EFISOL

solutions for thermal insulation

thermal acoustic

insulation

lightweight concrete

refurbishment

Mineral range

SOPREMA GROUP

summary

our mineral range

Vermiculite and Perlite are directly stemming from natural mineral sources and are processed in our plants in the Chapelle Saint Luc, Saint Rambert d'Albon and Colomiers.
Both aggregates are used alone or mixed to exploit their insulating properties in terms of thermal insulations and fire protection.

In addition the intrinsic qualities of these natural aggregates allow more than lightness and mechanical strength for applications such as upgrading floors (wet or dry) or protective coatings.

Summary

performance comfort

PERLITE AGGREGATE IS MAINLY DEDICATED TO UPPGRADING FLOORS DURING A REFURBISHMENT:

perlite

Mineral insulation, natural and light, this siliceous volcanic rock operated by **EFISOL**, is the ideal lightweight aggregate for the rehabilitation of your old floors.

EFISOL offers two products:
- **Perlibeton**
- **Efimix**

100 %

NATURALLY NON-COMBUSTIBLE

This mineral rock, expanded into special furnaces, is fireproof (classification A1).

ECOLOGICAL

Fully mineral and natural.
No risk of irritation.

EASY TO IMPLEMENT

The process is the same as for a traditionnal concrete: by mixing water, cement, sand and perlite to obtain a lightweight concrete.

RELIABLE

Perlite has a natural mineral origin.
He is extremely stable over time.

ROTPROOF

Stable and inert Perlite does not attract rodents or insects.

ECONOMICAL

Tiles are directly bonded with C2 glue, without smoothing coating P3.

perlibeton : TO BE MIXED

100 % +

EASY TO PREPARE

Mix the water, cement and vermiculite then the aggregate (see dosage p16).

CONVENIENT AND ECONOMICAL

Excellent mechanical strength to weight ratio. Tiles directly bonded with C2 glue, without smoothing coating P3.

FAST

Quick set concrete and drying after 4 hours only!

Access is possible after 24 hours.

ADAPTED

Mineral aggregate compatible with hydraulic binders. Homogeneous mixture.

DESCRIPTION

Excellent density/mechanical strenght ratio. Economical product: **Perlibeton** is the ideal compromise for the refurbishment of old wood floors: limiting overloads, reducing the height of the screed.

Intended to resilient flooring and wooden floors, it is a lightweight concrete fully optimized for tiles directly bonded with C2 glue (tile adhesive mortar according to EN 12004), without smoothing coating P3 (= 3 to 10 mm coating).

4 good reasons to choose Perlibeton

1. **A Thermal insulation:** the air is trapped into the particles of expanded perlite. Perlibeton plays both role of thermal and acoustic insulation. In only one intervention, it allows to reduce heat loss and noise between floors.
2. **Easy to implement:** its preparation as its implementation is easy, practical and predictable. Ease of smoothing and adhesion properties are excellent, the quality of the final project is ensured.
3. **Lightness:** Its density is particularly low (<700 kg/m3) compared to traditional concretes. **Perlibeton** is the ideal compromise for the refurbishment of old wooden floors: Limiting overloads, reducing the height of the screed and having an excellent density/mechanical strenght ratio. From mineral sources the perlite mixed with sand and cement give a very homogeneous aspect.
4. **Nontoxic:** the perlite is 100% neutral. No toxic gases, or smoke under the effect of heat.

IMPLEMENTATION

1 The substrate must be cleaned of rubbles and puddles.

2 Place a peripheral separation tape along vertical walls and pipe penetration.

Lay of a polyethylene film (150 microns) or **Vélaphone®.**

3 Lay the welded mesh. (50 x 50 mm, minimum weight 650g/m²) on the floor without perforating the polyethylene film.

4 Equalize levels with wooden wedges to obtain the desire thickness.

5 Pour **Perlibeton** between the wooden wedges while positionning the welded mesh in the middle of the concrete. Joints splits are carried out at maximum 24 after pouring (every 40 m²). Same for uncoupling joints (in case of flue in the attic or beams, think to disengage the walls from the pipe or the beams).

6 Level the surface with a ruler, remove wooden wedges, fill the holes with **Perlibeton.**

7 Smoothing: smooth with a trowel. This operation is facilitated by the flexibility of lightweight concrete **Perlibeton.**

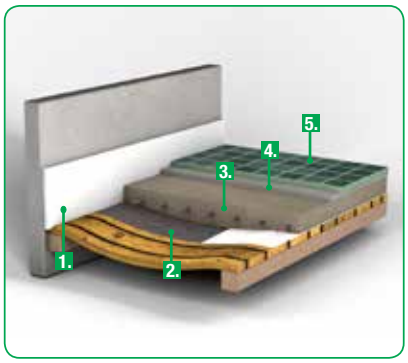
8 Tiles are directly bonded with **C2** glue. Other flooring: **P3** flooring.

perlibeton : TO BE MIXED

Technical tips

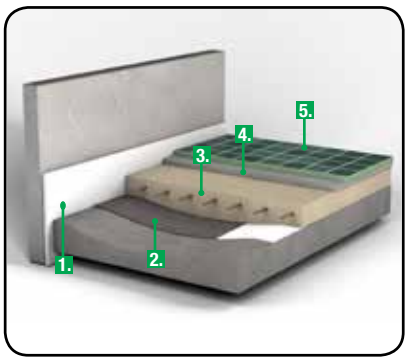
1. Do not pour if the temperature is under + 5 ° C.
2. After pouring to avoid any desiccation if heat (> + 25 ° C) or wind, cover the work with a polyethylene film during 24 hours.
3. Position linearly uncoupling joints every 8 m on a surface of 40 m², by a pattern layout prior to position heat bridge and upstands or stud walls.
4. Comply with the full drying time 7 to 14 days depending on the type of flooring.
5. For the polyethylene film or **Velaphone®** installation, ensure overlapping strips as well as the joint seals to prevent penetration of moisture in the substrate (15 cm for a polyethylene film, 3 to 5 cm for **Velaphone®**).
6. On uneven substrate: implementation of a welded mesh (Ø 1.4 x 1.8 mm mesh 50 x 50 mm). Be careful not to puncture the polyethylene film.

Implementation on uneven substrate



1. Resilient layer.
2. **Velaphone®** or 150 microns polyethylene film.
3. Reinforced screed using **Perlibeton**.
4. **C2** glue bonding and its primer or **P3** glue bonding and its primer depending on flooring.
5. flooring.

Implementation on masonry substrate



1. Resilient layer
2. **Velaphone®** or 150 microns polyethylene film.
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5. flooring.

perlibéton : TO BE PUMPED

100 % +

EASY
Its mineral aggregate gives it consistency and an adequate flow (dosing page16).

PVERSATILE
Suitable for all types pumps (traditional, piston pump, screed...).

DURABLE
Limits pollution of tanks and units mixtures.

CURING
Curing and drying after 4h. Accessible after 24h.

Perlibeton Pumpable version: The lightweight concrete of batching plants

efimix

A lightweight concrete "READY TO USE"

100 % +

HANDY & RELIABLE
All components are mixed at the factory.

SIMPLE
It only remains to add water into the pan mixer, (dosing p.16).

ADAPTED
Deliveries directly on worksites (bags of 23 kg).
Saving space.
Optimized consumption.

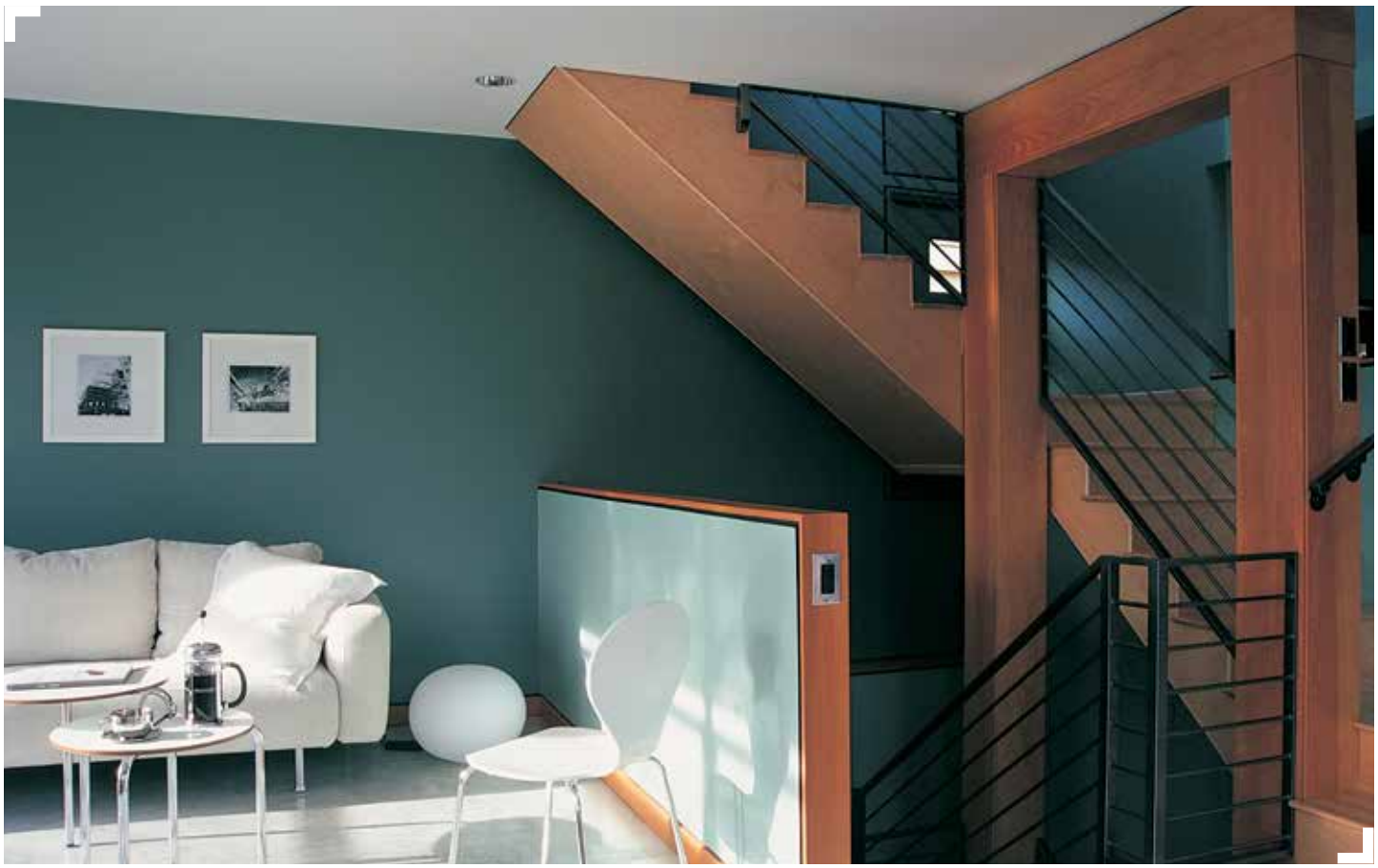
EASY
Easy opening. Easy smoothing.

Technical tips

1 **ON TIMBER DECK SUBSTRATE:**
Place a wire mesh into **Efimix** concrete:
- Diam. 1.4 x 1.8 mm
- 50 stitches
- 650 g/m².

2 **MOVEMENT JOINTS:**
Position linearly uncoupling joints every 8 m on a surface of 40 m².

3 **BAGS EXPIRATION DATE:**
12 months from manufacturing date written on the bag.



non-combustible light ecological

VERMICULITE IS INTENDED TO ATTICS INSULATION AND REHABILITATION OF AGED FLOORING

vermiculite

Mineral stone
Vermiculite is a hydrous, silicate mineral that is classified as a phyllosilicate and that expands greatly when heated.

Heat treated in our furnaces, it has undeniable advantages such as thermal an ecological insulation, unalterable and lightweight! It finds applications in various fields.

EFISOL offers three products derived from vermiculite
- **Vermex® M**
- **Vermex® H**
- **Vermaspha®**

3 processing steps :

Initially the rock is composed of multilayer flakes separated by water molecules.

During thermal treatment at + 900°C, steam transforms the multilayers flakes into grains with an accordion shaped.

The volume of flakes increases from 10 to 20 times. The air stored into Vermex® grains provides their insulating properties.

+ good reasons to choose Vermiculite

SOUND INSULATION	Reduces the effects of resonance on floors and walls.
EASY TO IMPLEMENT	No cutting, no seal, isolates even the most difficult parts to access.
IMPLEMENTATION	**Vermex® M**: Simply poured. **Vermex® H**: insufflated or poured.
ROTPROOF	Does not attract bugs or rodents.
NONTOXIC	Contains no toxic product. No toxic gases or smokes under the effect of heat.

vermex®

Vermex® is an **EFISOL**'s brand.
expanded flakes see their volumes multiplied by a coefficient of 10 to 20!

Vermex® M

Insulation or refurbisment of an old wood flooring is a childish game! Thanks to the lightness, the simplicity of dosing and to the fast implementation of **Vermex®.**

Vermex® H

Insulation of vertical walls in cons-partitions without losing living space.

4 good reasons to choose Vermex®

1. **Vermex®** provides thermal and acoustic insulation. **Vermex® M** for floors insulation and **Vermex® H** for walls. **Vermex®** properties help to reduce resonance effects on floors and walls.
2. Easy to use and implement, **Vermex®** is poured in bulk and isolates the most difficults parts to access such as joints structures, joistings, lower parts, and through the walls...
3. For attics and wood floorings insulation, **Vermex® M** is simply poured. For cavity walls insulation, **Vermex® H** is insufflated or poured. Its implementation does not cause many damage to decoration.
4. **Vermex®** is rotproof and unalterable. It does not attract bugs or rodents and provides over time all guarantees in terms of comfort and performance.

IMPLEMENTATION: in loft floors

1 Pour **Vermex® M** between the joists.

2 Spread **Vermex® M** with a rake.

3 Equalize levels to provide the desired thickness.

4 You may add **Vermex® M** on an existing insulation which has settled after a time.

5 Lay resilient strips on joinst before the fitting of a particule board, in the case of acoustics requirements.

Technical tips

1. No waterproofing layer needed on the insulation.
2. Do not walk between the joists.
3. In the case of areas difficult to access, equalize the surface with a rake.
4. In case of high ventilation, sprinkle plaster and slightly moistened it.

vermex® M concrete

100 % +

EASY TO PREPARE
A single dosage for a mixture of water, cement and vermiculite in a pan mixer or manually mixed (page 17).

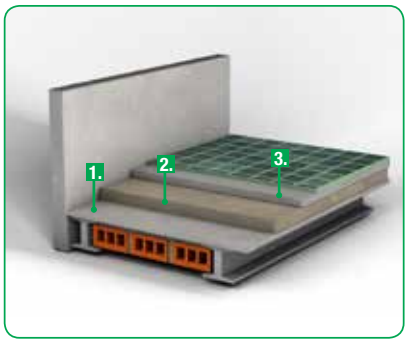
FAST
Cement screed or sealing mortar is ready to implement after 48 hours only!

LIGHT
Vermex® M is 6 times lighter than conventional concrete!

Vermex® M allows to make up the significant alignments without overloading for the former substrate!

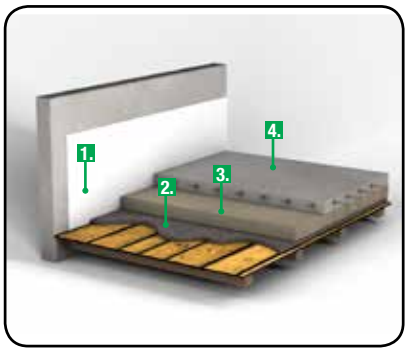
ADAPTED
Vermex® is a mineral aggregate, blended with cement, it has an homogeneous aspect and does not deteriorate over time.

Implementation on masonry substrate



1. Former substrate
2. **Vermex® M** concrete: Thickness 5 cm min. to 30 cm max.
3. Mortar 3 to 5 cm thick. dosed at 300 kg/m3 reinforced or not if 1 is a compression slab.

Implementation on wood flooring substrate



1. Resilient layer.
2. 150 microns polyethylene film or **Vélaphone®** felt.
3. **Vermex® M** concrete: Thickness 5 cm min. to 30 cm max.
4. Reinforced screed 4 cm thick. Meshes 50 x 50 mm over 1.4 x 1.8 mm at mid-thickness.

5 good reasons To choose Vermex® M

1. **Vermex® M** complies with NF EN 13055-1, (light aggregate for concrete, mortar and cement grount) and is CE marked.
2. **Lightness (density < 0.4)**
   6 times lighter than traditional concrete, **Vermex® M** concrete is an ideal refurbishment solution without overloading for the former substrate.
3. **Full compatibility with cement**
   Vermex® M is a natural aggregate which perfectly combines with cement. Their mixture is homogeneous and the concrete does not deteriorate over time.
4. **Thermal and acoustic contributions**
   Vermex® M reduces leakage of calories between floors and improve their sound insulation.
5. **Noncombustibility (A1)**
   Thanks to its classification A1, **Vermex® M** also enters into the composition of light concrete and coatings for fire protection.

Technical tips

1. The substrate must be cleaned from rubbles or puddles.
2. Protection against corrosion: Metallic parts such as metal girders, beams or tubes can be embedded in the **Vermex® M** concrete.

IMPLEMENTATION: Light concrete

Equalize levels with wooden wedges to provide the desired thickness.

Mix **Vermex® M** concrete.

Spread out the concrete between the wood wooden wedges.

Level the surface with the ruler. Remove wooden wedges. Fill the holes.

vermaspha®

DESCRIPTION

Vermaspha® is a dry and light solution given to old wood floors level. In addition to its acoustic qualities, **Vermaspha®** is a thermal insulator (lambda = 0.076 W / (mK)). **Vermaspha®** reduces leakage of calories between floors and energy consumption but also mitigates noise impacts.

In just 1 step:
- **Floor leveling**
- **Thermal and sound insulation**

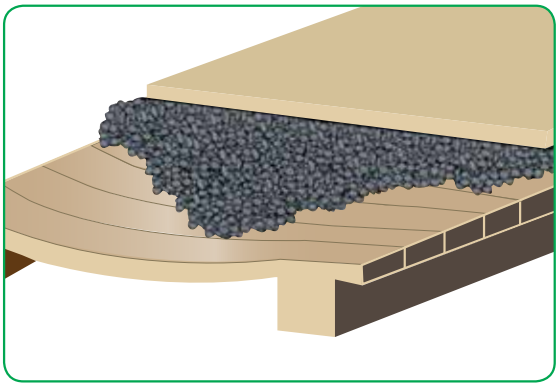
4 reasons to choose Vermaspha®

1. Ready to use, **Vermaspha®** does not require intake of water. The achievement is thus performed dry. It only remains to install a CTBH or OSB panel that meets the requirements of NF EN 300 / OSB 3, then floor covering parquet or carpet without delay traffic.
2. Acoustic and thermal insulation.
3. **Vermaspha®** nature and treatment provide it an incomparable lightness. Whatever is the thickness of implementation from 1 cm to 12 cm compacted, excessive weight is very low. Density: 300 kg/m^3.
4. **Vermaspha®** is being implemented by simply pouring and compaction, without any preparation or elaborate finishes.

PREPARATORY WORKS

- **On disjoint floors with cracks or holes and in wet rooms:**
  A bitumen felt stretched and stapled (overlapping strips of 5 cm).
- **On coated surfaces, waxed or stained:**
  Cold bituminous emulsion **Aquadère®** is recommended.
  Check the pipes fixed every 80 cm and protect them, if necessary cover them with at least 2 cm of compacted **Vermaspha®**.Temporarly block the gates. Install resilient layers on vertical walls upstands. Substrate must be dry and clean with a sufficient resistance to loads.
- Perpendicular to doorways, 3 wooden wedges of 50 cm long and 1 cm height incorporated in **Vermaspha®** will be used to screw the panels (avoids alignment tolerance).

- **FLOOR LEVELLING FROM 1 TO 12 CM COMPACTED WITHOUT WATERING INTAKE AND NO OVERLOADING**
  Up to 6 cm thick., just compact **Vermaspha®** in successive layers of 5 cm thick.
- **Vermaspha® «THIN LAYERS».**
  No matter what is the type of your substrate, if you provide applying a bitumen primer (eg: **Aquadère®** solvent-free) to increase adherence, you may limit thickness to level up to 1 cm compacted.



IMPLEMENTATION

1 **Preparation and installation of the rulers:**
mark the floor with a spirit level. Put the wedge level (**1/3 thicker** than the shape to realize), and rulers at 50 cm from the walls.

3 **Spread out Vermaspha®:**
Spread out clumps of **Vermaspha®** over the surface using a rake.

5 **Remove wooden wedges**
Remove wooden wedges and fill holes with **Vermaspha®**.

7 **Panels installation**
Wooden panels are laid on the **Vermaspha®** with a peripheral space of 5 mm left between panels and walls.

2 **Vermaspha® spillage:**
Remove lumps in the bags by hitting them on the floor. Then, spill **Vermaspha®** between rulers.

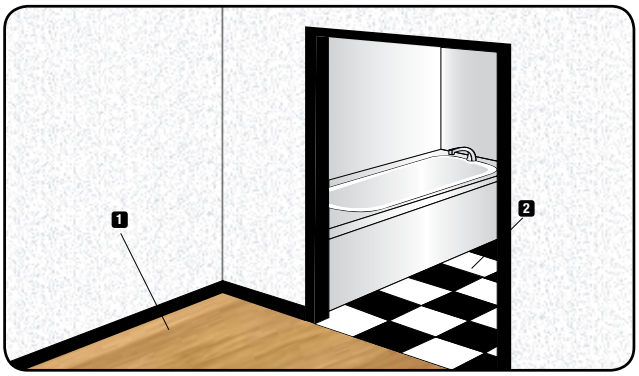
4 **Levelling:**
Equalize levels to provide the desired thickness. Level the surface with a ruler.

6 **Compaction:**
Use a rammer and a rammer shoe starting along the walls. Compaction must be done by sucessive layer of 5 cm thick. If layers are < 3 cm, layers must be particurarly well compacted.

8 **Panels sticking:**
Put the panel under the blocks edges **(a)** (and not under the rulers) of 3 mm think, on which the next panel will slide.

NUMEROUS FINISHES AND REPARTITION

- Carpet
  Directly placed on CTBH (19 mm mini) or OSB slabs (15 mm mini).
- Laminate flooring
  Directly placed on CTBH (19 mm mini) or OSB slabs (15 mm mini).
- Tiles, parquet and PVC flooring
  Are sealed or glued on a reinforced screed concrete minimum thickness of 5 cm with a wire mesh of 1.4 x 1.8 mm, 50 x 50 mm.



1 You can lay a laminate flooring or carpet which have good sound insulation characteristics (setting on CTBH or OSB panels).

2 Tiles are suitable for kitchens and bathrooms (installation on screed). In bathrooms, **Vermaspha®** must stop at the frame of the bath.

Technical tips

1 Installation of wooden wedges must start from high point (without insert).

2 Chipboard quality CTBH (minimum thickness: 19 mm - Maximum length: 2100 mm) or OSB panels (minimum thickness: 15 mm - Maximum length: 2485 mm) that meet NF EN 300/OSB 3 requirements, machined on four faces, laid in staggered lines and glued to their shores.

3 Minimum thickness of 1 cm on specific areas compacted with bituminous emulsion and 3 cm on main surface.

4 **Vermaspha®** must be applied in a room where temperature is between 5°C and 40°C. If the ambiant temperature is less or over the indicate range, the product and room temperature must be stabilized for at least 24 hours. Heat the place where the implementation will take place at +10°C.

non-combustible light ecological

MIX OF VERMICULITE AND PERLITE

efiperl

Vermiculite a mineral stone
Vermiculite is a hydrous, silicate mineral that is classified as a phyllosilicate and that expands greatly when heated.

Heat treated in our furnaces, it has undeniable advantages such as thermal an ecological insulation, unalterable and lightweight! It finds applications in various fields.

Perlite is an expanded volcanic rock:
perlite expends in our furnaces. It is noncombustible and does not release any smoke or toxic gases.

efiperl

100 % +

EASY IMPLEMENTATION
No cutting, no seal, isolates the most inaccessible places.

NONTOXIC
Contains no toxic product.
No toxic gases or smoke under the effect of heat.

ROTPROOF
Does not attract bugs or rodents.

LIGHT
Helps to complete existing insulation without compressing it.

DESCRIPTION

Efiperl is a mix of calibrated exfoliated vermiculite grains and calibrated expanded perlite grains:

- Allows floor thermal insulation of loft floors.
- Used as light aggregate for concrete and mortar.

2 reasons to choose Efiperl

1. Saving on money and material consumption when using a lightweight concrete.
2. More effective thermal insulation.

IMPLEMENTATION: as an insulator in loft floors

1. Pour **Efiperl®** between ceiling joists either on the existing floor.

2. Equalize thickness.

3. Lay resilient strips on joinst before the fitting of a chipboard, in the case of acoustic requirements.

MPLEMENTATION: as a light aggregate (dosage p.18)

1. Wood wooden wedges are installed to provide the desired thickness and level to be reached.

2. Mix concrete.

3. Level the surface with the ruler. Remove wooden wedges.
   Fill the holes.

technical characteristics

Perlibeton

Characteristics		Values		
Dry concrete density		about 700 kg/m³		
Setting of concrete (+ 20°C)		about 3 h		
Pedestrian access		after 6 h		
Thermal conductivity (λ)		0,21 W/m.K		
Mechanical strength	Number of days	3 days	7 days	28 days
	Compressive strenght	2.5 MPa	3.3 MPa	3.5 MPa
	Flexural strenght	0.45 MPa	0.75 MPa	0.80 MPa
Dosage (1 m³ of lightweight concrete = 800 liters of Perlibeton)		**Perlibeton**	8 bags (= 800 liters)	1 bag (=100 liters)
		Cement	320 kg	40 kg
		Sand 0 to 4 mm diameter	190 kg	15 liters
		Water	160 liters (+/- 10)	20 liters
Compatibility (DTU 52.1 : Technicial guideline for sealed flooring)		non-compressible		

Can be used with C2 glue classification (tile adhesive mortar according to EN 12004) without P3 coating classification. Technical Guideline (2006 version)

Perlibeton pumpable version

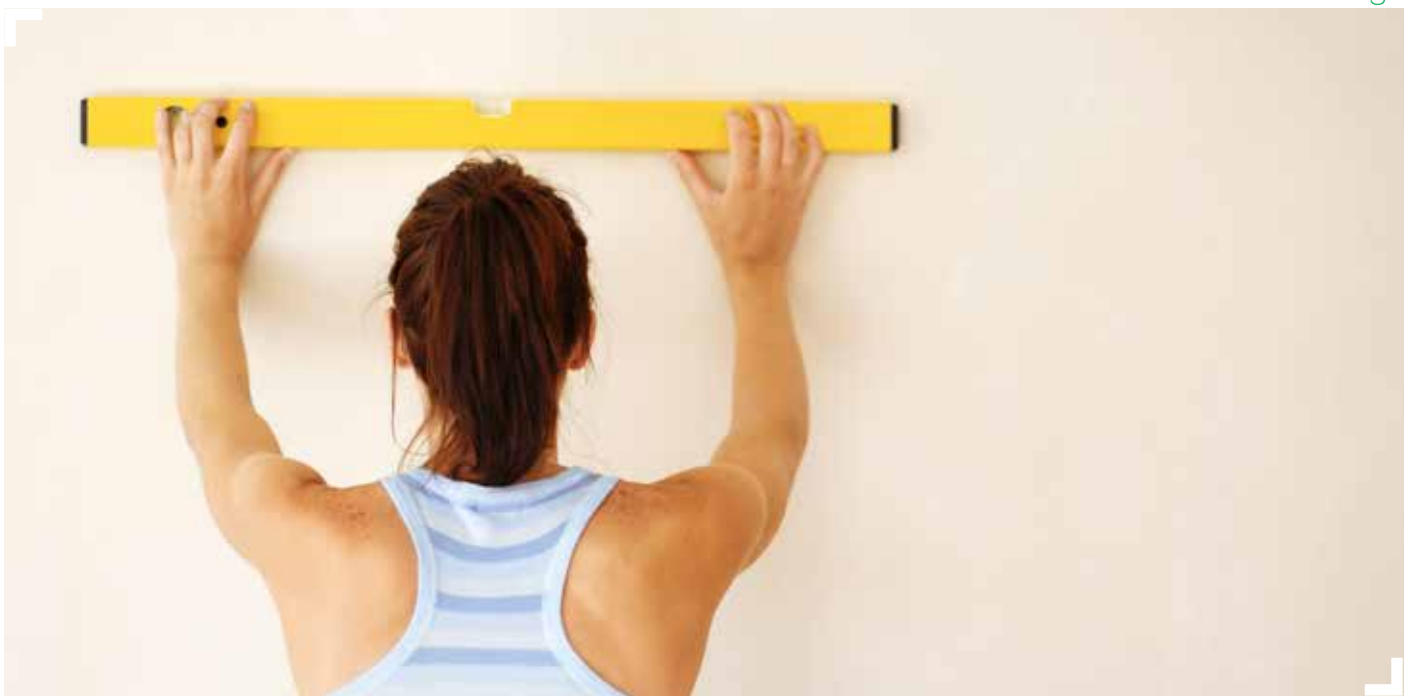
Characteristics		Values		
Dry concrete density		900 to 1000 kg/m³		
Thermal conductivity (λ)		0,30 W/m.K		
Mechanical strength	Number of days	3 days	7 days	28 days
	Compressive strenght	2.7 MPa	4.1 MPa	5.2 MPa
	Flexural strenght	1.1 MPa	1.6 MPa	2.7 MPa
Dosage		**Perlibeton**	8 bags (= 800 liters)	
		Cement	350 kg	
		Sand 0 to 4 mm diameter	400 kg	
		Water	200 liters (+/- 10)	
Compatibility (DTU 52.1 : Technicial guideline for sealed flooring)		non-compressible		

Can be used with C2 glue classification (tile adhesive mortar according to EN 12004) without P3 coating classification. Technical Guideline (2006 version)

efimix

Characteristics		Valeurs		
Dry concrete density		900 to 1000 kg/m³		
Setting of concrete (+ 20°C)		about 4 h		
Mechanical strength (MPa)	Number of days	3 days	7 days	28 days
according to test	Compressive strenght	4.8 MPa	6.4 MPa	6.5 MPa
CERIB 03DPO 404	Flexural strenght	1.4 MPa	1.7 MPa	2.1 MPa
Dosage in a cement mixer		1 bag (23 kg) for 9 liters of water		
Consumption		33 bags/m³		

Can be used with C2 glue classification (tile adhesive mortar according to EN 12004) without P3 coating classification. Technical Guideline (2006 version)



Vermex® M and Vermex® H

Characteristics	Values
Thermal conductivity (λ)	about 0,07 W/m.K at + 10°C
Density	80 to 90 kg/m³
Melting point	about + 1300°C
Specific heat	0,2 Cal/g/°C
Reaction to fire	EUROCLASS A1
■ **Packaging:** 100 liters bag upright on pallet with plastic wrapping	

Thermal resistance					
Thickness (cm)	4 m².K/W	5 m².K/W	10 m².K/W	15 m².K/W	20 m².K/W
Vermex® M	0,55 m².K/W	0,70 m².K/W	1,45 m².K/W	2,20 m².K/W	2,90 m².K/W
Vermex® H	0,5 m².K/W	0,65 m².K/W	-	-	-

Vermex® H consists of very thin vermiculite & silicone

Vermex® M concrete

Characteristics of Vermex® M concrete	Values
Coefficient of thermal conductivity (λ)	0,24 W/m.K
Compressive strength after 28 days	0,4 MPa
Dry concrete density	350 to 400 kg/m³
Reaction to fire	EUROCLASS A1

Composition of 1 m³ of concrete with a dry density of 400 kg/m³		For 1 bag of Vermex® M
Vermex® M	14 to 15 bags	1 bag
Cement: CPJ-CEM II A or B/32,5 or 42,5 - CPA-CEM I/42,5	250 to 300 kg	20 kg
Water	400 to 450 liters	25 to 30 liters

technical characteristics

Vermaspha®

Characteristics	Values
Thermal conductivity (λ)	0,076 W/m.K
Density of the compacted product	250 to 300 kg/m³

- **Sold products:** paper bag of 50 liters (50 bags/palet)
- **Precautions: Vermaspha®** bags must be protected from from water and frost.
  Use : up to one year after its expiry date
- **Installation accessories:** metalic rammer, racket kit and metal roller 60 cm diameter.
- **Average consumption:** bag of 50 liters: 3 to 3,5 m² compacted for around 1 cm thickeness
  1 m² compacted for around 3 to 3,5 cm thickness

Efiperl

Thermal insulation Efiperl characteristics	
Efiperl density	105 kg/m³
Efiperl Thermal conductivity	0,056 W/m.K
Consumption per m²	1 bag for 10 cm
Thermal resistance for a 20 cm thickness	3,55 m².K/W

Lightweight concrete Efiperl

Composition for 1 m³ of concrete in a mixer		For 1 Efiperl bag
Efiperl	12 to 13 bags	1 bag
Concrete : CPJ-CEM II A or B/32,5 or 42,5 - CPA-CEM I/42,5	250 kg	20 kg
Water	355 - 365 liters	30 liters

Lightweight concrete characteristics	
Dry concrete density	300 kg/m³
Thermal conductivity	0,15 W/m.K
Compressive strenght at 28 days	0,13 MPa

EFISOL

Solutions for thermal insulation

Insulation is not only a matter of saving energy and money, as well it improves your house or building comfort. SOPREMA GROUP offers a range of insulating systems which meets all the requirements of today and tomorrow's market.

✔ A range adapted to technical requirements and regulations

✔ A unique know-how to insulate all type of substrates: roofs, walls, floors and ceilings,

✔ An efficient complementary line of acoustic and natural thermal insulation

with **Vélaphone®** and **Univercell® Confort**.

Efisol, comfort by insulating

A project under way
We have solutions!
www.soprema.com
Tel. +33 3 88 79 84 84

SOPREMA GROUP

14 rue de Saint Nazaire | BP 60121 | 67025 STRASBOURG CEDEX 1
contact@soprema.com | Tel: +33 (0)3 88 79 84 00 | Fax: +33 (0)3 88 79 84 01

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Looking for a sales contact in order to discuss a future project or a project that is under way? Contact our sales division:

SOPREMA Export Department:
Phone:**+ 33 (0)3 88 79 84 84**
Fax: **+33 (0)3 88 79 84 85**
E-mail: **contact@soprema.com**
More information on: **www.soprema.com**

eco struction

SOPREMA GROUP

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