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# TECHNICAL DATA SHEET

DRAIN mono


Totally perforated pipe TP(360°)


Locally perforated pipe LP(180°±10°)


Multipurpose pipe MP(≤120° )


Unperforated transport pipe UP

Ring stiffness class:

**SN8**

**Open product**

## MONODRAIN SN8

DN/OD series R3 type drainage pipe with smooth external and internal surface

Conformity:
EN 1852-1; DIN 4262-1;
(DBS 918 064)
Pipe profile type: R3
Perforation: TP(360°); LP
(180°±10°); MP(≤120°); UP

## PRODUCT DESCRIPTION

Drainage pipe with smooth internal and external surface according to product standard EN 1852-1, DIN 4262-1 (DBS 918 064) conforms to profile type R3. Perforation classes TP (360° totally perforated drainage pipe), LP (180°±10° locally perforated pipe), MP (≤120° multipurpose pipe) and UP (unperforated liquid transport pipe). Water filtration inlet perforation opening area ≥100 [$cm^2$/m] (for perforated pipes). Pipes are available in bars — with a pipe length of 6 [m]. The supplied sealing ring grants a hermetic seal with a pressure rating of ≥0,5 bar (for coupling area). Oil resistant seal acc. to requirements of EN 681-2 p.5.10.

Pipe material: PP (polypropylene).

Sealing ring material: EPDM (ethylene-propylene-diene rubber (terpolymer)).

Pipe produced according to standard: EN 1852-1, DIN 4262-1 (DBS 918 064)

Sealing rings conform to standard: EN 681-1/A3

## APPLICATION AREA

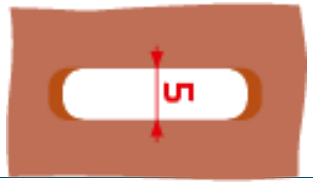
Drainage pipes are best suited for establishing hidden horizontal drainages to ensure dehumidification of the landfills. Drainage is to be installed on the land where ground-water depth is less than dehumidification norm, i.e. where high humidity saturation in the ground may result in slower drying of the productive soil at spring, as well as in de-struction of basements of the building, road elution, etc. In agriculture, forestry, in parks, squares and peat fields;

- Stadiums and sport complexes;
- Temporary and permanent drainage systems at construction sites;
- Landfills (liquid and biogas collection);
- For civil and industrial buildings and construction areas;
- Airport territory construction;
- Harbour and dock territory construction;
- Road construction application:

Storage of sealing rings according to standards ISO 2230 and EN 681-1/A3 D.

Installation performance in accordance with standard EN 1610; CEN/TR 1046.

Both ends of perforation opening are rounded.



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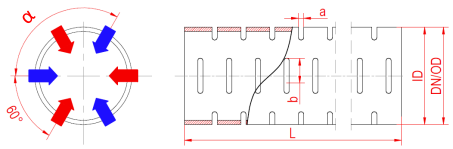
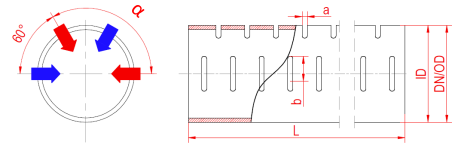
## PRODUCT DIMENSIONS

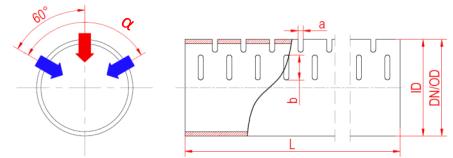
| Nominal size | DN/OD 110 | DN/OD 160 | DN/OD 200 | DN/OD 250 |
|---|---|---|---|---|
| Inside diameter ID, mm | 99,0 | 144,6 | 179,4 | 232,8 |
| Pipe bar length (L), m | 6 | 6 | 6 | 6 |
| **Perforation opening parametres for perforation classes — TP, MP and LP** | | | | |
| Perforation opening width (a), mm | 5 | 5 | 5 | 5 |
| Perforation opening area, $cm^2/m$ | ≥100 | ≥100 | ≥100 | ≥100 |
| **Perforation opening parameters for perforation class TP (360°)** | | | | |
| Perforation angle (α) | 120° | 120° | 120° | 120° |
| Perforation opening length, mm (b) | 31 | 31 | 31 | 31 |
| Perforation opening quantity on transverse plane normal to profile foot, pcs | 3 | 3 | 3 | 3 |
| **Perforation opening parameters for perforation class LP (180°±10°)** | | | | |
| Perforation angle (α) | 120° | 120° | 120° | 120° |
| Perforation opening length, mm | 46 | 46 | 46 | 46 |
| Perforation opening quantity on transverse plane normal to profile foot, pcs | 2 | 2 | 2 | 2 |
| **Perforation opening parameters for perforation class MP (≤120°)** | | | | |
| Perforation angle (α) | 120° | 120° | 120° | 120° |
| Perforation opening length, mm | 61 | 61 | 61 | 61 |
| Perforation opening ratio on transverse plane normal to profile foot, pcs | 2:1 | 2:1 | 2:1 | 2:1 |



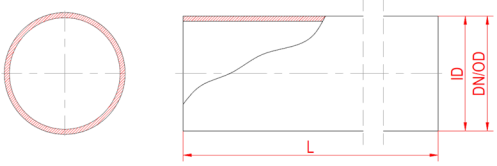

TP class 360° totally perforated pipe. Water inlets are evenly distributed along pipes circumference.




LP class 180°±10° locally perforated pipe. Water inlets are located in the upper part of the pipe symmetric to pipes vertical axis in 180°±10° area, but flow line (used for collection and transportation of liquids) is not perforated and stands opposed to inlet area.




MP class ≤120° multipurpose pipe. Water inlets are located in the upper part of the pipe symmetric to pipes vertical axis in max of 120° area, but flow line (used for collection and transportation of liquids) is not perforated and stands opposed to inlet area.




UP class unperforated liquid transport pipe is used for transportation of water.

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Ring stiffness class:

**SN8**

**Open product**

## MONODRAIN SN8

DN/OD series R3 type drainage pipe with smooth external and internal surface

Conformity:
EN 1852-1; DIN 4262-1;
(DBS 918 064)
Pipe profile type: R3
Perforation: TP(360°); LP
(180°±10°); MP(≤120°); UP

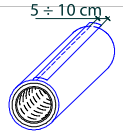
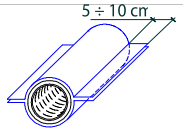
## PRODUCT PARAMETERS

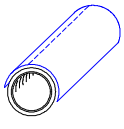
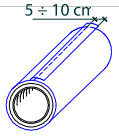
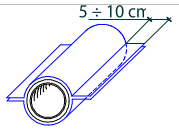
| Pipe physical and mechanical properties | | |
|---|---|---|
| **Parameter** | **Value** | **Test method** |
| Material | PP | EN 1852-1<br>DIN 4262-1<br>(DBS 918 064) |
| Ring stiffness, kN/m² | 8 | EN 9969 |
| Impact resistance —10°C ❄ (staircase method) | $H_{50}$≥1000mm<br>No break below 500 mm | EN 11173 |
| **Sealing ring physical and mechanical properties for TP, LP, MP un UP class pipes** | | |
| **Rubber sealing ring** | | |
| Material | EPDM | ISO 1629 |
| Durability in low temperature, at t= -25°C | 72 h | ISO 815 |
| | 168 h | ISO 3387 |
| Chemical resistance | pH2<pH<pH12 | ISO/TR 7620 |
| Permeability pressure | <0,5 bar | EN ISO 13254<br>EN ISO 13259<br>Condition B and C |
| Oil resistance* | Conforms | EN 681-2 |
| **Pipe flushing (cleaning) allowance parameters** | | |
| Max pressure, bar | 120 | |
| Minimum flow rate, l/min | 80 | |

*Oil resistant seal acc. to requirements of EN 681-2 p.5.10; conformity determined by Volume change in oil test acc. to ISO 1817

## FILTER MATERIAL APPLICATION OPTIONS

Drainage pipes MONODRAIN R3 are produced without filter material overlay. If it is necessary then application of filter material must be done on site. Recommended application of filter material overlay is demonstrated in the tables bellow.

| Class TP 360° totally perforated pipe recommended filter material overlaying options | |
|---|---|
| **A variant** | **B variant** |
| Pipe is covered fully along it's circumference with a single sheet of filter material overlay | Pipe is covered along it's circumference with two identical sheets of filter material overlays |
|   |   |

| Class LP 180°±10° locally perforated pipes and class MP ≤120° multipurpose pipe recommended filter material overlaying options | | |
|---|---|---|
| **A variant** | **B variant** | **C variant** |
| Only perforated area is overlaid with a single filter sheet | Pipe is fully covered along it's circumference with a single filter sheet | Pipe is covered along it's circumference with two identical sheets of filter material overlays |
|  |   |   |

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## 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 |
| EN 1852-1 | Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene (PP). Part 1: Specifications for pipes and fittings and the system |
| (DBS 918 064) | (Plastic pipes and manholes for the railway facilities drainage) |
| **Pipe geometric parameters according to:** | |
| EN 3126 | Plastic piping systems - Plastic components - Determination of dimensions |
| **Pipe mechanical parameters according to:** | |
| EN ISO 9969 | Thermoplastics pipes - Determination of ring stiffness |
| EN 9967 | Thermoplastics pipes - Determination of creep ratio |
| EN 11173 | Plastics piping and ducting systems - Thermoplastics pipes - Determination of resistance to external blows by staircase method |

## APPLICATION BY SUBSTANCE TYPE

| Substance type | Without filter material overlay | With A type filter material overlay* | With coco fiber filter material overlay* |
|---|---|---|---|
| **Binding– poorly filtering ground** | | | |
| Clay | No | No | Yes |
| Dense sandstone | No | No | Yes |
| Sandstone | No | Yes | Yes |
| **Non-binding– poorly filtering ground** | | | |
| Loam | No | Yes | No |
| **Binding–well filtering ground** | | | |
| 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 |

*- If substance requires a filter material overlay then application of filter overlay must be done on site.

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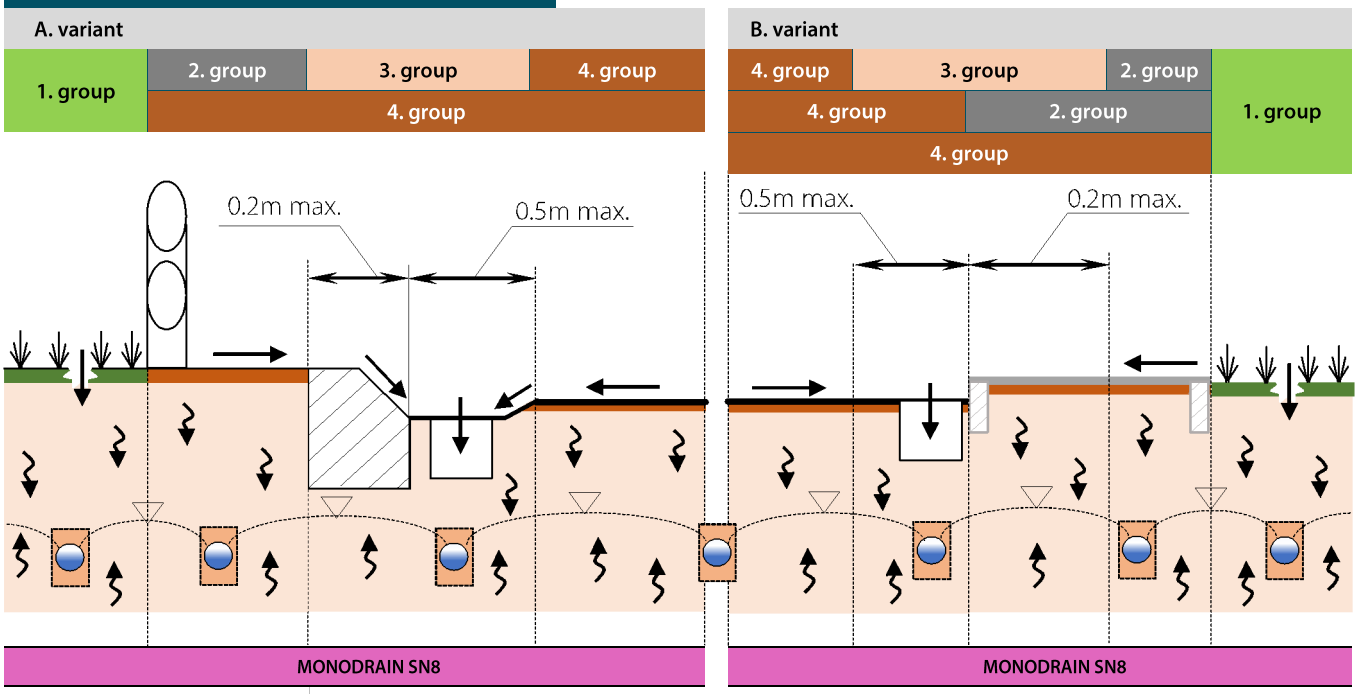
# TECHNICAL DATA SHEET

MONODRAIN R3 SN8 and SN16 pipes application for drainage piping systems

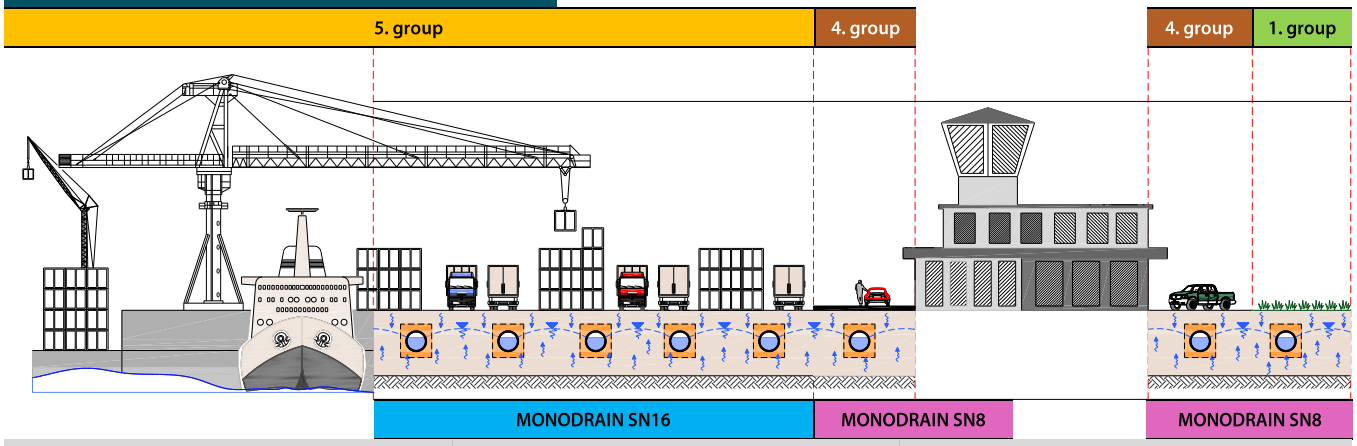
## ROAD CONSTRUCTION APPLICATION




| | |
|---|---|
| A. variant | Typical highway cross-section, split into groups according to nominal strength (SN) class application of MONODRAIN pipes. |
| B. variant | Representative cross section of city street (carriageway) and pavement (sidewalk) or a hard shoulder, split into groups according to nomi- |

| 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 pedestri- an streets), hard shoulders and parking areas, for all types of road vehicles. |

## HARBOR AND DOCK APPLICATION




| 1. Group | 4. Group | 5. Group |
|---|---|---|
| Areas which can only be used by pedestrians and pedal cyclists. | Carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles. | Areas imposing high wheel loads, e.g. docks, aircraft pavements. |

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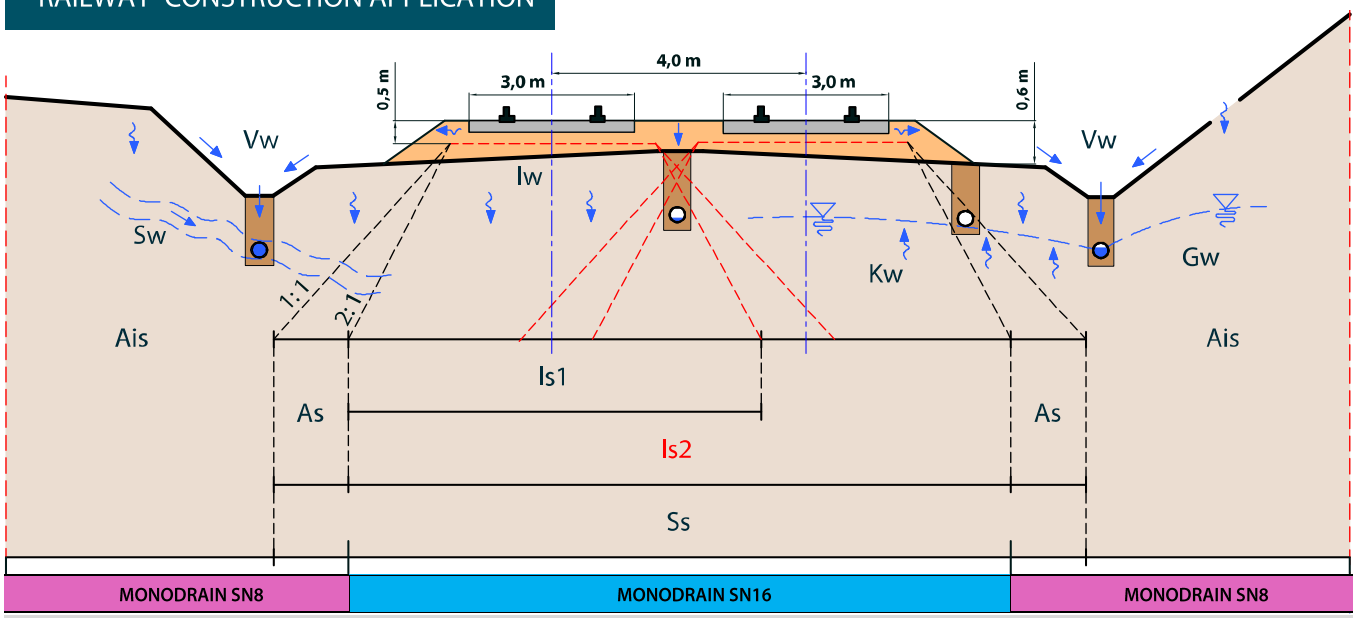
## RAILWAY CONSTRUCTION APPLICATION




| Description of used terms | |
|---|---|
| **Vw** - terrestrial water;<br>**Lw** - infiltration water;<br>**Kw** - capillary water;<br>**Sw** - water layer;<br>**Dw** - groundwater, still water | **Is 1** - inside traffic load influence area (from 1 track)<br>**Is 2** - inside traffic load influence area (from 2 tracks)<br>**As** - outside traffic load influence area<br>**Ss** - traffic load influence area<br>**Ais** - area outside of traffic load influence |

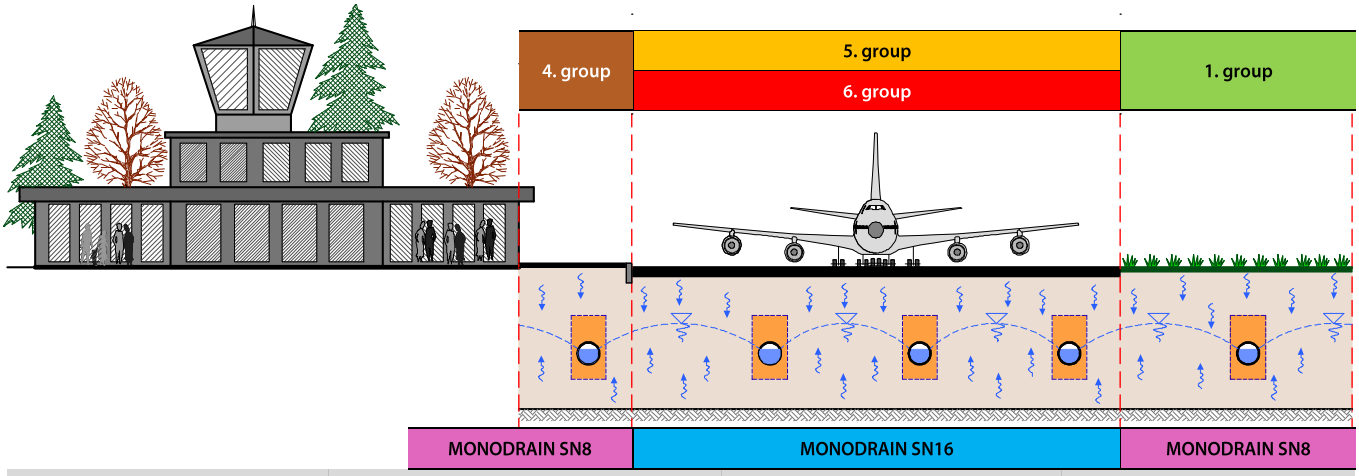
**Drainage pipe nominal ring stiffness class (SN) selection by usage area and ground group**

| Ais | As | Is 1 and Is 2 |
|---|---|---|
| MONODRAIN SN8 | MONODRAIN SN8 | MONODRAIN SN16 |
| Applicable to all ground groups* | Applicable to all ground groups* | Applicable to G1, G2 and G3 ground groups* |

*Ground groups according to ATV-A 127

| | | | |
|---|---|---|---|
| G1 - non-binding sand and gravel | G2 - well binding sand and gravel | G3 - binding mixed ground and coarse sand | G4 - binding ground (e.g. clay) |

## AIRPORT TERRITORY APPLICATION




| 1. Group | 4. Group | 5. Group | 6. Group |
|---|---|---|---|
| Areas which can only be used by pedestrians and pedal cyclists. | Carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles. | Areas imposing high wheel loads, e.g. docks, aircraft pavements. | Areas imposing particularly high wheel loads, e.g. aircraft pavements. |