

For more information on Delta Membrane Systems visit [www.barbourproductsearch.info](http://www.barbourproductsearch.info)

# DELTA<sup>®</sup>

DELTA<sup>®</sup> protects property. Saves energy. Creates comfort.

**DÖRKEN**

## DELTA<sup>®</sup>-MS Sub-base Course

### Fast safety that lasts.

Tested concrete substitute.  
High compressive strength.



■ Protection system

■ For construction and civil engineering

■ For horizontal applications

STANDARD QUALITY

**An ideal alternative to traditional lean-concrete sub-base courses? DELTA®, of course!**



■ **DELTA®-MS Sub-base Course**

General building regulations require that foundation slabs must be laid on a specially-prepared sub-base course. When made of lean concrete, which is normally done, this calls for 5 centimetres more excavation depth. The implications: Higher labour and equipment costs and a waiting period during construction, factors that have a very negative impact, particularly where large surfaces are involved.

Laid out straight from the roll on many construction sites, ever since 1986, DELTA®-MS Sub-base Course represents an ideal alternative. With its obvious advantages, the system immediately pays for itself: Very high compressive strength, faster installation, no equipment costs, no extra excavation, and no waiting. What is more, DELTA®-MS Sub-base Course protects the foundation walls and keeps cement grout from seeping into the ground.

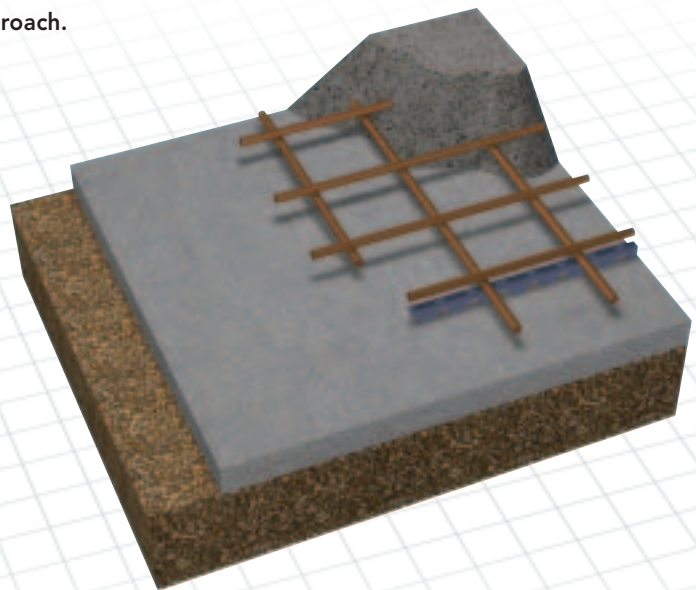
DELTA® quality branded products made by Dörken. Certified by Prof. Dr. Heckötter, Münster University of Applied Sciences, Laboratory for Soil Mechanics, Earth Works, and Foundation Engineering.

**Better quality plus lower installation costs:**

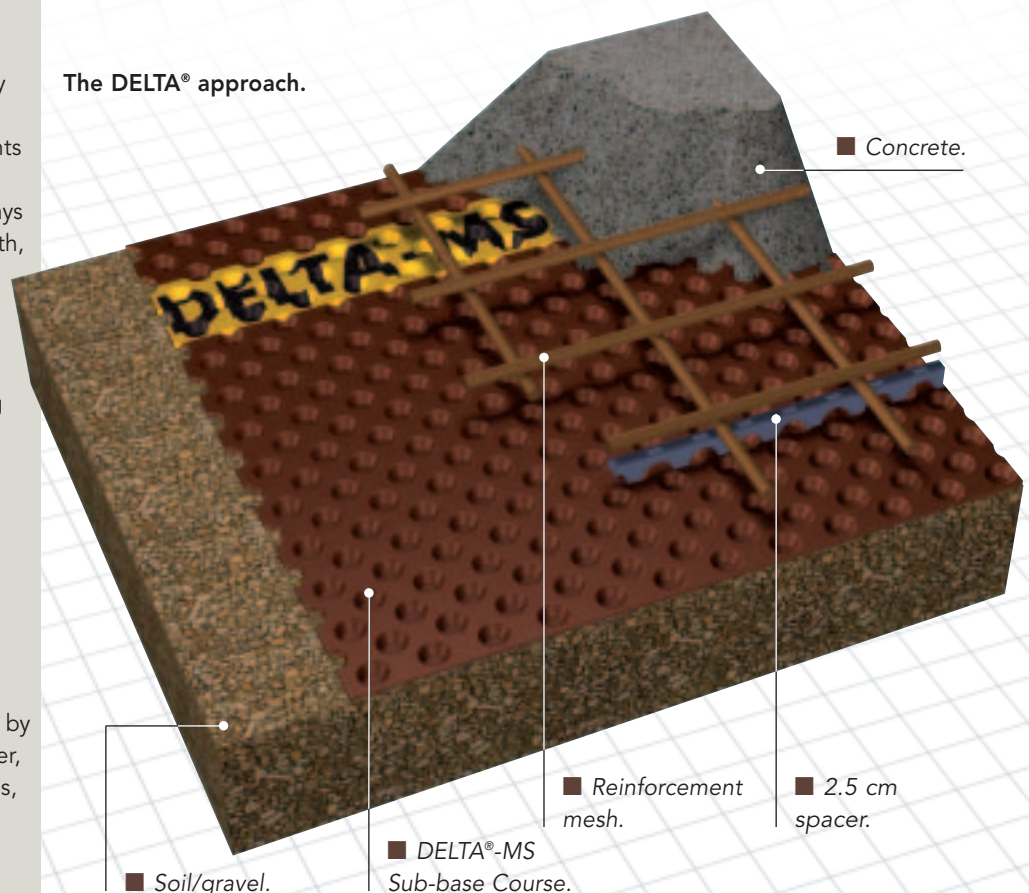
# DELTA®-MS Sub-base

## Good pressure distribution. Fast

The classic approach.



The DELTA® approach.



STANDARD QUALITY



Sheets can be rolled out easily and quickly.

Overlaps should be 20 cm minimum.

Reinforcement-mesh spacers are safely held in place.

# se Course

## st application. Protects foundation slabs.

### DELTA®-MS Sub-base Course ...

- ... consists of a dimpled sheet made of special high-density polyethylene.
- ... ensures good pressure distribution and low point loads through its more than 1,800 dimples per m<sup>2</sup>.
- ... is 100% recyclable.
- ... keeps cement grout from seeping into the ground.
- ... is laid out straight from the roll. No need for costly equipment or extra excavation.
- ... resists acids, alkalines, oils, and solvents.
- ... features a high compressive strength of c. 250 kN/m<sup>2</sup>.
- ... will bear the weight of workers and wheelbarrows.
- ... safely holds reinforcement-mesh spacers in place.
- ... additionally protects the foundation slab from rising damp.
- ... is safe for drinking water and resists root penetration and rot.



DELTA®-MS Sub-base Course will bear the weight of workers and wheelbarrows, saving time and money.



### The right solution for every problem.

Simply roll out the sheets of DELTA®-MS Sub-base Course on level compacted ground. They offer fast, enduring safety under all conditions.

#### Building construction

Ideal for seepage-absorbing ground.

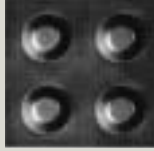








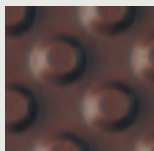
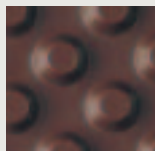
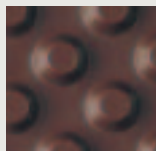
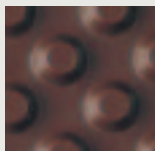
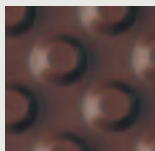
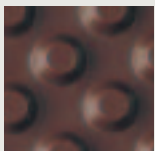
#### Underground construction and civil engineering

Safe pressure-free drainage of seepage, fissure, and underground water.

#### Cast concrete floors

Laid out under a cast concrete floor, DELTA®-MS Sub-base Course offers safety from rising damp.

**This 168-hours benchmark load test proves:  
DELTA®-MS Sub-base Course is more durable, better, and safer.**

	Start of test	24 hours	30 hours	40 hours	66 hours	...	168 hours
Foundation protection 1		 After 24 hours: Stress cracks and material fragmentation.					
Foundation protection 2			 After 30 hours: Stress cracks and material fragmentation.				
Foundation protection 3				 After 40 hours: Stress cracks and material fragmentation.			
DELTA®-foundation protection; example: DELTA®-MS Sub-base Course						...	

**Your choice:  
Either take a risk, or take advantage of the guaranteed quality of DELTA®-MS Sub-base Course.**



**Test procedure.**

Specimens with 9 dimples each were placed in a square stainless-steel cylinder and exposed to a square test weight of c. 24.5 kg (equivalent to a load of c. 5 t/m<sup>2</sup>). As a wetting agent, the cylinder was filled with tap water to which 2% marlophen 812 had been added to lower interface tension. Specimens were stored in a drying oven at 55 °C and visually inspected once a day for stress cracking.

Assessment criteria: Each sample consisted of no less than 4 specimens of equal weight and configuration. The scope of this test did not include rotting properties (bacterial material degradation) but was confined to the potential attack of chemical substances that might be present in the environment of the dimpled sheet.

**The undisputed winner:  
DELTA®-MS Sub-base Course – no stress cracks, no material fragmentation.**

Enhanced with special stabilisers and produced in an innovative process, DELTA®-MS Sub-base Course constitutes an ideal alternative to lean concrete.

As the above test shows, other dimpled sheets will become brittle much faster under a concrete floor slab. As a mark of their outstanding quality, the brown

sheets of DELTA®-MS Sub-base Course bear a characteristic orange stripe along their entire length.

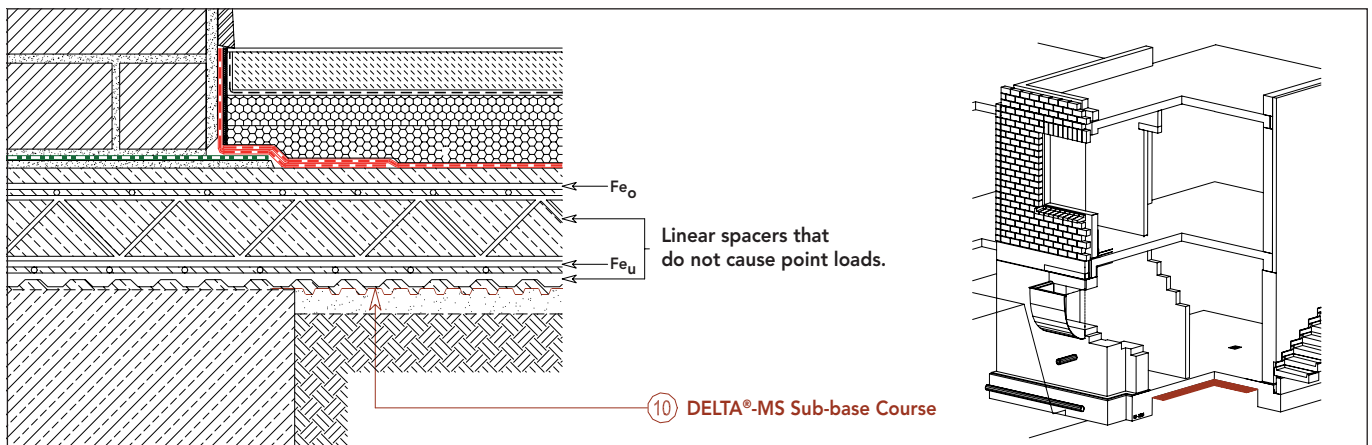


DELTA®-MS Sub-base Course offers a high degree of safety when applied under fibre concrete.



Ideal protection from damp for resin floors. A waterproof system is created by firmly bonding connections and overlaps using either DELTA®-THAN cartridge adhesive or DELTA®-THENE-BAND T 300. Before DELTA®-MS is laid out, the floor slab must be covered with about 1cm of sand to keep the sheets from shifting.

## Waterproofing options at a glance.



Schematic foundation diagram.

## Cogent cost advantages in application.

	Lean Concrete	DELTA®-MS Sub-base Course
5 cm extra excavation	100 %	n.a.
Material costs	100 %	70 – 80 %
Application	100 %	3 – 6 %
1 day's waiting	100 %	n.a.
Equipment cost: Pump	100 %	n.a.

## DELTA<sup>®</sup>-MS Sub-base Course

### Technical Data Overview:

Dimpled sheet material	Special HDPE
Dimple height	approx. 8 mm
Compressive strength	approx. 250 kN/m <sup>2</sup>
Elongation at break	approx. 60 %
Air gap between dimples	approx. 5.3 l/m <sup>2</sup>
Service temperature range	-30 °C to +80 °C
Elasticity modulus as per ISO 178	1,500 N/mm <sup>2</sup>
Roll sizes	20 m x 1.0 m 20 m x 1.5 m 20 m x 2.0 m 20 m x 2.4 m 20 m x 3.0 m

## An example from the field.



A demonstration of the high compressive strength of DELTA<sup>®</sup>-MS Sub-base Course.

DELTA<sup>®</sup> is a registered trademark of Ewald Dörken AG, Herdecke, Germany.

# DELTA<sup>®</sup>



### DELTA<sup>®</sup> System ...

#### ... for owners:

" ... What I get is a mature problem solution provided at a fair price by the top specialist in quality branded products!"

#### ... for workers:

" ... What I get is a complete system made by a single manufacturer that enables me to do anything to the owner's entire satisfaction. There is no safer way!"

#### ... for planners:

" ... I can be certain that both innovative and standard products will be used in implementing my roof and cellar plans in a systematic and forward-looking way."



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