DELTA®

DELTA®-radon protection system

Reliable protection against radon.



Radon affects almost everyone

Definition, legal basis, planning of radon protection measurements.

Radon gas is a natural, radioactive, invisible and odorless noble gas that penetrates cellars and homes from the ground. Especially in regions with a high uranium content in the soil, the radon concentration is increased. Long-term exposure can cause lung cancer.



Limit and guideline values in new and existing buildings

If rooms are used for more than 30 hours per week, the measured radon concentration must be below 300 Bq/m³ in the annual average according to the new Radiation Protection Ordinance (StSV, 2017) / European Directive 2013/59/Euratom7. The World Health Organization (WHO) goes even further and recommends the lowest possible radon concentration, with a reference value of 100 Bq/m³ on an annual average. The following figure shows a simplified map of the risk of radon in various European countries.

Even in areas with a lower risk, a higher radon exposure can occur at a particular location. The real radon concentration in the soil or in living spaces can only be determined by measurements.

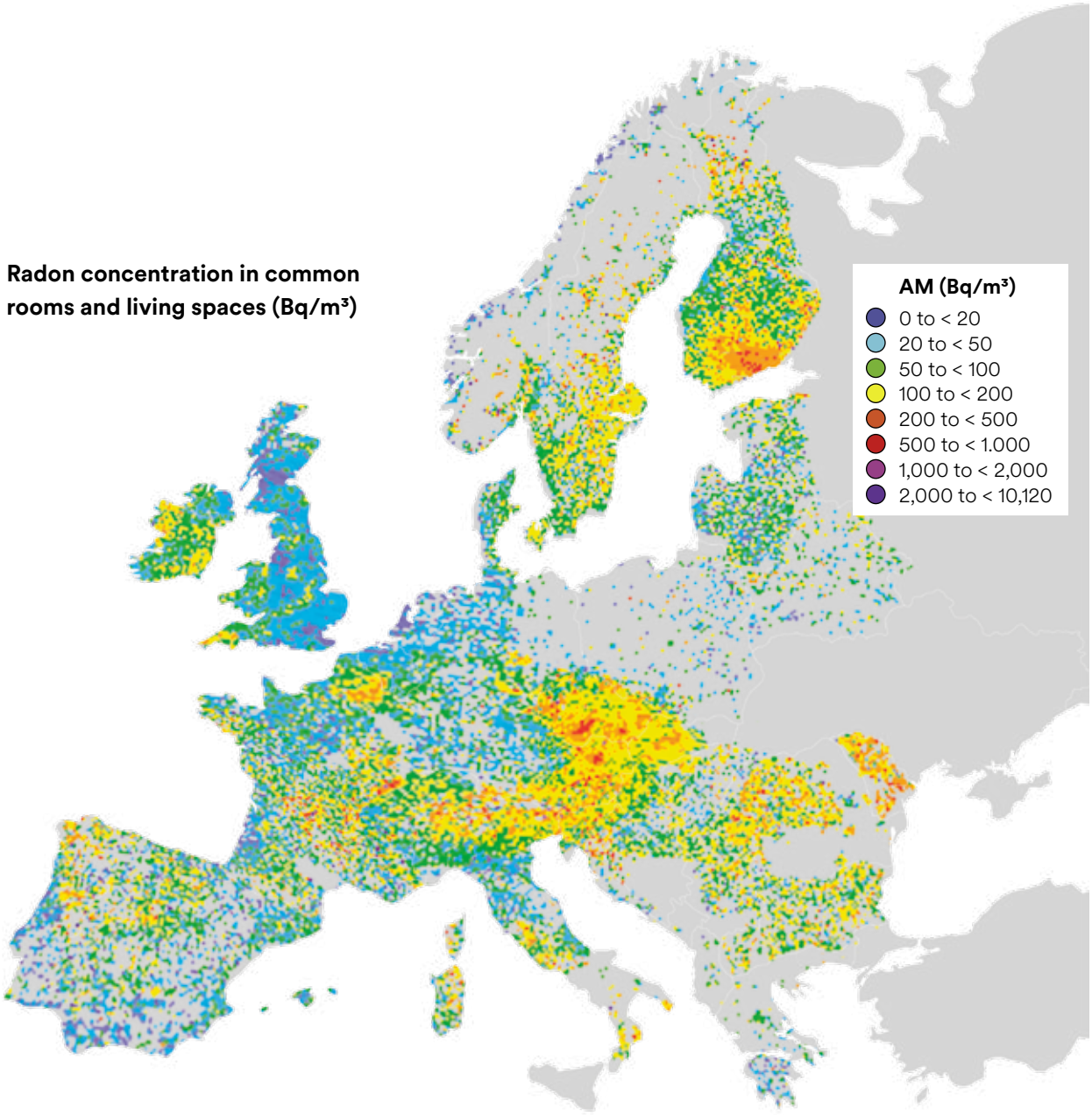
Factors that influence the radon concentration in the indoor air

The radon concentration in the air of a building depends on the properties of the soil, but also on architectural features and and ventilation. It also varies depending on ventilation and heating habits of the occupants.

Type and condition of the substrate

In addition to the composition of the soil and rock (uranium and radium content), the size of the rock grains (radon content of the soil air) and the permeability of the soil (circulation of radon-containing air) also play a decisive role. Particular caution is required on slopes, scree slopes, granite, karst and gravel soils. However, radon hardly penetrates compact or loamy layers.

Radon concentration in common rooms and living spaces (Bq/m³)



Building concept

The parts of the building that come into direct contact with the ground (cellars, crawl spaces, floors at the lowest level, etc.) are the ones through which radon enters the building before it reaches the common rooms. The penetration of radon is favoured by cracks, pipework through ceilings and floors, etc.

Air exchange in buildings

Air exchange is also an important parameter. During the course of the day, the radon concentration in a room fluctuates depending on windows and doors are open or not. The worse the building is ventilated, the higher the radon concentration.

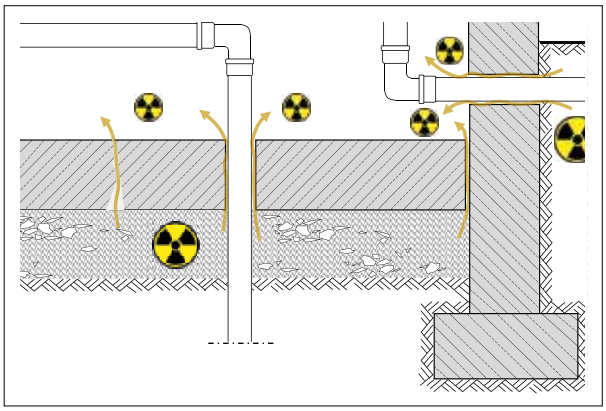
Radon exposure: causes and solutions

Radon can enter buildings through leaks in the floor slab and foundation (e. g. cracks or pipes).

The reduction of radon concentrations in common rooms is usually achieved through a combination of different measures, e. g. regular or mechanical ventilation of living spaces, sealing floors, cracks and pipes. Another approach is the use of of radon extraction systems that extract radon from the soil before it enters the building.





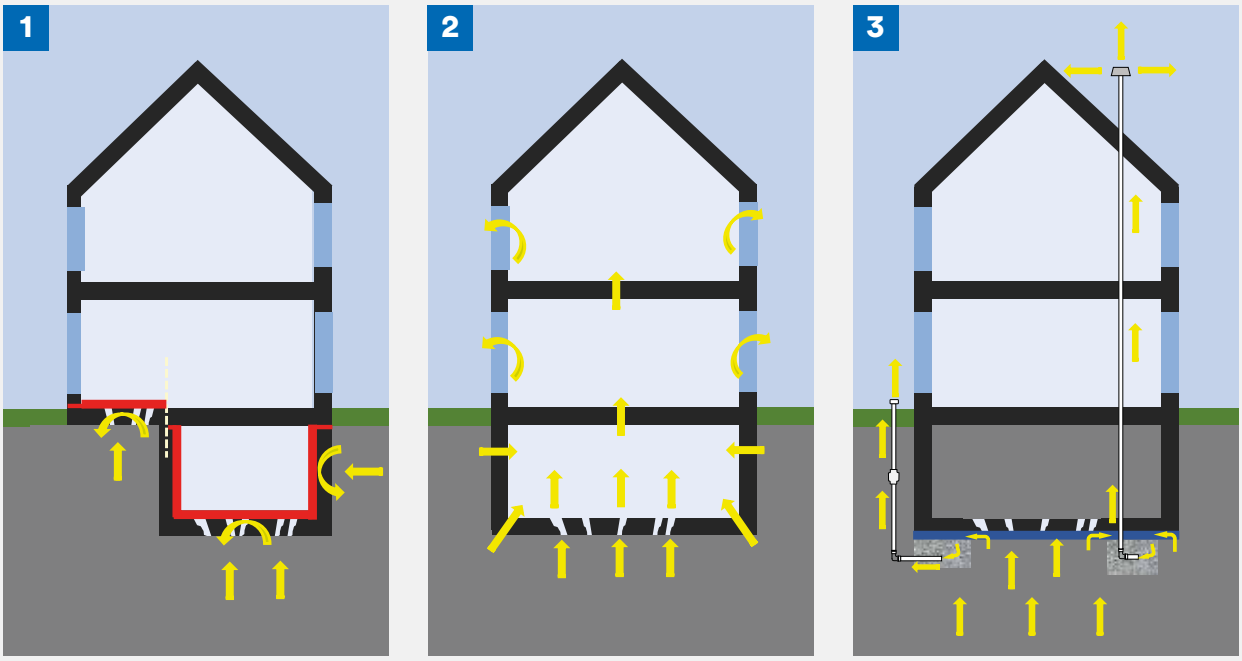


Analysis of the radon infiltration zones

- Air supply through cable and pipes (electricity, telephone, TV, etc.)
- Leakage between the floor slab and the penetration
- Leaking door or ceiling between cellar and living area
- Damage to the floor/wall: Hole, crack
- Permeable material: clay, parquet, etc.
- Presence of an air/floor exchanger, e. g. geothermal heat exchanger
- Lack of tightness of the floor in the living area living area
- Leak between the floor slab and the wall (e. g. a defective expansion joint)
- Air circulation through cavity materials: Concrete blocks, plasterboard, etc.
- Specific opening such as a manhole, a sump, trap door, etc.



DELTA®-radon protection system



The three main measures to limit the concentration of radon:

1. Increasing the DENSITY between the floor and the common rooms
2. Improve VENTILATION to ensure effective air circulation and reduce radon concentration
3. Overpressure in the living area or underpressure in the lower areas of the building (basement, crawl space or the building ground itself) combined with a GASDRAINAGE below the floor slab

The most effective solutions may require a combination of different measures. The effectiveness of a measure after its implementation should be checked by renewed measurements of the radon concentration.

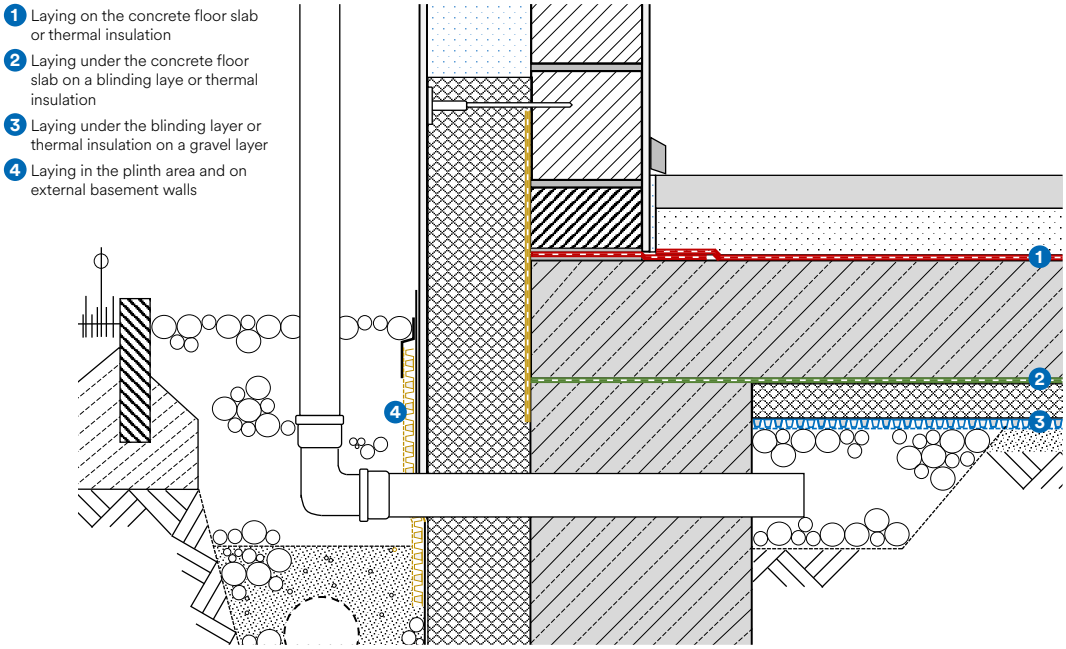
Tips for realisation

- Arrange for long-term radon measurement
- Plan precautionary measures for new buildings
- Consider radon protection as part of (general or thermal) refurbishment.

Which DELTA® system for which application?

We offer the right solution for every application.

Whether for renovation or new construction, for sealing against radon gas or drainage underneath the floor slab – the DELTA® radon protection system prevents radon gas from entering through building components and elements with contact to the ground into the building or thecommon rooms. Floor slab and, if necessary, basement walls are permanently and reliably separated from the radon-contaminated soil.



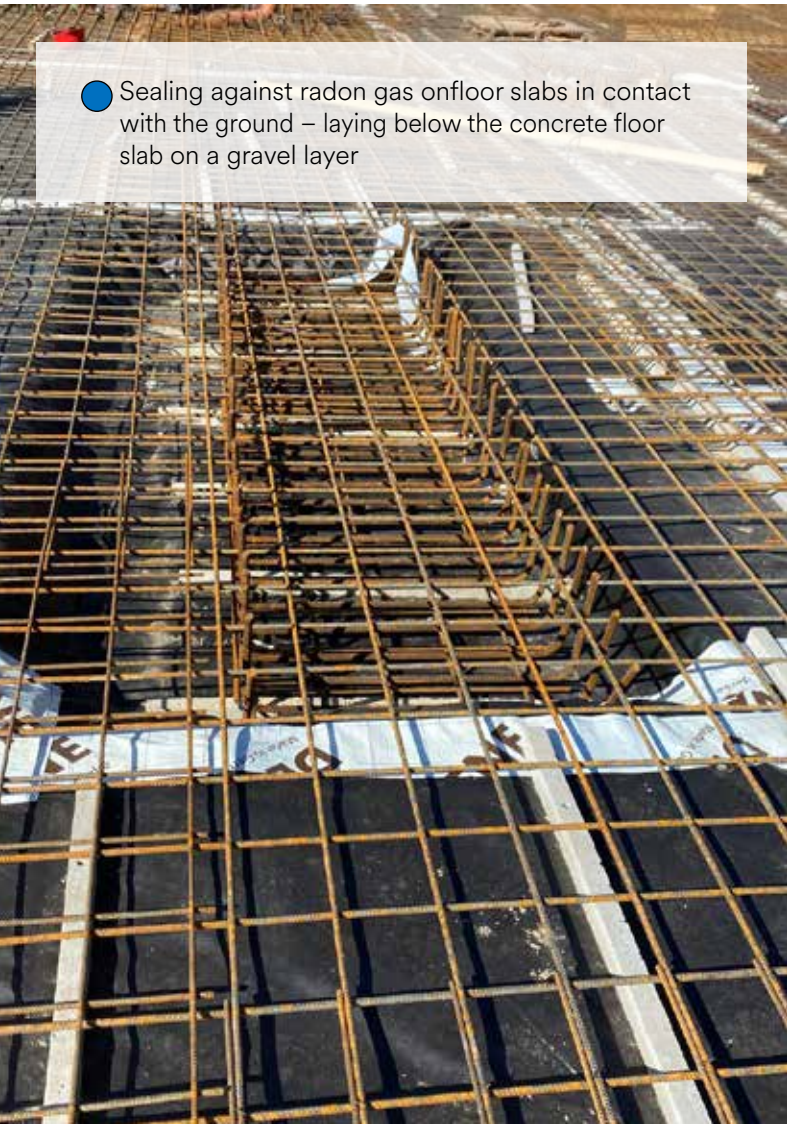
	DELTA®-THENE	DELTA®-RADONSTOP LIGHT	DELTA®-RADONSPERRE 460	DELTA®-RADONSTOP ULTRA	DELTA®-TERRAXX
On the floor slab	Radon sealing (self-adhesive)	Radon sealing	Radon sealing	Radon sealing	
Below the floor slab					
Laying on a blinding layer		Radon sealing	Radon sealing	Radon sealing	
Laying on the insulation of a thermal floor panel	Radondichtend (selbstklebend)	Radon sealing	Radon sealing	Radon sealing	
Laying on a gravel layer		Radon sealing (incl. protective fleece)	Radon sealing (incl. protective fleece)	Radon sealing (incl. protective fleece)	Radon sealing and draining
Vertical Application					
Laying in the plinth area and on exterior basement walls	Radon sealing (self-adhesive)				Radondraining



Laying underneath the floor slab on a blinding layer or above the floor slab



Sealing against radon gas on floor slabs in contact with the ground – laying on the insulation of a thermal floor slab



Sealing against radon gas onfloor slabs in contact with the ground – laying below the concrete floor slab on a gravel layer



Radon gas sealing and drainage – laying below the concrete floor slab on a gravel layer

The DELTA® radon protection system at a glance

The coordinated and tested system comprises radon-sealing and gas-draining membranes as well as connection accessories for a permanent reduction of the radon concentration indoors. The DELTA® radon protection system is suitable for both new buildings and refurbishments.



Radon sealing membranes

- DELTA®-RADONSTOP LIGHT
- DELTA®-RADONSPERRE 460 / DELTA®-DPC 500
- DELTA®-RADONSTOP ULTRA
- DELTA®-THENE as horizontal and vertical radon sealing



Radon sealing and draining membranes

- DELTA®-TERRAXX



Radon-proof connection and bonding accessories

- DELTA®-THENE-BAND, DELTA-MULTI-BAND® M 100, DELTA-MULTI-BAND® FLEXX 100 for membrane overlaps
- DELTA®-TILAXX ULTRA, DELTA®-THAN for linear connections to rising components
- DELTA®-FLEXX-BAND FG 80 / FG 150 for penetrations
- DELTA®-THENE ECKEN, DELTA®-FLEXX-BAND FG 150 for corners
- DELTA®-PROTEKT for cross-section sealing in and under walls



TEST REPORT No. 134122/2022

Effective radon protection through tested system

The simplest and most effective measure to keep the radon concentration in the air of common rooms below the guide values* is to seal the floor slab and basement walls. In addition regular ventilation, a special extraction system, if necessary combined with a gas drainage system below the floor slab can help to further reduce the radon concentration.

With the flat DELTA®-RADON membranes and the matching DELTA® accessories, we offer a tested system that fulfils all limit values (e.g. radon diffusion < 10^{-11} m²/s), both over the entire surface and in the detail area.

* see page 2





DELTA®-radon protection system

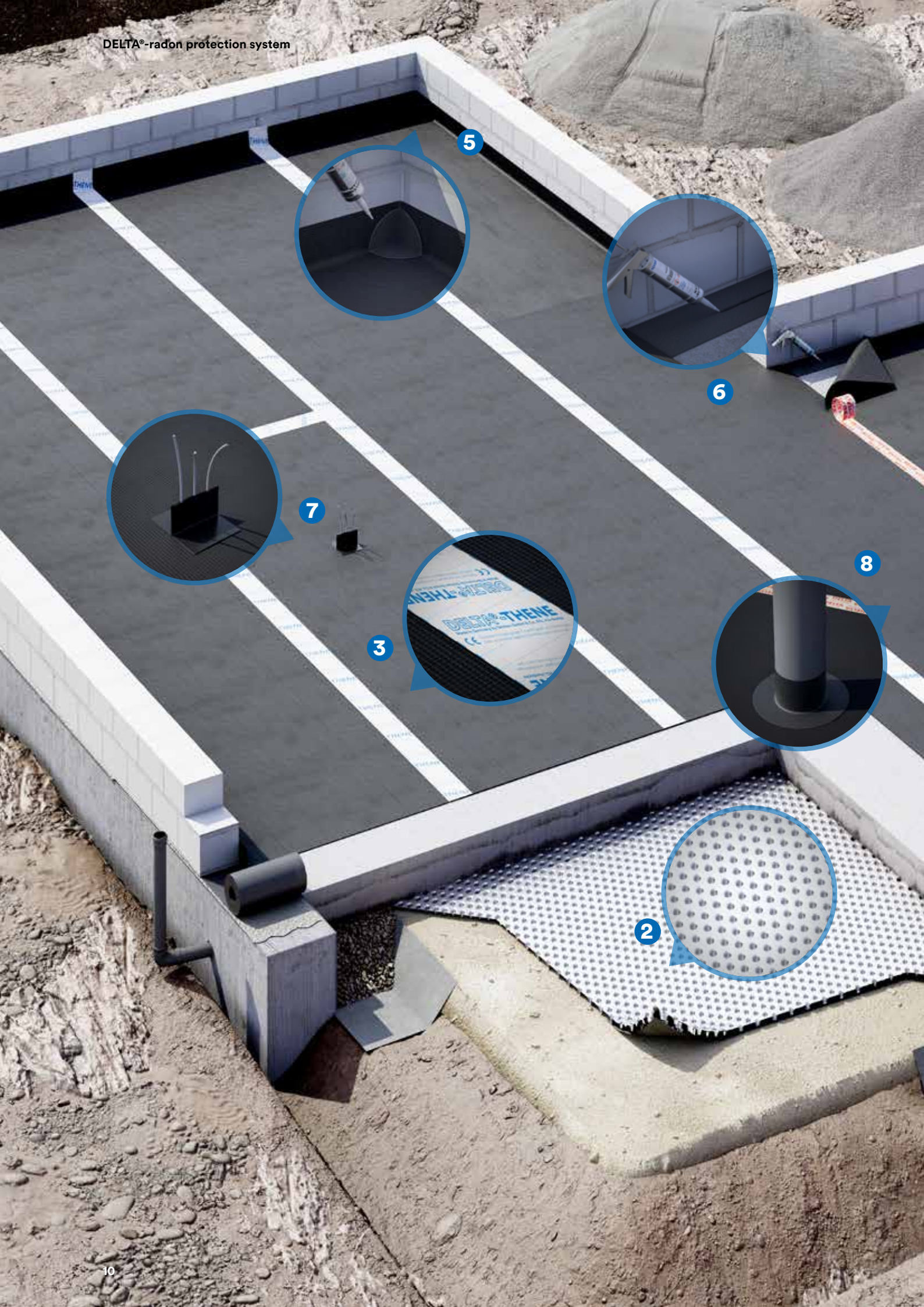


“With the tested DELTA®-radon protection system I focus on security from the ground up and ensure healthy indoor air and a sustainable protection against radon exposure. Preventive and effective, for carefree inhabited rooms.”








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DELTA-THENE

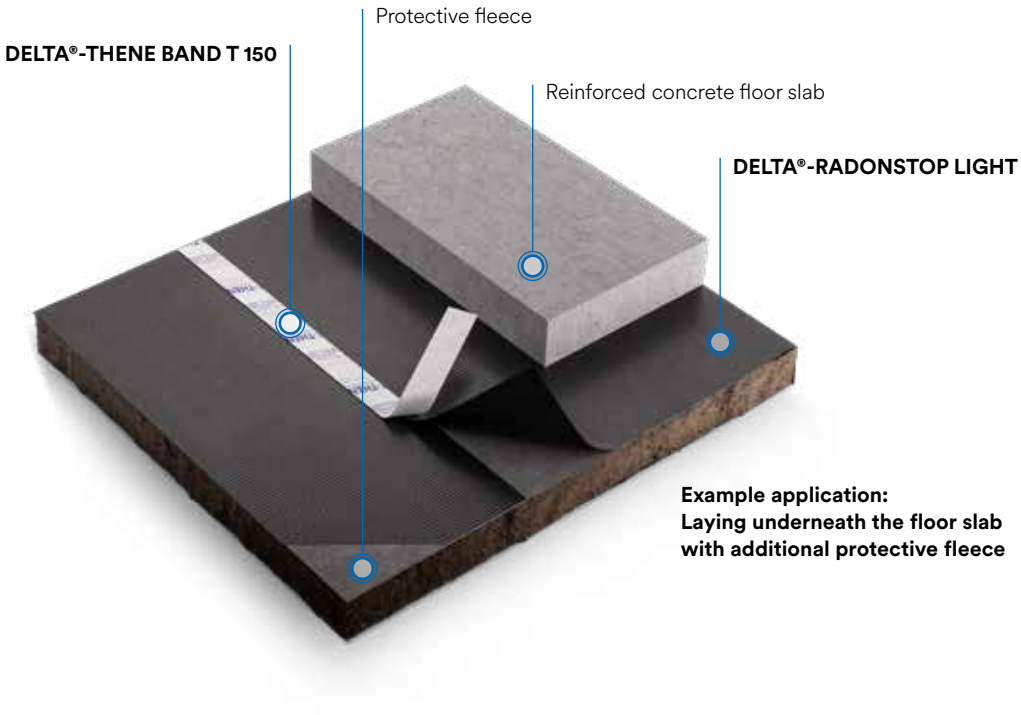
1. DELTA®-RADONSTOP LIGHT/ULTRA / DELTA®-THENE (radon sealing membranes)
2. DELTA®-TERRAXX (radon sealing and drainage membrane)
3. DELTA®-THENE BAND T 150 (bonding of the overlaps of DELTA®-RADONSTOP below the floor slab)
4. DELTA-MULTI-BAND® M 100, DELTA-MULTI-BAND® FLEXX 100 (bonding the overlaps of DELTA®-RADONSTOP above the floor slab)
5. DELTA®-THENE ECKEN
6. DELTA®-THAN or DELTA®-TILAXX ULTRA
7. DELTA®-FLEXX-BAND FG 80 (sealing of electrical sockets or cables)
8. DELTA®-FLEXX-BAND FG 150 (sealing of pipe penetrations)
9. DELTA®-PROTEKT (damp-proof course)

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DELTA®-RADONSTOP LIGHT

The versatile waterproofing membrane against radon gas and ground moisture.

The monolithic polyolefin-based radon gas barrier is suitable for applications above or below* the concrete floor slab. Suitable substrates: Concrete floor slab, pressure-resistant insulation boards, gravel layer*
(* only in combination with a protective fleece).



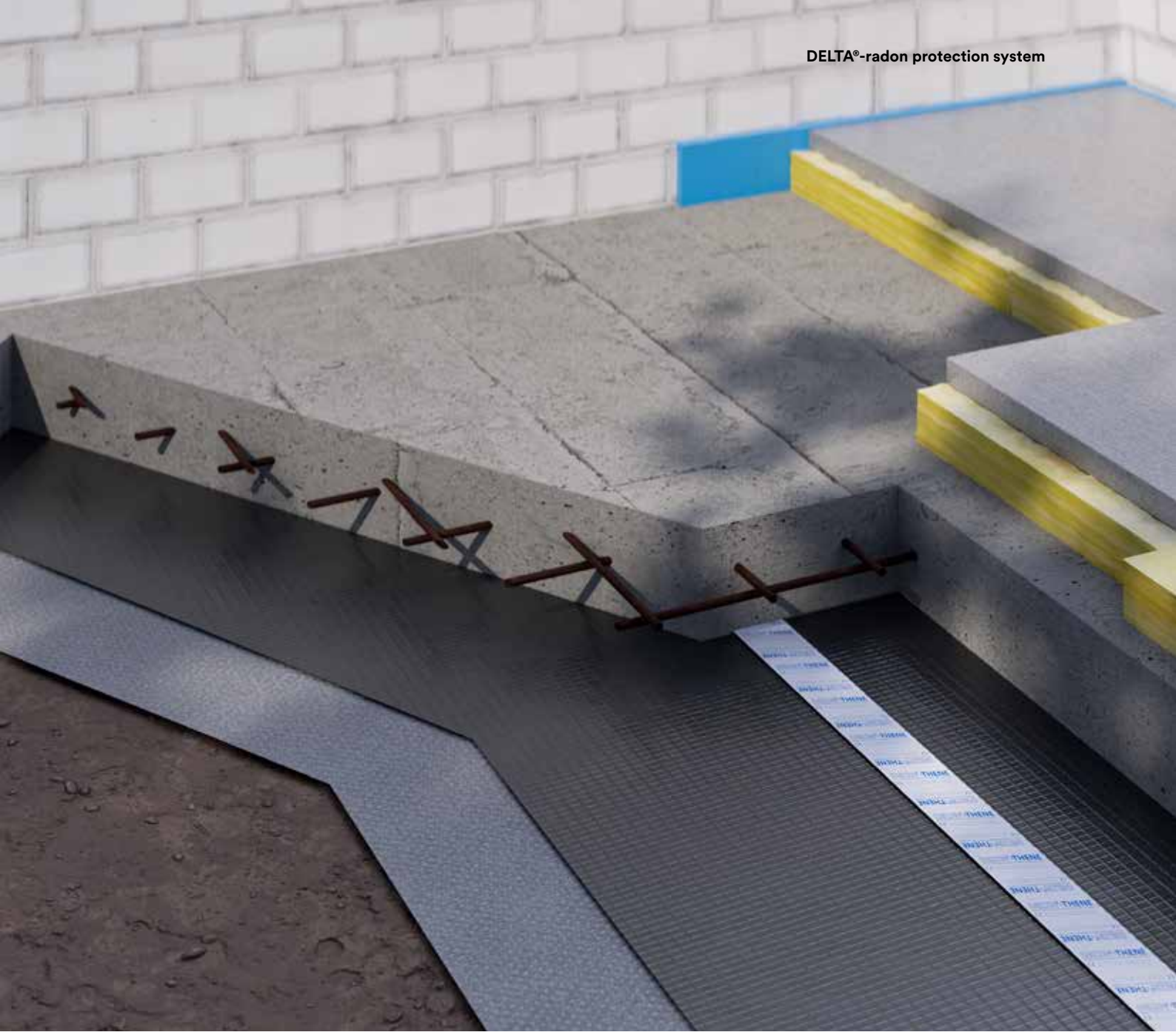
**Example application:
Laying underneath the floor slab
with additional protective fleece**

The advantages at a glance

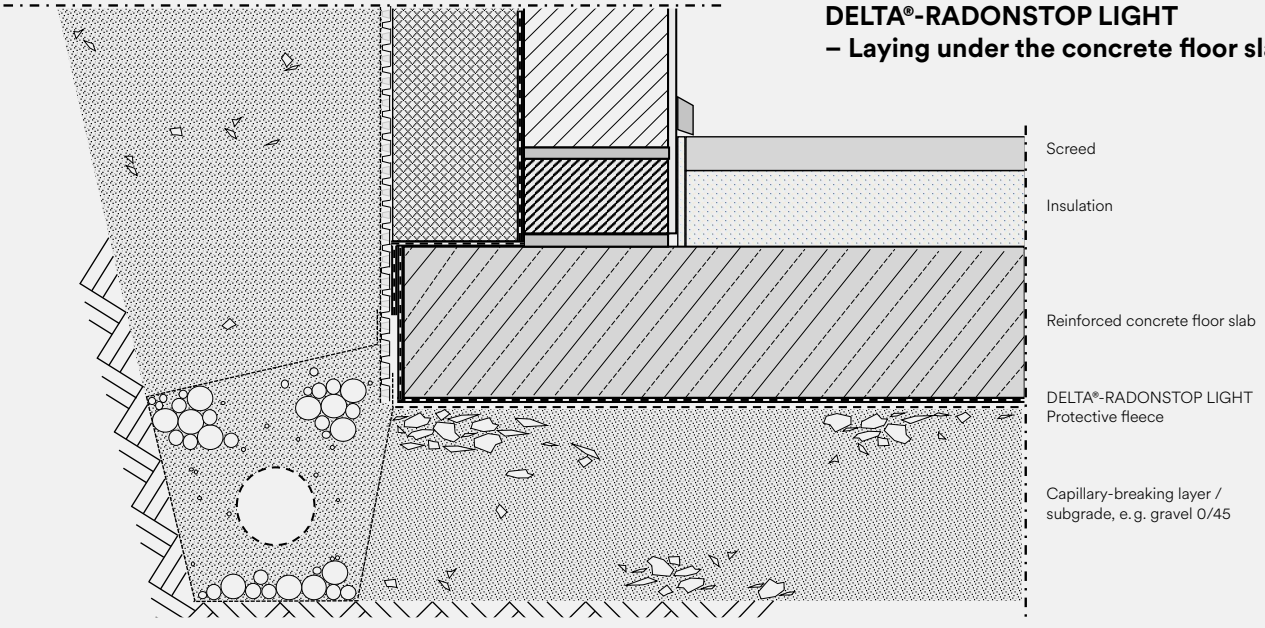
- Both on the surface and in the connection area tested system for reliable protection against radon.
- The membrane can also be used as a moisture barrier underneath the screed or the concrete floor slab.
- The roll width of 4 metres enables quick installation and minimises overlaps.
- DELTA®-RADONSTOP LIGHT impresses with its good mouldability, so that the the sheet is easy to work with, even with difficult details.
- Slip-resistant thanks to the grid embossing on both sides of the surface.
- The material is bitumen-compatible and rot-proof.

Alternatives

- DELTA®-RADONSPERRE 460 / DELTA®-DPC 500: Due to the higher surface weight, these radon protection membranes are more durable and UV-resistant, particularly suitable for applications applications with higher loads or longer outdoor exposure times.
- DELTA®-THENE: Vertical waterproofing and radon protection radon protection – see pages 16/17



DELTA®-RADONSTOP LIGHT – Laying under the concrete floor slab

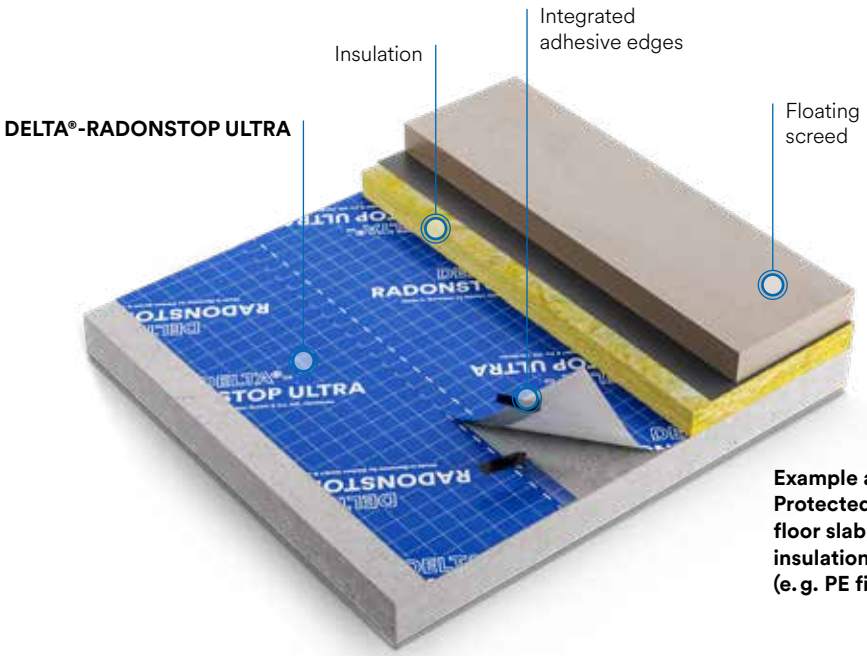


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DELTA®-RADONSTOP ULTRA

The grid-reinforced, very robust waterproofing membrane against radon gas and methane as well as for sealing against ground moisture and non-pressing water on floor slabs.

The multi-layer foil composite with integrated adhesive edges and aluminium insert is suitable for applications above or below the concrete floor slab in combination with an additional fleece. Suitable substrates: Concrete floor slab, pressure-resistant insulation boards, gravel layer (only in conjunction with a protective fleece)



Example application: Protected installation between floor slab and directly applied insulation, separating layer (e. g. PE film), floating screed.

The advantages at a glance

- Maximum impermeability to water vapour (S_d value ≥ 1,500 m) and radon gas (radon diffusion approx. 1.4 - 10^{-13} m²/s).
- 3-in-1 function - Permanent sealing not only against radon, but also against methane and soil moisture.
- Integrated self-adhesive edges for quick and reliable bonding of the overlaps.
- Grid printing (10 × 10 cm) for fast and precise cutting.
- Very robust and resistant for reliable protection from damage during the construction phase.

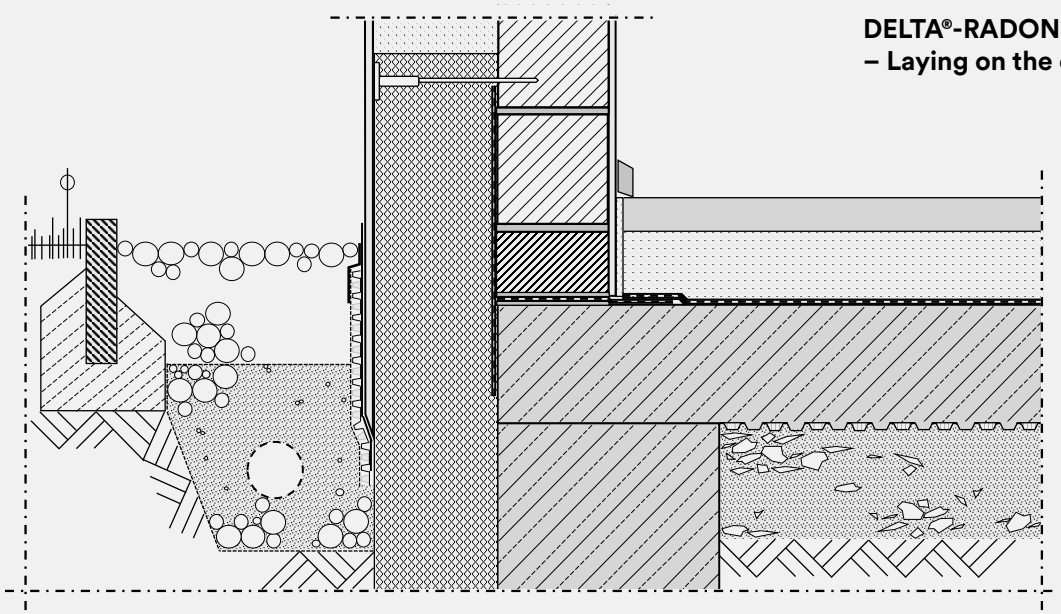
Additional applications

- Waterproofing against ground moisture on bare floors in contact with the ground DIN 18533-1: Water exposure class W 1.1-E (DIN 18533-1) and W 1.2-E (general building inspectorate test certificate).
- Sealing against radon gas on raw floors in contact with the ground raw floors.
- Sealing on intermediate storey ceilings (no wooden beam ceilings) above rooms with high humidity.
- Barrier layer against residual moisture ingress from concrete ceilings.

Not suitable as a seal against liquids acting from above liquids from above.



DELTA®-RADONSTOP ULTRA – Laying on the concrete floor slab

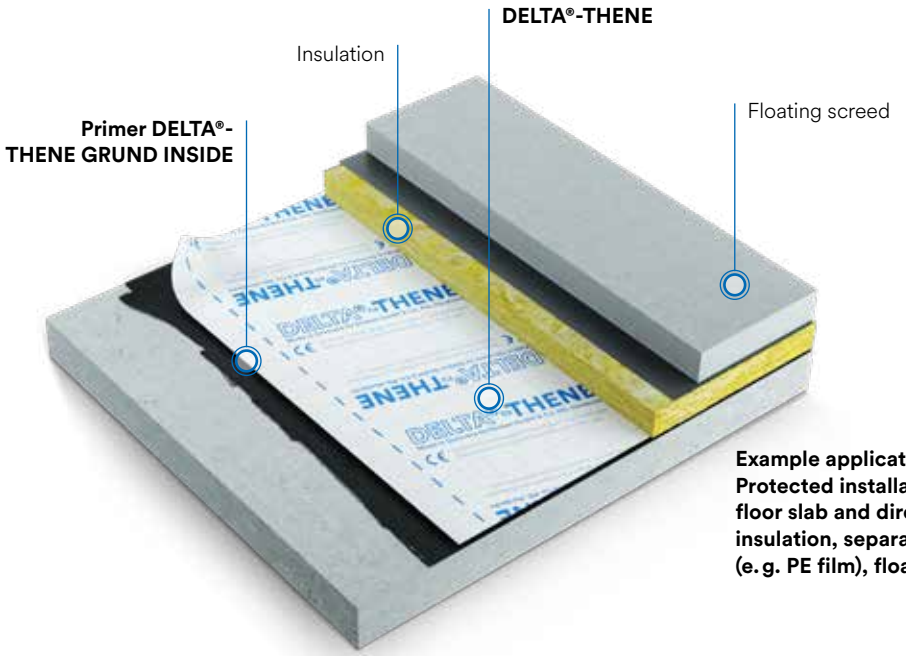


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DELTA®-THENE

The self-adhesive solution for reliable protection of the building envelope against moisture, spray water and radon.

The full-surface cold self-adhesive membrane made of bitumen rubber and cross-laminated special HDPE carrier film is suitable for applications above or below the concrete floor slab on the insulation of a thermal floor slab. Suitable substrates: Concrete floor slab, pressure-resistant insulation boards



Example application: Protected installation between floor slab and directly applied insulation, separating layer (e. g. PE film), floating screed.

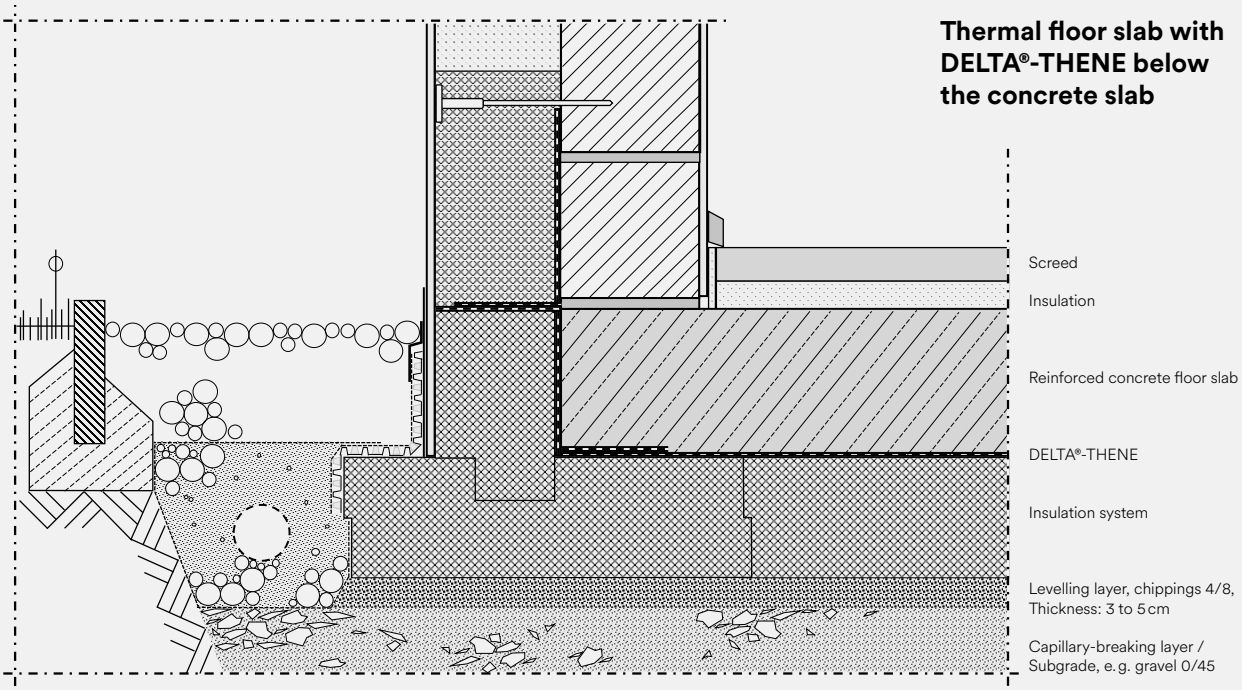
The advantages at a glance

- Full-surface cold self-adhesive waterproofing membrane for reliable protection against radon and ground moisture.
- Solid bond with the substrate.
- Also as an easy-to-apply solution on vertical substrates (e. g. external basement walls).
- easy to handle connection to damp proof courses.
- Immediately functional. Immediately after gluing waterproof and rainproof.

Laying on the insulation of a thermal floor slab

As a structural waterproofing membrane, DELTA®-THENE not only provides protection against ground moisture and non-pressing water, but also forms a radon gas-tight envelope. Thanks to the self-adhesive underside, the membrane is ready for use immediately after application onto the insulation boards. The low thickness of only 1.5 mm allows a high degree of flexibility. The membrane can therefore be easy moulded to components.





Thermal floor slab with DELTA®-THENE below the concrete slab

Screed

Insulation

Reinforced concrete floor slab

DELTA®-THENE

Insulation system

Levelling layer, chippings 4/8, Thickness: 3 to 5 cm

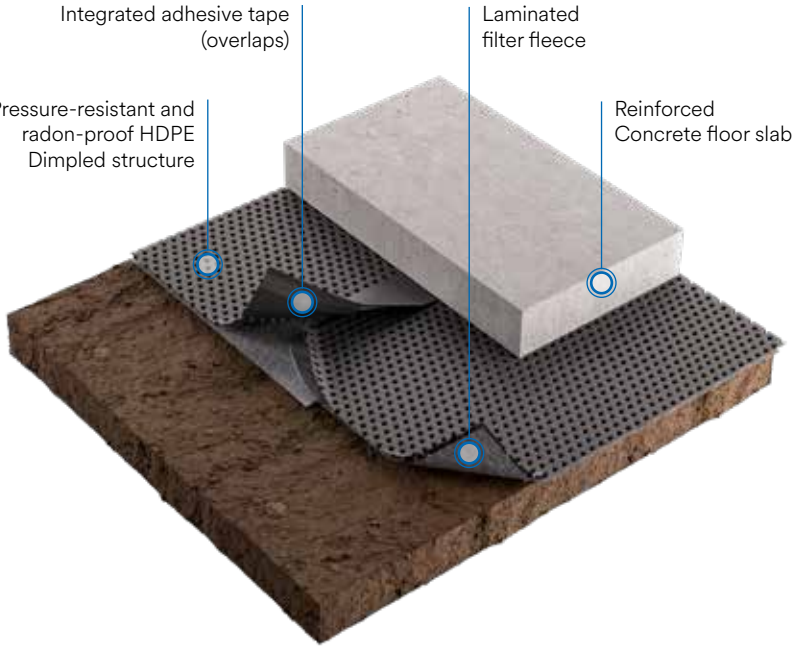
Capillary-breaking layer / Subgrade, e. g. gravel 0/45

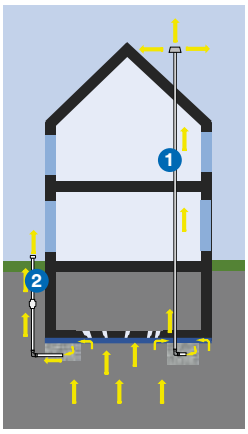
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DELTA®-TERRAXX

The structured 2-in-1 radon-proof and -draining system.

The 2-layer composite material consisting of a pressure-resistant dimpled sheet, a laminated filter-stable geotextile (GRK 2) and integrated DELTA®-TERRAXX self-adhesive edge forms both a radon-proof envelope as well as an approx. 10 mm high gas draining layer. For applications below the concrete floor slab in direct contact with the substrate (e. g. gravel layer)





1 Passive suction
(natural buoyancy)
Radon deflection system

2 Active extraction
(fan insert)

The advantages at a glance

- Controlled and reliable water and radon drainage.
- 1 layer / 3 functions: Blinding layer, radon sealing and drainage.
- Significantly lower installation height and complexity than with mineral drainage layers with filter fleece and radon seal (10 mm vs > 200 mm).
- No waiting time between laying the membrane and concreting of the floor slab.
- No seepage of the cement paste.
- Very low settlement due to high compressive strength of the dimpled structure and low elongation of the fleece for a permanent drainage function.
- Tested long-term durability of 100 years.

Combined water and radon management

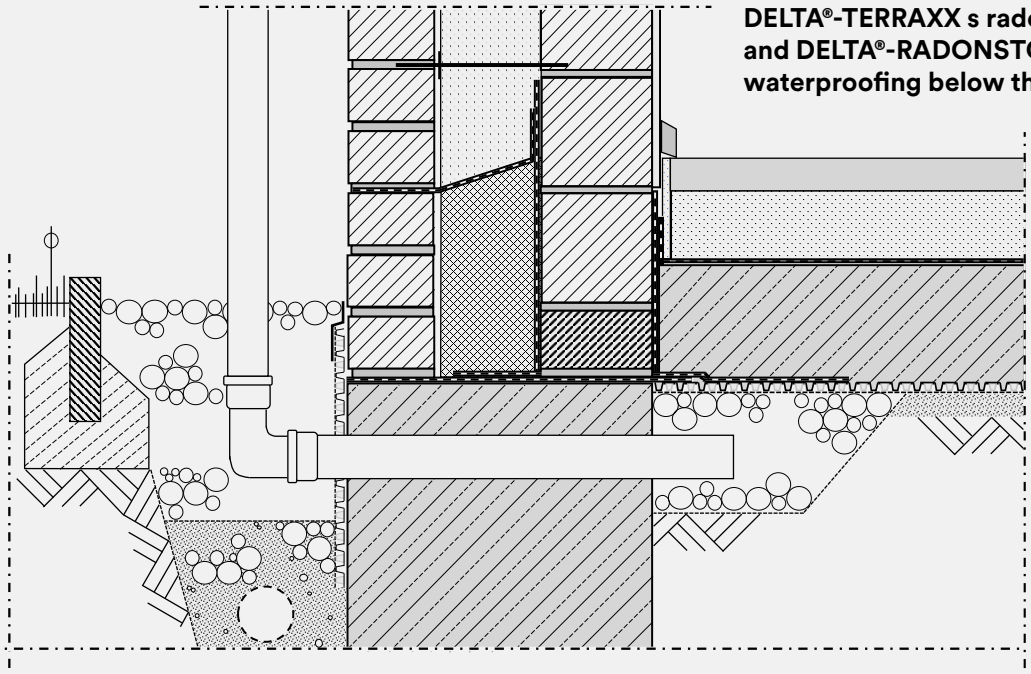
Combined water and radon management If water is to be drained at certain points below the drainage, it can be advantageous to combine radon drainage with water drainage (mixed radon + water drainage system). The structure of DELTA®-TERRAXX must not be permanently filled with water, because then the drainage level would no longer generate negative pressure.

Radon diversion system

The radon draining DELTA®-TERRAXX membrane ensures in conjunction with a ventilation duct for the free radon removal or activation of the radon bypass system. This can be achieved with passive (by thermal draught) or active (with a fan) systems.

DELTA®-radon protection system

DELTA®-TERRAXX s radon gas drainage and DELTA®-RADONSTOP LIGHT as waterproofing below the concrete base



Screed

Insulation

DELTA®-RADONSTOP ULTRA
DELTA®-THENE, DELTA®-DPC 500

Reinforced concrete floor slab

DELTA®-TERRAXX
with fleece facing downwards

Sand layer, thickness: 3 to 5 cm

Soil

Technical overview



DELTA®-RADONSTOP LIGHT



DELTA®-RADONSPERRE 460

Material	Black polyolefin, slip-resistant profiled (top and underside)	Black polyolefin, slip-resistant profiled (top and underside)
Reaction to fire	Class E, EN 13501-1	Class E, EN 13501-1
Mass per unit area	ca. 280 g/m², EN 1849-2	ca. 460 g/m², EN 1849-2
Thickness	ca. 0,4 mm, EN 1849-2	ca. 0.7 mm, EN 1849-2
Maximum tensile strength MD/CMD	ca. 250/160 N/5 cm, EN 12311-2	ca. 350/250 N/5 cm, EN 12311-2
Elongation at maximum tensile strength MD/CMD	ca. 80/80 %, EN 12311-2	ca. 80/80 %, EN 12311-2
Tear resistance MD/CMD	ca. 100/100 N, EN 12310-1	>120 / >120 N, EN 12310-1
Durability of the watertightness against artificial ageing and chemicals	passed, EN 1296 and 1847	passed, EN 1296 and 1847
Water vapour permeability (S_d)	ca. 95 m, EN 1931	ca. 195 m, EN 1931
Folding at low temperatures ≤	-40 °C, EN 495-5	-25 °C, EN 495-5
Radon diffusion coefficient	$5.8 \cdot 10^{-12}$ m²/s	$< 5.8 \cdot 10^{-12}$ m²/s
CE conformity	EN 13967	EN 13967
Roll dimensions	25 m × 4 m	25 m × 4 m
Roll weight	ca. 28 kg	ca. 46 kg
Application type (according to DIN SPEC 20000-202)	–	–
Water exposure class (according to DIN 18533)	–	–
Room utilisation class (according to DIN 18533)	–	–
Crack class (according to DIN 18533)	–	–
Compressive strength (short-term compression behaviour)	–	–
Compression under compressive stress 1,008 h (compression creep)	–	–







	DELTA®-RADONSTOP ULTRA	DELTA®-THENE	DELTA®-TERRAXX
	PE film composite with aluminium layer and reinforcing fabric.	Bitumen rubber compound as sealing and adhesive layer with cross-laminated special HDPE cover film	Dimpled structure made of high-density polyethylene (PE-HD) combined with a welded-on polypropylene geotextile (GRK 2) and a self-adhesive edge.
	Class E, EN 13501-1	Class E, EN 13501-1	E (in combination with a non-combustible substrate)
	ca. 350 g/m², EN 1849-2	ca. 1,600 g/m², EN 1849-2	ca. 710 g/m², EN 1849-2
	ca. 0.6 mm, EN 1849-2	≥ 1.5 mm, EN 1849-2	ca. 0.6 mm, EN 1849-2
	ca. 530/450 N/5 cm, EN 12311-2	ca. 290/250 N/5 cm, EN 12311-2	15.7/14.9 kN/m, EN 10319
	ca. 17/18 %, EN 12311-2	≥ 150%, EN 12311-2	ca. 52 % / 47 %, EN 10319
	ca. 470/520 N, EN 12310-1	ca. 180/200 N, EN 12310-1	ca. 180/200 N, EN 12310-1
	passed, EN 1296 and 1847	passed, EN 1296 and 1847	passed, EN 1296 and 1847
	> 1,500 m, EN 1931	≥ 170 m, EN 1931	> 100 m
	-45 °C, EN 495-5	-30 °C, EN 495-5	-40°C, EN 1109
	$1.4 \cdot 10^{-13}$ m²/s	$< 1.0 \cdot 10^{-11}$ m²/s	ca. $5.0 \cdot 10^{-12}$ m²/s
	EN 13967	EN 13909	EN 13252
	40 m × 1.50 m	20 m × 1.0 m / 5 m × 1.0 m	12.5 m × 2.40 m
	ca. 22 kg	ca. 38 kg / ca. 8 kg	ca. 22 kg
	–	BA; MSB-nQ	-
	–	W1-E (W1.1-E, W1.2-E) and W4-E	-
	–	RN1 to RN3	-
	–	R1-E to R3-E	-
	–	–	< 4 % at 100 kPa, EN 25619-1
	–	–	ca. 400 kN/m², EN 25619-2

Radon tightness with system

DELTA® accessory products for consistent quality.

To create a complete, perfectly harmonised and high-quality radon sealing system, we offer you various system components in addition to the flat radon sealing membrane DELTA®-RADONSTOP. These are tailored to a wide variety of requirements and conditions and serve as the perfect complement.



DELTA®-THENE BAND T 150

Adhesive tape for bonding the overlaps of DELTA®-RADONSTOP. For applications below the floor slab.

Material	Combination of cross-laminated special HDPE film and a sealing and adhesive layer made of bitumen rubber
Thickness	ca. 1.5 mm
Radon diffusion coefficient	< 1.0 · 10^{-11} m²/s
Roll dimension	150 mm × 10 m
Processing temperature	+5 to +30 °C
Functional area	-30 to +80 °C
Packaging	2 rolls/carton, 90 rolls/pallet



DELTA-MULTI-BAND® M 100 / DELTA-MULTI-BAND® FLEXX 100

Universal adhesive tape for bonding the overlaps of DELTA®-RADONSTOP. For applications above the floor slab.

Material	Solvent-free and plasticiser-free pure acrylic adhesive on grid-reinforced UV-stabilised cover film with release paper.
Radon diffusion coefficient	< 1.0 · 10^{-11} m²/s
Roll dimension	100 mm × 25 m
Processing temperature	+5 to +30 °C (DELTA-MULTI-BAND® M 100) -5 to +30 °C (DELTA-MULTI-BAND® FLEXX 100)
Functional area	-30 to +80 °C
Packaging	6 rolls/carton, 510 rolls/pallet



DELTA®-FLEXX-BAND FG 80 / 150

Expandable connection and sealing tapes for sealing electrical sockets and cables (FG 80) or pipe penetrations (FG 150).

Material	Expandable cold-welding butyl rubber adhesive on a longitudinal and transverse PE film with high elongation in longitudinal and transverse direction
Thickness	ca. 2 mm
Radon diffusion coefficient	ca. 2.9 · 10^{-12} m²/s
Roll dimension	80 mm × 6 m (FG 80), 150 mm × 10 m (FG 150)
Processing temperature	+5 to +30 °C
Functional area	-30 to +80 °C
Packaging	3 rolls/carton and 288 rolls/pallet (FG 80), 4 rolls/carton and 120 rolls/pallet (FG 150)



DELTA®-TILAXX ULTRA

Universally applicable, high-performance, permanently elastic sealing and bonding adhesive for exterior and interior applications. The cartridge adhesive is highly resistant to ageing, weather and water resistant, solvent-free and can be used at temperatures from 0 °C.

Material	Hybrid adhesive based on MS polymers (modified silanes)
Recommended track width	ca. 6 – 8 mm
Consumption	approx. 6 – 7 metres/cartridge
Filling weight	290 ml per cartridge
Processing temperature	from 0 °C ambient and component temperature (frost-free)
Functional area	-30 to +80 °C
Packaging	12 cartridges/carton and 84 cartons/pallet



DELTA®-THAN

Permanently elastic adhesive made from special rubber for bonding and joining in outdoor areas. It offers the best security for wall connections. Filling weight: 310 ml per cartridge / 600 ml per tubular bag.

Material	Permanently elastic solvent-based cartridge adhesive made of special rubber
Recommended track width	ca. 6 – 8 mm
Consumption	approx. 7 metres/cartridge (310 ml)
Processing temperature	+5 to +30 °C
Functional area	-30 to +80 °C
Packaging	12 cartridges/carton and 84 cartons/pallet



DELTA®-THENE INNENECKE and DELTA®-THENE AUSSENECKE

Especially for corners. Flexible plastic moulded parts for securely sealing corners in the foundation area or plinth formations.

Material	Thermoplastic elastomer
Thickness	ca. 2 mm
Dimension inside corner	ca. 100 × 100 × 100 mm
Dimension outside corner	ca. 200 × 200 × 100 mm
Processing temperature	+5 to +30 °C
Functional area	-30 to +80 °C
Packaging	20 pieces/carton, 100 cartons/pallet



DELTA®-PROTEKT

Damp proof courses according to DIN 18533, application type MSB-Q, for use as radon-barrier horizontal cross-section sealing in and under walls.

Material	EVA sealing layer with double-sided PP fleece lamination on both sides
Thickness	ca. 1.2 mm
Radon diffusion coefficient	$< 1.0 \cdot 10^{-11}$ m²/s
Roll dimension	25 m × 0.115 / 0.175 / 0.20 / 0.24 / 0.25 / 0.30 / 0.365 / 0.50 / 0.60 / 0.75 / 1.00 m
Processing temperature	+5 to +30 °C
Functional area	-30 to +80 °C
Packaging	0.115: 100 rolls/palette 0.175 / 0.20 / 0.24 / 0.25: 80 rolls/palette 0.30: 60 rolls/palette 0.365 / 0.50 / 0.60: 40 rolls/palette

Essential installation instructions – Surface and overlap



Laying

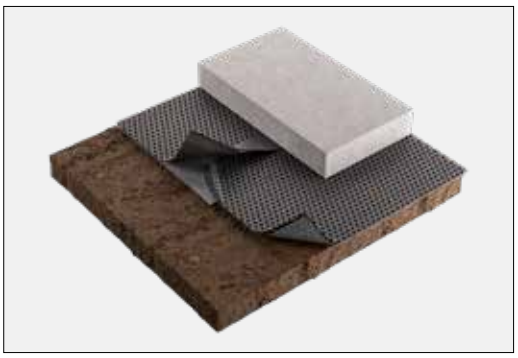
- The substrate must be level, pressure-resistant, clean, free from foreign bodies, ridges, gravel pockets and cavities.
- The membrane is laid loosely on the substrate.
- The overlaps (10 cm) in the longitudinal direction are bonded with DELTA®-THENE-BAND T 150 (laying below the floor slab) or DELTA-MULTI-BAND® M 100 / DELTA-MULTI-BAND® FLEXX 100 (installation above the floor slab). With DELTA®-RADONSTOP ULTRA, the overlaps are made with the self-adhesive edges of the sheet.
- The overlaps (10 cm) in the transverse direction are bonded with DELTA®-THENE-BAND T 150 or DELTA-MULTI-BAND® M 100 / DELTA-MULTI-BAND® FLEXX 100. The strip must be positioned in the centre. Both the longitudinal and transverse overlaps must be pressed firmly with a pressure roller.

Essential installation instructions - Surface and overlap



Additional instructions for laying the self-adhesive DELTA®-THENE

- The substrate must be level, pressure-resistant, clean, free from foreign bodies, ridges, gravel pockets and cavities.
- All mineral substrates must be coated with DELTA®-THENE GRUNDANSTRICH or DELTA®-THENE GRUND INSIDE (solvent-free).
- Unroll DELTA®-THENE and cut to the required length, align and remove the release paper for laying / bonding and press on the sheet.
- Execution of the integrated overlap bonding: Remove the blue cover strip attached to one side of the edge and press the overlapping sheet onto the underlapping sheet.



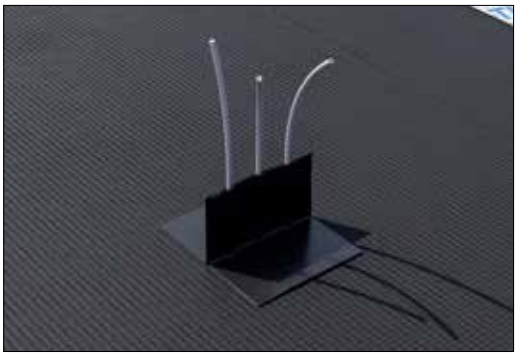
Additional instructions for laying DELTA®-TERRAXX

- DELTA®-TERRAXX is used as a draining and sealing protective layer against radon and rising damp on a level substrate (if necessary on a layer of sand approx. 3 cm thick) with the fleece facing downwards.
- If an additional radon-proof membrane (e. g. DELTA®-RADONSTOP LIGHT, DELTA®-RADONSTOP ULTRA, DELTA®-THENE) is laid above the floor slab, the longitudinal overlaps can be realised with the integrated self-adhesive edge. (see drawing on page 18).
- If DELTA®-TERRAXX fulfils both the gas-draining and radon sealing function, the longitudinal overlaps are additionally bonded with the adhesive tape DELTA®-THENE-BAND T 150.
- Transverse joints are sealed by a 20 cm wide overlap of the sheets and subsequent overlapping with DELTA®-THENE-BAND T 150.

Please provide desired link

Further installation instructions: DELTA®-THENE

Important installation instructions – Penetrations and connections

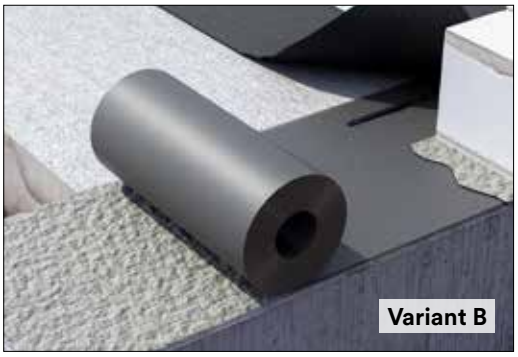






Penetrations
Penetrations in the floor slab must be individually sealed with DELTA®-FLEXX-BAND FG 80 / F 100 (e. g. cables, thin pipes) or with DELTA®-FLEXX-TAPE FG 150 (e. g. pipes). A minimum overlap of 10 cm must be maintained in each case.





Wall connection

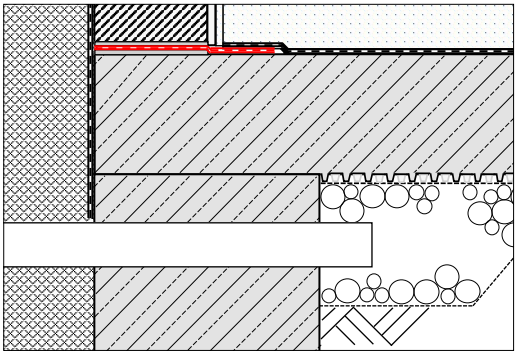
- Variant A: DELTA®-RADONSTOP is installed on the wall at right angles up to the upper edge of the screed and sealed with a DELTA®-THAN or DELTA®-TILAXX ULTRA bead. Then mechanically secure the upper edge of the sheet e. g. with disc-headed nails in the masonry joints at a distance of approx. 50 – 70 cm.
- Variant B: DELTA®-RADONSTOP is attached to the DELTA®-PROTEKT damp proof course under the wall with a DELTA®-THAN or DELTA®-TILAXX ULTRA bead.

Important installation instructions – Penetrations and connections

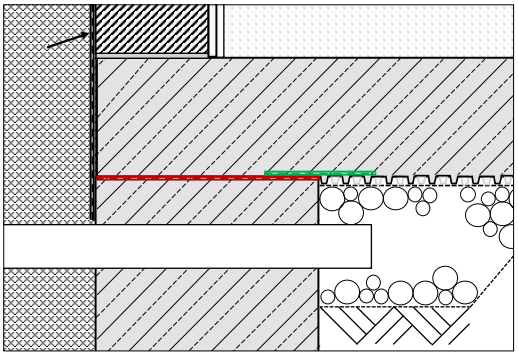


Corner formation – inside corners
DELTA®-RADONSTOP is run up the wall. This creates a fold in inside corners. This fold is aligned and folded over to one side. The upward-facing opening of this fold near the upper edge is bonded with DELTA®-THAN or DELTA®-TILAXX ULTRA.

Corner formation – outside corners
Cover DELTA®-RADONSTOP in the area of the corner incision with DELTA®-THENE CORNER and bond it tightly on all sides with DELTA®-THAN or DELTA®-TILAXX ULTRA.



Additional instructions for the installation of DELTA®-TERRAXX (case 1)
The radon protection is installed as drainage with DELTA®-TERRAXX below the floor slab and as a radon seal with DELTA®-RADONSTOP LIGHT floor slab. DELTA®-TERRAXX is laid without any further bonded connection to the strip foundation.



Additional instructions for the installation of DELTA®-TERRAXX (case 2)
Radon protection is provided as drainage and radon seal exclusively below the floor slab with DELTA®-TERRAXX. The membrane is attached to the strip foundation by means of DELTA®-THENE BAND T 150.

Further installation instructions: DELTA®-THENE

Please provide desired link

DÖRKEN

Dörken GmbH & Co. KG
Wetterstraße 58
58313 Herdecke

+49 23 30/63-636
+49 23 30/63-357
membranes@doerken.de
www.doerken.com

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