

# STRUCTURAL RESTORATION

Static reinforcement, energy upgrading and acoustic rehabilitation



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Solutions for Building Technology

# HOW TO REHABILITATE A TIMBER FLOOR?

One of the most effective methods of reinforcing an existing timber floor (Fig.1) is to increase its structural stiffness. Increasing the stiffness, both level and off-level, generates multiple benefits in the building being renovated. A stiffer floor provides excellent acoustic performance, reduces vibration transmission and limits the vertical deformation of existing beams. Increasing the stiffness, together with a suitable anchor system to the perimeter structure (Fig.2), also makes it possible to seismically adapt the building by effectively transmitting horizontal actions.

Three techniques can be used to significantly increase the structural stiffness:

1. installation of a perforated LBB metal strap arranged crossed and connected with LBS screws (Fig.3);
2. construction of a composite timber-to-timber floor connected by full thread crossed connectors VGZ (Fig.4);
3. construction of a composite cement-to-timber floor connected by double thread crossed connectors CTC (Fig.5):

The qualitative representation of the stiffness of each of these three solutions can be evaluated in the comparative graph below "Floor stiffness".

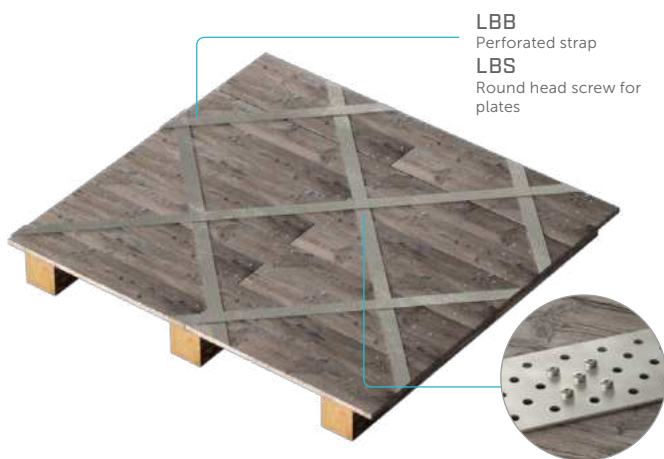
1 Existing floor



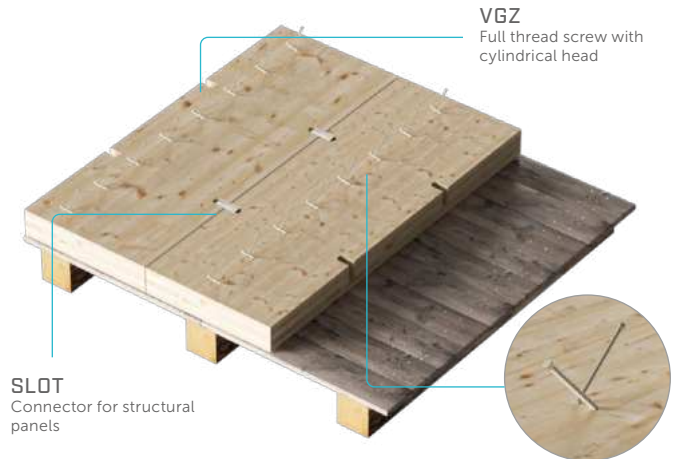
2 Timber-to-timber floor with perimeter reinforcement



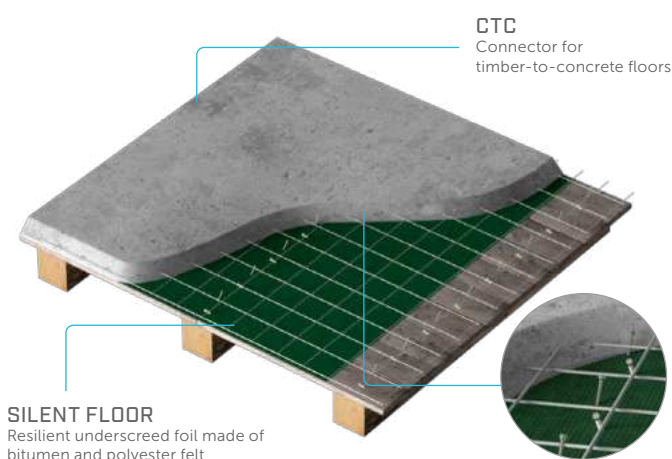
3 Floor reinforced with LBB perforated strap



4 Timber-to-timber floor with VGZ

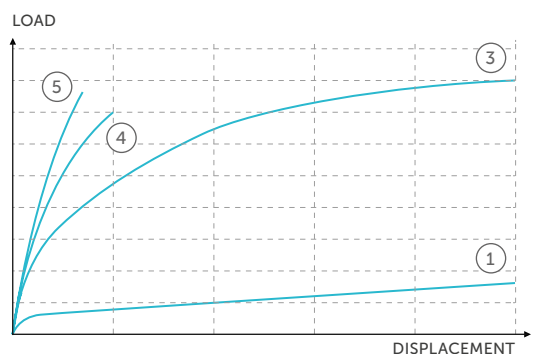


5 Timber-to- concrete floor with CTC



## Floors stiffness

The floor stiffness is identified by the slope of the elastic portions of the monotonic load-slip curve.





## HOW TO REHABILITATE TIMBER BEAMS?

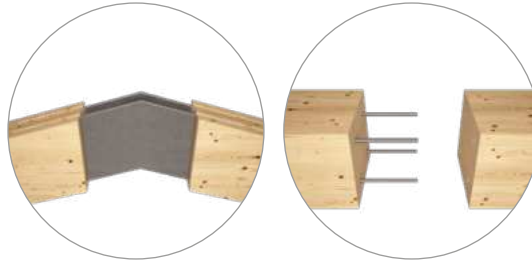
### XEPOX EPOXY ADHESIVE

A historical family of products for joints between timber elements, able to guarantee an excellent restoration of strength and stiffness. The different viscosities of XEPOX products guarantee versatile uses for different types of joints, both for new constructions and for structural recoveries. The use in combination with steel, in particular plates, sandblasted or drilled, and rods, allows to provide high strength in limited thickness. The cartridge format also allows it to be used for aesthetic adjustments and gluing in small quantities.

#### REHABILITATION OF DAMAGED PARTS



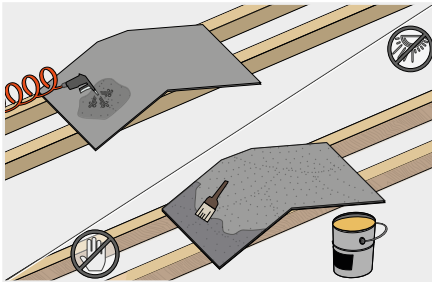
#### MOMENT CONTINUITY JOINT



#### AESTHETIC IMPROVEMENTS

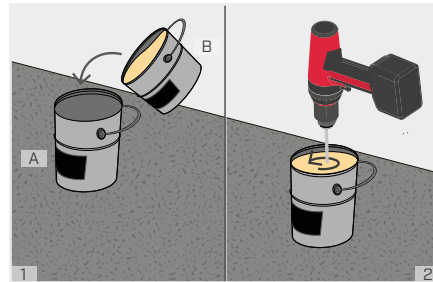


### MOMENT JOINTS WITH PLATES



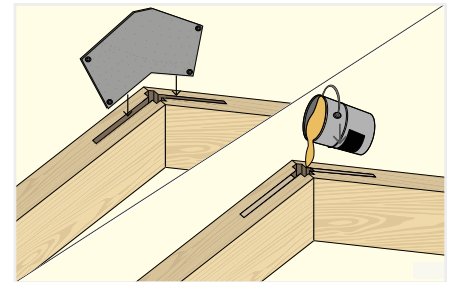
#### Preparation of metallic supports

The metallic bits reinforcing the joints must be cleaned and ungreased. Smooth sheets must be treated with grade SA2,5/SA3 sanding and then protected through a layer of XEPOX P to avoid their oxidation.



#### Product preparation

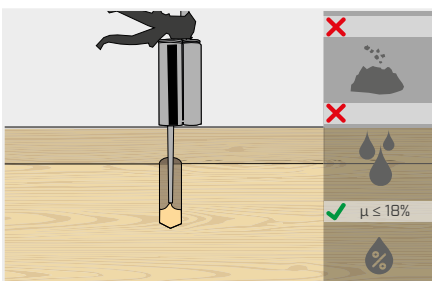
To use the product in drums, pour the hardener (component B) into the drum containing the epoxy resin (component A). Vigorously mix the two different coloured components. A suitable double-helix mixer mounted on a power tool is recommended.



#### Resin coating

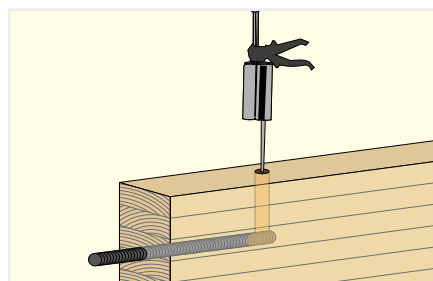
It is best to provide "useful" bearing of adhesive to be made with a special machine at the top of the structural timber elements as an additional guarantee of the functionality of the contact system. Spaces between the metallic and timber bits should be 2÷3 mm wide on each side.

### JOINTS WITH GLUED RODS



#### Grooving and hole treatments

Before pouring and injecting the adhesive, holes and grooves must be protected from meteoric water and humidity, and cleaned with compressed air.



#### Resin coating

Joints with rods are suitable for extrusion with biaxial cartridges, given the small quantities of resin. To change the amount of adhesive to be injected, cut the end of the nozzle. For gluing long rods, it is recommended to prepare filling holes at right angles to the rod.

#### Adhesive conservation

Epoxy adhesives must be maintained at moderate temperature levels (approximately +16°C/+20°C) both in winter and summer until the moment they are used.

#### Adhesive application

The advised ambient application temperature is  $> +10\text{ }^{\circ}\text{C}$ . If the temperature is too cold, it will be necessary to warm up the packages at least one hour prior to using them or warm up the application sites and the metallic bits before percolating the product.

# XEPOX F FLUID

## TWO COMPONENTS EPOXY ADHESIVE



### RELIABLE

Proven durability evidenced by 30 years of use in timber construction.

### HIGH PERFORMANCE

High-performance two-components epoxy adhesive. The strength of the connection is dependent on the timber due to the adhesives over-performance

### VERSATILE

In cartridges for practical and fast use, in 3 litre and 5 litre sizes for larger volume joints.

Two-components epoxy adhesive for structural usage, applicable via injection into holes and grooves, provided that the slots are accurately sealed. Preferable for binding timber connectors bent (Turrini-Piazza method) into timber-concrete composite floors, both with new and existing beams; gaps between timber and metal of approximately 2 mm or more. Percolation into the vertical holes in the grooves after inserting the metal plate or rod inserts. Pourable and injectable with cartridge. Shelf life 36 months in the original unopened packaging, at temperatures between +5°C and 30°C.

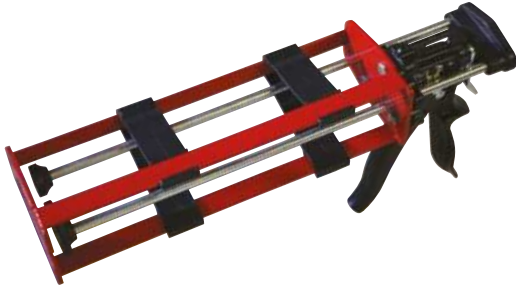
### VIDEO

Scan the QR Code and watch the video on our YouTube channel



# MAMMOTH DOUBLE

## SPECIAL GUN FOR TWO-COMPONENT ADHESIVE



<b>FOCUS</b>	Suitable for XEPOX line cartridges, such as XEPOXF400 and XEPOXD400
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# LITE BAND

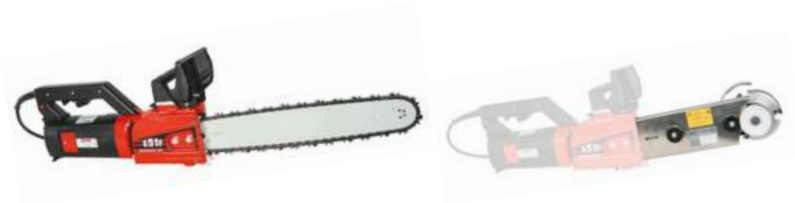
## ACRYLIC SINGLE-SIDED ADHESIVE TAPE



<b>FOCUS</b>	Ideal for sealing and shaping elements to be consolidated with XEPOX resins
<b>MATERIAL</b>	PE support with cross-linked acrylic adhesive
<b>ROLL DIMENSIONS</b>	50 mm x 50 m
<b>FIELDS OF USE</b>	Temporary adhesion on timber or permanent adhesion on fabric

# GZE51 + GZ130

## ELECTRIC CHAINSAW + CONVERSION ACCESSORY FOR GROOVE CUTTER



<b>FOCUS</b>	Fast and precise milling of grooves for power lines and technical installations
<b>FIELDS OF USE</b>	For milling widths between 19 and 24 mm
<b>APPLICATION</b>	Thanks to electric propulsion, it can be used without problems inside buildings

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## XEPOX P PRIMER

### TWO COMPONENTS EPOXY ADHESIVE



Two-component epoxy adhesive with extremely low viscosity and high wetting properties for structural reinforcements through carbon or glass fiber textures. Useful to protect sanded metal sheets SA2,5/SA3 (ISO 8501) and to realize FRP (Fiber Reinforced Polymers) bits. Applicable by roller, spray and brush. Shelf life 36 months in the original unopened packaging, at temperatures between +5°C and +30°C.



## XEPOX L LIQUID

### TWO COMPONENTS EPOXY ADHESIVE



Two-components epoxy adhesive for structural usage, very fluid, applicable via pouring into very deep vertical holes and suitable for large joints with hidden bits placed in quite extended grooves, also good in case of reduced spacing (1mm or more), provided that the slots are accurately sealed. Pourable and injectable. Shelf life 36 months in the original unopened packaging, at temperatures between +5°C and +30°C.



## XEPOX D DENSE

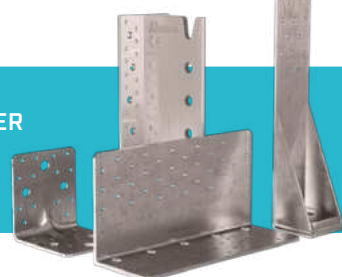
### TWO COMPONENTS EPOXY ADHESIVE



Two-component epoxy thixotropic (dense) adhesive for structural usage, applicable via injections especially into horizontal or vertical holes in Glulam and solid timber beams, masonry or reinforced concrete walls. Injectable with cartridge. Shelf life 36 months in the original unopened packaging, at temperatures between +5°C and +30°C.



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# XEPOX G GEL

## TWO COMPONENTS EPOXY ADHESIVE



Two-components epoxy gel adhesive for structural usage, applicable via trowel also on vertical surfaces, permits the realization of thick or uneven layers. Suitable for large timber overlaps, for gluing structural reinforcing elements by using glass or carbon fiber textures and for metal or timber coatings. Spreadable. Shelf life 36 months in the original unopened packaging, at temperatures between +5°C and +30°C.



# PLASTUK

## BICOMPONENT PUTTY FOR INDOOR AND OUTDOOR REPAIRS



Available in different colours for the various types of timber. After 20 - 30 minutes the treated surface can be sanded, painted or varnished. By adding up to 10% RESTOKITT it is also possible to create custom hues.



# RESTOKITT

## INDOOR REPAIR PUTTY



Line of putties for repairing timber in indoor and outdoor environments. Quick-drying and available in various colours, they can be mixed together and are easy to sand, ideal for repairing damaged wooden surfaces of furniture, stairs, windows, doors and much more. Solvent-free, they are soluble in water and alcohol. After final sanding, the surface can be etched, oiled, waxed or painted.



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### CERTIFICATION

Timber-to-concrete fastener with specific CE certification according to ETA-19/0244. Tested and calculated with parallel and crossed arrangement of 45° and 30° connectors, with and without wooden planking.

### RAPID DRY SYSTEM

Approved system, self-drilling, reversible, fast and minimally invasive. Optimum static and noise performances, both for new projects and structural restoration.

### COMPLETE RANGE

Self-perforating tip with notch and countersunk cylindrical head. Available in two diameters (7 and 9 mm) and two lengths (160 and 240 mm) to optimize the number of fasteners.

### INSTALLATION INDICATOR

During installation, the under head counter-thread serves as "correct installation" indicator and increases the fastener tightness inside the concrete.



<b>FOCUS</b>	CE marking, timber-to-concrete
<b>HEAD</b>	cylindrical, countersunk
<b>DIAMETER</b>	7,0   9,0 mm
<b>LENGTH</b>	160   240 mm

See also:

### JIG VGZ 45°

#### TEMPLATE FOR 45° SCREW CONNECTIONS

Its shape allows an easy and fast screwing of any type of screw with a precise inclination of 45°



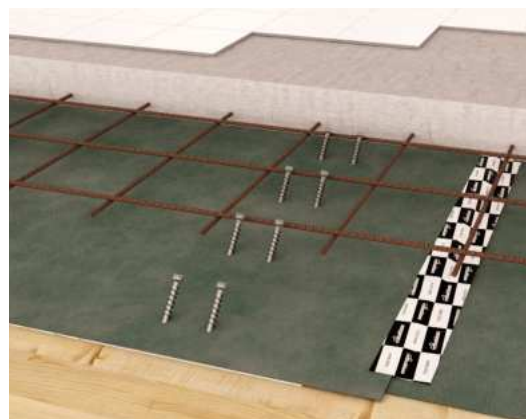


## SILENT FLOOR

RESILIENT UNDERSCREED FOIL



FIELDS OF USE	underscreed
MATERIAL	elastoplastomeric bitumen coupled with polyester felt
ROLL DIMENSIONS	5,0 mm x 1,05 m x 10 m
DYNAMIC STIFFNESS S'	27 MN/m <sup>3</sup>
ΔLW *	28 dB



## SILENT EDGE

SELF-ADHESIVE STRIP FOR PERIMETER SEPARATION



MATERIAL	Closed cell polyethylene
THICKNESS	4,0 mm
DIMENSIONS	bands from 150 mm
APPLICATION	perimeter desolidarisation floor strip
INSTALLATION	adhesive strip



## SILENT STEP

SUBSTRATE MADE OF POLYETHYLENE SERVING AS A VAPOUR BARRIER



FIELDS OF USE	underfloor
MATERIAL	NPE polyethylene with PE film
ROLL DIMENSIONS	2,0 mm x 1,0 m x 15 m
MASS PER UNIT AREA	100 g/m <sup>2</sup>
PROTECTION FROM RISING DAMP (Sd)	> 75 m



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# VGZ HARDWOOD

## FULLY THREADED SCREW FOR HARDWOODS

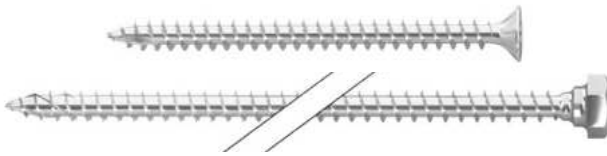


FOCUS	fastener for hardwood
HEAD	cylindrical, countersunk
DIAMETER	7,0   9,0 mm
LENGTH	from 140 to 320 mm



# VGS

## FULLY THREADED SCREW WITH COUNTERSUNK OR HEXAGONAL HEAD



See also:

**VGU**  
45° WASHER FOR VGS



**LEWIS**  
TWIST DRILL BITS



# RTR

## STRUCTURAL REINFORCEMENT SYSTEM



See also:

**D 38 RLE**  
4-SPEED CORDLESS SCREWDRIVER



**SLEEVES**  
DIAMETER 16 AND 20 mm







VIDEO

# LOCK C FLOOR

CONCEALED HOOK TIMBER-TO-CONCRETE CONNECTOR



See also:

**SKR | SKS**  
SCREW ANCHOR FOR CONCRETE



# VIN FIX

VINYL ESTER CHEMICAL ANCHOR WITHOUT STYRENE



See also:

**FLY**  
GUN FOR 310 ml CARTRIDGES



**MAMMOTH**  
GUN FOR 400 ml CARTRIDGES



# MET

THREADED RODS, NUTS AND WASHERS



See also:

**CRICKET**  
8 SIZES RATCHETING WRENCH

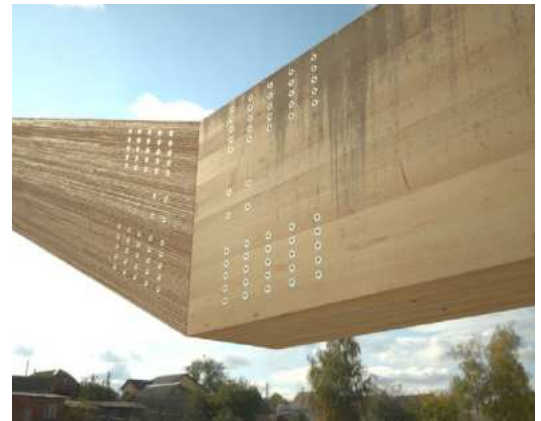


**SOCKET**  
SOCKET



# SBD

## SELF-DRILLING DOWEL



FOCUS	self-drilling, timber-to-metal-to-timber
HEAD	cylindrical, countersunk
DIAMETER	7.5 mm
LENGTH	from 55 to 235 mm

# TAPS

## CAPS AND PLUGS FOR TIMBER



# DISC FLAT A2

## REMOVABLE CONCEALED CONNECTOR



FOCUS	universal joints
TIMBER SECTIONS	from 100 x 100 mm to 280 x 280 mm
STRENGTH	$R_v$ over 40 kN, $R_{ax}$ over 70 kN
FASTENERS	KKF AISI410, KOS A2

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# PROFI

PROFESSIONAL WORKSITE KIT



ARTEMIS	ROPE 1	PROTECTOR	BACK
<b>CE</b>	<b>CE</b>	<b>CE</b>	<b>CE</b>
EN 361 EN 358 EN 813 EN 12277/A/C	EN 566 EN 795/B	EN 397	EN 353-2 EN 358 EN 567 EN 12841 A/B ANSI/ISEA Z359.15-2014



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# LBB

## PERFORATED STRAP



FOCUS	tension fastening
WIDTH	from 40 to 80 mm
THICKNESS	1,5   3,0 mm
FASTENERS	LBA, LBS

# ZVB

## HOOKS FOR BRACINGS



FOCUS	hooks, disks and tensioners for the construction of bracing systems
DIMENSIONS	from M10 to M30
MATERIAL	spheroidal cast iron hooks, discs and tensioners in S355 carbon steel

# HBS EVO

## COUNTERSUNK SCREW



See also:

### CATCH

#### SCREWING DEVICE

Thanks to CATCH, even longer screws can be screwed on quickly and safely without the risk of the bit slipping.





# SHARP METAL

## STEEL HOOKED PLATES



FOCUS	timber-to-timber shear joint
LENGTH	1   2   5 m
THICKNESS	0,75 mm
FASTENERS	HBS, TBS, TBS MAX

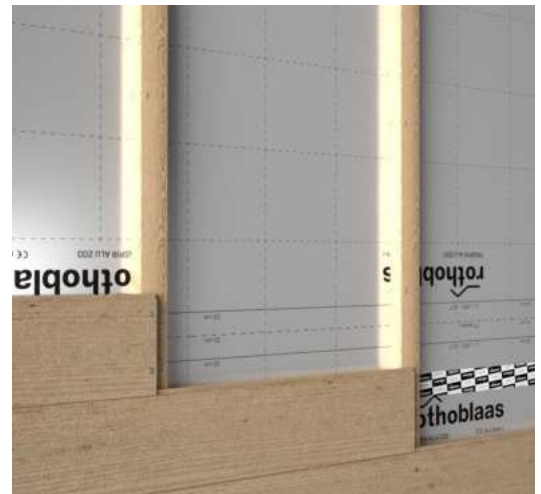


# TRASPIR ALU

## REFLECTIVE HIGHLY BREATHABLE MEMBRANE



FOCUS	waterproof, it allows the passage of vapour and reflects heat externally
MASS PER UNIT AREA	120   200   430 g/m <sup>2</sup>
WATER VAPOUR TRANSMISSION	Sd < 0,1 m
SPECIAL	3.0 m versions with A2 reaction to fire certification

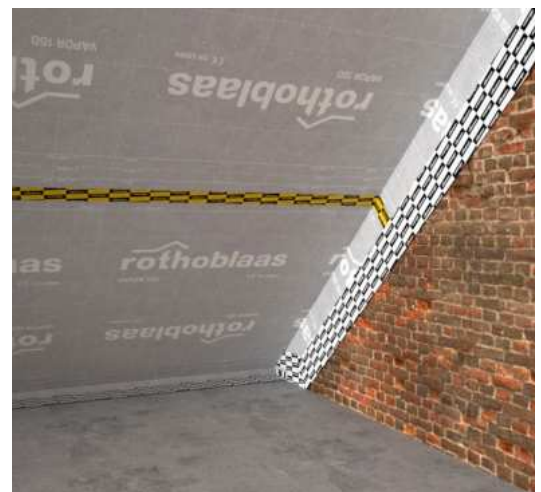


# VAPOR

## VAPOUR CONTROL MEMBRANE



FOCUS	waterproof, it blocks vapour
MASS PER UNIT AREA	from 110 to 260 g/m <sup>2</sup>
WATER VAPOUR TRANSMISSION	versions from Sd = 4 m to Sd = 40 m
SPECIAL	self-adhesive and 3.0 m versions



# CLIMA CONTROL

## MEMBRANE WITH VARIABLE VAPOUR DIFFUSION



### VARIABLE DIFFUSION

Variable resistance to vapour diffusion: maximum protection for walls and excellent security in insulation.

### ENERGY RECONDITIONING

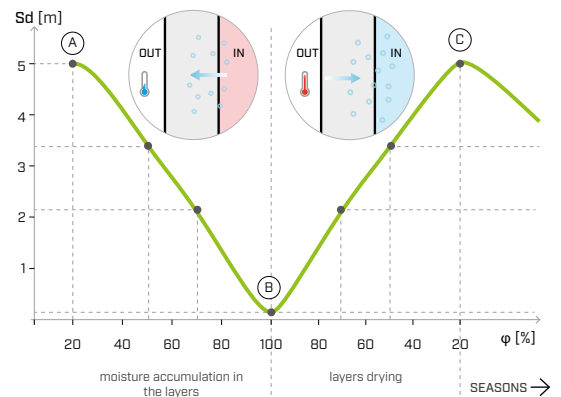
Ideal to increase energy performance for packages and solutions for reconditioning of existing structures.

### TRANSPARENCY

Easy to install thanks to its transparent quality; controls the passage of water vapour based on climate and humidity.

<b>FOCUS</b>	waterproof, it regulates the passage of vapour thanks to the variable Sd
<b>MASS PER UNIT AREA</b>	from 80 to 160 g/m <sup>2</sup>
<b>WATER VAPOUR TRANSMISSION</b>	variable diffusion, between Sd = 0.2 and Sd = 5 m
<b>SPECIAL</b>	membrane with variable vapour diffusion

- (A) **DRY LAYERS : Sd 5 m**  
maximum protection - vapour barrier to limit the passage of vapour in view of the season when moisture accumulates within the layers
- (B) **HUMID LAYERS : Sd 0,15 m**  
maximum breathability - breathable membrane to allow drying during the reverse steam diffusion phenomenon
- (C) **DRY LAYERS : Sd 5 m**  
maximum protection for the start of a new year and a new cycle





# HERMETIC FOAM

HIGH PERFORMING SOUNDPROOFING SEALING FOAM



See also:

**FLY FOAM**  
FOAM GUN

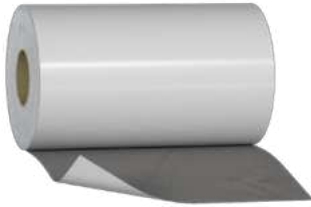


**FOAM CLEANER**  
DETERGENT FOR CARTRIDGE GUNS



# PROTECT

SELF-ADHESIVE BUTYL BAND, IT CAN BE PLASTERED



FOCUS	waterproofing and sealing of ground connection and window/door frames
MATERIAL	adhesive butyl compound with polypropylene (PP) fabric support, and release liner
DIMENSIONS	100/200 mm x 20 m   330 mm x 10 m   500 mm x 10 m
THICKNESS	1 mm

# FLUID MEMBRANE

SYNTHETIC SEALING MEMBRANE FOR BRUSH AND SPRAY APPLICATION



The synthetic resin mix is elastic and resistant to any movement of the sealed cracks. It can be applied using a roller, brush or spray with the possibility of inserting a synthetic reinforcing fabric. Removable with hot water.



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## PLASTER BAND

SPECIAL HIGH-ADHESION TAPE, CAN BE ALSO PLASTERED



FOCUS	highly adhesive tape that can be plastered for interior or exterior use
MATERIAL	support made of breathable membrane or vapour control membrane
WIDTH	from 60 mm to 200 mm
SPECIAL	versions with additional adhesive strip and with integrated plaster mesh



## BARRIER SD150

VAPOUR BARRIER



FOCUS	waterproof, it allows the passage of vapour
MASS PER UNIT AREA	190 g/m <sup>2</sup>
WATER VAPOUR TRANSMISSION	Sd > 145 m
SPECIAL	100% PE, also ideal for underscreed installation as a separating layer



## TRASPIR WELD EVO 360

MONOLITHIC BREATHABLE MEMBRANE SEALABLE





# CAP TOP

## TARPAULIN FOR ROOFS

### PROTECTION

During construction, it offers temporary protection against rain and avoids infiltration of dust and construction remains into the cracks between the panels.

### MATERIAL

Truck tarpaulin in polyester covered in matt lacquered PVC.



DIMENSIONS	from 10 x 12 m to 14 x 16 m
THICKNESS	0,5 mm
MASS PER UNIT AREA	600 g/m <sup>2</sup>
TENSILE STRENGTH (transverse and longitudinal)	2200 / 2000 N/50 mm
TEAR RESISTANCE (transverse and longitudinal)	280 / 250 N/50 mm

See also:

### CAP SUPER

#### ROOFING SYSTEM FOR CONSTRUCTION SITES

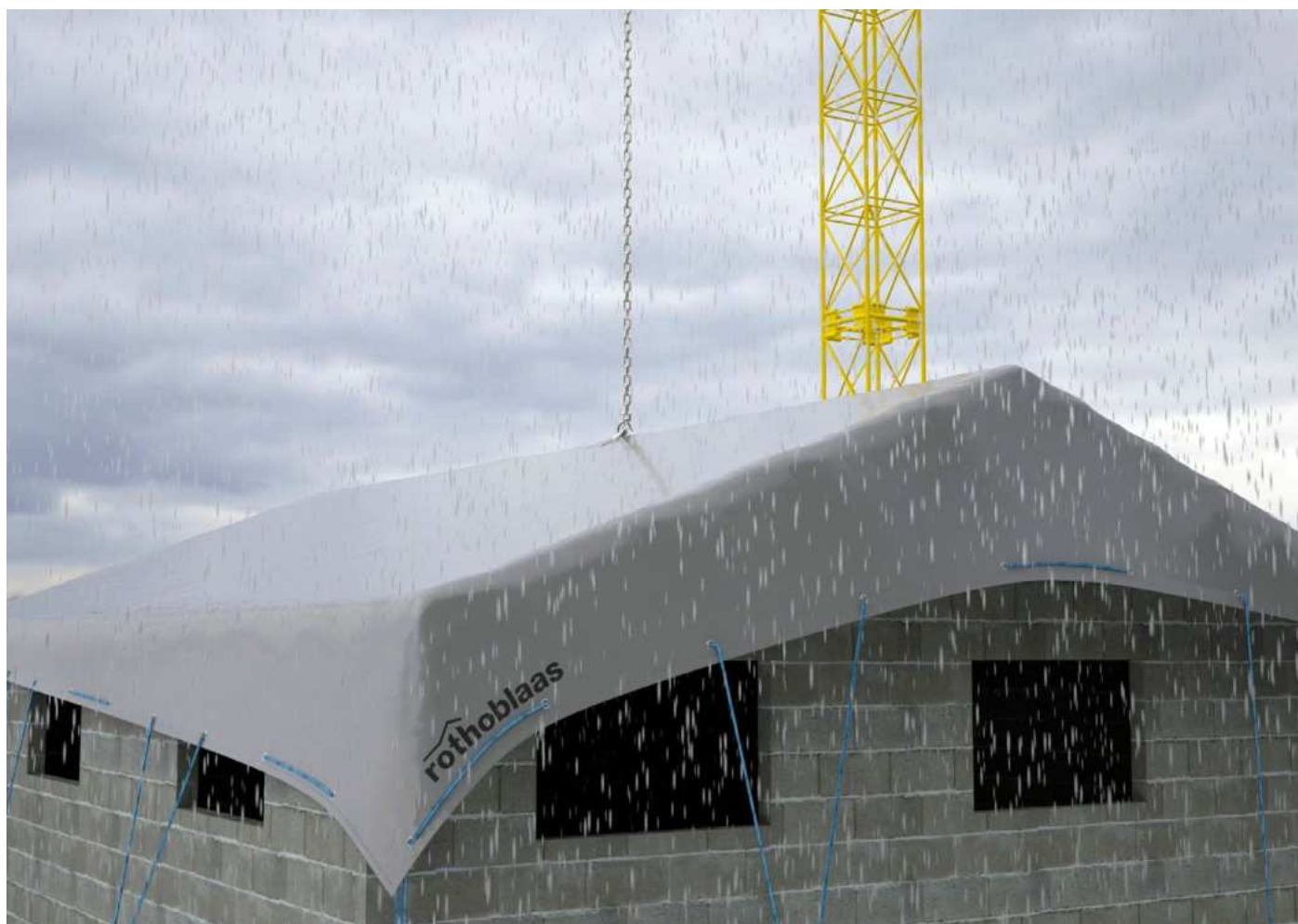
With this solution you can reduce or increase the size of the roofing system to adapt it to the floors.

Thanks to the reinforced metal eyelets on the edge and underside, the tarpaulin can be fixed every metre on the roof.

The large mass per unit area and the type of material guarantee better mechanical resistance and durability over time.



VIDEO



### FASTENING

Screws for timber | Plates and connectors | XEPOX epoxy adhesive  
CLT slab-to-column connections | Terraces and facades | Anchors for concrete

### AIRTIGHTNESS AND WATERPROOFING

Tapes and sealants | Roof and ventilation elements | Membranes

### SOUNDPROOFING

Resilient profiles | Soundproofing layers | Sealants

### FALL PROTECTION

Lifeline | Lifeline components | Anchor points | Collective protection and accesses | PPE | Fastening systems and accessories

### TOOLS AND MACHINES

Carpentry tools | Measurement | Templates | Construction site protection  
Transport and Lifting | Wood repair | Drill bits and cutters | Machines



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