

SYSTEMS FOR THE BUILDING SECTOR

Drain, cover, thermo-insulate, sound-proof



TeMa
Technologies
and Materials

HIGH BUILDING PROTECTION

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Ideas and solutions for residential building



Strong for the experienced gained from one of the main international leaders operating in the sector, the **TeMa** Group soon distinguished itself for the introduction of innovative technologies, new materials and an advanced production system in Italy, Spain, Turkey and Russia.

Working in over 60 countries, **TeMa** is the protagonist in the building market, also thanks to a purposely created Division to collaborate with designers and companies working in this sector.

TeMa: *new healthy perspectives to those living the home today.*

This is the mission that **TeMa Divisione Edilizia** (TeMa Building Division) pursues through the continuous research for new products, the active involvement of designers and companies, the collaboration with clients during the pre-sales and post-sales phases.

Quality laboratory, specialised technical department and commercial network work together transforming every market requirement in an objective to efficiently and rapidly pursue. The sales network working world-wide allows rapid circulation and comparison between the different approaches to troubleshooting linked to the use of the materials, in order to be able to propose the most suitable solution for every condition.



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Commercial structure

The continuous comparison with the most demanding international markets, push **TeMa** towards a constant improvement of its products and services. The sharing of experiences, the training of in-house staff and the updating of external collaborators are the basis for strongly client orientated professional growth, aimed at satisfying their requirements, orientating their choices with specific solutions for every problem.

- **Capillary sales network**
- **Regional agencies formed by prepared professionals**
- **Technical Department - commercial support to agencies**
- **In-house customer service and logistics**
- **Training and information activity through meetings and seminars**
- **Continuous research for new solutions through international partnerships**
- **Push towards innovation**





The TeMa drainage: a solving system



TeMa has a range of products studied to offer definitive solutions to the different drainage problems, both for new constructions, and for restructurings.

Protecting the home from dampness starts with the soil. Waterproof, protect the sheaths, drain water, create anti-dampness air chambers, are essential functions to guarantee the highest quality of the constructions. In addition, there are phenomenons like condensation, capillarity or infiltrations, object of many interventions during restructurings; situations that, for structural reasons, often constitute a difficult to solve problem. A correct airing of the walls prevents the forming of damp stains, plaster detachment and gives back the pleasure of living in a dry place. The resistance of these elements to atmospheric agents and the duration in time, translates in an optimisation of the investments and better use of the covered areas. This is why TeMa proposes advanced solutions for waterproofing, drainage and protection of treadable, vehicles access and roof gardens roofing.

T-Mix Drain

T-Mix Drain is a draining geocomposite obtained from the coupling of a drainage soul in polypropylene monofilaments with one or two non-woven geotextiles, also in polypropylene. The thicknesses vary from a minimum of 8 up to 20 mm.

T-Mix Drain WP

Mix Drain WP is a drainage geocomposite having an internal structure similar to **T-Mix Drain**, coupled in line with a waterproofing polyolefin membrane. Therefore, this composite presents, on one side, a waterproofing membrane with a selva of approx. 10 cm with butyl beam for the perfect sealing of overlappings.

T-Kone G Drain

T-Kone G Drain belongs to the category of geocomposites obtained by coupling a thermoformed slab in HDPE to a filtering geotextile.

T-Kone H XL

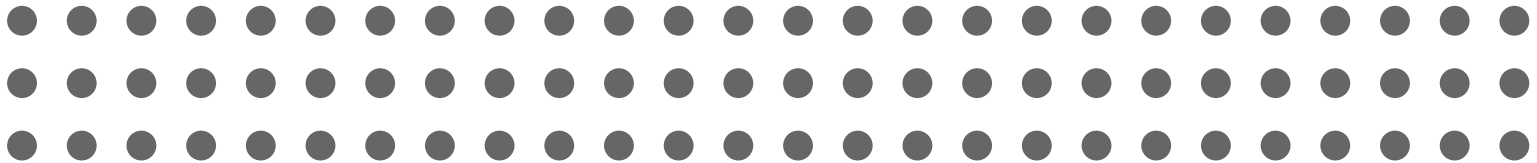
T-Kone H XL is a very large (20 mm) thermoformed slab in HDPE with exceptional resistance provided with holes for the evacuation of excess water.

Laboratory

TeMa has always believed that the key to success is the constant commitment in the research and development for new solutions. In particular in the building sector, the collaboration between the technical department and the test and quality laboratory, is crucial both for having the possibility to offer its customers state-of-the-art products, and to collaborate with designers and companies in the correct application of the proposed solutions. Tests for duration, resistance to compression, drainage ability in the most critical situations, thermal and acoustic trials and tests, are only some of the tests that the **TeMa** laboratories carry out daily to verify that the products are in line with the fixed severe quality Standards. For this continuous research for excellence, **TeMa** is provided with a UNI EN ISO 9001:2000 certified quality system, able to assure that the entire production is at the highest performing levels. In compliance with the CPD Directive (Construction Product Directive) 89/106/EEC, the product lines proposed by **TeMa** have followed the course for the achievement of the EC marking.



All work aspects are monitored and continuously optimised: from designing to production, from pre and post-sales assistance, to the distribution chain and delivery to the client. The comparison with the most reliable external laboratories, pushes towards a continuous improvement of the test and verification procedures carried out during all phases of the production processes.



- Test on raw materials
- Research and development support
- Qualitative and performance verifications on finished products and prototypes
- Product technical sheets editing and updating
- Quality control
- Certifications
- Supervision and control of the production processes
- Sample test on production batches and conformity verification





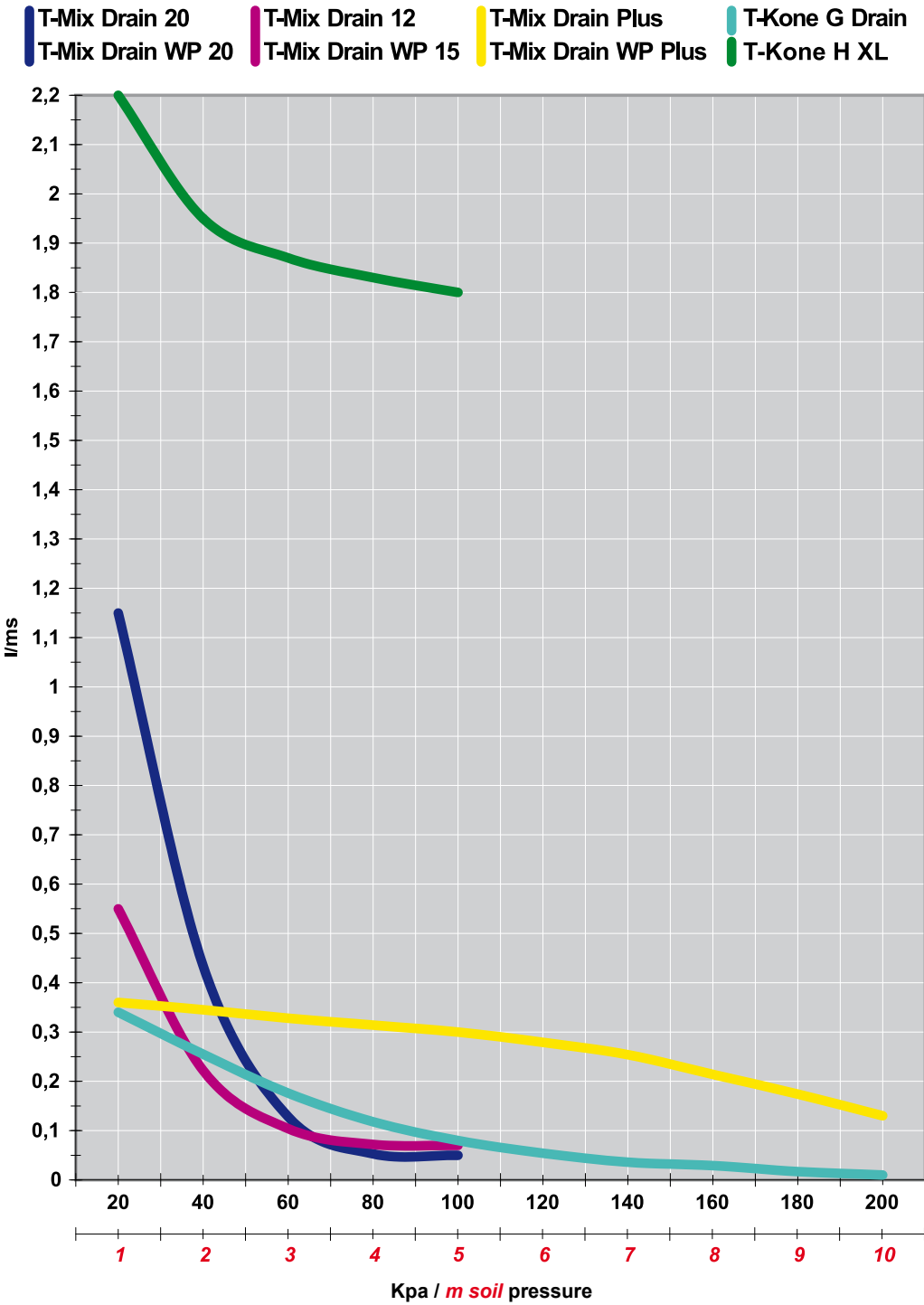
The horizontal drainage



Product	Geo-textiles	Section	Thickness (mm)	Low loads drainage	High loads drainage
T-Mix Drain 20 EL	2		20	****	**
T-Mix Drain 20	2		20	****	**
T-Mix Drain 12	2		12	***	**
T-Mix Drain WP 20	2(*)		20	****	**
T-Mix Drain WP 15	2(*)		15	***	**
T-Mix Drain Plus	2		8	**	****
T-Mix Drain WP Plus	2(*)		8	**	****
T-Kone G Drain	1		8	**	**
T-Kone H XL	-		20	***	***

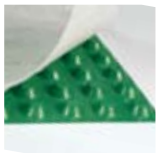
(*) One filtering side and the other provided with a waterproof polyolefin sheath

HORIZONTAL DRAINAGE



Drain

RECOM-
MENDED
PRODUCTS



Pressure	T-Mix Drain 20 EL	T-Mix Drain 20 / WP 20	T-Mix Drain 12 / WP 15	T-Mix Drain Plus/WP Plus	T-Kone G Drain	T-Kone H XL
20 kPa	1,15	1,15	0,55	0,36	0,34	2,2
50 kPa	0,23	0,23	0,13	0,33	0,22	1,9
100 kPa	0,05	0,05	0,07	0,30	0,08	1,8

Hydraulic capacity data (l/sm) of the Drainage geocomposite in the plan measured with soft/rigid contact according to EN ISO 12958

Protection of the
waterproofing and drainage
in correspondence of
vehicle access roofing
realised with
T-Mix Drain WP Plus



AFTER

BEFORE

Mechanical protection of the
waterproofing and drainage
in correspondence of a
treadable roofing realised
with **T-Kone**



Mechanical protection of the
waterproofing and drainage
in a vehicle access roofing
realised with
T-Mix Drain Plus

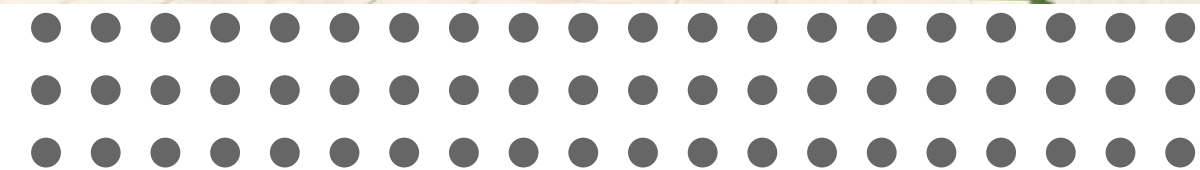




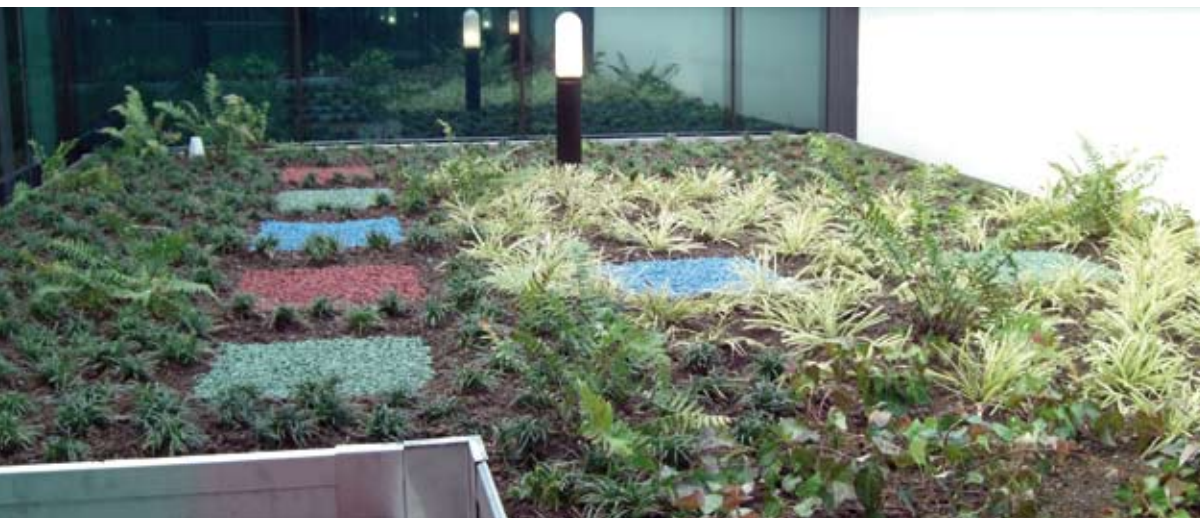
Mechanical protection of the waterproofing and drainage in a flower box realised with **T-Mix Drain 20**



Mechanical protection of the waterproofing and drainage on a roof garden roofing realised with artificial grass obtained with **T-Mix Drain Plus**



Drain



Roof garden roofing realised with real essences. The use of **T-Kone H XL** allows an excellent water and drainage storage of H_2O in excess



Mechanical protection of the waterproofing and drainage in a treadable roofing realised with **T-Kone G Drain**



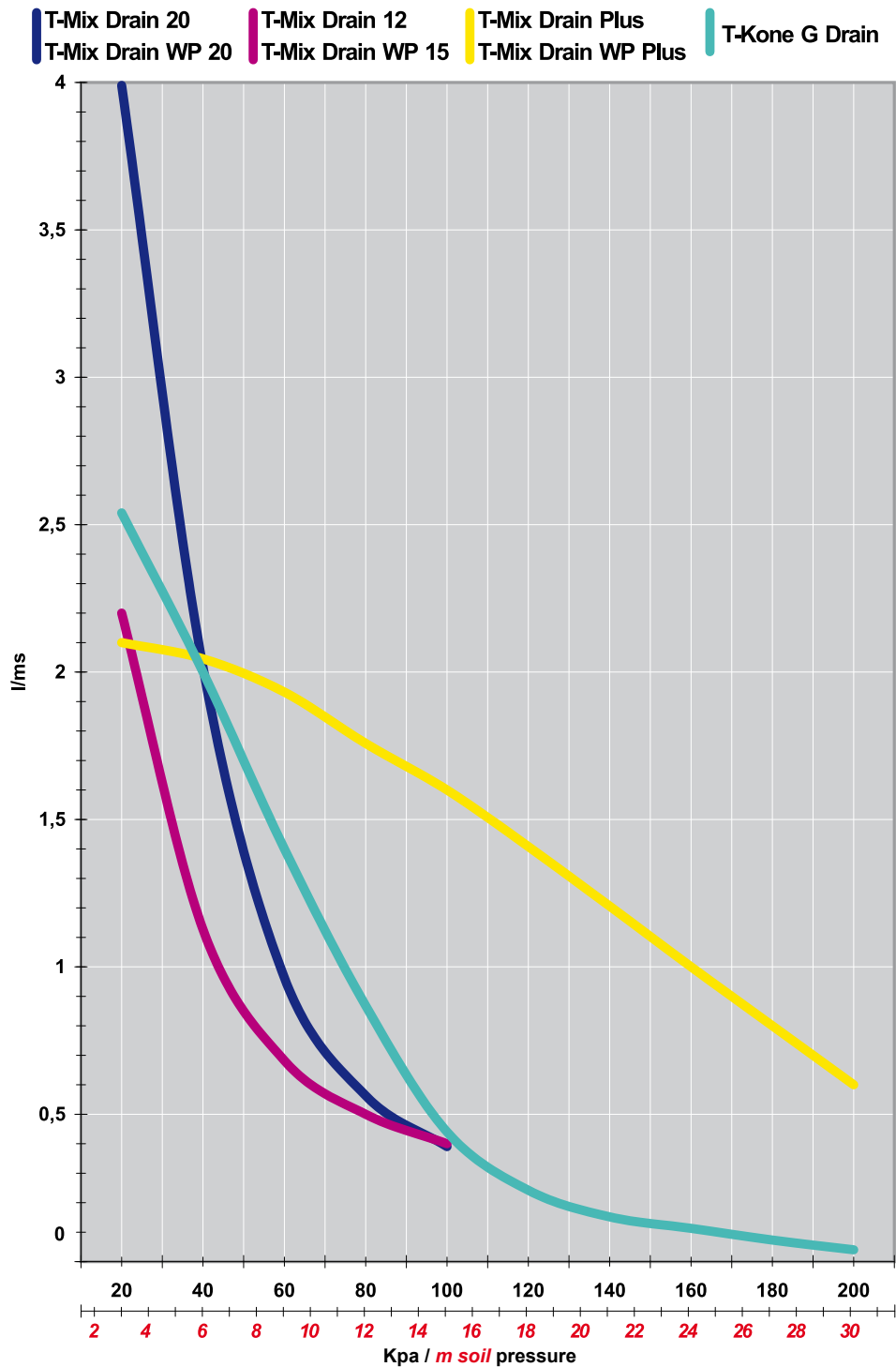
The vertical drainage



Product	Geo-textiles	Section	Thickness (mm)	Low loads drainage	High loads drainage
T-Mix Drain 20 EL	2		20	****	**
T-Mix Drain 20	2		20	****	**
T-Mix Drain 12	2		15	***	**
T-Mix Drain WP 20	2(*)		20	****	**
T-Mix Drain WP 15	2(*)		15	***	**
T-Mix Drain Plus	2		8	**	****
T-Mix Drain WP Plus	2(*)		8	**	****
T-Kone G Drain	1		8	**	**

(*) One filtering side and the other provided with a waterproof polyolefin sheath

VERTICAL DRAINAGE



Drain

RECOMMENDED PRODUCTS



Pressure	T-Mix Drain 20 EL	T-Mix Drain 20 / WP 20	T-Mix Drain 12 / WP 15	T-Mix Drain Plus/WP Plus	T-Kone G Drain
20 kPa	3,99	3,99	2,20	2,10	2,54
50 kPa	1,44	1,44	0,80	2,00	1,52
100 kPa	0,39	0,39	0,40	1,60	0,44

Hydraulic capacity data (l/ms) of the Drainage geocomposite in the plan measured with soft/rigid contact according to EN ISO 12958

Mechanical protection
of the waterproofing
and drainage in
correspondence of
foundations of a shopping
centre realised with **T-Mix
Drain 20**



Mechanical protection of the
waterproofing and drainage
realised with **T-Kone G Drain**





Mechanical protection of the waterproofing and drainage in a wall against earth realised with **T-Mix Drain 20**

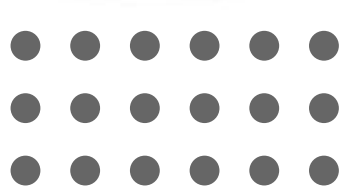


Drain





Waterproofing, drainage and disposable casing in a foundation realised with **T-Mix Drain 20 WP**





The vertical drainage: rehabilitation of the damp walls

Product	Geo-textiles	Section	Thickness (mm)	Low loads drainage	High loads drainage
T-Kone Plaster	1(*)		8	*	
T-Kone Plaster profile	2				

(*) Reinforcement mesh



Pressure	T-Kone Plaster	T-Plaster profile	T-Plug	T-Nail
20 kPa	2,54			
50 kPa	1,40			

Hydraulic capacity data (l/sm) of the Drainage geocomposite in the plan measured with soft/rigid contact according to EN ISO 12958

PROBLEM

The main cause of the presence of dampness in walls inside the home is to be found amongst the following possible causes:

- **No waterproofing systems in the external part of the wall (that in contact with the soil foundation).**
- **Damaging of the waterproofing system due to the absence of an efficient “mechanical protection of the waterproofing”.**
- **Air saturated by humidity (no adequate ventilation) and presence of cold walls (wall not thermally insulated) cause the condensation of the water steam on the cold wall.**

All this can cause a series of phenomenons which:

- **Appearance of white areas on the walls (phenomenon called “efflorescence”) due to the deposit of salts.**
- **Detaching of the superficial plaster.**
- **Appearance of damp areas.**



SOLUTION



The best solution consists in identifying the “real cause” amongst those listed above and radically eliminating it. However, this is

usually extremely difficult and expensive. The Tema solution to the problem is T-Kone Plaster.

The 8 mm air chamber between the original wall and the “new wall”, guarantee the circulation of air while the special profile at the base eliminates the dampness in excess.

- **T-Kone Plaster is resistant to a large number of atmospheric agents**
- **T-Kone Plaster is resistant to fungus and bacteria**
- **T-Kone Plaster is imputrescible and non-toxic**

LAYING INSTRUCTIONS



1 Clean the surface using a metal brush



2 Smoothen the surface with stucco



3 Fix T-Kone Plaster Profile “aligned” to the base and top of the wall using the provided nails



4 Measure the distance between the two profiles and cut the roll of T-Kone Plaster in equal measure



5 Fix T-K Plaster to the wall using T-Plug and T-Nail



6 Plaster

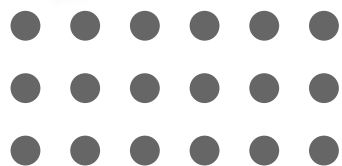


7 Paint/finish the surfaces with the wanted colour or material



8 Position both below and above the skirting board

Drain



Thermo-insulate

To be able to propose effective energy saving solutions for the home, it is necessary to clearly understand which are the methods with which heat is transmitted and dispersed. On the contrary to traditional insulation systems that, if of adequate thickness, slow the conduction of heat from walls, the TeMa reflecting products ensure that there is no energy exchange between the surfaces separated by them. This happens to the particular materials composing them, able to reflect over 97% of energy that hits them for irradiation, and to block the hot air that naturally moves upwards for convection.

ROOFS

The use of the range of **Thermo-Reflex** products by TeMa on roofings, allows a very high reduction of thermal dispersion in a reduced thickness. These advantages, in case of use on flat or sloped roofs, are coupled with the ability of Thermo-Reflex to be a perfect barrier to steam and wind. Thermo-Reflex is also a solution in case of interventions from inside the roof, especially in case of attics. It will be enough to install **Thermo-Reflex** on the ceiling of the attic to immediately improve the thermal performances of the ambient.

WALLS

Both during restructuring and in new realisations, **Thermo-Reflex** is the solutions that matches excellent thermal properties to the maximisation of the liveable surface. Its reduced thickness allows to obtain excellent yields without being forced to sacrifice wall space. This to the full advantage of the ratio between gross surface and treadable surface of the home. The easy laying also inside the wall and the ability to be a perfect barrier to steam make **Thermo-Reflex** the ideal answer for restructurings or interventions following realisation.

PAVINGS

Thanks to the heat reflection properties of the product, **Thermo-Reflex** is the ideal complement for the realisation of radiant heating systems. These systems allow, thanks to the low working temperatures, significant energy savings, also for the possibility of integrations with renewable energy sources (solar panels or geothermics) or boiler with high yield condensation.

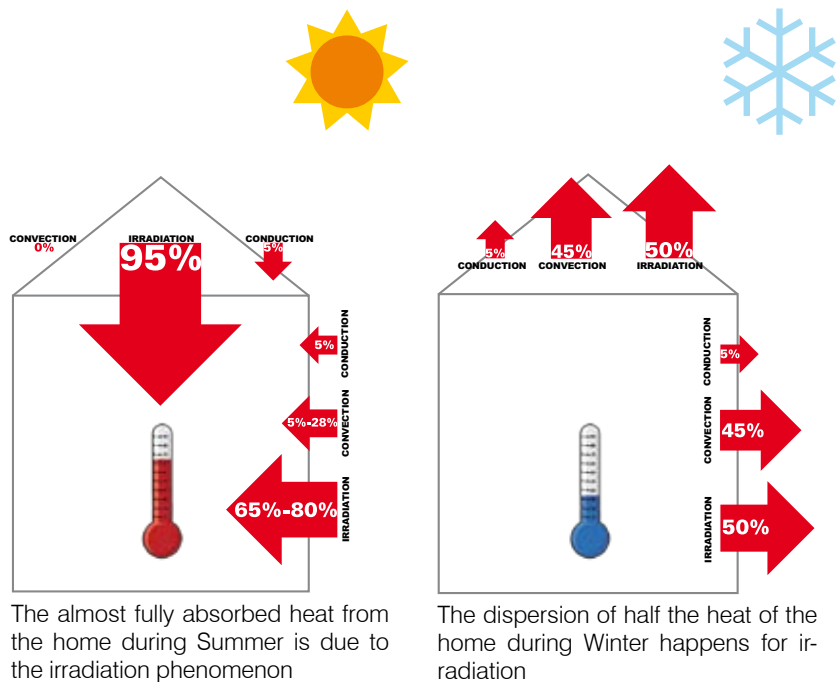
The functioning principle

By analysing how heat enters the home during the Summer and is dispersed during the Winter, it is possible to better understand the extraordinary effectiveness of **Thermo-Reflex**.

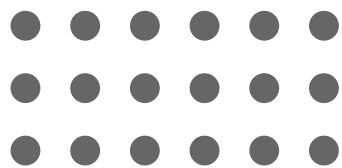
During Summer the thermal discomfort due to heat from the sun penetrating inside the home is mainly due to the irradiation phenomenon. Even up to approx. 95% with regard to roofing (and consequently, the loft). Our experience shows us that it is actually in the attic where we generally suffer the heat more during the Summer.

Whereas, during the Winter, when it is necessary to efficiently withhold the heat produced from the heating system, dispersion through the walls equals that of the roofing. In this case also the most responsible is irradiation, in the measure of approx. 50%.

Seeing as **Thermo-Reflex** is able to almost totally block irradiation, it can be assumed how its use can significantly reduce the input thermal flow (Summer) or the output (Winter).



<div>APPLICATION</div> <div>THERMO-REFLEX</div>		EXTERNAL ROOF	INTERNAL ROOF	FLOOR	WALL	PAVING	DIY
PRO18		★	★	★			
PRO11		★	★	★			
PRO15		★	★	★			
PRO5					★		
PRO DUO PRO DUO F						★	★



Thermo-insulate the roofs

Product	Material	N. layers	Section	Thickness (mm)	Weight (Kg/m ²)
PRO 18	Al, PP, PET, wool	18		40	0,846
PRO 11	Al, PP, PET	11		45	0,773
PRO 15	Al, PP, PET	15		32	0,633



EXTERNAL ROOF

The use of **Thermo-Reflex** on newly built roofing or in case of restructurings, allows reaching the best results thanks to the combined heat reflection and ventilation action. The reduced thickness and easy laying improve the execution speed meaning savings for both the company and for the final user. Storage, transport and laying no longer constitute a critical state; on the contrary, they can mean significant savings and bring greater profits, guaranteeing the highest thermal performances.

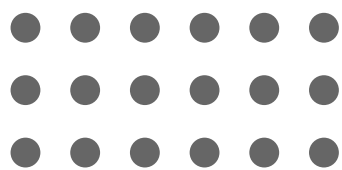


INTERNAL ROOF

Placed inside the roof, **Thermo-Reflex** guarantees a rapid and long-lasting improvement of the wellbeing conditions inside attics and liveable lofts. The particular heat reflection properties allow to benefit from a fresher climate during the Summer and from a more rapid and efficient heating during the cold season, without thermal dispersions.

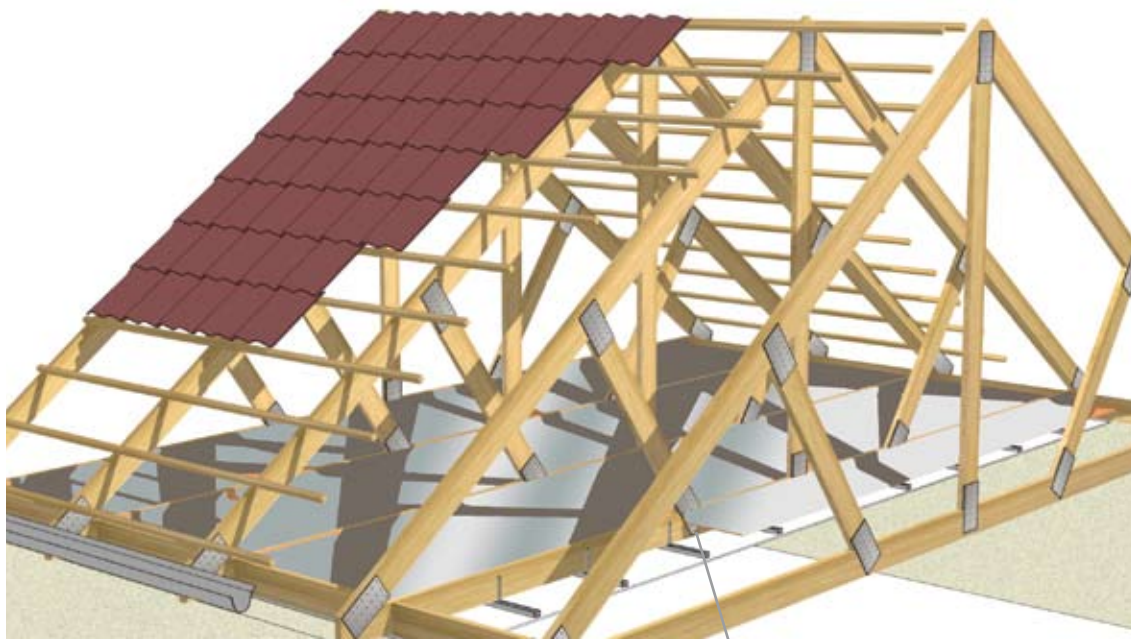


Thermo-insulate



Thermo-insulate the floors

Product	Material	N. layers	Section	Thickness (mm)	Weight (Kg/m ²)
PRO 18	Al, PP, PET, Wool	18		40	0,846
PRO 11	Al, PP, PET	11		45	0,773
PRO 15	Al, PP, PET	15		32	0,633



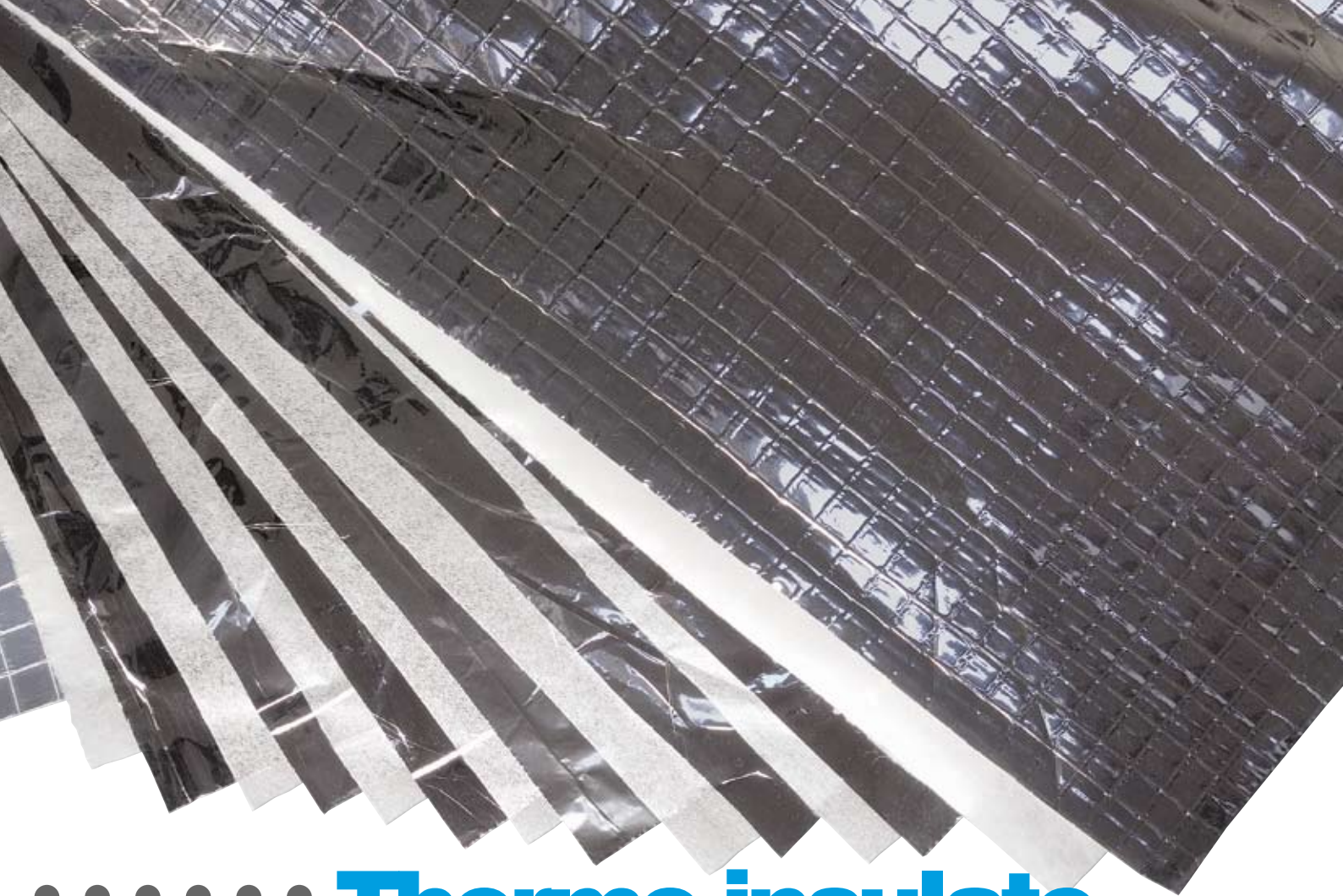
Also in case of constructions or restructurings where there is a liveable loft, the use of **Thermo-Reflex** is able to increase - with very contained costs - the energy yield of the building. The use of aluminium sheets and of the **Thermo-Reflex Tape**, also in aluminium, also guarantees a very efficient barrier to steam.

In particular, it can prove problematic and often very expensive in case of restructurings, improvement or replacement of the roof insulation. In these cases - if a floor is present - it can be advantageous to intervene on the latter, in this way avoiding to work on the internal or external surface of the roofing. In fact, it is enough to position a continuous surface of **Thermo-Reflex** on the floor paving, being careful to seal it along the perimeter with the appropriate **Thermo-Reflex Tape**. To prevent thermal dispersion during the cold seasons it is necessary to leave an air cavity of approx. 2 cm between the product and the paving.

The laying of **Thermo-Reflex** is very simple. Just arrange lacings on the paving on which to position (maybe with the aid of a stapler) adjacent liners of **Thermo-Reflex**. To guarantee continuity to the reflecting surface, we recommend using adhesive tape **Thermo-Reflex Tape**.

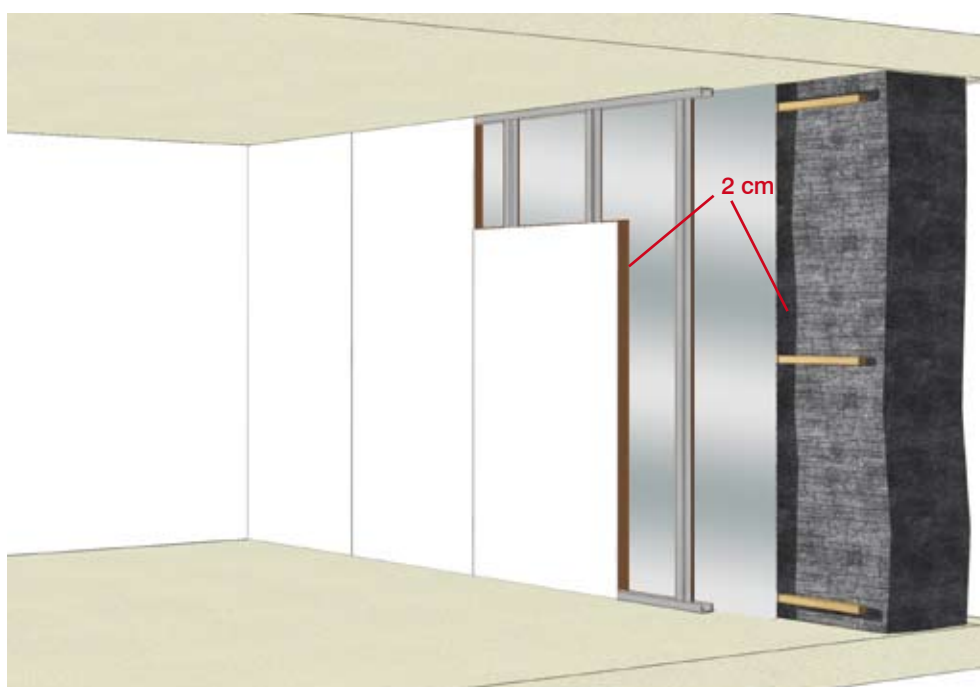


Thermo-insulate



Thermo-insulate the walls

Product	Material	N. layers	Section	Thickness (mm)	Weight (Kg/m ²)
PRO 5	Al, PP, PET	5		30	0,426



The external walls constitute - together with the roofing - the "skin" of the home. And, similarly to us, even this has to be suitable covered to protect us from adverse climate. In this case also, the products of the **Thermo-Reflex** range by TeMa, constitute the solution able to join full economy and large efficiency. Used as alternative to expensive and long interventions realised externally to the walls (cladding), **Thermo-Reflex** protects the home acting from inside the same.

The external walls of a home usually represent the largest surface separating the same home from the outside. As such, it must be perfectly insulated in order to prevent the dispersion of heat during the Winter months and to improve comfort during the Summer months. In case of interventions on already existing homes, the only possible solution to date was the intervention from the outside (cladding). But this system entails a series of limits, especially in condominiums. To realise an external cladding in a multi-family building, it is essential to intervene on the entire building, therefore requiring the approval of all joint-owners. From an economical point of view also, an intervention on the outside of the building entails significant costs linked to the structures necessary for the work, like scaffoldings, cranes or bridges.

On the contrary, the use of the products from the **Thermo-Reflex** range by TeMa, is able to join great use practicality, excellent and long-lasting performances, and contained costs.



ADVANTAGES

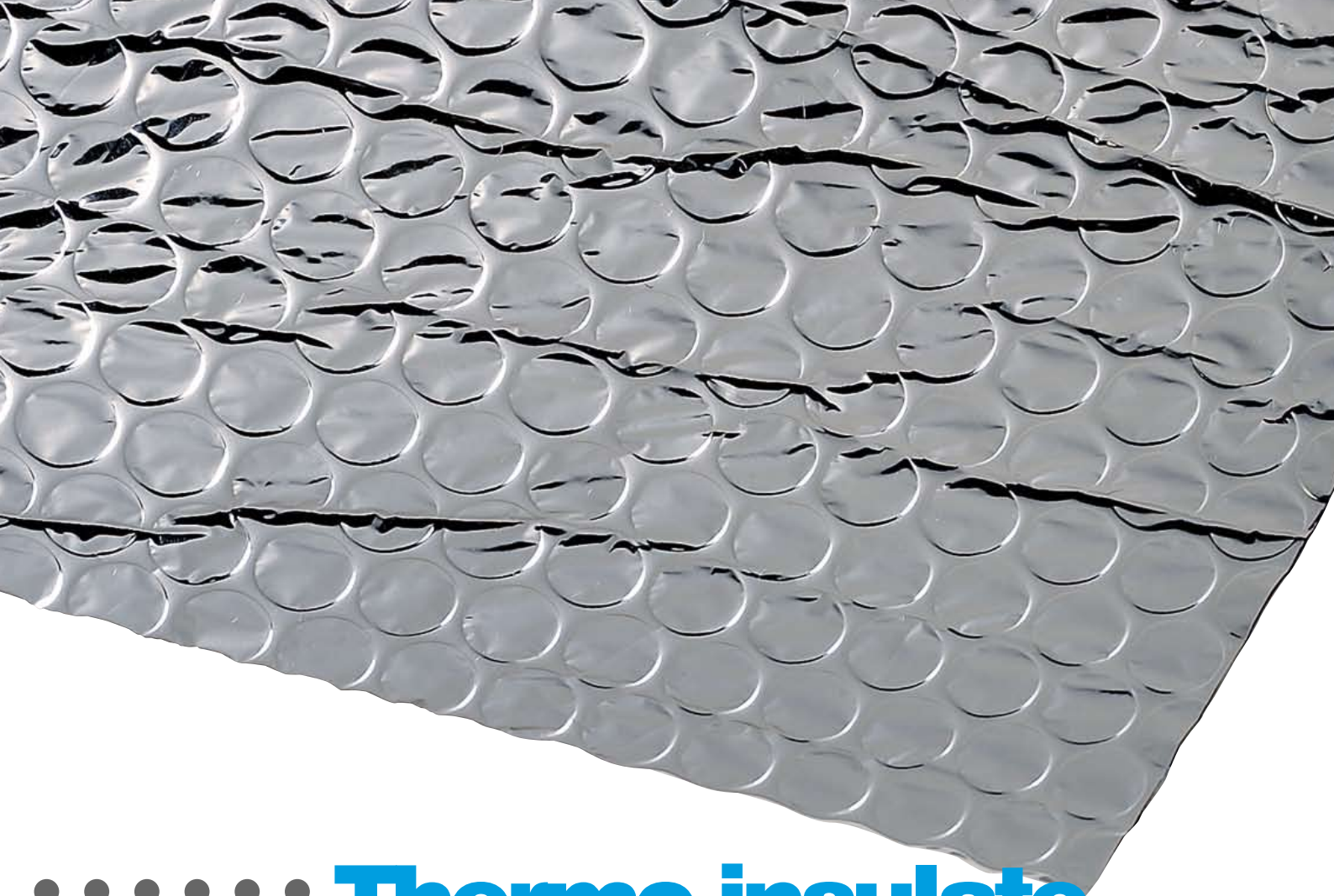
As well as the advantages due to the modality with which **Thermo-Reflex** blocks the heat flow both from the outside during the Summer and from the inside during the Winter, the advantage also due to the simple laying is highlighted in applying the product to the home walls.

Seeing as **Thermo-Reflex** is applied in the internal part of the walls, it can be used without any consent from the joint owners, obtaining immediate advantages like the decrease in heating costs, greater speed in reaching the wanted temperature, minor use (therefore, longer lasting) of the boilers, greater comfort during the Summer, even without the use of expensive air conditioning systems.



The laying is simple and does not require masonry interventions: just position spacing laths on the wall, on which to clinch adjacent liners of **Thermo-Reflex**, being careful to use the appropriate adhesive tape to join the liners to each other, in order to create a reflecting surface without interruption.

Once **Thermo-Reflex** is laid, it can be covered with plasterboard slabs, in this case also, leaving a small air cavity of approx. 2 cm.

Thermo-insulate



Thermo-insulate pavings and DIY

Product	Material	N. layers	Section	Thickness (mm)	Weight (Kg/m ²)
PRO DUO	Al, PP, PET	4		4	0,36
PRO DUO F	Al	4		10	-

RADIATOR

A radiator has the task to heat the inside of a home. Part of the energy developed is transmitted through irradiation. A simple panel of **Thermo-Reflex**, placed between the same radiator and the wall contributes to making this percentage of produced energy also fully available, without it being dispersed to the outside.



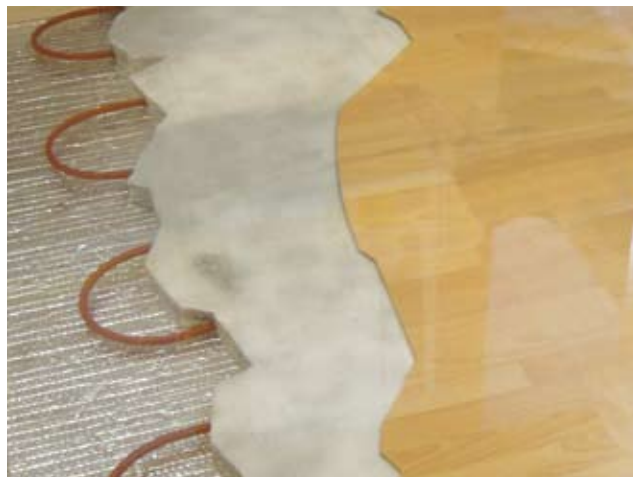
RADIATING PAVINGS

The heating system with radiating panels, usually placed on paving, is ever more used for the many advantages it entails, both in terms of comfort and saving. **Thermo-Reflex** perfectly combined with this type of application, managing to improve its yield and complete its advantages.

There are always more newly built home using alternative heating systems to the old radiator. Amongst these the most diffused is undoubtedly the "radiating paving" system, that used the entire paving surface with water at a significantly lower temperature compared to the normal wall radiators. It is the use of circulating water at working temperatures below 40°C, that makes this system perfectly integrated with condensation boilers or with the, so-called, renewable energies (solar panels, geothermics, etc.).

In this particular application type, **Thermo-Reflex** performs a series of functions, as well as that of insulation. In fact, its reflecting feature, increases the efficiency of the entire system. Furthermore - thanks to the presence of aluminium - **Thermo-Reflex** also constitutes a perfect barrier to steam.

Finally, **Thermo-Reflex** solves - in a definitive way - another problem also, often ignored, that relating to the infiltrations of Radon gas. This radioactive gas becomes extremely hazardous when it accumulates in closed premises, especially those in contact with soil. If inhaled it is carcinogenic. With the use of **Thermo-Reflex** on cold pavings, before the last casting, a perfect barrier is created against every possible infiltration of this hazardous gas.



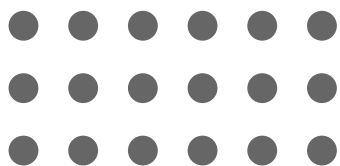
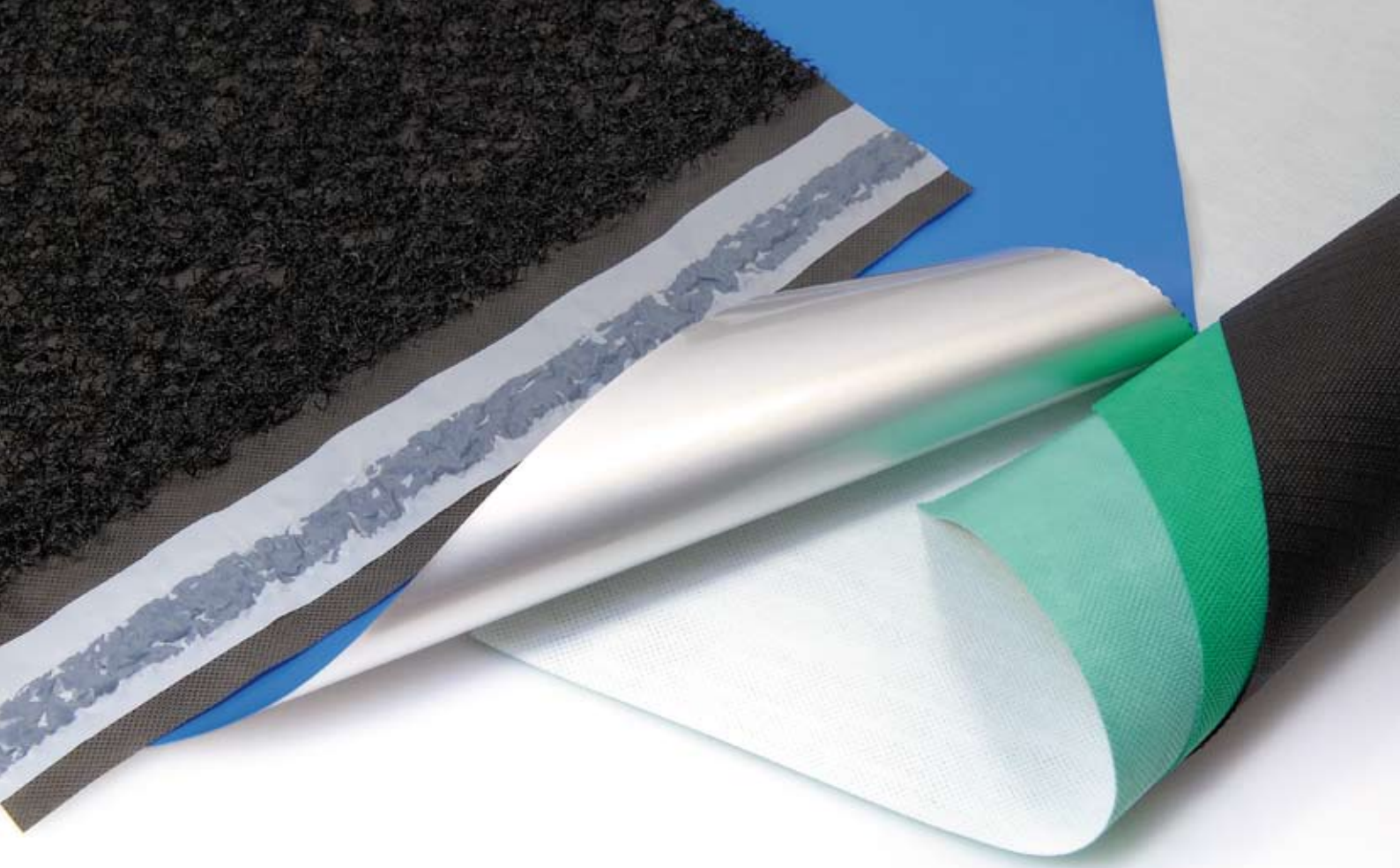
GARAGE

There are many homes where the garage confines with premises arranged for - even partially - homes, like for example liveable taverns. In these cases, the garage shutter represents a very weak point, from an insulation point of view, especially from the Winter cold. As it is usually made of a simple steel sheet, and not guaranteeing perfect sealing, it constitutes a passage through which the precious heat leaks and cold air enters.

For this problem TeMa recommends the use of a **Thermo-Reflex** panel that, if opportunely installed, can significantly reduce the energy dispersion of this side of the home.



Thermo-insulate



Cover

There are different interpretations within the market for the realisation of roofs and roofings. Maintaining the principle that a roof must protect from rain and thermal shocks, there are different realisation types, of ventilated roofs like non-ventilated, inspired by requirements, contexts and different traditions.

However, certain concepts are common to all roofing of liveable ambients:

- it is necessary to obtain perfect waterproofing (from outside to inside) at the same time guaranteeing the breathability to steam (from inside to outside);
- it is necessary to protect the insulating material from rain water and from water steam coming from inside the home;
- it is necessary to protect the boarding from condensation.

T-Vapo Stop barrier to steam

The task of **T-Vapo Stop** is that to block the passage of steam and of water. It is made of an aluminium lamina protected from a layer of polyester and one of polyethylene.

T-Vapo Slow steam brakes

T-Vapo Slow is a 3-layer waterproof membrane that brakes the passage of steam from inside the home towards the outside. Placed between the boarding and the thermal insulation, avoids the forming of condensation inside the insulation material.

T-Vapo Fast steam diffusors

T-Vapo Fast is essential for favouring steam leakage from the insulating layer. Realised with a technological layer permeable to steam and waterproof, is protected by non-woven layers in polypropylene, and protects the insulation from any water infiltrations, even during construction.

K-Roof steam diffusers

K-Roof is a conceptually unheard of product, that couples the action of a steam diffuser to a layer in polypropylene monofilament able to create a drainage plan underneath the steel sheet. Its use is essential for metal roofing.



Waterproofing and steam control

The hot air full of steam, rising towards the outside, in contact with the coldest parts may condense in correspondence with the insulating layer, jeopardising its efficiency.

TeMa has a range of waterproof liners, studied for the various types of roofing.

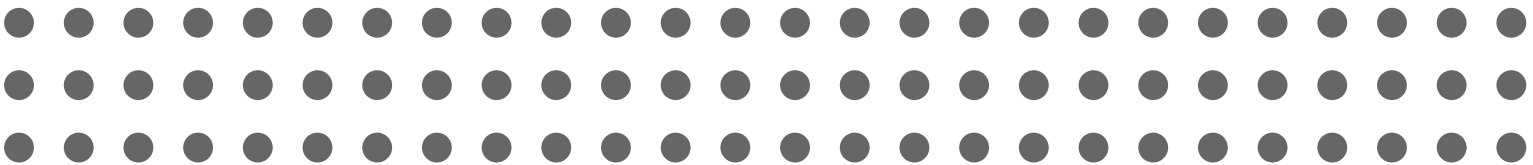
T-Vapo Stop and **T-Vapo Slow**, positioned underneath the insulation, perform the steam barrier or brake function.

The steam diffusers **T-Vapo Fast**, installed above the insulation, are waterproof and favour the leakage of any residue steam.

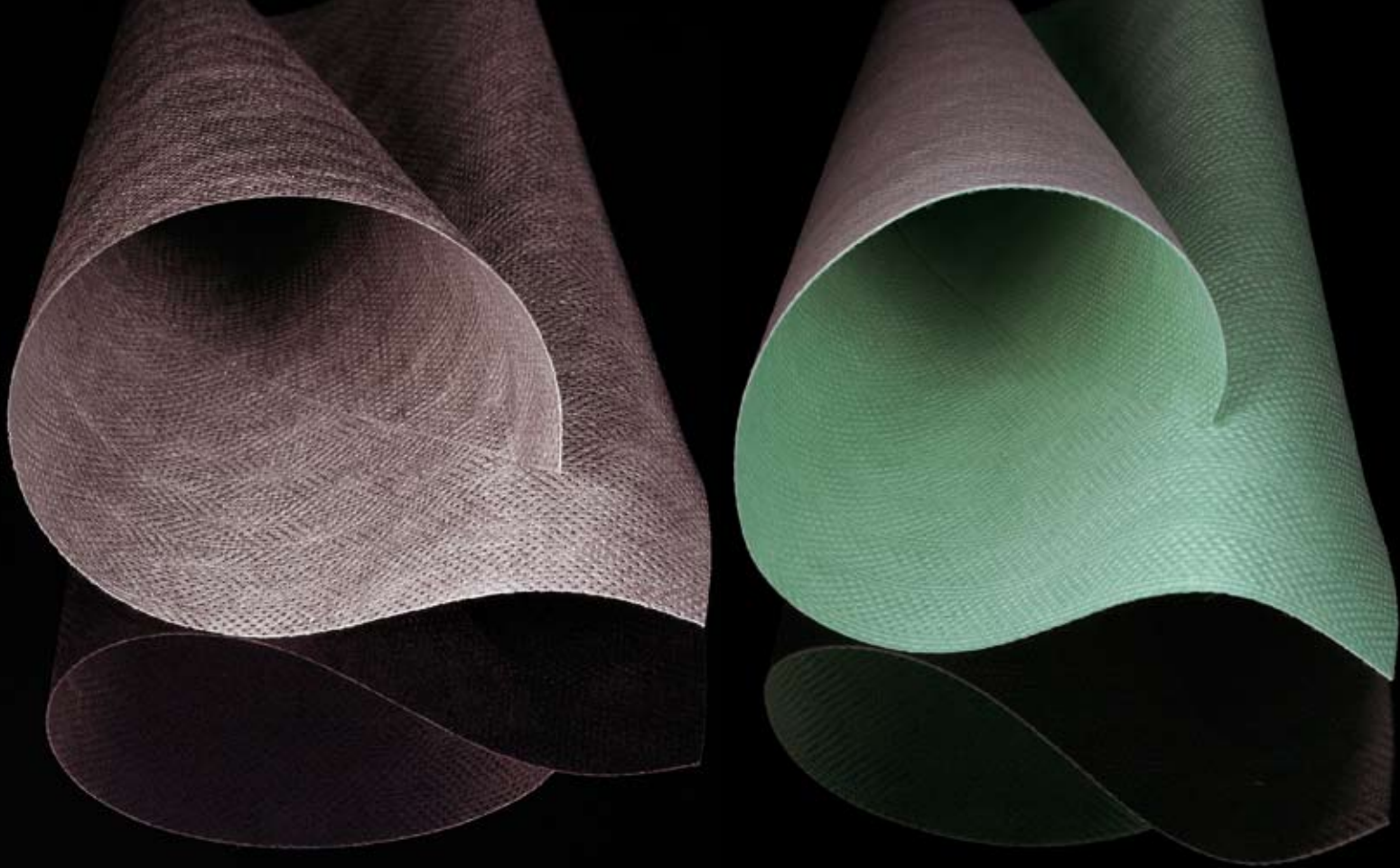
Whereas, if installed underneath the insulation, they protect the boarding from any condensation.

Waterproofing, steam control and drainage

For metal roofs, TeMa suggests the use of **K-Roof**, a revolutionary system, realised from a drainage cavity, that prevents the forming of condensation under the roofing and muffles the sound of rain or hailstone. **T-Colmo** is the ideal finish for every ventilated roof, whereas **K-Side Premium ZZ** and **K-Side**, drainage structures in polypropylene, allow the realisation of ventilated facades and permeable to steam.



types of realisations			TeMa solution				
			underneath thermal insulation		above thermal insulation	at ridge	difficult points and joints
			natural	synthetic			
roof ventilated (cold)	in boarding + laths		T-Vapo Slow Plus	T-Vapo Fast	T-Vapo Fast	T-Colmo	Bitu-T T-Tape T-Vapo Tape
	in boarding + boarding		T-Vapo Slow	T-Vapo Fast	T-Vapo Fast	T-Colmo	
	in concrete + boarding		T-Vapo Slow Net	T-Vapo Fast	T-Vapo Fast	T-Colmo	
	in concrete + laths		T-Vapo Slow Net	T-Vapo Fast	T-Vapo Fast	T-Colmo	
roof non-ventilated (hot)	in boarding without insulation + laths						
	in boarding + laths		T-Vapo Stop	T-Vapo Fast	T-Vapo Fast		
	in concrete + laths		T-Vapo Stop	T-Vapo Fast	T-Vapo Fast		
metal roof	any		K-Roof C10 B • K-Roof C10 F K-Roof C10 EP				K-Butyl Tape/ K-Butyl Stick/ Hammer



Ventilated roof in roof boarding and laths

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Slow Plus	PE TNT, controller	13	260	0,4	135
T-Vapo Fast 180	PET TNT, PE, net, TNT	0,02	290	0,7	170

USE WITH “SYNTHETIC” INSULATION

The same transpiring membrane can be used both above insulation (as second waterproofing), or underneath (as boarding protection from any condensation).

T-Vapo Fast 180, transpiring and waterproofing membrane, offers high breathability to steam, but guarantees protection from water.

LATHS BOARDING - 1	roof tiles
	laths and cross-laths
	ventilation chamber
	vertical laths
	T-Vapo Fast 180
	synthetic insulation
	T-Vapo Fast 180
	boarding
	beams



USE WITH FIBRE OR MINERAL INSULATION

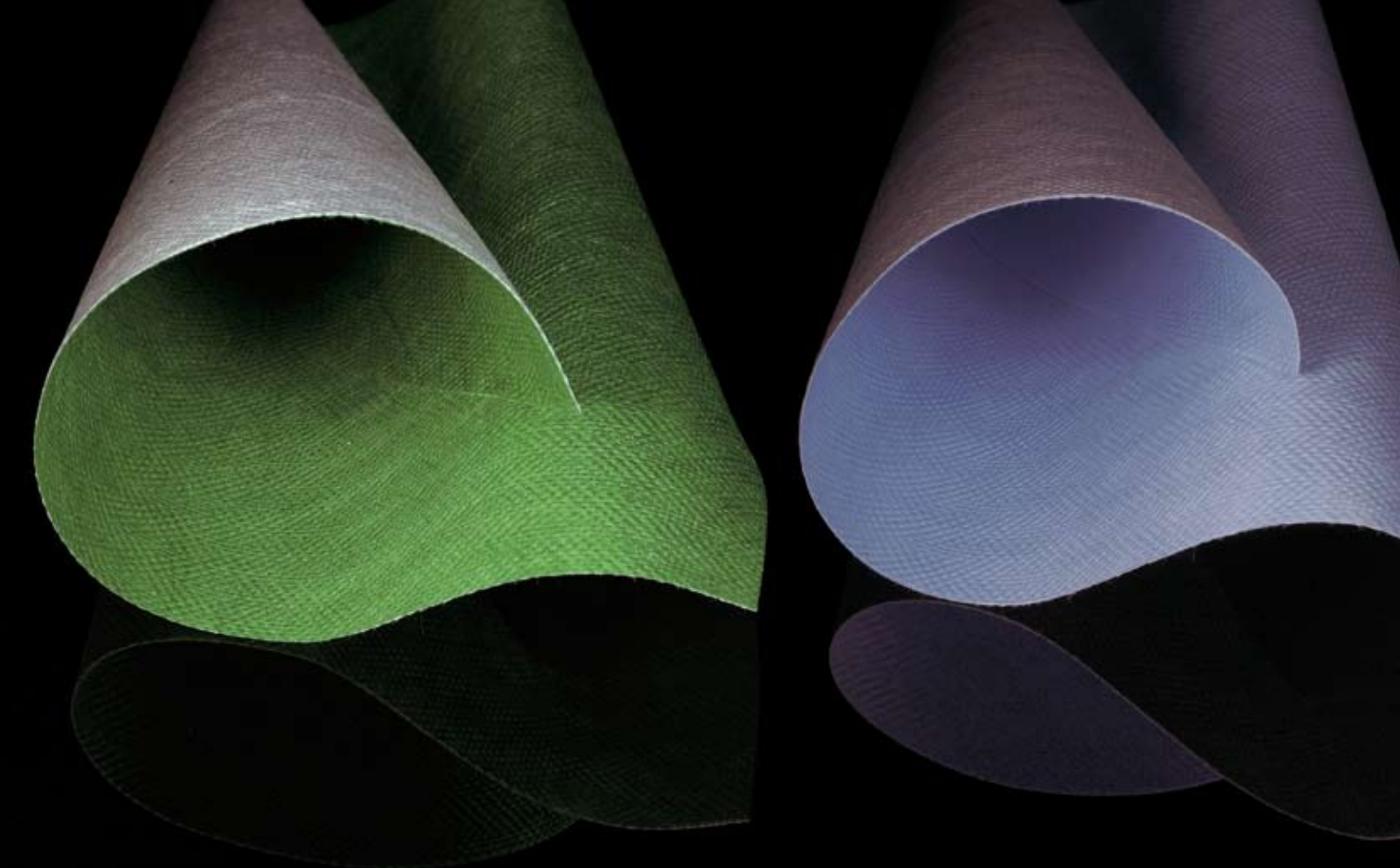
T-Vapo Slow Plus, highly resistance steam brake, used above boarding, constitutes a very consistent obstacle to the passing of steam. Protects the insulation material from the penetration of steam, even in particularly damp conditions, like the roofing of swimming pools, thermals or kitchens and in very rainy or humid areas.

T-Vapo Fast 180, waterproofing and transpiring membrane, used above the insulation constitutes an excellent second waterproofing.

LATHS BOARDING - 2	roof tiles
	laths and cross-laths
	ventilation chamber
	vertical laths
	T-Vapo Fast 180
	natural insulation
	T-Vapo Slow Plus
	boarding
	beams



Cover



• • • • • • • • • • • • • • • **Ventilated roof in roof boarding + roof boarding**

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Slow	PE TNT, controller	5	160	0,34	125
T-Vapo Fast 150	PET TNT, PE, TNT	0,02	270	0,6	150

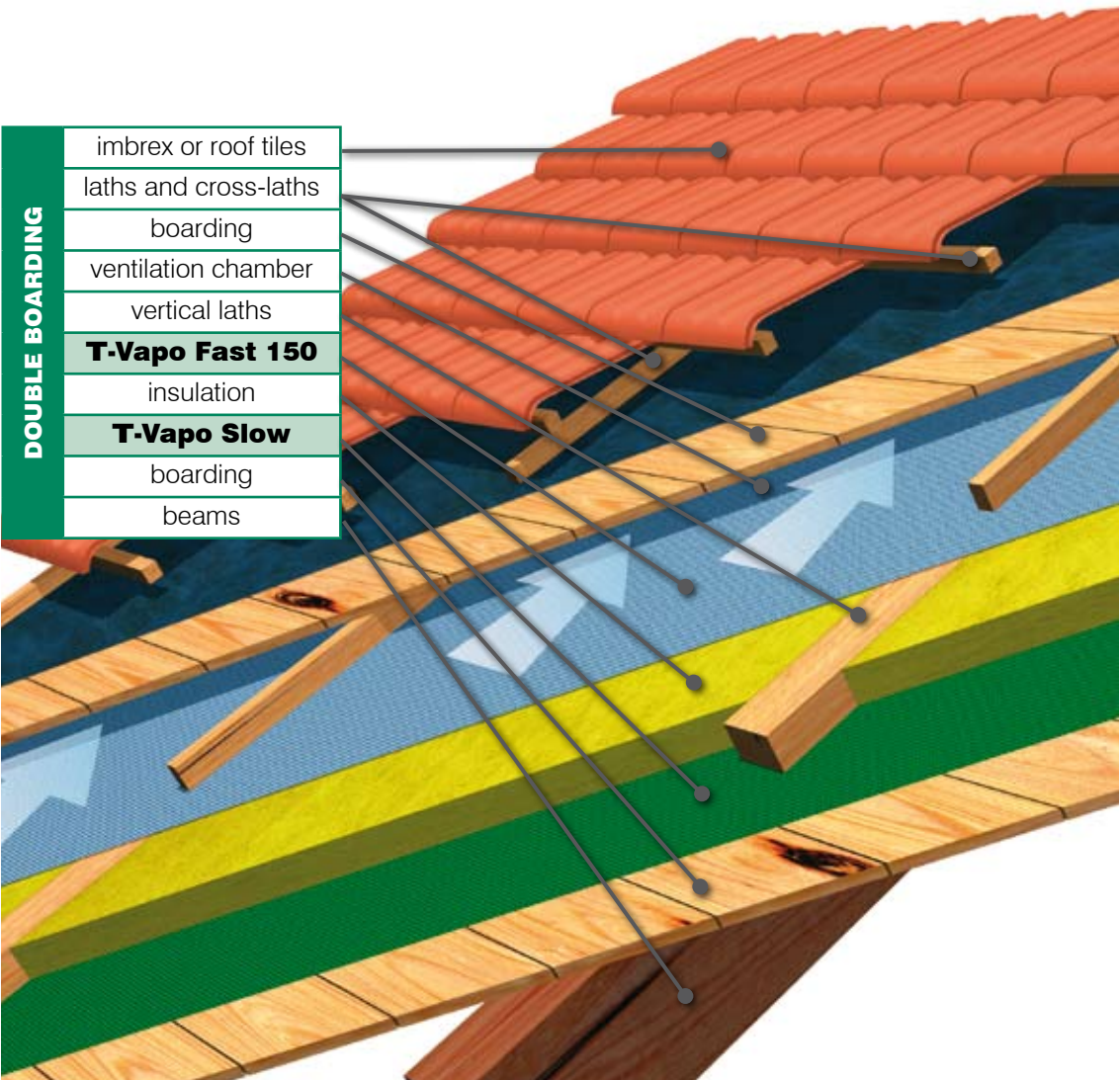
The solution of a ventilated roof with double boarding is that to offer higher qualification standards: guarantees the correct insulation of the loft - during Summer and Winter - and favours the perfect integration of the waterproofing, insulation and breathability functions. Thanks to a specific know-how, TeMa has realised certain products able to protect the various elements composing the roof structure, assuring its perfect functioning. **T-Vapo Slow** and **T-Vapo Fast 150** are waterproof membranes with differential breathability; opportunely installed in the different stratigraphy levels of the roof with double boarding, guarantee better functioning, prolonging its useful life.

T-Vapo Slow

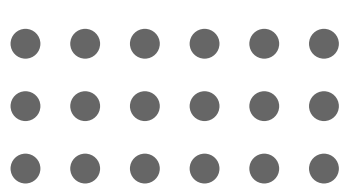
is a 3-layer waterproof membrane that brakes the passage of steam from inside the home towards the outside. Placed between the boarding and the thermal insulation, slows the passing of water steam in the insulation avoiding the forming of condensation inside the insulation material.

T-Vapo Fast 150

However, residue steam can reach the insulating layer. it is fundamental to favour its leakage towards the ventilation chamber before it condenses. The transpiring properties of the membrane **T-Vapo Fast 150**, favour this process; whereas, its waterproofing protects insulation from any infiltrations from the outside and from rain even during construction.



Cover



Ventilated roof in concrete + roof boarding

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Slow Net	PE TNT, net, controller	4,5	300	0,3	150
T-Vapo Fast 150	PET TNT, PE, TNT	0,02	270	0,6	150

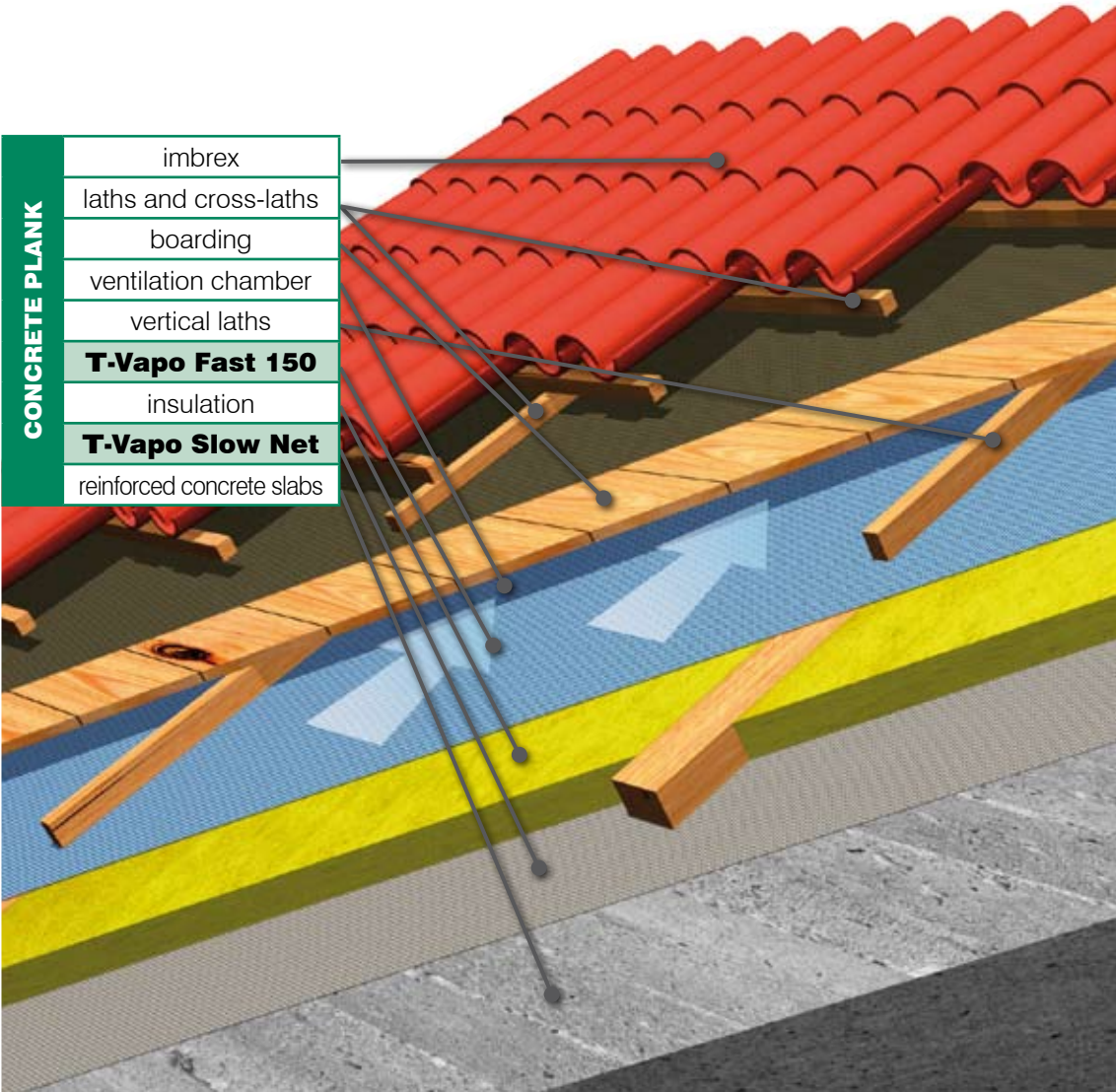
For concrete ventilated roofs with wooden boarding, we recommend repeating configuration with double layer of steam membrane, **T-Vapo Slow Net** and **T-Vapo Fast 150** for insulation protection.

T-Vapo Slow NET

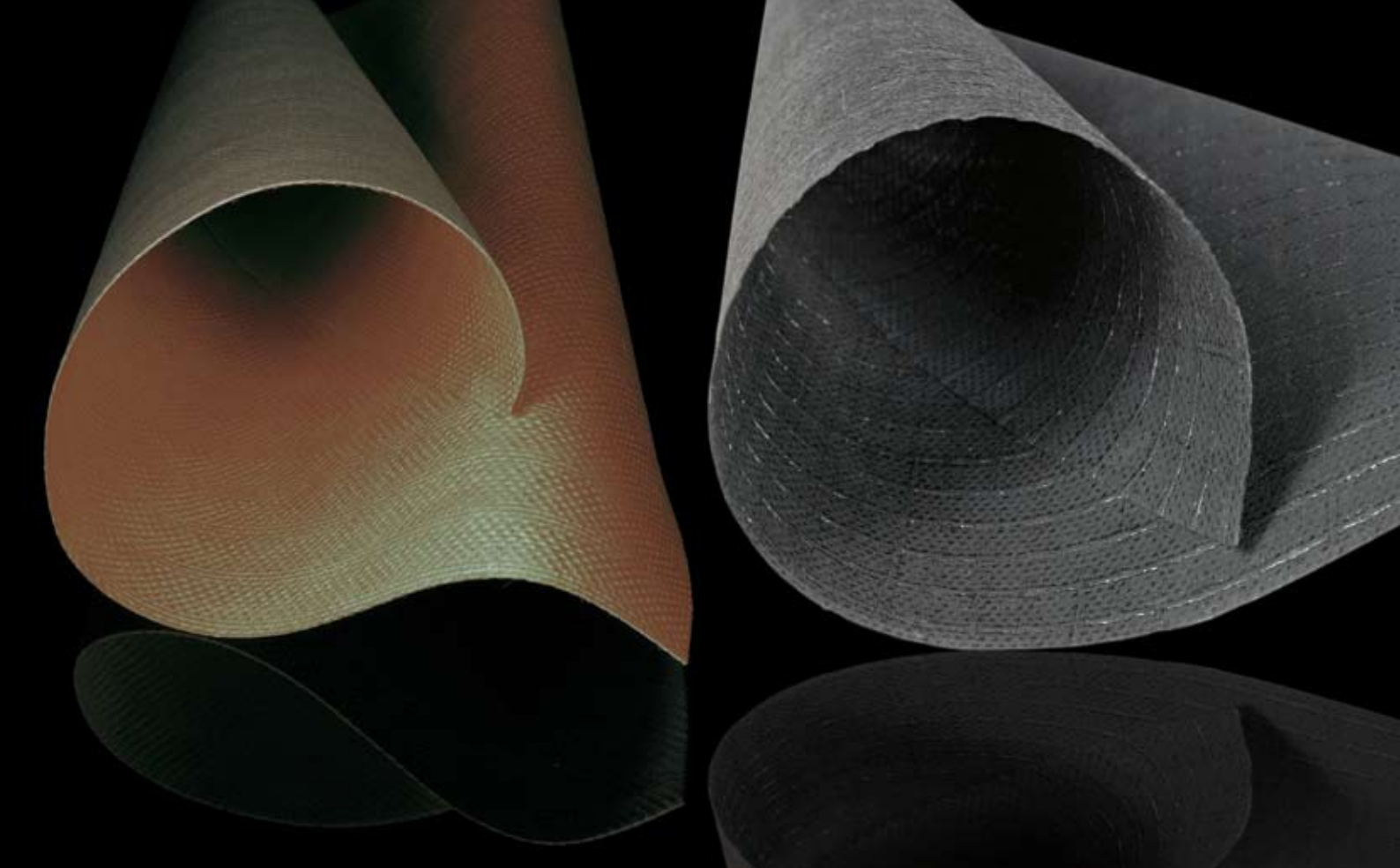
This waterproof and transpiring membrane offers a very consistent obstacle upon the passing of steam. Protects the insulation material from condensation even in particularly humid conditions, like the roofing of swimming pools, thermals or kitchens and in areas with heavy rainfalls. The coupling with a net increases its resistance, making it particularly suitable for “difficult” situations.

T-Vapo Fast 150

Essential product for favouring the leakage of steam from the insulation layer towards the ventilation chamber. Realised with a technological layer permeable to steam, protected by 2 layers of non-woven polypropylene, **T-Vapo Fast 150** protects the insulation from any water infiltrations, even during construction.



Cover



Ventilated roof in concrete and laths

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Slow Net	PE TNT, net, controller	4,5	300	0,3	150
T-Vapo Fast 210	PET TNT, PE, TNT	0,03	420	0,9	210

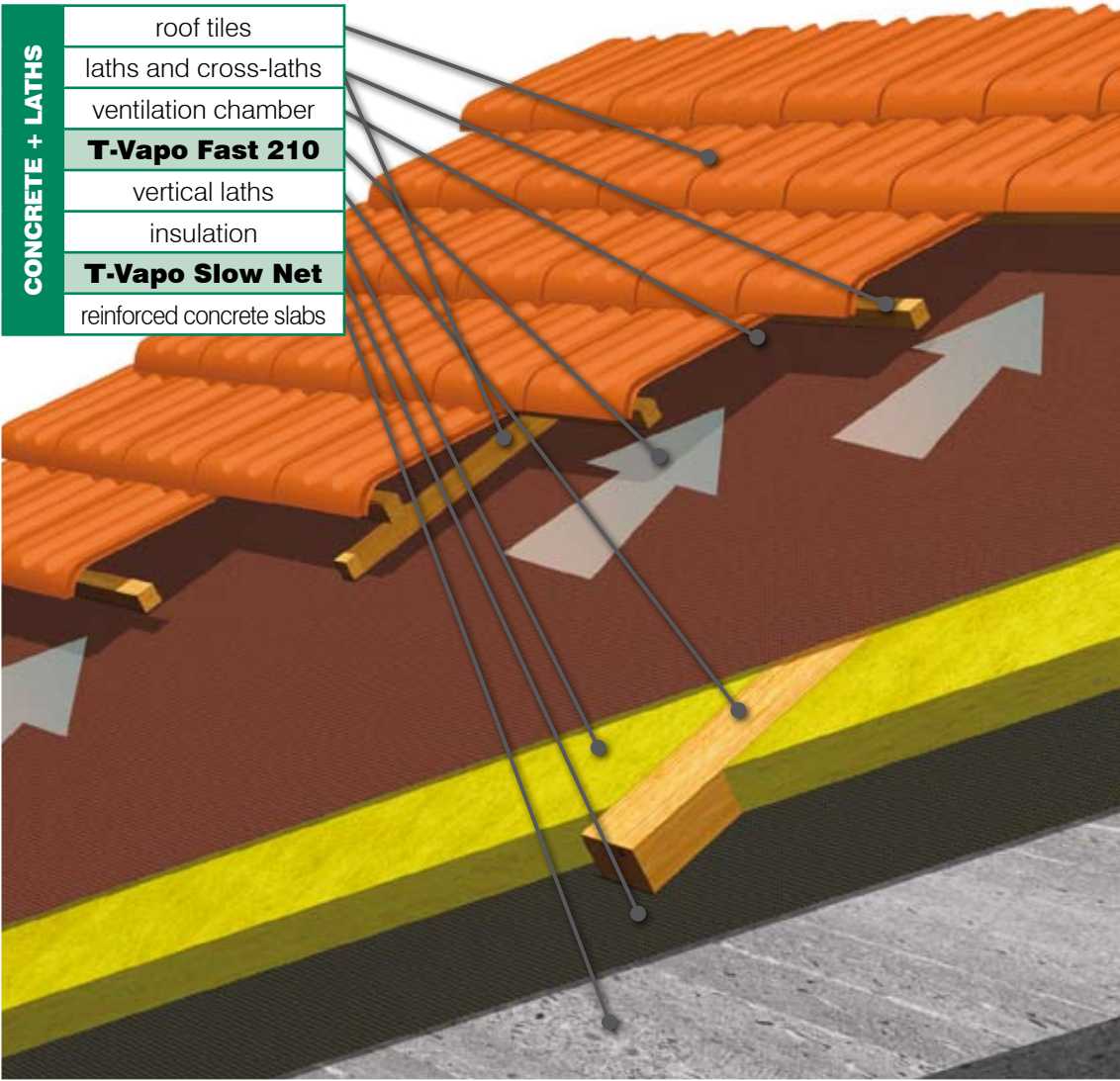
In concrete ventilated roof without wooden boarding, it is necessary to intervene to protect the insulation layer. For this combination, TeMa proposes the steam brake **T-Vapo Slow Net** to be positioned underneath the thermal insulation layer and the steam membrane **T-Vapo Fast 180** above it. In the more difficult points, as further protection from outside infiltrations, a bituminous membrane like **Bitu-T** can be used.

T-Vapo Slow NET

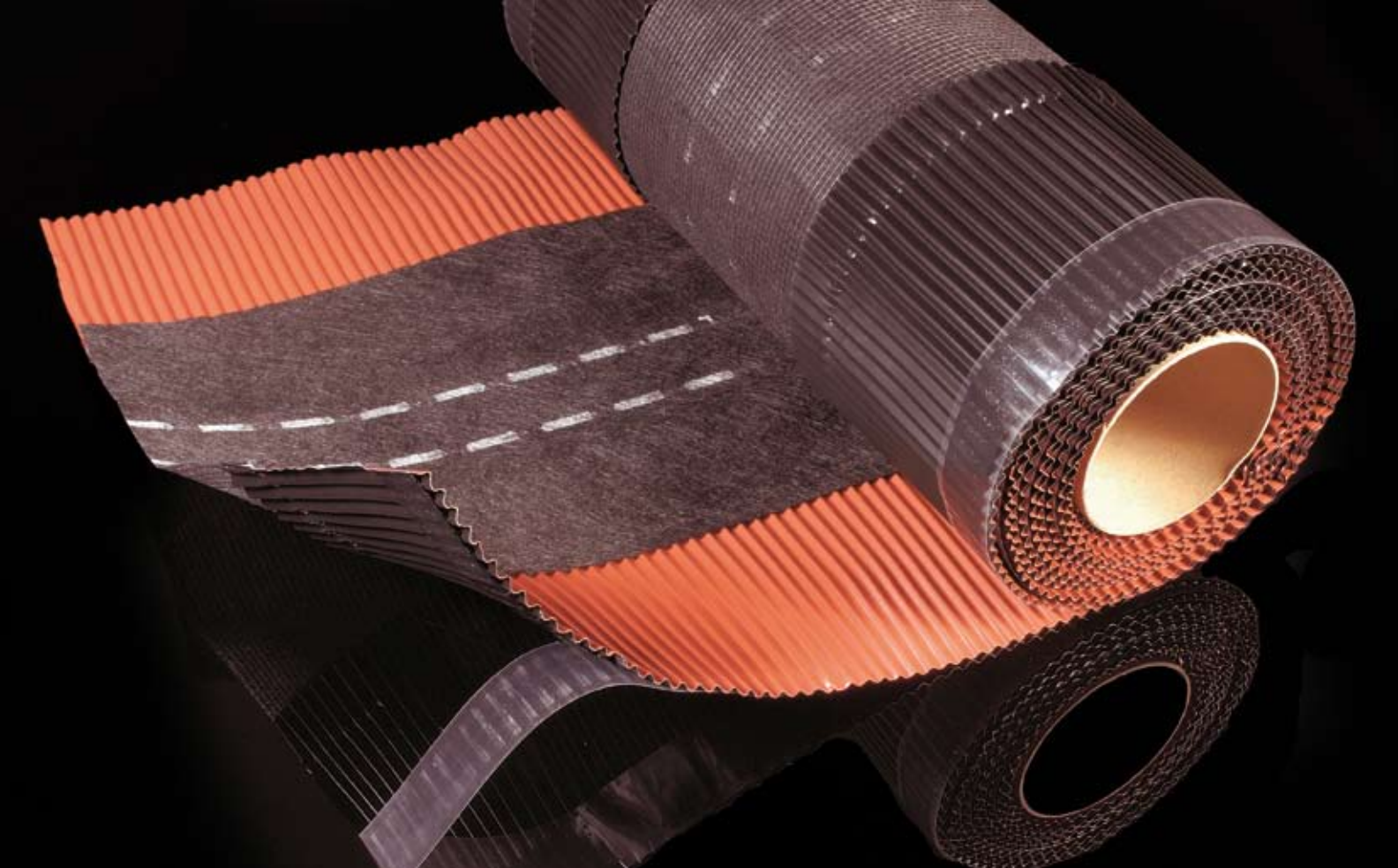
This 2-layers waterproof and transpiring membrane offers a very consistent obstacle upon the passing of steam. Protects the insulation material from condensation even in particularly humid conditions, like the roofing of swimming pools, thermals or kitchens and in areas with heavy rainfalls. The coupling with a net increases its resistance, making it particularly suitable for “difficult” situations.

T-Vapo Fast 210

Realised in 3 layers, it is the most robust amongst the membranes of the **T-Vapo Fast** line, condition that makes it particularly suitable for use under lath. It has high breathability to facilitate the leakage of residue water steam from the insulation layer, favouring its efficiency in time.



Cover



Ventilated under-ridge

Product	Material	Width	Air volume (cm ² /m)	Temp. resistance	Transpiring surf. (cm ²)
T-Colmo 32	AL, mineral fibre, net	32	175	-20 / +100 °C	1600
T-Colmo 38	AL, mineral fibre, net	38	175	-20 / +100 °C	1600

The efficiency of the ventilation is guaranteed by the possibility of air leaking - naturally pushed upwards - through the ridge line. Water or snow infiltrations must be, at the same time, prevented, even in strong wind conditions.

T-Colmo

Realised with glass and mineral fibre fabric and provided with aluminium side extensions, the ventilated ridge **T-Colmo** is essential in the realisation of ventilated roofings of any type, assuring maximum safety against water, snow infiltrations, and against insects.

Provided with a double central broken line to facilitate its correct positioning, **T-Colmo** is waterproof, at the same time assuring maximum ventilation.

Thanks to the special structure, with incorporated mineral fibre net resistant to UV rays and to the special adhesive strip, it perfectly adapts to every type of roofing material. The pleated aluminium side strips perfectly follow the flow of the roof tiles (or imbrex) underneath, to which they are glued using the special butyl adhesive strip, guaranteeing maximum waterproofing without preventing the correct air flow.

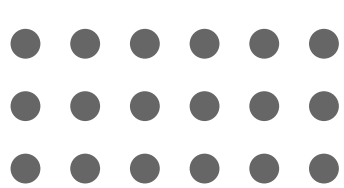
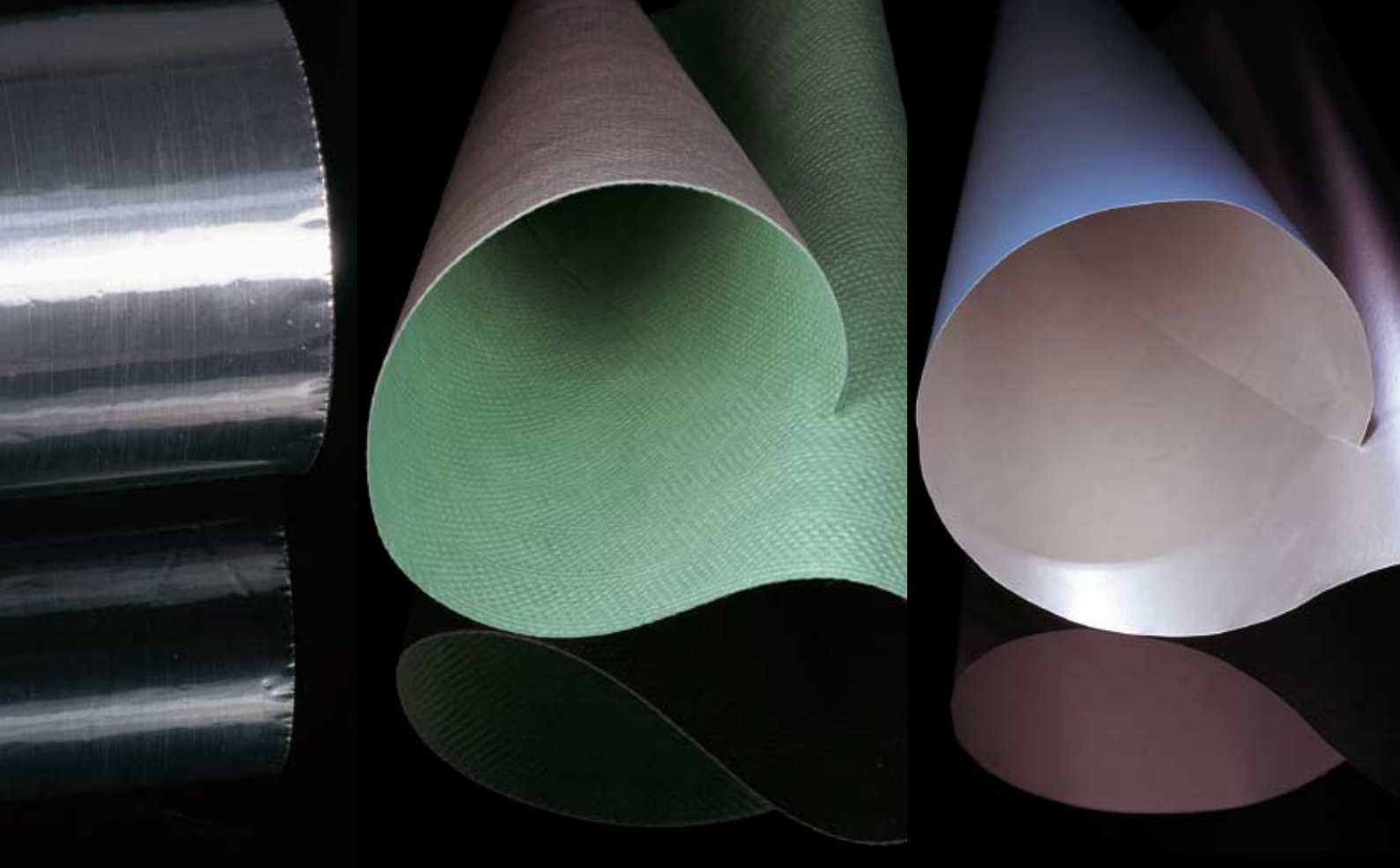
T-Colmo does not alter in colours, resists to bad weather and its laying can take place in any climatic condition. Once laid, **T-Colmo** perfectly camouflages thanks to its terracotta colouring.



Accessories: **T-Brackets**



Cover



Non ventilated roof in roof boarding + laths

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Stop	PS, Al, PE	1400	220	0,12	125
T-Vapo Fast 180	PET TNT, PE, net, TNT	0,02	290	0,7	170

Product	Material	S _d	Cold flex-ibility	Thickness (mm)	Break stretching
Bitu-T Alu	bitumen, Al	∞	-23°C	1,2	43% / 23%

In this case also the steam barrier **T-Vapo Stop** and the steam membrane **T-Vapo Fast 150** protect insulation from water steam and the bituminous membrane **Bitu-T Alu** offers perfect waterproofing and complete protection from steam.

T-Vapo Stop

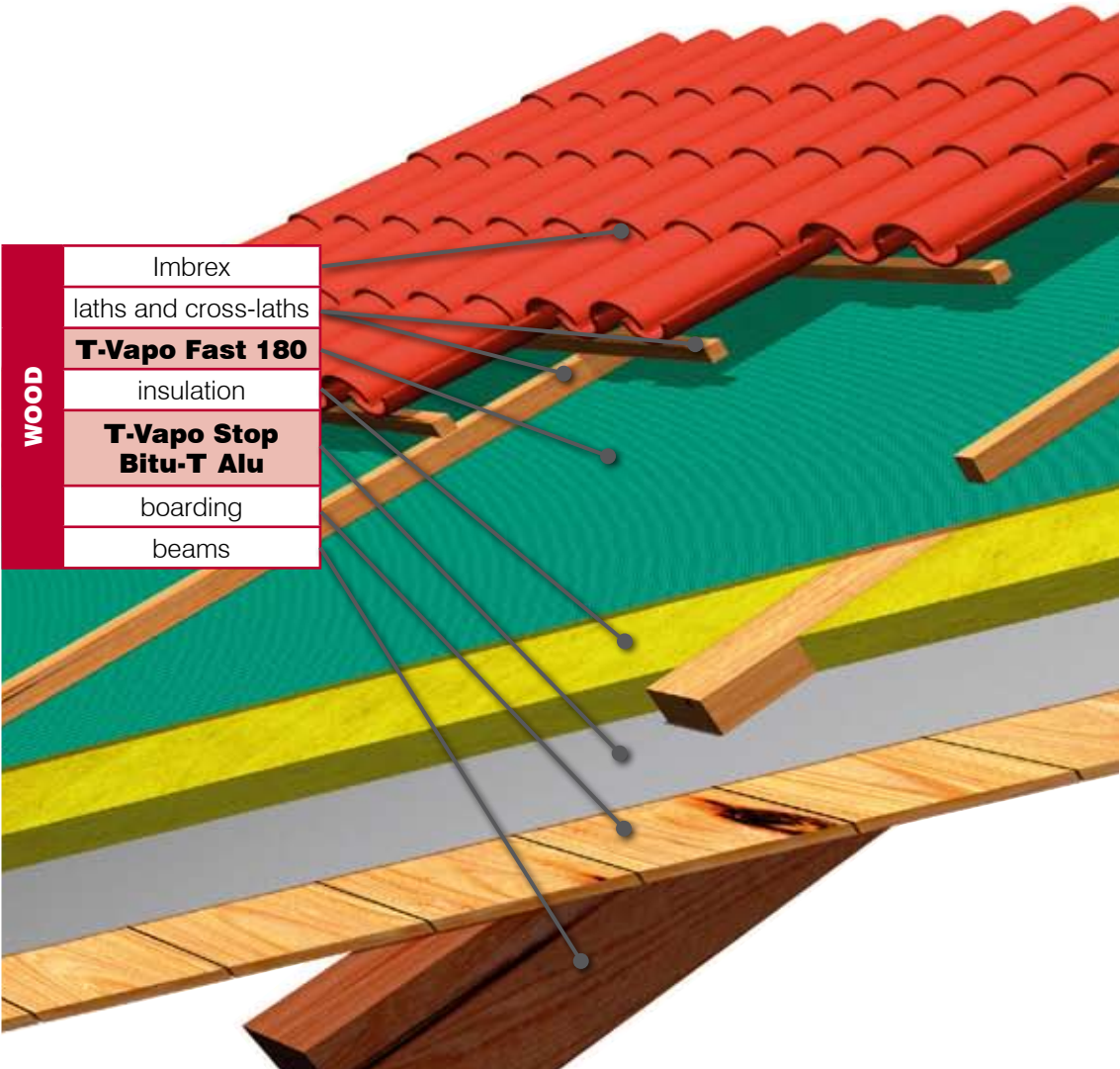
Its task is to block the passage of steam. Made of an aluminium steel sheet, protected by a layer of polyester and one of polyethylene, **T-Vapo Stop** it is applied with the special aluminate tape **T-Tape Alu** for the sealing of overlappings.

Bitu-T Alu

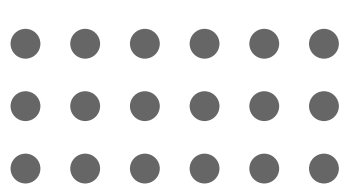
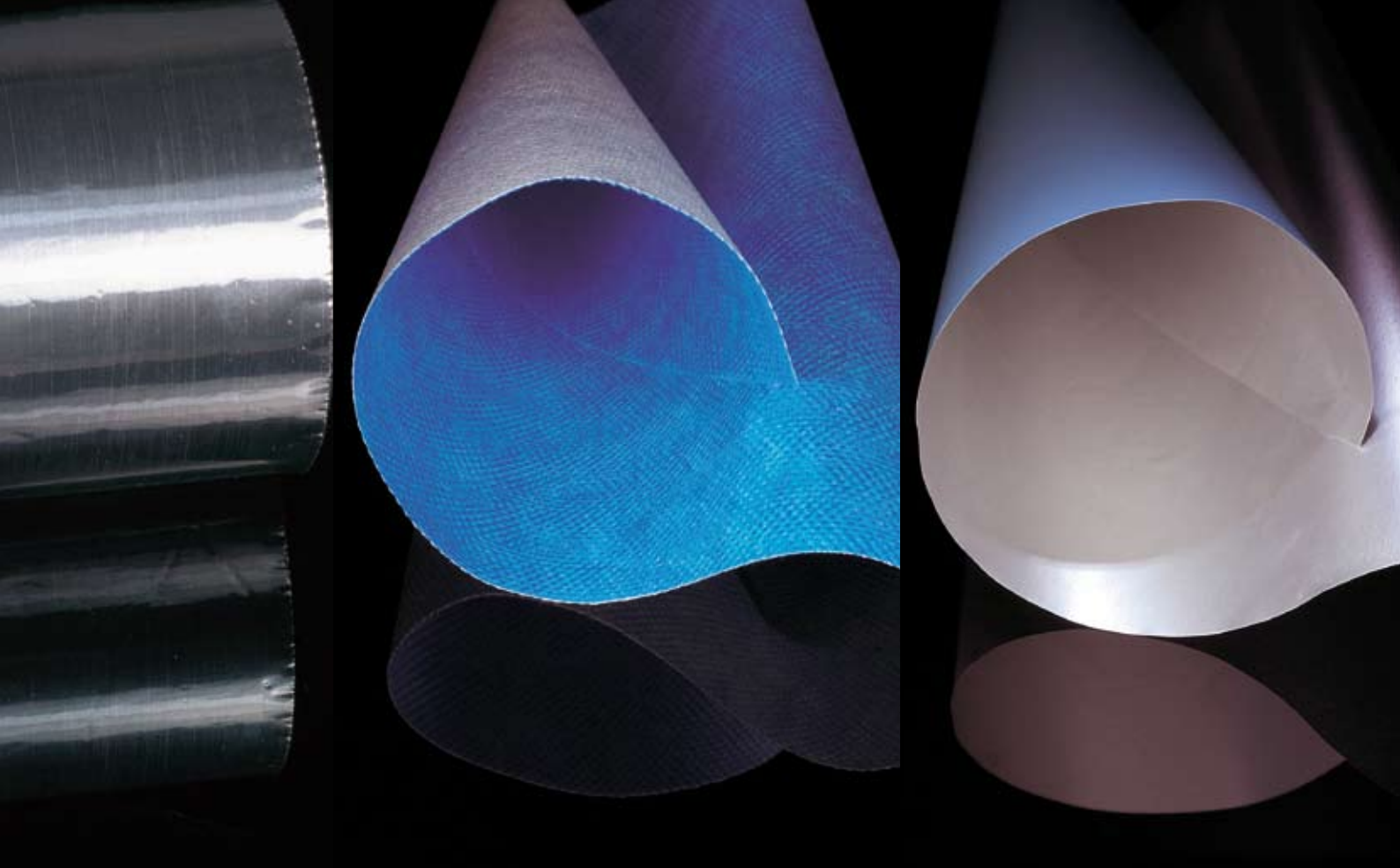
Used in alternative to **T-Vapo Stop**, the bituminous membrane **Bitu-T Alu** is perfectly waterproof and is applied without the use of flame, thanks to the particular adherence of the compound guaranteeing performances above those of traditional bituminous membranes. The special aluminium coating constitutes a perfect steam barrier, making it particularly advantageous in terms of costs and laying speed: with a single operation, perfect waterproofing and an efficient steam barrier is realised.

T-Vapo Fast 180

Realised in 3 layers, it is amongst the most robust membranes of the **T-Vapo Fast** line, condition that makes it particularly suitable for use under lath. It has high breathability to facilitate the leakage of residue water steam from the insulation layer, favouring its efficiency in time.



Cover



Non-ventilated roof in concrete + laths

Product	Material	S _d	Resistance to traction (N/5cm)	Thickness (mm)	Weight (g/m ²)
T-Vapo Stop	PS, Al, PE	1400	220	0,12	125
T-Vapo Fast 95	PET TNT, PE, TNT	0,02	220	0,35	95

Product	Material	S _d	Cold flex-ibility	Thickness (mm)	Break stretching
Bitu-T Alu	bitumen, Al	∞	-23°C	1,2	43% / 23%

The combined action of the steam barrier **T-Vapo Stop**, placed between slab and thermal insulation, and of a steam membrane like **T-Vapo Fast 95** allows protecting the insulation material from the condensation of water steam. Bitu-T Alu encloses in a single product, the functions of steam barrier and waterproofing membrane.

T-Vapo Stop

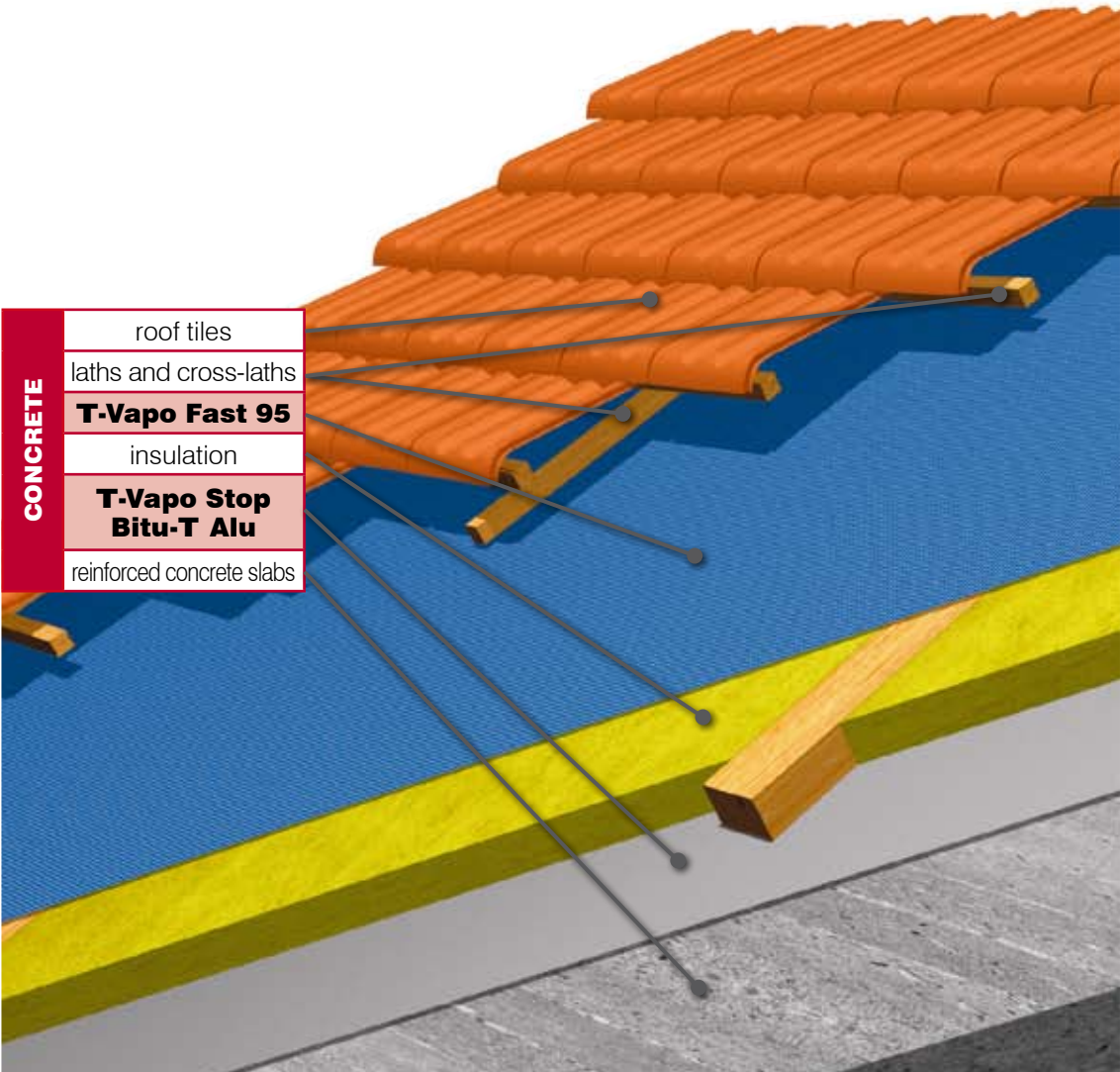
The task of this membrane is to block the passing of steam. Made of an aluminium lamina protected from a layer of polyester and one of polyethylene.

Bitu-T Alu

Used in alternative to **T-Vapo Stop**, the bituminous membrane **Bitu-T Alu** guarantees - as well as the steam barrier function - perfect waterproofing also, with performances above those of traditional membranes. The special aluminium coating also has the aim of reflecting Summer heat, offering better climatic conditions in lived-in lofts.

T-Vapo Fast 95

Realised in 3 layers and perfectly waterproof, **T-Vapo Fast 95** boasts high resistance. It has high breathability to facilitate the leakage of residue water steam from the insulation layer, preserving efficiency in time.



Cover



Metal roof with seaming technique

RECOMMENDED PRODUCTS



	K-Roof C 10 B	K-Roof C 10 F	K-Roof C 10 EP
Pressure			
Material	PP, controller, butyl	PP, controller	PP, controller
S_d	0,02	0,02	-
Resistance to fire	class E (B2)	class E (B2)	-
Thickness (mm)	8	8	8
Weight (g/m ²)	450	450	350

ACCESSORIES FOR LAYING

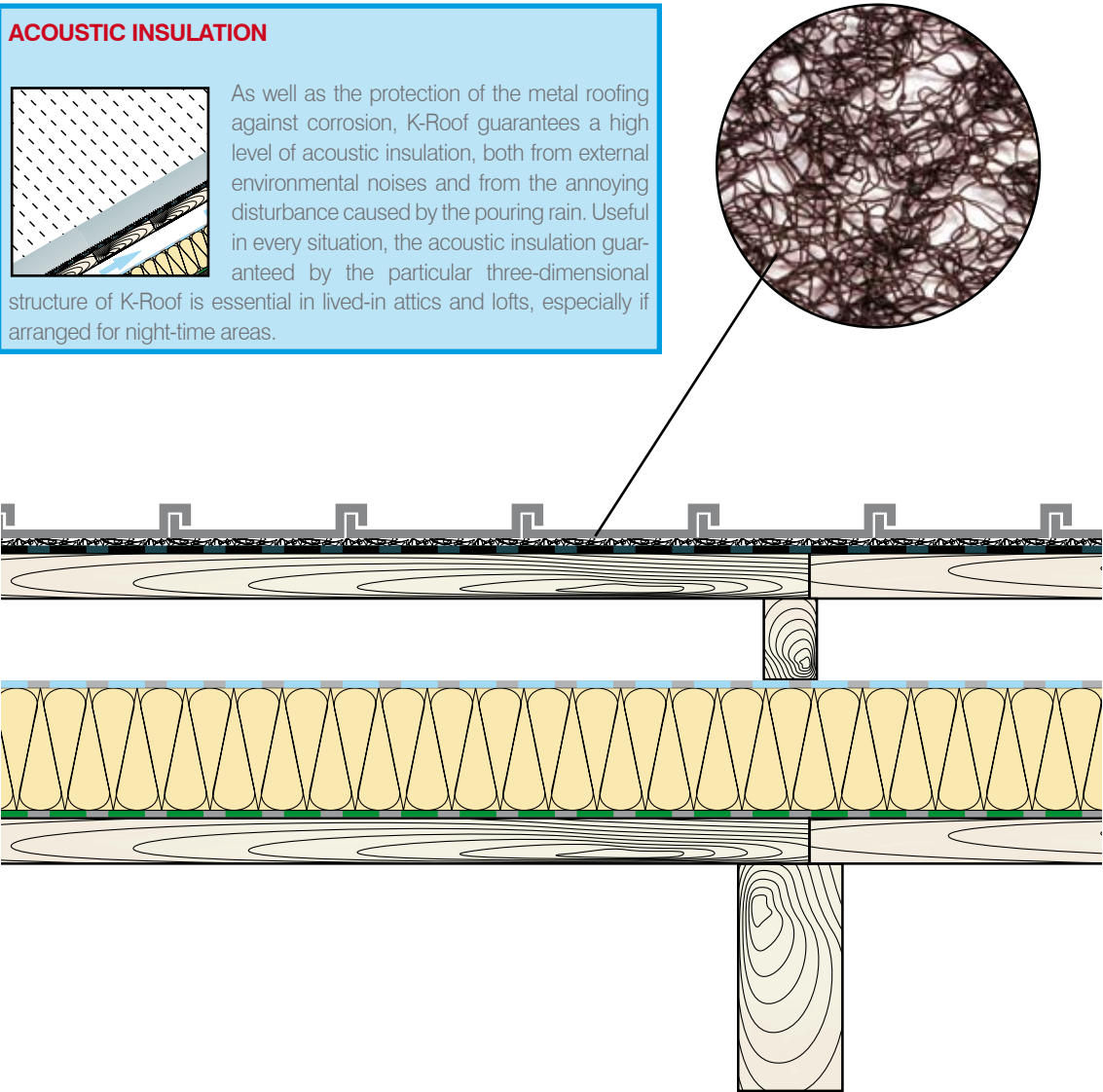


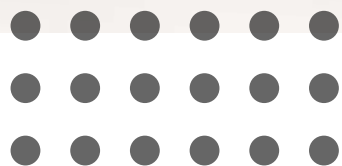
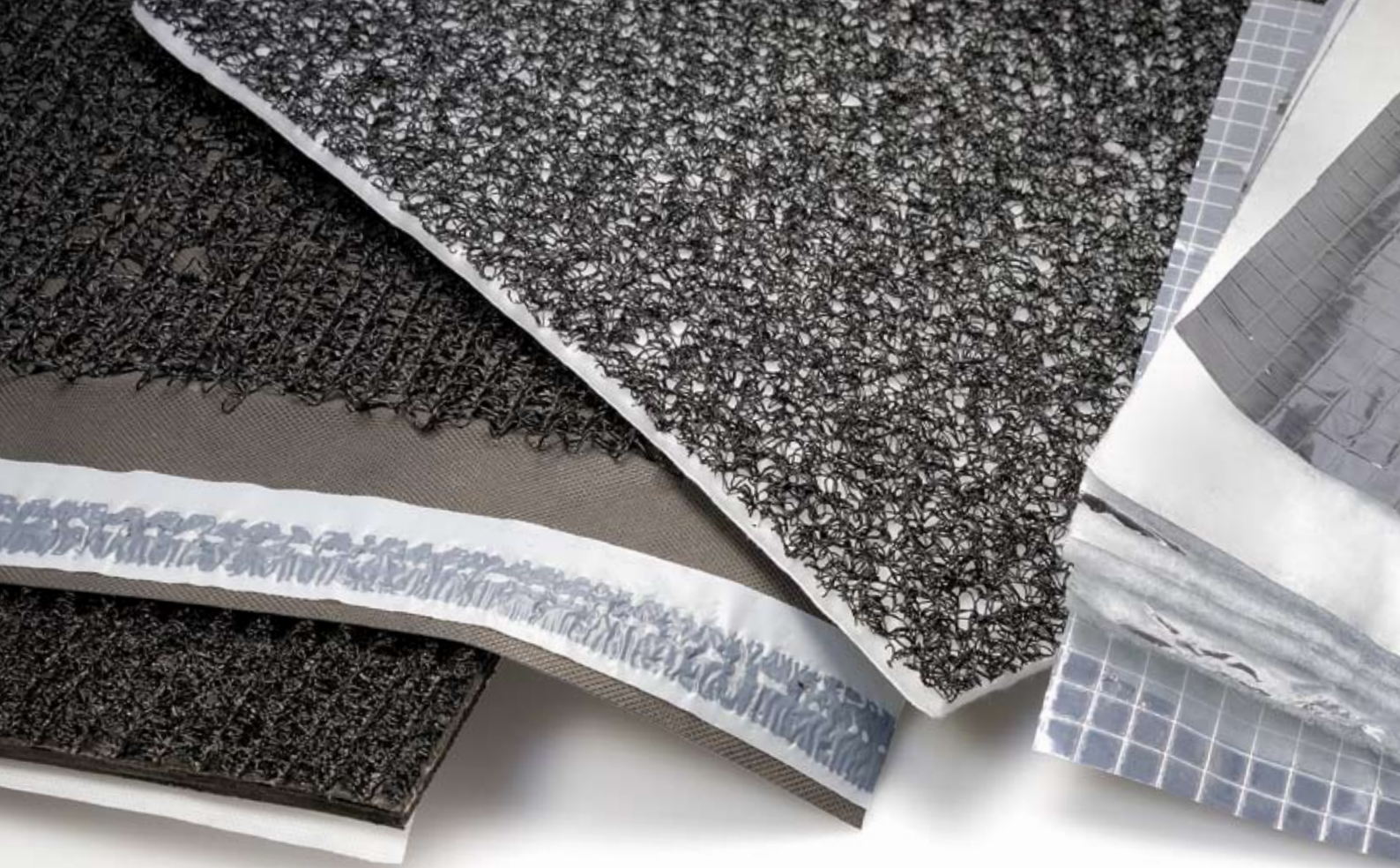
	K-Hammer	K-Butyl Stick	K-Butyl Tape	K-Nail
Description	Hammer stapler	Butyl glue in cartridge	Butyl adhesive tape	Clout nail with rubber seal washer
Measurements	29 cm	310 ml	2 cm x 25 m	25 x 16 mm

The use of metal roofing on any type of roof - ventilated or non-ventilated - entails an additional problem. Metal, despite guaranteeing longer life-span compared to traditional materials, tends to form condensation in the lower facade. K-Roof, conceived from the TeMa technology, the subtile specific for metal roofing also offering high acoustic absorption performances.

K-Roof

A great innovation that revolutionises the conception of metal roofing. **K-Roof** is a conceptually unheard of product, that couples the action of a steam diffuser to a layer in polypropylene mono-filament able to create a subtile drainage plan, with the addition of an butyl adhesive strip. Usually, due to repeated temperature changes that develop in a metal roof, condensation tends to form in correspondence of the lower facade of the roofing. Today, thanks to the monofilament mattress and the waterproof layer of **K-Roof C10 B**, a cavity is created under the roofing able to drain the excess water, avoiding that the stagnation of humidity can damage the metal material. Another advantage of K-Roof is of acoustic nature: the air chamber underneath the roofing and the special materials used, significantly reduce the annoying noise caused from rain and hailstone banging against this type of roof. The results are really impressive, all to the full advantage of the living comfort of lofts! **K-Roof** is also available in the versions **K-Roof C10 F**, without adhesive strip, and **K-Roof C10 EP**, with the monofilament layer only, in case a waterproof membrane has already been laid.





Sound-proof

The acoustic insulation is no longer only a privilege for a few but it has become a right for all. The new Standard introduces tight limits for both old and new buildings, whether its airborne noise or impact noise. TeMa offers a complete range of systems that will not leave space to misunderstandings: TeMa is ever more a trademark synonym of quality.

T-Silence

T-Silence is an under-block acoustic insulation obtained from a PP mat. Thermo-welding to a waterproof membrane and steam diffuser.

Geofon

Geofon is a subtile acoustic insulation system made of a bituminous layer thermo-coupled to one in PP.

Thermo-Reflex

Thermo-Reflex is a thermal acoustic insulation system from airborne noise made of more layers that, combined with the use of metal polyester, polyethylene and synthetic wadding, is able to significantly improve the acoustic efficiency of a building.



D.P.C.M. 5 December 1997

Determination of the passive acoustic requisites of the buildings

Table A: CLASSIFICATION OF THE LIVABLE AMBIENTS (art. 2)

category A:	residential buildings or assimilables
category B:	office buildings or assimilables
category C:	hotels, B&Bs and assimilable activities
category D:	hospitals, clinics, nursing homes and assimilables
category E:	schools at all levels and assimilables
category F:	buildings for recreational or culture activities or assimilables
category G:	buildings for commercial activities or assimilables

SIZES OF REFERENCE: DEFINITIONS, CALCULATION METHODS AND MEASUREMENTS
The evaluation indexes that characterise the passive acoustic requisites of the buildings are:

a)	index of the apparent sound insulating power of partition walls between rooms (R_w), to be calculated according to Standard UNI 8270:1987, Part 7, par. 5.1;
b)	index of the standardised facade acoustic insulation($D_{2m,nT,w}$), to be calculated according to the same procedures of which in previous point a.;
c)	index of the level of noise from treading of floors, normalised ($L_{n,w}$), to be calculated according to the procedure described in Standard UNI 8270:1987, Part 7, par. 5.2.

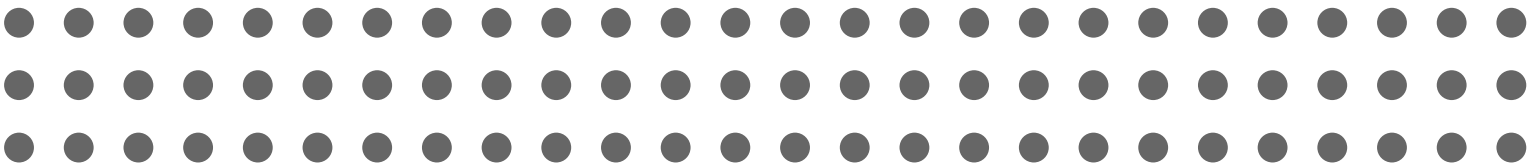


Table B: PASSIVE ACOUSTIC REQUISITES OF THE BUILDINGS, OF THEIR COMPONENTS AND OF THE TECHNOLOGICAL SYSTEMS

Categories of which in Tab. A	Parameters				
	$R'_w(*)$	$D_{2m,n,Tw}$	$L'_{n,w}$	L_{ASmax}	L_{Aeq}
D	55	45	58	35	25
A,C	50	40	63	35	35
E	50	48	58	35	25
B,F,G	50	42	55	35	35

(*) R_w values referred to separating elements between two individual residential units.
Note: with reference to the school buildings, the limits for the reverberation times are those reported in the circular by the Ministry of Public Works n. 3150 dated 22nd May 1967, stating the evaluation and testing criteria of the acoustic requisites in school buildings.



T-Silence is dry applied and is suitable for every type of floor (brick/cement or wood).



Kit T-Silence

T-Silence



The following table shows the calculations of the noise levels from treading ($L_{n,w}$) and the increase of the sound insulating power (ΔR_w) for the more common floors.

DESCRIPTION OF THE FLOOR USED	FEATURES OF THE FLOOR				CALCULATION OF THE NORMALISED TREADING NOISE INDEX $L_{n,w}$ (dB)			CALCULATION OF THE INCREASE OF SOUND INSULATING POWER R_w		
	Thickness	Surface mass	R_w	$L_{n,w,eq}$	block of 100 kg/m ²			block of 100 kg/m ²		
					walls of 140 kg/m ²					
	(cm)	(kg/m ²)	(dB)	(dB)	P80	C40	C40+	P80	C40	C40+
50 centre-to-centre latticed beams brick type A of 16+4 with plaster at intrados	21,5	270	49	78,9	54	50	47	7,5	10,5	10,5
50 centre-to-centre latticed beams brick type A of 20+4 with plaster at intrados	25,5	340	50	75,4	50	46	43	7	10	10
50 centre-to-centre pre-compressed concrete brick type A of 16+4 with plaster at intrados	21,5	269	48,5	79,0	54	50	47	7,75	10,75	10,75
50 centre-to-centre pre-compressed concrete beams brick type A of 20+4 with plaster at intrados	25,5	284	47,5	78,1	53	49	46	8,25	11,25	11,25
50 centre-to-centre pre-compressed concrete beams brick type B of 16+4 with plaster at intrados	22	273	47,5	78,7	54	50	47	8,25	11,25	11,25
50 centre-to-centre pre-compressed concrete beams brick type B of 20+4 with plaster at intrados	25,5	362	50	74,4	49	45	42	7	10	10
brick type B 16.5+4 slow reinforcement panel floors with plaster at intrados	22	321	48,5	76,3	51	47	44	7,75	10,75	10,75
brick type B 20.5+4 slow reinforcement panel floors with plaster at intrados	25,5	362	52,5	74,4	49	45	42	5,75	8,75	8,75
120 centre-to-centre pre-compressed concrete slabs and polystyrene	24	261	50,5	79,4	54	50	47	6,75	9,75	9,75
120 centre-to-centre pre-compressed concrete slabs and polystyrene	28,5	296	53,5	77,5	53	49	46	5,25	8,25	8,25
120 centre-to-centre pre-compressed concrete slabs brick type B	24	419	51,5	72,2	48	44	41	9,25	9,25	9,25
120 centre-to-centre pre-compressed concrete slabs brick type B	28,5	458	53,5	70,9	47	43	40	8,25	8,25	8,25

Sound-proof



- tiles as long as not subject to heavy stresses
- parquet as long as it is not glued to **Geofon**





Geofon

With **Geofon** there is no need to use sand, mortar or cement, but only adhesive. For a 20 m² room, 7 boxes of panels and one can of adhesive, in total 200 kg, are enough.

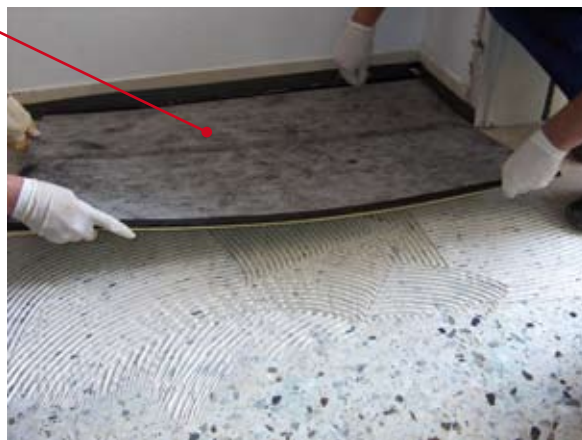
Laying becomes quicker and the room is available after only two days, instead of 3 weeks.

Every box of **Geofon** contains 3 m² of product and weighs 21kg.

Geofon has the advantage of enclosing in only 7 mm a high acoustic insulation power. In case of interventions on pre-existing pavings, **Geofon** reduces to a minimum (8-10 mm) the level difference between the various rooms, in case of finish laying of ceramic tiles it does not exceed 15 mm, from which the thickness of the pre-existing paving must be subtracted.

Laying is carried out without creating dust and humidity. **Geofon** is suitably packaged and does not leave residues in the home. The layer, not having to use sand and cement, can realise the work without dirtying, damaging or making the home unliveable.

Other systems, acoustically less performing, have until now created discomforts to those carrying out improvement interventions despite living in the home, due to the creation of the "site" and to the long working times. With **Geofon** the room is like new after only two days.

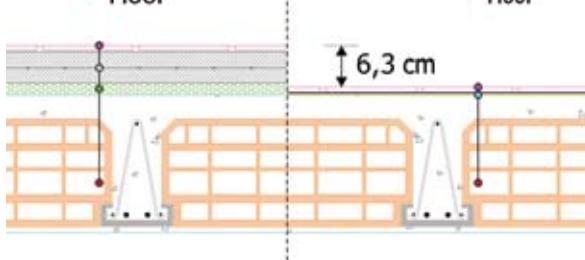


Old systems: 7,8 cm

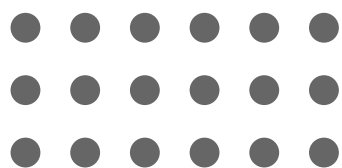
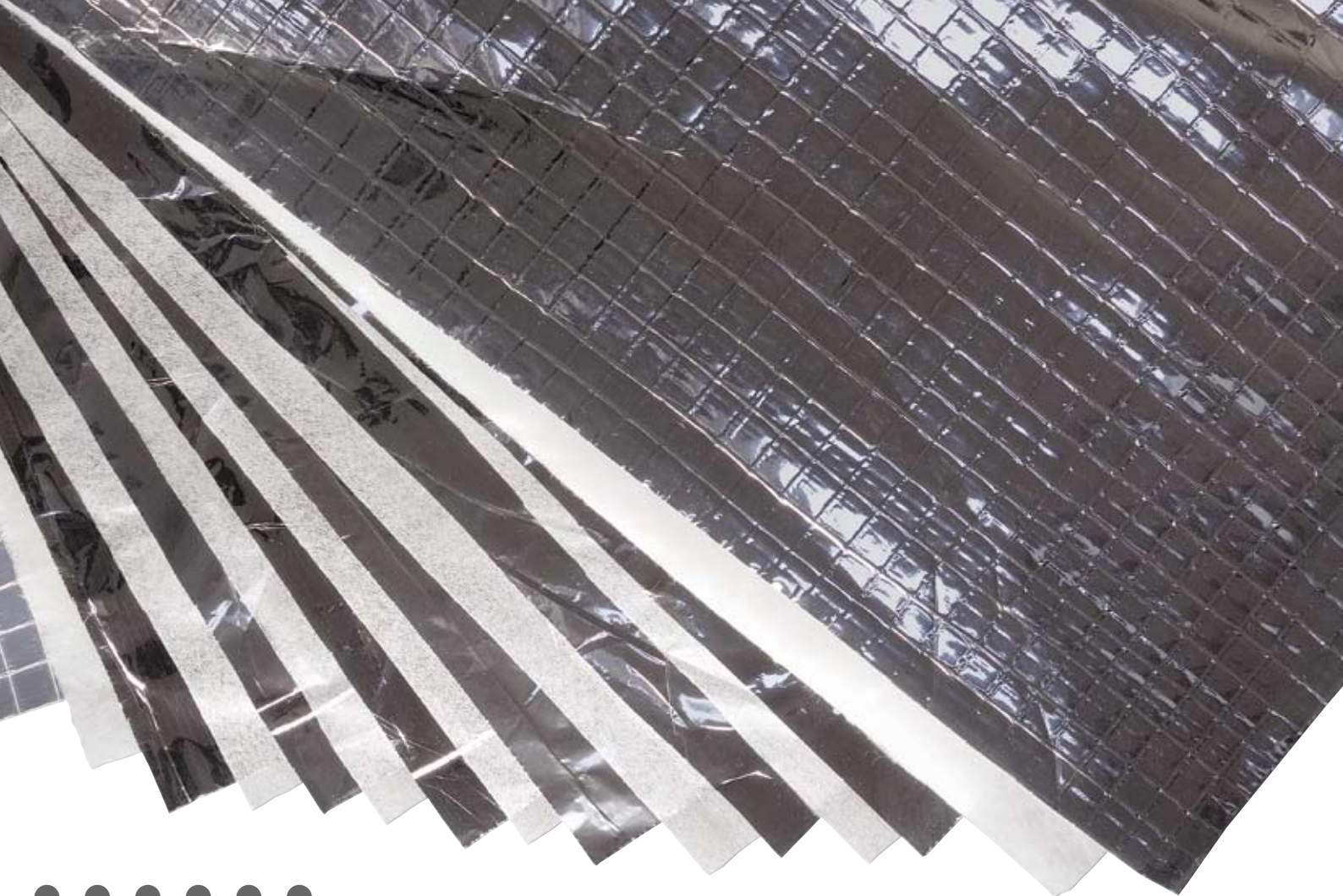
0,8 cm Tiles
5 cm Block
2 cm Insulation
Floor

TeMa System: 1,8 cm

0,8 cm Tiles
1 cm GEOFON
Floor



Sound-proof



Sound-proof the internal and external walls from airborne noise

Product	Material	N. layers	Section	Thickness (mm)	Weight (Kg/m ²)
PRO 5	Al, PP, PET	5		30	0,426

As well as the unquestioned advantages as thermal insulation seen in the Thermo-insulate chapter, **Thermo-reflex** is also an excellent barrier against airborne noise. Laying is easy and can be realised by unqualified staff, paying attention to a couple of precautions:

1. Leave a 2 cm air curtain on both sides through fixing on parallel (fig. A) or crossed (fig. B) wooden beams.
2. Seal the overlappings with the appropriate tape **Thermo-Reflex Tape** provided (see photo page 51).

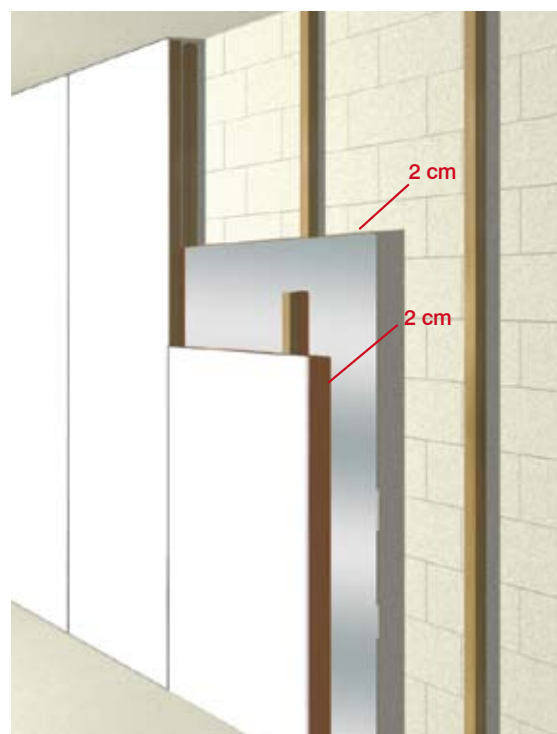


Fig. A

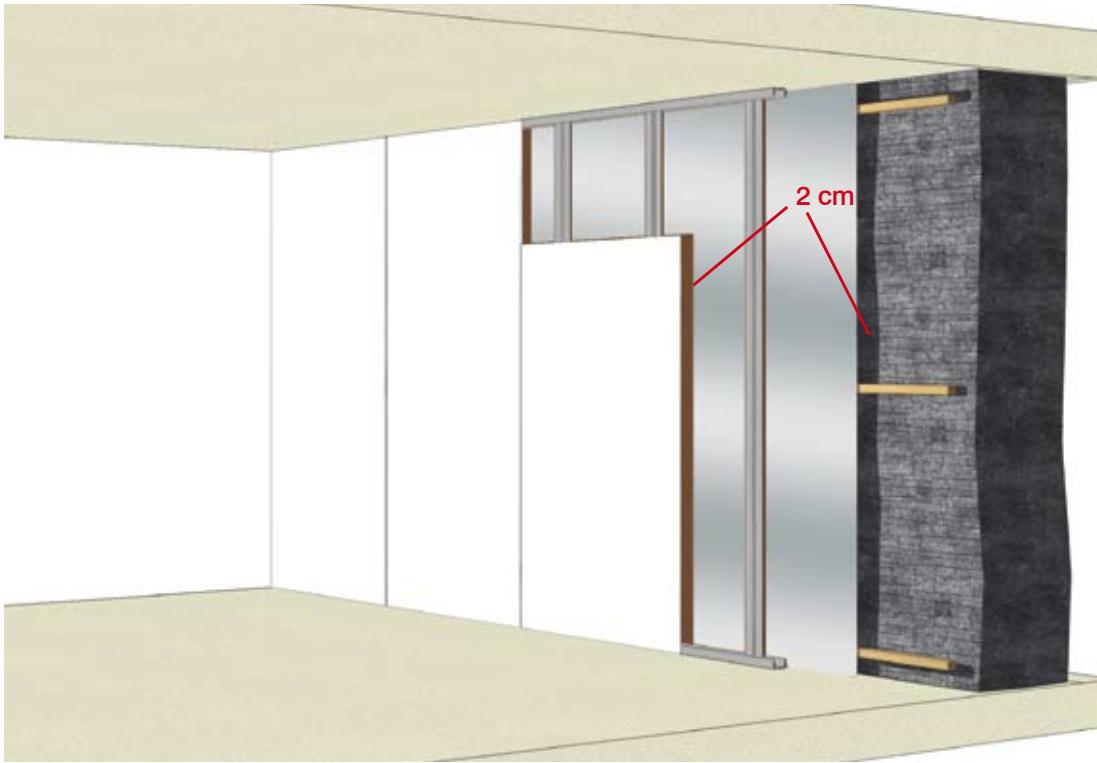


Fig. B



Thermo-Reflex Tape



Sound-proof



www.temacorporation.com
Tel. 0438.5031