

LITHOPLAST

CZECH MANUFACTURER
OF INSULATIONS AND PLASTIC
PRODUCTS



www.lithoplast.cz

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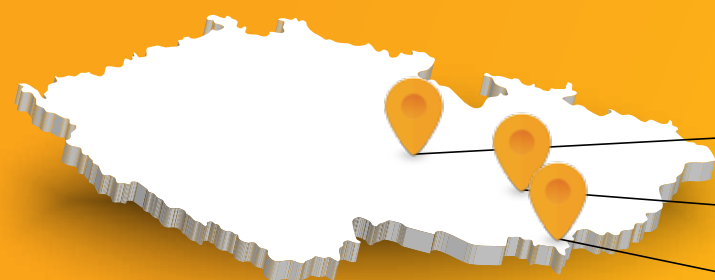
COMPANY PROFILE AND HISTORY

LITHOPLAST, s.r.o. is a wholly Czech producer of waterproofing membranes. The company manufacturing program includes the production of PENEFOL® smooth waterproofing membranes (LDPE and HDPE); LITHOPLAST® studded polyethylene (HDPE) membranes and accessories. The membranes are used primarily in the building industry, but they can also be applied in textile and leather manufacturing, sport, automotive and furniture industries. Apart from its own products, LITHOPLAST, s.r.o. is also an important distributor of geotextiles, drainage mats, PVC membranes and other insulation materials.

The company has been operating in the market since 1996, when it started with the distribution of flat PENEFOL® membranes. As of 2001, it extended its distribution to studded LITHOPLAST® membranes. The membranes had been manufactured by GUMOTEX, a.s. since 1980s. In April 2005, LITHOPLAST, s.r.o. bought the machines as well as the trademarks for the production of PENEFOL® and LITHOPLAST® membranes, and it became the sole owner of the technology for the production of smooth LD-PE and HD-PE PENEFOL® polyethylene membranes as well as LITHOPLAST® studded HD-PE membranes.

The manufacturing plant is situated in our premises in Žďár nad Sázavou. The manufacturing program is being periodically updated according to the current requirements of the market. Many tests and checks are performed during production in order to ensure conditions for the production of polyethylene membranes that suit market requirements and corporate, as well as European, standards. The production is certified by the Certificate of production control, and the individual products boast Product certificates. The quality management system is certified according to ČSN EN ISO 9001:2009.

LITHOPLAST, s.r.o. distributes its products from its storehouses (Žďár nad Sázavou, Brno, Lanžhot) and through important distributors of construction materials in the Czech Republic as well as abroad. It generally provides support to companies related to waterproof insulation application, and upon request it also ensures the complex training required to become familiar with the manufacturing program, combined with practical examples of membranes application and welding.



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LITHOPLAST, s.r.o. is holder of the following valid certificates:
Quality Management System certificate according to ČSN EN ISO 9001:2009
Product certificate / Certificate of production control system

www.lithoplast.cz

PENEFOL® 500

POLYETHYLENE WATERPROOFING
MEMBRANE (LDPE)

USAGE

Building industry

- separation layers in floor structures separating the thermal insulation
- alternative for roofing paper without sand blasting – under the roof covers
- sole plates supporting mats in track structures

Others

- cut-outs and reinforcements for textile and leather

manufacturing, sport, automotive and furniture industries

- identification membrane for cables, pipelines and other underground mains (color upon agreement)
- cap sealing for cosmetics and food processing industries (white color – health safety)
- protection of woody plants
- other packing and protective material
- fill for crates, carts, trash bins, etc.

DESCRIPTION

PENEFOL® 500 is used mainly as separation, steam-tight and identification membrane.

In floor structures in can be used as a separation layer separating the thermal insulation from other structures realized by means of wet processes. In ventilated two-sheath roof structures, the membrane can be applied under the roof covers from roof tiles, metal

sheet, Beronit, etc., to substitute roofing paper without sand blasting. Due to its safety (meets requirements of European Pharmacopoeia), the white version of the membrane is suitable for use in foodstuffs industry, cosmetics, medicine, haberdashery, bag production, textile and sports industry for various accessories, covers, sealings, etc. The membrane can be also used as packing or protection material.

TECHNICAL PARAMETERS

Material	polyethylene LDPE
Volumetric weight	500±90 kg/m³
Color	black, yellow
Elongation	min. 100 %
Tensile strength	min. 3 N/mm², 150 N / 50 mm (th. 1 mm)
Resistance against static load	method B, meets requirements at 20 kg
Water-tightness	method B, meets requirements at 60 kPa (th. 1 mm)

Skid resistance	diameter 157.4 N / 50 mm (th. 1 mm)
Equiv. dif. thickness s _d	diameter 115 m (th. 1 mm)
Cold flex temperature in flexion	-20 °C without cracks
Straightness	meets requirements
Dimensional stability	± 1 %
Thermal resistance	-20 °C to +70 °C
Flammability	F
Volume resistivity	1.6.10 ¹⁵ Ωm (th. 1 mm)

DIMENSIONS

Width [mm]	1000/1400	1000/1400	1000/1400	1000/1400
Thickness [mm]	0.8	1.0	1.5	2.0
Length [bm]	50	50	50/40	30
Package [m²/roll]	50/70	50/70	50/56	30/42
Surface density [kg/m²]	0.4	0.5	0.75	1
Weight of package [kg]	20/28	25/35	38/42	30/42

USAGE EXAMPLES



Color separation of underground cables



Sealing for food processing and pharmaceutical industries



Sole plates supporting mats, rail base covers, etc.



Reinforcements for bags, satchels and backpacks

PENEFOL® 650

POLYETHYLENE WATERPROOFING
MEMBRANE (LDPE)

USAGE

Building industry

- separation layers in floors and horizontal constructions
- anti-moisture insulation above the ground level

Others

- cut-outs and reinforcements for textile and leather manufacturing, sport, automotive and furniture industries
- other packing and protective material
- use for various cut-outs, seals, etc.

USAGE EXAMPLE

Anti-moisture insulation
above the ground level

DESCRIPTION

PENEFOL® 650 is a polyethylene membrane suitable mainly as a separation membrane in building constructions or as building insulation against ground moisture.

The membrane with a thickness from 1.0 mm to 2.0 mm is most frequently used to insulate building constructions against moisture above the ground level. The membrane with a lower thickness is suitable as a separation layer in floor structures. It separates and pro-

TECTS each flooring construction layer, mainly thermal insulation, etc. Another possible application is as floor insulation in wet processes, baths, shower-baths, washrooms, etc. The membrane can be used only in built-in conditions, as it must be fully protected against UV radiation. During installation it must be protected with a geotextile on both sides. Individual strips are connected exclusively by hot-air or hot-wedge welding, without use of open flames.

TECHNICAL PARAMETERS

Material	polyethylene LDPE
Volumetric weight	650±50 kg/m³
Color	black, yellow
Elongation	min. 110 %
Tensile strength	min. 5 N/mm², 250 N / 50 mm (th. 1 mm)
Resistance against static load	method B, meets requirements at 20kg
Water-tightness	method B, meets requirements at 60 kPa (th. 1mm)
Skid resistance	diameter 157.4 N / 50 mm (th. 1 mm)

Equiv. dif. thickness s _d	diameter 115 m (th. 1 mm)
Cold flex temperature in flexion	-20 °C without cracks
Straightness	meets requirements
Dimensional stability	± 1 %
Thermal resistance	-20 °C to +70 °C
Flammability	F
Volume resistivity	1.5.10 ¹⁵ Ωm (th. 0.75 mm)

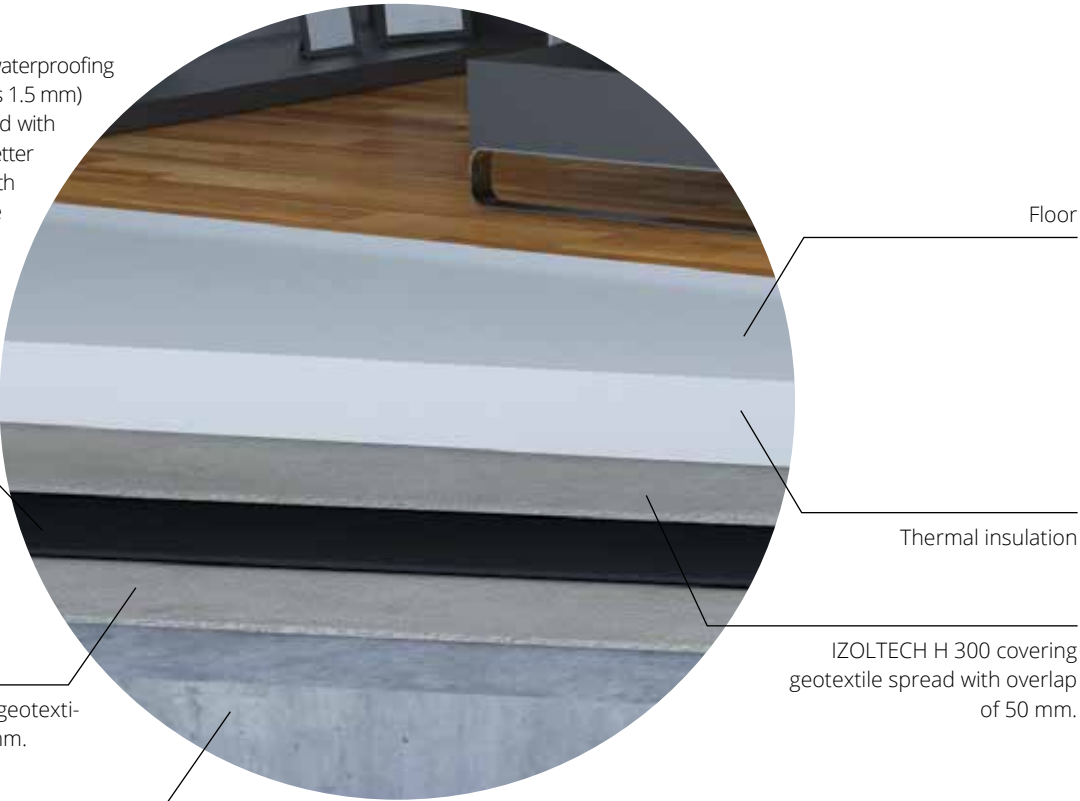
DIMENSIONS

Width [mm]	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400
Thickness [mm]	0.6	0.8	1.0	1.5	2.0
Length [bm]	100	50	50	50/40	30
Package [m²/roll]	100/140	50/70	50/70	50/56	30/42
Surface density [kg/m²]	0.39	0.52	0.65	0.975	1.3
Weight of package [kg]	39/55	26/36	33/46	49/55	39/55

Freely spread **PENEFOL® 650** waterproofing membrane (minimum thickness 1.5 mm) with overlap of 100 mm, welded with single or double welds (for better control), doubled in corners with **PENEFOL®** corner profiles. The membrane must be ended on a vertical wall under the plaster of at least 150 mm above ground level. All the details must be processed by manual welding and separate fittings.

IZOLTECH H 300 underlayer geotextile placed with overlap of 50 mm.

Concrete screed at least of thickness 60 mm



PENEFOL® 750

POLYETHYLENE WATERPROOFING
MEMBRANE (LDPE)

USAGE

Building industry

- waterproof insulation of foundations at and below ground level
- waterproof insulation layer and insulation against aggressive water and radon (up to medium risk)
- anti-corrosive protection of concrete and ferroconcrete structures
- anti-seepage protection of silaging gutters and manure pits, chemical baths of manufacturing

plants and warehouses, dump recultivation, etc.

Others

- cut-outs and reinforcements for textile and leather manufacturing, sport, automotive and furniture
- other packing and protective material
- use for various cut-outs, seals, etc.
- sheets of specific dimensions for various uses

DESCRIPTION

PENEFOL® 750 polyethylene membrane is the most popular well-tried chemically-resistant water-proof insulation. The membrane proves an excellent mechanical strength; it is resistant against aggressive water and the intrusion of plant roots. It provides radon-resistant features up to the medium risk. In all cases the membrane must be welded properly. Membrane with a thickness of 1.0 mm to 2.0 mm is mostly used for water-proof insulation of building structures. In case of use of PENEFOL® 750 membranes for insulation against radon, it

is necessary to calculate its thickness using volumetric radon activity measurements in the soil air.

The membrane can be used only in built-in condition, as it must be fully protected against UV radiation. During installation it must be protected with a geotextile on both sides. Individual strips are connected exclusively by hot-air or hot-wedge welding, without use of open flames.

TECHNICAL PARAMETERS

Material	polyethylene LDPE
Volumetric weight	750±50 kg/m³
Color	black, yellow
Elongation	min. 230 %
Tensile strength	min. 6 N/mm², 300 N / 50 mm (th. 1 mm)
Resistance against static load	method B, meets requirements at 20 kg
Water-tightness	method B, meets requirements at 60 kPa (th. 1mm)
Resistance against impacts	method A - 500 mm, method B - 350 mm

Skid resistance	diameter 336.6 N / 50 mm (th. 1 mm)
Equiv. dif. thickness s _d	diameter 148 m (th. 1 mm)
Cold flex temperature in flexion	-20 °C without cracks
Straightness	meets requirements
Dimensional stability	±1 %
Thermal resistance	-20 °C to +70 °C
Flammability	F
Coefficient of radon diffusion	K124/02/95, 13.10 ⁻¹² ±1.0.10 ⁻¹² m²/s

DIMENSIONS

Width [mm]	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400
Thickness [mm]	0.6	0.8	1.0	1.2	1.5	2.0
Length [bm]	100	50	50	50	50/40	30
Package [m²/roll]	100/140	50/70	50/70	50/70	50/56	30/42
Surface density [kg/m²]	0.45	0.6	0.75	0.9	1.125	1.5
Weight of package [kg]	45/63	30/42	38/53	45/63	56/63	45/63

USAGE EXAMPLE

Simple waterproof insulation
of bottom structures

Geotextile IZOLTECH H 300

Freely spread **PENEFOL® 750; PENEFOL® 800** waterproofing membrane with overlap of 100 mm, welded with single or double welds (for better control), doubled in corners with **PENEFOL®** corner profiles. All the details must be processed by manual welding and separate fittings.

IZOLTECH H 300 covering geotextile spread with overlap of 50 mm.

IZOLTECH H 300 underlayer geotextile placed with overlap of 50 mm.

Leveled concrete foundation without protrusions, excess of mortar or concrete and sharp edges.

LITHOPLAST® SANA 15/0.8; LITHOPLAST® INSTAL 20/1.0 protective studded membrane spread across the wall. If the depth of the protection membrane does not exceed the width of studded membrane strip, place another strip horizontally along the building structure. If the height is bigger, place the strips of drainage membrane vertically and make the joint with an overlap of one line of profiles. Lock the joints using a double-sided adhesive butyl rubber tape with a thickness of 15 mm. Studs are oriented out of the wall and in combination with geotextile it forms a drainage gap for water outflow.

If the studs are oriented towards the wall, **LITHOPLAST® INSTAL 20/0.8** can be used and it is not necessary to apply the geotextile on studded membrane. But the filling must be performed with care and sharp stones should be removed.

Drainage block – gravel fraction 16-32, perforated drainage tube DN 100 with outlet in sewerage, everything packed in filtering geotextile IZOLTECH H 500.

PENEFOL® 800

POLYETHYLENE WATERPROOFING
MEMBRANE (LDPE)

USAGE

Building industry

- waterproof insulation of foundations at and below ground level
- waterproof insulation layer and insulation against aggressive water and radon (up to medium risk)
- anti-corrosive protection of concrete and ferroconcrete structures
- anti-seepage protection of silaging gutters and manure pits, chemical baths of manufacturing

plants and warehouses, dump recultivation, etc.

Others

- cut-outs and reinforcements for textile and leather manufacturing, sport, automotive and furniture industries
- other packing and protective material
- use for various cut-outs, seals, etc.
- sheets of specific dimensions for various uses

DESCRIPTION

PENEFOL® 800 polyethylene membrane is a well-ried chemically resistant water-proof insulation. The PENEFOL® 800 membrane possesses an excellent mechanical strength; it is resistant against aggressive water and the intrusion of plant roots. It provides radon-resistant features up to the medium risk.

The membrane with a thickness of 1.0 mm to 2.0 mm is mostly used for insulation against radon. Membrane thickness for insulation against

radon should be calculated based on measurement of radon index and configuration of residential rooms in lower basement within the object.

The membrane can be used only in built-in condition, as it must be fully protected against UV radiation. During installation it must be protected with a geotextile on both sides. Individual strips are connected exclusively by hot-air or hot-wedge welding, without use of open flames.

TECHNICAL PARAMETERS

Material	polyethylene LDPE
Volumetric weight	800±50 kg/m³
Color	black, yellow
Elongation	min. 230 %
Tensile strength	min. 7 N/mm², 350 N / 50 mm (th. 1 mm)
Resistance against static load	method B, meets requirements at 20 kg
Water-tightness	method B, meets requirements at 60 kPa (th. 1 mm)
Resistance against impacts	method A - 500 mm, method B - 350 mm

Skid resistance	diameter 336.6 N / 50 mm (th. 1 mm)
Equiv. dif. thickness s _d	diameter 148 m (th. 1 mm)
Cold flex temperature in flexion	-20 °C without cracks
Straightness	meets requirements
Dimensional stability	±1 %
Thermal resistance	-20 °C to +70 °C
Flammability	F
Coefficient of radon diffusion	K124/02/95, 8.6.10 ⁻¹² ±1.0.10 ⁻¹² m²/s

DIMENSIONS

Width [mm]	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400
Thickness [mm]	0.6	1.0	1.2	1.5	2.0
Length [bm]	100	50	50	50/40	30
Package [m²/roll]	100/140	50/70	50/70	50/56	30/42
Surface density [kg/m²]	0.48	0.8	0.96	1.2	1.6
Weight of package [kg]	48/67	40/56	48/67	60/67	48/67

USAGE EXAMPLE

Simple waterproof insulation
of bottom structures

Geotextile IZOLTECH H 300

Freely spread **PENEFOL® 750; PENEFOL® 800** waterproofing membrane with overlap of 100 mm, welded with single or double welds (for better control), doubled in corners with **PENEFOL®** corner profiles. All the details must be processed by manual welding and separate fittings.

IZOLTECH H 300 covering geotextile spread with overlap of 50 mm.

IZOLTECH H 300 underlayer geotextile placed with overlap of 50 mm.

Leveled concrete foundation without protrusions, excess of mortar or concrete and sharp edges.

LITHOPLAST® SANA 15/0.8; LITHOPLAST® INSTAL 20/1.0 protective studded membrane spread across the wall. If the depth of the protection membrane does not exceed the width of studded membrane strip, place another strip horizontally along the building structure. If the height is bigger, place the strips of drainage membrane vertically and make the joint with an overlap of one line of profiles. Lock the joints using a double-sided adhesive butyl rubber tape with a thickness of 15 mm. Studs are oriented out of the wall and in combination with geotextile it forms a drainage gap for water outflow.

If the studs are oriented towards the wall, **LITHOPLAST® INSTAL 20/0.8** can be used and it is not necessary to apply the geotextile on studded membrane. But the filling must be performed with care and sharp stones should be removed.

Drainage block – gravel fraction 16-32, perforated drainage tube DN 100 with outlet in sewerage, everything packed in filtering geotextile IZOLTECH H 500.

PENEFOL® 950

POLYETHYLENE WATERPROOFING
MEMBRANE (HDPE)

USAGE

Building industry

- permanent protection and effective barrier against oil and oil products (fuel stations, service repair shops, parking places)
- insulation of sewage treatment plants and chemical plants, municipal waste dumps
- insulation of reservoirs for sludge storage
- insulation for silaging gutters
- insulation of chemical and irrigation vessels to avoid

the contamination of ground water, sealing of fire reservoirs

Others

- cut-outs and reinforcements for textile and leather manufacturing, sport, automotive and furniture industries
- sheets of specific dimensions for various uses

DESCRIPTION

PENEFOL® 950 is a chemically-resistant water-proof insulation poly-ethylene membrane intended mainly for use as insulation for building constructions, for insulation of garbage dumps, chemical baths, fuel stations, emergency and intercepting traps, reservoirs for sludge storage, insulation of silaging gutters, etc. The membrane provides sufficient protection against oil and chemical products, against high radon risk, against acids, alkali substances, salts and against of plant roots. Thanks to its composition it guarantees long life.

Membrane with a thickness from 1.5 mm to 2.0 mm is mostly used for waterproof insulation of dumps.

The membrane can be used only in built-in condition, as it must be fully protected against UV radiation. During installation it must be protected with a geotextile on both sides. Individual strips are connected exclusively by hot-air or hot-wedge welding, without use of open flames.

TECHNICAL PARAMETERS

Material	polyethylene HDPE
Volumetric weight	950±50 kg/m³
Color	black
Elongation	min. 230 %
Tensile strength	min. 19 N/mm², 800 N / 50 mm (th. 1 mm)
Resistance against static load	method B, meets requirements at 20 kg
Water-tightness	method B, meets requirements at 60 kPa (th. 1mm)
Resistance against impacts	method A - 800 mm, method B - 1500 mm

Skid resistance	diameter 904.6 N / 50 mm (th. 1 mm)
Equiv. dif. thickness s _d	diameter 443 m (th. 1 mm)
Cold flex temperature in flexion	-20 °C without cracks
Straightness	meets requirements
Dimensional stability	±1 %
Thermal resistance	-20 °C to +70 °C
Flammability	F
Coefficient of radon diffusion	K124/02/95, 4.8.10 ⁻¹² ±1.0.10 ⁻¹² m²/s

DIMENSIONS

Width [mm]	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400	1000/1400
Thickness [mm]	0.6	0.8	1.0	1.2	1.3	1.5	1.6	1.7	2.0
Length [bm]	100	50	40/50	40	40	40	40	40	30
Package [m²/roll]	100/140	50/70	40/70	40/56	40/56	40/56	40/56	40/56	30/42
Surface density [kg/m²]	0.57	0.76	0.95	1.14	1.235	1.425	1.52	1.615	1.9
Weight of package [kg]	57/80	38/53	38/67	46/64	49/69	57/80	61/85	65/90	57/80

USAGE EXAMPLES

Fuel stations

Sewage treatment plants

Chemical production

Mines and constructions with high radon risk

Municipal waste dumps

Tanks for slurry, agricultural buildings, cowsheds, etc.

Parking places and premises oil products leakage

Car repair shops, motor shows

LITHOPLAST® INSTAL

HDPE STUDDED MEMBRANE FOR RESCUE OF WET MASONRY
AND FOR PROVIDING VENTILATION FEATURES

USAGE

Building industry

- ventilation of insulation against radon at or below the ground level, aimed for high or medium levels of radon presence in soil air
- additional insulation against radon penetration in existing buildings
- remediation membranes for reconstructions of structures and subsequent ventilation

- remediation of wet masonry of existing structures in interior and exterior
- hidden casing

Others

- protection of woody plants
- exhibitions – possibility of sub-floor installations

DESCRIPTION

LITHOPLAST® INSTAL is a vacuum-shaped polyethylene membrane delivered in form of roll with stud height of 20 mm and plate form with stud heights of 40 mm, 60 mm and 80 mm. LITHOPLAST® INSTAL in form of roll is suitable for use as hidden casing creating ventilation gaps in applications focused on radon ventilation. LITHOPLAST® INSTAL in form of roll and plate is used as a ventilated insulation against moisture on horizontal surfaces and vertical masonry, for dehumidification of existing masonry during the

reconstruction of older or historical buildings, or as the flat draining element in underground portions of objects. The shaping creates a gap under the insulation, which allows air or water to flow out of the area protected by the LITHOPLAST® INSTAL membrane into the drainage system. The size of the studs of LITHOPLAST® INSTAL plate enables the placing of some installations under the membrane. This opportunity for subfloor installation can also be useful for constructions of temporary stands in exhibitions.

TECHNICAL PARAMETERS

Material	polyethylene HDPE
Volumetric weight	950±50 kg/m³
Color	black

Resistance against static load	method B, meets requirements at 20 kg
Thermal stability	-20 °C to +70 °C
Flammability	F

DIMENSIONS

Type	20/0.8/1340 (roll)	20/1.0/1340 (roll)	40/1.5 (plate)	60/1.6 (plate)	80/2.0 (plate)
Default membrane thickness [mm]	0.8±10 %	1.0±10 %	1.5±10 %	1.6±10 %	2.0±10 %
Width roll / plate [mm]	1340±2 %	1340±2 %	820±4 %	810±4 %	800±4 %
Length roll / plate [bm/mm]	20±2.5 %	20±2.5 %	1750±4 %	1750±4 %	1750±4 %
Sheet height [mm]	20	20	41	61	78
Air volume in studs [l/m²]	5	5	10.6	16.4	20.8
Air capacity of the gap [l/m²]	15	15	30.4	44.6	57.2
Compression strength [N/mm²]	0.1	0.14	0.12	0.06	0.05
Package [m²]	26.8	26.8	10x1.435	10x1.418	10x1.400
Surface density [kg/m²]	0.76	0.95	1.57	1.66	2.11
Weight of package [kg]	20	25	23	24	30

USAGE EXAMPLE

Reduction of radon risk by ventilation,
improving quality of the inside
environment via ventilation

Wall – LITHOPLAST® SANA 15/0.8; LITHOPLAST® INSTAL 20/0.8 studded membrane anchored together with the bearing plaster grating. Number of anchors 8-14 pcs./1m². Anchoring with disc shear plates between the studs; sealing of a hole in studded membrane using polyurethane binder.

Plaster, or in case of external ventilation of the gap a suitable heat insulation auxiliary wall.

LITHOPLAST® INSTAL 40/1.5; 60/1.6; 80/2.0 studded membrane in form of sheet installed side by side and anchored using clip applicator.

Concrete screed to level the studs and form a horizontal surface for the thermal insulation.

Thermal insulation with EPS polystyrene

Flooring structure

PENEFOL® 650/0.8 separation membrane placed with an overlap of 100 mm.

Leveled foundation without protrusions, excess of mortar or concrete and sharp edges.

LITHOPLAST® SANA

HDPE STUDDED MEMBRANE FOR THE RESTORATION OF WET MASONRY

USAGE

Building industry

- remediation membranes for reconstructions of structures and subsequent ventilation of structures
- remediation of wet masonry of existing structures in interior and exterior
- vertical drain walls

- protection of vertical insulation – alternative for conventional bricked insulation wall
- hidden casing

Others

- protection of woody plants

DESCRIPTION

This vacuum-shaped polyethylene membrane is used for the protection of vertical waterproof insulation, where it fully substitutes conventional protective brick insulation walls. Moreover, the membrane can be used during reconstructions of basements and foundations without complicated undercutting. Simply unfold the studded membrane and place it along the outer side of the building wall into the

excavated areas beside the masonry. Similar to LITHOPLAST® INSTAL membrane, the air gaps formed between building constructions and insulation reduce or even completely eliminate moisture inside the building constructions. For this reason this studded membrane is also suitable for the reconstruction of flat walls and floors inside a building.

TECHNICAL PARAMETERS

Material	polyethylene HDPE
Volumetric weight	950±50 kg/m³
Color	black

Resistance against static load	method B, meets requirements at 20 kg
Thermal stability	-20 °C to +70 °C
Flammability	F

DIMENSIONS

Type	15/0.8
Default membrane thickness [mm]	0.8±10 %
Width [mm]	1400±2 %
Length [bm]	20±2.5 %
Sheet height [mm]	13
Air volume in studs [l/m²]	3.5
Air capacity of the gap [l/m²]	9.5
Compression strength [N/mm²]	0.33
Package [m²/roll]	28
Surface density [kg/m²]	0.76
Weight of package [kg]	21

USAGE EXAMPLE

Recovery of the wet masonry with studded membrane

Uncover the exterior of the building construction to the depth reaching max. footing bottom to ensure that the statics will not be violated. Even out significant depressions or protrusions with reconstruction plaster. If you select the ventilation with piping, cut the cavities in masonry, imbed the ventilation pipes inside and cover them with plaster.



Drainage block – gravel fraction 16-32, perforated drain tube DN 100 with outlet in sewerage, everything packed in a filtering geotextile IZOLTECH H 500. It is a very important part of the total recovery ventilation system to avoid elevation, or accumulation of water at the building structure and its free penetration into the air insulation gap.

LITHOPLAST® SANA 15/0.8; LITHOPLAST® INSTAL 20/0.8 studded membrane spread across the wall. If the excavation height is lower than the width of studded membrane strip, unfold the strip horizontally along the building structure. If the height is bigger, apply the membrane vertically and make the joint with overlap of one line of profiles. Lock the joints using double-sided adhesive butyl rubber tape with a thickness of 15 mm. The studs should be oriented towards the masonry to form an air gap. Cover the membrane with geotextile. If the LITHOPLAST® INSTAL sheets are used, it is suitable to create a level foundation at the masonry footing (a concrete groove as a part of the drainage assembly), to place the sheets on this foundation and connect them with industrial stapler. Anchoring of the membrane is performed at the highest point, ca. 150 mm above the planned ending at terrain level. After the setting of refilled excavated soil cut the membrane in required height and perform the ending with a ventilation weather moulding.



LITHOPLAST® PERFOR

HDPE PERFORATED STUDDED MEMBRANE
PROVIDING DRAINAGE FEATURE

USAGE

Building industry

- draining layer with possible use for open terraces, balconies, flat roofs
- draining layer with possible use for roof parking areas
- draining layer in wet areas and plants, such as showers, swimming pools, breweries, soft drinks plants, dairies, etc.

DESCRIPTION

LITHOPLAST® PERFOR is a vacuum-shaped polyethylene membrane with cutouts within the studs (i.e. no water accumulates in studs, all the water flows out) and is used as drainage layer for open balconies, terraces, flat roofs, roof parking areas, wet processes etc.

The membrane creates studded cavities between watertight insulation and protection layers. Water penetrating through the pavement and bearing stratum for the pavement passes through the perforation to the bottom insulation and then freely flows out of the structure, or into the inner riggots. The insulation must be sloped to the properly connected drainage.

TECHNICAL PARAMETERS

Material	polyethylene HDPE
Volumetric weight	950±50 kg/m³
Color	black

Resistance against static load	method B, meets requirements at 20 kg
Thermal stability	-20 °C to +70 °C
Flammability	F

DIMENSIONS

Type	10/0.8
Default membrane thickness [mm]	0.8±10 %
Width [mm]	1400±2 %
Length [bm]	20±2.5 %
Sheet height [mm]	9
Air volume in studs [l/m²]	3
Air capacity of the gap [l/m²]	5
Compression strength [N/mm²]	0.23
Package [m²/roll]	28
Surface density [kg/m²]	0.76
Weight of package [kg]	21

USAGE EXAMPLE

Sheery insulation for terraces, balconies and wet areas

Balcony / terrace insulation – welded waterproofing membrane with perfect realization of all details (**PENEFOL® 800/1.5** – conditionally usable for small structures; this membrane must be integrated and concealed in the structure).

All the details on balcony / terrace insulation are performed using a plastic covered, anchored bar used for welding the waterproofing membrane.

Perfectly flat, compact foundation of the balcony/terrace bearing structure without holes, protrusions, rubble or gravel residues. There must be a slope of 1-2%, or the surface must be leveled to avoid gutter anchoring bars blocking water outflow due to their thickness.

Terrace surface finish with bearing layer of concrete screed or gravel applied directly on **LITHOPLAST® PERFOR** studded membrane.

LITHOPLAST® PERFOR 10/0.8 spread across the surface, fixed against moving in studs using double-sided butyl rubber tape in 40/40 cm distances and by means of assembly joint created using 40 mm thick single-sided adhesive butyl rubber tape.

Foundation, iron-smoothed geotextile resistant against scrolling on anchoring screws. The geotextile can be integrated in the waterproofing membrane (**IZOLTECH S 300**).

LITHOPLAST® DREN

HDPE PERFORATED, STUDED MEMBRANE
FOR „GREEN ROOFS“

USAGE

Building industry

- in roof garden structures, roofing structures of family and multi-family houses, terraces within shopping and business centers, creation of green areas above underground garages, etc.

Others

- in gardening for maintenance of green areas

USAGE EXAMPLE

Green roof with studded membrane

DESCRIPTION

This vacuum-shaped polyethylene membrane with cutouts outside the studs (i.e. water accumulates in studs) is intended for application in roof gardens, where it serves as an accumulation and drainage layer. The accumulation ability of the membrane lies in the retention of water in studs. This provides moisture balance in the set of garden layers. In the roofing structure, the LITHOPLAST® DREN membrane is applied to the extreme (leakproof) roofing membrane, including roof inlets and accessories. The “green roof” system contains a PE

drainage mat, PETEXDREN®, facilitating the drainage of excessive rain water through the perforation in the LITHOPLAST® DREN membrane. A geotextile spread across the drainage mat ensures the separation of soil and water. This structure creates a suitable bio-climate for roof gardens. LITHOPLAST® DREN is applicable up to a 5° slope without anchoring. LITHOPLAST® DREN is delivered in form of roll with stud height of 20mm and plate form with stud heights of 40 mm, 60 mm and 80 mm.

TECHNICAL PARAMETERS

Material	polyethylene HDPE
Volumetric weight	950±50 kg/m³
Color	black

Resistance against static load	method B, meets requirements at 20 kg
Thermal stability	-20 °C to +70 °C
Flammability	F

DIMENSIONS

Type	20/0.8/1340 (roll)	20/1.0/1340 (roll)	40/1.5 (plate)	60/1.6 (plate)	80/2.0 (plate)
Default membrane thickness [mm]	0.8±10 %	1.0±10 %	1.5±10 %	1.6±10 %	2.0±10 %
Width roll / plate [mm]	1340±2 %	1340±2 %	820±4 %	810±4 %	800±4 %
Length roll / plate [bm/mm]	20±2.5 %	20±2.5 %	1750±4 %	1750±4 %	1750±4 %
Sheet height [mm]	20	20	41	61	78
Air volume in studs [l/m²]	5	5	10.6	16.4	20.8
Air capacity of the gap [l/m²]	15	15	30.4	44.6	57.2
Compression strength [N/mm²]	0.1	0.14	0.12	0.06	0.05
Package [m²]	26.8	26.8	10x1.435	10x1.418	10x1.400
Surface density [kg/m²]	0.76	0.95	1.57	1.66	2.11
Weight of package [kg]	20	25	23	24	30

Drainage layer of light-weight gravel, KERAMZIT shall be used for thicker layers in vegetation layer set.

IZOLTECH H 300 filtering geotextile placed with an overlap of 50 mm.

Unfold plastic drainage element side by side - PETEXDREN® 400 for smaller studs, or PETEXDREN® 900 for bigger studs. Use light gravel, such as kemzit to fill bigger studs to increase the bearing capacity.

LITHOPLAST® DREN 20/1.0 spread on the surface with assembly joint performed with single-sided adhesive butyl rubber tape (the joint must not be continuous along the full length);

LITHOPLAST® DREN 40/1.5; LITHOPLAST® DREN 60/1.6; LITHOPLAST® DREN 80/2.0 in form of sheets, installed with edges placed in joints; assembly is anchored using clip applicator.

Vegetation layer

Welded waterproofing membrane with perfect realization of all details (**PENEFOL® 800/1.5** – conditionally usable for small structures; this membrane must be integrated and concealed in the structure).

Foundation, iron-smoothed geotextile resistant against scrolling on anchoring screws. The geotextile can be integrated in the waterproofing membrane (IZOLTECH S 300).

Perfectly flat, compact foundation of the roof bearing structure without holes, protrusions, rests of rubble or gravel.

ACCESSORIES

FOR PENEFOL® – LITHOPLAST®
WATERPROOFING MEMBRANES

LITHOPLAST



CORNER PROFILE

Plastic grooved strips of PENEFOL® 750 membranes enable the bending of the strip with a sharp angle and thus the creation of continuous L profiles. A corner profile is used to reinforce sharp corners and angles made of PENEFOL® in water-proof insulation baths, for the protection of waterproof insulations, and eventually as assembly part for anchoring. Moreover, it can be used for the ending of studded LITHOPLAST® membranes, mainly with studs with height of 40 mm, 60 mm, and 80 mm used for masonry, floors, etc. The corner profile can be welded to PENEFOL® waterproofing membranes via hot-air and roller pressing. It cannot be used as a separate waterproofing element.



PIPE ENTRIES

Pipe entries are used for the sealing of drainpipes and water ducts passing through waterproofing membranes. Cut the hole in the conical part of the crawl space. The hole should be 20% smaller than the piping diameter. Heat the conical part using a LEISTER hot air gun. The material will soften, facilitating the insertion of the piping. Slide the heated conical part of the piping as fast as possible. In the target position, it should touch the horizontal insulation. After cooling down, the pipe entry shrinks around the piping ensuring proper sealing. Pipe entries are available in LDPE, as well as HDPE versions. Using a Leister hot-air gun, weld the straight part of the (LDPE) pipe entry to horizontally installed PENEFOL® 650, 750, 80 waterproofing membranes while pressing with roller. A MASTERSil binder can be used to lock the welds and piping entries. Weld the straight part of the (HDPE) cable entry to horizontally installed PENEFOL® 950 waterproofing membranes using an extrusion weld.

ANGLE FITTING

Angle fitting is used to lock the water-tight welds on PENEFOL® 650; 750; 800 in right-angle angle of insulation structures ("outer corner"). The fitting should be welded on the part after the assembly and welding of waterproofing membranes in the angle of insulation structure. The weld is realized using a Leister hot-air gun along the total fitting perimeter, while pressing with a roller. A solid and flat surface in all three planes is a prerequisite for a perfect weld. The welding joints can be locked with a MASTERSil binder. The fitting has no sharp angles because of reaching small diameters during the folding of PENEFOL® waterproofing membranes.



PLASTIC COVERED BAR

Plastic covered bars are used for the ending, hanging up and anchoring of PENEFOL® 650; 750; 800 waterproofing membranes. The bar is reinforced with a perforated galvanized metal sheet with double-side welded PENEFOL® membrane. The total thickness of the bar is 3.5 mm - 4 mm. The bar can be bent in simple L- or Z-shape profiles to create, for example, a sill drip, for the ending of studded LITHOPLAST® INSTAL membranes, sealing flat membranes to the wall, etc. It can be anchored during building construction allowing for follow-up welding of PENEFOL® waterproofing membranes using a hot-air gun and roller pressing. In this way, one can create strong and anchored edges of insulation structure made from PENEFOL® membrane. The welding joints can be locked with a MASTERSil binder. UV-resistant plastic-covered Z-shaped PVC bars are used to end studded membranes applied on vertical drain walls above the ground level. These bars are manufactured according to the particular requirements of the client regarding the size and color of the Z-shaped bar.



CORNER FITTING

Corner fitting is used to lock water-tight welds on PENEFOL® 650; 750; 800 in right-angle corners of insulation structures. The fitting should be welded on the part after the assembly and welding of the waterproofing membrane in the corners of insulation structure ("inner corner"). The weld is made using a Leister hot-air gun along the total fitting perimeter, while pressing with a roller. A solid and flat surface in all three planes is a prerequisite for a perfect weld. The welding joints can be locked with a MASTERSil binder. The fitting has no sharp angles because of reaching small diameters during the folding of PENEFOL® waterproofing membranes.



BUTYL RUBBER TAPE

Double sided, adhesive butyl rubber tape is used for connecting PENEFOL® polyethylene membranes with a thickness of 0.6 mm, provided that no pulling or peeling force is applied to the joint (separation layers in floor or roof structures). The tape is also used for connecting LITHOPLAST® INSTAL, LITHOPLAST® SANA, LITHOPLAST® PERFOR, LITHOPLAST® DREN studded membranes.

After removing one of the protection layers, adhere the tape to the membrane within at least 10 mm from the edge of glued strip. Then remove the second protection layer and attach the adjacent membrane strip with a 50mm overlap. Press the joint using a roller. A joint of butyl rubber tape reaches its highest strength after 20 hours. In case of studded membranes, the adhesive tape should be positioned between the first and second line of studs.

GEOTEXTILE

OTHER USES OF PENEFOL® POLYETHYLENE MEMBRANES

LITHOPLAST



IZOLTECH GEOTEXTILE

IZOLTECH geotextile can be made of polypropylene (PP), polyester (PES), or as a mixture of polypropylene and polyester. It is used for lower structures as well as for roof structures. IZOLTECH is used as a ground waterproof insulation providing protection and separation of membranes (family and multifamily houses, industrial halls, shopping centers, reservoirs, dung holes, petrol stations, etc.) The geotextile is also used as a filter for “roof gardens”. The basic functions of every geotextile include protection of a main insulation layer within the construction, filtration, draining, separation of structure parts, etc. The roll of geotextile cannot be subject to unnecessary mechanical strain, such as bending or impact from sharp objects. IZOLTECH is transported in form of roll packed in PE packaging. Protection against moisture must be provided; the geotextile must be protected mainly against rain and UV-light.



Cut-outs as reinforcements for the protection of work instruments



Rail structures, sole plates supporting mats



Cut-outs as mudguards during autocross races

PETEXDREN® DRAINAGE MAT

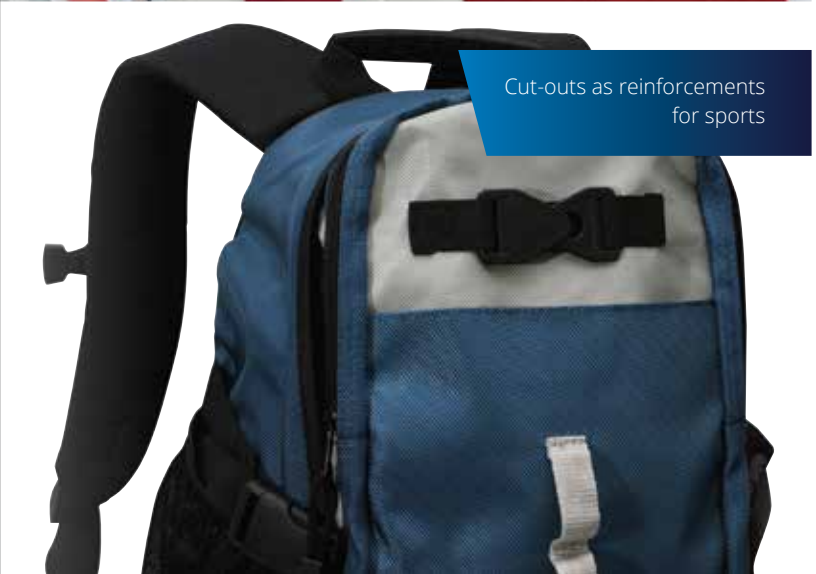
PETEXDREN® drainage mat is made of polyethylene fibers. The fibers are interwoven to ensure high water permeability if spread in horizontal position. The most popular products are PETEXDREN® 400 (1 roll with width 1,5 m, lap 50 linear meters, i.e. 75 m²) and PETEXDREN® 900 (1 roll with width 1,5 m, lap 35 linear meters i.e. 52.5 m²). Its advantage compared to other drainage materials is its low weight, easy handling and application. PETEXDREN® is used mainly in building industry, for the construction of support walls, road and railway constructions, landfills, reservoirs, multi-purpose sport areas and in all constructions requiring more intensive surface draining. Another important area of application of PETEXDREN® are so-called “green roof gardens”.



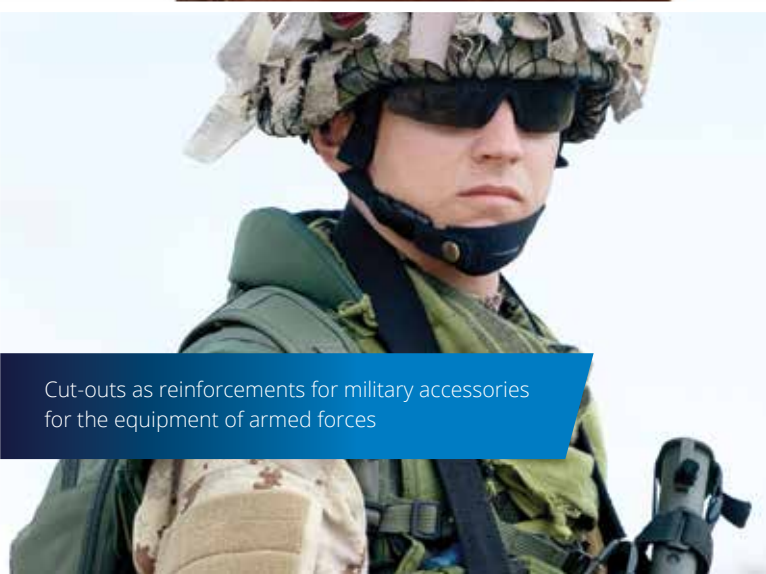
Cut-outs as reinforcements for automotive industry



Cut-outs as reinforcements for leather manufacturing industry



Cut-outs as reinforcements for sports



Cut-outs as reinforcements for military accessories for the equipment of armed forces

CZECH REPUBLIC

- agriKomp Bohemia s.r.o.
- Brněnské izolace, spol. s r.o.
- DEKTRADE a.s.
- DT - Výhybkárna a strojírna, a.s.
- EUROVIA CS, a.s.
- FASTRADE s.r.o.
- FIRESTA-Fišer, rekonstrukce, stavby a.s.
- GALA a.s.
- Gunnex s.r.o.
- Chládek a Tintěra, Pardubice a.s.
- Chládek a Tintěra, Havlíčkův Brod, a.s.
- Ing. Jindra Paličková
- Iveco Czech Republic, a.s.
- Izolace 21 s.r.o.
- IZOLFA CZ s.r.o.
- IZOMA a.s.
- METALCOM Kutná Hora a.s.
- METROS, a.s.
- Metrostav a.s.
- NIKA - TĚSNĚNÍ s.r.o.
- OHL ŽS, a.s.
- RK GEOFOL, s.r.o.
- RPA Izolace, s.r.o.
- Saint-Gobain Building Distribution CZ, spol. s r.o.
- SANOSTAV s.r.o.
- SKANSKA, a.s.
- Správa železniční dopravní cesty, státní organizace
- STAVOSPOL, s.r.o.
- STROJÍRNA Litvínov, a.s.
- TIPRO, s.r.o.
- TONDACH Česká republika s.r.o.
- TVAR výrobní družstvo Pardubice
- ZETOR TRACTORS a.s.
- ŽPSV a.s.

EUROPEAN UNION

- AJJ JANUSZ JAGUSCIK
Poland
- BAVA SLOVAKIA, s.r.o.
Slovakia
- BYTSTAV Levice, s.r.o.
Slovakia
- D + M Zügel GmbH
Germany
- DEKTRADE SR s.r.o.
Slovakia
- DT - Slovenská výhybkáreň, s.r.o.
Slovakia
- FALCO SK, s.r.o.
Slovakia
- FATRA IZOLFA, a.s.
Slovakia
- GAUDIUM záhradnícky podnik spol. s r.o.
Slovakia
- GEBHA-Production GmbH
Germany
- GUNNEX SK, s.r.o.
Slovakia
- Gunnex PL Sp. z o.o.
Poland
- Marabut Sp. z o.o.
Poland
- MASTER PLAST s.r.o.
Slovakia
- RAVEN a.s.
Slovakia
- Theo Klein GmbH
Germany

OTHER COUNTRIES

- Schwihag AG
Switzerland

HYPERMARKETS AND SUPERMARKETS

- TESCO
Brno, Dubnica nad Váhom, Třebíč, Pardubice, Jihlava, Tábor, Plzeň, Praha
- BAUHAUS
Brno
- BAUMAX
Brno, Třebíč
- ALBERT
Brno, Liberec, Teplice
- BILLA
Třebíč, Moravské Budějovice
- PRIMA
Třebíč, Jihlava
- OBI
Cheb, Mladá Boleslav
- KAUF LAND
Liberec, Karlovy Vary, Kladno, Modletice, Pelhřimov
- LIDL
Teplice, Slaný, Louny, Ústí nad Labem, Břeclav, Praha – Průhonice, Prosek, Karlovy Vary, Rožnov pod Radhoštěm, Karviná

FACTORY HALLS

- ŠKODA AUTO – Mladá Boleslav
- MASSIVE – Beroun
- HUHTAMAKI – Příbyslavice
- BOSCH – Jihlava
- DRAKA KABELY – Velké Meziříčí
- Volkswagen – Bratislava
- OTIS – Břeclav
- Třinecké železářny – Bohumín
- BorsodChem MCHZ – Ostrava
- Duslo – Šála
- Isover, Saint-Gobain Construction Products CZ – Častolovice

SELECTED CAR SHOWROOMS

- Nissan, Daewoo, Opel, Fiat, Peugeot

SELECTED PETROL STATIONS

- ARAL, ÖMV, SHELL

ADMINISTRATIVE, COMMERCIAL AND SHOPPING CENTERS

- Czech Technology Park Brno
- Technopark Praha
- M-PALÁC Brno
- MARKÍZA Bratislava TV station
- Campus Square Brno
- OLYMPIA Brno
- Brno Judicial Complex
- Residence of Czech Television - Kavčí hory

LANDFILLS, LANDFILL RESTORATIONS

- Brno – Černovice, Poprad, Trenčín, Banská Bystrica, Staříč, Rimavská Sobota, Kopřivnice

SILAGING GUTTERS AND BIOGAS PLANTS

- Knapovec, Kámen u Habrů, Němčice u Litomyšle, Loděnice u Opavy, Dolní Dobrouč, Valečov, Keřkov, Dětenice, Troubky u Přerova, Moravská Huzová u Šternberku, Troubelice u Uničova

STADIUMS AND SPORTS HALLS

- Soběslav, Vrchlabí, Prostějov, Opava, Hradec Králové, Jihlava