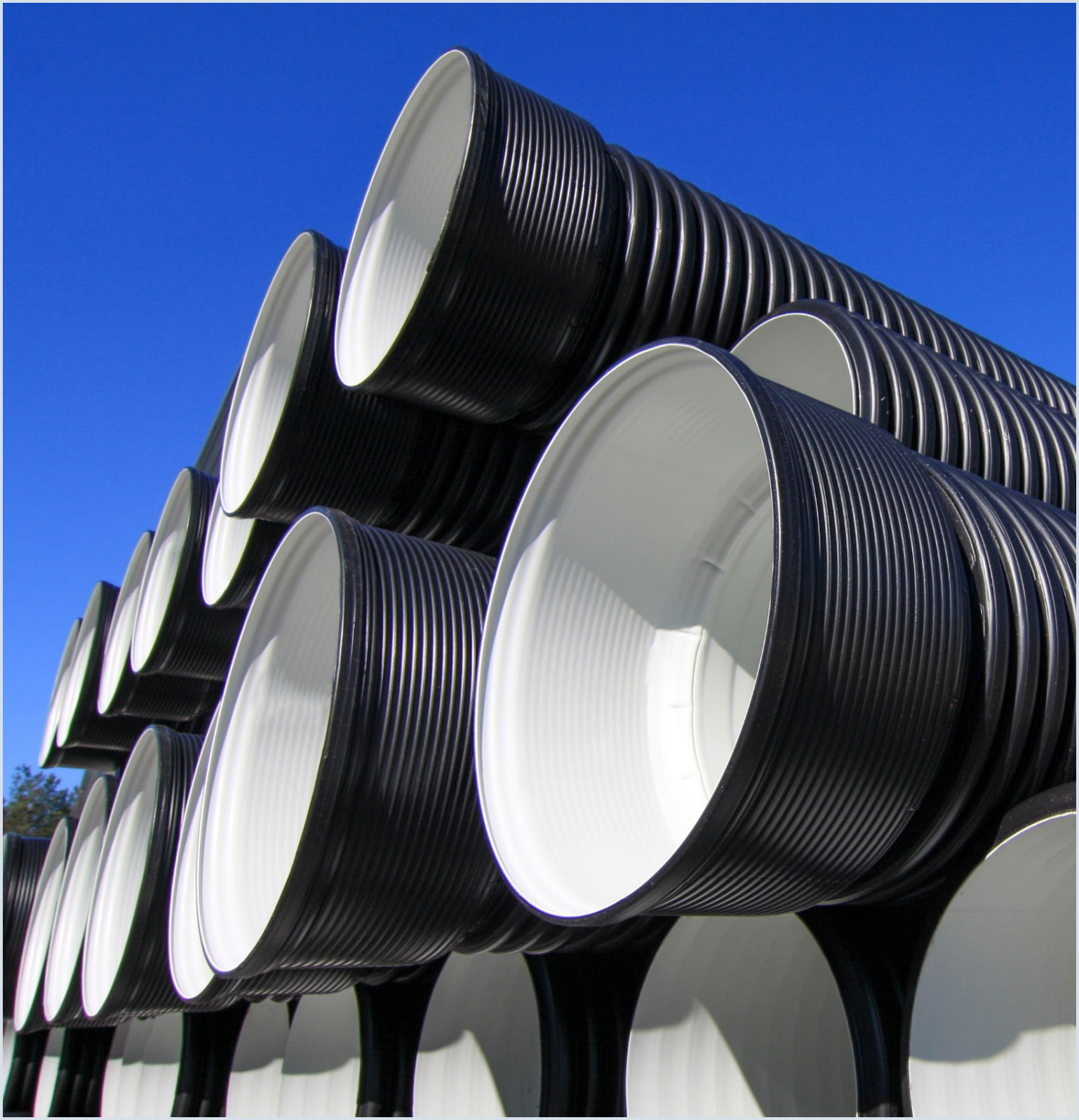


TECHNICAL DATA SHEET
PECOR QUATTRO

VIACON

Constructing connections.
Consciously.

PECOR QATTRO

The PeCor Quattro system is manufactured in compliance with EN 13476-1, EN 13476-3 standards.

DESCRIPTION

PeCor Quattro pipes are manufactured from polypropylene (PP) and consist of two walls, where the outer wall is corrugated to provide high ring stiffness of SN8 (8 kPa), and the inner wall is smooth to guarantee optimal flow conditions. PeCor Quattro pipes are manufactured in DN/ID diameter range from 200 mm to 1000 mm. The pipe socket molded at the production stage is an integral part of the pipe, allows for fast installation, and, coupled with an elastomeric gasket fastened on the spigot, provides the joints with the required tightness.

INTENDED USE

- road and railway culverts
- gravity sewer systems
- animal-friendly culverts and culverts under forest roads
- drainage culverts
- industrial ventilation systems
- agricultural ventilation systems

PRODUCT FEATURES AND ADVANTAGES

- no need to use heavy equipment for installation
- diversity of solutions
- quick and simple installation (low weight)
- reduced transport costs
- best mechanical and hydraulic properties
- corrosion resistance

TECHNICAL PROPERTIES

MATERIAL

PeCor Quattro pipes are made of polypropylene (PP). This material is characterised by outstanding mechanical properties, which translates to high ring stiffness of the pipe. Polypropylene is also characterised by high heat resistance (operating temperature up to 93°C, short-term up to 110°C), low surface roughness, and extremely high abrasion resistance at low density.

Physical and mechanical characteristics of propylene (PP) material and propylene (PP) pipe

- **Density: 0,90 – 0,91 g/cm3 – EN ISO 1183**
- **Modulus of elasticity:**
  min. 1250 MPa – EN ISO 178
- **Impact resistance:**
  H50≥1000 mm, at -10 °C – EN ISO 11173
  TIR≤10% at 0 °C – EN 3127
- **Resistance to heat:**
  No changes at 150±2 °C – ISO 12091
- **Ring flexibility:**
  No damage at 30% deformation
  EN ISO 13968

PeCor Quattro pipes are manufactured with the use of polypropylene with paint to obtain the desired colour:

- outer wall: RAL 9004 black
- inner wall: RAL 7035 light-gray

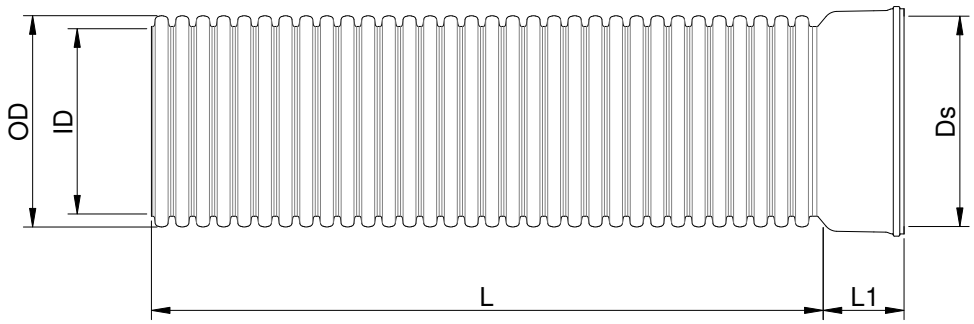
As a standard PeCor Quattro pipes are manufactured in black and grey (black outer corrugated wall, and light-grey inner wall).

The corrugation not only has a stiffening function but also is intended to achieve cooperation between pipes and the surrounding ground. The size of corrugation varies depending on pipe diameter. The corrugation diagram of PeCor Quattro pipes and the pipe dimensions are presented below.

The dimensions and tolerances are presented in tables below.

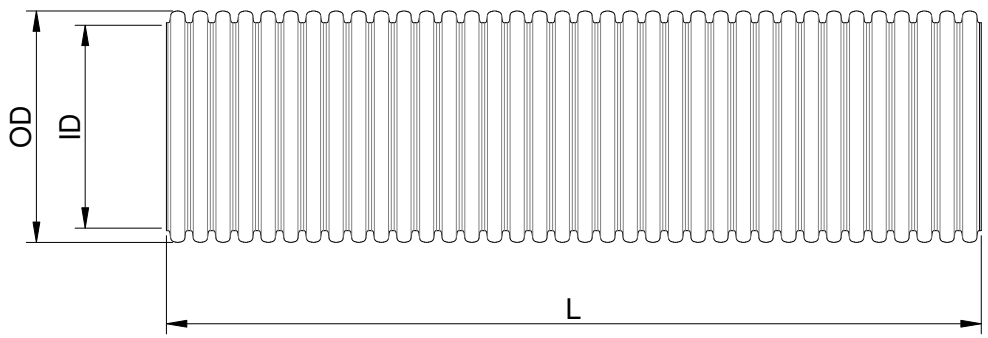
DIMENSIONS FOR PIPES WITH SOCKET

Nominal diameter DN [mm]	Inside diameter ID [mm]	Outside diameter OD [mm]	Diameter of a socket Ds [mm]	Length of a socket L1 [mm]	Length of a Quattro pipe L [mm]	
200	198	226	229	130	-	6000
300	298	339	345	155	-	6000
400	398	451	457	200	-	6000
500	499	570	579	240	-	6000
600	595	678	690	290	4500	6000
800	793	903	918	340	4500	6000
1000	993	1130	1146	390	4500	6000



DIMENSIONS FOR PIPES WITHOUT SOCKET

Nominal diameter DN [mm]	Inside diameter ID [mm]	Outside diameter OD [mm]	Length of a Quattro pipe L [mm]		
200	198	226	6000	7000	8000
300	298	339	6000	7000	8000
400	398	451	6000	7000	8000
500	499	570	6000	7000	8000
600	595	678	6000	7000	8000
800	793	903	6000	7000	8000
1000	993	1130	6000	7000	8000



RING STIFFNESS OF PECOR QUATTRO PIPES

Ring stiffness describes the strength and durability of PeCor Quattro pipes. PeCor Quattro pipes are manufactured in stiffness class SN8. Ring stiffness is a parameter that is declared by the producer for each manufactured batch of pipes. The declared nominal ring stiffness of PeCor Quattro pipe is the minimum guaranteed value for the given batch. Ring stiffness tests are performed by company laboratory in order to determine the force required to deform the inner diameter of the pipe by 3%.

Ring stiffness is tested in compliance with EN ISO 9969.

VIACON PECOR QUATTRO

ID 800 EN 13476-3 SN8 PP U RF30

Description:

- ViaCon - Producer
- PeCor Quattro - System name
- ID 800 - Nominal diameter
- - Construction product certification mark
- EN 13476-3 - Applicable standard
- SN8 - Ring stiffness
- PP - Material
- U - Area of application
- - Impact resistance at -10 °C
- RF30 - Ring flexibility

ELBOWS, T-PIPES AND MANHOLES

PeCor Quattro pipes can be used for production of elbows and T-pipes. Standard elements are:

- **elbows : 15°, 30° , 45° (made of 2 welded elements), 90°- (made of three welded elements)**
- **T-pipes: 90°**

On special demand, these elements can be produced also in nonstandard range of radii.

Manholes can be produced according to customer requirements/drawings but it should be checked and confirmed by ViaCon.

COVER DEPTH

Cover depth can be described as a vertical distance between top of the pipe and the road gradeline, including the road pavement. It is recommended (ENV 1046:2007 [11]) that the depth of cover for traffic areas should be not less than 0.6 m. It is also recommended that the cover provides sufficient protection against pipe buoyancy in areas with a high groundwater level.

ASSEMBLY OF PECOR QUATTRO PIPES

PeCor Quattro pipes can be joined by inserting the spigot of one pipe into the socket of another pipe. There must be a rubber gasket placed on the spigot first.

For proper installation these steps need to be followed:

- **check the pipe, socket and gasket in case of any damage**
- **remove any impurities from the spigot (the last groove) and the inside of the socket**
- **mark permanently on the spigot (e.g. using a waterproof marker) the insertion depth (the depth at which the pipe will be inserted into the socket)**
- **place a cleaned elastomeric gasket on the last groove, between the first and second ring**
- **apply joining lubricant on the inner wall of the socket (or other connector) and the outer surface of the gasket Note: do not use lubricants that might damage the gasket, e.g. petroleum-based greases or oils**
- **insert the spigot with the gasket into the socket up to the mark on the pipe**

The installation can be considered as finished if the socket edge is as deep as marked on the entire perimeter of the pipe,

PeCor Quattro pipes can be cut into any installation lengths. If cutting is necessary, it should be done in the groove between the rings. Do not cut pipes in any other way. After cutting, remove any impurities.

BACKFILLING

The grain size of the aggregate used for bed and backfill of the pipe (gravel, mine run, sand-gravel mix) depends on the size of the corrugation rings. For PeCor Quattro pipes, the maximum recommended size of individual grains at the place of contact with the pipe wall and in its immediate vicinity (approx. 0.3 ÷ 0.5 m) is 31.5 mm.

Larger grains are allowed in the remaining area, assuming that the following conditions are met:

- **uniformity coefficient Cu ≥ 4**
- **curvature coefficient 1 ≤ Cc ≤ 3**
- **water permeability coefficient k_{10} > 6 m/day**

TRANSPORT AND STORAGE

STORAGE

PeCor Quattro pipes should be stored on a flat surface, in horizontal orientation. on wooden beams with a thickness that prevents the socket from reaching the floor. To avoid a socket deformation, wooden spacers shall be placed between each layer of PeCor Quattro pipes. Sockets cannot touch each other.

Pipes should be secured against displacement. Pipes, fittings and other elements of the system may be stored outdoors without any additional protection, for 12 months from the date of production. If the storage period is longer, adequate protection against weather, e.g. UV radiation needs to be provided. If pipes, fittings and manholes are covered with tarpaulinthat is impermeable to light adequate ventilation shall be provided. All elements should be protected against fire.

TRANSPORT

Pipes, fittings and connectors can be transported by any means adequate for their size. All the elements should be protected against displacement during transportation. The pipes should not be dragged, but carried over. Due to the risk of damage to the corrugation rings, sockets or other pieces during unloading, do not drop the pipe from the truck or use steel cables for unloading.

OTHER INFORMATION

Each application of PeCor Quattro pipes requires a technical design, including estimated loads, hydrological conditions and other limiting outlines. Appropriate diameter of the cross section has to be chosen. The design should follow the guidelines issued by ViaCon as well as requirements of respective country.