



Flexible in piping systems



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GrainDrain from GrainPlastics is produced from PE and/or PP in diameters Ø 25mm, 50mm, 60mm, 65mm, 80mm, 100mm, 125mm, 160mm and 200mm.

Usage of PE- and PP pipesystems has many advantages;

- PE- and PP pipes are sustainable with a long lifespan;
- PE- and PP pipe can be processed and used at both high and low temperatures;
- PE- and PP pipes have a high chemical resistance;
- PE- and PP pipes have a high ring stiffness;
- PE- and PP pipes are environment friendly.
- all materials have been produced from recycled material and/or are totally recyclable;

The standard color is black.

Diameters Ø 50mm, 60mm, 65mm, 80mm, 100mm en 125mm have a KOMO certification.

The perforated pipes can be wrapped with several wrappings. The function of such a wrapping is filtering out sand-particles and increasing the wet perimeter of the system (pipe plus wrapping) which increases the influx of groundwater. The density of the filter is specified with an O90-number, meaning that 90% of all particles larger than the named O90-value will be filtered out by the wrapping.

(More info about wrappings can be found at the product-info-pages).

OD	ID	Coil	Certificate	Ring stiffness
25mm	20mm	250/500m	-	SN8
50mm	42mm	50/200m	KOMO	SN8
60mm	50,5mm	50/150m	KOMO	SN8
65mm	55,5mm	50/150m	KOMO	SN8
80mm	68,5mm	50/100m	KOMO	SN8
100mm	87mm	50m	KOMO	SN6
125mm	107,5mm	50m	KOMO	SN4
160mm	136mm	25/50m	-	SN4
200mm	176mm	20m	-	SN4



Product description:

GrainDrain flexible drainage in PE and/or PP is KOMO certified for diameters* Ø 50mm, 60mm, 65mm, 80mm, 100mm and 125mm. Sizes Ø 160mm and Ø 200mm meet general requirements. GrainPlastics produces both a perforated and an unperforated version.

Material:

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)

Application:

- Horizontal drainage
- Infiltration

Prescribers:

- PE- or PP- flexible drainage "GrainDrain" Ømm
- Color black, incl. click-socket
- Perforated or unperforated
- KOMO-certified.
- Producer GrainPlastics BV

Outer diameter (mm)	25	50	60	65	80	100	125	160	200
Inner diameter (mm)	20	42	50,5	55,5	68,5	85	107,5	140	176
Perforation rows (pc)	4	6	6	6	6	8	8	6	6
Perforation width (mm)	0,8	1,3	1,3	1,3	1,3	1,5	1,5	1,5	1,8
Perforation length (mm)	6	8	10	11	12	16	16	20	20
Perforations per m	430	210	210	210	321	308	244	348	330
Perf. surface per m (mm ²)	2064	2184	2730	3003	5008	7392	5856	10440	9900
Weight (gr/m) ±	75	160	200	220	325	415	590	900	1440
Ring stiffness	SN8	SN8	SN8	SN8	SN8	SN6	SN4	SN4	SN4
Min. bending radius (mm)	100	100	120	130	160	200	250	320	400



Product description:

This wrapping is KOMO certified and is a popular wrapping in road construction, agricultural and horticultural markets and can be delivered in a PP450, PP700 or PP1000* version.

Application of this type of fiber in combination with an iron-rich soil is not recommended because iron-residue can be formed in the wrapping.

Material

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)
- Wrapping PP-fiber coming from the textile-industry (recycled raw material)

Filter properties

- PP450 - O90 450 μ - Dense structure
- PP700 - O90 700 μ - Open structure
- PP1000* - O90 1000 μ - Very open structure

Application

- Agri- and horticultural markets
- Welling
- Sport and recreational fields
- Road construction

Prescribers

- PE- or PP- flexible drainage "GrainDrain" \varnothing mm
- Color black, incl. click-socket
- PP450 (or PP700) wrapped
- KOMO-certified
- Producer GrainPlastics BV

*More info on PP1000 see 1.3





Product description:

GrainDrain flexible drainage with wrapping GrainFlex1000 (artificial grass-fiber, KOMO certified).

This wrapping is available for diameters Ø 60mm, 65mm, 80mm and 100mm.

In situations where coco-fiber is less applicable, for example in calcareous soil, GrainFlex1000 can be the right replacement. GrainFlex1000 has the same density (O90 1000 μ) and can be applied in sandy soils.



Material

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)
- Wrapping PP-fiber coming from the artificial grass-fields (recycled raw material)

Filter properties

- GrainFlex1000 - O90 1000 μ - Very open structure

Application

- Agri- and horticultural markets
- Welling
- Sport and recreational fields
- Road construction

Prescribers

- PE- or PP- flexible drainage "GrainDrain" Ømm
- Color black, incl. click-socket
- GrainFlex1000 (or PP1000) wrapped
- KOMO-certified
- Producer GrainPlastics BV

**Product description:**

GrainDrain flexible drainage wrapped with coconut fiber.

In cases where artificial fibers can not be applied, for example in iron-rich soil, coco can be used. The open structure of the coco-wrapping (O90 1000 μ) makes it suitable for usage in sandy soils.

Coco is an organic fiber and therefore susceptible to natural decomposition-processes. After degeneration of the fiber, a cavity will remain around the pipe, which supports the drainage of water for a long time afterward. In order to maintain this function, preventive flushing of the system is not recommended.

Material

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)
- Wrapping coconut fiber coming from the coconut-production (recycled raw material)

Filter properties

- Coco normal - O90 1000 μ - Very open structure
- Coco heavy - O90 700 μ - Open structure

Application

- Agri- and horticultural markets
- Welling
- Sport and recreational fields
- Road construction

Prescribers

- PE- or PP- flexible drainage "GrainDrain" \varnothing mm
- Color black, incl. click-socket
- Coco-fiber wrapped
- Producer GrainPlastics BV





Product description:

GrainDrain flexible drainage with a Nylon wrapping.

Nylon is mainly being applied as a filter in tree-aeration-systems and temporary drainage.

Nylon is a fragile wrapping and therefore not a stock-item, the coils are being packed in foil to protect the wrapping.



Material

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)
- Wrapping nylon stocking

Filter properties

- Nylon stocking has variable filter-properties
- Non voluminous

Application

- Temporary drainage
- Welling
- Tree aeration pipesystems

Prescribers

- PE- or PP- flexible drainage "GrainDrain" Ømm
- Color black, incl. click-socket
- Nylon stocking wrapped
- Producer GrainPlastics BV

**Product description:**

GrainDrain flexible drainage wrapped with a non-woven Polyester textile.

Fleece-wrapping has a dense structure and can be used on soils with a fine structure. The wrapping is mainly applied on sand- and clayground and mostly used in Belgium and Germany.

Material

- PE-drainage - HDPE-regranulate (recycled raw material)
- PP-drainage - PP-regranulate (recycled raw material)
- Wrapping polyester textile

Filter properties

- O90 180-240 μ - Non voluminous

Application

- Agri- and horticultural markets
- Welling
- Sport and recreational fields
- Road construction

Prescribers

- PE- or PP- flexible drainage "GrainDrain" \varnothing mm
- Color black, incl. click-socket
- Polyester fleece wrapped
- Producer GrainPlastics BV





Product description:

PP suction-tube (Blue), Ø 80 and 100mm, has been developed to withstand forces that are released during usage in combination with pumps. With a ring stiffness of nominal SN10 (ascertained SN14 to SN19) PP blue suction-tube is highly suitable for this heavy job.

When a vacuum-pump is connected to a regular blind drainage-tube (PE or PVC), constriction of the pipe may occur. PP suction-tube can withstand this pressure; the pipe is produced from a high quality raw material and has a higher vacuum-resistance than a regular drainage-tube. Usage of PP as raw material also means that the pipe has a high chemical resistance (see info-page 4, chemical resistance) making the pipe suitable for draining contaminated groundwater.



Material

- PP-drainage - PP-granulate (new material)

Connection

- Every coil is fitted with a PP/PE click-socket

Application

- Welling
- Remediation polluted soil

Prescribers

- PP blue suction-tube Ømm
- Unperforated,
- Color blue, incl. click-socket
- Producer GrainPlastics BV



Product description:

GrainDrain TwinTube flexible double wall drainage in PE is available in diameters Ø 90mm, 100mm, 110mm, 125mm, 160mm en 200mm. TwinTube consists of an outside corrugated pipe with an innerwall on coils or lengths. The advantage in comparison to single wall drainage is a higher ringstiffness and improved waterflow because of the extra innerwall.

The standard color of this item is black and the system can be wrapped with different types of wrapping.

Standard fittings are available for diameters Ø 100mm, 125mm, 160mm and 200mm (T-pieces, sockets, stops and reduction-pieces). Bends seldom have to be used thanks to the flexibility of our product.

Material

- HDPE outerwall, PE-granulate (new material)
- LDPE innerwall, PE-regranulate (recycled material)

Connection

- Every coil or length is fitted with a click-socket.

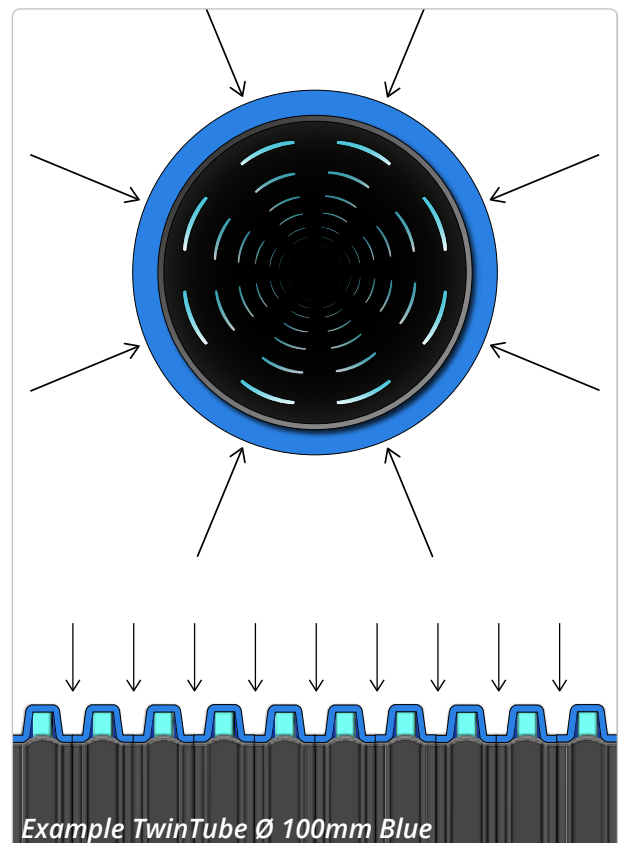
Application

Suitable for applications with increased requirements such as:

- Deep-drainage
- Infiltration
- Vacuum extraction systems (unslotted)

Prescribers

- PE Double wall flexible drainage
- "GrainDrain TwinTube" Ømm
- Perforated, Color black, incl. click-socket
- Producer GrainPlastics BV





GrainDuct cable protection pipe is produced from PE in diameters Ø 40mm, 50mm, 63mm, 75mm, 90mm, 110mm, 125mm, 160mm and 200mm, on flexible coils of 25 meters or 50 meters and on rigid 6 meter lengths, all fitted with click-sockets.

The HDPE outerwall is red and the LDPE innerwall is black*. On request GrainDuct cable protection pipe can be produced in other colors. This item is produced according to the European norm CEI-IEC 61386-24.

GrainDuct cableduct on coils is fitted with a pull-string and has an innerwall which eases the process of cable pulling.

OD	ID	Coil	Bend-radius	Length	Ring stiffness
40mm	32mm	25/50m	350mm	--	SN8
50mm	41mm	25/50m	350mm	--	SN8
63mm	52mm	25/50m	400mm	6m	SN8
75mm	61mm	25/50m	400mm	6m	SN8
90mm	75mm	25/50m	450mm	6m	SN8
110mm	94mm	25/50m	450mm	6m	SN6
125mm	106mm	25/50m	500mm	6m	SN4
160mm	135mm	25/50m	650mm	6m	SN4
200mm	175mm	25m	750mm	6m	SN4

When the system needs to be water-resistant, rings can be added to the click-socket. The system will then be water-resistant according to the IP67 norm (see chapter 5). This means that the pipes are dust-proof and are protected against immersion under a 1m watercolumn for a period of 30 minutes.

*The innerwall can be colored black or dark-grey, smaller sizes can be produced with a natural inner-layer.

**Product description:**

GrainDuct flexible double wall cable protection pipe in PE, on coils.

GrainDuct cableduct is produced on coils with a HDPE outerwall and a LDPE innerwall. The outerwall is red and the innerwall is black*. The pipe is produced with an innerwall which makes it easier to pull the cable through the system. The coils are equipped with a PET pull-string with a pull-force of $\pm 37\text{kg}$., which is added during production.

Material

- HDPE outerwall, PE-granulate (new material)
- LDPE innerwall, PE-regranulate (recycled material)
- PET pull-string

Connection

- Every coil or length is being fitted with a click-socket.
- When the system needs to be water-resistant, rings can be added which makes the system waterproof according to the IP67 norm.

Application

- Protection of cables and pipes

Prescribers

- GrainDuct cable protection pipe \varnothing mm
- Double wall PE, including pull-string and click-socket
- Flexible coils 50 meters or 25 meters, color red,
- Producer GrainPlastics B.V.



*The innerwall can be colored black or dark-grey, smaller sizes can be produced with a natural inner-layer.

**Product description:**

GrainDuct PE double wall cable protection pipe in 6 meter lengths.

GrainDuct cableduct on lengths is produced from HDPE, the outerwall is red and the innerwall is black.

The pipe is produced with an innerwall making it easier to pull the cable through the system.

**Material**

- HDPE outerwall, PE-granulate (new material)
- HDPE innerwall, PE-regranulate (recycled material)

Connection

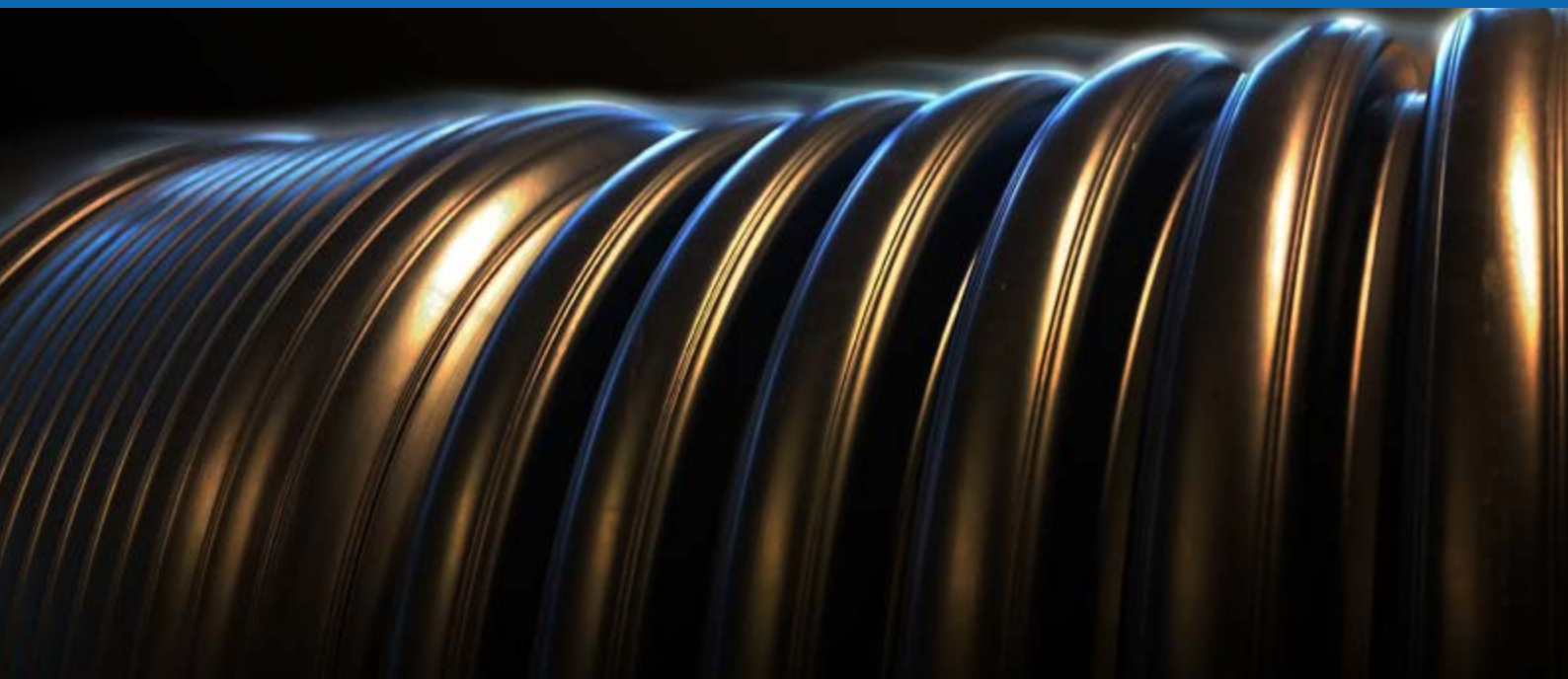
- Every coil or length is being fitted with a click-socket.
- When the system needs to be water-resistant, rings can be added which makes the system waterproof according to the IP67 norm.

Application

- Protection of cables and pipes

Prescribers

- GrainDuct cable protection pipe Ømm
- Double wall PE, Including pull-string and click-socket
- 6 meter lengths, color red
- Producer GrainPlastics B.V.



Sewage pipes are produced from PP in diameters Ø 200mm, 250mm, 315mm and 400mm, with a ring stiffness of SN8 (PROLAN/KOMO) or SN4 (AGRILAN). The standard length is 6 meter incl. a welded coupler.

Next to the PP sewage for heavy usage, GrainPlastics offers an agricultural version, a dam-pipe from PE Ø 315mm in 8 meter lengths. This pipe has a ring stiffness of SN4, is black and is produced without a socket. The usage of plastic as raw material has advantages; pipes are easy to process and are significantly lighter in weight versus concrete pipes.

Infiltration-sewage

It is also possible to fit the pipes with slots and a wrapping, making the system suitable for usage as a PP Infiltration or Drainage-Transport system.

Colors

The standard colors are black, redbrown and green.

OD	ID	Quantity per pallet
200mm	175mm	23pc
250mm	220mm	12pc
315mm	276mm	8pc
400mm	350mm	5pc





Product description:

PROLAN double wall sewage SN8 in PP, is produced in diameters Ø 200mm, 250mm, 315mm and 400mm, in 6 meter lengths. PROLAN is KOMO certified for these diameters in the colors black and red-brown.

PROLAN is produced from PP raw material, both for the inner- and the outerwall. Standard colors for the outerwall are black, redbrown and green. The innerwall is produced from light-grey material which improves visibility for camera-inspections and is smooth improving the flow of water.



Material

- PP-outerwall, PP-granulate (new raw material)
- PP-innerwall, PP-granulate (new raw material)

Connection:

- Fitted with a welded PP coupler incl. rubber ring.

Application

- Sewage

Prescribers

- PROLAN PP sewage Ømm, SN8, color black
- Double wall PP, Incl. welded socket, 6 meter lengths
- KOMO-certified
- Producer GrainPlastics B.V.

**Product description:**

AGRILAN twinwall agricultural sewage is produced from PP in diameters Ø 200mm, 250mm, 315mm and 400mm in lengths of 6 meter.

AGRILAN has a PP inner- and outerwall. The standard color of the outerwall is black and the innerwall is dark-grey.

AGRILAN's light-weight makes it a cost-effective alternative for the agricultural market.

Material

- PP-outerwall, PP-regranulate (recycled raw material)
- PP-innerwall, PP-regranulaat (recycled raw material)

Connection:

- Fitted with a welded PP coupler incl. rubber ring.

Application

- Agricultural use
- Dam-pipe

Prescribers

- AGRILAN PP Agricultural sewage Ømm, SN4, color Black
- Double wall PP, Incl. welded socket, 6 meter lengths
- Producer GrainPlastics B.V.





Product description:

AGRILAN double wall dam-pipe SN4 in PE is available in diameter \varnothing 315mm on 8 meter lengths without a socket.

AGRILAN dam-pipe is produced from PE raw material for both the inner- and the outerwall. The standard color is black with a dark-grey innerwall.

AGRILAN PE is offered at a very attractive price and is a very suitable alternative for conventional corrugated pipes that are currently applied in the agricultural market.



Material

- PE-outerwall, PE-regranulate (recycled raw material)
- PE-innerwall, PE-regranulate (recycled raw material)

Connection:

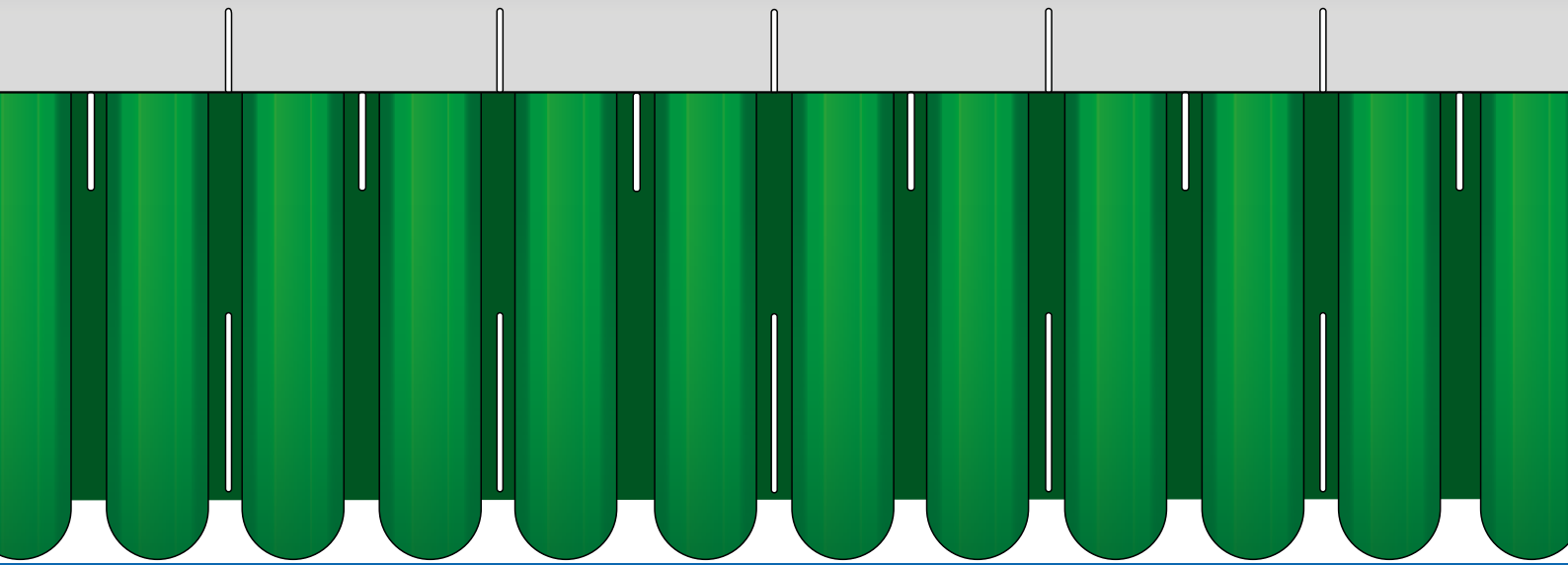
- Excl. socket

Application

- Agricultural usage
- Dam-pipe

Prescribers

- AGRILAN PE Agricultural dam-pipe \varnothing 315mm
- SN4, color black
- Double wall PE, 8 meter lengths
- Producer GrainPlastics B.V.

**Product description:**

GrainPlastics PP SN8 Infiltrationpipe is produced in PP in diameters Ø 200mm, 250mm, 315mm and 400mm in lengths of 6 meter.

Infiltrationpipe is produced in PP-raw material for both the inner- and outerwall, the standard color is green, other colors can be produced on request. A socket and sealing-ring are pre-fitted.

The pipe can be wrapped with different types of wrapping and the perforation can be changed to a partial slitting when desired (2/3 or 1/3 slitted).

Material

- PP-outerwall, PP-granulate (new raw material)
- PP-innerwall, PP-granulate (new raw material)

Connection:

- Fitted with a welded PP coupler incl. rubber ring.

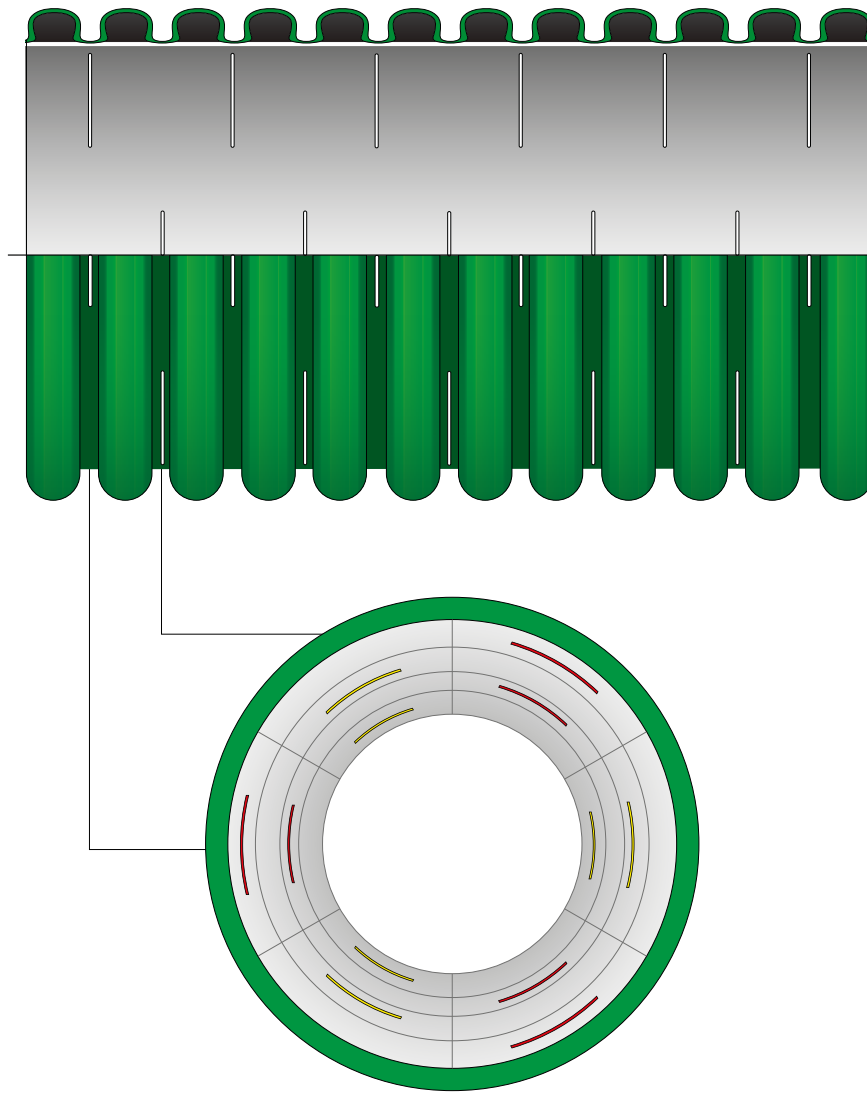
Toepassing

- Infiltration
- DT-pipe (Drainage Transport)

Prescribers

- GrainPlastics Infiltrationpipe SN8 Ømm
- Doublewall PP, Including welded socket, 6 meter lengths
- Color Green
- Producer GrainPlastics B.V.





	200	250	315	400
Number of perforations	6	6	6	6
Perforation width (mm)	2	2	2	2
Perforation length (mm, +/- 10mm)	50	60	60	60
Number of perforations per m1	135	114	93	72
Perforated surface (mm ² /m1)	13500	13680	11160	8640

Wrapping type	Description	Properties
PP450	PP fibre, non-woven	Density O90 450μ
PP700	PP fibre, non-woven	Density O90 700μ
HF180	Slip-over Geotextile, woven	Density O90 180μ, permeability 50 l/m ² s
NW15/NW16	Slip-over Geotextile, non-woven	Density O90 85μ, permeability 85 l/m ² s





PE solid wall (smooth) pipes are produced in LDPE (PE40) Ø 16mm, 20mm, 25mm, 32mm, 40mm, 50mm, 63mm and HDPE (PE100) in diameters Ø 20mm, 25mm, 32mm, 40mm, 50mm, 63mm, 75mm, 90mm, 110mm, 125mm, 160mm, 200mm and 250mm.

Application of different types of solid wall PE pipes.

With a piping system out of PE, you are choosing a sustainable and high-quality system. Our assortment of PE smooth pipes has been developed with care and has been subjected to testing according to the applying certification-norms.

System type	Color-coding	Certificate	European norm
Water pipe LDPE	Black / 4 blue stripes	Kiwa & WRAS PE40	NEN-EN12201
Water pipe HDPE	Black / 4 blue stripes	Kiwa	NEN-EN12201
Pressure pipe	Black	KOMO	NEN-EN13244
Gas pipe	Black / 4 yellow stripes	Gastec	NEN-EN1555
Glass fiber pipe (ridged inside)	Green or blue	n/a	n/a

Specials

In addition to the products with certification it is possible for us to produce a pipe without certifications, fitted to your special demand, something which can create an attractive price-advantage.

Lengths

This product is available in different lengths;

KIWA LDPE Ø 16 – 63mm on coils of 50 and 100 meters, KIWA/KOMO/Gastec Ø 20 – 110mm SDR17 and SDR11 on coils of 50 and 100 meters, KOMO Ø 75 – 110mm SDR17 on sturdy lengths of 10 meters and KIWA/KOMO/Gastec Ø 125 – 250mm SDR17 and SDR11 on lengths of 10 meters.



Overview diameter – pressure-class and wall-thickness

Type	PE40	PE100 – Kiwa/KOMO HDPE			PE100 – Gastec HDPE	
	Kiwa/WRAS LDPE	SDR17	SDR13,6*	SDR11	SDR17,6	SDR11
SDR/Ø	SDR9					
16	1,8	--	--	--	--	--
20	2,2	--	--	2,0	2,3	3,0
25	2,7	2,0	2,0	2,3	2,3	3,0
32	3,5	2,0	2,4	3,0	2,3	3,0
40	4,3	2,4	3,0	3,7	2,3	3,7
50	5,4	3,0	3,7	4,6	2,9	4,6
63	6,8	3,8	4,7	5,8	3,6	5,8
75	--	4,5	5,6	6,8	4,3	6,8
90	--	5,4	6,7	8,2	5,2	8,2
110	--	6,6	8,1	10,0	6,3	10,0
125	--	7,4	9,2	11,4	7,1	11,4
160	--	9,5	11,8	14,6	9,1	14,6
200	--	11,9	14,7	18,2	11,4	18,2
250	--	14,8	18,4	22,7	14,2	22,7

*SDR13,6 only available on request, no standard stock-item

Overview length per diameter

Type Ø/m1	Length 10m	Coil	
		50m	100m
16	--	KIWA ZPE	KIWA ZPE
20	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
25	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
32	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
40	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
50	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
63	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
75	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
90	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
110	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
125	KIWA/KOMO/GASTEC	--	--
160	KIWA/KOMO/GASTEC	--	--
200	KIWA/KOMO/GASTEC	--	--
250	KIWA/KOMO/GASTEC	--	--

Other lengths and reels available on request

- Resistant
- Moderately resistant
- Not resistant

	PP		PE		PVC	
	20°C	60°C	20°C	60°C	20°C	60°C
Aceton 100%	●	●	●	●	●	●
Ammonia	●	●	●	●	●	●
Aniline	●	●	●	●	●	●
Acetic acid 10%	●	●	●	●	●	●
Acetic acid 100%	●	●	●	●	●	●
Benzene	●	●	●	●	●	●
Gasoline	●	●	●	●	●	●
Beer	●	●	●	●	●	●
Broorn (liquid)	●	●	●	●	●	●
Butane	●	●	●	●	●	●
Chlorine gas 1%	●	●	●	●	●	●
Chloroform 100%	●	●	●	●	●	●
Chromic acid 50%	●	●	●	●	●	●
Citric acid 10%	●	●	●	●	●	●
Cyclohexanone	●	●	●	●	●	●
Animal and vegetable oil	●	●	●	●	●	●
Ether	●	●	●	●	●	●
Ethyl alcohol up to 96%	●	●	●	●	●	●
Hydrobromic acid 75%	●	●	●	●	●	●
Hydrobromic acid 40%	●	●	●	●	●	●
Formaldehyde 40%	●	●	●	●	●	●
Phosphoric Acid 30%	●	●	●	●	●	●
Phosphoric acid 90%	●	●	●	●	●	●
Lodine (solution)	●	●	●	●	●	●
Potassium chloride and water	●	●	●	●	●	●
Potassium Chromate 20%	●	●	●	●	●	●
Potassium hydroxide	●	●	●	●	●	●
Lysol	●	●	●	●	●	●

- Resistant
- Moderately resistant
- Not resistant

	PP		PE		PVC	
	20°C	60°C	20°C	60°C	20°C	60°C
Milk	●	●	●	●	●	●
Lactic acid 10%	●	●	●	●	●	●
Lactic acid 90%	●	●	●	●	●	●
Methyl alcohol	●	●	●	●	●	●
Formic acid to 50%	●	●	●	●	●	●
Formic acid to 100%	●	●	●	●	●	●
Mineral oil	●	●	●	●	●	●
Sodium carbonate (diluted)	●	●	●	●	●	●
Sodium carbonate (concentrated)	●	●	●	●	●	●
Sodium chloride	●	●	●	●	●	●
Sodium hydroxide (caustic soda)	●	●	●	●	●	●
Phenol	●	●	●	●	●	●
Propane (gas)	●	●	●	●	●	●
Nitric acid 10%	●	●	●	●	●	●
Nitric acid 25%	●	●	●	●	●	●
Nitric acid 70%	●	●	●	●	●	●
Talk	●	●	●	●	●	●
Tetrachlorocarbon	●	●	●	●	●	●
Toluene	●	●	●	●	●	●
Trichlorocarbon	●	●	●	●	●	●
Hydrogen peroxide	●	●	●	●	●	●
Silver nitrate 10%	●	●	●	●	●	●
Hydrochloric acid	●	●	●	●	●	●
Hydrochloric acid 35%	●	●	●	●	●	●
Sulfuric acid 10%	●	●	●	●	●	●
Sulfuric acid 98%	●	●	●	●	●	●

Data is based on theoretical values. Combinations of different compounds and other influences may affect results. In case of doubt, materials need to be tested in the local environment.

When watertightness is required, sealrings can be applied in combination with standard sockets. The system will then become watertight in accordance to the IP67-norm. This means that the pipes are dustproof and are protected against immersion up to 1 meter depth for a period of 30 minutes.

The IP-code (International Protection Rating, also known as Ingress Protection) is being used as an indication for protection of electrical equipment.

An IP-code consists of two digits. The first digit indicates the protection level against solids, the second digit indicates the protection level against fluids.

Protection rate against touch and penetrating objects (first digit)

nr.	meaning	IP codename
0	Not protected	IP 0X
1	Protected against solid objects larger then 50mm	IP 1X
2	Protected against solid objects larger then 12mm	IP 2X Safe to touch
3	Protected against solid objects larger then 2,5mm	IP 3X
4	Protected against solid objects larger then 1mm	IP 4X
5	Protected against dust-particles	IP 5X Dust-free
6	Dust-resistant	IP 6X Dust-resistant

Protection rate against fluids (second digit)

nr.	meaning	IP codename
0	Not protected	IP X0
1	Protected against dripping water	IP X1 Dripwatertight
2	Protected against dripping water when tilted at 15°	IP X2
3	Protected against spraying water	IP X3 Rainwatertight
4	Protected against splashing of water	IP X4
5	Protected against water jets	IP X5
6	Protected against powerful water jets	IP X6
7	Protected against immersion, up to 1 m depth	IP X7 Watertight
8	Protected against immersion, 1 m or more depth	IP X8



Drainage: Sizes, coilsizes, certification and ring stiffness

OD	ID	Coil	Certification	Ring stiffness
25mm	20mm	250/500m	None	SN8
50mm	42mm	50/200m	KOMO	SN8
60mm	50,5mm	50/150m	KOMO	SN8
65mm	55,5mm	50/150m	KOMO	SN8
80mm	68,5mm	50/100m	KOMO	SN8
100mm	85mm	50m	KOMO	SN6
125mm	107,5mm	50m	KOMO	SN4
160mm	140mm	25/50m	None	SN4
200mm	176mm	20m	None	SN4

Drainage: Perforations, weight en bend-radius

Outer diameter (mm)	25	50	60	65	80	100	125	160	200
Perforation rows (pc)	4	6	6	6	6	8	8	6	6
Perforation width (mm)	0,8	1,3	1,3	1,3	1,3	1,5	1,5	1,5	1,8
Perforation length (mm)	6	8	10	11	12	16	16	20	20
Perforations per m	430	210	210	210	321	308	244	348	330
Perforated surface per m (mm ²)	2064	2184	2730	3003	5008	7392	5856	10440	9900
Weight (gr/m) ±	75	160	200	220	325	415	590	900	1440
Min. bend-radius (mm)	100	100	120	130	160	200	250	320	400

Drainage: Waterdrainage in liters per minute at a hydraulic slope in cm over 100m of:

DN.	5	8	10	15	20	25	30	40	50
50	9	12	14	17	20	23	26	30	36
60	15	20	23	27	32	36	41	48	55
65	19	25	29	35	42	48	55	63	72
80	36	46	54	65	76	85	100	112	127
100	65	85	98	118	140	160	180	210	240
125	115	153	173	211	258	287	316	380	420
160	220	280	325	385	485	535	600	700	800
200	400	540	600	720	870	950	1090	1300	1500

Drainage: Wrappings en characteristics

Wrapping	Density	Details	Soil-type
PP450	O90 450μ	Artificial, KOMO	non-ferrous soil, grain size > 450 micron
PP700	O90 700μ	Artificial, KOMO	non-ferrous soil, grain size > 700 micron
PP1000 (GrainFlex1000)	O90 1000μ	Artificial, KOMO	non-ferrous soil, grain size > 1000 micron
Coco	O90 1000μ	Organic	non-calcareous, grain size > 1000 micron
Coco heavy	O90 700μ	Organic	non-calcareous, grain size > 700 micron
Nylon	O90 variable	Artificial, furnerable	no data available
Geotextile	O90 180-240μ	Artificial, non woven	no data available

Cableduct; Diameters, coils, bend radius, length, ring stiffness

OD	ID	Coil	Bend radius	Length	Ring stiffness
40mm	32mm	25/50m	350mm	--	SN8
50mm	41mm	25/50m	350mm	--	SN8
63mm	52mm	25/50m	400mm	6m	SN8
75mm	61mm	25/50m	400mm	6m	SN8
90mm	75mm	25/50m	450mm	6m	SN8
110mm	94mm	25/50m	450mm	6m	SN6
125mm	106mm	25/50m	500mm	6m	SN4
160mm	135mm	25/50m	650mm	6m	SN4
200mm	175mm	25m	750mm	6m	SN4

	PROLAN sewage	AGRILAN agricultural pipe	AGRILAN dam-pipe
Diameter	Ø 200, 250, 315, 400mm	Ø 200, 250, 315, 400mm	Ø 315mm
Material	PP	PP	PE
Ring stiffness	SN8	SN4	SN4
Certification	KOMO	None	None
Standard length	6m, incl. socket	6m, incl. socket	8m, excl. socket

Sewage: Sizes and packing-size		
OD	ID	Pallet
200mm	175mm	23pc
250mm	220mm	12pc
315mm	276mm	8pc
400mm	350mm	6pc

Sewage: Waterdrainage in liters per minute at a hydraulic slope in cm over 100m of:									
DN.	5	8	10	15	20	25	30	40	50
200	420	540	660	780	900	1020	1080	1380	1500
250	960	1020	1080	1380	1680	1800	1980	2400	2820
315	1260	1620	1920	2640	2940	3480	3840	4080	5100
400	2700	3420	4020	4860	5400	6600	7500	8400	9000

Infiltration: Perforations properties				
	200	250	315	400
Number of perforations	6	6	6	6
Perforation width (mm)	2	2	2	2
Perforation length (mm, +/- 10mm)	50	60	60	60
Number of perforations per m1	135	114	93	72
Perforated surface (mm ² /m1)	13500	13680	11160	8640

Infiltration: Wrapping properties		
Wrapping type	Description	Properties
PP450	PP fibre, non-woven	Density O90 450µ
PP700	PP fibre, non-woven	Density O90 700µ
HF180	Slip-over Geotextile, woven	Density O90 180µ, permeability 50 l/m ² s
NW15/NW16	Slip-over Geotextile, non-woven	Density O90 85µ, permeability 85 l/m ² s

GrainPlastics BV tests pipesystems on ring stiffness (pressure from the outside) in accordance to the requirements which apply to the different products (BRL1410 for drainage, European norm CEI-IEC 61386-24 for Cableduct and BRL9208 for PROLAN sewage).

Below you will find the ring stiffness applicable on our products with a substantiation per class.

Description	Class
PP blue suction-piping Ø 80mm	SN10
PP blue suction-piping Ø 100mm	SN10
Drainage Ø 25 t/m 80mm	SN8
Cableduct Ø 40 t/m 90mm	SN8
PROLAN PP Ø 200 t/m 400mm	SN8
Drainage Ø 100mm	SN6
Cableduct Ø 110mm	SN6
Drainage Ø 125 t/m 200mm	SN4
Cableduct Ø 125 t/m 200mm	SN4
AGRILAN PP Ø 200 t/m 315mm	SN4
AGRILAN PE Ø 315mm	SN4

Pressureclass	Kn/m ²	Newton/m ²	Kg/m ²	Gr/cm ²
SN10	10 Kn/m ²	10000 Newton/m ²	1000 Kg/m ²	100 Gr/cm ²
SN8	8 Kn/m ²	8000 Newton/m ²	800 Kg/m ²	80 Gr/cm ²
SN6	6 Kn/m ²	6000 Newton/m ²	600 Kg/m ²	60 Gr/cm ²
SN4	4 Kn/m ²	4000 Newton/m ²	400 Kg/m ²	40 Gr/cm ²

System type	Color-coding	Certificate	European norm
Water pipe LDPE	Black / 4 blue stripes	Kiwa & WRAS PE40	NEN-EN12201
Water pipe HDPE	Black / 4 blue stripes	Kiwa	NEN-EN12201
Pressure pipe	Black	KOMO	NEN-EN13244
Gas pipe	Black / 4 yellow stripes	Gastec	NEN-EN1555
Glass fiber pipe (ridged inside)	Green or blue	n/a	n/a

Overview diameter – pressure-class and wall-thickness							
Type	PE40 Kiwa/WRAS LDPE	PE100 – Kiwa/KOMO HDPE			PE100 – Gastec HDPE		
SDR/Ø	SDR9	SDR17	SDR13,6*	SDR11	SDR17,6	SDR11	
16	1,8	--	--	--	--	--	
20	2,2	--	--	2,0	2,3	3,0	
25	2,7	2,0	2,0	2,3	2,3	3,0	
32	3,5	2,0	2,4	3,0	2,3	3,0	
40	4,3	2,4	3,0	3,7	2,3	3,7	
50	5,4	3,0	3,7	4,6	2,9	4,6	
63	6,8	3,8	4,7	5,8	3,6	5,8	
75	--	4,5	5,6	6,8	4,3	6,8	
90	--	5,4	6,7	8,2	5,2	8,2	
110	--	6,6	8,1	10,0	6,3	10,0	
125	--	7,4	9,2	11,4	7,1	11,4	
160	--	9,5	11,8	14,6	9,1	14,6	
200	--	11,9	14,7	18,2	11,4	18,2	
250	--	14,8	18,4	22,7	14,2	22,7	

*SDR13,6 only available on request, no standard stock-item

Overview length per diameter			
Type	Length	Coil	
Ø/m1	10m	50m	100m
16	--	KIWA ZPE	KIWA ZPE
20	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
25	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
32	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
40	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
50	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
63	--	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
75	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
90	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
110	KOMO	KIWA/KOMO/GASTEC	KIWA/KOMO/GASTEC
125	KIWA/KOMO/GASTEC	--	--
160	KIWA/KOMO/GASTEC	--	--
200	KIWA/KOMO/GASTEC	--	--
250	KIWA/KOMO/GASTEC	--	--

Other lengths and reels available on request

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