



Guide



Product Range Guide

Building infrastructure

Underground pressure and gravity piping
systems and stormwater management
systems



An Orbia business.

2024

Complete solution for building infrastructure



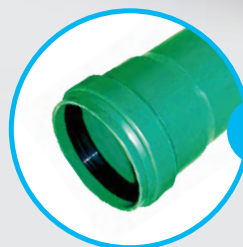
Wavin X-Stream



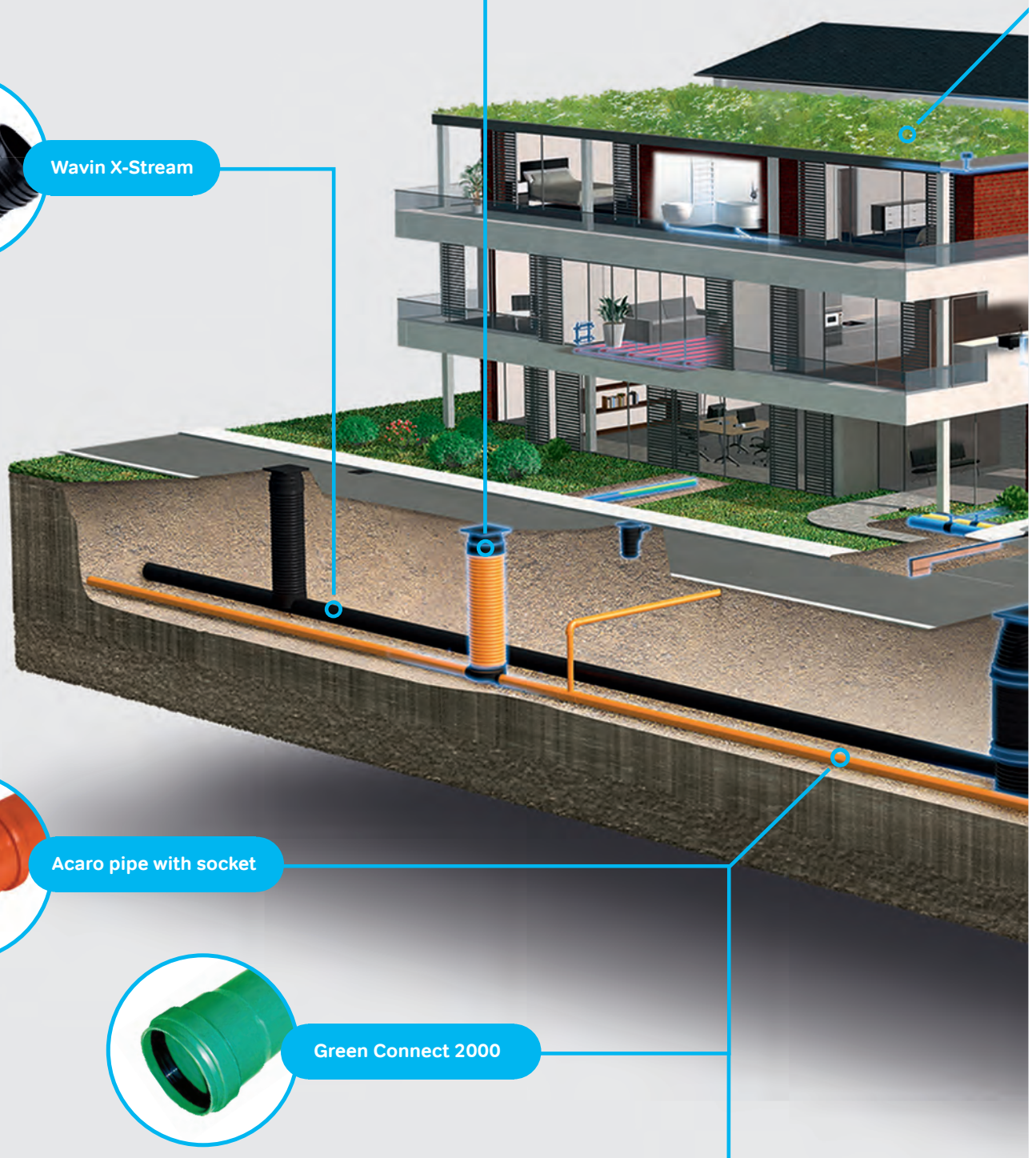
Wavin Basic



Acaro pipe with socket



Green Connect 2000





Wavin PolderRoof



Wavin AquaCell 400



Wavin Q-Bic Plus



Wavin Tegra



PVC-U



PVC-O



Content

References	5
Wavin pressure systems	6
PVC-O – Apollo system	6
PVC-U – pressure system	10
PE – pressure system	10
Wavin gravity drain & sewer systems	10
Smooth wall gravity drain & sewer systems	10
Profiled wall gravity drain & sewer systems	12
Wavin manholes and inspection chambers	15
Wavin Tegra manholes and inspection chambers	16
Wavin Basic inspection chambers	18
Wavin Road Gullies	20
Wavin Tegra Road Gullies	20
Wavin Basic Road Gullies	20
Wavin water management system for rain water	22
Wavin AquaCell 400	22
Wavin Q-Bic Plus	24
Certificates, European Standards	26

References



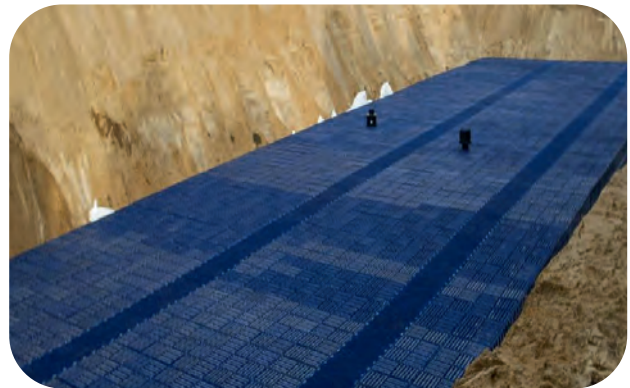
The main railway station in Łódź
Poland



Opole Power Plant
Poland



Port Lotniczy Ławica
Poznań



Port Lotniczy Olsztyn
Mazury



Posnania Shopping Center
Poland Poznań

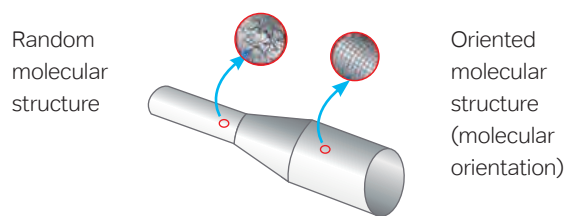


Municipal Stadium in Białystok
Poland

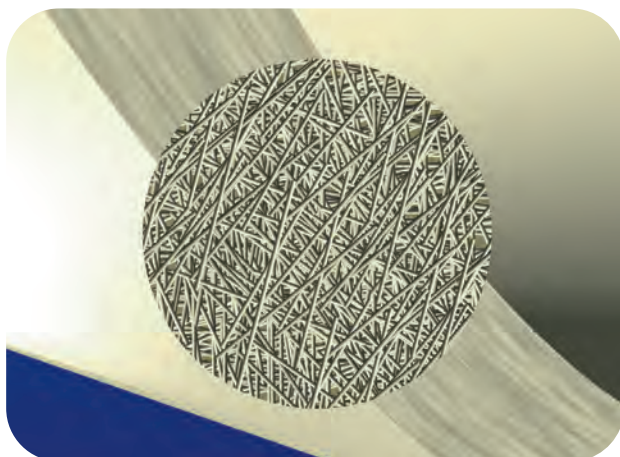
Wavin pressure systems

Wavin APOLLO PVC-O Pressure Pipe Systems

Wavin Apollo PVC-O Pipe Systems are designed for in pressurized water transport lines according to international standards. Thanks to its superior technical properties, it can be used in many different application areas.



Wavin PVC-O pipe production line



Molecular Orientation

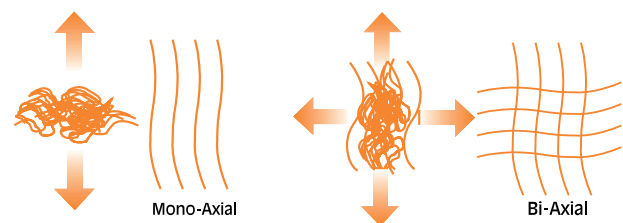
Characteristics of the pipe

Normally, PVC molecules are randomly arranged. The polymer molecules are oriented in the same direction with material being produced at suitable pressure, temperature and speed. This process is called the molecular orientation. As a result, the new molecular structure can be seen even with the naked eye. The molecular orientation process improves all mechanical properties of PVC.

The laminar molecular structure of Wavin Apollo PVC-O pipes and the random molecular structure of U-PVC pipes can be seen through the cross section.

Application Areas

- ⊙ Potable water collection and distribution lines
- ⊙ Agricultural and environmental irrigation lines
- ⊙ Industrial applications - treatment
- ⊙ Fire hydrant lines
- ⊙ Pressure sewer lines
- ⊙ Cable duct



Product Portfolio

Wavin Apollo pipes (PVC-O) are manufactured from MRS450 class raw material in accordance with the international standard. Pipes are manufactured in pressure class PN10 (SDR17), PN12,5 (SDR45,8) and PN16 (SDR37) from 110mm to 315mm. Pipes are socketed and have integrated sealing. It is also possible to produce without socket. The pipe length can be at least 1,2 meters (excluding socket) and maximum 6 meters. Apollo pipes can be used with all types of socketed plastic and cast-iron fittings.



ISO 16422:2014

	APOLLO PN10/12,5 MRS450 C 1,6/2,0 SDR 45,8	APOLLO PN16 MRS 450 C 1,6 SDR 37
	Wall Thickness	Wall Thickness
Ø110	2,40	3,10
Ø125	2,80	3,50
Ø140	3,10	3,90
Ø160	3,50	4,40
Ø200	4,40	5,50
Ø225	5,00	6,20
Ø250	5,50	6,90
Ø280	6,20	7,70
Ø315	6,90	8,70

Advantages

Mechanical	High impact resistance
	Ductility (Flexibility)
	High long term Hydrostatic Strength
	Low crack propagation rate
Hydraulic	Large inner flow area
	Resistance to the effect of water hammer
	Flexible and sealed connection
	Low friction and pressure loss
Installation	Lightweight and easy to carry
	Socketed connection – fast installation
	Easy bedding and backfilling

Wavin gravity drain & sewer systems

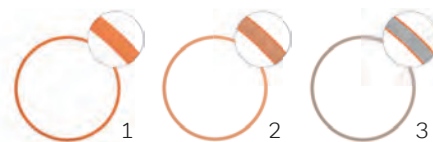
Smooth wall pipe systems with smooth walled pipes for non-pressure buried drains and sewers

Wavin offers a full range of systems for constructing gravity drain and sewer networks made of thermoplastics (PVC, PP, PP-MD and PE). They can be used to create sanitary, storm and combined sewage systems, house connections and underfloor sewer systems as an extension of the soil and waste discharge system of the building and to connect road gullies.

Wavin pipe systems create complete gravity systems together with Wavin Tegra and Basic manholes and inspection chambers as well as Wavin Tegra RG and Basic RG gullies.

Thanks to material / design combination characteristics (including chemical resistance, abrasion resistance and high tightness), Wavin systems also find various other applications, e.g. in road construction, agriculture, and industry. Systems comparison included in tables.

They can also be combined with traditional pipe systems. Wavin systems use various construction and material solutions of pipes based on various European standards. The systems use socketed push-in joints with elastomeric sealing rings.



1. PVC-U sewer system pipes with Solid Wall
2. PVC-U multilayer sewer system pipes with foamed core
3. PVC-U sewer system pipes with solid wall and core made of recycled PVC-U - Low Carbon version

Wavin PVC-U



Wavin Green Connect 2000



Wavin Acaro



Essential characteristics

- very wide range of universal fittings: bends, branches, couplers, repair couplers, reducers, plugs and caps
- mechanical saddles for site connections to an active sewer
- back flow valves
- protective sleeves for passage through walls and concrete manholes connections
- on request, fittings for various pipe stiffness classes with fixed seals in grey colour (Wafix) available

- loose seal - tightness 0,5 bar
- on request semi-fixed seals TPE with PP retaining element that holds the seal securely in position
- special 3-lip seals – tightness 2.4 bar patented 5-lip
- seals – tightness 5.0 bar
- internal pipe markings for easy of pipe identification during CCTV inspections

Characteristics of smooth wall pipe systems

		Systems with smooth-wall pipes DN/OD									
		PVC-U sewer systems Pipes with Solid Wall				PVC-U Multilayer sewer systems Pipes with foamed core		Wavin Green Connect 2000 SN10		Wavin Acaro SN12, SN16	
Material		PVC-U				PVC-U		PP-MD		PP	
Stiffness class		SN4	SN8			SN4	SN8	SN8	SN16 ³⁾	SN8 ³⁾	SN16 ³⁾
Stiffness of pipes (kN/m ²)		≥ 4	≥ 8	≥ 10	≥ 12	≥ 4	≥ 8	≥ 10	≥ 16	≥ 12	≥ 16
Diameters DN/OD	110		X			X	X	X	X	X	X
	125 ¹⁾	X	X			X	X	X			
	160	X	X / LC ²⁾			X	X	X	X	X	X
	200	X	X / LC ²⁾	X	X	X	X	X	X	X	X
	250	X	X	X	X	X	X	X	X	X	X
	315	X	X / LC ²⁾	X	X	X	X	X	X	X	X
	400	X	X	X	X	X	X	X	X	X	X
	500	X	X	X	X	X	X	X	X	X	X
	630								X	X	X
¹⁾ Dimension 125 is available in a limited number of OCS ²⁾ Low Carbon version with 3-layers solid wall available in WPO / range to be expanded ³⁾ In two colours: (coral and blue) which allows colour coding of the type of network											
Standards		EN 1401 LC pipes: – EN 13476-2 + requirements EN 1401				EN 13476-2		EN 14758-1		EN 1852-1	
Certificates		NPM – Denmark MPA – Germany				NPM – Denmark MPA – Germany		MPA – Germany		MPA – Germany	
Applications areas		UD/ BD	UD	U	U	UD	UD	UD		UD	UD
		application area codes: U: for buried piping system more than 1 m from the building D: for buried piping system under and within 1 m from the building with connection to the waste discharge system of the building B: area above ground inside the building or outside buildings fixed onto the wall;									
Distinctive properties		– abrasion resistance – high chemical resistance – LC version includes PVC-U recycles in core and minimize carbon footprint				– lightweight – use of foamed core minimizes carbon footprint		– abrasion resistance – high chemical resistance – very high ring stiffness and impact strength – temperature resistance till 95 °C			
Recommended uses		– pipeline with temperature of wastewater up to max 60 °C continuously and max 5 minutes 75 °C – pipeline slope up to 45% (while maintaining a flow speed of up to 7 m/sec)				– pipeline with temperature of wastewater up to max 60 °C continuously		– shallow installation below road surfaces – min 50 cm – pipeline with high temperature wastewater up to max 95 °C – water protection zones			
Colour		orange				orange		green		Code for water – red-brown for foul water – blue pipes for storm water	

Piping systems with profiled external surface for non-pressure buried drains, sewers and drainage



Wavin X-Stream



Wavin TwinWall PE



Essential characteristics

- patented "sculptured" socket
- symmetrical seal - tightness 0,5 bar
- wide range of universal fitting made of PP used with both type of pipes: bends, branches, couplers, repair couplers, reductions, plugs, caps and adapters to smooth walled pipe systems. Apart of standard fittings other solutions are available on request.
- mechanical saddles for site connections to an active drains and sewers

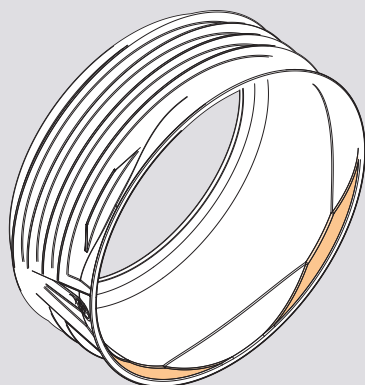
Advantages of the X-Stream and Twin Wall PE systems

- ⊕ Unique socket connection – patented -up to 50% lower push-in forces (socketed joints) quick and easy installation – especially important for large diameters
- ⊕ Symmetrical seal – eliminates mistakes during installation
- ⊕ Good transfer of high static loads (e.g. soil, road construction) and dynamic loads (e.g. heavily loaded roads, and highways)
- ⊕ Bright colour inside facilitates CCTV inspection
- ⊕ Particular improvement over traditionally used rigid pipes
 - ⊕ light weight pipe, easy to transport, handle and install
- even in large diameters
- ⊕ high hydraulic efficiency allows for a smaller slope of the piping system
- ⊕ longer pipe section / less connection / improvement in tightness of pipelines
- ⊕ easy design and shaping of the system by contractors – full and wide offer of fittings: system connectors, inlet connectors for a system of smooth-walled pipes possibility to order individual solutions

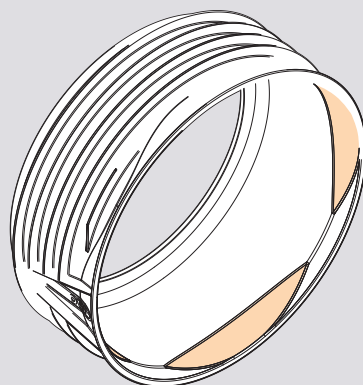
Characteristics of piping systems with profiled external surface

Structural piping system with smooth internal and profiled external surface (DN/ID)					
		Wavin X-Stream – pipes and fittings for drains and sewers	Wavin X-Stream – pipes slotted for drainage*	Wavin TwinWall PE pipes	
Material		PP	PP	PE ($\rho > 945 \text{ kg/m}^3$)	
Stiffness class		SN8	SN8	SN4	SN8
Stiffness of pipes (kN/m²)		≥ 8	≥ 8	≥ 4	≥ 8
Diameters DN/OD	100	X	X		
	150	X	X		
	200	X	X		X
	250	X	X		
	300	X	X		X
	400	X	X	X	X
	500	X	X		X**
	600	X	X		X
	800	X	X		
(*) Total area of openings $\geq 50 \text{ cm}^2/\text{m}^2$; The width of the slots is 1,5 mm; Type of slots: Type TP – slots made around the 360° of circumference Type LP – slots made on 220° of circumference Type MP – slots made on 120° of circumference (**) without socket only					
Standards		EN 13476-2		DIN 4262-1	
Certificates		NPM – Denmark MPA – Germany	NPM – Denmark MPA – Germany		
Applications areas		U		U	
Distinctive properties		– abrasion resistance – lightweight pipes		– abrasion resistance	
Recommended uses		– gravity drains and sewers – culverts roads and railways – animal passage – protective pipes	– road drainage	– culverts roads and railways – animal passage – protective pipes	
Colour		black outside light grey inside		black outside black inside	black outside red-brown inside

1. Special socket design:
initial seal compression



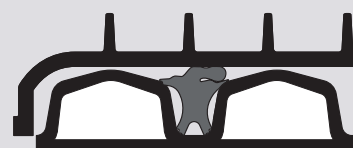
2. Special socket design:
final seal compression



3. Pressed joint in final position



A seal location in between first and second corrugation of a plain end of a pipe.



Final location of a seal in a socket joint giving secure water tightness.



When a socket joint is under preparation it is possible to mark off the sequence of this procedure to ensure firm and watertight joint.

The socket joint with the seal guarantees tightness on the minimum level of 0,5 bar water pressure (EN 476). Using reduced push-in forces one can achieve tight and durable joint.

Wavin manholes and inspection chambers



Wavin offers a range of manholes and inspection chambers made of thermoplastics (PP and PE): Wavin Tegra and Wavin Basic, with different diameters, dedicated for connection of different smooth wall pipe systems, different levels of technical advancement, and therefore for different areas of application.

Tegra manholes and inspection chambers are designed for many even the most difficult soil and water conditions and extreme static and dynamic loads. They allow for wide possibilities of shaping the network. Basic inspection chambers are designed for less demanding conditions and have fewer possibilities (See Table on pages 17 & 19).

The manholes and inspection chambers consist of a base and a shaft. The manhole additionally has a transition part (cone) and a ladder. They are manufactured based on the European standard EN 13598-2.

Elements and pipe connections in bases use socketed push-in joints with elastomeric sealing rings.

Thanks to material / design combination characteristics (including chemical resistance, abrasion resistance and high tightness), Wavin manholes and inspection chambers also find various other applications, e.g. in road construction, agriculture, and industry.



Wavin manholes and inspection chambers

For smooth-walled pipes up to DN/OD 315 and structural (including X-Stream and national solutions) DN/ID 300, Wavin Tegra bases have wide range of flowprofiles including straight, bends and collective 90 or 45°.

In larger diameters, the sockets are straight. The bases are equipped with a flat, double bottom, which ensures structural integrity and durability by groundwater column up to 5 m, and at the assembly stage they are a significant help for contractors.

The shaft pipes are corrugated and have a special construction suitable for vertical installation.

They are available in stiffnesses SN>2 and SN>4. Cones and ladders in the Wavin Tegra 1000 guarantee ergonomics and staff safety.

Essential characteristics

- flat bottom plate
- flex adaptors in pipe connections till 315
- wide range of bases (see above)
- tightness tested till 2,4 bar
- steep surfaces on the sides of the flow profile in Tegra inspection chambers
- resistance to hydrostatic uplift without extra measures (e.g. ballasting, concrete casting, anchoring), only correct, permanent compaction of the backfilling is required)

Wavin Tegra 1000




Wavin Tegra 600



Wavin Tegra 425



Characteristics of the Wavin Tegra Family

		Wavin Tegra family		
		Wavin Tegra 1000	Wavin Tegra 600	Wavin Tegra 425
Type		manhole	inspection chambers	
Application area				
Max. depth			6m*	
Max water column above the base invert			5m	
Traffic load		SLW60 / D400**		
(*) till 10 m with installation conditions confirmation by Wavin / not exceeded must be water column (5m) (**) Tegra 1000, 600 with E600 covers can be used with installation conditions confirmation by Wavin				
Standards	EN 13598-2			
Certificates	NPM - Denmark			
Shafts	DN/ID 1000	DN/ID 600(*)	DN/ID 425	
Stiffness of pipes (kN/m²)	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN2 – black SN4 – red-brown	
(*) in the offer also Tegra 600 bases prepared for other national shaft pipes solutions – send request to producing OC – WPO				
Bases – colour	black			
Bases – pipe connections SW* – diameters	110			X
	160	X	X	X
	200	X	X	X
	250	X	X	X
	315	X	X	X
	400	X		
	500	X		
Bases	SW – smooth-walled pipe systems, e.g. PVC-U solid and ML pipe systems, PP-MD – Green Connect 2000 and PP Acaro systems Structural pipe systems must be connected using adapters			
Straight	160–500	160–400	110–315	
Bends	160–315	160–315	110–200	
Type T 90°	160–315	160–315	110–200	
Type X 90°	160–315	160–315	110–200	
Type X 45°	200	200		
Blind base	X	X	plug	
Structural pipe systems must be connected using adapters				
Cone	1000 / 600	N/A		
Ladder	GRP – yellow – acc. EN 14396	N/A		

Wavin Basic inspection chambers

The Basic family includes Basic 600, 400 and 315 inspection chambers. Their application areas and possibilities are rationalized. They are adapted to the most common areas, excluding extreme ones and the range of bases includes the most popular straight and collective flow profiles at an angle of 45°.

As risers corrugated shaft pipes DN/ID 600 and 315 and DN/OD 400 SN 2 and SN4 are used. Basic 400 chambers also have bases that use DN/OD 400 smooth-wall pipes as the riser.

The Basic family together with the Tegra family allows for freedom in network design.

Within the Basic family, there is and is constantly expanding the range of elements made of PP recyclate. These products have a lower carbon footprint than those produced from primary raw materials and are marked with the LC symbol (Low Carbon Footprint). Their production is the implementation of the goals of the Global Sustainable Development Strategy.

Essential characteristics

- Unique base 200/160 X 90
- In Basic 600, 315 and 425 outlet in form of pipe spigot (not socketed)
- Bases : Basic 315 and Basic 400 available as LC (Low Carbon)



Wavin Basic



Wavin Basic 600



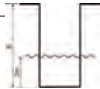
Wavin Basic 400



Wavin Basic 315



Characteristics of the Wavin Basic Family

		Wavin Basic family			
		Wavin Basic 600	Wavin Basic 425	Wavin Basic 400	Wavin Basic 315
Type	inspection chambers				
Application area					
Max. depth			6m*		
Max water column above the base invert			3m		
Traffic load	SLW60 / D400**				
Standards	EN 13598-2				
Certificates	BENOR-Belgium			BENOR - Belgium	
Shafts	DN/ID 600	DN/ID 425	DN/OD 400	DN/OD 315	
Stiffness of pipes (kN/m²)	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN2 – black SN4 – red-brown Smooth wall pipe*	Corrugated: SN4 – red-brown	
(*) Both type of sewer pipes and all stiffens classes can be used. SN 2 is enough. Dedicated SN2 with foamed core with requirements of EN 13598-2 are not available in all OCs – send request to WGE					
Bases – colour	black				
Bases – pipe connections SW* – diameters	110		X	X	X
	160	X	X	X	X
	200	X	X	X	X
	250	X			
	315	X			
Bases	SW* pipe connections:				
Straight	160–315	110–200	110–200	110–200	
Type X 45°	160–315	110–200	110–200	110–200	
Type X 90°		Straight 200/ connections 160		Straight 200/ connections 160	
Plug	X	X	X	X	

Wavin Road Gullies



Gullies equipped with frames and gratings are used to collect water runoff from the surface. They are used with gravity drain and sewer systems.

Wavin offers two families of PP gullies – Wavin Tegra Road Gullies and Wavin Basic Road Gullies. They both are intended to be used in pedestrian or vehicular traffic areas.

The gullies Wavin Tegra RG and Wavin Basic RG comply with the EN 17670-2 standard.

Wavin Tegra Road Gullies

The Wavin Tegra RG offer include:

- ① Indirect loaded road gullies “**IRG**” installed where the traffic load will not be carried by the gully
- ② Direct loaded road gullies “**DRG**” installed where the traffic load will be carried by the complete gully and are reinforced by additional ribs.

Wavin Tegra RG gullies are with sand / silt trap having volume $M = 45\text{dm}^3$ and $L=70\text{dm}^3$. When needed on request it is possible to make larger sand traps. In there settling pollutants are retained before the rainwater reaches the drains and sewers. Addition to the standard sand trap Wavin Tegra RG gullies have two innovative solutions that are optional.



First is innovative filter which give the ability to retain floating impurities. In this way, Wavin Tegra RG gully successful ensure greater patency and avoid clogging and increase reliability of surface water collecting system.

Secondly – when the receiver is a combined sewage system, an innovative water lock (siphon) preventing odour release in Wavin Tegra RG can be assembled. This siphon keeps easily access to gullies sand trap and not prone to blocking like other known solutions.

Part of gullies range is made of PP recyclates. These products have a lower carbon footprint than those produced from primary raw materials. Their production is the implementation of the goals of the Global Sustainable Development Strategy. Road gullies made of recyclates are intended for area having water maximum depth of 2,5 m from ground level and made of virgin PP are for 4 m water column.



Benefits vs traditional gullies

- easy, timesaving, single-person assembly without the use of heavy equipment due to low weight, 2 types of ergonomic handles and a stable base and easy height adjustment,
- siphon – innovative water trap accessible from inside
- 360° filter – stopping floating pollutants improve efficiency and reliability of hardened surface drainage
- settling tank with a rounded bottom, easy to clean,
- sand trap cleaning efficiency of 95% in a very short time,
- easy access to the bottom b by cleaning devices
- chemical resistance and no water absorption and no damage due to freezing
- no settlement due to dynamic loads thanks to the low weight and flexibility of the shaft

Characteristics of Wavin Tegra and Wavin Basic Road Gullies

	Wavin Tegra & Wavin Basic Gullies			
	Wavin Tegra 425/400 RG	Wavin Tegra 315 RG	Wavin Basic 400 RG	Wavin Basic 315 RG
Standards	EN 17670-2 EN 13598-2	bottoms : EN 17670-2 shaft pipes: EN 13598-2 for all		
Type	IRG	IRG DRG (version reinforced with additional ribs)	IRG	IRG
Type	with sand trap	with sand trap	without sand trap	without sand trap
Volume of sand trap	L: V = 70 dm ³ M: V = 45 dm ³ On request XL: V = 110 dm ³	L = 70 dm ³ M = 45 dm ³	N/A	N/A
Water trap	All gullies in both versions – with water lock – without water lock	All gullies in both versions – with water lock – without water lock	N/A	N/A
Filter 360°	All gullies in both versions – with filter 360° – without filter 360°	All gullies in both versions – with filter 360° – without filter 360°	N/A	N/A
Application area	Traffic load SLW60 / D400 IRG version made of vPP – 4m* IRG version made of recycled PP – 2,5m* DRG – shallow till 1 m			
	(*) Traffic load SLW60 / D400 Maximum depth from ground level to the lowest point of the internal surface of the road gully – acc. EN 17670-2			
Shafts	Corrugated DN/ID 425 outside spigot end shaft connections and corrugated DN/OD 400 inside spigot end shaft connections	Corrugated DN/ID 315 outside spigot end shaft connection	Corrugated DN/OD 400	Corrugated DN/ID 315
Stiffness of shaft pipes	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN4 – red-brown	Corrugated: SN2 – black SN4 – red-brown	Corrugated: SN4 – red-brown
Bases – colour	black			
Outlets	110	X	X	X
	125	X – DRG only		
	160	X	X	X
	200			
Distinctive properties	– Optional filter 360° that stops floating impurities and prevents them from clogging the outlet – Optional unique water trap (siphon) installed inside gully			

Wavin AquaCell 400

Wavin offers solutions for storm water management. We can design and deliver infiltration, attenuation or storage tanks for rain water. Units are able to inspection and cleaning using inspection chambers. The units are resistant to heavy traffic load too.

The AquaCell 400 is a sustainable attenuation crate which is faster to install, easier and a more sustainable attenuation tank. Made of 100% recycled plastic, modular construction and good resistance to traffic loads. The stackable design also makes Wavin AquaCell 400 space-saving.



Why choose Wavin AquaCell 400 for surface water management?



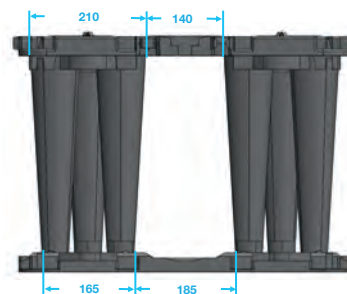
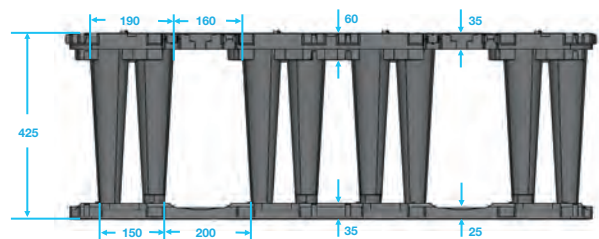
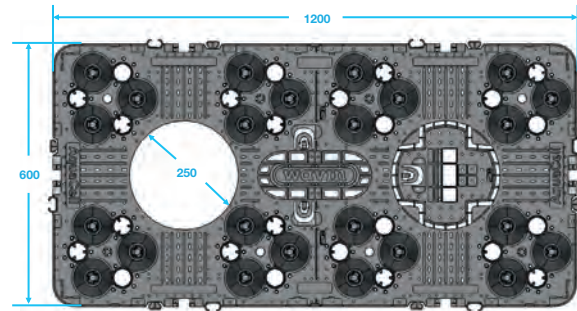
Cost & time savings
- 3 times faster to install

- ⊙ Lightweight units with handgrips
- ⊙ Integrated connectors and push fit functionality
- ⊙ No clips, pegs or tools are needed!



4 times less storage space & manual handling

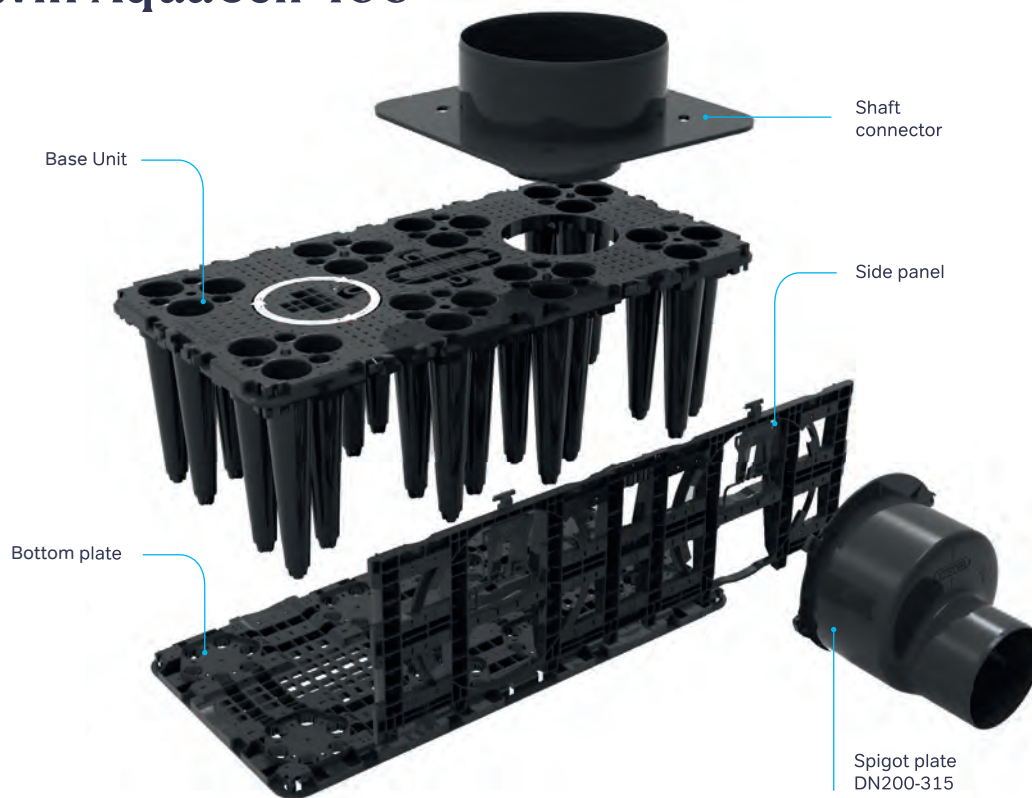
- ⊙ Nested design for neat stacking
- ⊙ Reduced handling & plant movement on site
- ⊙ Easier logistical planning



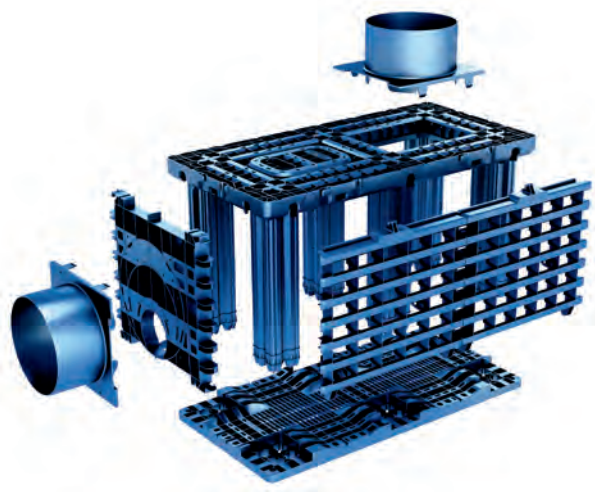
Properties:

Base Unit	Material Dimensions (mm) Volume (Gross) Volume (Net) Void rate Weight (kg) Pipe connections	Recycled PP (Polypropylene) 1200×600×400* (L×W×H) 0.288 m ³ 0.276 m ³ 96 % 11.4 110mm, 160mm, 200mm, 315mm
Bottom plate	Material Dimensions (mm) Weight (kg)	Recycled rPP (Polypropylene) 1200×600×35 (L×W×H) 3.6
Side plate	Material Dimensions (mm) Weight (kg)	Recycled PP (Polypropylene) 1155×373×50 (L×W×H) 2.3
DN200-315 Spigot plate	Material Dimensions (mm) Weight (kg)	Recycled PP (Polypropylene) 360×360×318 (L×W×H) 1.3

Wavin AquaCell 400



Wavin Q-Bic Plus



Camera access

The entire Wavin Q-Bic Plus structure is designed to allow the best possible access for inspection and cleaning.

Features include:

- ① Smooth, continuous, wide inspection channels to ensure obstruction-free inspection
- ② Lateral chamfers keep the camera on-track in the best possible position, 77% open floor space, allowing all areas inside the structure to be inspected and cleaned

Cleaning

Wavin Q-Bic Plus units have been manufactured using high quality material and have extremely smooth surfaces, which help to guard against deposits of silt and debris clinging to the inside of the units, making the cleaning process easier. The easy to clean inner construction, has rounded columns and lateral chamfers, so easy navigation is guaranteed without the hoses or cables getting hooked up or damaged on sharp edges.

The cleaning capability has been tested for pressures up to 200 bar at 3500 m³/min. without damage.

Access for inspection and maintenance

Wavin Q-Bic Plus is arguably the most accessible infiltration and attenuation system on the market.

The six columns of each storage unit ensure the static stability of the structure, which means there is no need for internal separating walls or additional components that might obstruct the space. As a result of this, all three dimensions of the structure can be inspected and cleaned.

The inspectable areas of the structure make up at least 77% of the total floor area and enables you to build up a 360° picture throughout the whole structure. The channels, which run through the whole width and length of the structure, form clear inspection and maintenance routes. Measuring a maximum of 370mm wide, they provide sufficient room for any type of camera or inspection equipment.

Integrated inspection and cleaning shafts enable easy and clear access to every corner of the structure. Inspection and maintenance equipment can easily be sent into the structure to investigate all areas.

Wavin Q-Bic Plus delivers functionality, security, clear inspection and maintenance throughout its entire operational lifespan.



Table 1: Characteristics of Q-Bic Plus modular units

Characteristic (unit)	Value
Unit dimensions per storage cell (nominal) (L × W × H) (mm)	1200 × 600 × 600*
Unit volume per storage cell (nominal) (m ³)	0.45
Unit dimensions of Base Plate (nominal) (L × W × H) (mm)	1200 × 600 × 70 ^[2]
Storage volume per storage cell (net) (m ³)	0.417; with bottom plate 0.433
Porosity (void ratio) (%)	95
Column Unit (nominal weight) (kg)	14
Side Plate (nominal weight) (kg)	2.85
Connection Plate (nominal weight) (kg)	1.95
Close Base Plate (nominal weight) (kg)	4.6
Open Base Plate (nominal weight) (kg)	3.5
Material	Virgin polypropylene (PP) and recycled PP
Durability	Up to 60 years

[1] 30mm of the total height is used for connection into either the Base Plate or previous layer.

[2] When the Base Plate is fitted to the Column Unit (on the bottom layer of a tank), then the effective height of the Base Plate is 30mm.

Table 2: Minimum cover depths

	Landscaped areas ^[1]	Car park with vehicle mass <3000 kg ^[2]	Car park with occasional vehicle mass <9000 kg ^[3]	Vehicles up to 60000kg GVW ^[4]
Minimum cover depth required (m)	0.30 ^[5]	0.50	0.93	1.74

[1] Landscaped areas where drive-on mowers are used in accordance with Table 4.2 of CIRIA Report C680.

[2] Driveways to individual houses and car parks with height barriers to limit vehicle size, cars up to 3000kg GVW (e.g. people carrier) in accordance with Table 4.2 of CIRIA Report C680.

[3] Car parks: cars or light vehicles up to 9000kg (GVW) in accordance with Table 4.2 of CIRIA Report C680.

[4] Low-speed roads (<15 mph), vehicles up to 60000kg GVW (e.g. articulated lorries) in accordance with Table 4.2 of CIRIA Report C680.

[5] CIRIA C680 recommends a minimum cover of 500mm where drive-on mowers may be used.

European Standards

EN 12201

Plastics piping systems for water supply, and for drainage and sewerage under pressure – Polyethylene (PE)

EN 1329-1

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – Unplasticized poly(vinyl chloride) (PVC-U) – Part 1: Specifications for pipes, fittings and the system

EN 1401-1

Plastics piping systems for non-pressure underground drainage and sewerage – Unplasticized poly(vinyl chloride) (PVC-U) – Part 1: Specifications for pipes, fittings and the system

EN 1555-1

Plastics piping systems for the supply of gaseous fuels – Polyethylene (PE)

EN 1852-1

Plastics piping systems for non-pressure underground drainage and sewerage – Polypropylene (PP) – Part 1: Specifications for pipes, fittings and the system

EN 13476-1

Plastics piping systems for non-pressure underground drainage and sewerage – Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 1: General requirements and performance characteristics

EN 13476-2

Plastics piping systems for non-pressure underground drainage and sewerage – Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, Type A

EN 13476-3

Plastics piping systems for non-pressure underground drainage and sewerage – Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 3: Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B

EN 14758-1

Plastics piping systems for non-pressure underground drainage and sewerage – Polypropylene with mineral modifiers (PP-MD) – Part 1: Specifications for pipes, fittings and the system

EN 13598-1

Plastics piping systems for non-pressure underground drainage and sewerage – Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 1: Specifications for ancillary fittings and shallow chambers

EN 13598-2

Plastics piping systems for non-pressure underground drainage and sewerage – Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 2: Specifications for manholes and inspection chambers

EN 14396

Fixed ladders for manholes

EN 17670-2

Plastics piping systems for non-pressure underground conveyance of surface water – Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Part 2: Specification for road gullies

Rohre und Formstücke für die unterirdische Entwässerung im Verkehrswege- und Tiefbau - Teil 1: Rohre, Formstücke und deren Verbindungen aus PVC-U, PP und PE

ISO 16422

Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure Specifications

EN 17152-1

Plastics piping systems for non-pressure underground conveyance and storage of non-potable water - Boxes used for infiltration, attenuation and storage systems – Part 1: Specifications for storm water boxes made of PP and PVC-U

Certificates

Manholes and Inspection chambers – Tegra family

Staatliche Materialprüfungsanstalt Darmstadt
Grafenstraße 2, 64283 Darmstadt
Zertifizierungsstelle

MPA
Darmstadt

Durch das Deutsche Institut für Bautechnik anerkannte Prüf-, Überwachungs- und
Zertifizierungsstelle gemäß § 27 der Hessischen Bauordnung

Übereinstimmungszertifikat

Reg.-Nr. K 1705 / 02.2019

Hiermit wird gemäß § 26 der Landesbauordnung des Landes Hessens (HBO) bestätigt, dass
das Bauprodukt

Kontroll- und Einsteigschächte für erdverlegte drucklose Abwasserkanäle und
-leitungen mit der Bezeichnung „Tegra 425, Tegra 1000 und Tegra 1250“ der
Abmessungsgruppen 2, 3 und 4.

der Herstellwerke

Wavin Polska Dobczyńska 43 64-320 Buk, (PL)	Lankhorst Moldings Prinsengracht 2 8600 AE Sneek - Netherlands	Nordisk Wavin A/S Wandvej 1 DK-8450 Hammel
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nach den Ergebnissen der werkseigenen Produktionskontrolle und der von der bauaufsichtlich
anerkannten Überwachungsstelle

Staatliche Materialprüfungsanstalt Darmstadt
Grafenstraße 2
64283 Darmstadt

durchgeführten Fremdüberwachung den Bestimmungen der
Hessischen Verwaltungsvorschrift Technische Bestimmungen (H-VVTB) vom 18.09.2018
Kapitel C2.12.1.7 bekannt gemachten technischen Regeln DIN EN 13598-2, in Verbindung
mit DIN CEN/TS 13598-3 entspricht.

Darmstadt, 23.07.2019


Dr.-Ing. P. Bender
Zertifizierungsstelle der MPA Darmstadt


Dipl.-Ing. (FH) L. Veith
Stellvertretender Leiter der Zertifizierungsstelle
nach HBO

64283 Darmstadt, Grafenstraße 2 - Postfach 11 14 60, 64229 Darmstadt - Telefon: (06151) 16-2400

INSTA-CERT

CERTIFICATE

Date of valid edition No.
16-01-2020 2111

Date of first issue
23-08-2019

Name and address of certificate holder
Nordisk Wavin A/S
Wandvej 1
DK-8450 Hammel
Denmark

Conformity marks covered by the certificate


Information regarding the certificate holder/manufacturer

Contact person Lars J. Baungaard	Telephone +45 89 53 64 80
	Email lars.baungaard@wavin.com
Manufacturer Lankhorst Engineered Products BV	Place of manufacture Prinsengracht 2 8607 AD Sneek The Netherlands

Product covered by the certificate

Type of product Plastics piping systems for non-pressure underground, drainage and sewerage - (PVC-U) - (PP) and (PE)	Standard Normative document EN 13598-2	Specific rules INSTA-CERT SBC EN 13598-2
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Type	Size group (DN/OD)	Application area	Types
Inspection chamber, TEGRA 1000 PP	1: (≥ 110 ≤ 200) 2: (> 200 ≤ 500)	U	1, 2, 3 and 4

Approved raw materials and sealing rings are specified in Annex 1 which is confidential.

The certificate holder above is hereby given permission to use the INSTA-CERT mark on or in connection with products, which fulfill the requirements of the standard or the normative document specified above (what is said in this document about INSTA-CERT mark will also be valid for marks defined in relevant SBC). The certificate is valid on the condition that the certificate holder complies with "General rules for certification by partners of INSTA-CERT" (GRC) and the specific rules applying to certification of products of the type mentioned. The certificate holder is obliged to indemnify INSTA-CERT partners of any claim for damages or any other expenses to which partners may become liable as a result of injuries caused by a product manufactured or sold by the certificate holder. This also applies to defective or faulty products.

Unless terminated, the certificate will be automatically extended for one year at a time. The certificate will be re-issued with a new "date of valid edition" only if the content and/or conditions of the certificate have been changed. Termination may take place to the end of a year subject to three months' notice on the part of the certificate holder and the certification body. Information on valid certificates is available on INSTA-CERT's homepage: www.insta-cert.net. The certificate is not transferable.

MEMBER OF INSTA-CERT
DANCERT AS
Jenssen Baasgaard Jensen
CEO

This certificate is electronically signed
INSTA-CERT CERTIFICATE Revision 16 of 2016-03-01

CSTB
le futur en construction

Héabate par NFRC Certification

NF

CERTIFICAT

Assainissement gravitaire en matériaux thermoplastiques
Regards, boîtes d'inspection et de branchement dans les zones de circulation et réseaux enterrés profondément

Désignation commerciale : TEGRA 600

Le CSTB atteste que le(s) produit(s) ci-dessus est (sont) conforme(s) à des caractéristiques décrites dans le référentiel de certification NF 442 en vigueur, après évaluation selon les modalités de contrôle définies dans ce référentiel.

En vertu de la présente décision notifiée par le CSTB, AFNOR Certification accorde à :

La société **WAVIN France**
Zone Industrielle La Faillouise - BP 5
FR - 03150 VARENNES SUR ALLIER
Usine(s) de **PL - 64320 BUK / DK - 8450 HAMMEL**

le droit d'usage de la marque NF Assainissement gravitaire en matériaux thermoplastiques pour le(s) produit(s) objet(s) de cette décision, pour toute sa durée de validité et dans les conditions prévues par les exigences générales de la marque NF et le référentiel mentionné ci-dessus.

Décision de reconnaissance n° 25-01-887-08 du 4 mars 2016.
Cette décision annule et remplace la décision de reconnaissance n° 25-01-887-05 du 10 juillet 2015

DESCRIPTION PRODUIT
Boîte d'inspection de 600 mm de diamètre en PP.
Norme applicable NF EN 13598-2

Ce certificat comporte 3 pages.
Caractéristiques
MARC-CADIN TROUILLE
Tel : 01 64 68 62 95
Fax : 01 64 68 66 44

Caractéristiques certifiées

- Caractéristiques dimensionnelles (diamètres, épaisseurs, raccourcissements)
- Intégrité structurelle
- Résistance aux chocs de fillement de fond
- Régularité dimensionnelle de la réalisation
- Étanchéité des bagues de joint
- Étanchéité des joints de la rampe

Centre scientifique et technique du bâtiment
100 rue de la République - 93100 La Courneuve - France
Tél : 01 75 53 83 83 - Fax : 01 75 53 83 83 - www.cstb.fr

BCCA

BENOR

BENOR CERTIFICATE

Issued on the basis of the provisions of the Implementation Rules for BENOR certification of plastics piping systems for non-pressure underground drainage and sewerage, TRA BB 601, to the company

Wavin Belgium nv
Gentse Baan 62, BE - 9100 Sint-Niklaas,

for the production of

Buried PP manholes and inspection chambers (DN425/600/800) in traffic areas and deep underground installations in non-pressure drainage and sewerage systems with a maximum depth of 6m from ground level to the invert of the main chamber: TEGRA

manufactured in the production unit

Wavin Polska spolka akcyjna
Ul. Dobczyńska 43, PL - 64-320 Buk,

in accordance with the

NBN EN 13598-2: 2020 "Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Specifications for manholes and inspection chambers"

By issuing this certificate, BCCA declares that, on the basis of (i) the initial assessment of the product characteristics by means of testing; (ii) the initial evaluation and acceptance of the quality assurance in production; (iii) the regular external control of the implementation of the quality assurance processes and the control schemes agreed upon; (iv) regular control tests in a recognised external laboratory, sufficient confidence can be given to the measures taken by the certificate holder for guaranteeing conformity with the prescriptions. The annex to this certificate gives the data with regard to the certified product. This document is an annex to the certificate and is authorized by BCCA.

Following the issuing of this certificate and as long as it is maintained valid, BCCA grants the right to use the BENOR mark to the certificate holder. The proof of delivery of a product under the BENOR mark is given by a suitable identification on the product or, if this isn't possible, on the packaging. The use of the BENOR mark does not relieve the certificate holder of his responsibilities with regard to the delivered product.

The validity of this certificate can be checked via www.bcca.be.

N° certificate BB-601-352-13598-2 PP-3774-26646 | Valid from 2023-05-01 until 2026-04-30
Issued in Brussels, on 16 May 2023.

Dr. B. De Blasen,
President of the General management
Committee for certification and approval

BELGIAN CONSTRUCTION CERTIFICATION ASSOCIATION NPO
REGISTERED OFFICE: CANTERSTEEN, 47 BE-1000 BRUSSELS
OPERATIONAL OFFICE: HEIMELJAAN, 8 BE-1631 DIESEM
TEL : +32 2 238 24 11
MAIL: BCCA@BCCA.BE | WWW.BCCA.BE

Certificates

Pipe systems

ITC INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a.s.
Vlada Tomáše Bati 299, Louky, 763 02 Zlín, Czech Republic
Division CSI – Centre of Civil Engineering **CSI**

AUTORIZOVANÁ OSOBA č. 224
Rozhodnutí o autorizaci č. 11/2023 ze dne 7. srpna 2023

vydává

PRODUCT CERTIFICATE

No. 24 0048 V/AO

In compliance with the provision of Section 5, Subsection 2 of the Government Order No. 163/2002, Collection of Laws, as amended by the Government Order No. 312/2005, Collection of Laws and Government Order No. 215/2016, Collection of Laws (hereafter GO 163), which lays down technical requirements for selected building products, the Authorized Body No. 224 confirms that for the construction product:

Green Connect 2000 – polypropylene pipes with mineral modifiers (PP-MD) for non-pressure underground drainage and sewerage, DN/OD 110 – DN/OD 315, SN 10

placed on the market by the company
Wavin Czechia s. r. o.
Rudeč 848, 277 13 Kostelec nad Labem, Czech Republic
having company's registration number: CZ27560597

from the site of manufacturer
Wavin Czechia s. r. o.
Logistics park VGP, Do Čertous 2659/12 – hall B3, 193 00 Praha 9
– Horní Počernice, Czech Republic

It has reviewed the documents submitted by the applicant, carried out the initial type testing on a sample and assessed the factory production control. The Authorized Body No. 224 ascertained conformity of the product properties with essential requirements of the GO 163, Collection of Laws, as amended by the Government Order No. 312/2005, Collection of Laws, which are specified by the Construction Technical Approval No. STO – AO 224 – 1080/2021. Further, the Authorized Body No. 224 ascertained that the factory production control complies with the submitted technical documentation and ensures that the products placed on the market fulfil the requirements laid down by the above mentioned norms set by the technical documentation pursuant to Section 4, Subsection 3 of the GO 163, as amended.

This Certificate was issued on the basis of the Certification Report No. 795200182/2024 dated 2024-02-06 containing conclusions of the assessment, the test results obtained and basic description of the product, as necessary for its identification.

This Certificate remains valid as long as the requirements laid down in the technical documentation and/or Construction Technical Approval in reference to the manufacturing conditions in the factory or the PPC itself are not modified significantly. The Authorized Body No. 224 performs at least once per year a surveillance of the factory production control, takes samples of the product and by the way of testing it finds out, if the product properties comply with the requirements of the Construction Technical Approval according to the Section 4 of the mentioned Government Order. If the Authorized Body finds any shortcomings it has the right to cancel or amend the Certificate if has issued.

Issued in Zlín on: 2024-02-06
Mgr. Jiří Heš, Representative of the Authorized Body No. 224

ITC INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a.s.
Vlada Tomáše Bati 299, Louky, 763 02 Zlín, Česká republika
Divize CSI – Centrum stavebního inženýrství **CSI**

AUTORIZOVANÁ OSOBA č. 224
Rozhodnutí o autorizaci č. 11/2023 ze dne 7. srpna 2023

vydává

CERTIFIKÁT VÝROBKU

č. 21 0166 V/AO/a

V souladu s ustanovením §5, odst. 2, nařízení vlády č. 163/2002 Sb., kterým se stanoví technické požadavky na vybrané stavební výrobky, ve znění nařízení vlády č. 312/2005 Sb. a nařízení vlády 215/2016 Sb. (NV 163), Autorizovaná osoba č. 224 potvrzuje, že u stavebního výrobku

Trubky a tvarovky WAVIN SOLIDWALL z neměkčeného polyvinylchloridu (PVC-U) pro beztlakové podzemní kanalizační systémy, d 160 mm až d 500 mm, SN 12

uváděného na trh společností
Wavin Czechia s. r. o.
Rudeč 848, 277 13 Kostelec nad Labem, Česká republika
DIČ: CZ27560597

z místa výroby
(trubky)
Wavin Polska S. A., ul. Dobreżyńska 43, 64-320 Buk, Polsko
Wavin Hungary kft., Újgyártelep, 2072 Zsámbék, Magyarország
(tvarovky)
Nyloplast Europe b.v., Postbus/P.O.Box 5113, NL-3296 ZG S-Gravenmeer, Holandsko

pléžkoumala předložené podklady, provedla počáteční zkoušku typu výrobku na vzorku a posoudila způsob kontroly výrobku a zjistila, že uvedený výrobek splňuje základní požadavky nařízení vlády, konkretizované ve stavebním technickém osvědčení č. STO – AO 224 – 1080/2021a. Autorizovaná osoba č. 224 zjistila, že způsob kontroly výrobku odpovídá příslušné technické dokumentaci a zabezpečuje, aby výrobky dodávané na trh splňovaly požadavky stanovené shora uvedeným stavebním technickým osvědčením a odpovídaly technické dokumentaci podle §4, odst. 3, NV 163.

Certifikát byl vydán na základě Protokolu o certifikaci č. 795200182/2024 ze dne 30. 4. 2024, který obsahuje závěry zjištění a ověření, výsledky zkoušek a základní popis výrobku, nezbytný pro jeho identifikaci.

Tento certifikát zůstává v platnosti po dobu, po kterou se požadavky stanovené v technických předpisech nebo stavebním technickém osvědčení, na které byl uveden, odkaz, nebo výrobní podmínky v místě výroby či způsob kontroly výrobku výrazně nezmění.

Autorizovaná osoba č. 224 provádí nejméně jedenkrát za 12 měsíců dohled nad řádným fungováním kontroly výrobku, odebrá vzorky výrobků, provádí jejich zkoušky a posuzuje, zda vlastnosti výrobku odpovídají stavebnímu technickému osvědčení podle ustanovení §5 výše uvedeného nařízení vlády. Pokud autorizovaná osoba č. 224 zjistí nedostatky, je oprávněna zrušit nebo změnit tento certifikát.

Issued in Zlín on: 2021-04-27
Revision a): 2024-04-30
(Replaces the withdrawn certificate 21 0166 V/AO issued on 2021-04-27)

Mgr. Jiří Heš, Representative of the Authorized Body No. 224

ITC INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a.s.
Vlada Tomáše Bati 299, Louky, 763 02 Zlín, Česká republika
Divize CSI – Centrum stavebního inženýrství **CSI**

AUTORIZOVANÁ OSOBA č. 224
Rozhodnutí o autorizaci č. 11/2023 ze dne 7. srpna 2023

vydává

STAVEBNÍ TECHNICKÉ OSVĚDČENÍ

č. STO – AO 224 – 1080/2021/a

v souladu s § 2 a § 3 nařízením vlády č. 163/2002 Sb., ve znění nařízením vlády 312/2005 Sb. a nařízením vlády č. 215/2016 Sb.

Autorizovaná osoba osvědčuje vhodnost technických vlastností výrobku

trubky a tvarovky WAVIN SOLIDWALL z neměkčeného polyvinylchloridu (PVC-U) pro beztlakové podzemní kanalizační systémy, d 160 až d 500 mm, SN 12

uváděného na trh společností
Wavin Czechia s. r. o.
Rudeč 848
277 13 Kostelec nad Labem
IČ: 27560597
DIČ: CZ27560597

z místa výroby:
(trubky)
Wavin Polska S. A., ul. Dobreżyńska 43, 64-320 Buk, Polsko
Wavin Hungary kft., Újgyártelep, 2072 Zsámbék, Magyarország
(tvarovky)
Nyloplast Europe b.v., Postbus/P.O.Box 5113, NL-3296 ZG S-Gravenmeer, Holandsko

ve vztahu k základním požadavkům na stavby a určenému použití výrobku ve stavbě.

Zakázka č.: 795200182
Počet stran: 9
Místo a datum vydání: Zlín, 27. 4. 2021
Změna a): 30. 4. 2024
Platnost osvědčení do: 30. 4. 2027

Mgr. Jiří Heš, představitel autorizované osoby č. 224

KOMO
Productcertificaat
K44865/04

kiwa

Uitgegeven	2021-08-15	Vervangt	K44865/03
Geldig tot	Onbepaald	D.o.t.	2018-06-01
Pagina	1 van 4		

PP geribbelde hulpstukken voor buitenrotering onder vrij verval
Wavin Nederland B.V.

VERKLARING VAN KIWA
Dit productcertificaat is op basis van BRL 9206-2 'Buisen en hulpstukken met gestruuctuurde wand voor buitenrotering onder vrij verval – Deel 2 - Type B: PP, PE' d.d. 30 augustus 2017, afgegeven conform het Kiwa-Reglement voor Certificaat.

Het kwaliteitsstelsel en de productkenmerken van dit product worden periodiek gecontroleerd. Op basis daarvan verklaart Kiwa dat het gerechtvaardigd vertrouwen bestaat, dat:

Het door de certificaathouder geleverde product bij aflevering voldoet aan:

- De in dit productcertificaat vastgelegde technische specificatie;
- De in dit productcertificaat en in de BRL vastgelegde producteisen.

mits PP geribbelde hulpstukken voor buitenrotering onder vrij verval voorzien zijn van het KOMO®-merk op een wijze als aangegeven in dit productcertificaat.

Ron Scheepers
Kiwa

Dit productcertificaat is opgenomen op de website van Stichting KOMO: www.komo.nl en www.komo-online.nl. Gebruikers van dit productcertificaat wordt geadviseerd om te controleren of deze nog geldig is. Raadpleeg hierbove de website van Kiwa: www.kiwa.nl.

Kiwa Nederland B.V. St. Wierden Druivenlaan 273 Postbus 10 2200 AB, Rijswijk Tel. +31 (0)88 44 41 00 Fax +31 (0)88 44 41 20 NL-Kiwa.info@kiwa.com www.kiwa.nl	Certificaathouder Wavin Nederland B.V. J.C. Nieuwenhuis 5 7772 SG, Zandvoort Tel. +31 (0)20 661 5000 Fax +31 (0)20 661 5000 info@wavin.nl www.wavin.nl	Productcertificaat Wavin Polska S.A. ul. Dobreżyńska 43 64-320 Buk POLSKA Tel. +48 (0)81 891 17 05 Fax +48 (0)81 891 16 11 www.wavin.pl
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KOMO

Beoordeeld in:
• Kwaliteitsstelsel
• Product
• Periodieke controle

Pipe systems

This document represents the English translation of the original German certificate issued by MPA Darmstadt. Please note that German is the official language of certificates of compliance according to regional building laws and only the German version is legally binding.

Staatliche Materialprüfungsanstalt Darmstadt
Grafenstraße 2, 64283 Darmstadt
Zertifizierungsstelle



Testing laboratory, inspection body and certification body according to § 27 of the "Hessische Bauordnung" (HBO) approved by the "Deutscher Institut für Bautechnik" (DIBt)

Certificate of Compliance

Reg.-No. K 1726-2 / 08.2020

This is to certify according to § 26 of the "Hessische Bauordnung" (HBO), Germany that the following construction product

Pipes made of polypropylene (PP) with smooth inner and profiled outer surface for non-pressure underground drainage and sewerage (Size group 1, 2 and 3)

produced in the factory

Warin Polska S.A.
ul. Dobieżyńska 43
PL-64-320 Buk

regarding the results of the production control and the third party inspection carried out by the approved inspection body

Staatliche Materialprüfungsanstalt Darmstadt
Grafenstraße 2
64283 Darmstadt

complies with the requirements of the

der Hessischen Verwaltungsvorschrift Technische Baubestimmungen (H-VVtB) vom 13.06.18, Kapitel C 2, I.2.1.21 bekannt gemachten technischen Regeln DIN EN 13476-3 :2009-04 in Verbindung mit DIN EN/TS 13476-4:2013-07

The manufacturer is therefore authorized to mark the construction product with the German mark of conformity (Ü-Sign).

This certificate is valid for 5 years.

Darmstadt, *08.02.2024*

This document represents the English translation of the original German certificate issued by MPA Darmstadt. Please note that German is the official language of the certificates of compliance according to the regional building laws and only the German version is legally binding.





Dr.-Ing. P. Bender
Certification body of MPA Darmstadt

Dipl.-Ing. (FH) L. Veith
Deputy head of Certification body according to HBO

64283 Darmstadt, Grafenstraße 2 - Postfach 114 82, 64229 Darmstadt - Telefon: (09151) 1624800

Apollo PVC-O Pipes: TSE Certification according to ISO 16422



TÜRK STANDARLARI ENSTİTÜSÜ
TÜRK STANDARLARINA UYGUNLUK BELGESİ
TURKISH STANDARDS INSTITUTION
CERTIFICATE OF CONFORMITY TO TURKISH STANDARDS

Millî Savunma Bakanlığı - Ministry of National Defense
TSE TÜRK STANDARLARI ENSTİTÜSÜ

BELGE NUMARASI REFERENCE NUMBER OF LICENCE	029560-TSE-0102
BELGENİN İLK VERİŞİ TARİHİ DATE OF FIRST ISSUE OF LICENCE	18.03.2015
BELGENİN SON GEÇERLİLİK TARİHİ LICENCE VALID UNTIL	18.03.2025
BELGE SAHİBİ KURULUŞUN ADI NAME OF THE LICENSE HOLDER	WAVIN TR PLASTİK SANAYİ ANONİM ŞİRKETİ
BELGE SAHİBİ KURULUŞUN ADRESİ ADDRESS OF THE LICENSE HOLDER	ÖZEL EVLER MAH. GİRNE BLV. WAVIN YÖNETİM BİNASI NO 204 YÜREĞİR ADANA/TÜRKİYE
ÜRETİM YERİ ADI NAME OF THE MANUFACTURING PLACE	WAVIN TR PLASTİK SAN. A.Ş.
ÜRETİM YERİ ADRESİ ADDRESS OF THE MANUFACTURING PLACE	ÖZEL EVLER MAH. GİRNE BLV. 204/A YÜREĞİR ADANA/TÜRKİYE
İPTAL BELGENİN BELGE NUMARASI (varsa) INDICATION OF SUPERSEDED LICENCE (if any)	029560-TSE-0101
TEŞCİLİ TİCARİ MARKASI REGISTERED TRADE MARK	PİKA
İLGİLİ TÜRK STANDARDI RELATED TURKISH STANDARD	TS ISO 16422 / 02.04.2014
BELGE KAPSAMI SCOPE OF LICENCE	Bağcı sızdırmaz su sistemlerinde kullanılan borular ve eklemeler parçaları - Yüksek basınçlı plastik boruların katılamaz polikarbonat (PC) (PVC-O) sistemleri Anma Çapı: Ø 110mm (Dış) / DEN - Ø 315 mm (Dış) Anma Basınç: PN 5, PN 0,3, PN 8, PN 10, PN 12,5, PN 16, PN 20 ve PN 25 Boru Boyu: Çıplak / Kuvvetlendirilmiş / Plastik Boru Sistemleri

05.03.2024
Belgelendirme Merkezi Başkanı Adına
FATMA KURT
TSE ADANA BELGELENDİRME MÜDÜRÜ

Belge, belge sahibinin ürünleri, sistemleri, hizmetleri vb. için kullanılmak üzere, ilgili teknik şartnamelere, standartlara ve diğer teknik şartnamelere uygun olarak üretilen ve test edilmiş ürünler için geçerlidir. Belge, belge sahibinin ürünleri, sistemleri, hizmetleri vb. için kullanılmak üzere, ilgili teknik şartnamelere, standartlara ve diğer teknik şartnamelere uygun olarak üretilen ve test edilmiş ürünler için geçerlidir. Belge, belge sahibinin ürünleri, sistemleri, hizmetleri vb. için kullanılmak üzere, ilgili teknik şartnamelere, standartlara ve diğer teknik şartnamelere uygun olarak üretilen ve test edilmiş ürünler için geçerlidir.

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1 / 1

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