

# PRODUCT CATALOGUE



- **GREENFOL**
- **GREENFOL DREN**
- **TECHFOL**
- **TECHFOL DREN**



[www.plastmaster.pl](http://www.plastmaster.pl)

## Ladies and gentlemen

As a leading manufacturer of drainage geocomposites and HDPE geomembranes, basing on our long experience in the production of geosynthetics, we are expanding our range of products with two new product families, that is. **GREENFOL and TECHFOL.**

**GREENFOL and GREENFOL DRAIN** - a series of products for the accumulation of water in structures of green roofs.

**TECHFOL and TECHFOL DRAIN** - two product series, of excellent hydraulic parameters for applications where the anticipated drainage of protected structures exceeds 3 l/ms of the drainage structure.

Both families of new products are based on our innovative system of profiled membrane, height of which is 20 mm. A specially designed shape of the dimples and the precision of forming process allows them to maintain high compressive strength. The profile of dimples, developed in our company, provides high capacity of water accumulated, creating water reservoirs for plants growing on the roof. Appropriate distribution of the profiles gives the possibility of joining the sheets by overlapping, both alongside and perpendicular to the direction of covering.

We invite you also to get acquainted with our other products of **VENTFOL, HYDROFOL, DRENFOL and DRENTXILE** series on our website [www.plastmaster.pl](http://www.plastmaster.pl).  
Our all products are CE certified.

 **JEDNOSTKA NOTYFIKOWANA Nr 1488**  
**INSTYTUT TECHNIKI BUDOWLANEJ**  
**ZAKŁAD CERTYFIKACJI**  
ul. FILTROWA 1, 03-411 WARSZAWA  
tel.: (22) 57 96 167, (22) 57 96 168, fax: (22) 57 96 296  
e-mail: certyfikacja@itb.pl, www.itb.pl

 **PCA**  
AC 038

**CERTYFIKAT ZGODNOŚCI**  
**ZAKŁADOWEJ KONTROLI PRODUKCJI**

**1488-CPR-0338/Z**

Zgodnie z Rozporządzeniem Parlamentu Europejskiego i Rady (UE) Nr 305/2011 z dnia 9 marca 2011 r. (Rozporządzenie CPR), niniejszy certyfikat odnosi się do wyrobu budowlanego:

**VENTFOL (folia kubelkowa)** odnosi: Eko, Standard, Super, Strong, Extra, Power  
FOLIA HDPE DO OCIEPLAŁA PRZEDEWNIENIOWEJ I WYKONANIEJ GŁĘBIJ LUB DRENFOLY

**DRENFOL (geokompozyt)** odnosi: Folia 600+ 1000 g/m<sup>2</sup>, geowłóknina 90+ 150 g/m<sup>2</sup>  
FOLIA HDPE Z GEOWŁÓKNINĄ I FUNKCJĄ F-040 (FILTRACJA, ROZDZIELANIE, DRAINAGE)

**DRENTXILE (geokompozyt)** odnosi: Folia 600+ 1000 g/m<sup>2</sup>, geotkanina 85+ 200 g/m<sup>2</sup>  
FOLIA HDPE Z GEOTKANINĄ I FUNKCJĄ F-040 (FILTRACJA, ROZDZIELANIE, DRAINAGE)

**GREENFOL (folia kubelkowa)** odnosi: Folia 600+1000 g/m<sup>2</sup>  
FOLIA HDPE Z FUNKCJĄ D DRAINAGE

**GREENFOL DREN (geokompozyt)** odnosi: Folia 600+1000 g/m<sup>2</sup>, geowłóknina 90+ 1000 g/m<sup>2</sup>  
FOLIA HDPE POŁĄCZONA Z GEOWŁÓKNINĄ I FUNKCJĄ F-040 (FILTRACJA, DRAINAGE)

**TECHFOL (folia kubelkowa)** odnosi: Folia 600+1000 g/m<sup>2</sup>  
FOLIA HDPE DO OCIEPLAŁA PRZEDEWNIOWEJ I WYKONANIEJ GŁĘBIJ LUB DRENFOLY

**TECHFOL DREN (geokompozyt)** odnosi: Folia 600+1000 g/m<sup>2</sup>, geowłóknina 90+ 1000 g/m<sup>2</sup>  
FOLIA HDPE POŁĄCZONA Z GEOWŁÓKNINĄ I FUNKCJĄ F-040 (FILTRACJA, ROZDZIELANIE, DRAINAGE)

wyprodukowanego przez:

**PLAST MASTER TERESA I RYSZARD SUDOL**  
ul. Polna 4B  
37-100 Łańcut

w zakładzie produkcyjnym:

**PLAST MASTER TERESA I RYSZARD SUDOL**  
ul. Polna 4B  
37-100 Łańcut

Niniejszy certyfikat potwierdza, że wszystkie postanowienia dotyczące oceny i weryfikacji stałości właściwości użytkowych, określone w załączniku ZA norm:

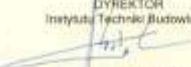
**EN 13252:2000, EN 13252:2002/A1:2005, EN 13967:2012,**  
(odpowiedniki krajowe: PN-EN 13252:2002, PN-EN 13252:2002/A1:2006, PN-EN 13967:2012)

w systemie 2+ w odniesieniu do właściwości użytkowych określonych w niniejszym certyfikacie są stosowane oraz, że:

zakładowa kontrola produkcji spełnia wszystkie wymagania określone dla tych właściwości użytkowych.

Niniejszy certyfikat został wydany po raz pierwszy 19.08.2013 (zakładzono 12.08.2014, 30.07.2015) pozostałe zmiany, dopóki nie zmienią się metody badań lub wymagania dotyczące zakładowej kontroli produkcji, zawarte w zharmonizowanych normach, zastosowane do oceny właściwości użytkowych zadeklarowanych zasadniczych charakterystyk oraz sam wyrob budowlany i warunki jego wytwarzania nie ulegną istotnej zmianie oraz pod warunkiem, że nie zostanie zawieszony lub wycofany przez jednostkę certyfikującą zakładową kontrolę produkcji.

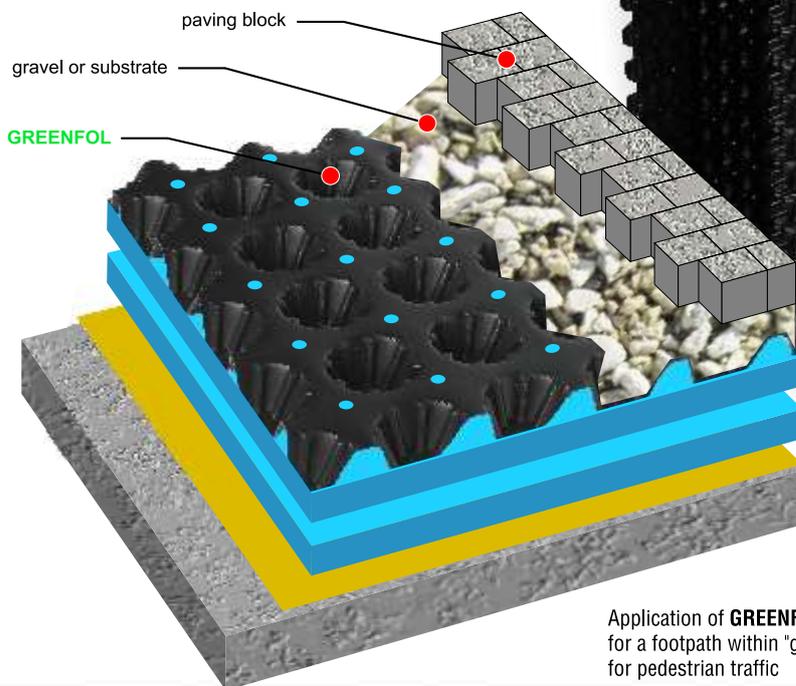
ZASTĘPCA KIEROWNIKA  
Zakładu Certyfikacji  
  
mgr inż. Piotr Maciejak

  
DIREKTOR  
Instytutu Techniki Budowlanej  
  
dr inż. Marcin M. Kruk

Warszawa, 30.07.2015

# GREENFOL GEOMEMBRANE

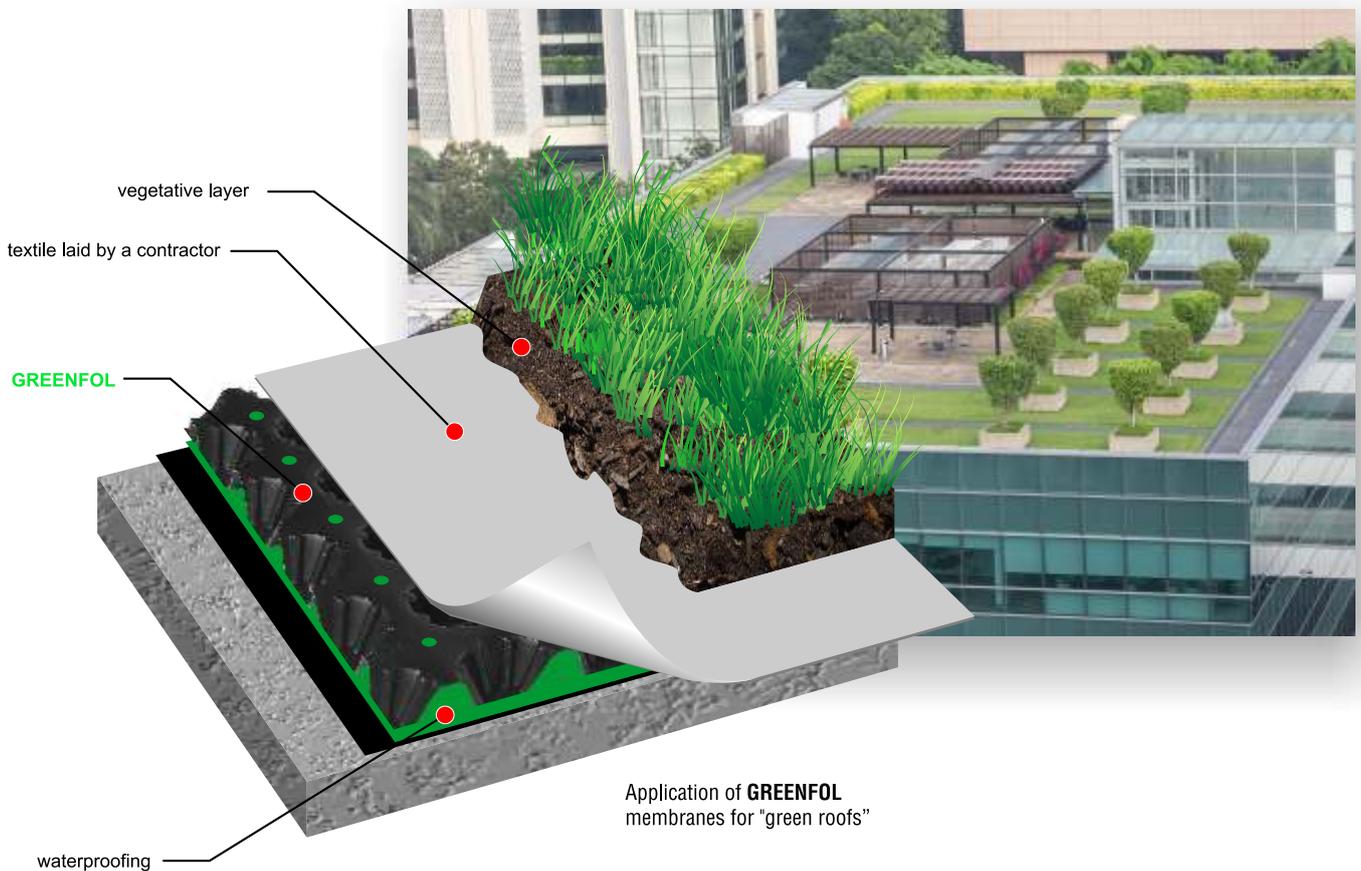
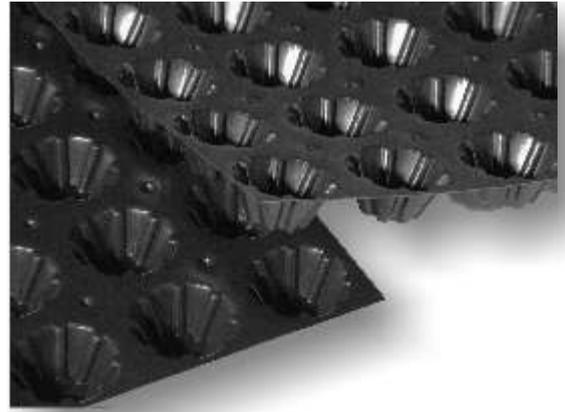
**GREENFOL** is a series of dimpled geomembranes, intended for the construction of green roof systems. Made with the surface mass of 600-1000 g/m<sup>2</sup>. When geomembrane is laid on the roof surface its top side forms a water reservoir of the nominal capacity of up to 7 l/m<sup>2</sup>. The bottom side, through its dimples of 20 mm high, creates an air gap providing the air flow and draining the excess water to the green roof gutter systems. Specially developed dense perforation of approximately 400 holes/m<sup>2</sup> in the top part of the membrane, ensures the excess water to flow to the bottom (drainage) side of the green roof system, preventing water retention in the form of spills during heavy rainfall or autumn-spring season. The construction also allows to fill dimples with, for example, gravel or other aggregate thus increasing several times the resistance to pressure. When a project provides the use of an integral separation-filtration layer in the form of any kind of geotextiles, the unique "ribbed" design of dimples provides excellent strength exceeding 250 kN/m<sup>2</sup>, and this allows the use of **GREENFOL** membrane for the construction of green roofs designed for pedestrian and light vehicular traffic.



Application of **GREENFOL** geomembrane for a footpath within "green roof" area for pedestrian traffic

## INSTALLATION METHOD

**GREENFOL** membrane is supplied in rolls. Its installation is done by simply laying on the protected surface. The membrane shall be overlapped. Each of joined sheets shall overlap by a minimum of one row of dimples. The installation process must be scheduled in such a way as to reduce membrane cutting, to avoid damage to the dimples. The membrane can be laid along as well as across the covered surface without losing its hydraulic and mechanical properties. When installing the membrane in order to protect it from uplifting during wind gusts and from overheating during intense sunlight, the membrane shall be ballasted with water. Before laying the membrane, previously completed construction works have to be accepted, for example, thermal insulation, damp insulation, rain water collecting system installation, etc. The water collecting dimples can be filled with appropriate aggregate, for example, gravel. The top surface can be separated from the substrate layers with a suitable geotextile. When using our geomembranes, always follow the installation guidelines contained in the work technical design.



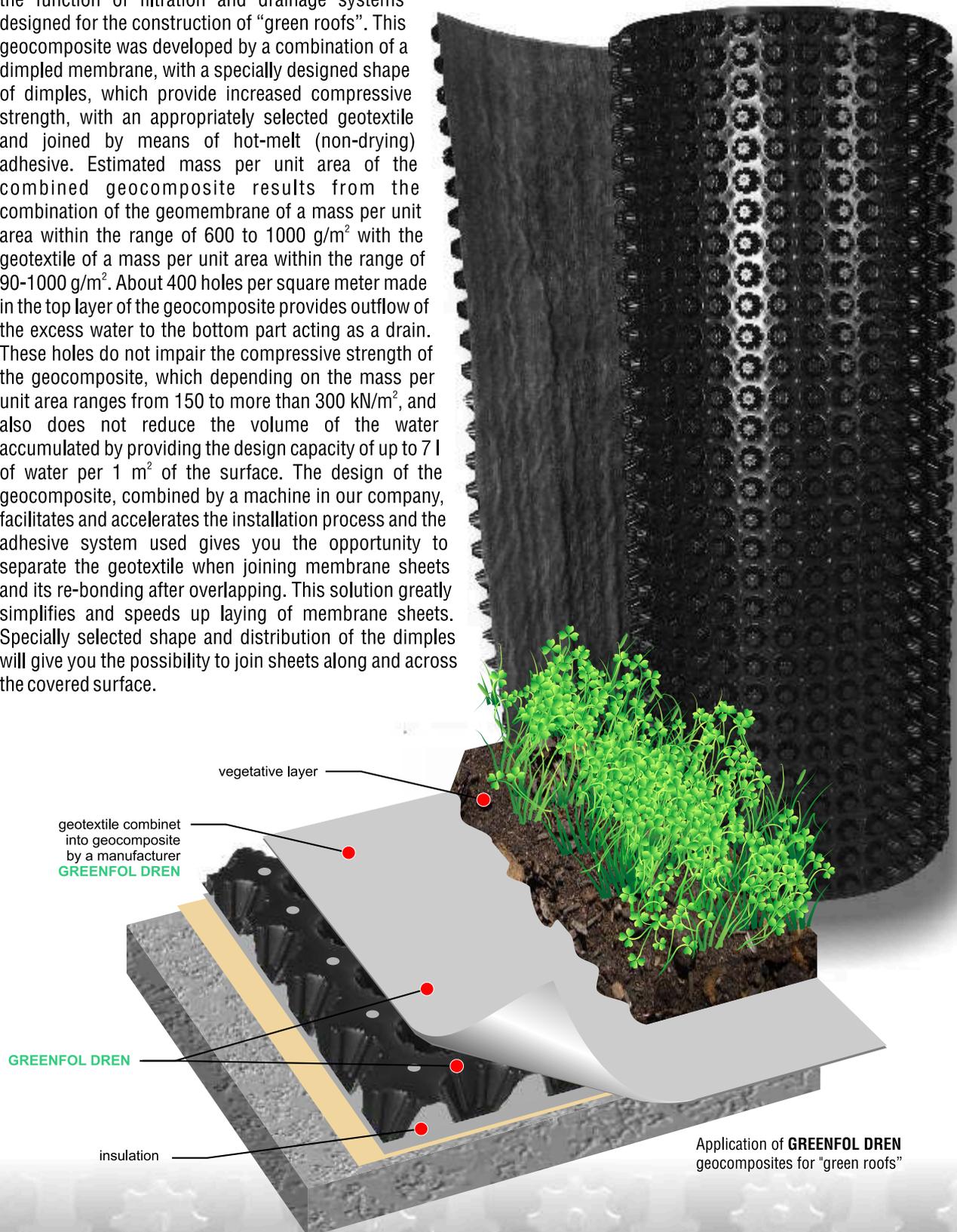
Application of **GREENFOL** membranes for "green roofs"

## TRANSPORT AND STORAGE

**GREENFOL** membranes are supplied in rolls with a width of 3 m, rolls are secured and labelled, and CE marked. During transport and storage, the product should be protected from mechanical damages and high temperatures. For longer storage periods, membrane rolls shall be stored upright.

# GREENFOL DREN GEOCOMPOSITES

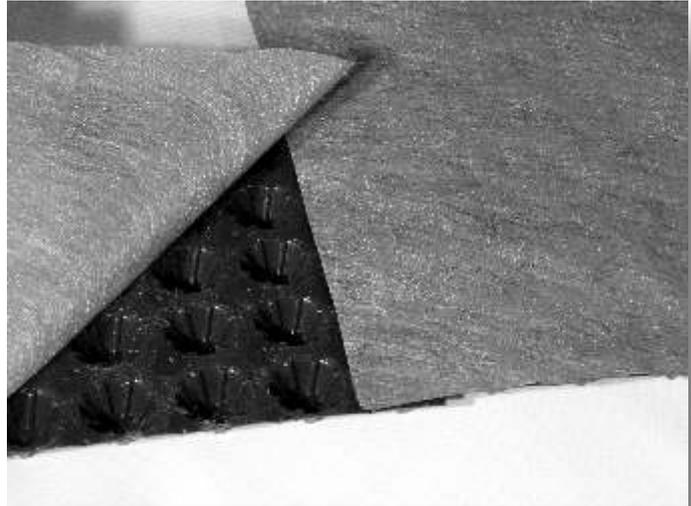
**GREENFOL DREN** is a series geocomposites with the function of filtration and drainage systems designed for the construction of "green roofs". This geocomposite was developed by a combination of a dimpled membrane, with a specially designed shape of dimples, which provide increased compressive strength, with an appropriately selected geotextile and joined by means of hot-melt (non-drying) adhesive. Estimated mass per unit area of the combined geocomposite results from the combination of the geomembrane of a mass per unit area within the range of 600 to 1000 g/m<sup>2</sup> with the geotextile of a mass per unit area within the range of 90-1000 g/m<sup>2</sup>. About 400 holes per square meter made in the top layer of the geocomposite provides outflow of the excess water to the bottom part acting as a drain. These holes do not impair the compressive strength of the geocomposite, which depending on the mass per unit area ranges from 150 to more than 300 kN/m<sup>2</sup>, and also does not reduce the volume of the water accumulated by providing the design capacity of up to 7 l of water per 1 m<sup>2</sup> of the surface. The design of the geocomposite, combined by a machine in our company, facilitates and accelerates the installation process and the adhesive system used gives you the opportunity to separate the geotextile when joining membrane sheets and its re-bonding after overlapping. This solution greatly simplifies and speeds up laying of membrane sheets. Specially selected shape and distribution of the dimples will give you the possibility to join sheets along and across the covered surface.



Application of **GREENFOL DREN** geocomposites for "green roofs"

## INSTALLATION METHOD

GREENFOL DREN geocomposite is supplied in rolls. Its installation is done by laying on the protected surface. The geocomposite sheets shall be overlapped. To make the overlap, you shall separate the geotextile and, after having the overlap made, re-bond it. Each of joined sheets shall overlap by a minimum of one row of dimples. The installation process must be scheduled in such a way as to reduce membrane cutting, to avoid damage to the dimples. The geocomposite can be laid along as well as across the covered surface without losing its hydraulic and mechanical properties. When installing the geocomposite in order to protect it from uplifting during wind gusts and from overheating during intense sunlight, the geocomposite shall be ballasted with water. Before laying the membrane, previously completed construction works have to be accepted, for example, thermal insulation, damp insulation, rain water collecting system installation, etc. When using our geomembranes, always follow the installation guidelines contained in the work technical design.

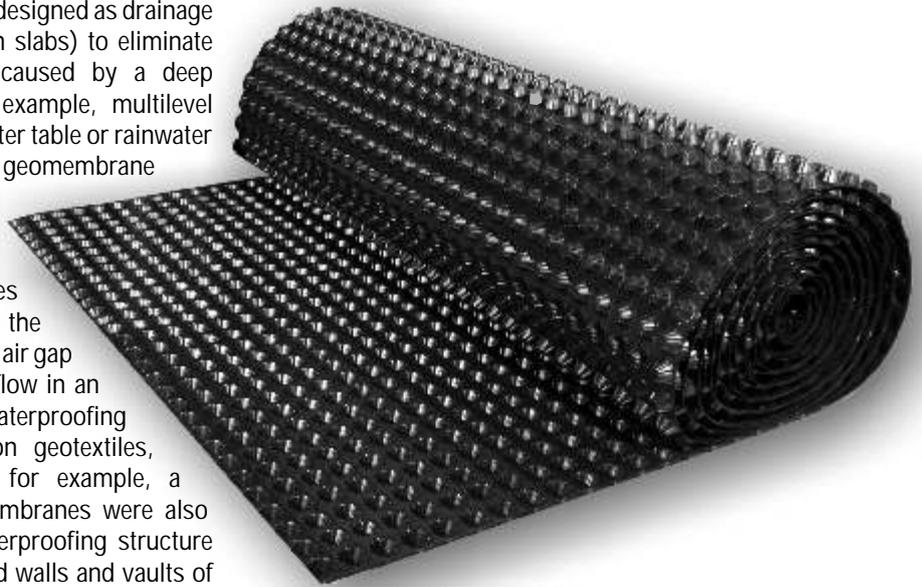


## TRANSPORT AND STORAGE

GREENFOL DREN geocomposite is supplied in rolls, rolls are secured and labelled, and CE marked. During transport and storage, the product should be protected from mechanical damages and high temperatures. For longer storage periods, membrane rolls shall be stored upright and protected against sunlight.

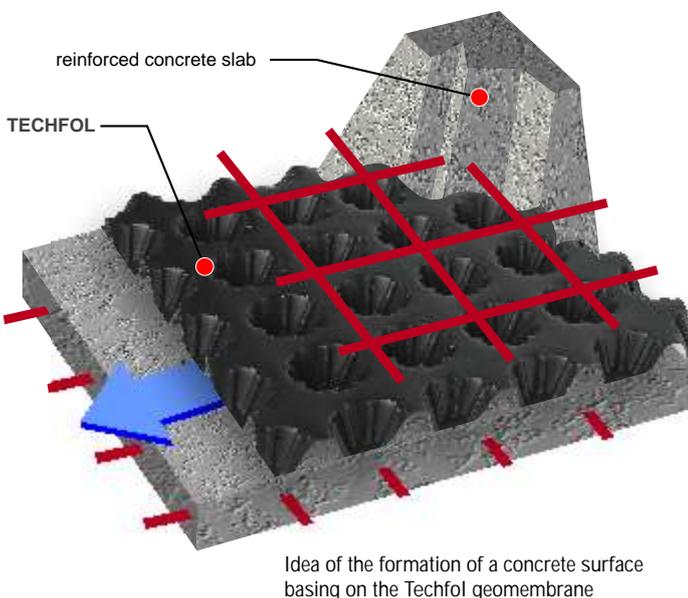
# TECHFOL GEOMEMBRANES

TECHFOL a series of dimpled membranes designed for special structures of floors and walls, when they are designed as drainage structures (diaphragm walls and foundation slabs) to eliminate destructive hydrostatic pressure that is caused by a deep foundation of a construction object, for example, multilevel garages, and structures with high ground water table or rainwater level. The protection lies in the fact that the geomembrane laid, or rather its profiles (dimples) become a "mould" filled with concrete, thereby forming (after curing) a drainage structure. A special "ribbed" design of dimples ensures their resistance to pressure when filling the structure with concrete. The resulting 20 mm air gap is also a draining space providing a water flow in an amount of more than 12 l/ms. This type of waterproofing structures do not even require separation geotextiles, because this function is performed by, for example, a diaphragm wall. TECHFOL dimpled geomembranes were also developed with a view to their use as waterproofing structure element in the process of repairing damaged walls and vaults of tunnels.

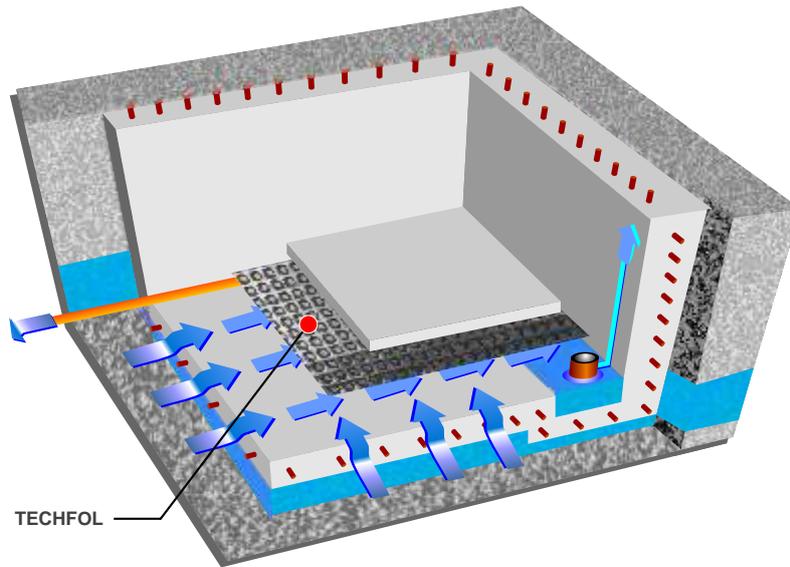


## INSTALLATION METHOD

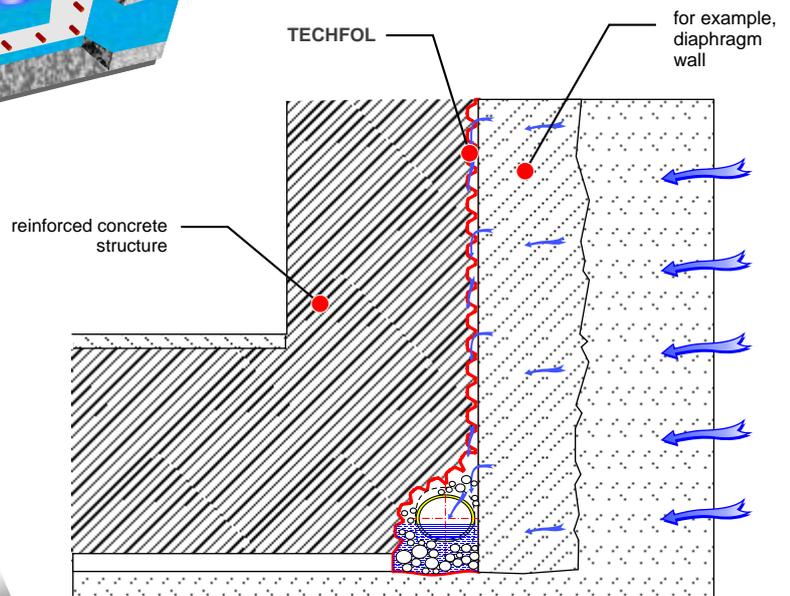
TECHFOL geomembrane is supplied in rolls. Its installation is done by proper laying on the protected surface. The membrane shall be overlapped. Each of joined sheets shall overlap by a minimum of one row of dimples. The installation process must be scheduled in such a way as to reduce membrane cutting, to avoid damage to the dimples. The membrane can be laid along as well as across the covered surface without losing its hydraulic and mechanical properties. When the design specifies to obtain a tight seal joint of sheets, the overlap shall be performed in such a way that a minimum of three rows of dimples of each of joined sheets shall overlap and a minimum one path of butyl tape is placed within the overlap area. Before laying the membrane, previously completed construction works have to be accepted. When using our geomembranes, always follow the installation guidelines contained in the work technical design.



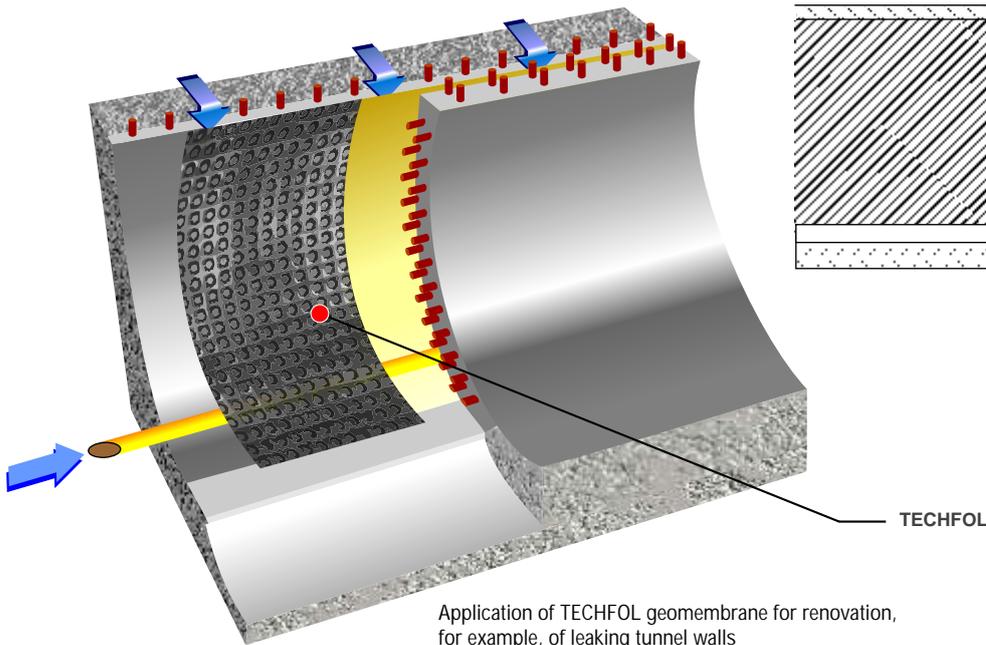
# APPLICATION OF TECHFOL GEOMEMBRANES



Application of TECHFOL geomembrane for a draining layer on a drainage (diaphragm) foundation slab



Application of TECHFOL geomembrane for a tight seal wall behind a diaphragm wall



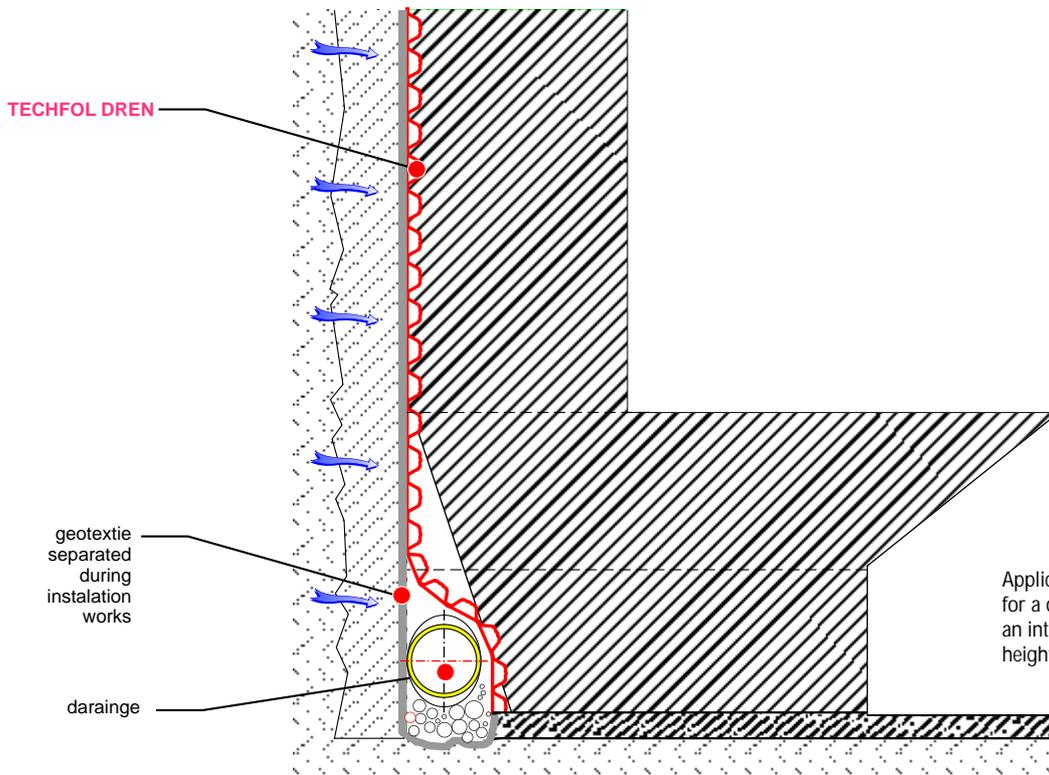
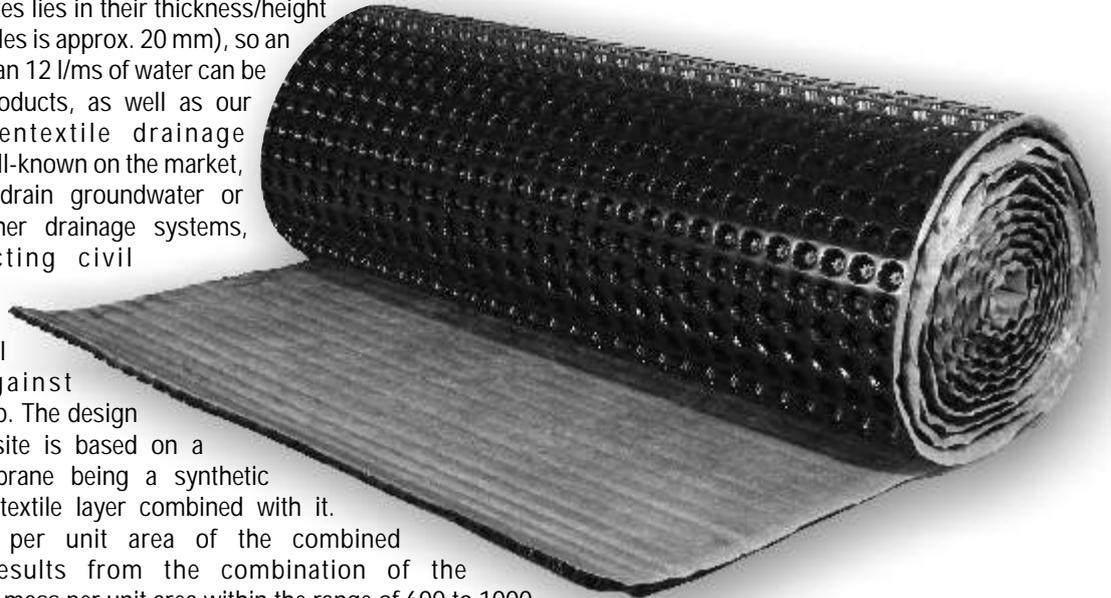
Application of TECHFOL geomembrane for renovation, for example, of leaking tunnel walls

## TRANSPORT AND STORAGE

TECHFOL geomembrane is supplied in rolls of the width of up to 3 m, rolls are secured and labelled, and CE marked. During transport and storage, the product should be protected from mechanical damages and high temperatures. For longer storage periods, membrane rolls shall be stored upright and protected against sunlight.

# TECHFOL DREN GEOCOMPOSITES

TECHFOL DREN is a series of drainage geocomposites with Filtration + Separation + Drainage capabilities. The specificity of these geocomposites lies in their thickness/height (the height of dimples is approx. 20 mm), so an amount of more than 12 l/ms of water can be drained. These products, as well as our Drenfol or Drentextile drainage geocomposites well-known on the market, are designed to drain groundwater or rainwater to further drainage systems, thereby protecting civil engineering structures, bridge and tunnel abutments, against moisture and damp. The design of the geocomposite is based on a dimpled geomembrane being a synthetic barrier and a geotextile layer combined with it. Estimated mass per unit area of the combined geocomposite results from the combination of the geomembrane of a mass per unit area within the range of 600 to 1000 g/m<sup>2</sup> with the geotextile of a mass per unit area within the range of 90-1000 g/m<sup>2</sup>. Rigid dimples reinforced with "ribs" provide very high compressive strength in relation to their height.



Application of TECHFOL DREN geocomposite for a drainage system of a retaining wall with an intense groundwater inflow on a part of its height

## INSTALLATION METHOD

TECHFOL DREN geocomposite is supplied in rolls. Its installation is done by proper laying on the protected surface. The geocomposite sheets shall be overlapped. To make the overlap, you shall separate the geotextile and, after having the overlap made, re-bond it. Each of joined sheets shall overlap by a minimum of three rows of dimples. To obtain a tight seal joint of sheets, a minimum one path of butyl tape can be placed within the overlap area. The geocomposite shall be laid with the geotextile toward the water inflow (outside of the protected structure). The installation process shall be scheduled in such a way as to reduce the number of punctures through the geotextile and geomembrane. Places of punctures through the geomembrane shall be sealed, for example, with butyl tape. Places of punctures through the geotextile shall be sealed by sticking a proper "patch" using a piece of the geotextile. The geocomposite can be laid along as well as across the covered surface without losing its hydraulic and mechanical properties. Before laying the geocomposite, previously completed construction works have to be accepted, for example, damp insulation, rain water collecting system, etc. When using our geocomposites, always follow the installation guidelines contained in the work technical design.



## TRANSPORT AND STORAGE

TECHFOL DREN geocomposite is supplied in rolls, rolls are secured and labelled, and CE marked. During transport and storage, the product should be protected from mechanical damages and high temperatures. For longer storage periods, membrane rolls shall be stored upright and protected against sunlight.

**SPECIFICATIONS OF GEOCOMPOSITES AND GEOMEMBRANES, GREENFOL AND TECHFOL according to the harmonized standard EN PN EN 13252**

Property	Test Method	Unit/ Requirement	Value					
			GREENFOL 850	GREENFOL .1000	GREENFOL DREN 850±110	GREENFOL DREN 1000±110	TECHFOL DREN 850±110	TECHFOL DREN 1000±110
Tensile strength	PN EN ISO 10319	kN/m	MD 7,8 (-0,6) CMD 6,1 (-0,7)	MD 10 (-0,5) CMD 7,5 (-0,7)	MD 16 (-0,6) CMD 11,6 (-0,6)	MD 17,5 (-0,6) CMD 12,5 (-0,6)	MD 16 (-0,6) CMD 11,6 (-0,6)	MD 17,5 (-0,6) CMD 12,5 (-0,6)
Relative elongation at maximum load	PN EN ISO 10319	%	MD 51 (±4) CMD 34 (±2)	MD 56 (±5) CMD 33 (±3)	MD 47 (±2) CMD 35 (±2,5)	MD 50 (±2) CMD 41 (±5)	MD 47 (±2) CMD 35 (±2,5)	MD 50 (±2) CMD 41 (±5)
In-plane water flow capacity of a product 20kPa/gradient 1,0	PN EN ISO 12958	(m <sup>3</sup> /s) x 10 <sup>-3</sup>	12,3 (-0,9)	12,3 (-0,9)	12,3 (-0,9)	12,3 (-0,9)	12,3 (-0,9)	12,3 (-0,9)
Water collecting capability	-----	l/m2	about 7	about 7	about 7	about 7	NA	NA
Resistance to static puncture (CBR)	PN EN ISO 12236	kN	NA	NA	1,00 (-0,10)	1,00 (-0,10)	1,00 (-0,10)	1,00 (-0,10)
Dynamic perforation resistance (cone drop)	PN EN 13433	mm	NA	NA	35 (+7)	35 (+7)	35 (+7)	35 (+7)
Characteristic opening size	PN EN ISO 12956	µm	NA	NA	140 (± 42)	140 (± 42)	140 (± 42)	140 (± 42)
Compressive strength	PMS 967252:2013	kN/m <sup>2</sup>	225 (-10)	330 (-40)	220 (-10)	325 (-30)	220 (-10)	325 (-30)
Mass per unit area	PN EN ISO 9864:2007	g/m <sup>2</sup>	850 (±85)	1000 (±100)	990 (±100)	1140 (±115)	990 (±100)	1140 (±115)
Durability according to Annex B, Resistance to weathering	PN EN 12224	----	Cover within a month after application	Cover within a month after application	Cover within 2 weeks after application			
Durability according to Annex B, Resistance to chemical degradation	PN EN ISO 13438	----	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C	Durability planned for a minimum of 25 years on natural soils with a 4<pH<9 and a temperature <25°C

**SPECIFICATIONS OF TECHFOL GEOMEMBRANES according to the harmonized standard EN PN EN 13967**

Property	Test Method	Unit/Requirement	Value	
			TECHFOL 850	TECHFOL .1000
Water tightness	PN EN 1928 Test A	2kPa/24h	Test requirements are met	Test requirements are met
Resistance to static load	PN EN 12730	kg/24h	≥ 20	≥ 20
Maximum tensile force	PN EN 12311-2	N/50mm	MD ≥ 400 CMD ≥ 330	MD ≥ 600 CMD ≥ 420
Elongation at maximum tensile force	PN EN 12311-2	%	MD ≥ 43 CMD ≥ 25	MD ≥ 39 CMD ≥ 25
Durability of water tightness against ageing	PN EN 1928 after testing per PN EN 1296	2kPa/24h	Test requirements are met	Test requirements are met
Durability of water tightness against chemicals	PN EN 1928 after testing per PN EN 1847	2kPa/24h	Test requirements are met	Test requirements are met
Resistance to impact	PN EN 12691	mm	≥ 1000	≥ 1000
Resistance to tearing (nail shank); products without reinforcement	PN EN 12310-1	N	MD ≥ 420 CMD ≥ 400	MD ≥ 510 CMD ≥ 505
Reaction to fire	PN EN 13501-1	---	F	F
Compressive strength	PMS 967252:2013	kN/m <sup>2</sup>	≥ 215	≥ 295
Mass per unit area	PN EN 1848-2	g/m <sup>2</sup>	850	1000

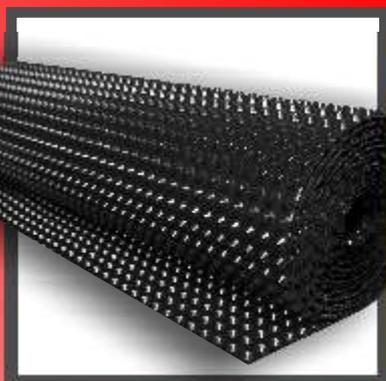
**STANDARD DIMENSIONS OF ROLLS AND THEIR PALLETISING**

Type	Standard width of rolls <sup>1</sup> (m)	Standard length of rolls <sup>2</sup> (m)	Maximum number of rolls per pallet <sup>3</sup>
GREENFOL	1,5 and 3,0	15	4
GREENFOL DREN	1,5	10	4
TECHFOL	1,5 and 3,0	15	4
TECHFOL DREN	1,5	10	4

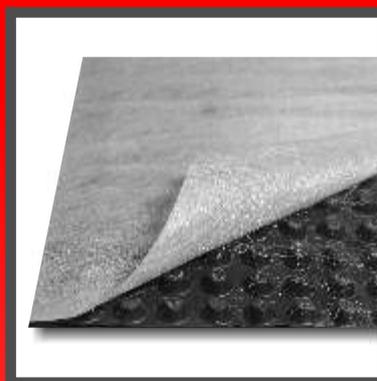
- For widths other than standard ones indicated in the table above, the order must be agreed individually.
- For lengths other than standard lengths given, the order must be agreed individually.
- For products of a width greater than 2 m, transport and palletising shall be agreed individually when ordering.

**OUR OTHER PRODUCTS**  
More information on the website  
[www.plastmaster.pl](http://www.plastmaster.pl)

## **VENTFOL**



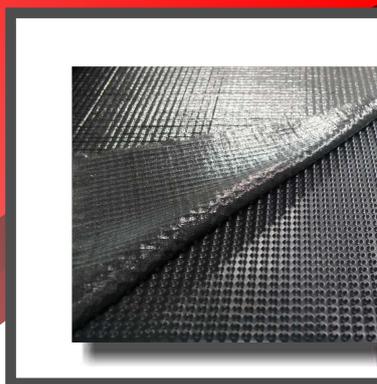
## **DRENFOL**



## **HYDROFOL**



## **DRENTEXTILE**



### **PLAST MASTER**

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