

DRAINAGE OPTIONS

DELTA® SUMPS & PUMPS



When specifying a sealed cavity membrane system, full consideration must be given to drainage, when installed below ground.

The concept of the drained cavity system is to collect and manage any moisture which breaches the integrity of the structure by channelling, collecting, and discharging such free water via a suitable evacuation point.

Channels, laid to a nominal fall, can discharge passively into a sump or be connected to a drainage system but access for maintenance should be provided.

Access ports allow inspection and water jetting of channels, while sumps have a sealed access cover which allows for annual maintenance checks to be carried out, which are recommended.

If drainage has been installed, it should be flood tested before covering it up to make sure the system works.

Delta offer a choice of sump+pump stations to fit the purpose, and free advice is available from their technical staff.

Delta Retrofit Sumps are fitted with a dual pump system and have three 110mm side inlets to take ground water, and grey water from shower, laundry and sink waste.

DELTA® AQUADUCT

DELTA® CHANNEL



Delta Aquaduct is a drainage channel which acts as a perimeter conduit bedded in at the floor/wall angle. Where appropriate, it can be laid under the slab to take off ground water to a sump or soak away, and reduce flotation pressures from bearing on the slab.

Delta Aquaduct is fully perforated for maximum performance, and incorporates an outer geotextile filter to prevent particles from entering the channel.

The product comes on a roll 150m x 60mm diameter. It is also available in 100m x 100mm dia rolls.

Delta Channel is a water collection conduit which is bedded into a preformed channel at the floor/wall angle. Holes in the channel wall allows water to ingress at this point to drain away to a sump or soak away. Access ports are available to allow maintenance and inspection.

'FREE LIME' RISK

When new concrete forms the structure, to walls or particularly floors, there is a risk of excess free lime leaching out during the curing process. When a cavity drainage system is used in this type of application, a silicification pre-treatment of the concrete should be used to prevent the risk of free lime build up, and blockage of the drainage cavity. Delta Keisol is applied as two spray coats for this purpose, and is available in 30kg drums.

POWER FAILURE?

HELP IS AT HAND



If you've installed a cavity drained system internally, one of the main design considerations is how are you going to manage the water collection and discharge. This can be done passively into existing drainage points, if available and appropriate.

However, the majority of projects require a collection sump + pump, to automatically manage the evacuation of any water ingress. This type of unit requires mains power to operate, so what can be done if the power fails, and is coincident with high water ingress? Here are two options from Delta.

High Water Level Alarm - This system gives an audible warning if a high level situation occurs. It is fitted with it's own rechargeable battery, which is trickle charged, and will still operate in the event of mains power failure.

Delta Power-Pack - This unit is designed to run the pumps if a power failure occurs. The unit is trickle charged under normal conditions, and will auto switch to battery power if mains power fails. The unit will pump approx. 8,100 litres in back up mode but this can be upgraded by adding up to ten extra power units. Adding one unit raises the capacity to 24,300 litres.

Delta Power Pack Pumps 8,100 Ltr in back up mode & Power Unit

DELTA®-MS 500:



Cavity drainage membrane for use on walls and floors, as a waterproof system. A choice of finishes are available. Can also be used externally for waterproof protection of sub-ground structures.

Material:	high density polyethylene
Thickness:	approx. 0.6 mm
Stud height:	approx. 8 mm
Roll size:	available in clear
(With flat edge of 7 cm on one side)	2.4 x 20 m
Compressive strength:	2.0 x 20 m
Drainage capacity:	> 250 kN/m ²
	approx. 2.25 l/s · m
	approx. 135 l/min · m
	approx. 8 100 l/h · m
Air volume between studs:	approx. 5.3 l/m ²
Temperature resistance:	- 30°C to + 80°C
Chemical properties:	resistant to chemicals, resistant to root penetration, rotproof, neutral towards drinking water
Behaviour in fire:	B2 accord. to DIN 4102, in the case of special requirements possibly B1 accord. to DIN 4102 (test mark PA III 2.2087)

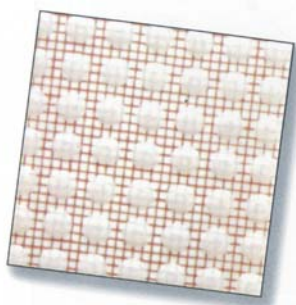
DELTA®-MS 20:



Dimpled sheeting with particularly high drainage capacity and compressive strength, suitable for high performance seepage layers in building and civil engineering construction.

Material:	high density polyethylene
Thickness:	approx. 1 mm
Stud height:	approx. 20 mm
Roll size:	2.0 x 20 m
	In the case of special requirements, also available in board format
Compressive strength:	approx. 150 kN/m ²
Drainage capacity:	approx. 10 l/s · m
	approx. 600 l/min · m
	approx. 36 100 l/h · m
Air volume between studs:	approx. 14 l/m ²
Temperature resistance:	- 30°C to + 80°C
Chemical properties:	resistant to chemicals, resistant to root penetration, rotproof, neutral towards drinking water
Behaviour in fire:	B2 accord. to DIN 4102, in the case of special requirements possibly B1 accord. to DIN 4102

DELTA®-PT:



Dimpled sheeting with plastic mesh welded on, suitable as a damp-proof base for plaster or shotcrete, e.g., as a seepage layer in tunnel construction, or for repairing basements internally.

Material:	high density polyethylene
Thickness:	approx. 0.5 mm
Stud height:	approx. 8 mm
Roll size:	2.0 x 20 m
	1.5 x 10 m
Compressive strength:	approx. 70 kN/m ²
Drainage capacity:	approx. 5 l/s · m
	approx. 300 l/min · m
	approx. 18 100 l/h · m
Void between studs:	approx. 5.5 l/m ²
Temperature resistance:	- 30°C to + 80°C
Chemical properties:	resistant to chemicals, resistant to root penetration, rotproof, neutral towards drinking water
Behaviour in fire:	B2 accord. to DIN 4102

DELTA®-FM:



DELTA®-FM is specifically designed for floor applications, to combat dampness, and contamination. The special low stud profile (3mm) minimises changes in floor levels but still provides an air gap to achieve damp pressure equalisation.

The membrane is a fast-track application that allows various floor finishes to be achieved with zero 'down time'. The R.H. levels are isolated in the air gap, and

controlled. Delta-FM can be used in new build, remedial or refurbishment projects for floors, and walls.

Material:	Virgin high-performance PE-VHD
Application:	Special low stud profile for floor. Can be used on walls
Sheet thickness:	approx. 0.6 mm
Dimple height:	approx. 3 mm
Compressive strength:	approx 140 kN/m ²
Roll dimensions:	20m x 2m (40m ²)
Volume between dimples:	approx 2.1 l/m ²
Service temperature range:	-30degC / +80degC

DELTA MEMBRANE SYSTEMS LTD.



DELTA SYSTEM 500

'Providing Waterproofing Solutions'

Uniclass L6814	EPIC F831
CI/SfB (13.9)	Ln6 (L34)

February 2006

The Sealed System

In soil retaining situations such as basements and vaults etc. The **DELTA** sealed system is recommended. The membrane selection depends on the required finish and flow rate if applicable. All membrane junctions, fixing points, service entries and other protrusions are sealed with the **DELTA** range of sealing products. Where active ground water is evident or expected drainage of one form or another should be incorporated into the specification. Our technical staff are available to give advice in this respect.

The Ventilated System

In above ground situations or in areas where no free running water is expected, for example where external pavements have been built up, the ventilated system can be used. The ventilated system with air gap at top and bottom does not require sealed joints or fixings, a 200mm overlap is sufficient in this situation. This method is seen as a sympathetic

solution in Heritage type properties as a general damp proofing system. The fabric of the building remains unchanged but the new internal surfaces are 'dry' and are salt and contamination free. Both dry lining or plaster direct finishes are available on the ventilated system.

Floors

As well as being a complete waterproofing and damp proofing system, the **DELTA** system is also used to upgrade damp and defective floors. With excellent crush resistance the system lends itself to a variety of different finishes which include conventional screeds, thin layer fast drying screeds and wood based floating floors. Insulation can also be used in conjunction with the system where required. The system can be linked to the D.P.C. constructed within a new wall or to an existing D.P.C.

Preparation

As the membrane systems are mechanically fixed there is no



reliance on the ability of the product to bond to the substrate. The **DELTA** system can be applied



to a variety of different substrates for example over existing renders or broken down bitumen coatings, etc. This can be easily achieved without detriment to the integrity of the system.

Damp Pressure Equalisation

The studded structure of the membrane allows the dampness behind the membrane to move in all directions unhindered, therefore the whole of the wall or floor surface takes the damp loading. Break downs created by weak points are eliminated. The product does not divert the problem to other areas.

Flexibility

In structures where movement or vibration can be a problem, examples being under street vaults, railway arches, and buildings constructed with movement joints,



the **DELTA** system can cope. The **DELTA** membrane has an elongation break of greater than 50%.

Speed

As there is little or no preparation required the system is by comparison quick to install. When dry finishes are used the system is a 'fast track' solution. Decoration does not need to be delayed as there is no drying process.

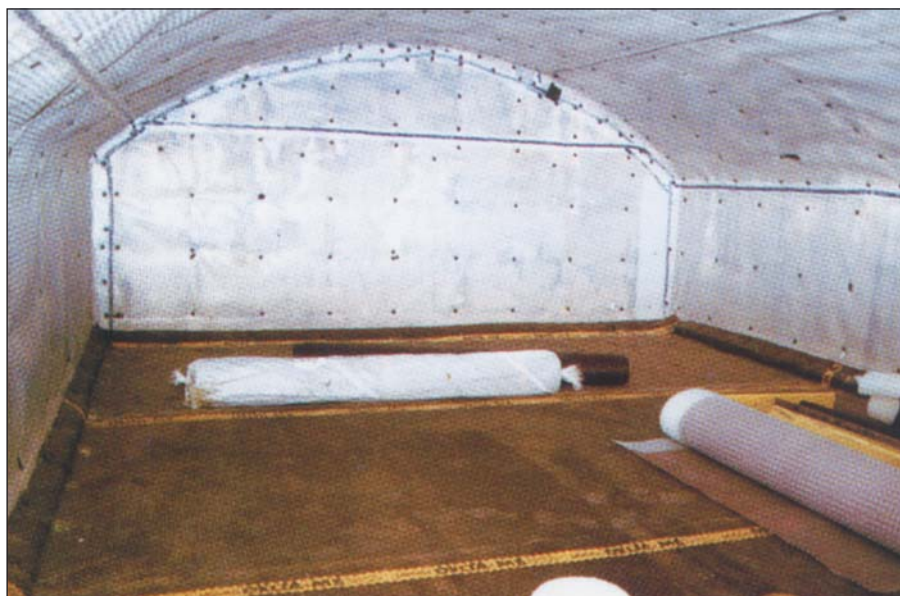
DELTA Membrane Systems are the U.K. arm of the world's largest producer of cavity drain systems. The market leading **DELTA** brand has a track record approaching three decades. The **DELTA** systems have been used successfully in many situations in the U.K, from small domestic basements up to major waterproofing projects such



as London Underground stations. There is rarely a dampness or water ingress problem that falls outside the scope of the capabilities of the **DELTA** system.

What are DELTA Systems

With the introduction of the latest Standard BS.8102:1990 'Protection of structures against water from the ground', the use of cavity



membranes has been generally accepted in the U.K. **DELTA** Systems are a complete range of products which are used together to solve many of today's problems in both new and old construction. **DELTA** Systems can easily deal with aggressive ground water conditions, where basements are liable to flooding, or indeed where simple dampness, contamination or salting problems are prevalent. Other more diverse applications include turf covered roofs, barn conversions, tunnel linings or even as a barrier against radon gas.

The main components of the system are the membranes themselves. These are manufactured from virgin high density polyethylene which is thermally and alkaline stabilised. The stud heights vary from 3mm for **DELTA-FM**, 8mm for **DELTA MS 500 & DELTA PT** to 20mm for **DELTA MS 20**. The cavity created by the membrane contains between 2.1 and 10 litres of space respectively. This is known as either the 'Air Gap' or the 'Drained Cavity', in wet situations.

The Membranes

DELTA-MS 500 This is used for walls and floors, and is supplied in 2.4, & 2m x 20m rolls. This membrane can be used for light water ingress situations, and is available yellow (**DELTA-FM**), and **clear**. The MS 500 **clear** aids the selection of good fixing points in more difficult application i.e. random stone and friable brickwork. The sealed **DELTA - Plug** is used to secure System 500, the centre shank of this fixing is also used for subsequent dry lining applications.

DELTA PT LATH This membrane has a mesh incorporated on the internal face which is attached by a thermic welding process at the time of manufacture. The sealed PT



fixing plug is used to secure the membrane at 250mm horizontal and vertical centres. The welded mesh and fixing plugs allow for direct render 1.1.6.

(cement/lime/sand), or plasters: Tarmac Whitewall, Carlite Bonding, or dab fixed plasterboard for internal applications. When this grade is used for external above ground protection polymer renders can be used as a finish. These renders are polymer modified and can also have reinforcing fibres incorporated for added strength and durability. This grade is available in clear 2.0m x 20m (40m²) or 1.5m x 10m (15m²).

DELTA MS 20 This is a heavy gauge version of System 500 with deep 20mm studs. This is used where extra drainage capacity is required, for example on deeper structures, or where a larger flow

rate is required. MS 20 can also be used as a 'cavity former' for many types of new construction. The rolls are a full 2 metre width by 20 metres in length (40m²).

Guarantee

DELTA membrane systems come with a thirty year product guarantee. The guarantee covers the membrane and ancillary components. Based on experience, accelerated ageing tests and a quality manufacturing system to ISO 9001, the DELTA range can also be guaranteed with confidence.

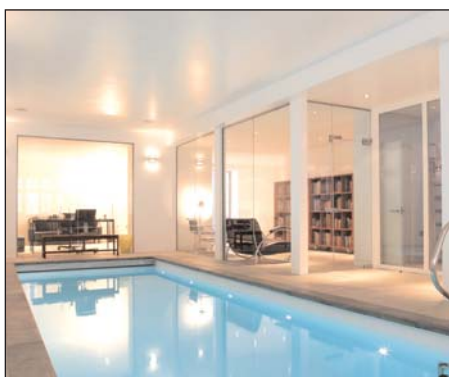
Technical site and/or office visits

Staff are available to visit site to give advice on particularly difficult or unusual situations, where appropriate specifications are prepared to assist in the correct use of the system.

Who Installs DELTA Systems

Although DELTA systems are by comparison, easy to install, it must be recognised that correct diagnosis of the problem is essential so that DELTA systems can be designed and tailored to the needs of the building, to give the best possible performance. It is therefore recommended that only competent specialist contractors, who understand dampness, and the associated problems, be employed to survey the site, install the system and thereby ensure the best possible performance of the system. DELTA systems are installed by a nationwide network of specialist contractors who are holders of 'Registered Installers' Certificates. These contractors also offer guarantees for their workmanship, giving peace of mind to the client.

COMPLETED BASEMENT PROJECTS



Leisure



Study



Photography Studio



Playroom



Home Cinema



Music Room