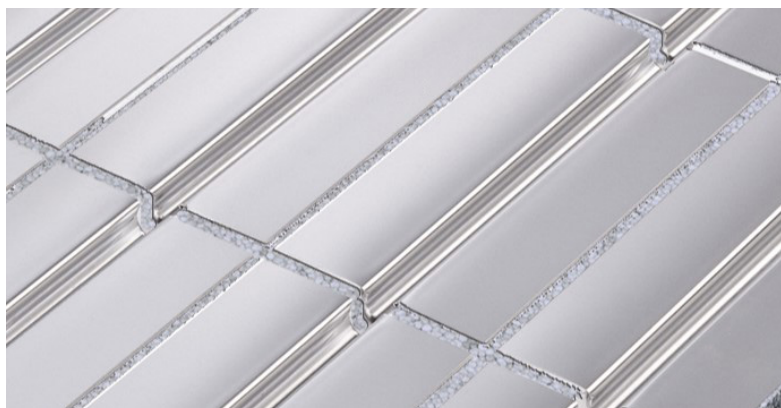


ENERGY BasicLine Slim

Pipe support elements made of Neopor® (expanded polystyrene with high thermal insulation) for heating and cooling surfaces in dry-wall construction



Fields of application:

The dry system based on expanded polystyrene sheets (Neopor® 032) topped with heat-conducting plates made of aluminium is a highly efficient system in terms of its heating rate, controllability and energy utilisation. Unlike heated wet screed, the through-heating time is reduced by 75 % at a significantly lower supply flow temperature. In conjunction with intelligent, thin-layered load distributing layers, high traffic load bearing capacities up to 5.0 kN/m² and large-sized surface layers can be implemented reliably.

Energy BasicLine Slim can be used in frost-free interior areas on the floor, wall and ceiling for heating and cooling.

Energy BasicLine Slim is water-proof, alkaline-resistant and thus suitable for heating and cooling in all areas with the exception of underwater areas like swimming pools.

Energy BasicLine Slim, with a thickness of 22 mm (including PROSECUREfibretec 2.0), is very thin and thus ideal for renovating older buildings. Door heights and window sills can be maintained. No more waiting for screeds to dry!

Energy BasicLine Slim is the most efficient surface heating and cooling system for new construction that is optimised in terms of energy. The extremely fast response to the needs of the people in the room always provides the desired level of comfort with minimum use of primary energy.

- Heats up and cools off quickly
- Energy is used highly efficiently - only as needed
- Prefabricated, high-precision parts that can be divided easily through an intelligent grid pattern

- Shortest construction time due to dry-wall construction - surface layers can be installed immediately
- Waterproof - can also be used in wet areas, including around swimming pools and for floor-level showers
- Can be used for all surface layers in combination with tested load distributing layers
- High load capacity and improvements of soundproofing performance can be implemented

Product advantages:

The **Energy BasicLine Slim** pipe support elements are sophisticated and can easily be used universally in new construction and renovation. The low weight per unit area makes the system ideally suited for lightweight timber construction as well as for renovating old ceilings with a low load capacity. The individual pipe support elements have a thickness of just 20 mm and are manufactured on the highest level of quality in Germany in conjunction with the permanently glued-on aluminium heat conducting plates. The aluminium heat conducting plates feature thermal conductivity that is more than four times better than steel (200 W/mK). Compared to steel, aluminium is neutral in terms of corrosion properties.

Water is guided into the elements using only one multi-layered composite pipe; this makes the system absolutely oxygen-tight and prevents corrosion to metal parts of the heating system.

After installing the pipe support elements and the pipe, the entire area is glued over with **PROSECUREfibretec 2.0** reinforcement and decoupling mat. This not only protects the

ENERGY BasicLine Slim

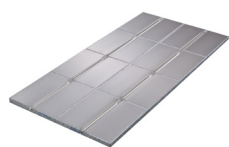
work from mechanical damage and dirt, but at the same time provides the needed problem-free adhesion bridge to usual sealing and bonding compounds for surface layers in dry and wet areas, in residential and commercial applications. The glass fibre mesh with high tensile strength decouples the upper surface layers. Multi-layered and solid parquet can be glued on directly. Laminate, design flooring with HDF carrier and parquet with click connection in combination with a **PROBASE PU-M 3.0** or **PROBASE PU-M 3.0 aqua-stop** underlay material for soundproofing can be laid directly in a floating configuration. For large-format tiles or sheets and for carpet and design flooring, load distribution plates such as **ENERGY PES**, gypsum or cement fibre sheets or low-shrinking, cement-based compound in a layer thickness of 8 - 10 mm can be used for top-level substrates.

In all cases, the surface layer is close enough to the heating/cooling layer that requested temperature changes can be implemented with maximum speed. Due to these efficient system configurations, a comfortable climate with significantly lower supply flow temperatures is reached. As the preferred sources, heat generators such as a heat pump and solar energy are used.

The system includes the compatible distributor and control technology, which creates cost-effective options for implementation in renovation projects with mixer groups and room temperature limiting valves.

- Easy to handle and simple to use
- Low installation height
- Compensates for cracks
- Heats up and cools down quickly
- Ecologically safe

Energy BasicLine Slim system elements:



Pipe support element Slim, straight with laminated aluminium heat-conducting plates
Pipe distance 25 cm
Item no. 93900



4 x diverter element Slim with laminated aluminium heat-conducting plates
Pipe distance 25 cm
Item no. 93902



Pipe support element Slim, straight with laminated aluminium heat-conducting plates
Pipe distance 12.5 cm
Item no. 93901



8 x diverter element Slim with laminated aluminium heat-conducting plates
Pipe distance 12.5 cm
Item no. 93903



Edge plate Slim without pipe aperture and without aluminium heat-conducting plates
Item no. 93904



Frame support PU Slim
Item no. 93717

Data:

Product	Dimensions [L x W x H]	Item no.
BasicLine Slim pipe support element for pipe distance of 25 cm	1000 x 500 x 20 mm	93900
BasicLine Slim 4 x diverter for pipe distance of 25 cm	1000 x 500 x 20 mm	93902
BasicLine Slim pipe support element for pipe distance of 12.5 cm	1000 x 500 x 20 mm	93901
BasicLine Slim 8 x diverter for pipe distance of 12.5 cm	1000 x 500 x 20 mm	93903
BasicLine Slim edge plate	1000 x 500 x 20 mm	93904
Frame support PU Slim	1000 x 45 x 20 mm	93717

ENERGY BasicLine Slim

Specifications:

Base element	Neopor®-Platte EPS 032; 240 kPa
Heat conduction plate	Aluminium, 0.5 mm thick, with pipe feed in Ω -profile, flanged
Thermal conductivity	0.032 W/mK
Heat transfer resistance [R]	0.62 m ² K/W
Vapour diffusion factor	40 in accordance with DIN 12086
Bending strength	0,25 N/mm ²
Load capacity [kN/m ²]	2.5 in accordance with DIN 1991-I-1
Fire behaviour	Euroclass E according to DIN EN 13501-1
Temperature resistance	-40 °C - +80 °C

System components:



PROSTRIP Basic PE

Edge insulating strip with approx. 25 mm wide self-adhesive strips
 Roll of 25 m
 Item no. 93527



PROSECUREfibretec 2.0

Reinforcement and decoupling mat
 Roll 10 m / 25 m
 Width 1 m
 Item no. 93719 / 93720



PROBAND S

Special glass mesh fabric with butt-joining tape adhesive tape affixed in the centre width approx. 75 mm, roll 25 m
 Item no. 93722



PROFIX

Dispersion fixative
 5 kg pail
 Item no. 93780



ENERGY PES

Decoupling and load distribution plates
 1150 x 600 x 5 mm
 Item no. 93751



ENERGY multi-layered composite pipe

16 x 2 mm
 Roll of 100 m Item no. 93727
 Roll of 300 m Item no. 93730



ENERGY press coupling

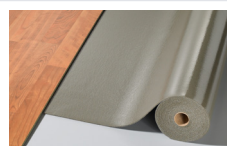
Press coupling can be compressed with a U-shaped manual crimper
 16 x 2 mm
 Item no. 93731



ENERGY plug coupling

Plug coupling with integrated press function, grouting mark and colour coding
 16 x 2 mm
 Item no. 93745

Supplementary products:



PROBASE PU-M 3.0

Flooring underlayment
 5.5 x 1.0 m
 Item no. 93646



PROBASE PU-M 3.0 aqua-stop

Flooring underlayment with aqua-stop, with / without joint sealing tape
 5.5 x 1.0 m
 Item no. 93619 / 93616

Storage and transport:

Boards should be transported and stored, lying flat wherever possible, in a cool and dry place protected from sunlight and dirt.

Environmental protection and disposal:

Dispose of containers and leftover product as stipulated by law and in accordance with regional regulations.

Instructions on hazardous goods and substances:

No special measures required.

Preparation/assessment of substrate:

The **Energy BasicLine Slim** pipe support elements can easily be used universally in new construction and renovation. The concept with a thickness of 20 mm, pipe distances of 25 cm and 12.5 cm and heat-conducting plates made of aluminium ensure maximum energy efficiency with low supply flow temperatures, fed by the oxygen-tight multi-layered composite pipe with a diameter of 16 mm. This enables individual, sustainable solutions to be implemented cost-effectively.

The basic system is suitable for living rooms with a traffic load bearing capacity of 2.5 kN/m². The load capacity of the substrate must be suitable for the planned use (DIN EN 1991-I-1).

The prerequisite for installation is creating a level surface on the substrate.

ENERGY BasicLine Slim

For floors, DIN 18202 Table 3 Row 4 is applicable:

**Pitch as limit values in [mm] at
Measuring point distances in [m]**

Row	Relationship	0.1 m	1 m	4 m	10 m	15 m
4	Finished floors with more stringent requirements, e.g. with self-levelling fillers	1 mm	3 mm	9 mm	12 mm	15 mm

These tolerances are compensated by the system without any issues. Unevennesses of up to approx. 10 mm on concrete or mineral screed floors are compensated best by using self-levelling, cement-based screeding compound.

Larger areas of unevenness, such as those encountered during renovation, should preferably be filled using a bound filler with a compressive resistance of $> 1.5 \text{ N/mm}^2$ with a low dead weight and simultaneous thermal insulation.

A dry load distributing layer such as an OSB sheet or gypsum or cement fibre sheet is placed over the entire surface. The thickness is based on the planned future loads.

Areas of unevenness on wood joist ceilings also have to be looked at on a case-by-case basis. In many cases, it is sufficient to additionally affix loose boards or attach an additional load distribution plate.

Existing coverings made of tile, natural stone, parquet or non-textile plastic coverings can usually be laid directly if the levelness of the surface complies with requirements.

For floors in cellars where the insulating and/or sealing situation is unknown, additional sealing measures may be required. These can range anywhere from a PE film as a vapour barrier to watertight bituminous sheeting in accordance with DIN 18533, where a level substrate would have to be created on top of it.

Laying/working:

Preparatory measures/site planning

Structure

- The substrate to be lined with the **Energy BasicLine Slim** System is level: DIN 18202 Table 3 Row 4. All structural work on the floor is complete. The floor is ready to be lined in terms of its load capacity and equilibrium moisture content.
- All plaster and drywall work is complete in the area of the surface to be lined.

- Sealing measures in accordance with DIN 18533 and DIN 18534 are complete on the structure.
- The distributor is correctly positioned in the distributor cabinet, the supply lines from the energy generator are connected in a depressurised condition.
- A binding and accessible metre marking is present in each storey.
- The space for later built-in fixtures such as bath tubs and shower trays is demarcated authoritatively.
- Changes of surface layers are identified in a legally binding manner in the floor plan.
- Additional insulation installed on-site complies with **Proline ENERGY** requirements in terms of load capacity and plane flatness.

Infrastructure

- The water and electrical connections are present and functional.
- A weather-neutral room for storing goods is present and can be protected from irregular access.
- Containers are provided in compliance with local disposal guidelines for disposing of any packaging.
- During the installation work, no third-party labourers are within the area to be lined.
- A cordon for protecting the work can be set up and reliably enforced.

Technology

- The 230 V /50 Hz power supply connection is present and functional in the distributor cabinet.
- Elements of the control system, both wired and wireless, are installed between the room thermostat and distributor.

Working

Attach **PROSTRIP basic PE edge-insulating strips** to all rising components and installation parts to prevent non-positive connections and sound bridges.

Route the frame support on all sides according to the routing plan. Presort **Energy BasicLine Slim** pipe support elements in accordance with the layout drawing.

According to their absorbency, wooden subfloors must be pre-coated with a suitable primer in a film-forming manner and be left to dry completely. The presorted elements can then be glued with **PROFIX**. To do so, use a lambskin roller to apply **PROFIX** in a film-forming manner on the grease-free, clean, and adhe-

ENERGY BasicLine Slim

sion-ready subfloor (coverage approx. 400 g/m²) and install the elements according to the installation diagram. On absorptive mineral substrates, the pipe support elements have to be adhered using thin-bed adhesive of class C2 S2 or higher. We recommend starting work from one corner of the room and continuing towards the passage at which the tube heat exchanger leaves the room.

Route the **ENERGY** multi-layered composite pipe to follow the heating circuit. To do so, set up the pipe reel outside the room on the installation substrate such that the pipe is guided directly into the room in which the system is to be installed and can be installed without torsion. To do so, feed the pipe ahead in a large arc and use your foot to snap it into the pipe grooves without applying additional force. A heating circuit is usually installed without coupling between the feed and return of the distributor.

If, despite this, it should be necessary to install a press-fit or plug-in coupling, position the coupling such that it is flush with the surface in the **Energy BasicLine Slim** pipe support element.

Once all heat exchangers have been installed, the work must be protected from tampering by third parties! After a successful pressure test, the area brought to this stage of completion must be affixed with **PROSECUREfibretec 2.0** in combination with **PROFIX** (use approx. 400 g / m²). If required, clean the adhesion surface before to make sure the subfloor is grease-free, clean, and adhesion-ready. For details, refer to the current data sheet! (installation direction perpendicular to the pipe routing) To increase load capacity from a traffic load bearing capacity of 2.5 kN/m² to 5.0 kN/m² or the present system planning of the floor structure, **ENERGY PES** is routed directly on **PROSECUREfibretec 2.0**. For this purpose, the corresponding space is first designed with **ENERGY PES** in a running bond pattern and gaps are closed using pieces cut to size.

Then, the **ENERGY PES** sheets are reattached in sections and adhered directly to **PROSECUREfibretec 2.0** without tension using a thin-bed adhesive of Class C2 S2 or higher. The edge insulating strip is not compressed in the process!

After the glue dries – observe the information on the data sheet from the corresponding manufacturer – the planned surface layer can be applied.

As an alternative to the **ENERGY PES**, a load-distributing compensation can be established on **PROSECUREfibretec 2.0** using low-shrinkage, cement-based, self-levelling compound. The minimum thickness is 8 mm. The butt joints have to be adhered using **PROBAND S** between the strips of **PROSECUREfibretec 2.0** such that levelling compound does not seep underneath. The

edge terminations must be configured similarly. After the application dries completely (see manufacturer's information) the planned surface layer can be applied.

The following additional rules apply:

- The surface heating and cooling systems from Proline Systems GmbH are installed by qualified tradespeople exclusively.
- The substrates to be covered with **Energy BasicLine Slim** must have a sufficient level of flexural strength, compressive resistance and low vibration for the intended load.
- The use of floor conveyors and lift trucks with metal rollers and polyamide wheels normally represents high to extremely high mechanical loads. **Energy BasicLine Slim** is not suited to this application.
- The smallest tile format of **Energy BasicLine Slim** must not be smaller than 10 x 10 cm without a load distribution plate.
- The largest tile format must not exceed an area of 1.0 m² (with **ENERGY PES** / with levelling compound)
- The tile format must correspond to a ratio of ≤ 2:1 (length:width).
- For a format > 33 x 33 cm or higher, a load distribution plate is required. Either lay **ENERGY PES** as described above or a layer of 8 - 10 mm thick, cement-based, low-shrinkage, self-levelling compound.
- The tile thickness must not exceed 8 mm.
- Mosaic is always installed on a load distribution plate.
- The joint compound must be suitable in terms of its strength and adherence to the tile. At minimum, select a high-quality flexible joint. A dispersion joint is preferable.
- Multi-layered parquet should have a minimum thickness of 10 mm.
- On underfloor heating, solid parquet boards should be no longer than 120 cm and no thinner than 21 mm.
- Mortar hardened with polymers, dispersion and reaction resin adhesive and elastic joint fillers used to install surface layers on the **Energy BasicLine Slim** must have reached their rated strength before they can be approved for their intended use.
- The installation sequence must take into account the curing times in relation to the laying temperature and manufacturer's specifications so that previously laid sections are not weakened or even damaged.
- **Energy BasicLine Slim** does not eliminate the need to install building joints, connecting joints and expansion joints.

ENERGY BasicLine Slim

- Natural and artificial stone coverings that are known to have a tendency to deform if they take on water should only be laid on **Energy BasicLine Slim** with suitable, water-free bonding compounds.
- Wooden floorboards must be screwed down tight. Individual floorboards must not shift towards or away from each other under any circumstances. Sheets of wood must be screwed down tight every 40 cm in a square pattern and the tongue and groove joints must be permanently glued. The supports of a beam ceiling must not exceed a dimension of 75 cm between the centre lines. The wood moisture must be the same as the moisture balance.
- For the detailed floor structure of **Energy BasicLine Slim** depending on the type and format of the surface layer and the planned load, refer to the respective system data sheet and the technical documentation. In case of doubt, seek advice from the Proline Systems Application Technology department.

Standards and regulations:

It is recommended that the following standards and regulations are observed and taken into consideration:

- DIN EN 1264 Water based surface embedded heating and cooling systems
- DIN 18352 Tile laying work
- DIN 18332 Natural stone work
- DIN 18333 Cast stone work
- DIN 18353 Screed work
- DIN 18356 Working with parquet
- DIN 4725 Floor heating, systems and components
- DIN 18202 Tolerances in building construction
- DIN 18560 Screeds in building construction
- DIN 18533 Waterproofing of elements in contact with soil
- DIN 18534 Waterproofing for indoor applications
- DIN 18157 Execution of ceramic linings by thin mortar bed technique
- DIN EN 1991-1-1 Actions on structures
- Bulletins from German Association of Screed and Flooring
- Bulletins from Association of Tiles and Natural Stone in the Central Association of the German Construction Industry
- Interface co-ordination for heating flooring constructions
- Bulletins from German Federal Association of Surface Heating and Surface Cooling (BVF)
- Bulletin entitled "Highly loaded floor coverings" from the Central Association of the German Construction Industry
- Tile and slab information entitled "Information on decoupling" from the Central Association of the German Construction Industry
- German Natural Stone Association – Structural engineering information for natural stone

For detailed information about planning and execution, refer to the technical documentation.

All information, references, instructions, basic engineering principles, regulations, standards and expertise are based on German and largely equivalent European regulations and training standards, irrespective of additional country-specific supplements and amendments.

All our specifications are based on our experience and careful analysis. We are unable to examine or influence the diversity of associated materials used and the various construction site and processing conditions in detail. Fulfilment of an imposed work order and verifiable functionality of the object therefore depends on the observation of current VOB rules and the recognised rules of technology.

Our details do not absolve the accountable planner's and fitter's obligation to assess - on their own authority - the building conditions and practicability of the products. In case of doubt, carry out your own tests or seek technical application advice. Please refer to the laying and working guidelines of the floor covering manufacturers or the manufacturers of associated products.

All product data sheets previously published are superseded by this product data sheet once published.

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ENERGY BasicLine Slim

Installation instructions



Lay the edge-insulating strips around the perimeter of the wall. Adjust the first frame support and glue it to the load-bearing substrate.



Start with the elements described according to the layout drawing and bond to the substrate over the entire area.



Continue laying the pipe support elements as described previously.



Adjust the elements using specified break-age points and fill the edge and corner areas with edge elements. Never cut the aluminium sheets!



Connections on wall surfaces and compensations surfaces are filled using BasicLine edge plate and bonded across the entire surface.

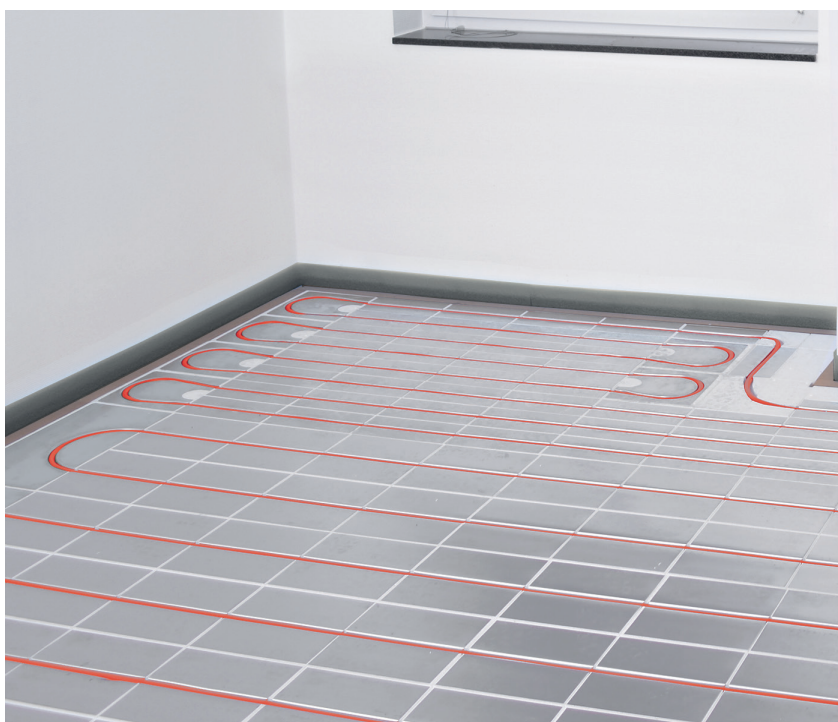


Individually cut the pipe feeds using the hot cutter. Run long pipe feeds in S-shaped paths.

In doorways, the frame support has to be installed parallelly to the wall surface and glued completely. In this way it serves as support for the door elements.



Press the multi-layer composite pipe into the pipe channels in a large arc from above without any tension. Maximum heating circuit length is 120 m.



You can see the area with the finished Proline ENERGY BasicLine Slim installation in the image above. The PROSECUREfibretec 2.0 is bonded over the entire surface with PROFIX dispersion fixative to protect the laid elements and the pipe as well as to stabilise the surface. The following installation steps can be found in our system configurations.