Technical catalogue

LARETER

VDA® system of POWER-LOCK pipes and bends

Transport of pressurised fluids

aliaxis

Contents

General characteristics
VDA

PVC-A is a polymer alloy developed in 1995 from the collaboration of the English body North West Water with the plastics research institute Pipeline Development Lt. The combination of the ductility and toughness characteristics of polyethylene chloride and the high-strength characteristics of PVC-U has resulted in a new product with high performance at the same cost.

The VDA system of POWER-LOCK pipes and curves has been designed to provide the best performance for the specific application of the transport of water and fluids under pressure.

The new formulation of the VDA system, obtained through the addition of appropriate additives and stabilizers, has made PVC-A a technically and economically very valid solution for the transport of water under pressure.

The strength of this innovative product lies in the extraordinary ability to combine the ductile and elastic behaviour of polyethylene with the mechanical strength of PVC.

The VDA LARETER range includes PVC-A POWER-LOCK pipes and curves from diameter ø 50 mm to diameter ø 500 mm with operating pressures of 8 - 10 - 12.5 - 16 - 20 bar.

Characteristics

- **Good tolerance to chemical agents:** resistance to most acids and alkalis, paraffinic/aliphatic hydrocarbons and salt solutions. It is not recommended for the transport of polar organic compounds, including some types of chlorinated and aromatic solvents. Fully compatible with the transport of foodstuffs, demineralised water, potable water and untreated water, as provided for by current national and international standards.
- **Weight reduction:** 25% less than traditional pipes made of plastics of equal diameter and PN (considering a PN16).
- **Good thermal stability:** excellent performance in the intermediate temperature range between 20°C and 50°C, reduced coefficients of thermal expansion and high safety factors in service. Considerable characteristics of resistance to combustion, the flame, in fact, is ignited at 399 ° C and persists only in extreme conditions: if the concentration of oxygen is 2 times higher than atmospheric, or in the presence of a flame from an external source. Flash point: 399 °C. Oxygen index: 45%. Thanks to the reduced coefficient of thermal conductivity (λ = 0.16 W/m K according to EN ISO 22007-3) the use of PVC-U resin for transporting hot fluids reduces heat loss and virtually eliminates condensation problems.
- **Good mechanical strength:** excellent mechanical characteristics combined with exceptional impact resistance guarantee operation for operating pressures from 8 to 20 bar at 20°C.

Density	
Test method	ISO 1183-1
Unit of measurement	g/cm^3
Value	1.35 - 1.41
Modulus of elasticity	
Test method	ISO 527-1
Unit of measurement	$MPa = N/mm^2$
Value	2500
Ultimate elongation	
Test method	ISO 6259
Unit of measurement	%
Value	80
Tensile strength	
Test method	ISO 6259
Unit of measurement	$MPa = N/mm^2$
Value	≥40
VICAT softening temperature	
Test method	ISO 2507-1
Unit of measurement	°C
Value	≥80
Thermal conductivity	
Test method	EN ISO 22007-3
Unit of measurement	W/mK
Value	0.16
Coefficient of linear thermal expansion	
Test method	ISO 11359-2
Unit of measurement	mm/mK
Value	0.07 - 0.08
Limiting Oxygen Index	
Test method	ISO 4859-1 - ASTM D2863
Unit of measurement	%
Value	45

VDA System

The **sustainable** and **innovative** solution for transporting and treating water, **simple** and **fast** to install, reliable and safe without maintenance.

VDA is the revolutionary high-efficiency Aliaxis system for transporting water under pressure made of PVC-A, an innovative additive PVC polymer alloy that combines the resistance of PVC-U with the ductility of Polyethylene, thus creating a product that is very resistant to crack propagation.

This material offers mechanical and hydraulic performance levels superior to those of traditional plastics, greater guarantees of seal over time of the pipes, quality of the water transported, ease of transport and installation, reduced installation and operating costs.

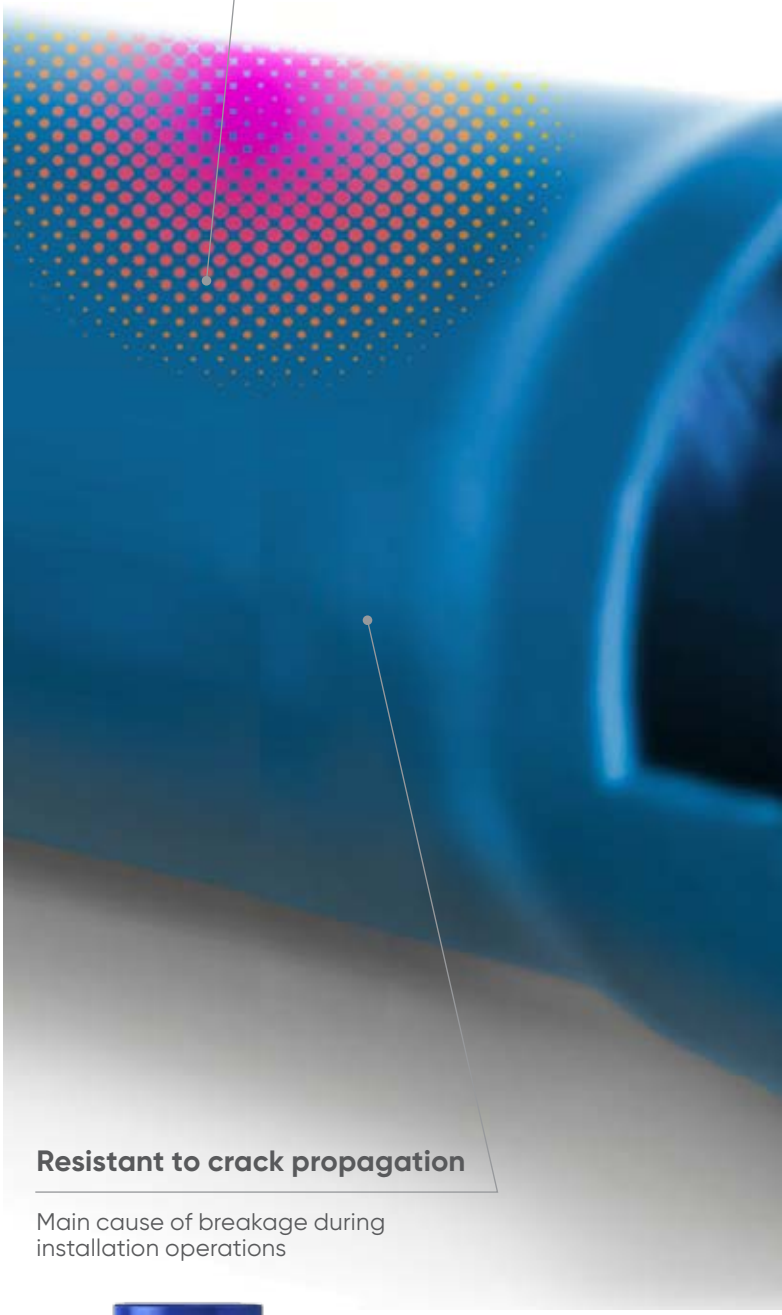
The VDA range of LARETER includes PVC-A POWER-LOCK pipes and curves from Ø50 to Ø500 mm with operating pressures of 8 - 10 - 12.5 - 16 - 20 bar.

CHARACTERISTICS

- High resistance to crack propagation during laying
- Significant impact resistance to concentrated loads even at low temperatures
- Good tolerance to chemicals
- Lower weight with the same diameter and pressure
- Longer plant life: life cycle greater than 50/80 years
- Increased water service delivery efficiency
- Simplified installation
- Great sealing reliability thanks to the FORSHEDA 601 POWER-LOCK™ seal
- Reduced installation and maintenance costs
- Zero risk of incorrect laying of pipes

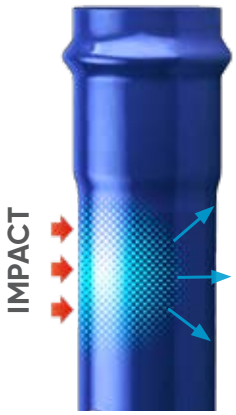
Impact resistant

High shock absorption capacity thanks to the elasticity characteristics of the material.



Resistant to crack propagation

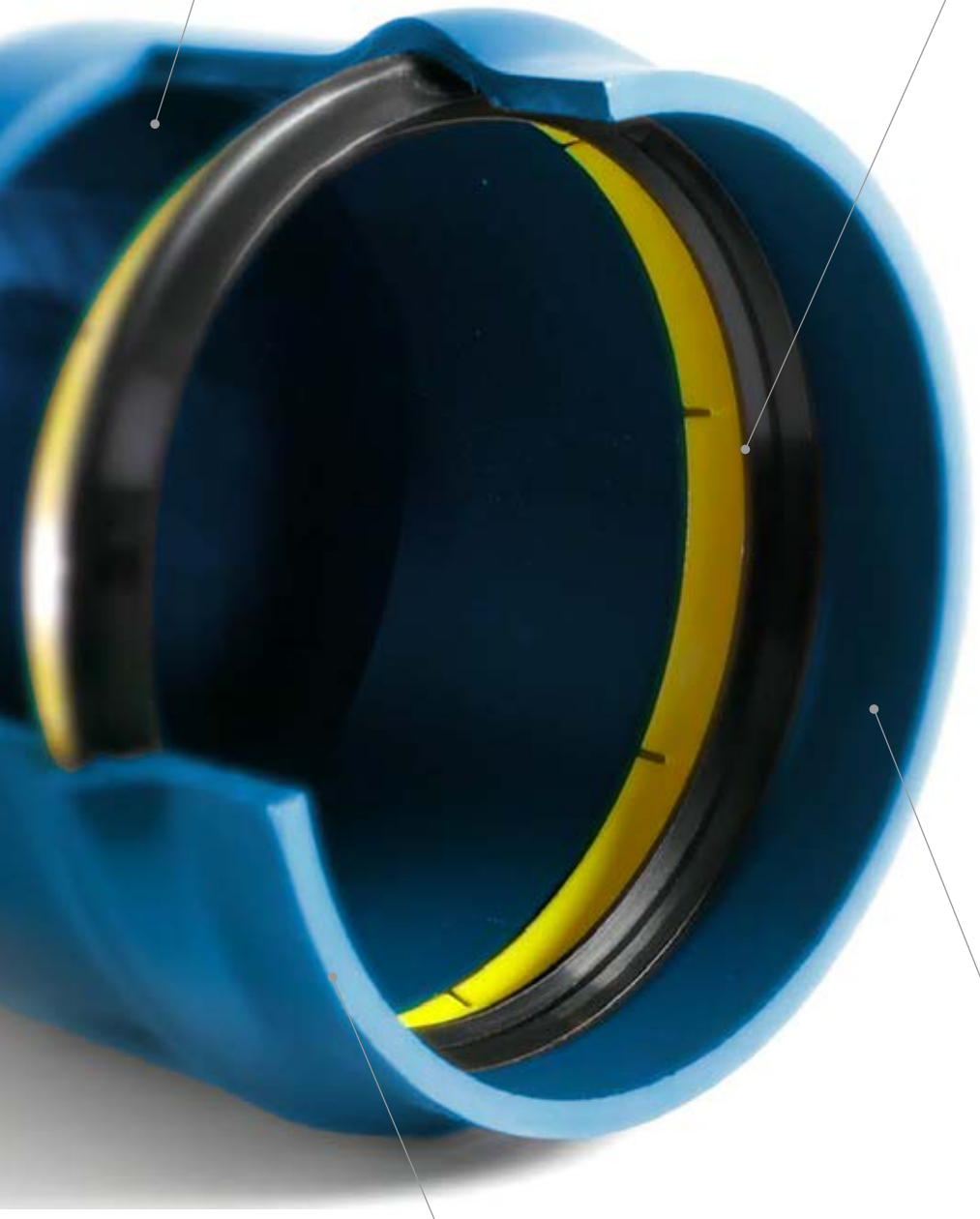
Main cause of breakage during installation operations



Dispersion and absorption of instantaneous impact

Corrosion resistant

No risk of leakage along the network compared to traditional metal pipes.



Guaranteed hydraulic seal

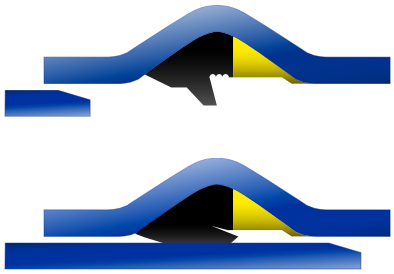
Gasket FORSHEDA 601 POWER-LOCK™ mechanically pre-inserted with heat during the tube pipe belling phase.

Immovable seal that prevents errors during installation.

Flexible rubber element that ensures perfect adhesion on the pipe.

Guarantee of hydraulic seal with both positive and negative pressures up to -0.5 bar

Angular deflection of the gasket up to 3° (high compensation and flexibility of the joint).



Maximized flow rate

Compared to traditional plastics, VDA reduces overall plant costs.

The VDA system guarantees:

• Greater capacity with the same external diameter

• Reduced pressure drops

• Lower pumping energy

Quick and easy installation

Greater handling and safety on site thanks to the reduced weight compared to other pipes of equal diameter and PN.

Reduced installation times and costs thanks to fast and reliable jointing technology

Reference standards

VDA

The production of the VDA lines is carried out following the highest quality standards at the Lareter headquarters in Fiesso Umbertiano (Rovigo - Italy), a company certified UNI EN ISO 9001 (Company quality certification issued by IIP - Istituto Italiano Plastici), UNI EN ISO 14001 (Environmental certification issued by BSI - British Standard Institution) and ISO 45001 (Management systems for occupational health and safety issued by BSI - British Standard Institution).

- **BS PAS 27: 1999**

PVC-A non-plasticized polyvinylchloride alloy pipes and bends under pressure

- **Potability certified according to Ministerial Decree no. 174/2004**
- **UNI EN 1622 - Odour and taste threshold**

Approvals and quality marks

- **KIWA (Keurings Institut Voor Waterleiding Artikelen Holland)**

KQ KIWA QUALITY KIP-105133

Standard that fully incorporates and reciprocates BS PAS 27:1999.

- **EPD HUB - 1 Feb 2022 EN 16904 Product Category Rules (PCR) for internal plastic piping systems.**

HUB-1151, Environmental product declaration

According to EN 15804+A2 & ISO 14025 / ISO 21930.

- **ECOVADIS - International sustainability certification**

Ecovadis manages the 1st collaborative platform that allows companies to monitor the sustainability performance of their suppliers, in 150 sectors and 110 countries.

World-class standards-based assessment model: GRI (Global Reporting Initiative), UNGC (United Nations Global Compact), ISO 26000.

Environmental certifications

The EPD® environmental product declaration of the Lareter VDA range

In the current geo-political scenario where the focus is increasingly on environmental sustainability and the protection of biodiversity, Lareter has strongly wanted to make its contribution.

This choice led the company to undertake the process for the EPD "Environmental Product Declaration" certification.

It is a Type III environmental label defined by the ISO 14025 standard that falls within the EU environmental policies (IPP - Integrated Product Policies) and serves to outline and quantify the impact of the LCA "Life Cycle Assessment" life cycle of a given product, from the extraction of raw materials to its disposal, detailing:

- The consumption of resources, both as raw materials and energy carriers;
- The extent of atmospheric emissions, both transport and process;
- The production of waste and discharges into water bodies.

The EPD declaration, although voluntary, has an international value and allows to communicate to internal and external stakeholders the validity of environmental policies and the commitment made by Lareter towards the territory, the production chain and the end user.

Once the information collection is finished, the declaration is verified by an independent and accredited third party and is made available on the EPD Hub, the international Program Operator chosen by Lareter that manages the writing processes of the Product Category Rules (PCR).

The Ecovadis certification of the plant "Environmental performance evaluation system"

The Ecovadis certification is a tool for evaluating the environmental, social and governance (ESG) performance of companies at an international level. It is issued following an independent assessment based on a standardized and transparent methodology through which companies must demonstrate that they adopt sustainable and responsible practices in different areas, including work, the environment, ethics and governance. The certification process starts with a questionnaire that covers a range of issues relevant to sustainability, such as water management, respect for human rights, environmental protection and the fight against corruption. Once the questionnaire is completed, the data is analyzed by a team of experts who evaluate the company's ESG performance and assign a score based on a scale from 0 to 100.

Since 2022, the Lareter plant in Fiesso Umbertiano (RO) has been certified a silver medal (best 15%: 85th percentile or higher, the "percentile" ranking compares the performance of a company with those of all companies in all sectors evaluated by ECOVADIS in the previous 12 months).

This result represents one of the key milestones to help reduce the environmental and social impact in the industrial sector.

Installation instructions

- The assembly of VDA pipes is faster and less tiring than traditional installations of other materials, especially thanks to the presence of the POWER-LOCKtm gasket.
- The coupling does not require the use of equipment, it is sufficient to lubricate the pipe mouth and the gasket before proceeding with the insertion.
- To further facilitate the work, the VDA pipes are provided with a marking to indicate the correct insertion depth.

Recommendations

It is recommended to use a brush for better lubrication.
Insert the male to the depth indicated by the marking.

Installation instructions

- The backfill is made manually up to half the diameter of the pipe and then compacted, simply by walking on it with your feet (Fig. 1).
- The backfill up to the upper pipe generatrix is done manually and compacted again with the feet (Fig. 2).
- A 150mm machine compacted layer can then be added, but not directly onto the upper tube generatrix (Fig.3).
- The backfill up to 150 mm above the upper generatrix of the pipe can be carried out in a single event when material such as sand or loose and screened soil is used (Fig. 4).
- The spoil material for the remaining backfill can be used compacted in layers no thicker than 250 mm, as long as they are not compacted directly above the pipe until reaching 300 mm in height from the upper generatrix of the pipe (Fig. 5).
- The remaining backfill can be completed and compacted according to the needs of the surface finish (Fig. 6).

Fig. 1 - Layer of filling material compacted by hand up to the middle of the tube.

Fig. 2 - Layer of filling material compacted by hand up to the upper tube generatrix.

Fig. 3 - Layer of filling material up to 150 mm compacted by machine.

Fig. 1

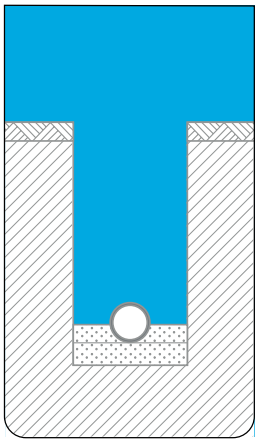


Fig. 2

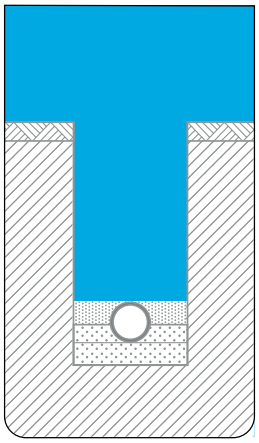


Fig. 3

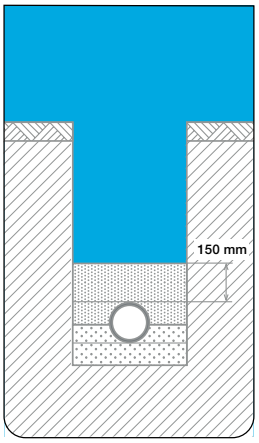


Fig. 4 - Backfill up to 150 mm above the upper generatrix of the pipe in a single event if it is used as a loose and screened sand or soil material.

Fig. 5 - Backfill with spoil material in layers no thicker than 250 mm.

Fig. 6 - Total backfill with spoil material in layers depending on the surface finish requirements.

Fig. 4

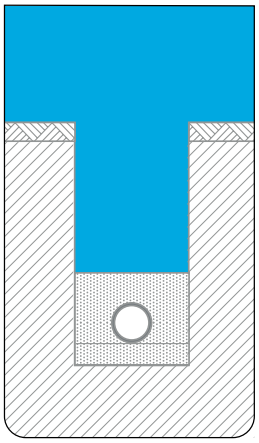


Fig. 5

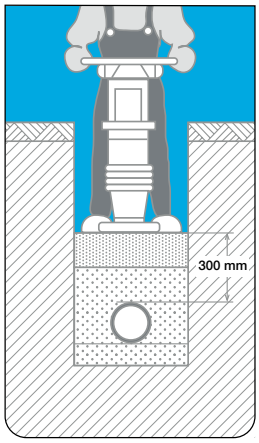
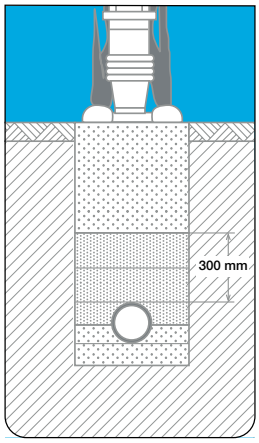


Fig. 6



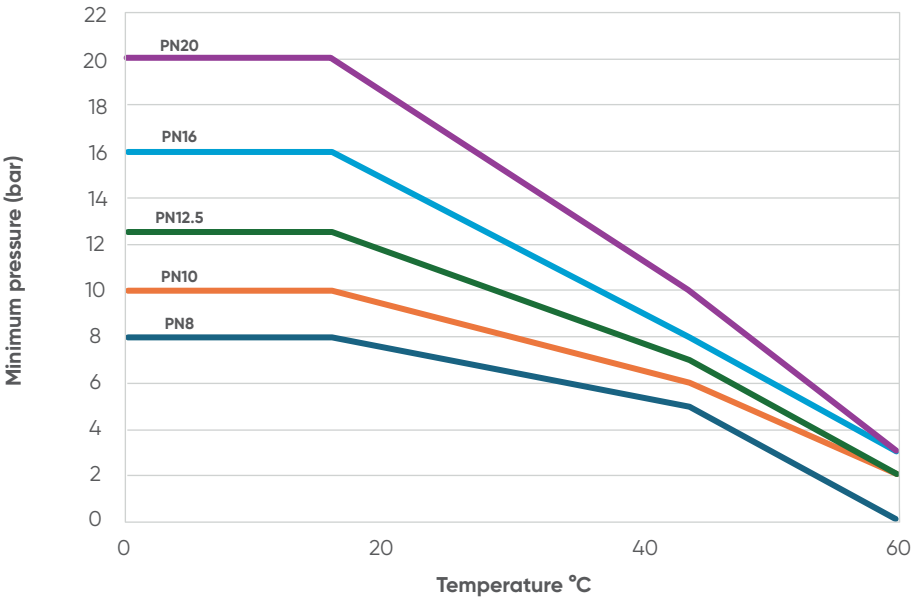
Main properties

Properties of PVC-U		Benefits
Thermal resistance		• Range of use 0-60°C
Low surface roughness		• High flow coefficients (extremely smooth internal walls) • Pressure drop constant over time • Low risk of stoppages due to scaling • Reduced transfer of material to the transported fluid
Chemical resistance		• Good chemical resistance for conveying acids and alkalis, paraffin/aliphatic hydrocarbons and saline solutions.
Abrasion resistance		• Extremely low operating costs due to its long service life
Insulating		• Non-conductive (immune to galvanic corrosion) • No condensation problems • Minimum heat loss
Linear thermal expansion coefficients		• Reduced need for supports and expansion joints, resulting in considerable advantages in terms of plant design
Easy to join (solvent weld sockets)		• Reduced installation costs thanks to quick joint by POWER-LOCKtm gasket
Fire behaviour		• Good resistance to combustion also due to the presence of self-extinguishing chlorine
Good mechanical resistance		• Improved mechanical characteristics due to ductility and crack propagation limitation

Technical Data

Pressure variation according to temperature

The operating pressures vary depending on the temperatures (Tmax = 60°C) as indicated in the following table.



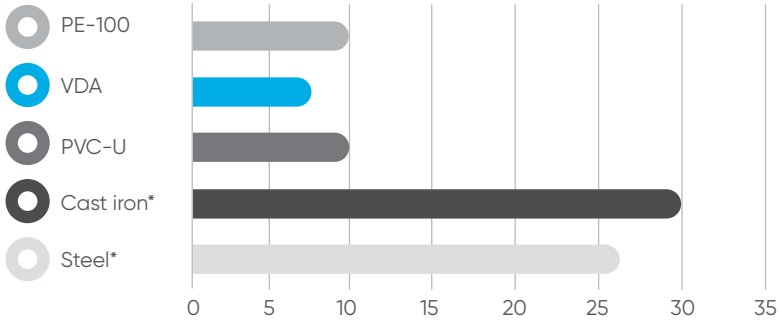
Correspondence between nominal pressure and annular stiffness

VDA Lareter tubes can also be used for the transport of fluids under gravity. In this case the reference mechanical quantity is the annular stiffness SN (KN/m²).

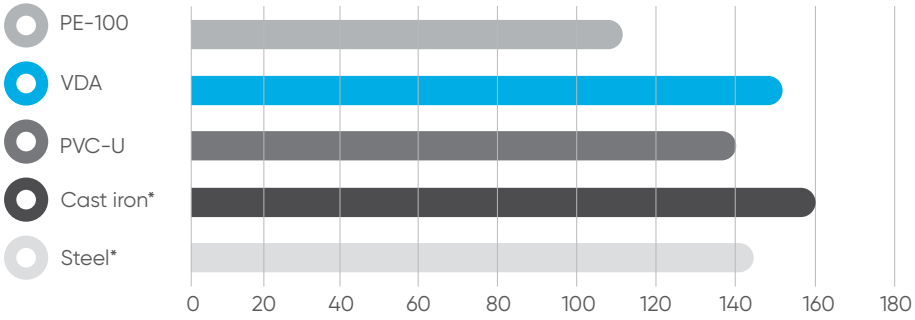
Standard	Values				
PN (bar)	8	10	12.5	16	20
SN (KN/m²)	3	5	10	20	40

Advantages of the VDA System over other materials

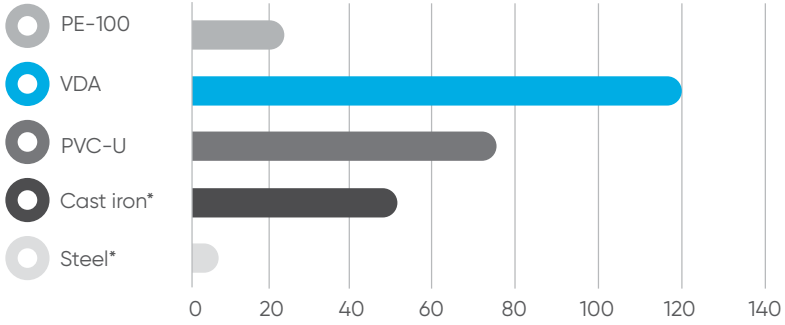
Weight per metre kg/m



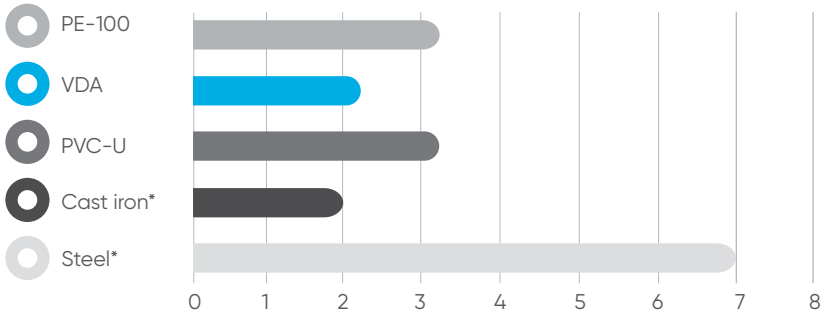
Flow rate l/s



Installation speed m/h



GWP (kgCO2e), CO2 emissions/kg material produced



Data are calculated for pipes diameter 200 PN 16 (PVC-A, PVC-U, PE 100).

*For cast iron and steel they refer to internal diameters.

Pipe pressure drops – 8 bar

Flow rate (Q) Litres/sec	V / J	Ø Ext. mm	50	63	90	110	125	140	160	200	225	250	280	315	355	400	500
		Ø Int. mm				104.6	118.8	133	152.8	191	214	238.8	266.2	300.8	338	381.2	476.2
0.5	V																
	J																
1.0	V																
	J																
1.5	V					0.18											
	J					0.35											
2.0	V					0.24	0.19										
	J					0.59	0.32										
2.5	V					0.3	0.23	0.19									
	J					0.89	0.48	0.28									
3.0	V					0.35	0.28	0.22									
	J					1.24	0.67	0.39									
3.5	V					0.41	0.32	0.26	0.2								
	J					1.65	0.89	0.52	0.27								
4.0	V					0.47	0.37	0.29	0.22								
	J					2.11	1.14	0.66	0.34								
5.0	V					0.59	0.46	0.37	0.28	0.18							
	J					3.19	1.72	0.99	0.51	0.17							
5.5	V					0.65	0.5	0.4	0.31	0.2							
	J					3.81	2.05	1.19	0.61	0.21							
6.0	V					0.7	0.55	0.44	0.33	0.21	0.17						
	J					4.47	2.41	1.39	0.71	0.24	0.14						
6.5	V					0.76	0.59	0.47	0.36	0.23	0.19						
	J					5.19	2.79	1.61	0.82	0.28	0.16						
7.0	V					0.82	0.64	0.51	0.39	0.25	0.2	0.16					
	J					5.95	3.2	1.85	0.94	0.32	0.19	0.11					
7.5	V					0.88	0.68	0.55	0.41	0.27	0.21	0.17					
	J					6.76	3.64	2.1	1.07	0.36	0.21	0.13					
8.0	V					0.94	0.73	0.58	0.44	0.28	0.23	0.18					
	J					7.61	4.1	2.37	1.21	0.41	0.24	0.14					
9.0	V					1.05	0.82	0.65	0.5	0.32	0.26	0.21	0.17				
	J					9.46	5.09	2.94	1.5	0.51	0.29	0.17	0.11				
10.0	V					1.17	0.91	0.73	0.55	0.35	0.28	0.23	0.18				
	J					11.5	6.19	3.57	1.82	0.62	0.36	0.21	0.13				
12.0	V					1.4	1.09	0.87	0.66	0.42	0.34	0.27	0.22	0.17			
	J					16.11	8.67	5	2.55	0.86	0.5	0.29	0.18	0.1			
14.0	V					1.64	1.27	1.01	0.77	0.49	0.39	0.32	0.26	0.2			
	J					21.42	11.53	6.65	3.39	1.15	0.66	0.39	0.23	0.13			
16.0	V					1.87	1.45	1.16	0.88	0.56	0.45	0.36	0.29	0.23	0.18		
	J					27.43	14.76	8.52	4.34	1.47	0.84	0.5	0.3	0.16	0.1		
18.0	V					2.1	1.63	1.3	0.99	0.63	0.51	0.41	0.33	0.26	0.21		
	J					34.1	18.35	10.59	5.39	1.82	1.05	0.62	0.37	0.2	0.12		
20.0	V					2.33	1.81	1.45	1.1	0.7	0.56	0.45	0.36	0.29	0.23		
	J					41.44	22.3	12.87	6.55	2.21	1.27	0.75	0.44	0.25	0.14		
25.0	V					2.92	2.26	1.81	1.37	0.88	0.7	0.56	0.45	0.36	0.28	0.22	
	J					62.61	33.69	19.44	9.89	3.34	1.92	1.13	0.67	0.37	0.21	0.12	
30.0	V					3.5	2.71	2.17	1.64	1.05	0.84	0.68	0.54	0.43	0.34	0.27	
	J					87.73	47.2	27.24	13.86	4.68	2.69	1.58	0.93	0.52	0.3	0.17	
35.0	V					4.08	3.17	2.53	1.92	1.23	0.98	0.79	0.63	0.5	0.4	0.31	
	J					116.68	62.77	36.22	18.43	6.22	3.58	2.1	1.24	0.69	0.39	0.22	
40.0	V					4.66	3.62	2.89	2.19	1.4	1.12	0.9	0.72	0.57	0.45	0.36	0.23
	J					149.37	80.36	46.37	23.59	7.96	4.58	2.69	1.58	0.88	0.5	0.28	0.1
45.0	V					5.25	4.07	3.25	2.46	1.58	1.26	1.01	0.81	0.64	0.51	0.4	0.26
	J					185.74	99.93	57.66	29.34	9.9	5.69	3.34	1.97	1.09	0.62	0.35	0.12
50.0	V						4.52	3.61	2.73	1.75	1.4	1.12	0.9	0.71	0.56	0.44	0.29
	J						121.43	70.07	35.65	12.03	6.92	4.06	2.39	1.32	0.75	0.42	0.15

V = Speed m/sec - J = Pressure drop m/km
The data in the pressure drop table were calculated with the Hazen-Williams Formula

Pipe pressure drops – 10 bar

Flow rate (Q) Litres/sec	V / J	Ø Ext. mm	50	63	75	90	110	125	140	160	200	225	250	280	315	355	400	500
		Ø Int. mm		58.8	70.4	84.8	103.8	118	132.2	151	188.8	212.4	236	264,4	297.4	335.2	377.6	472.2
0.5	V			0.19	75													
	J			0.75	0.31													
1.0	V			0.37	0.26	0.18												
	J			2.69	1.12	0.46												
1.5	V			0.56	0.39	0.27	0.18											
	J			5.69	2.37	0.96	0.36											
2.0	V			0.74	0.52	0.36	0.24	0.19										
	J			9.68	4.03	1.63	0.61	0.33										
2.5	V			0.93	0.65	0.45	0.3	0.23	0.19									
	J			14.62	6.09	2.46	0.92	0.5	0.29									
3.0	V			1.11	0.78	0.54	0.36	0.28	0.22									
	J			20.49	8.53	3.45	1.29	0.69	0.4									
3.5	V			1.3	0.91	0.63	0.42	0.33	0.26	0.2								
	J			27.25	11.34	4.58	1.72	0.92	0.53	0.28								
4.0	V			1.48	1.03	0.71	0.48	0.37	0.3	0.23								
	J			34.88	14.52	5.87	2.2	1.18	0.68	0.36								
5.0	V			1.85	1.29	0.89	0.6	0.46	0.37	0.28	0.18							
	J			52.7	21.93	8.86	3.31	1.78	1.02	0.54	0.18							
5.5	V			2.03	1.42	0.98	0.66	0.51	0.41	0.31	0.2							
	J			62.86	26.16	10.57	3.95	2.12	1.22	0.64	0.22							
6.0	V			2.22	1.55	1.07	0.71	0.55	0.44	0.34	0.22	0.17						
	J			73.84	30.73	12.42	4.64	2.49	1.43	0.76	0.26	0.15						
6.5	V			2.4	1.68	1.16	0.77	0.6	0.48	0.37	0.24	0.19						
	J			85.63	35.63	14.4	5.38	2.88	1.66	0.87	0.3	0.17						
7.0	V			2.59	1.81	1.25	0.83	0.65	0.52	0.4	0.26	0.2						
	J			98.21	40.87	16.51	6.17	3.31	1.9	1	0.34	0.19						
7.5	V			2.77	1.93	1.33	0.89	0.69	0.55	0.42	0.27	0.22	0.14					
	J			111.58	46.43	18.76	7.01	3.76	2.16	1.13	0.39	0.22	0.13					
8.0	V			2.95	2.06	1.42	0.95	0.74	0.59	0.45	0.29	0.23	0.19					
	J			125.73	52.32	21.14	7.9	4.23	2.44	1.28	0.43	0.25	0.15					
9.0	V			3.32	2.32	1.6	1.07	0.83	0.66	0.51	0.33	0.26	0.21	0.17				
	J			156.34	65.05	26.29	9.82	5.26	3.03	1.59	0.54	0.31	0.18	0.11				
10.0	V			3.69	2.58	1.78	1.19	0.92	0.73	0.56	0.36	0.29	0.23	0.19				
	J			189.98	79.05	31.94	11.94	6.4	3.68	1.93	0.65	0.37	0.22	0.13				
12.0	V				3.09	2.13	1.42	1.1	0.88	0.68	0.43	0.34	0.28	0.22	0.18			
	J				110.76	44.75	16.72	8.96	5.15	2.7	0.91	0.52	0.31	0.18	0.1			
14.0	V				3.61	2.49	1.66	1.29	1.03	0.79	0.51	0.4	0.33	0.26	0.21			
	J				147.31	59.52	22.24	11.91	6.85	3.59	1.21	0.69	0.41	0.24	0.14			
16.0	V				4.12	2.84	1.9	1.47	1.17	0.9	0.58	0.46	0.37	0.3	0.24	0.19		
	J				188.59	76.2	28.47	15.25	8.77	4.59	1.55	0.88	0.53	0.3	0.17	0.1		
18.0	V				4.63	3.2	2.13	1.65	1.32	1.01	0.65	0.51	0.42	0.33	0.26	0.21		
	J				234.5	94.74	35.4	18.96	10.9	5.71	1.93	1.09	0.65	0.38	0.22	0.12		
20.0	V					3.55	2.37	1.84	1.46	1.12	0.72	0.57	0.46	0.37	0.29	0.23		
	J					115.13	43.02	23.04	13.25	6.94	2.34	1.32	0.79	0.46	0.26	0.15		
25.0	V					4.44	2.96	2.29	1.83	1.4	0.9	0.71	0.58	0.46	0.37	0.29	0.23	
	J					173.97	65	34.81	20.02	10.48	3.53	1.99	1.2	0.69	0.39	0.22	0.13	
30.0	V						3.55	2.75	2.19	1.68	1.08	0.85	0.69	0.55	0.44	0.35	0.27	
	J						91.07	48.78	28.05	14.68	4.95	2.79	1.67	0.96	0.55	0.31	0.17	
35.0	V						4.15	3.21	2.56	1.96	1.26	0.99	0.81	0.64	0.51	0.4	0.32	
	J						121.12	64.87	37.3	19.52	6.58	3.71	2.22	1.28	0.72	0.41	0.23	
40.0	V						4.74	3.67	2.92	2.24	1.44	1.14	0.92	0.73	0.58	0.46	0.36	0.23
	J						155.06	83.05	47.76	24.99	8.42	4.75	2.84	1.64	0.93	0.52	0.29	0.1
45.0	V						5.33	4.12	3.29	2.52	1.61	1.28	1.03	0.83	0.65	0.52	0.41	0.26
	J						192.81	103.27	59.38	31.08	10.47	5.9	3.54	2.04	1.15	0.64	0.36	0.13
50.0	V							4.58	3.65	2.8	1.79	1.42	1.15	0.92	0.73	0.57	0.45	0.29
	J							102.49	72.16	37.77	12.73	7.17	4.3	2.47	1.4	0.78	0.44	0.15

V = Speed m/sec - J = Pressure drop m/km
The data in the pressure drop table were calculated with the Hazen-Williams Formula

Pipe pressure drops – 12.5 bar

Flow rate (Q) Litres/sec	V / J	Ø Ext. mm	50	63	75	90	110	125	140	160	200	225	250	280	315	355	400	500
		Ø Int. mm	45.2	57.2	69.2	83.8	102.4	115.4	129.2	148.8	186.2	207.8	231.6	258.6	293.2	330.4	370	461.8
0.5	V		0.32	0.2	0.14													
	J		2.69	0.86	0.34													
1.0	V		0.63	0.39	0.27	0.19												
	J		9.67	3.07	1.22	0.48												
1.5	V		0.94	0.59	0.4	0.28	0.19											
	J		20.46	6.5	2.58	1.02	0.39											
2.0	V		1.25	0.78	0.54	0.37	0.25	0.2										
	J		34.83	11.07	4.38	1.73	0.65	0.37										
2.5	V		1.56	0.98	0.67	0.46	0.31	0.24	0.16									
	J		52.63	16.73	6.62	2.61	0.99	0.55	0.32									
3.0	V		1.88	1.17	0.8	0.55	0.37	0.29	0.23									
	J		73.75	23.43	9.27	3.65	1.38	0.77	0.45									
3.5	V		2.19	1.37	0.94	0.64	0.43	0.34	0.27	0.21								
	J		98.08	31.16	12.33	4.86	1.83	1.03	0.59	0.3								
4.0	V		2.5	1.56	1.07	0.73	0.49	0.39	0.31	0.24								
	J		125.57	39.89	15.78	6.22	2.35	1.31	0.76	0.38								
5.0	V		3.12	1.95	1.34	0.91	0.61	0.48	0.39	0.29	0.19							
	J		189.74	60.28	23.85	9.39	3.54	1.98	1.14	0.58	0.2							
5.5	V		3.44	2.15	1.47	1	0.67	0.53	0.42	0.32	0.21							
	J		226.32	71.9	28.44	11.2	4.22	2.36	1.36	0.69	0.23							
6.0	V			2.34	1.6	1.09	0.73	0.58	0.46	0.35	0.23	0.18						
	J			84.46	33.41	13.16	4.96	2.77	1.6	0.81	0.27	0.16						
6.5	V			2.54	1.73	1.18	0.8	0.63	0.5	0.38	0.24	0.2						
	J			97.94	38.74	15.25	5.75	3.22	1.86	0.94	0.32	0.19						
7.0	V			2.73	1.87	1.28	0.86	0.67	0.54	0.41	0.26	0.21						
	J			112.33	44.44	17.5	6.59	3.69	2.13	1.07	0.36	0.21						
7.5	V			2.93	2	1.37	0.92	0.72	0.58	0.44	0.28	0.23	0.18					
	J			127.62	50.48	19.88	7.49	4.19	2.42	1.22	0.41	0.24	0.15					
8.0	V			3.12	2.13	1.46	0.98	0.77	0.62	0.47	0.3	0.24	0.2					
	J			143.81	56.89	22.4	8.44	4.72	2.72	1.37	0.46	0.27	0.16					
9.0	V			3.51	2.4	1.64	1.1	0.87	0.69	0.52	0.34	0.27	0.22	0.18				
	J			178.82	70.73	27.85	10.49	5.87	3.39	1.7	0.58	0.34	0.2	0.12				
10.0	V			3.9	2.67	1.82	1.22	0.96	0.77	0.58	0.37	0.3	0.24	0.2				
	J			217.3	85.96	33.84	12.75	7.13	4.11	2.07	0.7	0.41	0.24	0.14				
12.0	V				3.2	2.18	1.46	1.15	0.92	0.7	0.45	0.36	0.29	0.23	0.18			
	J				120.44	47.41	17.87	9.98	5.76	2.9	0.98	0.57	0.34	0.2	0.11			
14.0	V				3.73	2.55	1.71	1.34	1.07	0.81	0.52	0.42	0.34	0.27	0.21			
	J				160.18	63.06	23.76	13.28	7.66	3.85	1.3	0.76	0.45	0.27	0.15			
16.0	V					2.91	1.95	1.54	1.23	0.93	0.59	0.48	0.39	0.31	0.24			
	J					80.73	30.42	17	9.81	4.93	1.66	0.97	0.58	0.34	0.19			
18.0	V					3.27	2.19	1.73	1.38	1.04	0.67	0.54	0.43	0.35	0.27	0.22		
	J					100.38	37.82	21.13	12.19	6.13	2.06	1.21	0.72	0.42	0.23	0.13		
20.0	V					3.63	2.44	1.92	1.53	1.16	0.74	0.6	0.48	0.39	0.3	0.24		
	J					121.98	45.96	25.68	14.82	7.45	2.5	1.47	0.87	0.51	0.28	0.16		
25.0	V					4.54	3.04	2.4	1.91	1.44	0.92	0.74	0.6	0.48	0.38	0.3	0.24	
	J					184.32	69.44	38.8	22.39	11.26	3.78	2.22	1.31	0.77	0.42	0.24	0.14	
30.0	V						3.65	2.88	2.3	1.73	1.11	0.89	0.72	0.58	0.45	0.36	0.28	
	J						97.3	54.37	31.37	15.77	5.29	3.1	1.83	1.07	0.58	0.33	0.19	
35.0	V						4.26	3.35	2.68	2.02	1.29	1.04	0.84	0.67	0.52	0.41	0.33	
	J						129.4	72.31	41.72	20.97	7.04	4.13	2.44	1.43	0.78	0.44	0.25	
40.0	V						4.87	3.83	3.06	2.31	1.48	1.19	0.96	0.77	0.6	0.47	0.38	0.24
	J						165.66	92.57	53.4	26.85	9.01	5.28	3.12	1.82	0.99	0.56	0.32	0.11
45.0	V						5.47	4.31	3.44	2.6	1.66	1.33	1.07	0.86	0.67	0.53	0.42	0.27
	J						206	115.1	66.4	33.38	11.2	6.57	3.88	2.27	1.23	0.69	0.4	0.14
50.0	V							4.79	3.82	2.88	1.84	1.48	1.19	0.96	0.75	0.59	0.47	0.3
	J							139.87	80.69	40.56	13.62	7.98	4.71	2.75	1.5	0.84	0.49	0.17

V = Speed m/sec - J = Pressure drop m/km
The data in the pressure drop table were calculated with the Hazen-Williams Formula

Pipe pressure drops – 16 bar

Flow rate (Q) Litres/sec	V / J	Ø Ext. mm	50	63	75	90	110	125	140	160	200	225	250	280	315	355	400	500
		Ø Int. mm	44	56.6	67.6	82	100.2	114	127.6	146	182.4	205.2	228	255.4	287.4	323	361.8	
0.5	V		0.33	0.2	0.14													
	J		3.06	0.9	0.38													
1.0	V		0.66	0.4	0.28	0.1												
	J		11.02	3.24	1.37	0.54												
1.5	V		0.99	0.6	0.42	0.29	0.2											
	J		23.32	6.85	2.89	1.13	0.43											
2.0	V		1.32	0.8	0.56	0.38	0.26	0.2										
	J		39.71	11.65	4.91	1.92	0.73	0.39										
2.5	V		1.65	1	0.7	0.48	0.32	0.25	0.2									
	J		60	17.61	7.42	2.9	1.1	0.59	0.34									
3.0	V		1.98	1.2	0.84	0.57	0.39	0.3	0.24									
	J		84.07	24.67	10.39	4.06	1.53	0.82	0.48									
3.5	V		2.31	1.4	0.98	0.67	0.45	0.35	0.28	0.21								
	J		111.81	32.81	13.82	5.4	2.04	1.09	0.63	0.33								
4.0	V		2.64	1.6	1.12	0.76	0.51	0.4	0.32	0.24								
	J		177.99	42	17.69	6.91	2.61	1.39	0.81	0.42								
5.0	V		3.3	1.99	1.4	0.95	0.64	0.5	0.4	0.3	0.2							
	J		216.3	63.46	26.72	10.44	3.94	2.1	1.22	0.63	0.22							
5.5	V		3.63	2.19	1.54	1.05	0.7	0.54	0.44	0.33	0.22							
	J		258.01	75.69	31.88	12.45	4.69	2.51	1.45	0.75	0.26							
6.0	V		3.95	2.39	1.68	1.14	0.77	0.59	0.47	0.36	0.23	0.19						
	J		303.07	88.91	37.44	14.62	5.51	2.94	1.7	0.89	0.3	0.17						
6.5	V			2.59	1.82	1.24	0.83	0.64	0.51	0.39	0.25	0.2						
	J			103.01	43.42	16.96	6.39	3.41	1.97	1.03	0.35	0.2						
7.0	V			2.79	1.96	1.33	0.89	0.69	0.55	0.42	0.27	0.22						
	J			118.25	49.8	19.45	7.33	3.91	2.26	1.18	0.4	0.23						
7.5	V			2.99	2.1	1.43	0.96	0.74	0.59	0.45	0.29	0.23	0.19					
	J			134.35	56.58	22.09	8.33	4.44	2.57	1.34	0.46	0.26	0.16					
8.0	V			3.19	2.24	1.52	1.02	0.79	0.63	0.48	0.31	0.25	0.2					
	J			151.38	63.65	24.89	9.38	5.01	2.89	1.5	0.51	0.29	0.18					
9.0	V			3.59	2.52	1.71	1.15	0.89	0.71	0.54	0.35	0.28	0.23					
	J			188.24	79.27	30.95	11.66	6.22	3.6	1.87	0.64	0.36	0.22					
10.0	V			3.98	2.79	1.9	1.27	0.99	0.79	0.6	0.39	0.31	0.25	0.2				
	J			288.75	96.33	37.61	14.17	7.56	4.37	2.27	0.77	0.44	0.26	0.15				
12.0	V				3.35	2.28	1.53	1.18	0.94	0.72	0.46	0.37	0.3	0.24	0.19			
	J				134.97	52.7	19.86	10.6	6.12	3.18	1.08	0.61	0.37	0.21	0.21			
14.0	V				3.91	2.66	1.78	1.38	1.1	0.84	0.54	0.43	0.35	0.28	0.22			
	J				179.5	70.09	26.41	14.09	8.14	4.23	1.43	0.81	0.49	0.28	0.28			
16.0	V					3.04	2.04	1.57	1.26	0.96	0.62	0.49	0.4	0.32	0.25	0.2		
	J					89.73	33.81	18.04	10.42	5.41	1.83	1.04	0.62	0.36	0.36	0.12		
18.0	V					3.42	2.29	1.77	1.41	1.08	0.69	0.55	0.45	0.36	0.28	0.22		
	J					111.57	42.04	22.43	12.96	6.73	2.28	1.29	0.77	0.45	0.45	0.15		
20.0	V					3.8	2.54	1.97	1.57	1.2	0.77	0.61	0.5	0.4	0.31	0.25		
	J					135.59	51.08	27.25	15.74	8.17	2.77	1.56	0.94	0.54	0.54	0.18		
25.0	V					4.74	3.18	2.46	1.96	1.5	0.96	0.76	0.62	0.49	0.39	0.31	0.25	
	J						77.19	41.18	23.79	12.35	4.18	2.36	1.41	0.82	0.82	0.26	0.15	
30.0	V						3.81	2.95	2.35	1.8	1.15	0.91	0.74	0.59	0.47	0.37	0.3	
	J						108.15	57.7	33.33	17.3	5.85	3.3	1.98	1.14	1.14	0.37	0.21	
35.0	V						4.45	3.44	2.74	2.1	1.35	1.06	0.86	0.69	0.55	0.43	0.35	
	J						143.84	76.74	44.32	23	7.78	4.39	2.63	1.51	1.51	0.49	0.28	
40.0	V						5.08	3.93	3.14	2.4	1.54	1.22	0.99	0.79	0.62	0.49	0.39	
	J						184.15	98.24	56.74	29.45	9.96	5.62	3.36	1.94	1.94	0.62	0.36	
45.0	V						5.72	4.42	3.53	2.7	1.73	1.37	1.11	0.88	0.7	0.55	0.44	
	J						228.98	122.15	70.56	36.62	12.39	6.98	4.18	2.41	2.41	0.77	0.45	
50.0	V							4.91	3.92	2.99	1.92	1.52	1.23	0.98	0.78	0.62	0.49	
	J							148.44	85.74	44.5	15.05	8.48	5.08	2.93	2.93	0.94	0.54	

V = Speed m/sec - J = Pressure drop m/km
The data in the pressure drop table were calculated with the Hazen-Williams Formula

Pipe pressure drops – 20 bar

Flow rate (Q) Litres/sec	V / J	Ø Ext. mm	50	63	75	90	110	125	140	160	200	225	250	280	315	355	400	500
		Ø Int. mm	42.2	53.6	63.8	80.2	98	111.4	124.8	142.6	177	200.6	222.8	249.6	280.8			
0.5	V		0.36	0.23	0.16													
	J		3.75	1.17	0.51													
1.0	V		0.72	0.45	0.32	0.2												
	J		13.5	4.22	1.81	0.6												
1.5	V		1.08	0.67	0.47	0.3	0.2											
	J		28.59	8.92	3.82	1.26	0.48											
2.0	V		1.44	0.89	0.63	0.4	0.27	0.21										
	J		48.67	15.19	6.51	2.14	0.81	0.44										
2.5	V		1.79	1.11	0.79	0.5	0.34	0.26	0.21									
	J		73.54	22.95	9.83	3.23	1.22	0.66	0.33									
3.0	V		2.15	1.34	0.94	0.6	0.4	0.31	0.25									
	J		103.4	32.16	13.77	4.52	1.71	0.92	0.46									
3.5	V		2.51	1.56	1.1	0.7	0.47	0.36	0.29	0.22								
	J		137.04	42.77	18.31	6.01	2.27	1.22	0.61	0.37								
4.0	V		2.87	1.78	1.26	0.8	0.54	0.42	0.33	0.26								
	J		175.44	54.75	23.44	7.7	2.9	1.56	0.78	0.47								
5.0	V		3.58	2.22	1.57	1	0.67	0.52	0.41	0.32	0.21							
	J		265.09	82.73	35.42	11.63	4.38	2.35	1.18	0.71	0.25							
5.5	V		3.94	2.44	1.73	1.09	0.73	0.57	0.46	0.35	0.23	0.18						
	J		316.21	98.68	42.25	13.87	5.23	2.8	1.41	0.85	0.3	0.16						
6.0	V			2.67	1.88	1.19	0.8	0.62	0.5	0.38	0.25	0.2						
	J			115.91	49.63	16.29	6.14	3.29	1.65	0.99	0.35	0.19						
6.5	V			2.89	2.04	1.29	0.87	0.67	0.54	0.41	0.27	0.21						
	J			134.41	57.55	18.89	7.12	3.82	1.91	1.15	0.4	0.22						
7.0	V			3.11	2.2	1.39	0.93	0.72	0.58	0.44	0.29	0.23						
	J			154.16	66	21.67	8.17	4.38	2.19	1.32	0.46	0.25						
7.5	V			3.33	2.35	1.49	1	0.78	0.62	0.48	0.31	0.24	0.2					
	J			175.15	74.99	24.61	9.28	4.97	2.49	1.5	0.53	0.29	0.17					
8.0	V			3.55	2.51	1.59	1.07	0.83	0.66	0.51	0.33	0.26	0.21					
	J			197.36	84.5	27.74	10.45	5.6	2.81	1.69	0.59	0.32	0.2					
9.0	V			4	2.82	1.79	1.2	0.93	0.74	0.57	0.35	0.29	0.24					
	J			245.41	105.07	34.49	13	6.96	3.49	2.1	0.73	0.4	0.24					
10.0	V			4.44	3.14	1.99	1.33	1.03	0.82	0.63	0.41	0.32	0.26	0.21				
	J			298.22	127.68	41.91	15.79	8.46	4.24	2.55	0.89	0.49	0.29	0.17				
12.0	V				4.39	2.38	1.6	1.24	0.99	0.76	0.49	0.39	0.31	0.25	0.2			
	J				178.89	58.72	22.12	11.86	5.94	3.57	1.25	0.68	0.41	0.24	0.14			
14.0	V				4.39	2.78	1.86	1.44	1.15	0.88	0.57	0.45	0.36	0.29	0.23			
	J				237.92	78.09	29.42	15.77	7.9	4.74	1.66	0.9	0.54	0.31	0.18			
16.0	V				5.01	3.18	2.13	1.65	1.31	1.01	0.66	0.51	0.42	0.33	0.26			
	J				304.59	99.97	37.67	20.18	10.11	6.07	2.12	1.16	0.69	0.4	0.23			
18.0	V					3.57	2.39	1.85	1.48	1.13	0.74	0.58	0.47	0.37	0.3			
	J					124.31	46.84	25.09	12.57	7.54	2.64	1.44	0.86	0.5	0.28			
20.0	V					0.397	2.66	2.06	1.64	1.26	0.82	0.64	0.52	0.41	0.33			
	J					151.06	56.92	30.49	15.27	9.17	3.2	1.74	1.05	0.6	0.34			
25.0	V					4.96	3.32	2.57	2.05	1.57	1.02	0.8	0.65	0.52	0.41			
	J					228.26	86	46.08	23.07	13.85	4.84	2.63	1.58	0.91	0.52			
30.0	V						3.99	3.09	2.46	1.89	1.23	0.96	0.78	0.62	0.49			
	J						120.5	64.56	32.33	19.4	6.78	3.69	2.21	1.27	0.72			
35.0	V						4.65	3.6	2.87	2.2	1.43	1.11	0.9	0.72	0.57			
	J						160.26	85.86	43	25.8	9.01	4.9	2.94	1.69	0.96			
40.0	V						5.31	4.11	3.28	2.51	1.63	1.27	1.03	0.82	0.65			
	J						205.17	109.92	55.04	33.03	11.53	6.27	3.76	2.17	1.22			
45.0	V						5.98	4.63	3.69	2.83	1.84	1.43	1.16	0.93	0.73			
	J						255.12	136.68	68.44	41.07	14.34	7.8	4.68	2.69	1.52			
50.0	V							5.14	4.1	3.14	2.04	1.59	1.29	1.03	0.81			
	J							166.09	83.17	49.9	17.42	9.47	5.68	3.27	1.85			

V = Speed m/sec - J = Pressure drop m/km
The data in the pressure drop table were calculated with the Hazen-Williams Formula

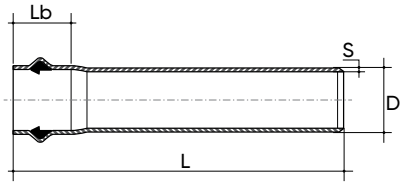
PRESSURE PIPES

Pressure piping for gasket junction system FORSHEDA 601 POWER-LOCK™

PRESSURE PIPING

Technical specifications	
Size range	d 50 ÷ 500 (mm)
Nominal pressure	PN 16 with water at 20° C PN 10 with water at 20° C
Temperature range	0 °C ÷ 60 °C
Coupling standards	**FORSHEDA JOINT,** gluing on request
Reference standards	**KQ KIWA QUALITY KIP-105133- BSPAS27** **D.M. No.174/2004-potability** **UNI EN 1622- odour and flavour threshold**
Fitting material	PVC-A colour BLUE RAL 5010

DIMENSIONS

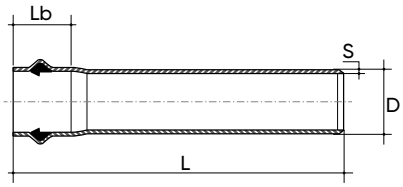


Pressure pipe VDA PN8

VDA Pressure Pipe, Blue RAL 5010, Length 6m, Connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Weight (kg/m)	Qty x pallet	PN8 Code
90	2.6	130	1.1	57	PIVDAPN08090F6L
110	2.7	130	1.4	57	PIVDAPN08110F6L
125	3.1	150	1.8	51	PIVDAPN08125F6L
140	3.5	160	2.3	45	PIVDAPN08140F6L
160	3.6	165	2.7	33	PIVDAPN08160F6L
200	4.5	180	4.2	20	PIVDAPN08200F6L
225	5.5	200	5.7	18	PIVDAPN08225F6L
250	5.6	210	6.5	12	PIVDAPN08250F6L
280	6.9	210	8.9	11	PIVDAPN08280F6L
315	7.1	230	10.4	9	PIVDAPN08315F6L
355**	8.5	250	13.8	6	PIVDAPN08355F6L
400	9.4	250	17.2	5	PIVDAPN08400F6L
500	11.9	255	27.3	2	PIVDAPN08500F6L

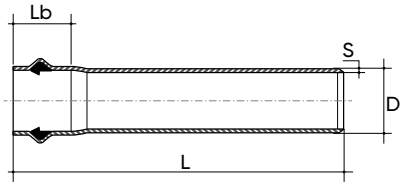
*Upon request



Pressure pipe VDA PN10

VDA Pressure Pipe, Blue RAL 5010, Length 6m, Connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Weight (kg/m)	Qty x pallet	PN10 Code
63	2.1	110	0.6	123	PIVDAPN10063F6L
75	2.3	120	0.8	87	PIVDAPN10075F6L
90	2.6	130	1.1	96	PIVDAPN10090F6L
110	3.1	130	1.6	57	PIVDAPN10110F6L
125	3.5	150	2.1	51	PIVDAPN10125F6L
140	3.9	160	2.5	45	PIVDAPN10140F6L
160	4.5	165	3.3	33	PIVDAPN10160F6L
200	5.6	180	5.2	20	PIVDAPN10200F6L
225	6.3	200	6.6	18	PIVDAPN10225F6L
250	7.0	210	8.0	12	PIVDAPN10250F6L
280	7.8	210	10.0	11	PIVDAPN10280F6L
315	8.8	230	12.6	9	PIVDAPN10315F6L
355	9.9	250	16.0	6	PIVDAPN10355F6L
400	11.2	250	20.5	5	PIVDAPN10400F6L
500	13.9	255	31.7	2	PIVDAPN10500F6L

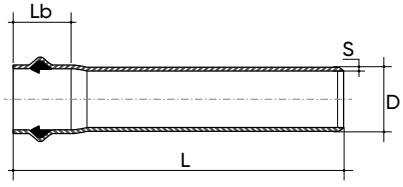


Pressure pipe VDA PN12.5

VDA Pressure Pipe, Blue RAL 5010, Length 6m, Connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Weight (kg/m)	Qty x pallet	PN12.5 Code
50*	2.4	110	0.6	194	PIVDAPN12050F6L
63	2.9	110	0.8	123	PIVDAPN12063F6L
75	2.9	120	1.0	87	PIVDAPN12075F6L
90	3.1	130	1.3	96	PIVDAPN12090F6L
110	3.8	130	1.9	57	PIVDAPN12110F6L
125	4.8	150	2.7	51	PIVDAPN12125F6L
140	5.4	160	3.4	45	PIVDAPN12140F6L
160	5.6	165	4.1	33	PIVDAPN12160F6L
200	6.9	180	6.5	20	PIVDAPN12200F6L
225	8.6	200	8.8	18	PIVDAPN12225F6L
250	9.2	210	10.4	12	PIVDAPN12250F6L
280	10.7	210	13.6	11	PIVDAPN12280F6L
315	10.9	230	15.6	9	PIVDAPN12315F6L
355**	12.3	250	21.6	6	PIVDAPN12355F6L
400	15.0	250	27.0	5	PIVDAPN12400F6L
500	19.1	255	42.9	2	PIVDAPN12500F6L

* Gluing only ** On request

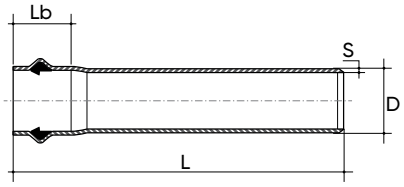


Pressure pipe VDA PN16

VDA Pressure Pipe, Blue RAL 5010, Length 6m, Connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Weight (kg/m)	Qty x pallet	PN16 Code
50*	3.0	110	0.7	194	PIVDAPN16050F6L
63	3.2	110	0.9	123	PIVDAPN16063F6L
75	3.7	120	1.3	87	PIVDAPN16075F6L
90	4.0	130	1.6	96	PIVDAPN16090F6L
110	4.9	130	2.4	57	PIVDAPN16110F6L
125	5.5	150	3.1	51	PIVDAPN16125F6L
140	6.2	160	3.9	45	PIVDAPN16140F6L
160	7.0	165	5.1	33	PIVDAPN16160F6L
200	8.8	180	7.9	20	PIVDAPN16200F6L
225**	9.9	200	10.0	18	PIVDAPN16225F6L
250	11.0	210	12.7	12	PIVDAPN16250F6L
280	12.3	210	16.0	11	PIVDAPN16280F6L
315	13.8	230	19.5	9	PIVDAPN16315F6L
355	15.6	250	25.4	6	PIVDAPN16355F6L
400	17.5	250	33.9	5	PIVDAPN16400F6L
500	21.9	255	48.4	2	PIVDAPN16500F6L

* Gluing only ** On request



Pressure pipe VDA PN20

VDA Pressure Pipe, Blue RAL 5010, Length 6m, Connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Weight (kg/m)	Qty x pallet	PN20 Code
50*	3.9	110	0.9	194	PIVDAPN20050F6L
63	4.7	110	1.3	123	PIVDAPN20063F6L
75	5.6	120	1.8	87	PIVDAPN20075F6L
90**	5.9	130	2.0	96	PIVDAPN20090F6L
110	6.0	130	3.0	57	PIVDAPN20110F6L
125**	6.8	150	3.8	51	PIVDAPN20125F6L
140	7.6	160	5.0	45	PIVDAPN20140F6L
160	8.7	165	6.5	33	PIVDAPN20160F6L
200	11.5	180	10.1	20	PIVDAPN20200F6L
225**	12.2	200	12.2	18	PIVDAPN20225F6L
250**	13.6	210	15.1	12	PIVDAPN20250F6L
280**	15.2	210	18.9	11	PIVDAPN20280F6L
315	17.1	230	25.0	9	PIVDAPN20315F6L

* Gluing only ** On request

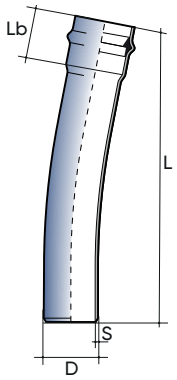
CURVE POWER-LOCK

VDA curves produced from certified pipes with pre-installed hot seal FORSHEDA 601 POWER-LOCK™

PRESSURE POWER LOCK CURVE

Technical specifications	
Size range	d 63 ÷ 400 (mm); Degrees: 11°, 22°, 30°, 45°, 90°
Nominal pressure	PN16 - PN10
Temperature range	0 °C ÷ 60 °C
Coupling standards	**FORSHEDA JOINT,** gluing on request
Reference standards	**Curves produced from certified pipes:** • KQ KIWA QUALITY KIP-105133- BSPAS27 • D.M. No.174/2004-potability • UNIEN 1622- smell and taste threshold
Fitting material	PVC-A colour BLUE RAL 5010

DIMENSIONS

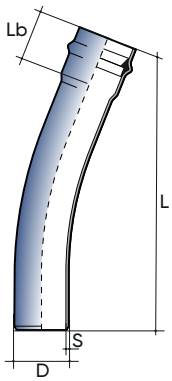


POWER-LOCK VDA PN10 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 11 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	2.1	110	80	PBVDAPN10063F1L
75	2.3	120	80	PBVDAPN10075F1L
90	2.6	130	80	PBVDAPN10090F1L
110	3.1	130	60	PBVDAPN10110F1L
125	3.5	150	45	PBVDAPN10125F1L
140	3.9	160	35	PBVDAPN10140F1L
160	4.5	165	25	PBVDAPN10160F1L
200	5.6	180	*	PBVDAPN10200F1L
225	6.3	200	*	PBVDAPN10225F1L
250	7.0	210	*	PBVDAPN10250F1L
280	7.8	210	*	PBVDAPN10280F1L
315	8.8	230	*	PBVDAPN10315F1L
355	9.9	250	*	PBVDAPN10355F1L
400	11.2	250	*	PBVDAPN10400F1L

* Quantity to be defined

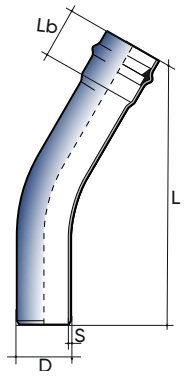


POWER-LOCK VDA PN10 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 22 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	2.1	110	80	PBVDAPN10063F2L
75	2.3	120	80	PBVDAPN10075F2L
90	2.6	130	80	PBVDAPN10090F2L
110	3.1	130	60	PBVDAPN10110F2L
125	3.5	150	45	PBVDAPN10125F2L
140	3.9	160	35	PBVDAPN10140F2L
160	4.5	165	25	PBVDAPN10160F2L
200	5.6	180	*	PBVDAPN10200F2L
225	6.3	200	*	PBVDAPN10225F2L
250	7.0	210	*	PBVDAPN10250F2L
280	7.8	210	*	PBVDAPN10280F2L
315	8.8	230	*	PBVDAPN10315F2L
355	9.9	250	*	PBVDAPN10355F2L
400	11.2	250	*	PBVDAPN10400F2L

* Quantity to be defined

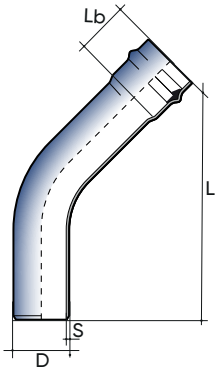


POWER-LOCK VDA PN10 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 30 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	2.1	110	80	PBVDAPN10063F3L
75	2.3	120	80	PBVDAPN10075F3L
90	2.6	130	80	PBVDAPN10090F3L
110	3.1	130	60	PBVDAPN10110F3L
125	3.5	150	45	PBVDAPN10125F3L
140	3.9	160	35	PBVDAPN10140F3L
160	4.5	165	25	PBVDAPN10160F3L
200	5.6	180	*	PBVDAPN10200F3L
225	6.3	200	*	PBVDAPN10225F3L
250	7.0	210	*	PBVDAPN10250F3L
280	7.8	210	*	PBVDAPN10280F3L
315	8.8	230	*	PBVDAPN10315F3L
355	9.9	250	*	PBVDAPN10355F3L
400	11.2	250	*	PBVDAPN10400F3L

* Quantity to be defined

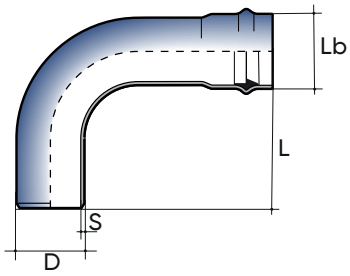


POWER-LOCK VDA PN10 curve

VDA pressure POWER-LOCK curve,
Blue RAL 5010, 45 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	2.1	110	80	PBVDAPN10063F4L
75	2.3	120	80	PBVDAPN10075F4L
90	2.6	130	80	PBVDAPN10090F4L
110	3.1	130	60	PBVDAPN10110F4L
125	3.5	150	45	PBVDAPN10125F4L
140	3.9	160	35	PBVDAPN10140F4L
160	4.5	165	25	PBVDAPN10160F4L
200	5.6	180	*	PBVDAPN10200F4L
225	6.3	200	*	PBVDAPN10225F4L
250	7.0	210	*	PBVDAPN10250F4L
280	7.8	210	*	PBVDAPN10280F4L
315	8.8	230	*	PBVDAPN10315F4L
355	9.9	250	*	PBVDAPN10355F4L
400	11.2	250	*	PBVDAPN10400F4L

* Quantity to be defined

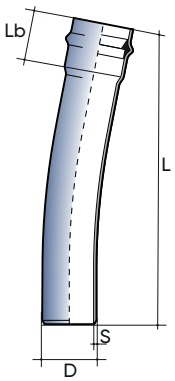


POWER-LOCK VDA PN10 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 90 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	2.1	110	55	PBVDAPN10063F9L
75	2.3	120	55	PBVDAPN10075F9L
90	2.6	130	55	PBVDAPN10090F9L
110	3.1	130	45	PBVDAPN10110F9L
125	3.5	150	35	PBVDAPN10125F9L
140	3.9	160	25	PBVDAPN10140F9L
160	4.5	165	25	PBVDAPN10160F9L
200	5.6	180	*	PBVDAPN10200F9L
225	6.3	200	*	PBVDAPN10225F9L
250	7.0	210	*	PBVDAPN10250F9L
280	7.8	210	*	PBVDAPN10280F9L
315	8.8	230	*	PBVDAPN10315F9L
355	9.9	250	*	PBVDAPN10355F9L
400	11.2	250	*	PBVDAPN10400F9L

* Quantity to be defined

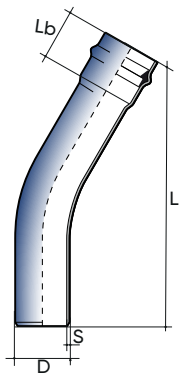


POWER-LOCK VDA PN16 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 11 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN16 Code
63	3.2	110	80	PBVDAPN16063F1L
75	3.7	120	80	PBVDAPN16075F1L
90	4.0	130	80	PBVDAPN16090F1L
110	4.9	130	60	PBVDAPN16110F1L
125	5.5	150	45	PBVDAPN16125F1L
140	6.2	160	35	PBVDAPN16140F1L
160	7.0	165	25	PBVDAPN16160F1L
200	8.8	180	*	PBVDAPN16200F1L
225	9.9**	200	*	PBVDAPN16225F1L
250	11.0	210	*	PBVDAPN16250F1L
280	12.3	210	*	PBVDAPN16280F1L
315	13.8	230	*	PBVDAPN16315F1L
355	15.6	250	*	PBVDAPN16355F1L
400	17.5	250	*	PBVDAPN16400F1L

* Quantity to be defined

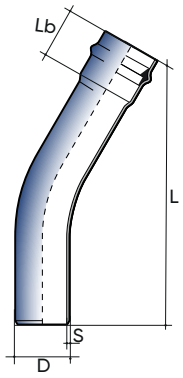


POWER-LOCK VDA PN16 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 22 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN16 Code
63	3.2	110	80	PBVDAPN16063F2L
75	3.7	120	80	PBVDAPN16075F2L
90	4.0	130	80	PBVDAPN16090F2L
110	4.9	130	60	PBVDAPN16110F2L
125	5.5	150	45	PBVDAPN16125F2L
140	6.2	160	35	PBVDAPN16140F2L
160	7.0	165	25	PBVDAPN16160F2L
200	8.8	180	*	PBVDAPN16200F2L
225**	9.9	200	*	PBVDAPN16225F2L
250	11.0	210	*	PBVDAPN16250F2L
280	12.3	210	*	PBVDAPN16280F2L
315	13.8	230	*	PBVDAPN16315F2L
355	15.6	250	*	PBVDAPN16355F2L
400	17.5	250	*	PBVDAPN16400F2L

* Quantity to be defined ** On request

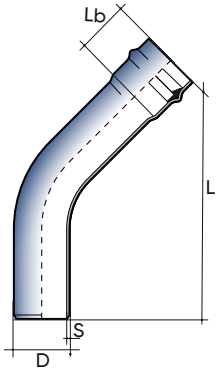


POWER-LOCK VDA PN16 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 30 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN16 Code
63	3.2	110	80	PBVDAPN16063F3L
75	3.7	120	80	PBVDAPN16075F3L
90	4.0	130	80	PBVDAPN16090F3L
110	4.9	130	60	PBVDAPN16110F3L
125	5.5	150	45	PBVDAPN16125F3L
140	6.2	160	35	PBVDAPN16140F3L
160	7.0	165	25	PBVDAPN16160F3L
200	8.8	180	*	PBVDAPN16200F3L
225**	9.9	200	*	PBVDAPN16225F3L
250	11.0	210	*	PBVDAPN16250F3L
280	12.3	210	*	PBVDAPN16280F3L
315	13.8	230	*	PBVDAPN16315F3L
355	15.6	250	*	PBVDAPN16355F3L
400	17.5	250	*	PBVDAPN16400F3L

* Quantity to be defined ** On request

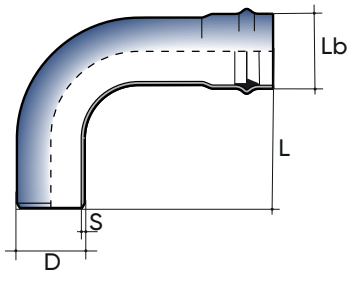


POWER-LOCK VDA PN16 curve

VDA pressure POWER-LOCK curve,
Blue RAL 5010, 45 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN10 Code
63	3.2	110	80	PBVDAPN16063F4L
75	3.7	120	80	PBVDAPN16075F4L
90	4.0	130	80	PBVDAPN16090F4L
110	4.9	130	60	PBVDAPN16110F4L
125	5.5	150	45	PBVDAPN16125F4L
140	6.2	160	35	PBVDAPN16140F4L
160	7.0	165	25	PBVDAPN16160F4L
200	8.8	180	*	PBVDAPN16200F4L
225**	9.9	200	*	PBVDAPN16225F4L
250	11.0	210	*	PBVDAPN16250F4L
280	12.3	210	*	PBVDAPN16280F4L
315	13.8	230	*	PBVDAPN16315F4L
355	15.6	250	*	PBVDAPN16355F4L
400	17.5	250	*	PBVDAPN16400F4L

* Quantity to be defined ** On request



POWER-LOCK VDA PN16 curve

VDA pressure POWER-LOCK curve,
Blu Ral 5010, 90 DEGREES, connection FORSHEDA 601 POWER-LOCK™

D (mm)	S (mm)	Lb (mm)	Qty x pallet	PN16 Code
63	3.2	110	55	PBVDAPN16063F9L
75	3.7	120	55	PBVDAPN16075F9L
90	4.0	130	55	PBVDAPN16090F9L
110	4.9	130	45	PBVDAPN16110F9L
125	5.5	150	35	PBVDAPN16125F9L
140	6.2	160	25	PBVDAPN16140F9L
160	7.0	165	25	PBVDAPN16160F9L
200	8.8	180	*	PBVDAPN16200F2L
225**	9.9	200	*	PBVDAPN16225F9L
250	11.0	210	*	PBVDAPN16250F9L
280	12.3	210	*	PBVDAPN16280F9L
315	13.8	230	*	PBVDAPN16315F9L
355	15.6	250	*	PBVDAPN16355F9L
400	17.5	250	*	PBVDAPN16400F9L

* Quantity to be defined ** On request

Item specifications
VDA system

Supply of VDA pipes made of polymeric alloy **PVC-A**, free of plasticizing fillers, intended for conveying drinking water, suitable for the construction of underground aqueduct networks, irrigation and pressure sewerage systems produced in accordance with the technical specification **KQ KIWA QUALITY KIP-105133** , which fully incorporates and reciprocates **BS PAS 27:1999**, the Ministerial Health Circular No. 102 of 02/12/1978 - **Ministerial Decree No.174 of 06/04/2004** "Regulations concerning materials and objects that can be used in fixed systems for the collection, treatment, supply and distribution of water intended for human consumption" and the standard **UNI EN 1622 (Odour and taste threshold)**, having the following characteristics:

Nominal diameter (Ø):

Pressure class (PN):

The VDA pipes **made of PVC-A polymer alloy** must be supplied with a **bell joint system of the POWER-LOCK** type with integrated gasket pre-inserted mechanically hot during the bell formation phase such as to make it totally integral. The seal, without metal inserts inside, will consist of an EPDM elastomer element in accordance with **UNI EN 681-1** co-moulded with a yellow reinforced polypropylene stiffening ring to guarantee perfect immovability. This connection system must ensure compliance with the test conditions prescribed by the standards **UNI EN 13844- 13845- 13846**. The entire supply will be accompanied by a certificate of conformity to the technical specification **KQ KIWA QUALITY KIP-105133** and by an environmental product declaration **(EPD)** in accordance with the standard **ISO 14025 Type III**, with specific calculation rules for the product category (PCR) according to the standard **UNI EN 15804:2012 + A2:2019**.

The pipes, in elements of **6 metres including the bell**, will be supplied with protective polypropylene (PP) caps at the ends, will be **BLUE RAL 5010** and must contain the following information: Manufacturer's name or brand, nominal size, nominal pressure, KQ standard, date, time and production line.

The pipes must also be produced by companies with a quality, environmental and safety management system certification in accordance with the **UNI EN ISO 9001, UNI EN ISO 14001 and ISO 45001:2018** standards respectively, certified by an accredited body according to **UNI CEI EN ISO/IEC 17021**.

DN ____ PN ____ SN ____ €/m ____

KQ KIWA QUALITY KIP-105133

EPD HUB - 1 Feb 2022 EN 16904 Product Category Rules (PCR) for internal plastic piping systems.

HUB-1151, Environmental product declaration

According to EN 15804+A2 & ISO 14025 / ISO 21930

LIVDA042024

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UNI EN ISO 9001 QUALITY

UNI EN ISO 14001 ENVIRONMENTAL MANAGEMENT

UNI ISO 45001 SAFETY

aliaxis