

# Properties

## ND X20 Drainage System

Material properties	Standard	Unit	Performance
Core	-	-	HIPS
Filter geotextile	-	-	PP
Separation geotextile	-	-	PP
<b>Mechanical properties (mean values)</b>			
Compressive strength	hEN ISO 25619-2	kPa <sup>1</sup>	270
Compressive strength at 10 % deformation	hEN ISO 25619-2	kPa <sup>1</sup>	270
Tensile strength <sup>2</sup> (MD / CMD) <sup>3</sup>	hEN ISO 10319	kN/m	7 / 8.5
CBR puncture resistance <sup>2</sup>	hEN ISO 12236	kN	1.15
Dynamic perforation <sup>2</sup> (cone drop)	hEN ISO 13433	mm	34
<b>Physical properties (typical values)</b>			
Construction height at 2 kPa	-	mm	20
Perforations per m <sup>2</sup>	-	-	1,540
Diameter perforations	-	mm	6.3
Water reservoir	-	l/m <sup>2</sup>	3.5
Material dimensions (L x W)	-	m	30 x 1.2
Mass	-	g/m <sup>2</sup>	1,014
Surface area per roll	-	m <sup>2</sup>	36
Roll diameter	-	cm	83
Roll weight	-	kg	36.5
<b>Hydraulic properties (mean values)</b>			
Opening size O <sub>99</sub> <sup>2</sup>	hEN ISO 12956	µm	100
Water permeability H <sub>50</sub> <sup>2</sup>	hEN ISO 11058	mm/s	110
<b>Drainage capacity (mean values) - 10 kPa - extensive green roof</b>			
Slope = 0 % - exceptional case	FH Karlsruhe (D) <sup>4</sup>	l/m <sup>2</sup>	-
Fall = 1 %	hEN ISO 12958 <sup>5</sup>	l/m <sup>2</sup>	0.7
Fall = 1.5 %	hEN ISO 12958 <sup>5</sup>	l/m <sup>2</sup>	0.8
Fall = 2 %	hEN ISO 12958 <sup>5</sup>	l/m <sup>2</sup>	1.0
Fall = 2.5 %	hEN ISO 12958 <sup>5</sup>	l/m <sup>2</sup>	1.0
Fall = 3 %	hEN ISO 12958 <sup>5</sup>	l/m <sup>2</sup>	1.1

1 kPa = kN/m<sup>2</sup>  
 2 Performance expressed of the filter geotextile only  
 3 MD = Machine direction / CMD = Cross machine direction  
 4 FH Karlsruhe (D) tested hard/hard  
 5 hEN ISO 12958 tested soft/hard

The values correspond to average results obtained in our laboratories and outside institutes and are indicative. The right is reserved to make changes at any time without notice. Standard variations in mechanical properties of 15 % and in hydraulic properties of 20 % and in physical properties of 5 % are normal.

[www.nophadrain.com/NDX20](http://www.nophadrain.com/NDX20)

**NOPHADRAIN**<sup>®</sup>  
 SMART GREEN ROOF SYSTEMS



For (semi-) intensive green roofs we recommend our powerful ND 4+1h Drainage System. For green roofs without slope we recommend our super high ND 5+1 Drainage System.



Even more water buffering? Upgrade your green roof system with the ND WSM-25 or ND WSM-50 Water Reservoir Panels.

# ND X20 Drainage System

The allrounder especially designed for extensive green roofs



Nophadrain BV

Visiting address  
 Mercuriusstraat 10  
 6468 ER Kerkrade  
 Netherlands

Postal address  
 Postbus 3016  
 6460 HA Kerkrade  
 Netherlands

T: +31 (0)45 535 50 30  
 T: +31 (0)45 535 39 30  
 E: [info@nophadrain.com](mailto:info@nophadrain.com)

[www.nophadrain.com](http://www.nophadrain.com)

**NOPHADRAIN**<sup>®</sup>  
 SMART GREEN ROOF SYSTEMS

# Let's rock & roll



Install with printed side up

## 3 in 1 product

1. Non-woven filter geotextile with 10 cm overlap
2. Dimpled core with approx. 20 mm construction height
3. Non-woven protection geotextile with 10 cm overlap

The geotextiles are glued and not thermally bonded to the dimpled core to avoid damage to the mechanical and hydraulic properties of the geotextile and the drainage system. Moreover it prevents the geotextiles to be pushed in between the dimples obstructing the drainage capacity.

The overlap on the upper side secures an optimal filtration. The overlap on the bottom side protects the waterproofing membrane perfectly during installation.

## Benefits of rolls



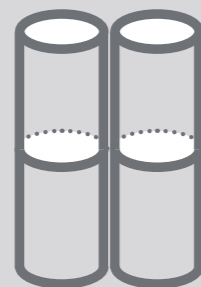
Easier to transport



Easier to unroll



Faster to install



2 x 2 rolls  
144 m<sup>2</sup> / pallet

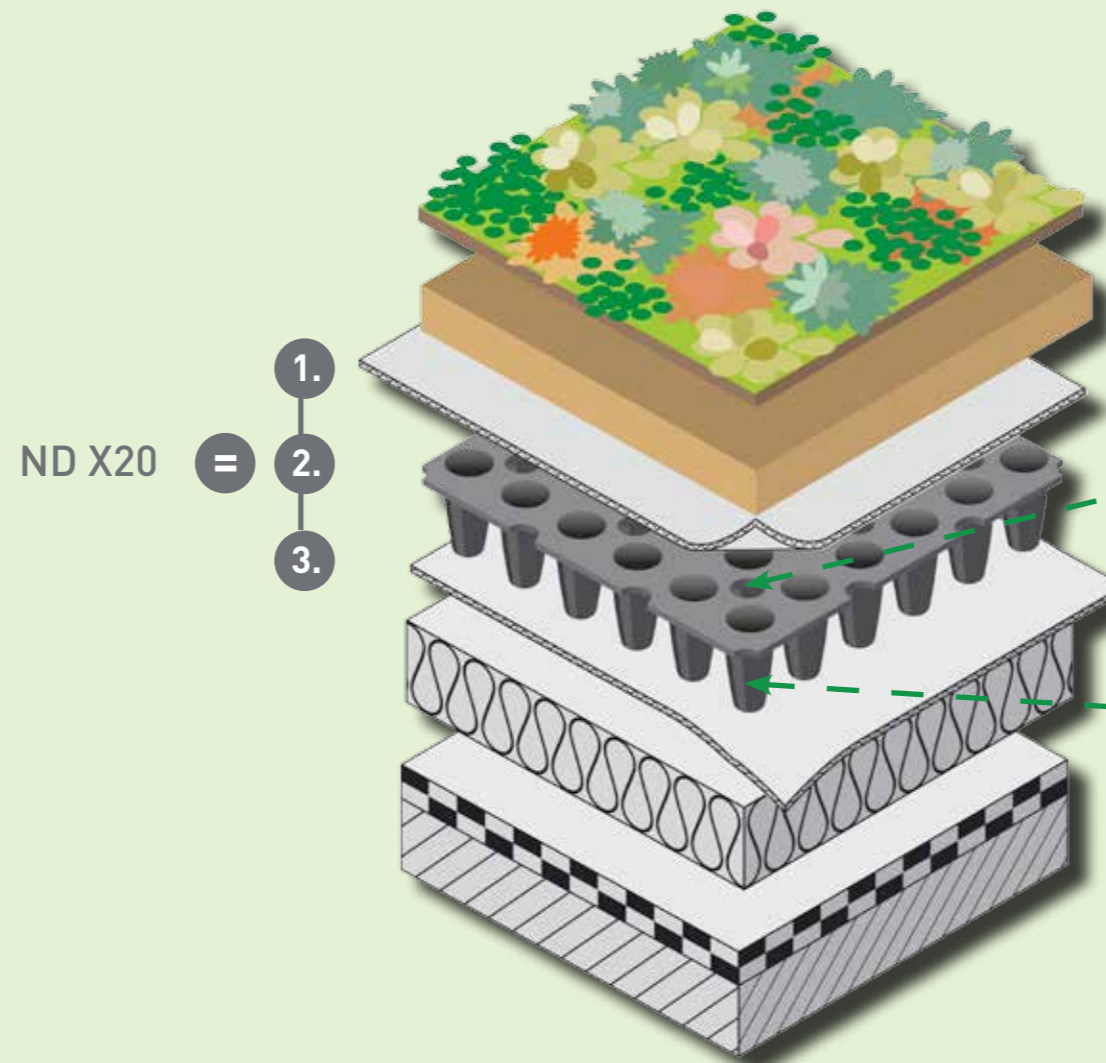
# ND X20 Drainage System

The allrounder especially designed for extensive green roofs

High-performance CE-marked drainage system with an innovative dimple design made out of recycled high impact polystyrene. This sandwich element has a perforated, vapour-permeable dimpled core with a compressive strength of 270 kPa. Its excellent creep resistance guarantees a consistent long term drainage capacity.

The ND X20 Drainage System is the heart of the Nophadrain Extensive Green Roof Systems. The approx. 20 mm high drainage system prevents waterlogging and the risk of frost heave in the substrate layer and allows extended drainage length.

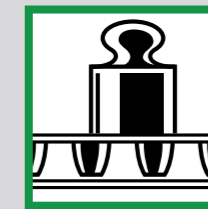
The ND X20 Drainage System is suitable for both warm roof and inverted roof constructions.



Approx. 20 mm

## Construction height of drainage system

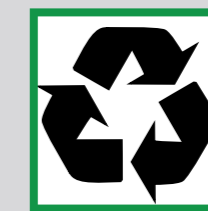
The construction height of approx. 20 mm prevents waterlogging in the substrate layer and allows extended drainage length.



Approx. 270 kPa

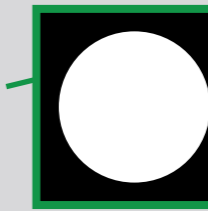
## High compressive strength

Very stable core designed for roofs with extensive vegetation and a substrate layer of 6 - 12 cm. The drainage system can be accessed during installation and for maintenance.



## Recycling

Material of dimpled sheet is made of recycled, high impact polystyrene (HIPS).



Approx. Ø 6.3 mm

## Suitable for warm roofs and inverted roof constructions

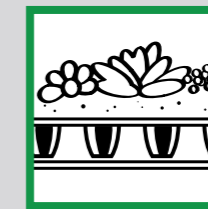
Big diffusion holes (Ø 6.3 mm) make ND X20 Drainage System also suitable for inverted roof constructions.



Approx. 3.5 l/m<sup>2</sup>

## High water buffering

Buffers approx. 3.5 l/m<sup>2</sup> water to nurture the vegetation during dry periods. TIP! Upgrade with ND WSM Water Reservoir Panels for even more buffering.



1 % [0.6 °] - 15 °

## True allrounder

Suitable for all standard roofs (fall of 1 % [0.6 °] - 15 °)\*.



0799-CPR-26

## CE-Marked

ND X20 Drainage System is CE-marked according to hEN 13252.



1. Unroll ND X20 Drainage System.

2. Apply substrate on top of ND X20 Drainage System.

3. Install extensive vegetation (e.g. ND Vegetation Blanket - Sedum).

\*For pitched roofs up to 15 ° we recommend the use of ND SM-50 Substrate Panels instead of substrate. Ask our advisors for the option with substrate or for our solutions for exceptional roof falls (slope < 1 % or fall > 15 °).