text{ dB}$$



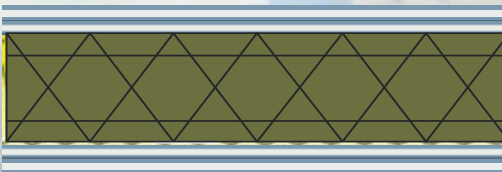
$$\underline{R_w = 47 \text{ dB}}$$



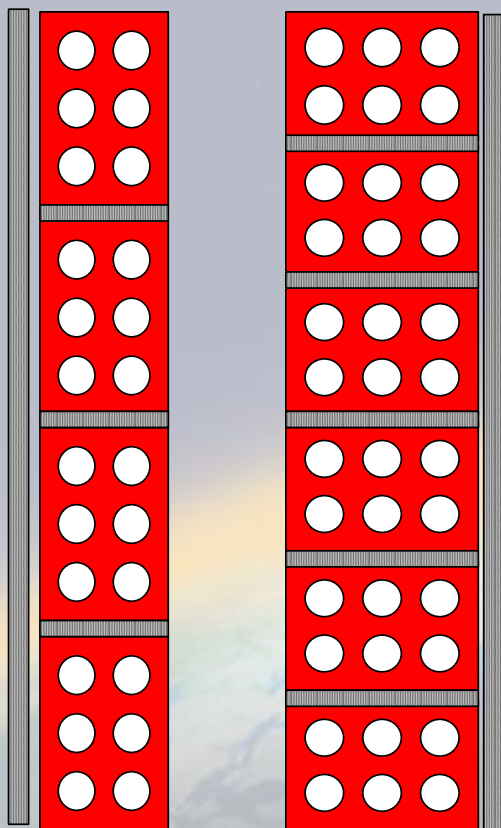
$$\underline{R_w = 48 \text{ dB}}$$



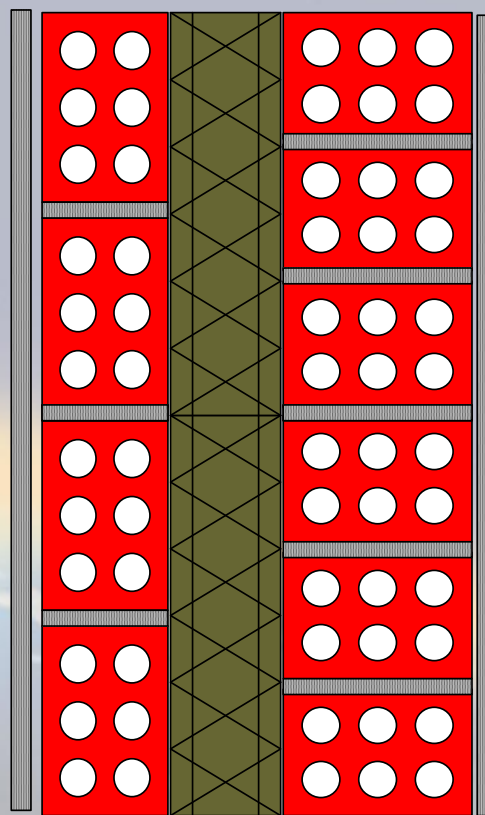
$$R_w = 56 \text{ dB}$$



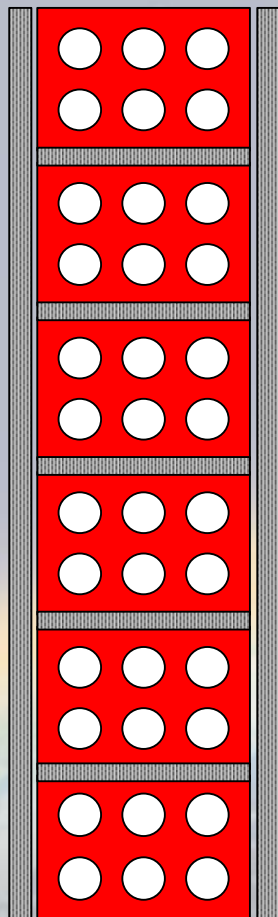
$R_w = 52 \text{ dB}$



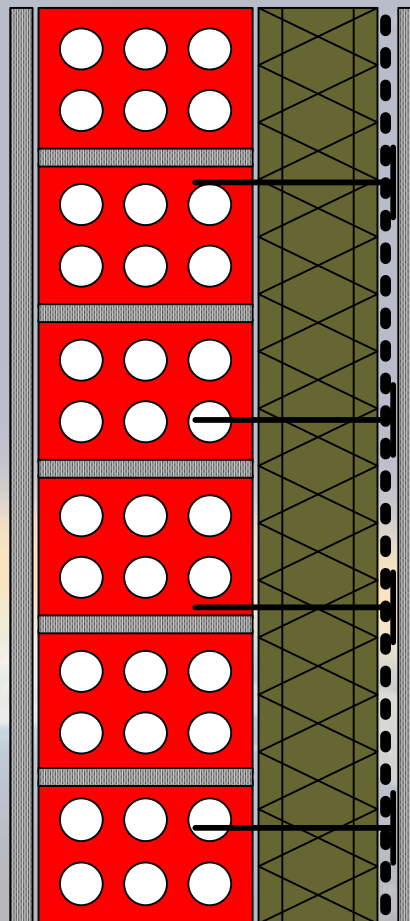
$R_w = 57 \text{ dB}$



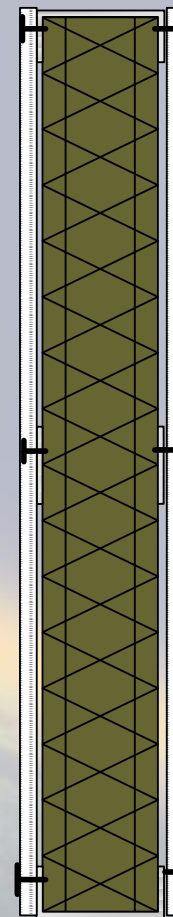
Rw = 39 dB

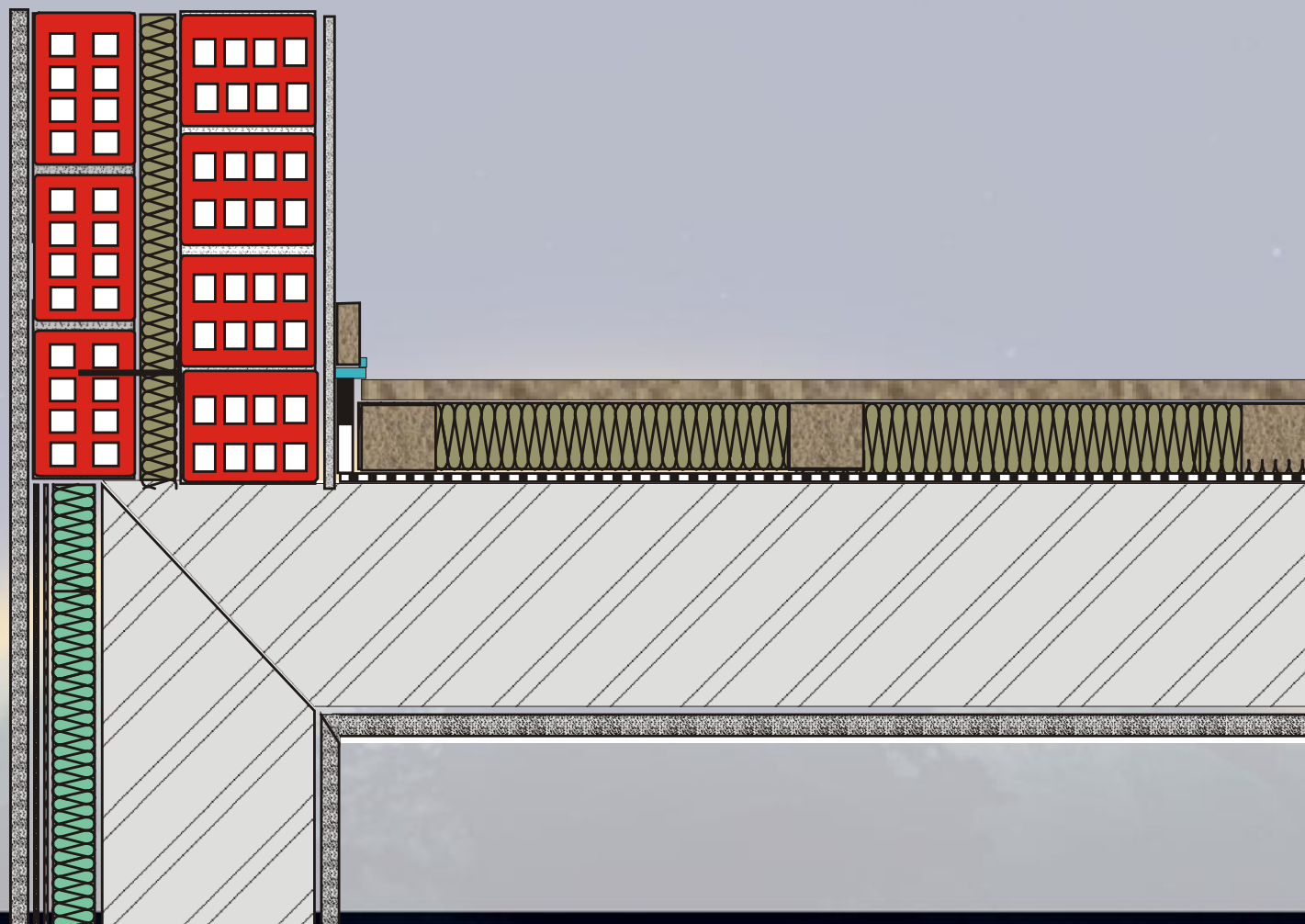


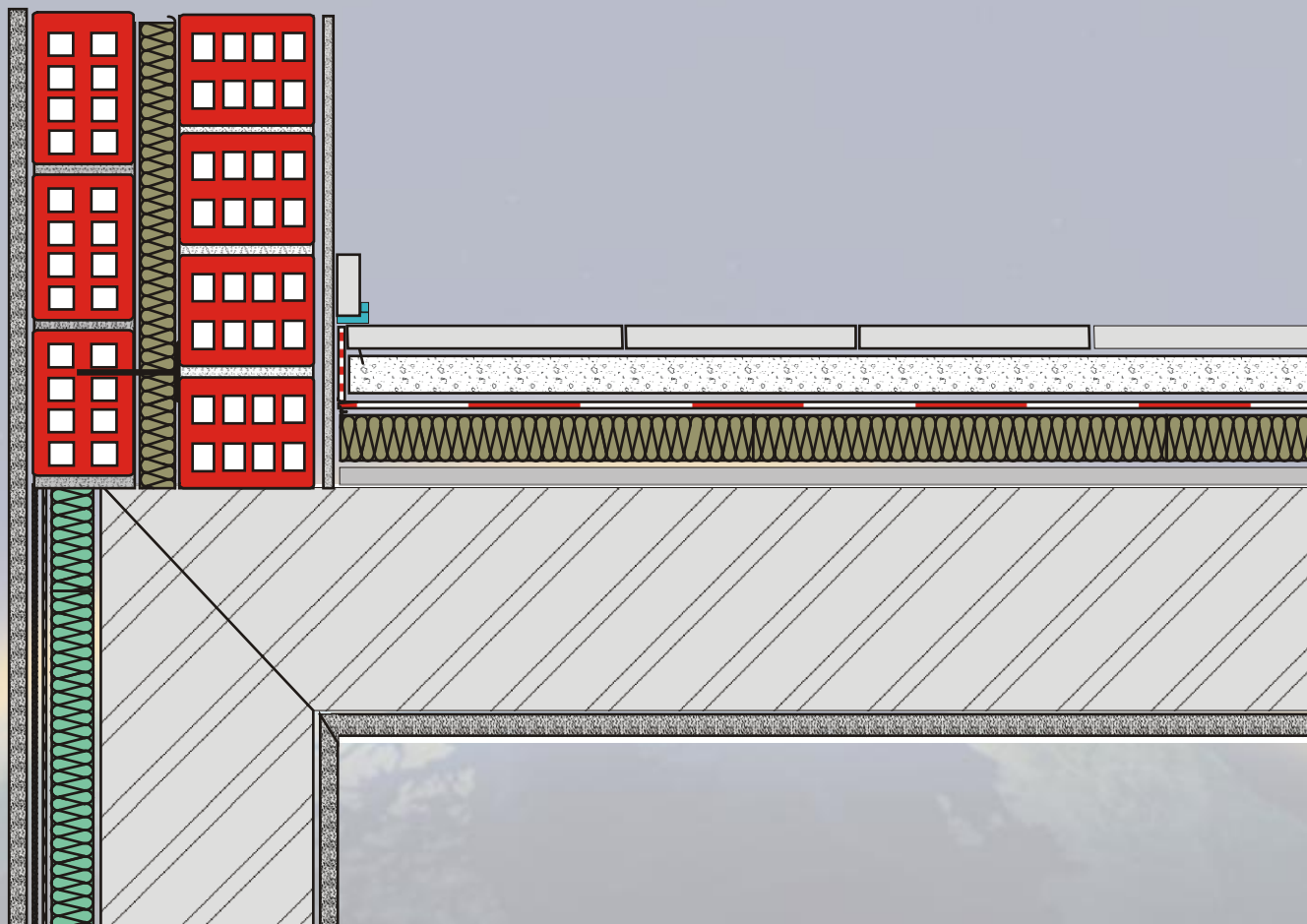
Rw = 51 dB



Rw = 47 dB

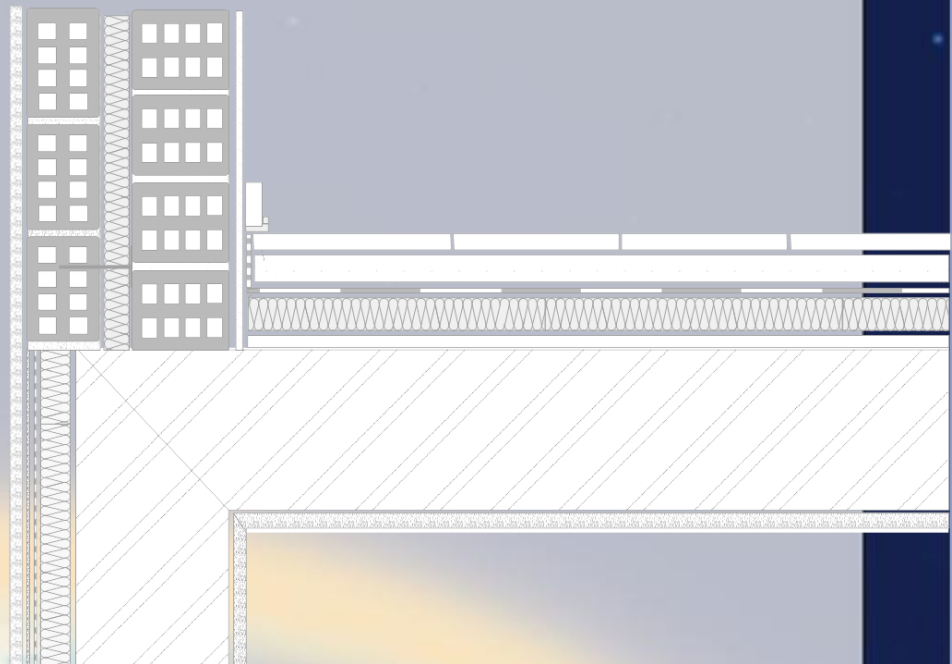






Δάπεδο Καταπολέμηση Κτυπογενούς θορύβου

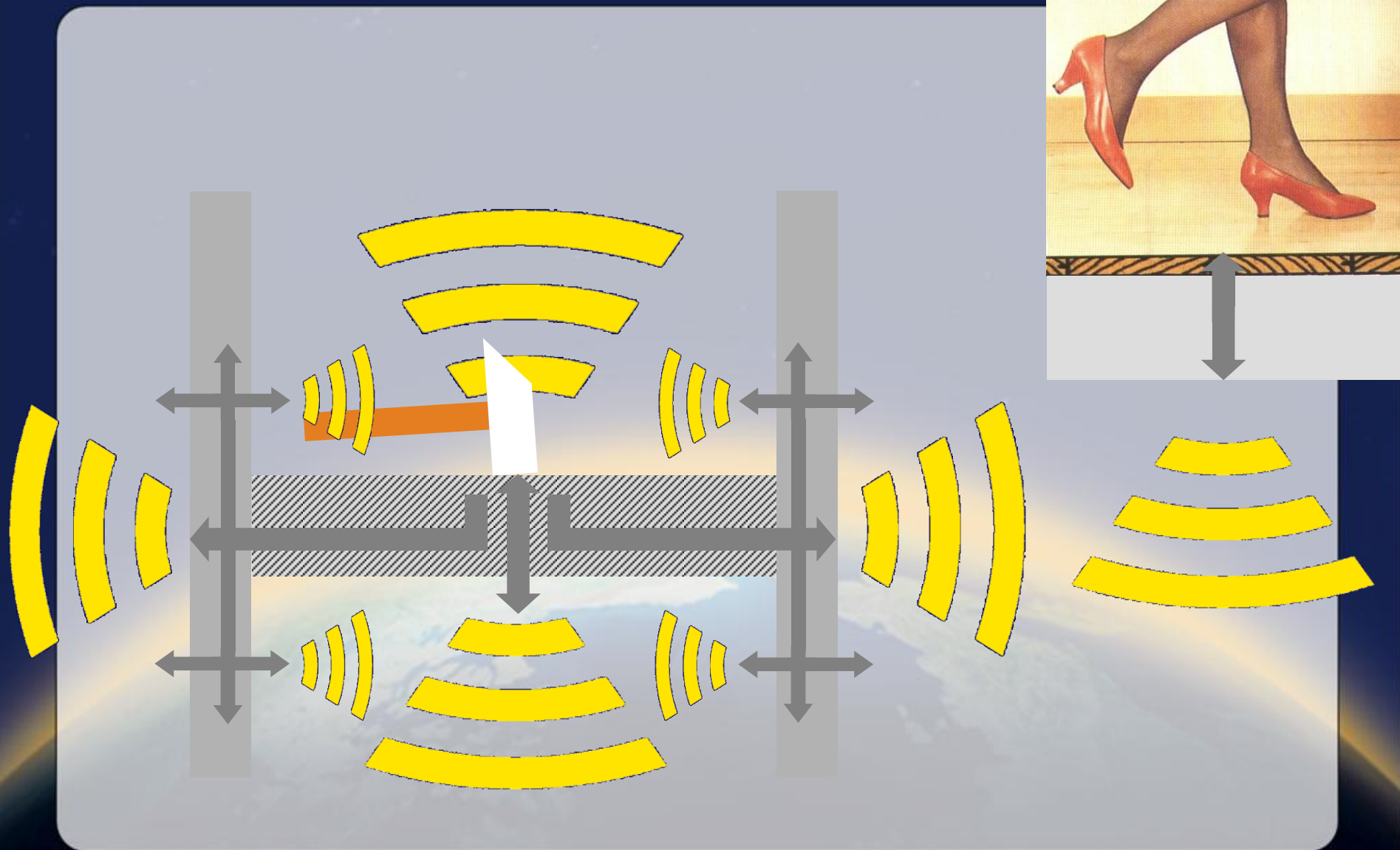
- Δημιουργία Πλωτού Δαπέδου
- Ηχομονωτικά προϊόντα με
δυναμική ακαμψία ≤ 10
MN/m³



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Ηχομόνωση Δαπέδων

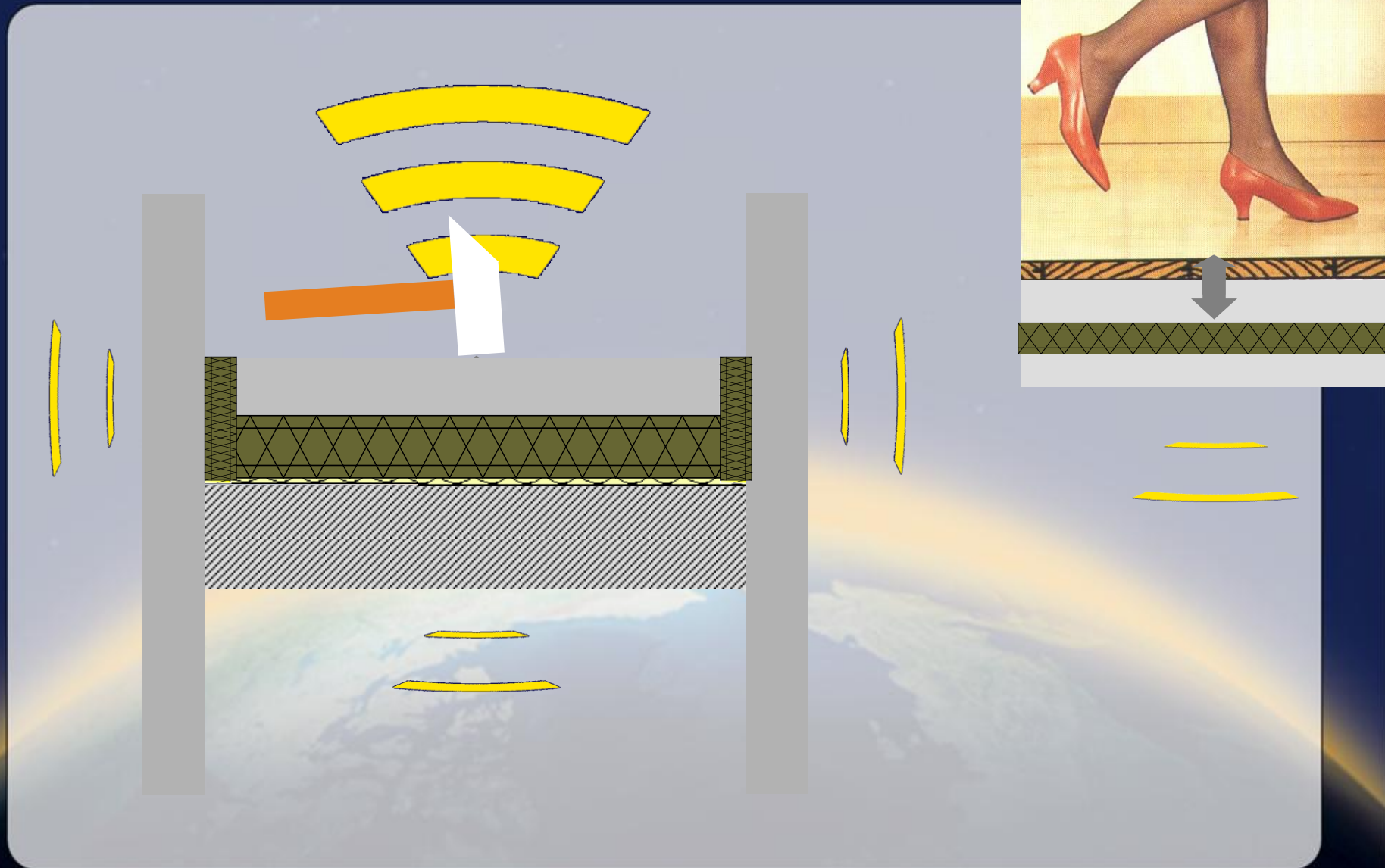
ENERGYSHIELD

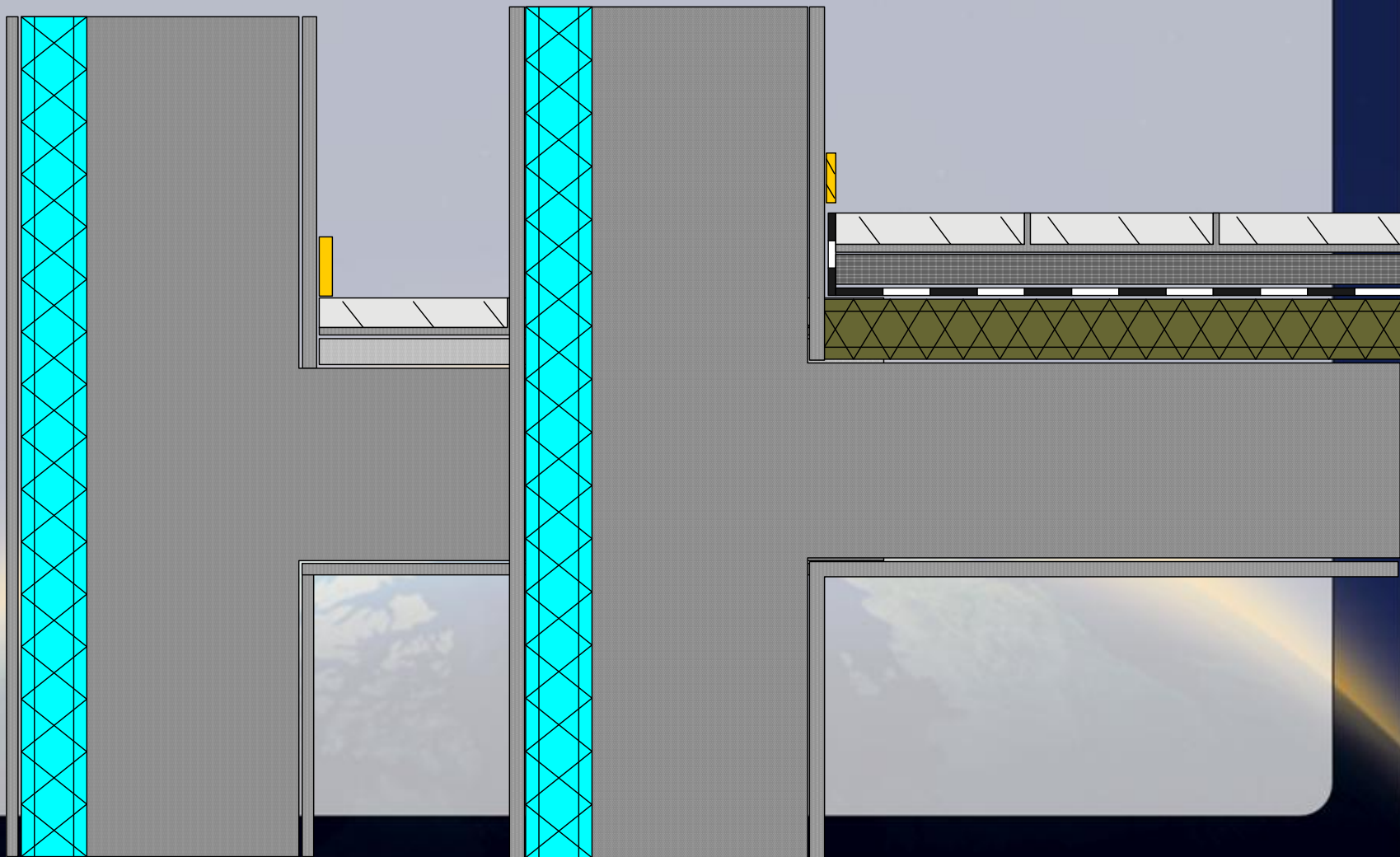


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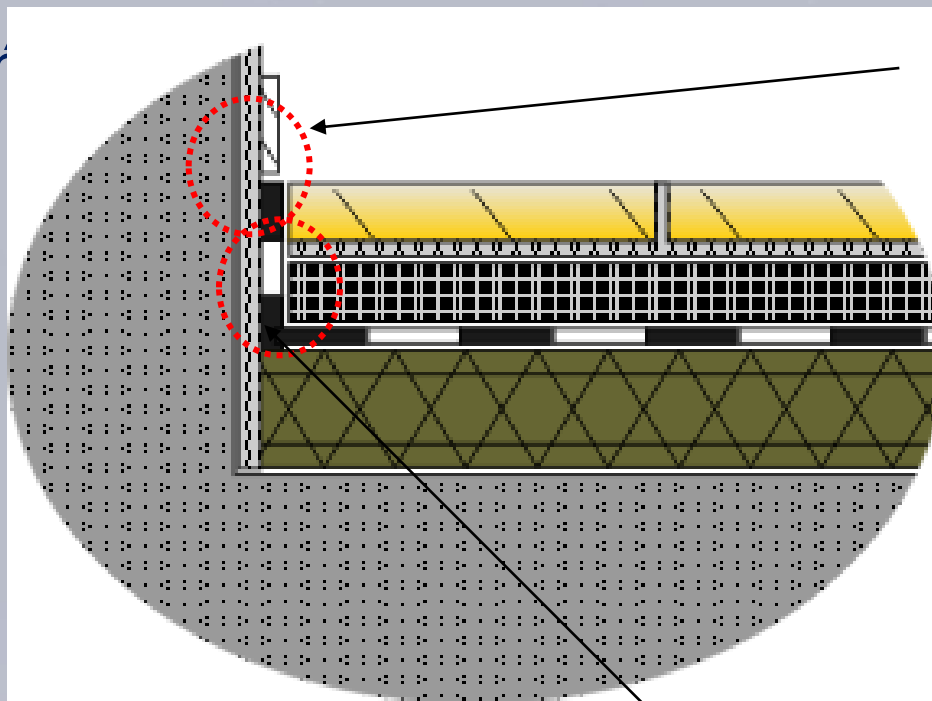
Ηχομόνωση Δαπέδων

ENERGYSHIELD



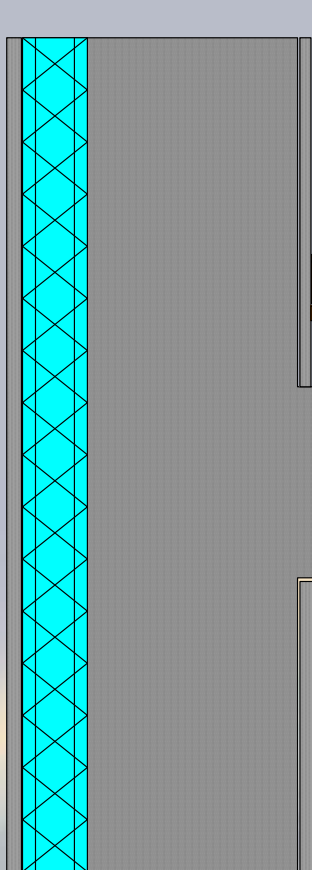
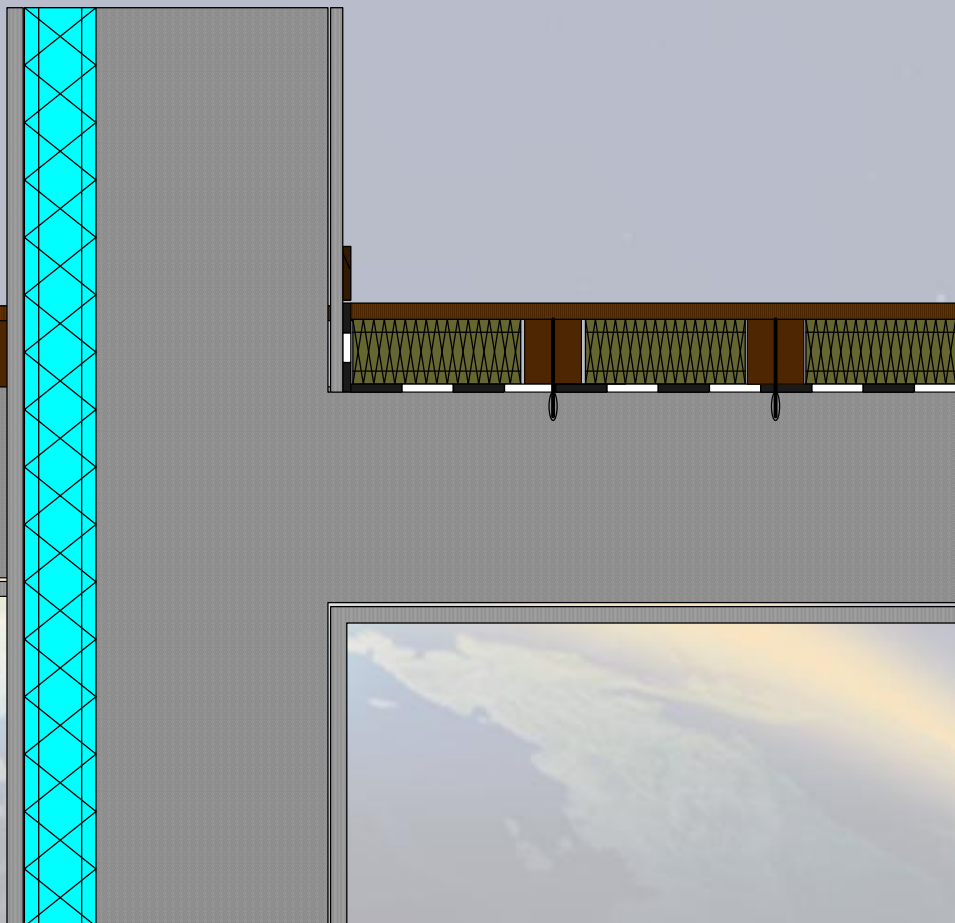
$L_{n,w} = 45 \text{ dB}$ $L_{n,w} = 53 \text{ dB}$ 

Με r

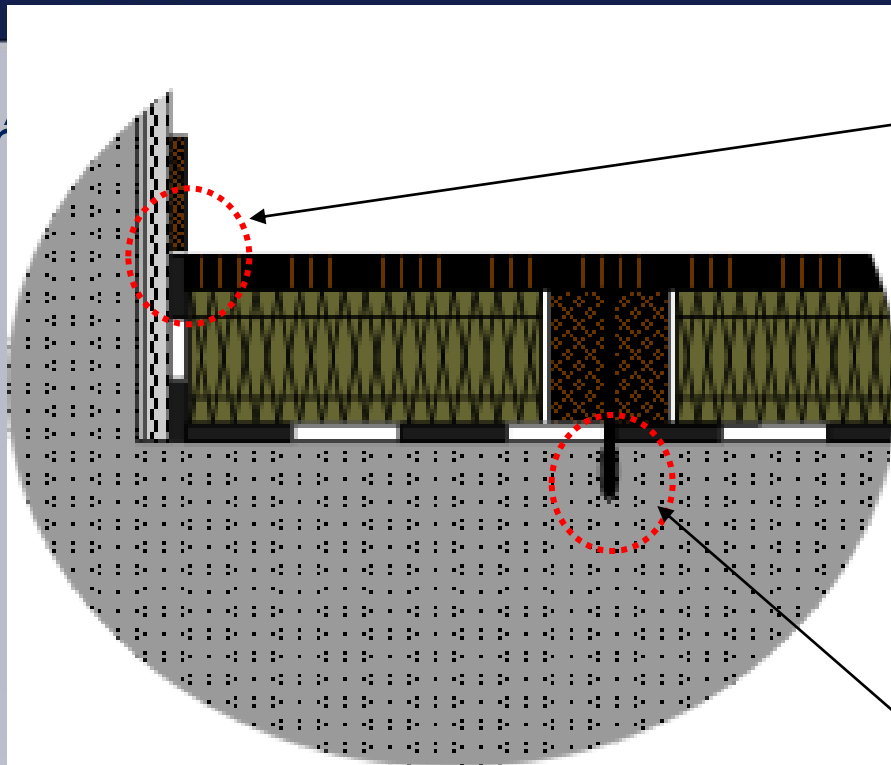


Σοβατεπί: Η επαφή του με την τελική επιφάνεια του δαπέδου δημιουργεί Ηχογέφυρα

Η αντικραδασμική μεμβράνη πρέπει να καλύπτει όλο το ύψος του δαπέδου

$L_{n,w} = 46\text{dB}$  $L_{n,w} = 52\text{dB}$ 

Με r



Σοβατεπί: Η επαφή του με την τελική επιφάνεια του δαπέδου δημιουργεί ηχογέφυρα

Βίδες: Πρέπει να έχουν ειδικά ηχομονωτικά προστατευτικά για να μην δημιουργήσουν ηχογέφυρες



ENERGY **SHIELD.**

Industrial Line

FIBRANgeo ***T - R***

Stella Chadiarakou

Dr. Mechanical Engineer

Type of Products

- Rolls

- R-050-AL
- R-560
- R-080



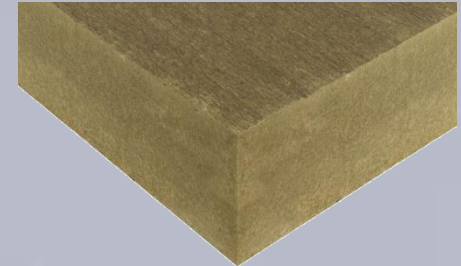
- Rolls with wire net

- R-560-KO
- R-080-KO
- R-001-KO
- R-021-KO



- Boards

- TB-560
- TB-080
- TB-001
- TB-021



- Loose Wool



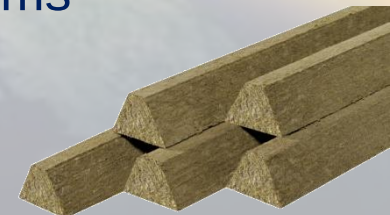
- Pipe Section

- PS 80



- Special Items

- SI



Advantages of FIBRANgeo T

- Thermal insulation
- Maximum service temperature .
- Sound insulation .
- Fire Protection
- Breathability - Water Repellence – Non-hygroscopic
- Resistant to mechanical loads
- Natural, inorganic, odourless, chemically inert (practically neutral Ph)
- Lightweight, easy to handle, cut and install
- Resistant to vibrations
- Does not allow the development of micro-organisms, insects or rodents
- Recyclable
- Friendly to the environment and to the end user

Application Area	FIBRAngeo T product type														
	Products														
	Mattress on wire net				Boards						Block	Pipe Section	Roll		
	R-560-KO	R-080-KO	R-001-KO	R-021-KO	TB-050	TB-560	TB-080	TB-001	TB-021	TBP 50	TBP-080	PS	R-050-AL	R-560	R-080
Piping systems	✓	✓	✓									✓	✓		
Process pipelines	✓	✓	✓												
High temperature pipelines			✓	✓											
Smoke and exhaust pipes			✓	✓											
Circular ducts															
Rectangular ducts															
Fire insulation for Circular ducts															
Fire insulation for Rectangular ducts															
Sound Insulation for Circular ducts	✓	✓	✓		✓	✓				✓					
Sound Insulation for Rectangular ducts	✓	✓	✓		✓	✓				✓					
Tank walls/drums	✓				✓	✓							✓		
Tank roofs										✓					
Vessels															
Boiler			✓		✓	✓	✓	✓	✓	✓					
Furnaces			✓		✓	✓	✓	✓	✓	✓					
Industrial chimneys															
Valves, Bends, Flanges	✓	✓													
Columns	✓				✓	✓	✓						✓		



Application

- Pipe Section
 - High Temperature
 - HVAC
- Tanks
- Vessels – Boilers
- Storage Tanks
- Columns
- Cold Boxes
- Gas ducts



Pipe Insulation

- Reduction of thermal losses
- Reduction of CO2
- Frost protection
- Stability of temperature
- Sound reduction
- Stability of condensation

Thermal Protection



Selection of materials

* Up to 300 C

- pipe section - **FIBRANgeo PS**
- roll with AL - **FIBRANgeo R-050-AL**

* > 300 C

- roll with wire net - **FIBRANgeo R-...-KO**

Tanks – Storage Tanks

- Reduction of thermal losses
- Stability of temperature of the stored substance
- Frost protection
- Stability of condensation

Thermal Protection



Selection of materials

- Low thermal conductivity
- Water repellent
- Boards are recommended
- High compression strength in case of foot traffic
- Vapor Barrier in case of low temperatures

Vessels - Boilers

- Reduction of thermal losses
- Frost protection
- Stability of the temperature of the stored substance
- Stability of the surface temperature

Thermal Protection



Selection of materials

Depend on ...

- position of the vessel
- temperature of the stored substance
- dimension of the vessel
- application

Gas Ducts

- Reduction of thermal losses
- Reduction of CO₂
- Frost protection
- Stability of temperature
- Sound reduction
- Stability of condensation

Thermal Protection

Selection of materials

* **Up to 300 C**

- pipe section
- roll with AL

* **> 300 C**

- roll with wire net



Columns

- Reduction of thermal losses
- Frost protection
- Stability of the temperature of the stored substance
- Stability of the surface temperature
- Sound absorption

Thermal Protection

Selection of materials

Depend on ...

- position of the vessel
- temperature of the stored substance
- dimension of the vessel
- application



Certification

CE

FIBRANgeo T products conform to the European Directive 89/106/EEC since 2004. In compliance with the above Construction Products Directive, all types of FIBRANgeo T stonewool products hold the CE marking and are in conformity with the European Norms **EN 14303/2009 and EN 13162/2008** which refer to mineral wool insulation products for industrial installations, building equipment and building applications. In accordance with the aforementioned European Standards, every insulation product acquires a designation code which declares its technical characteristics.



EUCEB

All **FIBRANgeo** stonewool insulation products also carry the certification mark EUCEB (European Certification Board for Mineral Wool Products). EUCEB is an independent organisation whose procedures ensure compliance of mineral wool insulation products with the Directive's 97/69/EC, Note Q, regarding their fibres biosolubility and their non-classification as 'carcinogenic' materials.

Moreover, according to EC Regulation 790/2009 (August 10, 2009) stonewool insulation products are no longer classified as products causing skin irritation (R38).



Designation Code

MW – EN 14303 – Ti – ST(+)_i – CS(10)_i – WS – MVi - AWi – AFri – CLi – Fi – pHi

- ❑ MW – Factory made mineral wool insulation material, manufactured from molten rock, slag or glass.
- ❑ EN 14303 – The European Standard number
- ❑ Ti – Thickness Tolerances. Classes for thickness tolerances from the nominal thickness (e.g. Class T2: - 5mm + 15mm, ClassT4: - 3mm + 5mm).
- ❑ ST(+)_i – Maximum Service (operating) Temperature (°C).
- ❑ CS(10)_i – Minimum Compressive Stress at 10% thickness deformation (kPa).
- ❑ WS – Short Term Water Absorption (kg/m²). Partial immersion of the material in water for 24 hours. The water absorption should be less than 1 kg/m².
- ❑ MVi – Water Vapour Transmission. The maximum ratio 'factor μ' of water vapour diffusion resistance of the material to the resistance of an equal thickness of air.
- ❑ AWi -Weighted Sound Absorption Coefficient. The value of the sound absorption coefficient in the frequency of 500Hz, measured on the standard weighted sound absorption curve.
- ❑ AF_i – Air flow resistivity (kPa s/m²). Measured as the air flow resistance of the material and should be greater than 5 kPa s/m².
- ❑ CLi / Fi/pHi – Trace quantities of water-soluble chloride, fluoride, silicate and sodium ions and the pH-value shall be determined in accordance with EN 13468. For chloride and fluoride, no test result shall exceed the declared value. For the pH-value, no test result shall deviate from the declared value by more than 1,0. Level soluble chlorides (mg/kg).

Fire Classification (EN 13501-1)

- **Class A1** – *non combustible. Products are not cause or contribute in fire acceleration (ISO 1182, ISO1716, EN 13823)*
- **Class A2** – *products must not show any sustained flaming for more than 20sec in the non combustibility test. They are testing for fire contribution, smoke intensity, burning droplets (ISO 1182, ISO1716, EN 13823)*
- **Class B** – *products must not spread more than 150mm in 60sec, when evaluated by a small flame test. They are testing for fire contribution, smoke intensity, burning droplets (EN 13823, EN ISO 11925-2)*
- **Class C** – *product contribute to flashover after 10min (EN 13823, EN ISO 11925-2)*
- **Class D** – *product contribute to flashover after 2min (EN 13823, EN ISO 11925-2)*
- **Class E** – *product is stable for less than 2min (EN ISO 11925-2)*
- **Class F** – *not tested or flammable*

Type of Products

- Rolls

- R-050-AL
- R-560
- R-080



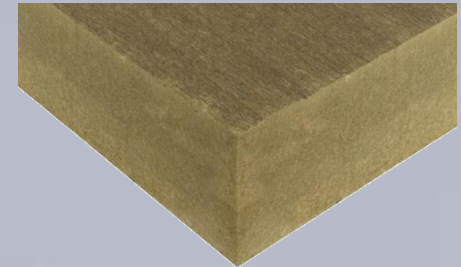
- Rolls with wire net

- R-560-KO
- R-080-KO
- R-001-KO
- R-021-KO



- Boards

- TB-560
- TB-080
- TB-001
- TB-021



- Loose Wool



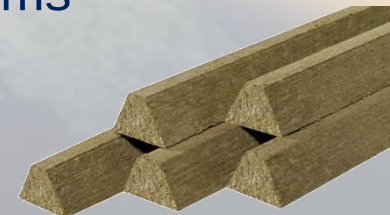
- Pipe Section

- PS 80



- Special Items

- SI



FIBRANgeo R-050-AL

MW(Mineral Wool) - EN 14303 - T2-ST(+/-100)600-WS1-MV1-AW1-CL10-F10-pH10,5

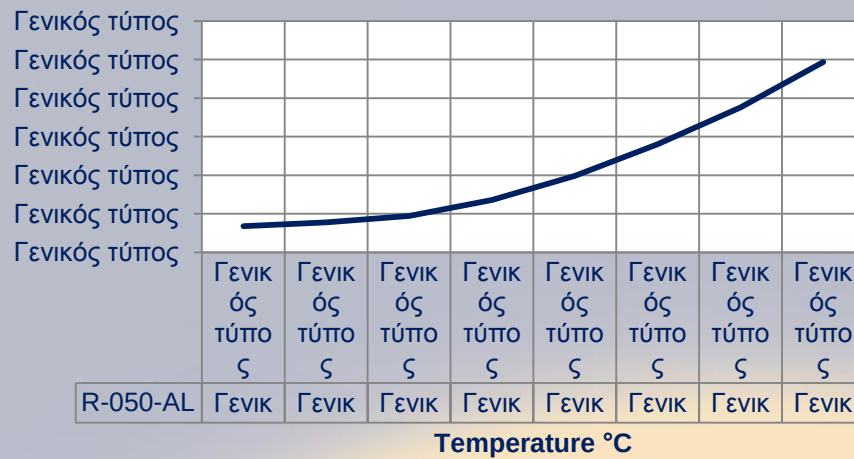


Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.035	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 80	EN 823
Maximum Service Temperature	-	°C	600	EN 14706
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF_r	kPa s/m ²	30 (without AL)	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1 (without AL)	EN ISO 11654 EN ISO 354
Water vapour diffusion equivalent air layer thickness	MV	m	>100	EN ISO 10456
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

FIBRANgeo R-050-AL

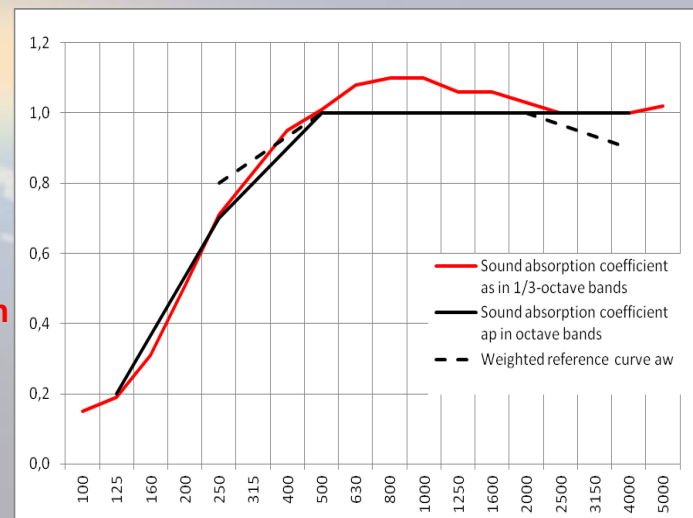
MW(Mineral Wool) - EN 14303 - T2-ST(+/-100)600-WS1-MV1-AW1-CL10-F10-pH10,5

Thermal Conductivity (W/mK)



Thermal Conductivity

Sound Absorption



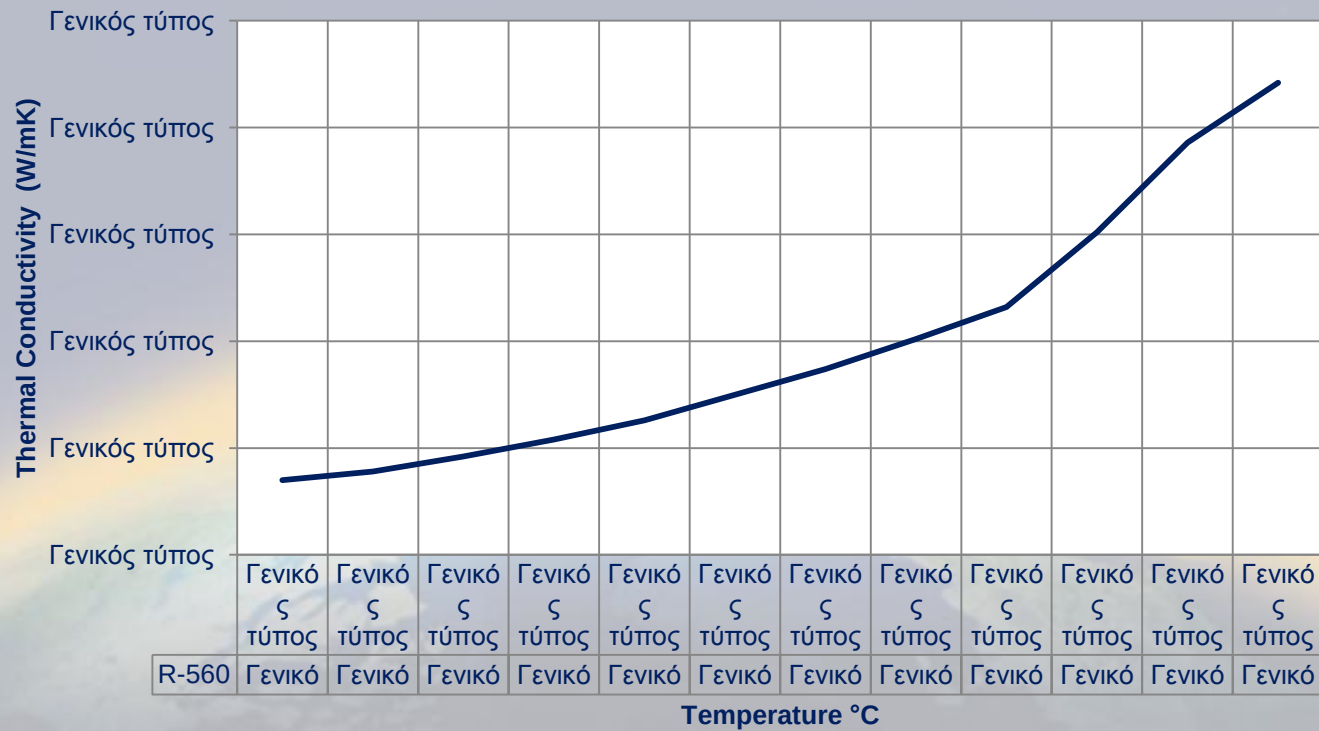
FIBRANgeo R-560

MW(Mineral Wool) - EN 14303 - T2-ST(+/250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.035	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 50	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+/-250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



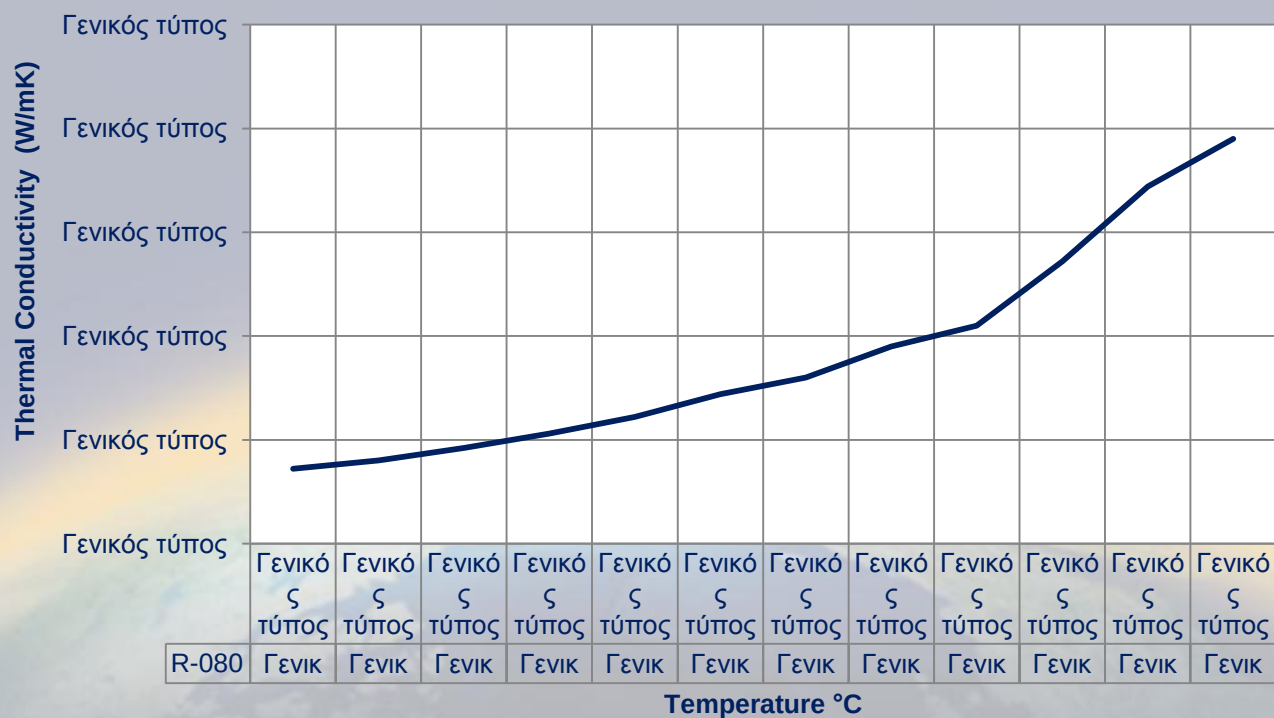
FIBRANgeo R-080

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.036	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 40	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MU1-AW1AFr35-CL10-F10-pH10,5

[illegible]

FIBRANgeo R-560-KO

MW(Mineral Wool) - EN 14303 - T2-ST(+/250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+/-250)650-WS1-MV1-AW1-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
-70	0.028
-60	0.029
-50	0.030
-40	0.031
-30	0.032
-20	0.033
-10	0.034
0	0.035
10	0.036
20	0.038
30	0.042

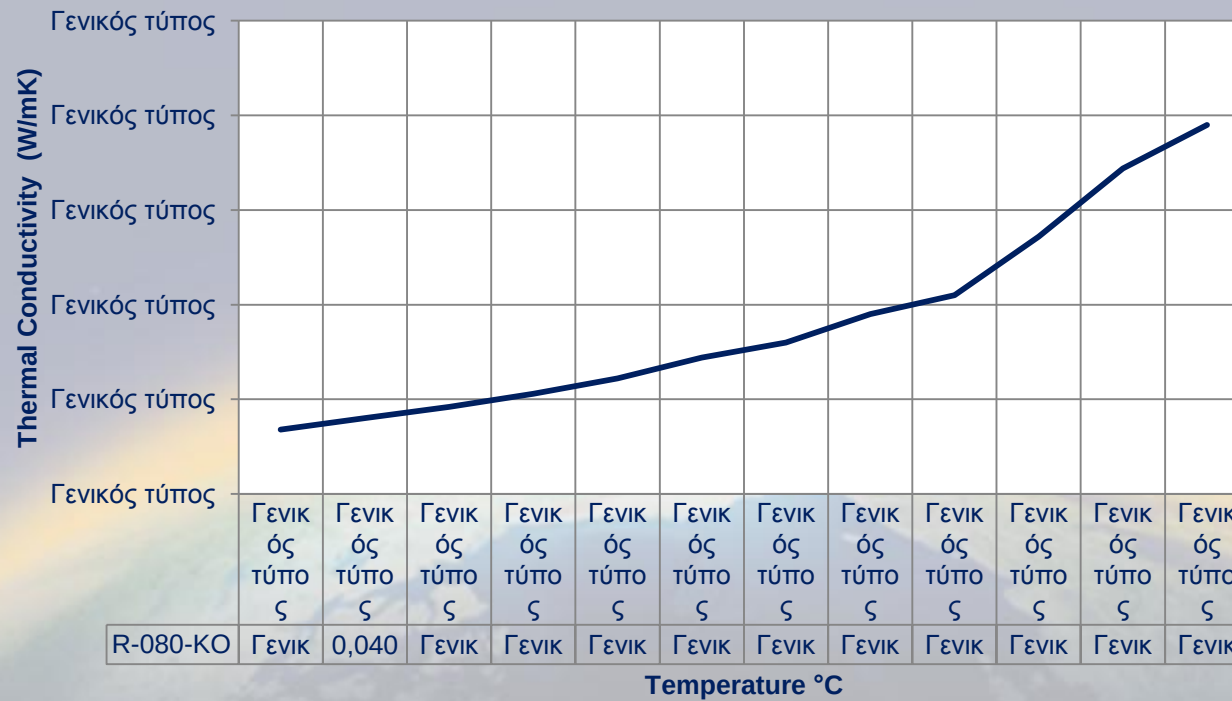
FIBRANgeo R-080-KO

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MU1-AW1-AFr55-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	55	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MV1-AW1-CL10-F10-pH10,5

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FIBRANgeo R-001-KO

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5

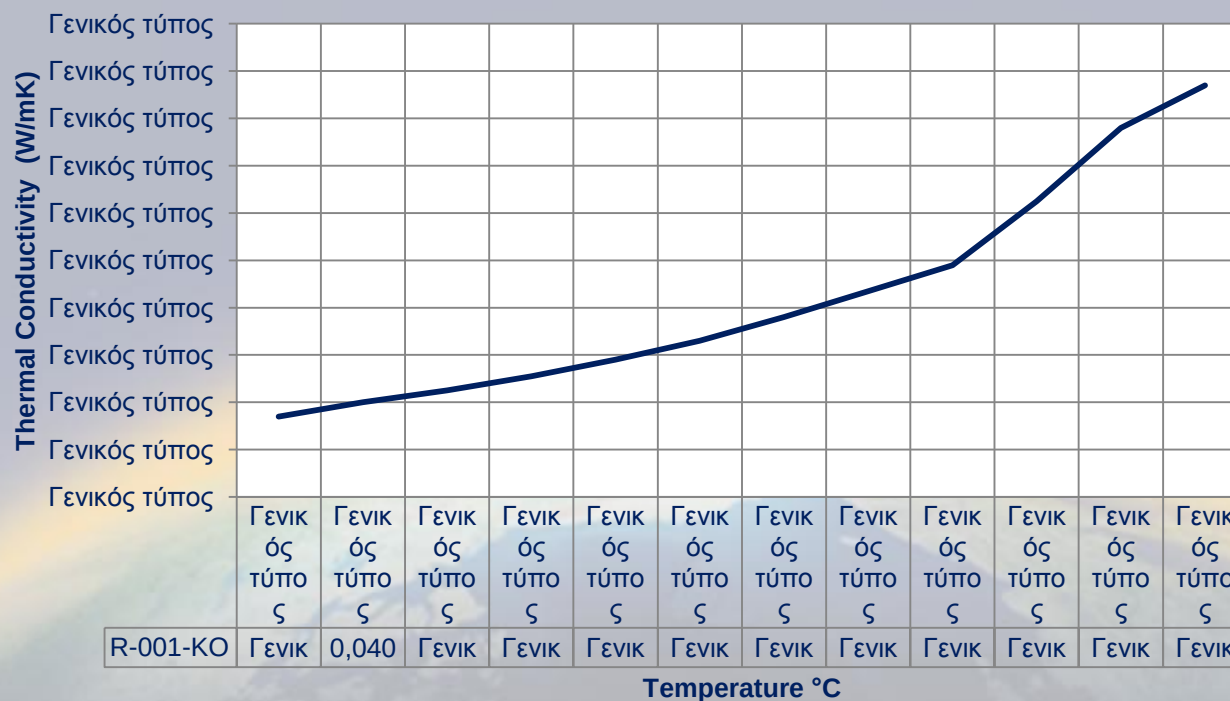


Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

FIBRANgeo R-001-KO

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MV1-AW1-CL10-F10-pH10,5

Thermal Conductivity



FIBRANgeo R-021-KO

MW(Mineral Wool) - EN 14303 - T2-ST(+/250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303- T2-ST(+)-650-WS1-MV1-AW1-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
-100	0.025
-80	0.026
-60	0.027
-40	0.028
-20	0.029
0	0.030
20	0.031
40	0.032
60	0.033
80	0.035
100	0.045



FIBRANgeo TB-560

MW(Mineral Wool) - EN 14303 - T2-ST(+/250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5

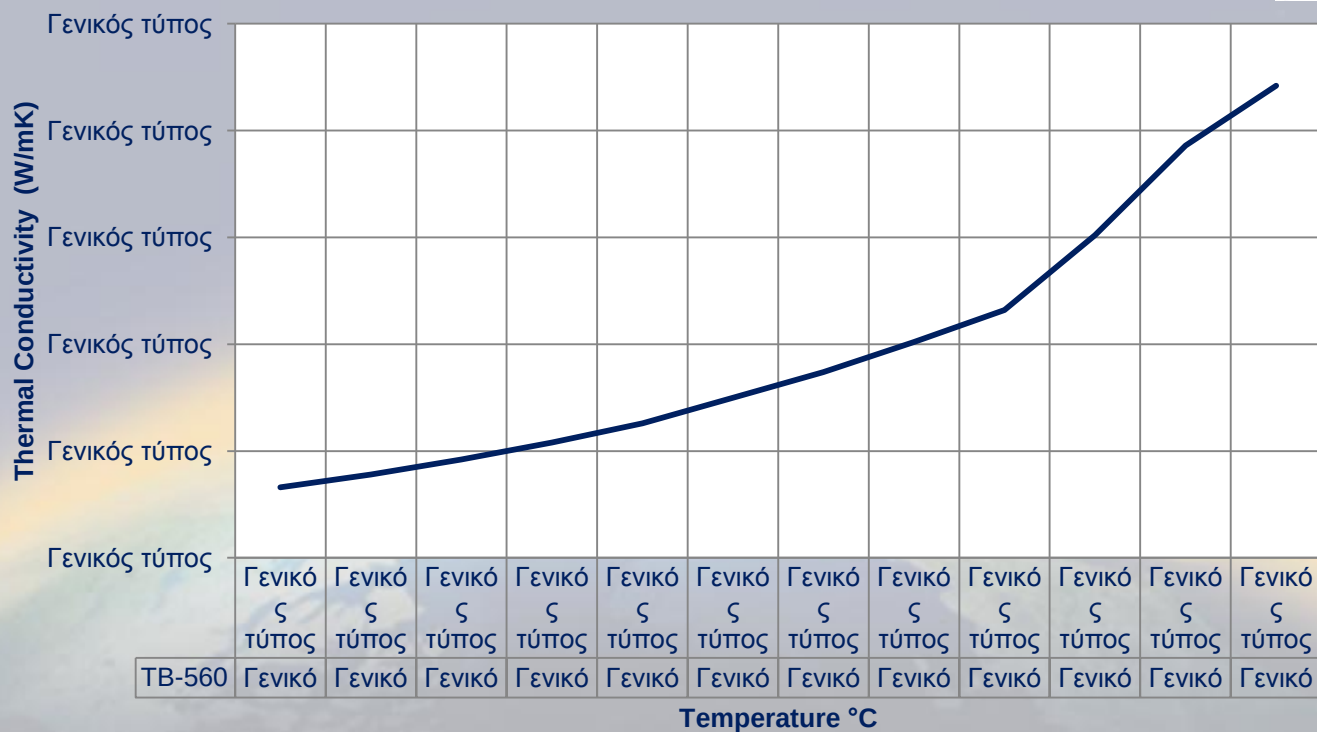


Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.033	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 160	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

FIBRANgeo TB-560

MW(Mineral Wool) - EN 14303 - T2-ST(+/-250)650-WS1-MU1-AFr35-CL10-F10-pH10,5

Thermal Conductivity



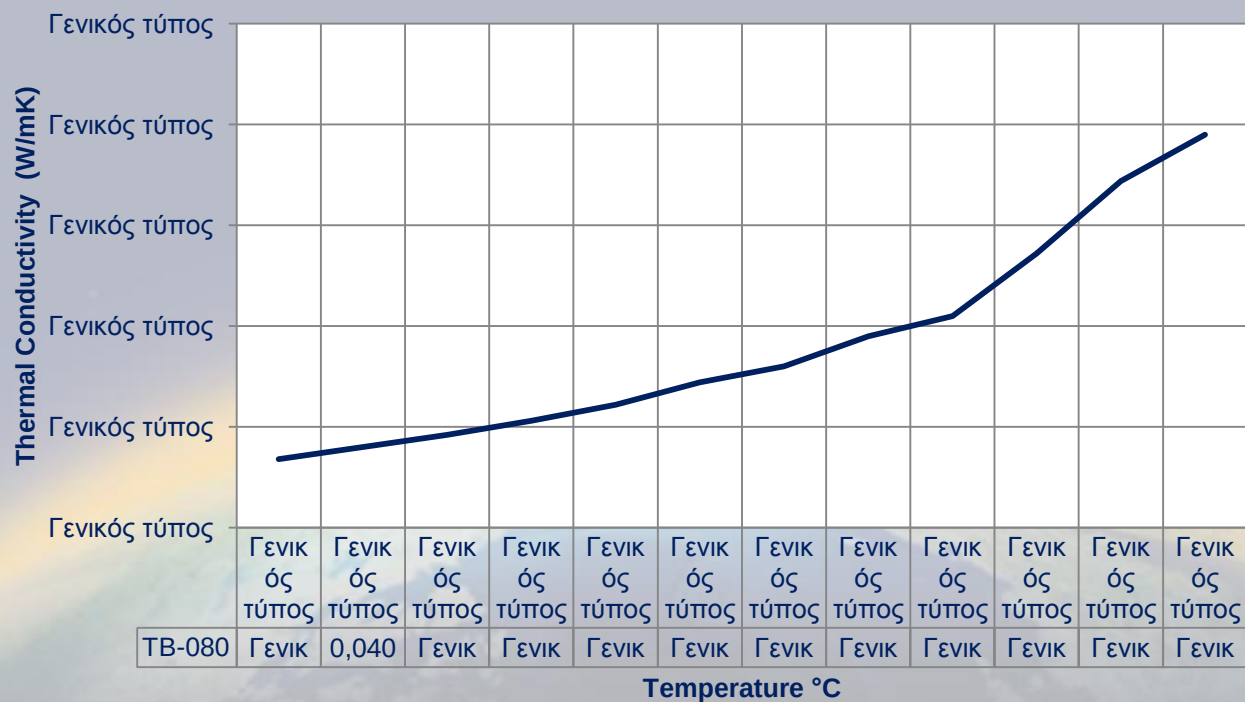
FIBRANgeo TB-080

MW(Mineral Wool) - EN 14303 - T2-ST(+)650-WS1-MU1-AW1-AFr55-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	55	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+)650-WS1-MV1-AW1-CL10-F10-pH10,5

[illegible]

FIBRANgeo TB-001

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303 - T2-ST(+)-650-WS1-MV1-AW1-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
20	0,040
30	0,041
40	0,042
50	0,043
60	0,044
70	0,045
80	0,046
90	0,048
100	0,055



FIBRANgeo TB-021

MW(Mineral Wool) - EN 14303 - T2-ST(+/250)650-WS1-MU1-AW1-AFr35-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0.034	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	30 - 120	EN 823
Maximum Service Temperature	-	°C	650	EN 14706
Fire Class			A1	EN 13501
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T2 (-5% , +15%)	EN 14303
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	35	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	1	EN ISO 11654 EN ISO 354
Water vapour diffusion resistance factor μ	MU		1	EN 12086
Trace quantities of water soluble chloride ions	CL	mg/kg	≤ 10	EN 13468
Trace quantities of water soluble fluoride ions	F	mg/kg	≤ 10	EN 13468
Level of the pH	pH	-	10,5 ± 1	EN 13468
Water leachable chloride, fluoride and PH-value	CL, F, PH	mg/kg	< 10 AS-quality for use over stainless steel. PH-value neutral to slightly alkaline	EN 13468 ASTM C795 ASTM C692 ASTM C871

MW(Mineral Wool) - EN 14303- T2-ST(+)-650-WS1-MV1-AW1-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
20	0.15
30	0.16
40	0.17
50	0.18
60	0.19
70	0.20
80	0.21
90	0.22
100	0.25



FIBRANgeo TBP 50

MW(Mineral Wool) - EN 14303- T4-ST(+)-650-CS(10)50-PL(5)600-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0,038	EN 13162 EN 12667 EN 12939
Nominal thickness	d _N	mm	30 - 160	EN 823
Fire classification	-	Class	A1 (Non-combustible)	EN 13501-1
Melting temperature	-	°C	>1000	DIN 4102-17
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T4 (-3, +5%)	EN 13162
Tensile strength perpendicular to faces	TR	kPa	15	EN 1607
Compressive Stress at 10% thickness deformation	CS(10)	kPa	50	EN 826
Shear Strength	SS	kPa	20	EN 12090
Point Load (applied on a small area of 50 cm²) at 5 mm thickness deformation	PL(5)	N	600	EN 12430
Compressibility The difference between the unloaded thickness and the loaded thickness, (Cp = dL - dB)*	CP	mm	2	EN 13162 EN 12431
Design Load	-	kN/m²	15	EN 13162
Dynamic Stiffness, s' (Board Thickness 50 mm)	SD	MN/m³	32	EN 29052-1
Short Term Water Absorption for 24 h	WS	kg/m²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m²	60	EN 29053
Weighted Sound Absorption Coefficient α _w (Board Thickness 50 mm)	AW	-	0,95 (Class A)	EN ISO 11654 EN ISO 354

MW(Mineral Wool) - EN 14303- T4-ST(+)-650-CS(10)50-PL(5)600-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
20	0.08
30	0.085
40	0.09
50	0.095
60	0.10
70	0.105
80	0.11
90	0.12
100	0.14



FIBRANgeo TBP-080

MW(Mineral Wool) - EN 14303- T4-ST(+)650-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0,039	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	200-300-400	EN 823
Fire classification	-	Class	A1 (Non-combustible)	EN 13501-1
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T4 (-3, +5%)	EN 13162
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	60	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	0,95 (Class A)	EN ISO 11654 EN ISO 354

MW(Mineral Wool) - EN 14303- T4-ST(+)-650-CS(10)50-PL(5)600-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5

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MW(Mineral Wool) - EN 14303- T4-ST(+)650-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5



Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0,039	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	200-300-400	EN 823
Fire classification	-	Class	A1 (Non-combustible)	EN 13501-1
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T4 (-3, +5%)	EN 13162
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Long Term Water Absorption for 28 days	WL(P)	kg/m ²	<3	EN 12087
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	60	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	0,95 (Class A)	EN ISO 11654 EN ISO 354

MW(Mineral Wool) - EN 14303- T4-ST(+)-650-CS(10)50-PL(5)600-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5

Temperature (°C)	Thermal Conductivity (W/mK)
-80	0.08
-70	0.085
-60	0.09
-50	0.095
-40	0.10
-30	0.105
-20	0.11
-10	0.115
0	0.12
10	0.13
20	0.14
30	0.15



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MW(Mineral Wool) - EN 14303- T8-ST(+)-650-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5

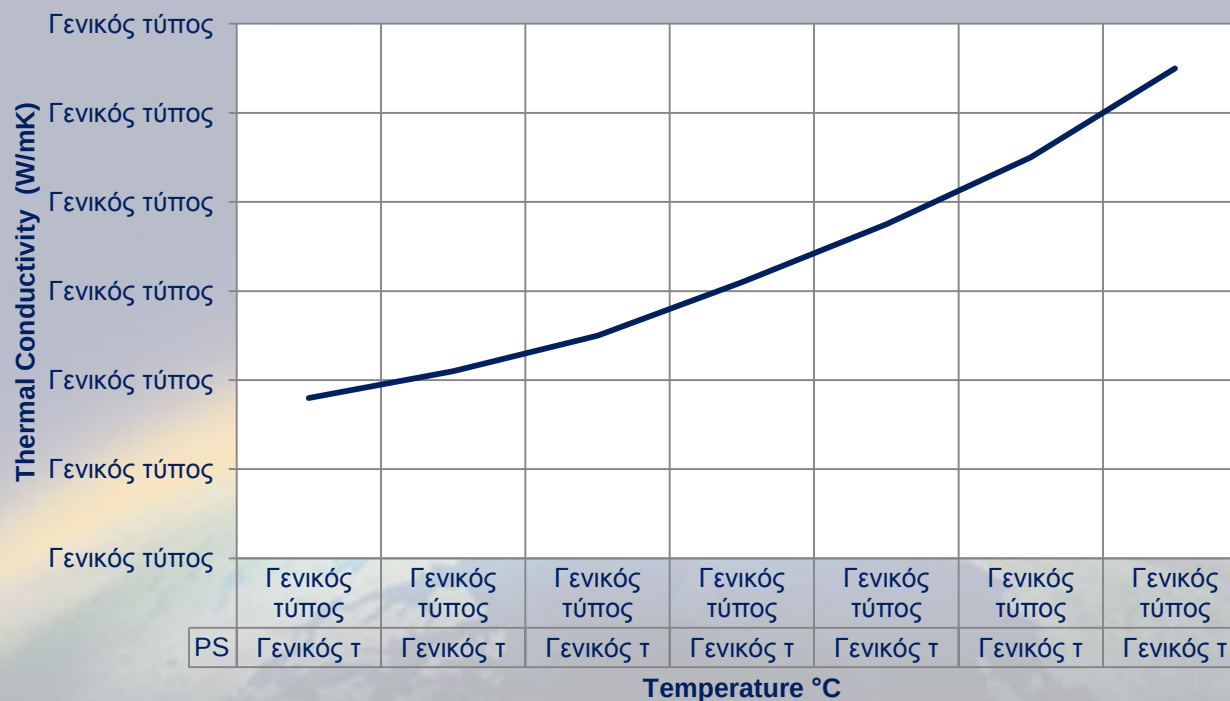


Technical Characteristics	Symbol EN-13162	Unit	Value	EN standard
Declared thermal conductivity at 10 °C	λ_D	W/(mK)	0,036	EN 13162 EN 12667 EN 12939
Nominal thickness	d_N	mm	25-160	EN 823
Fire classification	-	Class	A1 (Non-combustible)	EN 13501-1
Specific heat capacity	c	kJ/kg*K	0,84	-
Thickness tolerance	T	Class	T8 (-5, +5%)	EN 13162
Short Term Water Absorption for 24 h	WS	kg/m ²	<1	EN 1609
Water vapour diffusion resistance factor μ	MU	-	1	EN 12086
Air flow resistivity, r	AF _r	kPa s/m ²	60	EN 29053
Weighted Sound Absorption Coefficient α_w (Board Thickness 50 mm)	AW	-	0,95 (Class A)	EN ISO 11654 EN ISO 354

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MW(Mineral Wool) - EN 14303- T8-ST(+)-650-WS1-MU1-AW0,95-AFr60-CL10-F10-pH10,5

Thermal Conductivity



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