

## TECHNICAL DATA SHEET

### ND Strip 150 Drainage System



ND Strip 150 Drainage System

High-performance CE-marked drainage system made out of recycled high impact polystyrene. The core of the ND Strip Drainage System is a perforated dimpled sheet with a high compressive strength, a thickness of approx. 28 mm and a width of approx. 150 mm. The core is wrapped in a non-woven geotextile as a filter layer.

#### Application

The ND Strip 150 Drainage System can be used in single-layer green roof build-ups with limited falls, on metal sheet roofing and in street, golf course and sports field constructions.

#### Properties

- Material dimpled sheet: recycled high impact polystyrene (HIPS)
- Material geotextile filter: polypropylene (PP)
- Thickness: approx. 28 mm
- Width: approx. 150 mm
- Compressive strength: approx. 500 kPa
- Perforations/m<sup>2</sup>: approx. 575 / ø 15.8 mm
- Weight: approx. 1,357 g/m<sup>2</sup>
- Drainage capacity at i = 1 at 20 kPa: approx. 2.19 l/(s.m)
- Drainage capacity at fall ratio 2 % at 20 kPa: approx. 0.28 l/(s.m)

Product	Dimensions (L x W)	Packaging
ND Strip 150 Drainage System	approx. 30 m x 0.15 m	approx. 30 m, roll

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**Data sheet**

**DoPS150-006**

**NDS 150**

Material Properties	Standard	Unit	Performance
Core	-	-	HIPS
Filter geotextile	-	-	PP
Separation film	-	-	-
Separation geotextile	-	-	-
<b>Mechanical Properties (mean values)</b>			
Compressive strength	hEN ISO 25619-2	kPa	500
Compressive strength at 10 % deformation	hEN ISO 25619-2	kPa	500
Deformation at 1 mPa	hEN ISO 25619-2	%	-
Tensile strength <sup>1</sup> (MD/CMD) <sup>2</sup>	hEN ISO 10319	kN/m	9/10
CBR puncture resistance <sup>1</sup>	hEN ISO 12236	kN	1.6
Dynamic performance (cone drop)	hEN ISO 13433	mm	28
Resistance to weathering <sup>3</sup>	hEN ISO 12224	%	60/80
<b>Physical Properties</b>			
Construction height at 2 kPa	-	mm	28
Dimple height at 2 kPa	-	mm	26
Perforations per m <sup>2</sup>	-	-	575
Diameter perforations	-	mm	15.8
Water reservoir	-	l/m <sup>2</sup>	-
Material dimensions (L x W)	-	m	30 x 0.15
Mass per unit area	-	g	1,357
Surface area per roll	-	m <sup>2</sup>	4.5
Roll diameter	-	cm	100
Roll weight	-	kg	6
<b>Hydraulic Properties (mean values)</b>			
Opening size O <sub>90</sub> <sup>1</sup>	hEN ISO 12956	µm	100
Water permeability H <sub>50</sub> <sup>1</sup>	hEN ISO 11058	mm/s	95
<b>Drainage Capacity (mean values)</b>			
<b>Vertical drainage / Wall - gradient i=1</b>			
<b>Surface load</b>	<b>Build-in-depth</b>		
20 kPa	2.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 2.19
30 kPa	3.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 2.14
50 kPa	5.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 2.00
100 kPa	10.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 1.84
200 kPa	Exceptional	hEN ISO 12958 <sup>4</sup>	l/(s.m) 1.23
<b>Horizontal drainage / Roof</b>			
<b>Fall = 0 % - Exceptional case</b>			
≤ 2 kPa - extensive green roof		FH Karlsruhe (D) <sup>5</sup>	l/(s.m) -
≤ 10 kPa - intensive green roof		FH Karlsruhe (D) <sup>5</sup>	l/(s.m) -
<b>Fall = 1 % - Exceptional case</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.20
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.19
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.14
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.11
<b>Fall = 1.5 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.26
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.25
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.19
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.12
<b>Fall = 2 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.30
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.28
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.21
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.13
<b>Fall = 2.5 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.34
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.31
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.24
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.15
<b>Fall = 3 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.37
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.34
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.27
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.17

<sup>1</sup> Performance expressed on the filter/geotextile only

<sup>2</sup> MD = Machine direction / CMD = Cross Machine Direction

<sup>3</sup> Material has to be completely covered within 14 days after installation

<sup>4</sup> hEN ISO 12958 tested hard/soft

<sup>5</sup> FH Karlsruhe (D) tested hard/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.

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V08.2020

## TECHNICAL DATA SHEET

### ND Strip 300 Drainage System



ND Strip 300 Drainage System

High-performance CE-marked drainage system made out of recycled high impact polystyrene. The core of the ND Strip Drainage System is a perforated dimpled sheet with a high compressive strength, a thickness of approx. 28 mm and a width of approx. 500 mm. The core is wrapped in a non-woven geotextile as a filter layer.

#### Application

The ND Strip 300 Drainage System can be used in single-layer green roof build-ups with limited falls, on metal sheet roofing and in street, golf course and sports field constructions.

#### Properties

- Material dimpled sheet: recycled high impact polystyrene (HIPS)
- Material geotextile filter: polypropylene (PP)
- Construction height: approx. 28 mm
- Width: approx. 300 mm
- Compressive strength: approx. 500 kPa
- Perforations/m<sup>2</sup>: approx. 378 / ø 15.8 mm
- Weight: approx. 1,324 g/m<sup>2</sup>
- Drainage capacity at i = 1 at 20 kPa: approx. 4.39 l/(s.m)
- Drainage capacity at fall ratio 2 % at 20 kPa: approx. 0.55 l/(s.m)

Product	Dimensions (L x W)	Packaging
ND Strip 300 Drainage System	approx. 30 m x 0.30 m	approx. 30 m, roll

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**Data sheet**
**DoPS300-006**
**NDS 300**

Material Properties	Standard	Unit	Performance
Core	-	-	HIPS
Filter geotextile	-	-	PP
Separation film	-	-	-
Separation geotextile	-	-	-
<b>Mechanical Properties (mean values)</b>			
Compressive strength	hEN ISO 25619-2	kPa	500
Compressive strength at 10 % deformation	hEN ISO 25619-2	kPa	500
Deformation at 1 mPa	hEN ISO 25619-2	%	-
Tensile strength <sup>1</sup> (MD/CMD) <sup>2</sup>	hEN ISO 10319	kN/m	9/10
CBR puncture resistance <sup>1</sup>	hEN ISO 12236	kN	1.6
Dynamic performance (cone drop)	hEN ISO 13433	mm	28
Resistance to weathering <sup>3</sup>	hEN ISO 12224	%	60/80
<b>Physical Properties</b>			
Construction height at 2 kPa	-	mm	28
Dimple height at 2 kPa	-	mm	26
Perforations per m <sup>2</sup>	-	-	575
Diameter perforations	-	mm	15.8
Water reservoir	-	l/m <sup>2</sup>	-
Material dimensions (L x W)	-	m	30 x 0.3
Mass per unit area	-	g	1,324
Surface area per roll	-	m <sup>2</sup>	9
Roll diameter	-	cm	100
Roll weight	-	kg	12
<b>Hydraulic Properties (mean values)</b>			
Opening size O <sub>90</sub> <sup>1</sup>	hEN ISO 12956	µm	100
Water permeability H <sub>50</sub> <sup>1</sup>	hEN ISO 11058	mm/s	95
<b>Drainage Capacity (mean values)</b>			
<b>Vertical drainage / Wall - gradient i=1</b>			
<b>Surface load</b>	<b>Build-in-depth</b>		
20 kPa	2.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 4.39
30 kPa	3.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 4.29
50 kPa	5.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 4.00
100 kPa	10.0 m	hEN ISO 12958 <sup>4</sup>	l/(s.m) 3.68
200 kPa	Exceptional	hEN ISO 12958 <sup>4</sup>	l/(s.m) 2.46
<b>Horizontal drainage / Roof</b>			
<b>Fall = 0 % - Exceptional case</b>			
≤ 2 kPa - extensive green roof		FH Karlsruhe (D) <sup>5</sup>	l/(s.m) -
≤ 10 kPa - intensive green roof		FH Karlsruhe (D) <sup>5</sup>	l/(s.m) -
<b>Fall = 1 % - Exceptional case</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.41
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.37
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.29
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.21
<b>Fall = 1.5 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.51
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.50
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.37
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.24
<b>Fall = 2 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.60
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.55
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.41
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.27
<b>Fall = 2.5 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.67
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.62
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.47
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.30
<b>Fall = 3 %</b>			
≤ 10 kPa - extensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.74
≤ 20 kPa - intensive green roof		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.69
100 kPa - podium roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.53
200 kPa - parking roof deck		hEN ISO 12958 <sup>4</sup>	l/(s.m) 0.33

<sup>1</sup> Performance expressed on the filter/geotextile only

<sup>2</sup> MD = Machine direction / CMD = Cross Machine Direction

<sup>3</sup> Material has to be completely covered within 14 days after installation

<sup>4</sup> hEN ISO 12958 tested hard/soft

<sup>5</sup> FH Karlsruhe (D) tested hard/hard

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