

# TECHNICAL DATA SHEET



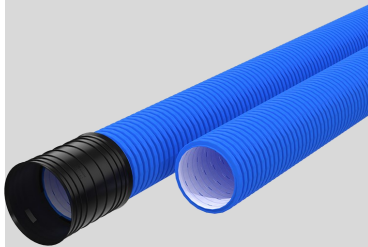
## EVODRAIN FLEX R2 TP SN4/SN8

Double walled (R2 type) drainage pipe DN/OD,  
totally perforated TP (360°)

Conformity:  
DIN 4262-1  
Pipe profile type: R2

### PRODUCT DESCRIPTION

Without filter material

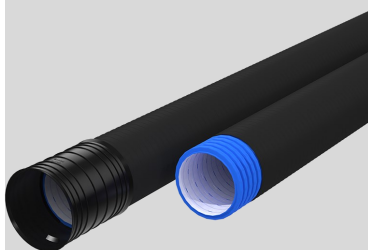


**EVODRAIN FLEX** is a drainage pipe with corrugated external wall and smooth internal surface according to product standard DIN 4262-1 conforms to profile type R2 and perforation class TP (360° totally perforated drainage pipe) with water filtration inlet perforation opening area  $\geq 50 \text{ cm}^2/\text{m}$ . Pipes are available in coils- total pipe length 50m. Every coil is supplied with a double sleeve. Nominal ring stiffness class SN4/SN8:

- Without filter material;
- With type A woven textile filter material overlay;
- With carpet type coir filter material overlay.

Pipes outer surface color is blue but inner is semi transparent.

With type A woven textile filter material overlay



Pipe material: HDPE (high density polyethylene).

Pipe produced according to standard: DIN 4262-1

Type A woven textile filter material: 100% polyester yarn with a nominal yarn linear density dtex=167 g/10km (den=150) with 48 fibril filament. Circular multi Lacoste knitted.

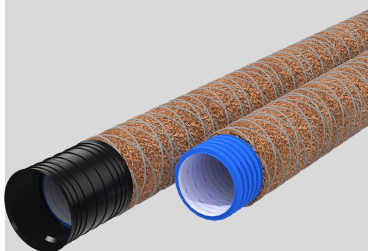
Carpet type coir filter material: 100% coco fiber stitched on two sides with Polypropylene (PP) or Jute netting.

Pipe produced according to standard: DIN 4262-1

Type A woven textile filter material produced according to: ASTM D6707-06, EN 13252

Carpet type coir filter material produced according to manufacturers technical specification which is portrayed in manufacturers technical data sheet.

With carpet type coir filter material overlay



### APPLICATION AREA

Corrugated drainage pipes are best suited for establishing hidden horizontal drainages to ensure dehumidification of the landfills. Drainage is to be installed on the land where ground-water depth is less than dehumidification norm, i.e. where high humidity saturation in the ground may result in slower drying of the productive soil at spring, as well as in destruction of basements of the building, road elution, etc.

- In agriculture, forestry, in parks, squares and peat fields;
- Temporary and permanent drainage systems at construction sites;
- Stadiums and sport complexes;
- Pavements, pedestrian and bicycle paths;
- Landfills (liquid and biogas collection);
- Road construction:
  - Without transport load;
  - With transport load

Drainage pipes with coir filters are specifically recommendable for usage in loamy, peaty soils where concentration of bivalent iron combinations in groundwater is 3–8 mg/l. Installation performance in accordance with standard EN 1610; CEN/TR 1046.

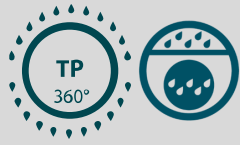
Ring stiffness:

**SN4**

**SN8**

**Open product**

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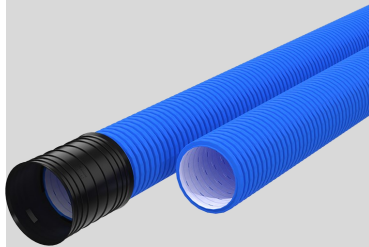
## EVODRAIN FLEX R2 TP SN4/SN8

Double walled (R2 type) drainage pipe DN/OD,  
totally perforated TP (360°)

Conformity:  
DIN 4262-1  
Pipe profile type: R2

### PRODUCT DIMENSIONS

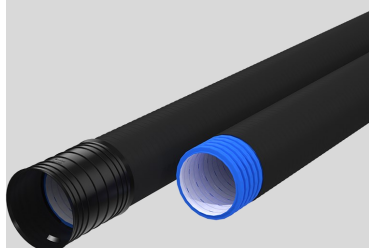
Without filter material



#### Pipe dimensions

Nominal size	63	75	90	110	125	160
Inside ID, mm	52	62,70	76,20	94,10	106,70	137,60
Profile height (h), mm	5,15	6,15	6,90	7,95	9,15	11,20
Perforation angle (α), m	60°	60°	60°	60°	60°	60°
Perforation opening length (b), mm	11,00	13,30	13,20	9,16	10,11	11,19
Perforation opening width (a), mm	1,20	1,20	1,40	1,20	1,20	1,40
Perforation opening area, cm <sup>2</sup> /m	≥50	≥50	≥50	≥50	≥50	≥50
Perforation opening quantity, pcs	3	3	3	6	6	6
Pipe length (coil), m	50	50	50	50	50	50

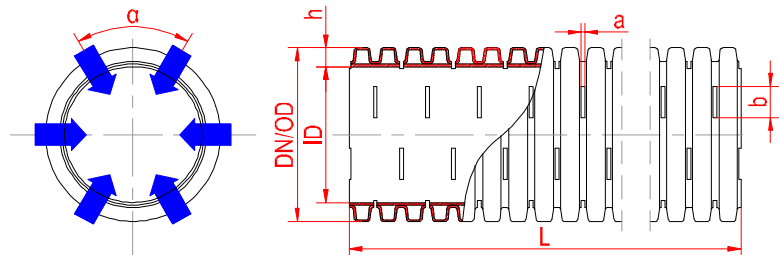
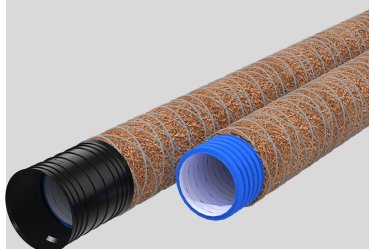
With type A woven textile filter material overlay



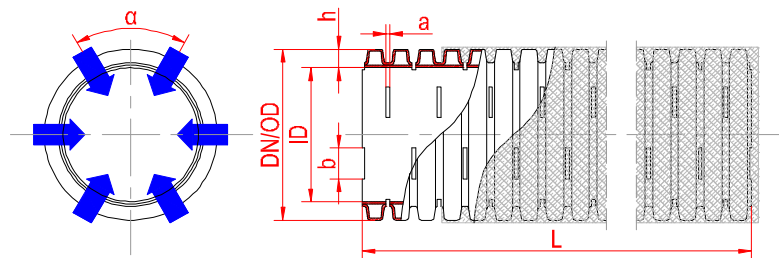
#### Type A woven textile filter material dimensions

Parameter	Value	Test method
Minimum fabric thickness, mm	0,600	ASTM D3887-96
Fabric thickness at 2 kPa, mm	0,600	EN ISO 9863-1

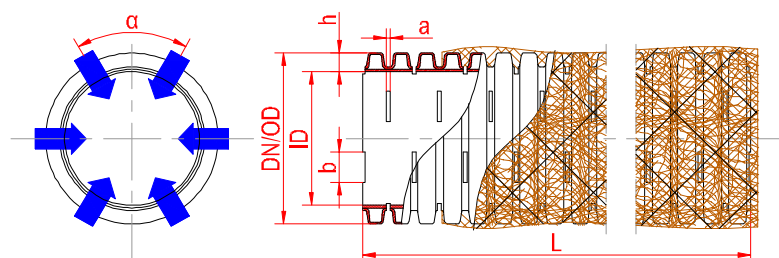
With carpet type coir filter material overlay



EVODRAIN FLEX R2 TP pipe without filter material



EVODRAIN FLEX R2 TP pipe with type A woven textile filter material overlay



EVODRAIN FLEX R2 TP pipe with carpet type coir filter material overlay

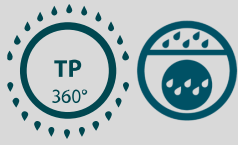
Ring stiffness:

SN4

SN8

Open product

# TECHNICAL DATA SHEET



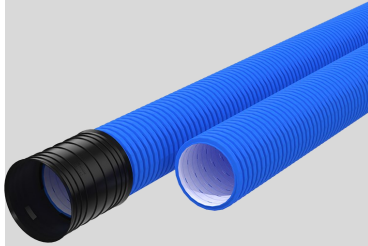
## EVODRAIN FLEX R2 TP SN4/SN8

Double walled (R2 type) drainage pipe DN/OD series,  
totally perforated TP (360°)

According to DIN 4262-1  
Pipe profile type: R2  
Perforation class: TP(360°)

### PRODUCT PARAMETERS

Without filter material



#### Pipe physical and mechanical properties

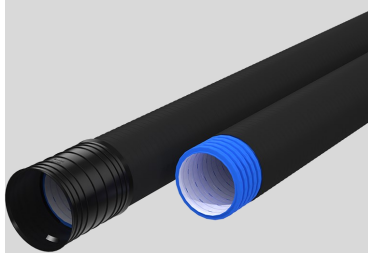
Parameter	Value	Test method
Material	HDPE	DIN 4262-1
Ring stiffness, kN/m <sup>2</sup>	4; 8	EN 9969
Resistance to external blows, by applying staircase method: d90, 0.8 ±0.005kg, Hmin 0.8m, t=(±0)°C	H <sub>50</sub> >1,2m	EN ISO 11173

#### Pipe flushing (cleaning) allowance parameters

Max pressure, bar	120
Minimum flow rate, l/min	80

#### Type A woven textile filter material physical and mechanical properties

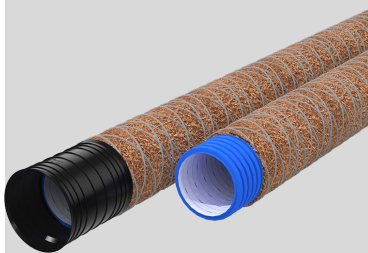
With type A woven textile filter material overlay



Parameter	Value	Test method
Material	PET	EN 13252 ASTM D6707-06
Areal density, g/m <sup>2</sup>	105..135	EN ISO 9864 ASTM D3887-96
Characteristic opening size O <sub>90</sub> , μm	max 300	EN ISO 12956
Apparent opening size, mm	0,300..0,425	ASTM D4751-12
Puncture resistance, N	1000	ASTM D6241-14
Static puncture resistance (CBR test), N	1000	EN ISO 12236
Minimum bursting strength, kPa	800	ASTM D3786/D3786M
Bursting strength (pneumatic method), kN/m <sup>2</sup>	800	EN ISO 13938-2

#### Type A woven textile filter material hydraulic properties

With carpet type coir filter material overlay



Bursting strength (pneumatic method), kN/m <sup>2</sup>	800	EN ISO 13938-2
Permittivity, s <sup>-1</sup>	3,8..4,2	ASTM D4491/D4491M
Permeability, cm/s	0,24..0,28	ASTM D4491/D4491M
Minimum water flow rate (51mm hydraulic head), l/min m <sup>2</sup>	11000	ASTM D4491/D4491M
Water permeability (without load) V <sub>150</sub> , m/s	0,183	EN ISO 11058
Minimum air permeability, cm <sup>3</sup> /cm <sup>2</sup> s	356	EN ISO 9237 ASTM D737-04

#### Type A woven textile filter material additional properties

Expected lifetime (ground with 4≤pH≤9, at ground temperature ≤25°C), years	<50	EN 13252
UV resistance	Not recommended to expose to direct sunlight for period that exceeds 45 days	
Chemical resistance	Generally good, however contact with strong acids and oxidizers should be avoided	
Atmospheric resistance	After installation in trench, pipe should be covered with soil, not more than a month afterwards	

Ring stiffness:

**SN4**  
**SN8**

**Open product**

#### Carpet type coir filter material physical and mechanical properties

Parameter	Value	Test method
Material	Coco fiber	Manufacturers technical documentation
Areal density, g/m <sup>2</sup>	≥500	EN ISO 9864

# TECHNICAL DATA SHEET

## STANDARDS APPLICABLE TO PIPES

Standard	Description
DIN 4262-1	Pipes and fittings for subsoil drainage of trafficked areas and underground engineering - Part 1: Pipes, fittings and their joints made from PVC-U, PP and PE
<b>Pipe geometric parameters according to:</b>	
EN 3126	Plastic piping systems - Plastic components - Determination of dimensions
<b>Pipe mechanical parameters according to:</b>	
EN ISO 9969	Thermoplastics pipes - Determination of ring stiffness
EN 9967	Thermoplastics pipes - Determination of creep ratio
EN ISO 11173	Plastics piping and ducting systems - Thermoplastics pipes - Determination of resistance to external blows by staircase method

## STANDARDS APPLICABLE TO FILTERS

### A type textile filter material conforms to standards:

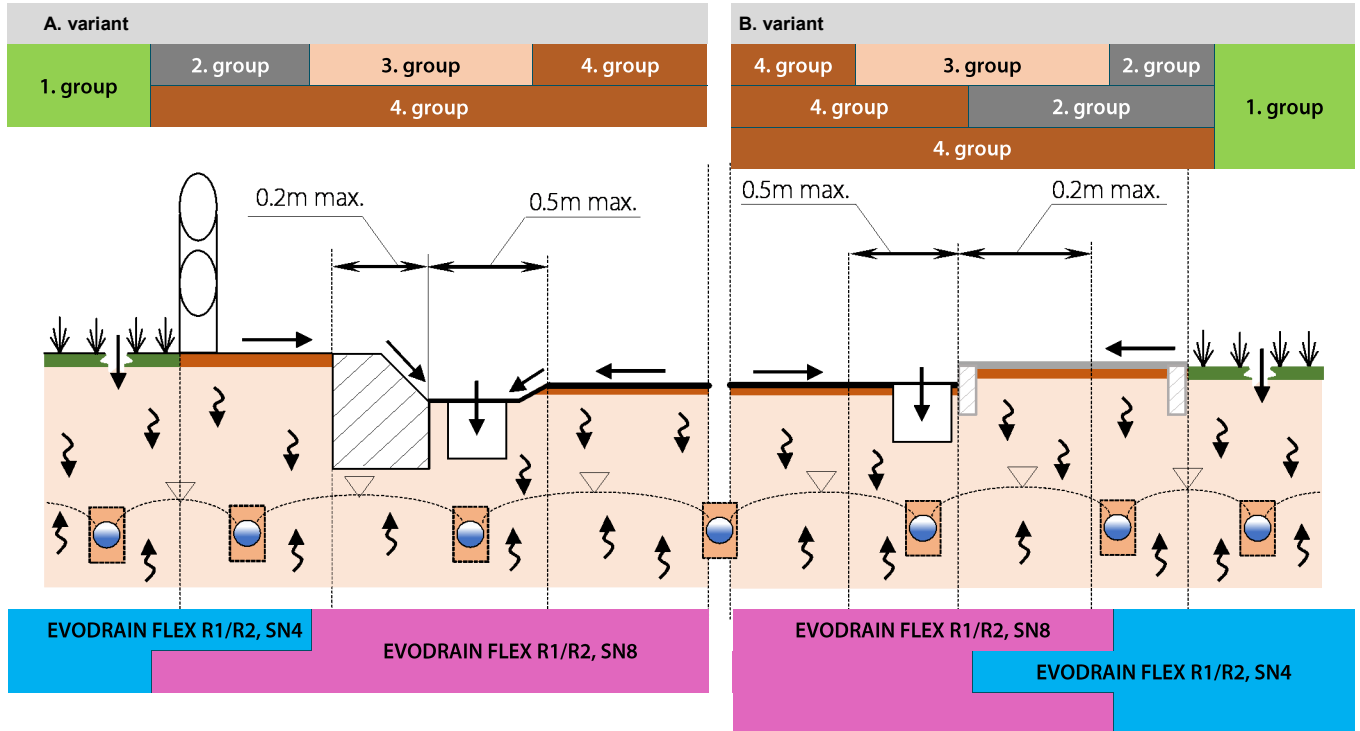
ASTM D6707-06	Standard specification for circular-knit geotextile for use in subsurface drainage applications
EN 13252	Geotextiles and geotextile-related products - Characteristics required for use in drainage systems
ASTM D3887-96	Standard specification for tolerances for knitted fabrics
EN ISO 9863-1	Geosynthetics - Determination of thickness at specified pressures - Part 1: Single layers
EN ISO 9864	Geosynthetics - Test method for the determination of mass per unit area of geotextiles and geotextile-related products
ASTM D4751-12	Standard test method for determining apparent opening size of a geotextile
EN ISO 12956	Geotextiles and geotextile-related products - Determination of the characteristic opening size
ASTM D6241-14	Standard test method for static puncture strength of geotextiles and geotextile-related products using a 50-mm probe
EN ISO 12236	Geosynthetics - Static puncture test (CBR test)
ASTM D3786/D3786M-13	Standard test method for bursting strength of textile fabrics- Diaphragm bursting strength tester method
EN ISO 13938-2	Textiles - Bursting properties of fabrics - Part 2: Pneumatic method for determination of bursting strength and bursting distension
ASTM D4491/D4491M-13	Standard test methods for water permeability of geotextiles by permittivity
EN ISO 11058	Geotextiles and geotextile-related products - Determination of water permeability characteristics normal to the plane, without load
ASTM D737-04	Test method for air permeability of textile fabrics
EN ISO 9237	Textiles - Determination of the permeability of fabrics to air

### Carpet type coco fiber filter material conforms to standards:

According to manufacturer technical specification which is portrayed in manufacturers product technical data sheet

# TECHNICAL DATA SHEET

## Pipe EVODRAIN FLEX R1/R2 application for drainage piping systems



A. variant

Typical highway cross-section, split into groups according to nominal strength (SN) class application of EVODRAIN FLEX pipes.

B. variant

Representative cross section of city street (carriageway) and pavement (sidewalk) or a hard shoulder, split into groups according to nominal strength (SN) class application of EVODRAIN FLEX pipes.

1. Group	2. Group	3. Group	4. Group
Areas which can only be used by pedestrians and pedal cyclists.	Pedestrian areas and comparable areas, car parks or car parking decks.	Areas of kerbside channels of roads which, when measured from the kerb edge, extends a maximum of 0.5m into the carriageway and maximum of 0.2m into the pedestrian area.	Carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles.

### APPLICATION BY SUBSTANCE TYPE

Substance type	Without filter material overlay	With A type filter material	With coco fiber filter material
<b>Binding– poorly filtering ground</b>			
Clay	No	No	Yes
Dense sandstone	No	No	Yes
Sandstone	No	Yes	Yes
<b>Non-binding– poorly filtering ground</b>			
Loam	No	Yes	No
<b>Binding–well filtering ground</b>			
Coarse sand	Yes	Yes	No
Binding sand	No	Yes	No
Non-binding sand (loose)	No	Yes	No
Gravel	Yes	Yes	No
Turf	No	Yes	Yes