

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-18/0013**  
**of 25 January 2018**

English translation prepared by DIBt - Original version in German language

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Nophadrain ND Drainage Systems  
SD Drainage System

Product family  
to which the construction product belongs

Geocomposite for drainage systems

Manufacturer

Nophadrain BV  
Mercuriusstraat 10  
6468 ER KERKRADE  
NIEDERLANDE

Manufacturing plant

Nophadrain BV  
Mercuriusstraat 10  
6468 ER KERKRADE  
NIEDERLANDE

This European Technical Assessment  
contains

9 pages including 5 annexes which form an integral part  
of this assessment

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

EAD 080001-00-0403

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## Specific Part

### 1 Description of the product

The construction products "Nophadrain ND Drainage System" and "SD Drainage System" are geocomposites for drainage, filtration and separation and consist of:

- a geospacer solely made of post industrial material (PIM) or post consumer material (PCM) namely recycled high impact polystyrene (HIPS) according to EN 13252 with thicknesses of 0,48 / 0,6 / 0,72 / 0,86 / 1,02 / 1,6 mm
- geotextiles used as a filter layer made of polypropylene:  
White 120 g/m<sup>2</sup> Non- woven Geotextile PP/PE (GVW 1000),  
White 115 g/m<sup>2</sup> Non- woven Geotextile PP/PE (GVW 900),  
Black 140 g/m<sup>2</sup> Non-Woven Geotextile (GVZ),  
Black 234 g/m<sup>2</sup> Woven Geotextile (GWZ) or  
Black 260 g/m<sup>2</sup> Non-Woven Geotextile (BS20grk4)
- geotextile or film used as a protection layer  
White PP slide foil

The geocomposite shows different dimensions with different performances according to EN 13252. In addition the performance of the characteristics of durability and short-term compression behavior is given.

Annex A shows the principles and performances of the product and furthermore the different types and dimensions of products.

### 2 Specification of the intended use in accordance with the applicable European assessment Document

The geocomposite is used as a drainage system for drainage, filtration and separation, depending on its properties according to EN 13252.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the product of 100 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works

### 3 Performance of the product and references to the methods used for its assessment

#### 3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	No performance assessed (npa)

English translation prepared by DIBt

### 3.2 Safety in use (BWR 4)

Essential characteristic	Performance
Water permeability normal to the plane	See Annex A4 to A5
Water flow capacity in the plane	See Annex A4 to A5
Tensile strength and elongation	See Annex A2 to A3
Static puncture (CBR-test)	See Annex A4 to A5
Dynamic perforation resistance	See Annex A4 to A5
Short-term compression behavior	See Annex A4 to A5
Protection efficiency of a geosynthetic against impact damage	No performance assessed (npa)
Characteristic opening size	See Annex A4 to A5
Resistance to weathering	See Annex A2 to A3
Durability	See Annex A1

### 3.3 General aspects

The verification of durability and serviceability is only ensured if the specifications of the technical file of the manufacturer are kept.

## 4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to Decision of the Commission 2015/1958 (EU) the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table applies.

Product	Intended use(s)	Level or class	System
Geocomposite	For building works	-	2+
	For uses subject to regulation on reaction to fire	-	1, 3, 4

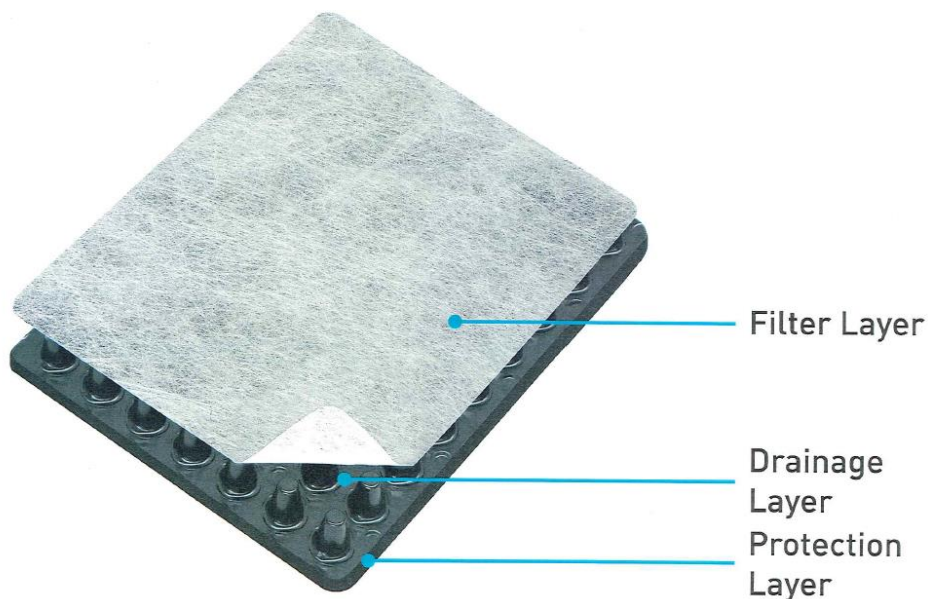
## 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 25 January 2018 by Deutsches Institut für Bautechnik

BD Dipl.-Ing. Andreas Kummerow  
Head of Department

*beglaubigt:*  
Hemme



Essential Requirements of the drainage system	Performance
Reaction to fire Classification according to EN 13501-1	No performance assessed
Water permeability normal to the plane	Levels in Annex A4 to A5
Water flow capacity in the plane	Levels in Annex A4 to A5
Tensile strength and elongation	Levels in Annex A2 to A3
Static puncture (CBR-test)	Levels in Annex A4 to A5
Dynamic perforation resistance	Levels in Annex A4 to A5
Short-term compression behavior	Levels in Annex A4 to A5
Protection efficiency of a geosynthetic against impact damage	npa
Characteristic opening size	Levels in Annex A4 to A5
Resistance to weathering	Levels in Annex A2 to A3
Durability	100 Years for all types of product

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Nophadrain ND Drainage Systems SD Drainage System	Annex A1
Principle of the product and performances of the Product	

English translation prepared by DIBt

Productname(s)	Thickness of core  HIPS  [mm]	High of Dimple  ca. [mm]	Core perforated  J/N	Filter Layer	Protection Layer	Tensile strength MD  EN ISO 10319  [kN/m]	Tensile strength CMD  EN ISO 10319  [kN/m]	Resistance to weathering  EN 12224  [d]
ND resp. SD 100	0,48	6	N	GVW 1000		8	8	14
ND resp. SD 100s	0,48	6	J	GVW 1000		8	8	14
ND resp. SD 100sv	0,48	6	J	GVW 1000	GVW 900	8	8	14
ND resp. SD 100zv	0,48	6	N	GVZ		9	10	30
ND resp. SD 120	0,48	6	N	GVW 1000	PP foil	8	8	14
ND resp. SD 120zv	0,48	6	N	GVZ	PP foil	9	10	30
ND resp. SD 200lt	0,6	12	N	GVW 1000		8	8	14
ND resp. SD 200lts	0,6	12	J	GVW 1000		8	8	14
ND 220lt	0,6	12	N	GVW 1000	PP foil	8	8	14
ND resp. SD 200ltzv	0,6	12	N	GVZ		9	10	30
ND resp. SD 200	0,72	12	N	GVW 1000		8	8	14
ND 200h	0,72	15	N	GVW 1000		8	8	14
ND 200hs	0,72	15	J	GVW 1000		8	8	14
ND 200hzv	0,72	15	N	GVZ		9	10	30
ND resp. SD 200sv	0,72	12	J	GVW 1000	GVW 900	8	8	14
ND resp. SD 200s	0,72	12	J	GVW 1000		8	8	14
ND 200zv	0,72	12	N	GVZ		9	10	30
ND 200zvs	0,72	12	J	GVZ		9	10	30
ND 200hd	0,86	12	N	GVW 1000		8	8	14
ND resp. SD 220	0,72	12	N	GVW 1000	PP foil	8	8	14
ND resp. SD 220zv	0,72	12	N	GVZ	PP foil	9	10	30
ND 220h	0,72	12	N	GVW 1000	PP foil	8	8	14
ND resp. SD 4+1	0,72	12	J	GVZ	GVW 900	9	10	30
ND resp. SD 4+1lt	0,6	12	J	GVZ	GVW 900	9	10	30
ND 4+1hd	1,02	12	J	GVZ	GVW 900	9	10	30
ND resp. SD 4+1h	0,72	15	J	GVZ	GVW 900	9	10	30
ND resp. SD 5+1	1,02	25	J	GVZ	GVW 900	9	10	30
ND resp. SD 6+1	1,02	25	J	GVW 1000		8	8	14
ND resp. SD 6+1v	1,02	25	J	GVW 1000	GVW 900	8	8	14
ND 6+1zg	1,02	25	N	GVW 1000		8	8	14
ND resp. SD 600hd	1,02	12	N	GWZ		45	27	14
ND resp. SD 600hdsv	1,02	12	J	GWZ	GVW 900	45	27	14
ND resp. SD 600hds	1,02	12	J	GWZ		45	27	14
ND resp. SD 600lt	0,72	12	N	GWZ		45	27	14
ND resp. SD 600lts	0,72	12	J	GWZ		45	27	14
ND resp. SD 600wv	0,86	12	N	GVW		8	8	14
ND resp. SD 600	0,86	12	N	GWZ		45	27	14
ND resp. SD 600s	0,86	12	J	GWZ		45	27	14
ND resp. SD 600sv	0,86	12	J	GWZ	GVW 900	45	27	14
ND resp. SD 620hd	1,02	12	N	GWZ	PP foil	45	27	14
ND resp. SD 620	0,86	12	N	GWZ	PP foil	45	27	14
ND resp. SD 620hdzv	1,02	12	N	BS20grk4	PP foil	20	20	14
ND resp. SD 600hdzv	1,02	12	N	BS20grk4		20	20	14

Nophadrain ND Drainage Systems  
SD Drainage System

Types of products and the performances

Annex A2

Productname(s)	Thickness of core  HIPS  [mm]	High of Dimple  ca. [mm]	Core perforated  J/N	Filter Layer	Protection Layer	Tensile strength MD  EN ISO 10319  [kN/m]	Tensile strength CMD  EN ISO 10319  [kN/m]	Resistance to weathering  EN 12224  [d]
ND 700	1,02	20	N	GVW 1000	-	8	8	14
ND 700s	1,02	20	J	GVW 1000		8	8	14
ND 700sv	1,02	20	J	GVW 1000	GVW 900	8	8	14
ND 700zv	1,02	20	N	GVZ		9	10	30
ND 700zw	1,02	20	N	GWZ		45	27	14
ND 700zws	1,02	20	J	GWZ		45	27	14
ND 700zwsv	1,02	20	J	GWZ	GVW 900	45	27	14
ND 700hd	1,6	20	N	GVW 1000		8	8	14
ND 700hds	1,6	20	J	GVW 1000		8	8	14
ND 700hdsv	1,6	20	J	GVW 1000	GVW 900	8	8	14
ND 700hdzws	1,6	20	J	GWZ		45	27	14
ND 700hdzws v	1,6	20	J	GWZ	GVW 900	45	27	14
ND 720	1,02	20	N	GVW 1000	PP foil	8	8	14
ND 720zv	1,02	20	N	GVZ	PP foil	9	10	30
ND 720zw	1,02	20	N	GWZ	PP foil	45	27	14
ND 720hd	1,6	20	N	GVW 1000	PP foil	8	8	14
ND 720hdzw	1,6	20	N	GWZ	PP foil	45	27	14
ND resp. SD 800	1,02	25	N	GVW 1000		8	8	14
ND 800s	1,02	25	J	GVW 1000		8	8	14
ND 800zv	1,02	25	N	GVZ		9	10	14
ND 800zw-1600	1,6	25	N	GWZ		45	27	14
ND 820	1,02	25	N	GVW 1000	PP foil	8	8	14
ND 900hd	1,6	25	N	GWZ		45	27	14
ND resp. SD 900	1,02	25	N	GWZ		45	27	14
ND 900s	1,02	25	J	GWZ		45	27	14
ND 900sv	1,02	25	J	GWZ	GVW 900	45	27	14
ND 900hds	1,6	25	J	GWZ		45	27	14
ND 900hdsv	1,6	25	J	GWZ	GVW 900	45	27	14
ND 920	1,02	25	N	GWZ	PP foil	45	27	14
ND 920hd	1,6	25	N	GWZ	PP foil	45	27	14
ND IR	0,48	4	N	GVW 1000		8	8	14
NDS resp. SDS 150	1,02	25	J	GVZ		9	10	30
NDS resp. SDS 300	1,02	25	J	GVZ		9	10	30
Sopradrain 27	1,6	25	N	GVW		8	8	14

Nophadrain ND Drainage Systems  
SD Drainage System

Types of products and the performances

Annex A3

English translation prepared by DIBt

Productname(s)	Static puncture EN ISO 12236 [kN]	Dynamic perforation EN ISO 13433 [mm]	Characteristic opening size EN ISO 12956 [µm]	Short term compression EN ISO 25619-1 kPa	Short term compression at 10% deformation EN ISO 25619-1 kPa	Water permeability normal to the plane EN ISO 110558 [m/s]	Waterflow Capacity in the plane Rigid/Soft EN ISO 12958 Gradient 1,0 20 kPa [m2/s]
ND resp. SD 100	1,5	38	150	500	450	0,100	2,91
ND resp. SD 100s	1,5	38	150	500	450	0,100	2,91
ND resp. SD 100sv	1,5	38	150	500	450	0,100	2,91
ND resp. SD 100zv	1,6	28	100	500	450	0,095	2,60
ND resp. SD 120	1,5	38	150	500	450	0,100	2,91
ND resp. SD 120zv	1,6	28	100	500	450	0,095	2,60
ND resp. SD 200lt	1,5	38	150	500	450	0,100	5,39
ND resp. SD 200lts	1,5	38	150	500	450	0,100	5,39
ND 220lt	1,5	38	150	500	450	0,100	5,39
ND resp. SD 200ltzv	1,6	28	100	500	450	0,095	4,80
ND resp. SD 200	1,5	38	150	700	650	0,100	5,31
ND 200h	1,5	38	150	450	450	0,100	7,44
ND 200hs	1,5	38	150	450	450	0,100	7,44
ND 200hzv	1,6	28	100	450	450	0,095	7,05
ND resp. SD 200sv	1,5	38	150	700	650	0,100	5,31
ND resp. SD 200s	1,5	38	150	700	650	0,100	5,31
ND 200zv	1,6	28	100	700	650	0,095	4,73
ND 200zvs	1,6	28	100	700	650	0,095	4,73
ND 200hd	1,5	38	150	900	800	0,100	5,15
ND resp. SD 220	1,5	38	150	700	650	0,100	5,31
ND resp. SD 220zv	1,6	28	100	700	650	0,095	4,73
ND 220h	1,5	38	150	700	650	0,100	7,44
ND resp. SD 4+1	1,6	28	100	700	650	0,095	4,92
ND resp. SD 4+1lt	1,6	28	100	500	450	0,095	5,08
ND 4+1hd	1,6	28	100	1200	1000	0,095	4,97
ND resp. SD 4+1h	1,6	28	100	450	450	0,095	6,90
ND resp. SD 5+1	1,6	28	100	500	500	0,095	13,63
ND resp. SD 6+1	1,5	38	150	300	300	0,100	8,02
ND resp. SD 6+1v	1,5	38	150	300	300	0,100	8,02
ND 6+1zg	1,5	38	150	300	300	0,100	8,02
ND resp. SD 600hd	5	7,5	150	1200	1000	0,015	5,50
ND resp. SD 600hdsv	5	7,5	150	1200	1000	0,015	5,50
ND resp. SD 600hds	5	7,5	150	1200	1000	0,015	5,50
ND resp. SD 600lt	5	7,5	150	700	650	0,015	5,57
ND resp. SD 600lts	5	7,5	150	700	650	0,015	5,57
ND resp. SD 600wv	1,5	38	150	900	800	0,100	5,15
ND resp. SD 600	5	7,5	150	900	800	0,015	5,45
ND resp. SD 600s	5	7,5	150	900	800	0,015	5,45
ND resp. SD 600sv	5	7,5	150	900	800	0,015	5,45
ND resp. SD 620hd	5	7,5	150	1200	1000	0,015	5,50
ND resp. SD 620	5	7,5	150	900	800	0,015	5,45
ND resp. SD 620hdzv	3,5	15	80	1200	1000	0,050	4,49
ND resp. SD 600hdzv	3,5	15	80	1200	1000	0,050	4,49

Nophadrain ND Drainage Systems  
SD Drainage System

Types of products and the performances

Annex A4



Productname(s)	Static puncture  EN ISO 12236  [kN]	Dynamic perforation  EN ISO 13433  [mm]	Characteristic opening size  EN ISO 12956  [µm]	Short term compression  EN ISO 25619-1  kPa	Short term compression at 10% deformation  EN ISO 25619-1  kPa	Water permeability normal to the plane  EN ISO 110558  [m/s]	Waterflow Capacity in the plane Rigid/Soft  EN ISO 12958  Gradient 1,0 20 kPa [m <sup>2</sup> /s]
ND 700	1,5	38	150	500	450	0,100	10,60
ND 700s	1,5	38	150	500	450	0,100	10,60
ND 700sv	1,5	38	150	500	450	0,100	10,60
ND 700zv	1,6	28	100	500	450	0,095	10,10
ND 700zw	5	7,5	150	500	450	0,015	10,75
ND 700zws	5	7,5	150	500	450	0,015	10,75
ND 700zwsv	5	7,5	150	500	450	0,015	10,75
ND 700hd	1,5	38	150	1000	550	0,100	11,56
ND 700hds	1,5	38	150	1000	550	0,100	11,56
ND 700hdsv	1,5	38	150	1000	550	0,100	11,56
ND 700hdzws	5	7,5	150	1000	550	0,015	11,65
ND 700hdzwsv	5	7,5	150	1000	550	0,015	11,65
ND 720	1,5	38	150	500	450	0,100	10,60
ND 720zv	1,6	28	100	500	450	0,095	10,10
ND 720zw	5	7,5	150	500	450	0,015	10,75
ND 720hd	1,5	38	150	1000	550	0,100	11,56
ND 720hdzw	5	7,5	150	1000	550	0,015	11,65
ND resp. SD 800	1,5	38	150	500	500	0,100	14,10
ND 800s	1,5	38	150	500	500	0,100	14,10
ND 800zv	1,6	28	100	500	500	0,095	12,94
ND 800zw-1600	5	7,5	150	1000	1000	0,015	14,25
ND 820	1,5	38	150	500	500	0,100	14,10
ND 900hd	5	7,5	150	1000	1000	0,015	14,25
ND resp. SD 900	5	7,5	150	500	500	0,015	14,30
ND 900s	5	7,5	150	500	500	0,015	14,30
ND 900sv	5	7,5	150	500	500	0,015	14,30
ND 900hds	5	7,5	150	1000	1000	0,015	14,25
ND 900hdsv	5	7,5	150	1000	1000	0,015	14,25
ND 920	5	7,5	150	500	500	0,015	14,30
ND 920hd	5	7,5	150	1000	1000	0,015	14,25
ND IR	1,5	38	150	500	250	0,100	1,38
NDS resp. SDS 150	1,6	28	100	500	500	0,095	2,05
NDS resp. SDS 300	1,6	28	100	500	500	0,095	4,10
Sopradrain 27	1,5	38	150	1000	1000	0,100	14,05

Nophadrain ND Drainage Systems  
SD Drainage System

Types of products and the performances

Annex A5