



DELTA[®]-TERRAXX Installation Instructions

High-performance protection and drainage system
for basements and flat roofs

Installation instructions for DELTA[®]-TERRAXX

General information

High-performance protection and drainage system for basement, wall and flat-roof applications.
Certified under EN 13252, DIN 4095, and DIN 18195.

The DELTA[®]-TERRAXX high-performance protection and drainage system is the universal solution for horizontal and vertical applications on all compression-resistant substrates. Featuring a fused-on geotextile and an integrated self-sealing edge, the dimpled sheet forms a perfect surface drainage.

■ DELTA[®]-TERRAXX is produced in rolls as a two-ply drainage sheet. It consists of virgin, well-stabilised, and eco-friendly HDPE plastic. Thanks to its smooth reverse side, the sheet distributes any load impinging on it evenly across the entire surface of the waterproofing. Consequently, it is perfectly safe to walk on any compression-resistant waterproofing during the building phase, with the sheet affording protection from mechanical damage and harmful thermal exposure.

The DELTA[®]-TERRAXX protection and drainage system enables the formation of a natural soil filter. Whenever water flows into the dimple cavity through the fused-on geotextile, it carries small particles of soil with it.

These particles form a natural soil filter directly in front of the geotextile, which reliably prevents any backed-up soil particles from seeping through. Ultimately, the permeability of the system depends on the permeability of the soil.



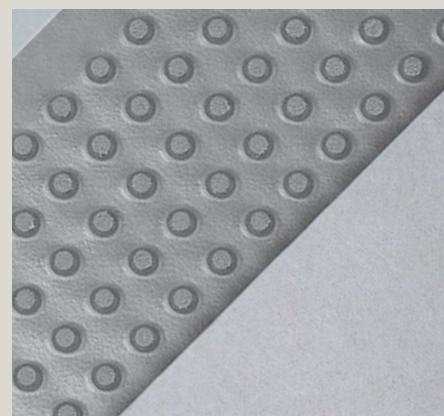
DIN 4095 as a drainage standard requires that any basement or foundation wall fitted with a drainage pipe must be equipped with a surface drainage system.

DELTA[®]-TERRAXX comprehensively meets the requirements of this standard.

When applied to compression-resistant and load-transmitting substrates or waterproofings such as, for instance, perimeter insulation boards, rigid or flexible sealing slurries, waterproof concrete, and cold-setting self-adhesive

waterproofing sheets, the DELTA[®]-TERRAXX protection and drainage system provides a maximum of safety for basement walls.

DELTA[®]-TERRAXX may be laid out on all commercial waterproofing sheets without additional protection or separation layers. One roll yields an efficient drainage layer measuring 30 m² in one pass. The time required for installation is no more than one minute per square metre. The drainage layer must completely cover the entire waterproofing surface as well as any junctions with rising building elements, such as parapets or walls. Uncovered vertical surfaces should be protected from mechanical influences by moulding strips or similar.



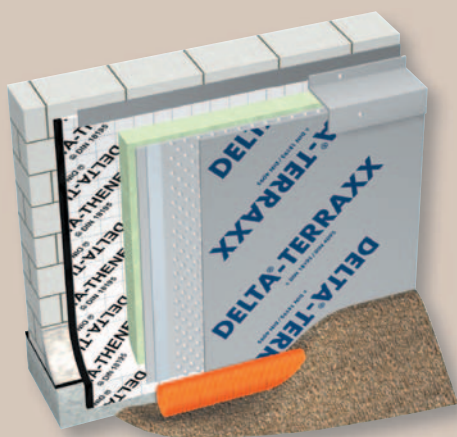
As the initial strength of the high-performance geotextile used is uncommonly high – a high initial modulus combined with minimum deformation under increasing loads – it is ideal for use in conjunction with dimpled sheets, particularly when compared to needle-punched mechanically bonded geotextiles. It consists of thermally-bonded continuous polypropylene fibres. Although the structure of the geotextile is three-dimensional, it is so thin that there is little risk of particles accumulating on it.



Conventional dimpled sheet



DELTA[®]-TERRAXX

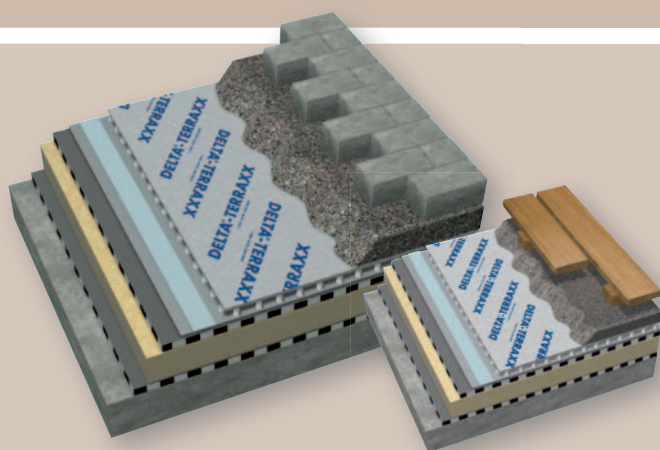
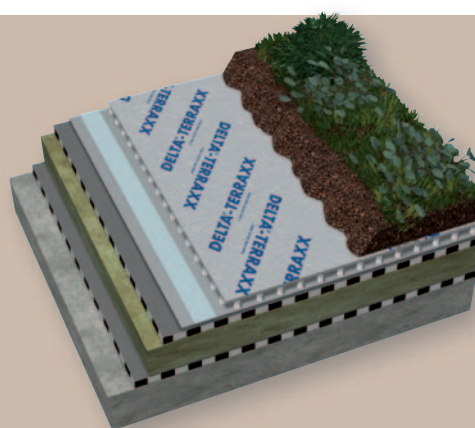


DELTA®-TERRAXX for vertical waterproofing

Attached to basements walls, DELTA®-TERRAXX offers maximum protection from impounded, fissure, and seepage water. Facing the ground, its dimples form a drainage layer covering the entire surface; the sheet surpasses the requirements of DIN 4095. Thanks to its high compressive strength of approx. 400kN/m², it can be installed at depths of up to 10 m.

DELTA®-TERRAXX for green roofs

In extensively planted roofs, the two-ply sheet acts as a protection, filtration, and seepage layer. It is similarly ideal for intensively planted roofs which, because of the high density of the substrate, do not require extra water storage but a high drainage capacity.

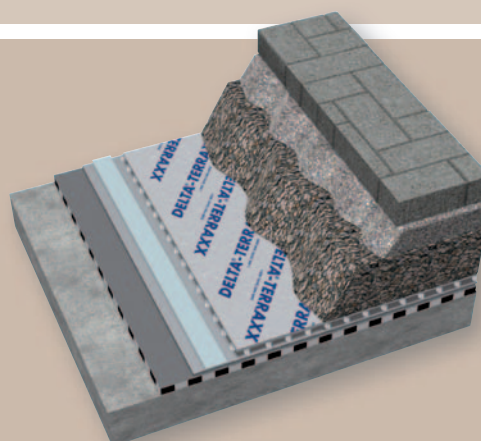


DELTA®-TERRAXX under gravel, flagstones and wood

Laid out on the waterproofing, DELTA®-TERRAXX forms an extremely robust protection and drainage layer to which a covering of sand or chips may be applied directly. The permanent-filtration geotextile keeps the dimples from silting up, thus guaranteeing that any excess water drains away completely.

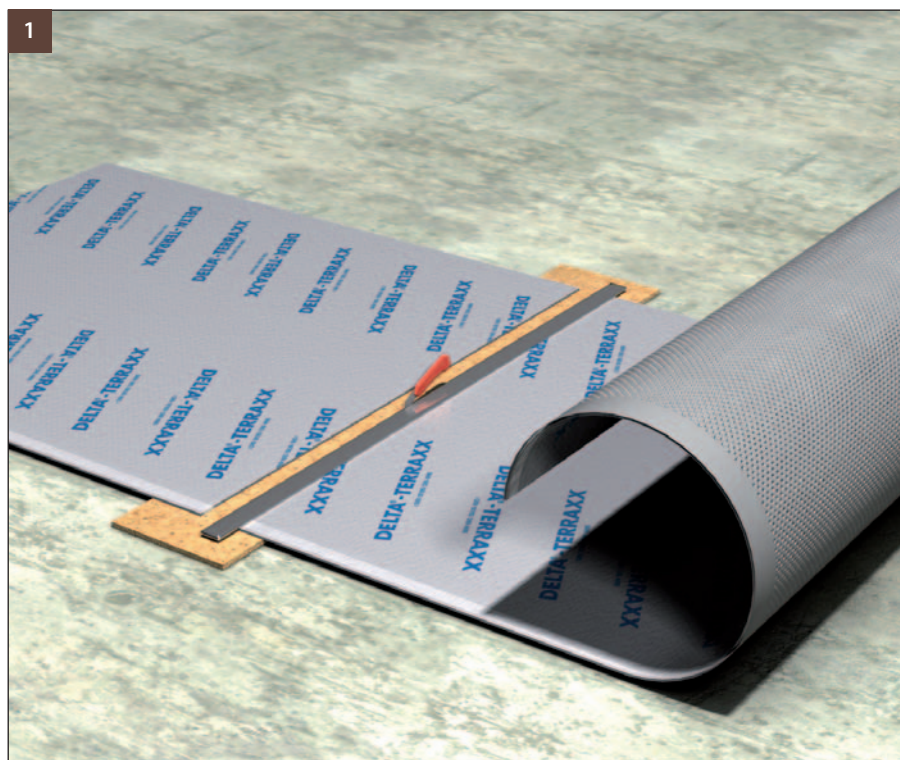
DELTA®-TERRAXX for driveable surfaces

Underneath driveable surfaces, DELTA®-TERRAXX forms an extremely robust protection and drainage layer which protects both the waterproofing and the pavement from being damaged by frost: by allowing precipitation water to drain away immediately, it prevents waterlogging which otherwise might damage these layers.



Installation instructions for DELTA[®]-TERRAXX

Vertical installation



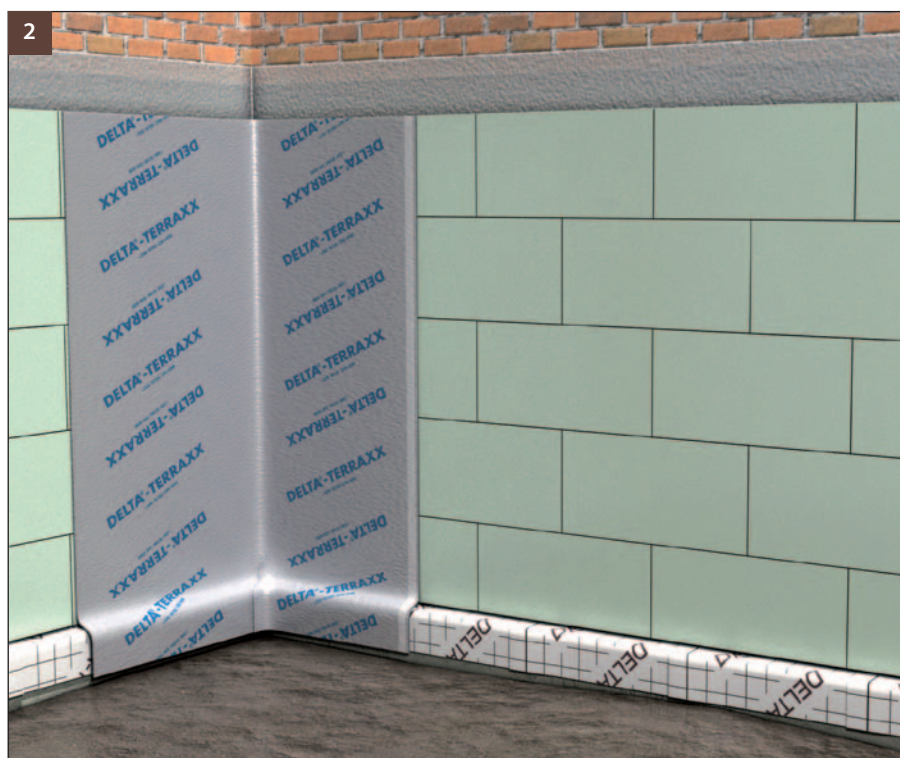
To protect pressure-sensitive elastic bitumen based waterproofing, please use DELTA[®]-GEO-DRAIN Quattro with its micro-perforated slip sheet backing.

Before installation

Check whether the masonry has been water-proofed and the perforated pipe installed in conformance with applicable standards.

Vertical installation: (Fig. 1)

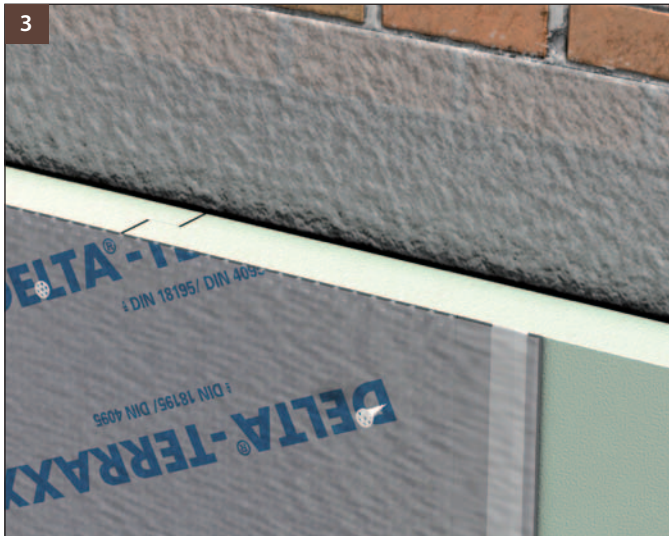
If the waterproofing layer is higher than 2.3 m, install sheet sections vertically next to each other. Use a utility knife to cut the sheet to length across the roll.



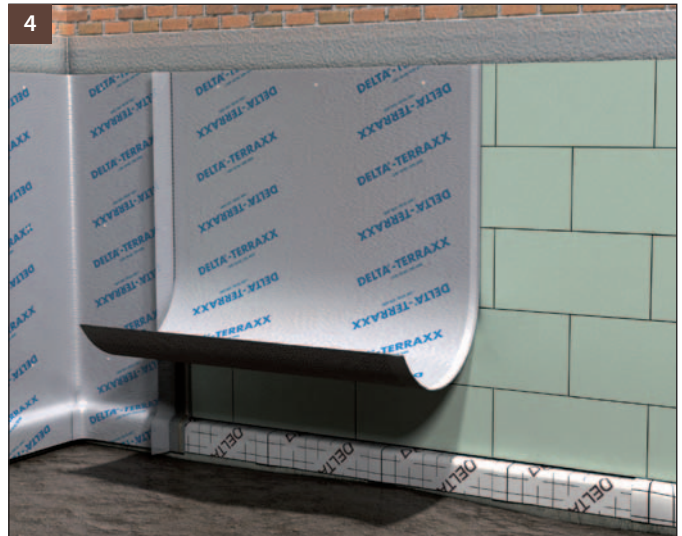
Installation on perimeter insulation

(Fig. 2)

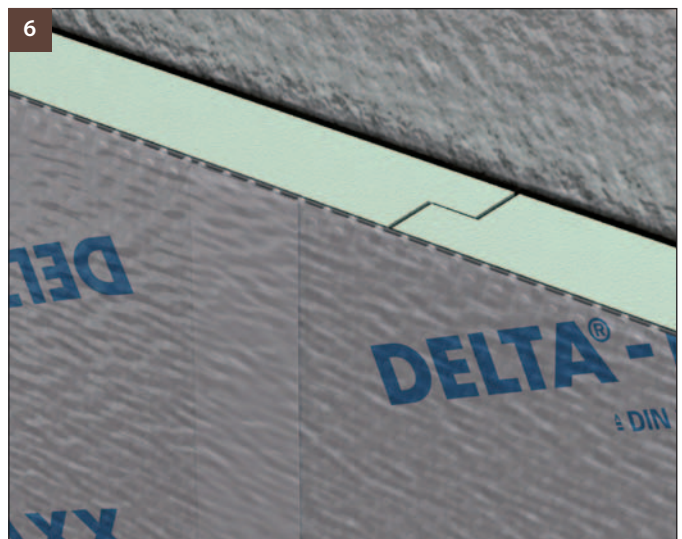
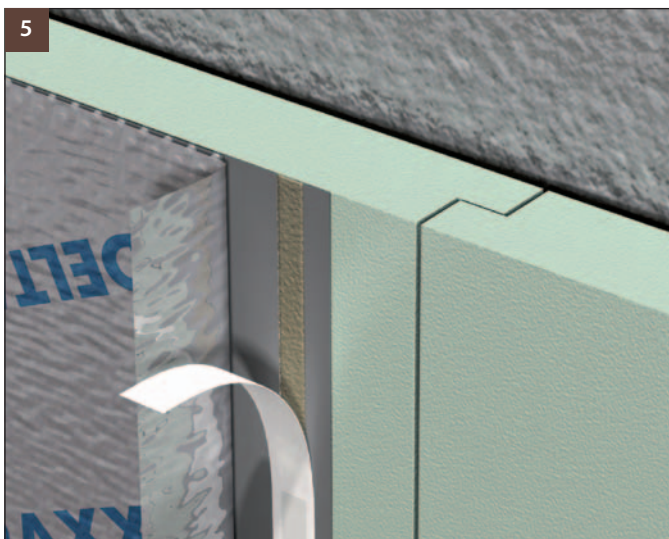
If there is an inside corner, start the installation there. Crease the sheet once along the centre and put it up in the corner. The fused-on geotextile should always face the soil. If the grade line has not yet been defined, attach the sheet temporarily c. 10 cm above the waterproofing. After backfilling, cut the sheet parallel to the finished grade.



(Fig. 3) DELTA®-TERRAXX may also be attached to perimeter insulation boards which, however, must be safely glued to the foundation waterproofing. In this case, drive at least one DELTA®-TERRAXX-SCHRAUBE per m² through the sheet into the insulation board, which should be at least 60 mm thick. The screws come with a matching TORX Bit T40 screwdriver. If interaction with the insulation is to be avoided, fasten the sheet above the insulation in the conventional manner.

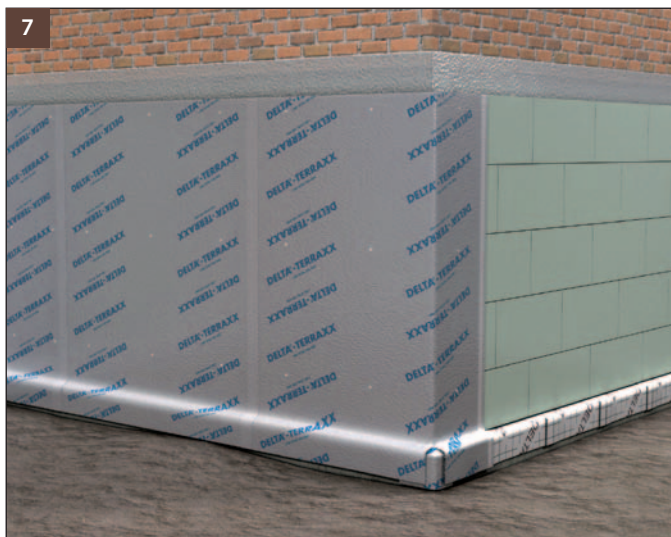


(Fig. 4, 5 and 6) To make an overlap, push the edge of the following sheet under the raised cloth edge. Remove the backing paper from the adhesive tape and glue the two sheets together.

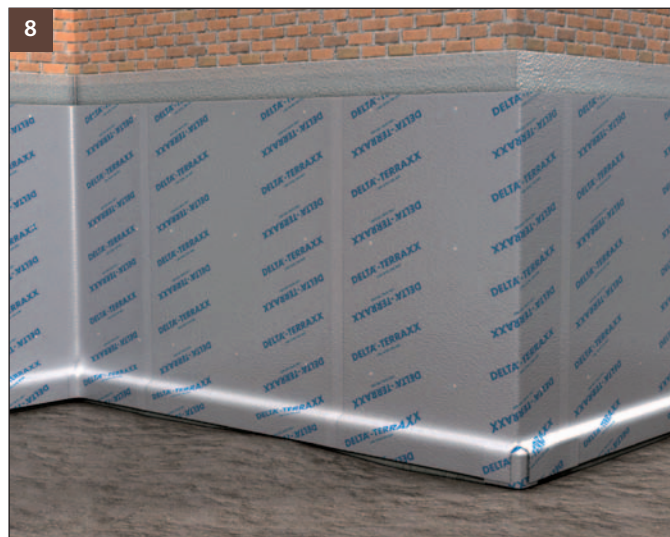


Installation instructions for DELTA[®]-TERRAXX

Vertical installation



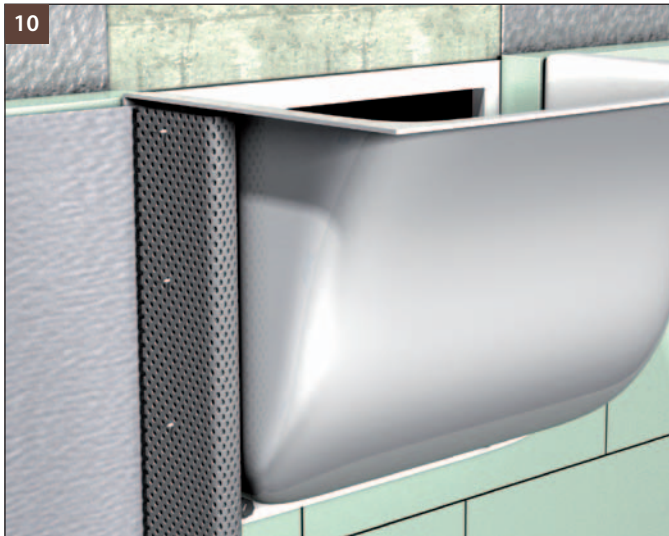
(Fig. 7) Before wrapping a sheet around an outside corner, crease it forcefully along the line of the edge.



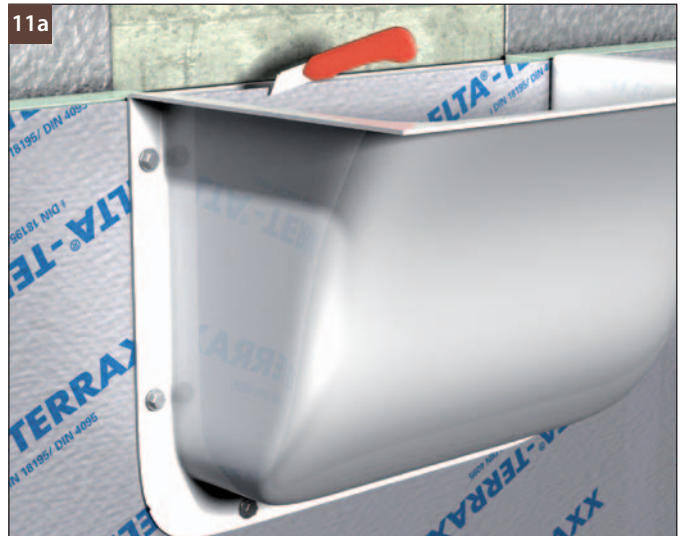
(Fig. 8) The last sheet to be installed should overlap the first sheet by at least 30 cm.



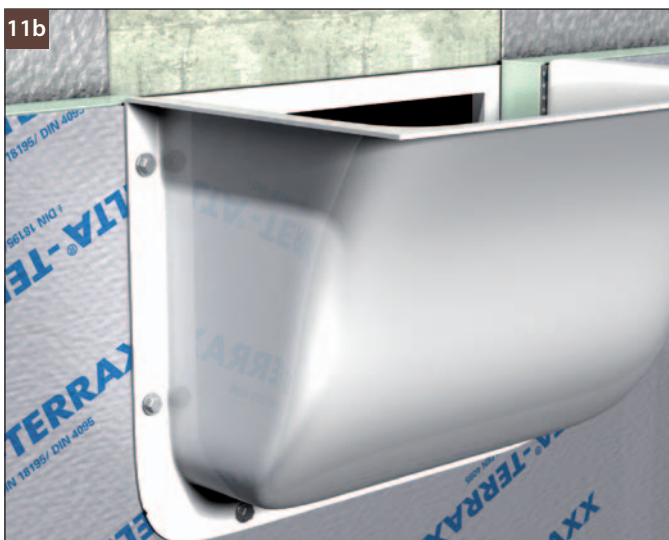
(Fig. 9) When sheets are applied to perimeter insulation boards, their upper edge should be sealed with DELTA[®]-TERRAXX-PROFIL.



(Fig. 10) When light wells have already been installed, cut the sheet precisely along the lower edge, make one vertical cut in the middle, and attach the projecting ends with adhesive pins.



(Fig. 11a) Mount plastic light wells directly on top of the sheet.



(Fig. 11b) Cut out window openings later.

Installation instructions for DELTA[®]-TERRAXX

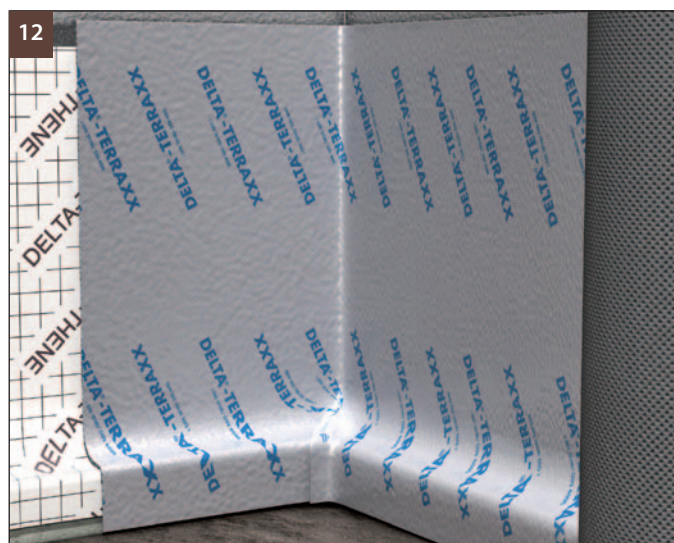
Vertical installation

Installation on concrete walls

If working with a nail gun, use DELTA[®]-MS-KNÖPFE as washers, so that no punch-trough is required.

Distance between fastening points

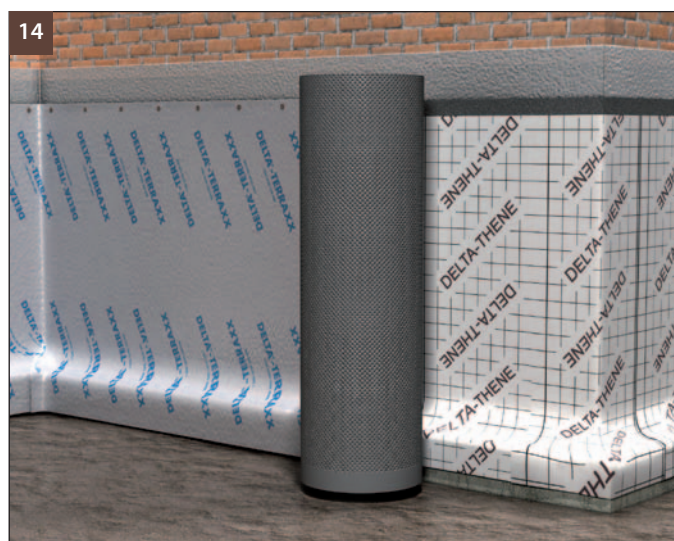
A distance of approx. 75 cm is ideal for installation depths up to 2 m. At greater depths exceeding 2 m, the distance between fastening points should be reduced.



(Fig. 12) If the waterproofing is no higher than 2.3 m, the sheet may be rolled out across the wall and fastened along its smooth edges, which saves 50 % of the installation time.



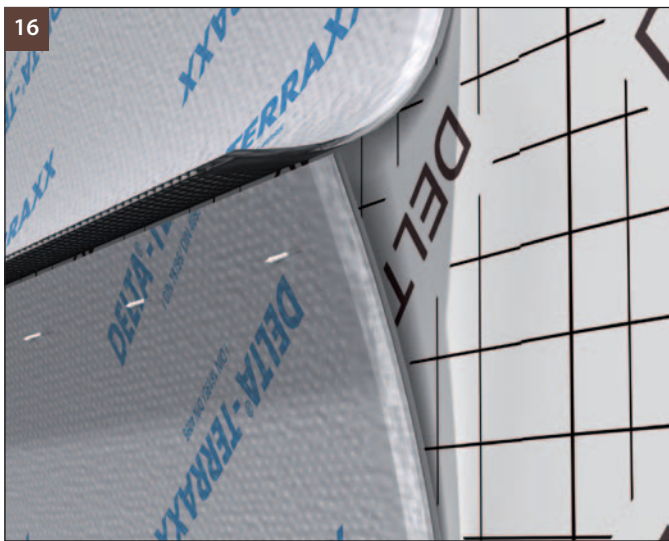
(Fig. 13) If the grade line is known, the sheet may be fastened immediately using DELTA[®]-MS DÜBEL.



(Fig. 14) If the grade line has not yet been defined, attach the sheet temporarily c. 10 cm above the edge of the waterproofing. After back-filling, cut the sheet parallel to the finished grade.



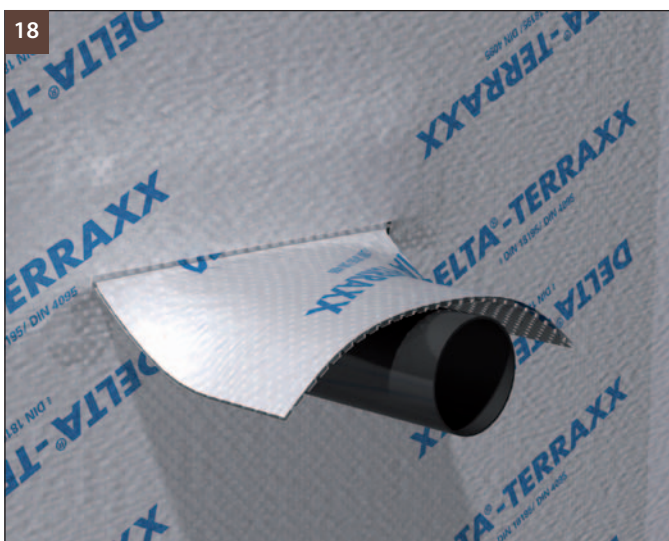
(Fig. 15) Protect the sheet with DELTA[®]-NOPPENBAHNEN-PROFIL and cover the fastening points.



(Fig. 16) To extend a vertically installed sheet, insert another sheet at least 20 cm deep under its end.



(Fig. 17) Join the two parts with at least four DELTA® adhesive pins.



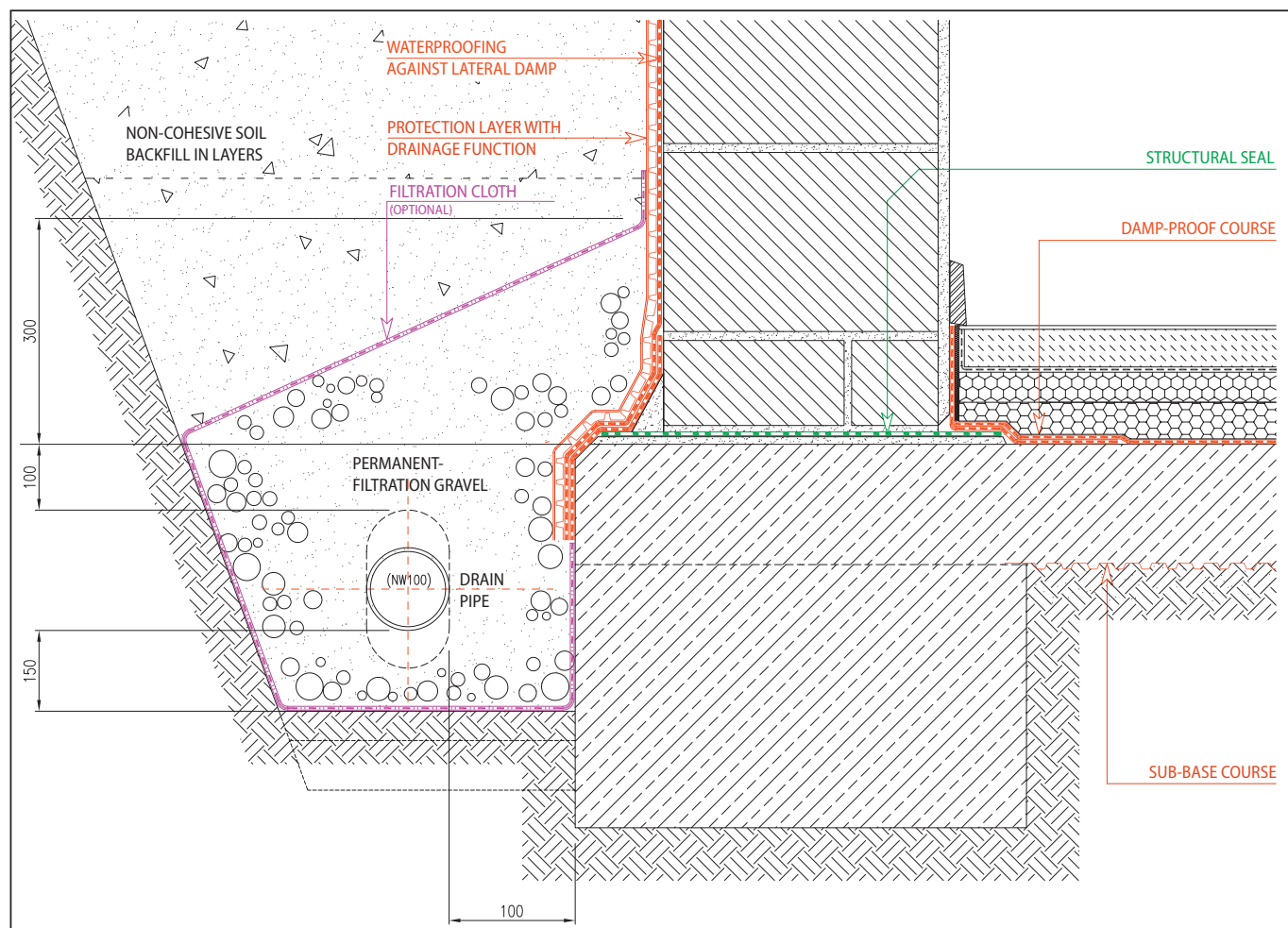
(Fig. 18) To accommodate a utility lead-through, make a V-shaped cut into the DELTA®-TERRAXX sheet, insert a cutting measuring c. 30 x 30 cm into the opening, and cover the lead-through. When backfilling later on, surround the opening with extra gravel so that any water can drain away more quickly. .

Installation instructions for DELTA[®]-TERRAXX

Vertical installation



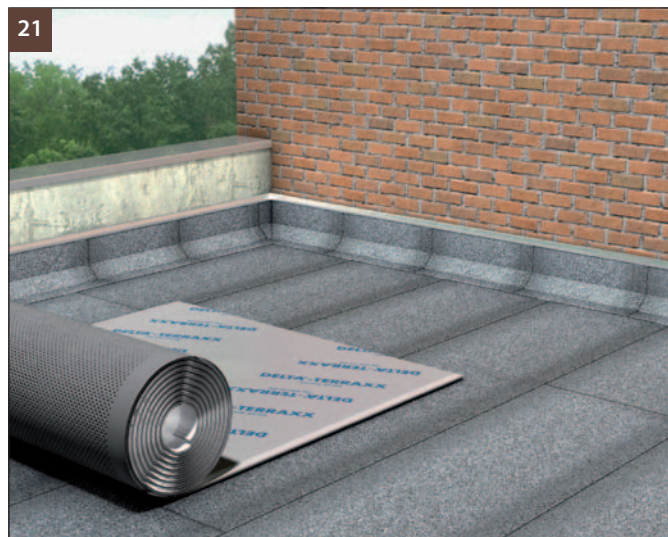
(Fig. 19) At the bottom, the DELTA[®]-TERRAXX drainage sheet should end close to the drainage pipe. Surround the pipe with a packing of permanent-filtration material (e.g. B 32-grade gravel) at least 15 cm thick. If the gravel does not guarantee permanent filtration, wrap the gravel packing in a geotextile. Never wrap the geotextile directly around the drain pipe but always around the entire gravel packing. Only this guarantees permanent functionality. Soil should be backfilled and compacted in layers. It should not contain sharp-edged rocks measuring more than 10 cm in diameter.



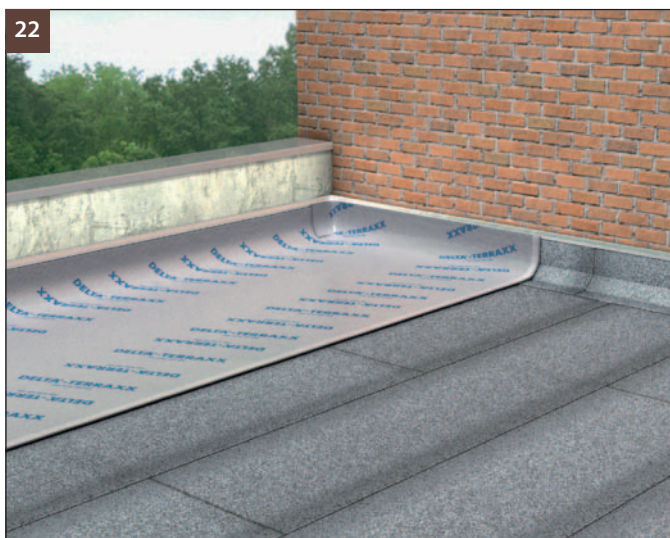
Horizontal installation



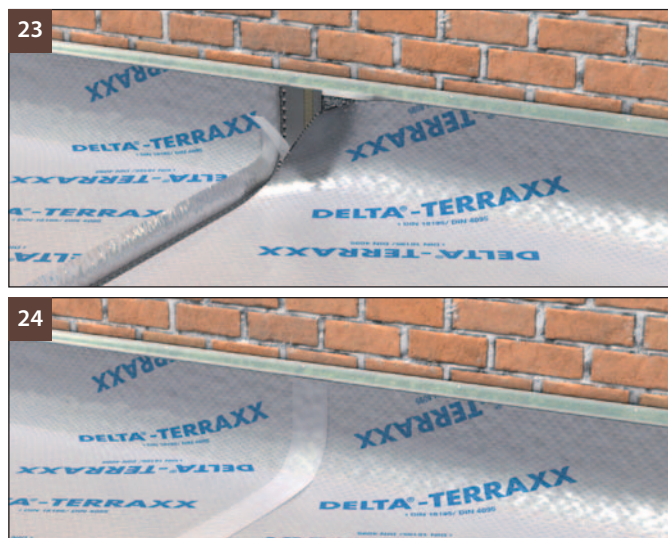
(Fig. 20) Clean waterproofed surfaces thoroughly so that the waterproof coating cannot be damaged after the drainage sheets have been laid out. If the roof is to be planted later on, the waterproof coating must be root-resistant or shielded against root penetration with a protective sheet.



(Fig. 21) Simply roll out the drainage sheet on the floor and/or the waterproofing, with the permanent-filtration geotextile facing up towards the covering layers. Use a utility knife to cut the sheet to the requisite length.



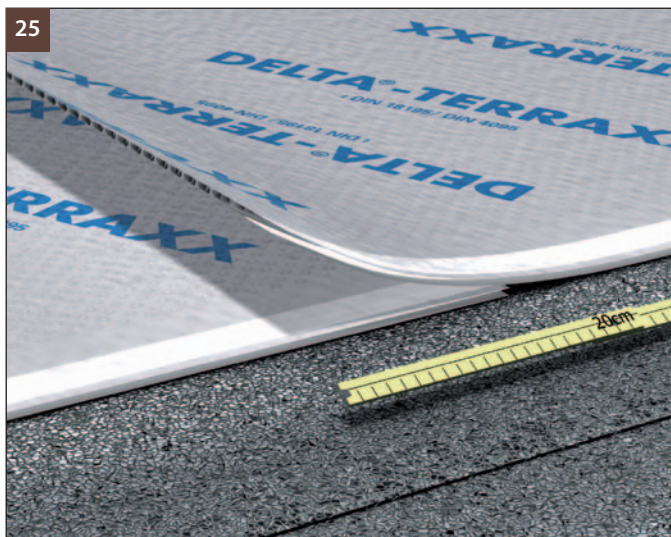
(Fig. 22) Rising building elements should be covered to a height of no less than 15 cm or, alternatively, to the grade line of the made ground.



(Fig. 23 and 24) Make sure that sheet overlaps are adequate. Overlap zones should be covered by a double layer of filtration cloth. To make an overlap, push the connecting sheet underneath the raised lateral cloth edge. Simply pull off the backing paper of the adhesive strip and glue the two dimpled sheets together.

Installation instructions for DELTA[®]-TERRAXX

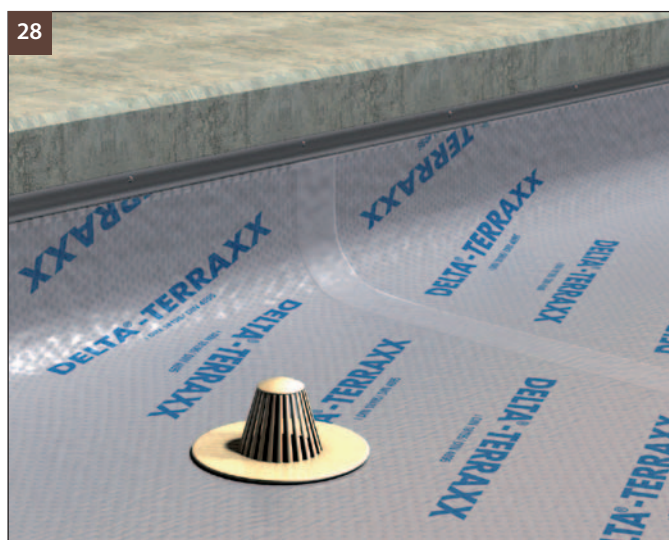
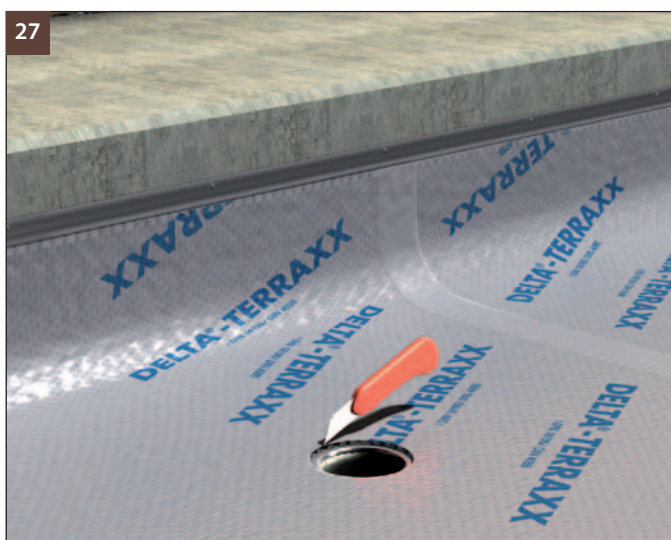
Horizontal Installation



(Fig. 25) If you need to extend a sheet at the head, push a minimum length of 20 cm of the extension sheet underneath.



(Fig. 26) If a ceiling is to be covered with made ground, the drainage layer will immediately bear the weight of a wheelbarrow without problems. With the made ground already applied, wheeled loaders may be employed on DELTA[®]-TERRAXX during the construction phase, provided that the soil is at least 20 cm thick



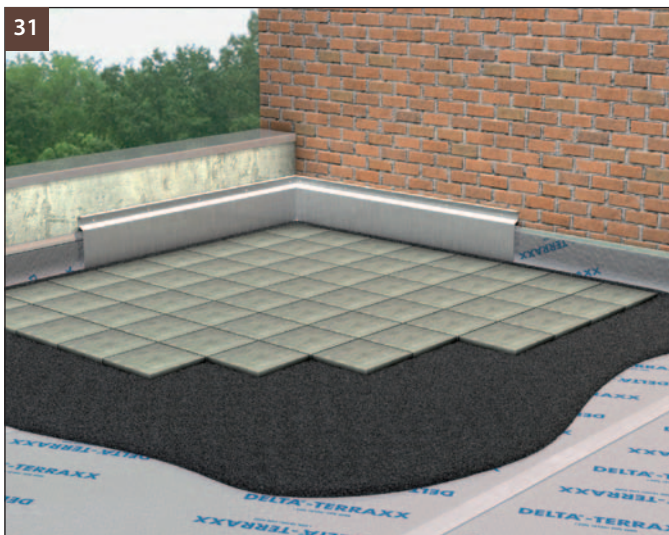
(Fig. 27 and 28) Cut out openings for roof drains carefully without damaging the waterproofing and arrange the sheet expertly around the opening.



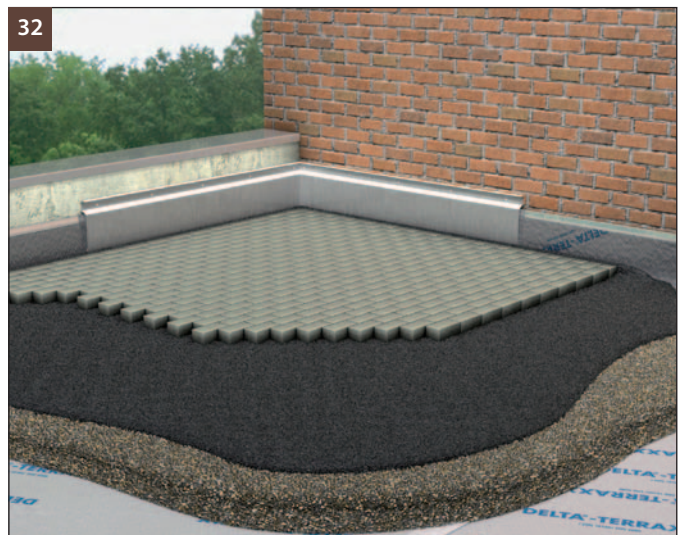
(Fig. 29) For green roofs, the planting substrate may be applied directly in the requisite thickness and planted as required. If a roof is to be planted extensively for low maintenance, substrate thicknesses should range between 8 and 15 cm. If it is to be planted intensively, the substrate should be applied in thicknesses ranging from 20 cm to 100 cm, depending on the plants. Normally, such a roof would require additional irrigation.



(Fig. 30) When a wooden terrace deck is to be installed on plane and firm ground, a bed of chips may be applied directly on top of the drainage sheet, after which the walkable wooden pavement may be completed.



(Fig. 31) To build a walkable surface on plane and firm ground, the chip bedding may be applied directly to the drainage sheet and the walkable slab pavement completed afterwards.



(Fig. 32) To make a driveable pavement, the sub-base and bedding layers may be applied directly to the drainage sheet, after which the driveable pavement may be completed.

In driveable pavements, the minimum thickness of the sub-base course must be computed individually, depending on the traffic density expected. Normally, using DELTA®-TERRAXX will considerably reduce covering heights in cast as well as uncast constructions.

Please use our free computation service at +49 (0) 23 30/63-578.

Sample requests for tender

Request for tender, DELTA[®]-TERRAXX for vertical application

DELTA[®]-TERRAXX for application to vertical waterproofing (made by Dörken GmbH & Co. KG, D-58311 Herdecke), two-ply protection and drainage system made of rot-proof HDPE featuring an integrated self-sealing edge for secure positioning during laying, colour: silver-grey for reduced emissions and enhanced heat-transfer resistance, to be delivered and expertly installed on masonry waterproofing.

Sheets to be put up and mechanically fastened above the waterproofing edge in conformance with the manufacturer's instructions (e.g. clout nails, wall plugs, or DELTA[®]-GEO-DRAIN-CLIP). Care must be taken to ensure adequate overlaps between sheets. Overlap zones should be covered with a double layer of filtration cloth. The cloth must face the soil.

DELTA[®]-TERRAXX for application on vertical perimeter insulation (made by Dörken GmbH & Co. KG, D-58311 Herdecke), two-ply protection and drainage system made of rot-proof HDPE and featuring an integrated self-sealing edge for secure positioning during laying, colour: silver-grey for reduced emissions and enhanced heat-transfer resistance, to be delivered and expertly installed on vertical perimeter insulation.

For laying and mechanically fastening sheets to insulation boards with a minimum thickness of 60mm in conformance with the manufacturer's instructions, use at least one DELTA[®]-TERRAXX SCHRAUBE per m². Make sure that sheet overlaps are adequate. Overlap zones should be covered with a double layer of filtration cloth. The cloth should face the soil.

Request for tender, DELTA[®]-TERRAXX for horizontal applications

DELTA[®]-TERRAXX (made by Dörken GmbH & Co. KG, D-58311 Herdecke), two-ply protection and drainage system made of rot-proof HDPE featuring an integrated self-sealing edge to keep it in position during laying and avoid seam gaps, colour: silver-grey for reduced emissions and increased heat-transfer resistance, to be delivered and expertly installed.

Laying: the geotextile should have an adequate overlap at butt joints (c. 10 cm). Longitudinal edges to be sealed with the integrated adhesive strip, covering the overlap with the fused-on geotextile. Openings for roof drains to be cut out and fitted properly. The permanent-filtration geotextile must face upwards and/or towards the soil.

Technical data

Dimpled sheet with drainage function:

Dimpled sheet	PEHD, silver
Filtervlies	PP, grey
Flat tab/self-sealing overlap edge	Yes/yes
Dimple height	approx. 9 mm
Air gap	approx. 7,9 L/m ²
Contact area dimples/substrate	approx. 8.000 cm ² /m ²
Compressive strength (transient loads)	approx. 400 kN/m ²
Compressive strength (permanent load)	approx. 90 kN/m ²
Installation depth	10 m
Service temperature range	- 30 °C to + 80 °C
Tensile strength	6,0 kN/m (EN ISO 10319)
Dynamic perforation resistance (cone drop test)	40 mm (EN 918)
Characteristic opening size O90	150 µm (EN 12956)
Roll size	12,5 m x 2,4 m

Hydraulic properties:

Drainage capacity under no load in L/s · m		
i = 0,02		0,40
i = 0,03		0,51
i = 0,10		1,03
i = 1,00		3,50
Drainage capacity under 20 kN/m ² in L/s · m		
i = 0,02		0,32
i = 0,03		0,42
i = 0,10		0,84
i = 1,00		3,10

Durability: To be covered within two weeks after installation. 25 years' life in natural soil having a pH value between 4 and 9 and a temperature of <25°C.

Accessories: DELTA®-DRAINAGEVLIES, separation and filtration cloth to safeguard the filtration function of surface drainage systems.

These installation instructions show examples. Variants are possible, provided they conform to the generally recognised rules of practice. Any deviations that may be necessary may be agreed separately with Dörken GmbH & Co. KG. .

■ We have no influence on object-specific conditions or on the proper and therefore successful application of our products. In cases of doubt, the suitability of a product should be tested in-house. An extensive collection of building details and sample requests for tender is available in PDF format at www.doerken.de for you to print out and save.

DELTA® accessories for DELTA®-TERRAXX.

Dörken makes your life easier – systematically.

Here is why you will like our handy DELTA® accessories:



DELTA®-TERRAXX-SCHRAUBE
For safely attaching DELTA®-TERRAXX to perimeter insulation boards. Patent-protected.



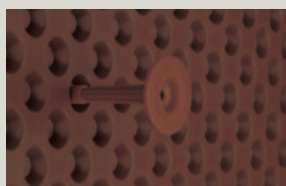
DELTA®-NOPPENBAHNEN-PROFIL
Edge-sealing strip.



DELTA®-TERRAXX-PROFIL
Edge-sealing strip for use with perimeter insulation. Patent pending.



DELTA®-MULTI FIXX
Universal fastener for all DELTA® dimpled and drainage sheets, reversible.



DELTA®-MS DÜBEL
Plastic nail plug for installing DELTA® drainage sheets.



DELTA®-DRÄNAGEVLIES
Separation and filtration cloth. Safeguards the filtration function of surface drainage systems.

DELTA® is a registered trademark of Ewald Dörken AG, Herdecke, Germany.

DELTA®



DÖRKEN

Dörken GmbH & Co. KG
Wetterstraße 58
58313 Herdecke
Tel.: +49 (0) 23 30/63-0
Fax: +49 (0) 23 30/63-355
bvf@doerken.de
www.doerken.de

A company of the Dörken Group

Delta Membrane Systems Ltd.
Delta House, Merlin Way
North Weald, Epping,
Essex CM16 6HR
Tel.: +44 (0)1992 523 523
Fax: +44 (0)1992 523 250
info@deltamembranes.com
www.deltamembranes.com

