

External sewage and drainage systems

Pragma and Pragma⁺ID

The Pipelife products for external sewage systems make a comprehensive and proven solution.

Why are Pipelife systems worth selecting?

At the moment we launched production of the Pragma structured wall system in PP-B (block polypropylene copolymer) and a comprehensive range of inspection chambers of PP-B polypropylene, available in 110 up to

630 mm diameters, our Customers received a high-quality sewerage system, made of uniform material.

At present, Pipelife offers new pipes called Pragma +ID, the nominal size of which is determined by their inside diameter. Pragma and Pragma +ID as the only structured pipes in Poland are fabricated with their sockets factory welded to the pipes in the maximum range of diameters.

The only socket pipes!

Sockets of unique design

With a view to ensuring the best quality of connections, Pipelife has developed new sockets of unique design for Pragma and Pragma⁺ID pipes. These sockets guarantee firm and tight connection to the pipe owing to the fabricated rotation weld. The new design adaptors for Pragma⁺ID pipes have a higher stopper ring inside the fittings so as to suit inside diameter of the pipe. It ensures the best connection to the pipe profile (small height of the ring may result in pressing the pipe corrugation into the stopper ring).

The sockets of Pragma and Pragma⁺ID pipes ensure the best stability and tightness because of eliminating the gasket at the pipe and socket connection. The gasket is now replaced by a heavy-duty weld.

Using the Pragma and Pragma⁺ID socket pipes reduces by 50% the number of gaskets on a particular pipe length, thus reducing by half the number of possible leaky spots. Also the installation and investment costs are significantly lowered.

Construction of Pragma sewage and drainage pipelines

The pipes are connected with the use of pipe fittings made of PP-B, and elastomeric sealing rings of SBR or EPDM, placed in the last groove between corrugations.

The gaskets for Pragma⁺ID pipes have a symmetric structure and are made of EPDM elastomer, characterized by a very high resistance to various chemical compounds.

The Pragma and Pragma+ID pipes and fittings are manufactured according to standard PN-EN 13476-3: 2007(U): Non-pressure systems of subsoil plastic pipelines for drainage and sewage. Systems of structured-wall pipes of non-plasticized polyvinyl chloride (PVC-U), polypropylene (PP) and polyethylene (PE). Part 3: Specifications for pipes and fittings with smooth inner wall and profiled outer wall and system Type B.

The Pragma and Pragma+ID pipes have a light-weight structured design with smooth inner wall and profiled (corrugated) outer wall with trapezoidal section, which as per standard PN-EN 13476-3:2007(U), belongs to Type B.

Approvals: COBRTI INSTAL AT/99-02-0752-03, IB-DiM AT/2003-04-0506, GIG Nr 4265058-12, Kiwa Holland BRL 9208.

Standards: PN-EN 13476-1:2007(U), PN-EN 13476-3:2007(U), ISO 9001.



Profil uszczelki Pragma+ID

Pragma drainage pipes

Pipelife is a manufacturer of drainage pipes made of polypropylene (PP-B), perforated according to DIN 4262-1. As required by the standard, all pipes have slots with a large inlet area, which equals min. 50 cm² /1 m of the pipe. The slots are 1.2 mm wide, and from 16 mm to 75 mm long.

Diameter		Number of slots/corrugation (around Perimeter) [pcs]	Pipe perforation type	Number of slots/ run, m [pcs]	Area of slots/ run,m of pipe [cm ² /run,m]
DN/OD [mm]	DN/ID [mm]				
160	139	6	TP (totally perforated)	54	62,2
200	174	6		46	62,9
250	218	6		46	62,9
315	276	6	LP (locally perforated)	37	58,6
400	348	6		29	56,4
160	139	4		54	59,6
200	174	4	MP (multipurpose)	46	57,4
250	218	4		46	57,4
315	276	4		37	56,8
400	348	4	MP (multipurpose)	29	54,3
160	139	2		54	54,4
200	174	2		46	54,1
250	218	2	MP (multipurpose)	46	54,1
315	276	2		37	53,3
400	348	2		29	52,2

TP (totally perforated) - slots around the entire perimeter
 LP slots at 2/3 of the upper part of perimeter, within 220° angle
 MP (multipurpose) - slots at 1/3 of the upper part of perimeter, within 120° angle; the pipes serve as locally perforated drainage / sewage pipes

Sockets of the Pragma pipes enable connection with the spigot end of thermoplastic pipes (PVC-U, PP) by means of elastomeric seal with grip ring of PP, mounted at the socket edge.

- Material - PP-B block polypropylene,
- Ring stiffness ≥ 8 kN/m² - PN-EN ISO 9969,
- Wall cross-section - corrugated, with reinforced corrugation peak,
- Design - structured pipe with corrugated outer wall and smooth inner wall,
- Drainage pipes have slotted perforations in corrugation valleys,
- Color - copper brown RAL 8004 outside, light-gray inside - for better reflection of camera light during inspection with the use of CCTV video technique,
- Seal - placed after the first corrugation, the socket is smooth inside,
- Socket - elongated for Pragma pipes.

Chemical resistance

Chemical resistance of the Pragma PP-B pipes conforms to standard ISO/TR 10358: "Classification of chemical resistance of plastic pipes and fittings".

Chemical resistance of the SBR or EPDM seals conforms to standard ISO/TR 7620: „Rubber materials - Chemical resistance“.

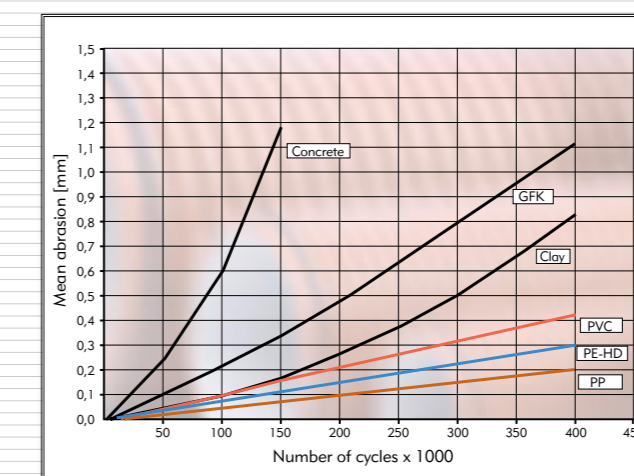
Polypropylene PP-B, as compared with PVC-U and PE, has the highest chemical resistance to most of the compounds specified in standard ISO/TR 10358.

Abrasion of pipes

According to standard PN-EN 295-3, the minimum resistance must ensure that the inner abrasion of the pipe inliner after 100 000 cycles does not exceed 0.2 mm.

Polypropylene (PP) has the highest abrasion resistance.

Abrasion of the Pragma pipes in PP-B after 400 000 cycles is as low as 0.2 mm, thus ensuring at least 50-year lifetime.



Durability and quality

Technology of production of Pragma oraz Pragma+ID PP-B pipes and fittings is environment friendly.

For many years Pipelife has offered its Customers the system of PP-B polypropylene pipes, fittings and inspection chambers, which is growing in popularity because of its excellent properties, enabling it to be used for many applications. Our many years of experience in production of thermoplastic systems, especially for sewage and drainage, guarantee high-quality products.

The pipes of PP-B have an excellent resistance to most acids, alkalis and salts (over 350 compounds specified in standard ISO/TR 10358). They ensure many years of trouble-free operation, in contrast to the traditional materials, vulnerable to corrosion and damage (concrete, steel, cast iron).

It should be borne in mind that the cost of materials used is low as compared to the cost of manufacture, installation of the sewage system and restoration of surface, especially within the roadway. Therefore, it is important to choose long-lasting and proven solutions.

Installation remarks

The thermoplastic sewage pipes shall be installed according to standards PN-ENV 1046 and PN-EN 1610. In case of the drainage pipes, the soil graining shall correspond to the size of slots. The type of gravel pack and number of filter beds shall be adapted for the type of drained soil. It is recommended that the gravel pack be made of mineral materials (broken stone) and that geofabric be placed at the interface with subsoil. Filtration coefficient of the gravel pack must be > 10 m/d and should increase towards the pipeline.

Physical and mechanical properties of Pipelife polypropylene pipes

It.	Properties	Unit	Value for PP-B
1	Young's modulus, E _{1min} (1 min.)	MPa	1300-1700
2	Mean density	kg/m ³	900
3	Yield strength	MPa	27-35
4	Bursting stress	MPa	39
5	Bursting elongation	%	>500
6	Mean coefficient of linear thermal expansion	mm/m°C	0,14
7	Charpy impact test	23°C	60-70
		-20°C	7
8	Thermal conductivity	W/Km	0,2
9	Specific thermal capacity	J/kgK	2000
10	Surface resistivity	Ω	>10 ¹²
11	Vicat softening temperature	°C	155
12	Maximum short-time temperature (up to 2 min.)	°C	95-100
13	Maximum long-time temperature	°C	60

Basic technical specifications	
Material:	PP-B (block polypropylene copolymer)
Diameters:	DN/OD from 160 to 630 mm (double wall)
	DN/ID from 150 to 800 mm New!
Rigidity class:	DN/OD from 160 to 400 mm New!
	SN ≥ 8 kN/m ²
Commercial lengths:	L = 2, 3 i 6 m
Type of connection:	socket, factory welded to the pipe

DN/OD – nominal size with reference to the outside diameter
 DN/ID – nominal size with reference to the inside diameter

slots



Application

- Household and combined sewage and rainwater systems under roads and motorways.
- Drainage system from perforated PP-B SN 8 pipes for draining roads, motorways, squares, airports, sports facilities, and landfill sites.
- Sewerage systems in areas affected by mining damage, up to Class III or IV, depending on diameter and length.
- Gravity pipelines, suitable for work in very high temperatures up to +95°C.
- Outlets of ducts for media with elevated temperature.
- Sewage systems for industrial waste water.
- Technological installations for industry.
- Culverts subject to operation in sub-zero temperatures.

- High impact resistance makes installation possible in winter time.
- Chemical resistance to aggressive sewage and/or environment, in accordance with standards ISO/TR 10358 and ISO/TR 7620.
- Excellent durability.
- Perfect abrasion resistance.
- Better hydraulic parameters, as compared with concrete or cast iron pipes.
- No accumulation of deposits or increase in hydraulic resistance for many years of service.
- Complete system of pipe fittings and PRO 400, PRO 630 inspection chambers and PRO 800, PRO 1000 manholes.
- Connections compatible with PVC-U smooth-walled pipes and fittings.
- Gaskets mounted so as to prevent their turning out.
- Very large inlet area of slots in PP-B drainage pipes, high performance > 50 cm²/run.m - DIN 4262-1.
- Lower weight as compared with double-wall PVC-U or PE pipes, and especially concrete, reinforced concrete and steel ones.
- Resistance of PP-B pipes and chambers to chemical, biological and physical corrosion.
- Central Mining Institute (GIG) certificate for use in mining damage areas up to Cat. II, III, IV.

Capabilities

- Installation and operation possible both in high and low temperatures.
- Can be cut to any length with a plain saw and connected with the socket.
- Suitable for use under heavy load conditions (national roads and highways) due to high ring stiffness 8 kN/m².
- Two spigot ends can be connected with slip coupling with no need for beveling (each piece of pipe is used).
- Can be connected to the existing networks of PVC-U smooth-walled pipes, including chambers and fittings of the system.

Advantages of Pragma system

- All pipes have a high ring stiffness ≥ 8 kN/m².
- Socket pipes (manufactured with socket firmly attached to the pipe).
- Resistance to high temperatures up to +95°C at short-time discharge of sewage.



Pragma PP-B sewage and drainage system - pipes

Type of pipe	Nominal diameter DN [mm]	Outside diameter DN/OD [mm]	Mean inside diameter DN/ID min. [mm]	Class of pipe	Ring stiffness SN [kN/m ²]	Length [m]		
						2	3	6
PP-B structured	160	160	139	T (heavy)	≥ 8	■	■	■
	200	200	174			■	■	■
	250	250	218			■	■	■
	315	315	276			■	■	■
	400	400	348			■	■	■
	500	500	435			■	■	■
	630	630	548			■	■	■

Pragma +ID PP-B sewage and drainage system - pipes

Type of pipe	Nominal diameter DN [mm]	Mean inside diameter DN/ID min. [mm]	Class of pipe	Ring stiffness [kN/m ²]
PP-B structured	150	150	T (heavy)	≥ 8
	200	200		
	250	250		
	300	300		
	400	400		
	500	500		
	600	600		
	800	800		

Pragma PP-B sewage and drainage system - fittings

Type of fitting	Angle	Passage diameter DN [mm]						Diameter DN [mm]
		160	200	250	315	400	500	
bend	15°	■	■	■	■	■	■	-
	30°	■	■	■	■	■	■	
	45°	■	■	■	■	■	■	
	88,5°	■	■	■	■	■	■	
tee-piece	45°	■	■	■	■	■	■	160
		■	■	■	■	■	■	200
	88,5°	■	■	■	■	■	■	250
		■	■	■	■	■	■	315
eccentric reducer		■	■	■	■	■	■	400
		■	■	■	■	■	■	500
		■	■	■	■	■	■	160
		■	■	■	■	■	■	200
		■	■	■	■	■	■	250
adaptor		■	■	■	■	■	315	
slip coupling		■	■	■	■	■	400	
union for PVC-U pipe (ring+seal)		■	■	■	■	■	500	
union for PVC-U socket		■	■	■	■	■	-	
seal		■	■	■	■	■	-	
plug		■	■	■	■	■	-	

SYSTEM

external sewage and drainage

PRAGMA PRAGMA+ID

made of PP-B



Sewerage



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