

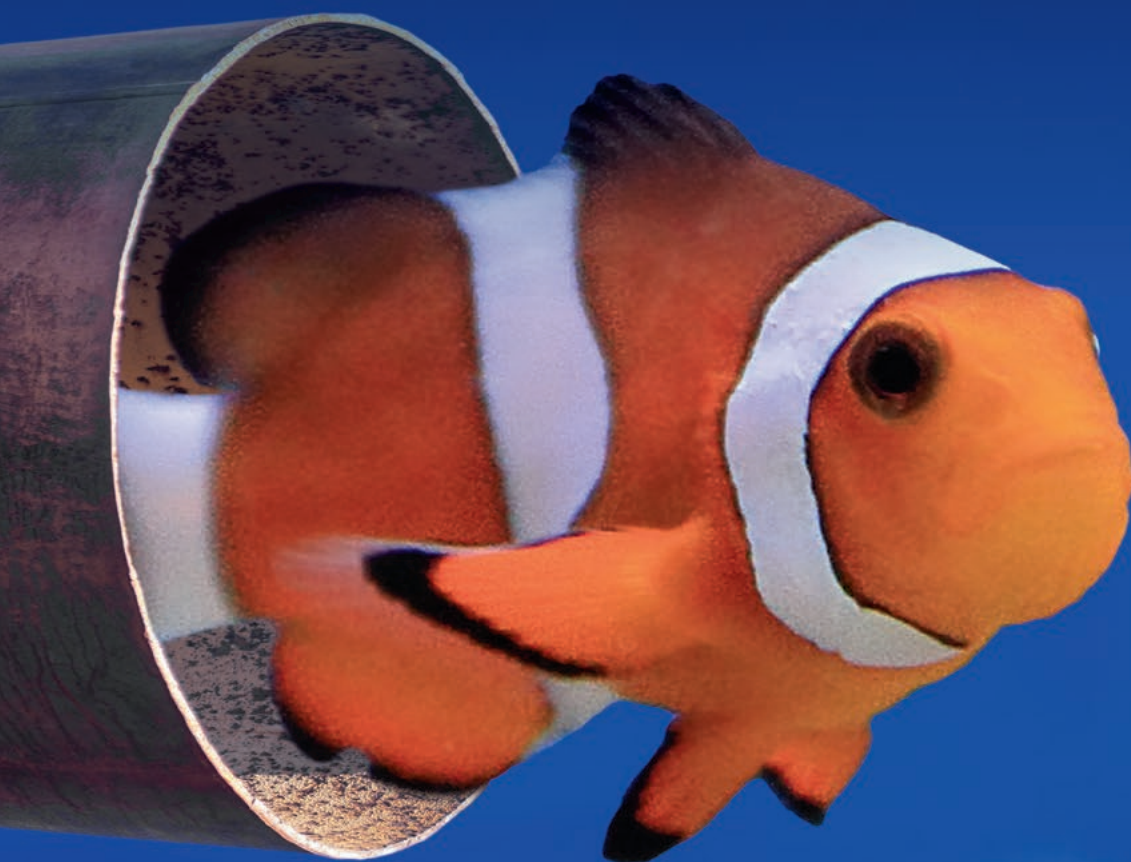
Trenchless installation

NEW!

PE 100-RT

# Compact Pipe<sup>®</sup>

Finding solutions



**wavin**

# Compact Pipe® – the close-fit process



*South africa, cape town,  
drinking water rehabilitation, DN 320,  
Martin & East / TT innovations*

## 30 years experience throughout the world

When local authorities, utilities, sewage plants and industrial companies are faced with the need to restore a pipeline, they have to choose a suitable method.

Where rehabilitation of the pipelines via open trenches is impossible due to inaccessibility, high traffic density or structures built over them, Wavin's Compact Pipe® comes into its own.

It only takes one working day to install Compact Pipe® PE pipe system in 100 – 600m of pipeline (depending on nominal width). The only civil engineering work required is digging of small insertion and target pits.

In existing sewer systems, the existing manholes are usually sufficient for installation purposes, thus minimizing disruption to local residents, road users and businesses. Worldwide, more than 2.5 million meters of Compact Pipe® PE pipes have already been installed without digging trenches.

## Compact Pipe®

- ⦿ Independent PE pipe for trenchless installation in old damaged piping
- ⦿ Solid-wall pipe construction made of PE 100-RT (Raised Temperature), PE 100 or PE 100-RC (Resistance to Crack)
- ⦿ For trenchless restoration of gas supply, water supply and industrial effluent pipelines
- ⦿ Compatible with PE standard fittings
- ⦿ Installation via existing manholes or small pits
- ⦿ Installation length of up to 600m\*
- ⦿ Quality and depreciation equivalent to a new PE pipeline

\*according to product range

### All-rounder for difficult locations

Whether in a historic town centre with listed buildings, under a busy motorway or on an industrial site – Compact Pipe® will rise to virtually every challenge. Its key advantages are the short installation times required and the minimal disruption to traffic flow. Because it is supplied on drums, it can be installed in continuous lengths without the need for joints. Compact Pipe® is approved for all media associated with sewers, pressurised wastewater lines, water and gas supply pipelines.

### Durable PE pipes

Compact Pipe® is available in various materials. Depending on the application, pipes made of high-temperature-resistant PE 100-RT (Raised Temperature), PE 100 or the extremely strong PE 100-RC (Resistance to Crack) are used. Compact Pipe® PE 100 pipes are operationally reliable for 80 years. The operational reliability for PE 100-RC pipes is 100 years.

### Leak-tight joints as standard

Pressure pipelines restored with Compact Pipe® are electrofused or butt-fused to existing pipelines. It is just as easy to incorporate flanges or fittings, for example. Service connections in pressure pipelines are made via an open trench and connected by fusing on so-called top-loading saddles. Service connections in non-pressure Compact Pipe® lines even be made without a trench using the Wavin CPZA® 2012 service connection.

### Factory production

Compact Pipe® is produced in a circular format via a PE extrusion process, pre-deformed in the factory and coiled onto a drum. The process quality is assured by checking the material's inherent memory effect and performing regular reversion tests on the QA test facility in the Twist factory.

Compact Pipe® offers additional features such as inspection-friendly coloring for analog and digital TV inspections by an IBAK certificate.



Wolfsburg, Allerpark / VFL stadium, Wastewater, DN300, SDR 17, trenchless rehabilitation, Diringler & Scheidel



Prag, City, DN500, SDR 17, trenchless rehabilitation, Zepris s.r.o.



IBAK certificate for inspection friendliness

# Areas of application



Frankfurt Airport, Sewer, DN400,  
SDR26, Diringer & Scheidel

## Restoring sewers and water and gas supply pipelines

The sewers and supply pipelines in Germany are in a poor state. Thousands of kilometres of the German sewer system are fractured and in need of repair. Similarly, around 7% of the water supply is lost every year due to defective pipelines. The supply utilities and local authorities will therefore have to make huge investments in new pipelines over the next few years. It is therefore important for them to find cost-effective pipe systems that guarantee longterm operational reliability.

Compact Pipe® has shown itself to be an ideal pipe system for the trenchless restoration of defective pipelines made from traditional materials such as cast iron, steel, concrete, PVC, stoneware or asbestos cement. The result: an independent PE pipe with the quality and lifespan of a new pipeline.

**NEW:** PE-100 RC Compact Pipe® options for trenchless installation of water and gas supply lines. These extremely resistant, PS 1075 certified pipes can be used in all types of bedding material. For example, RC grade Compact Pipe® lines are able to absorb the point loads generated by fracturing of the old pipe or any local ground settlement.

**NEW:** PE 100-RT Compact Pipe® options for temperature resistant industrial applications. PE 100-RT (Raised Temperature) material meets the requirements of ISO 24033, PE RT Type 2 for a sustained temperature of 70°C.

## Extensive rehabilitation

- ⦿ The public sewer network in Germany is approx. 490,000 km long and an estimated 15% of urban sewers are thought to leak.
- ⦿ Around 3.5 billion litres of water are lost in Germany every year due to defective water supply pipelines.

Sources: [www.munlv.nrw.de](http://www.munlv.nrw.de),  
North Rhine Westphalian  
Ministry of Climate Protection,  
Environment, Agriculture,  
Nature Conservation and  
Consumer Protection,  
Dipl.-Ing. (FH) R. Thoma,  
[www.vdivde-it.de](http://www.vdivde-it.de)

## Requirements of the old pipes

Compact Pipe® is a „pipe-within-a-pipe“ process. An independent new PE pipe is inserted into a defective old pipe using the close-fit technique. The old pipe serves as formwork during installation and remains in the ground. A pre-deformed, C-shaped PE pipe is pulled in and then installed by applying heat and pressure. It is important that the internal cross-section of the defective old pipe is equal to or greater than the external production size of the new PE pipe.

Example: For an old DA 250 pipe, SDR 26, in PE 100, green, the Compact Pipe® renovation range is 241 mm to 255 mm. Consequently the minimum internal diameter of the old pipe  $DI_{min}$  = production size = 241 mm. In most cases, installation of Compact Pipe® increases hydraulic flow capacity, even though the cross-section is reduced. Defective and encrusted internal surfaces of the old pipe (friction coefficient  $K = 1.5$ ) are replaced by smooth PE pipe surfaces with a low friction coefficient ( $\geq 0.01$ ).

A defective sewer pipe should first of all be evaluated as a whole (old pipe status I-III). The Compact Pipe® installation process is suitable for all conditions of pipe. However, if the old pipe displays more than 13% ovalisation (WGR, V) or deformation (Wv), the safety coefficients and dimensioning principles are no longer adequate. The standard method for cleaning sewers is high-pressure jet cleaning.

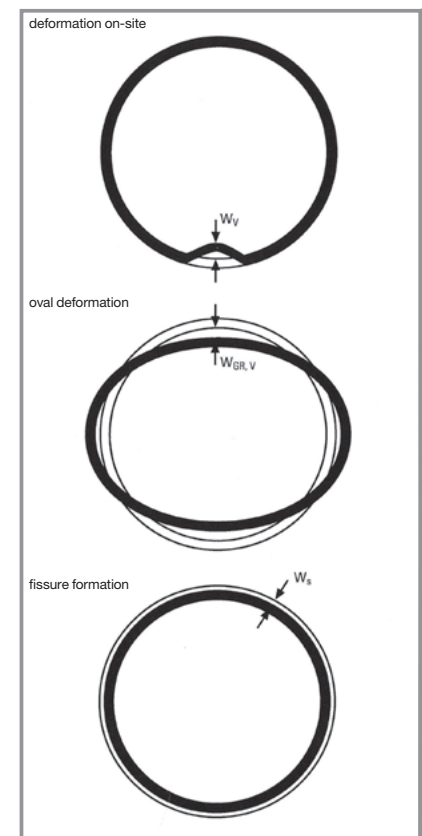
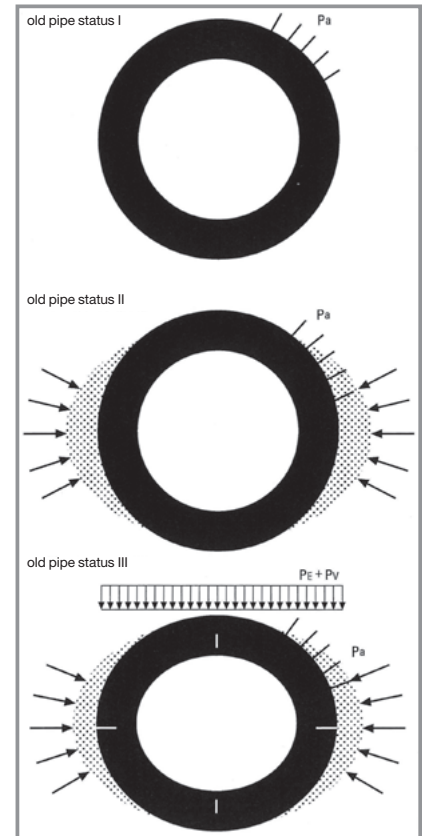


As a rule, mechanical cleaning with scraper pigs or similar is sufficient for pressure lines. For the installation to be successful, the minimum cross-section must be guaranteed. The pipeline is therefore calibrated after cleaning. Camera inspection, cleaning and calibration of a sewer or an old pipeline are an absolute must to ensure successful installation.

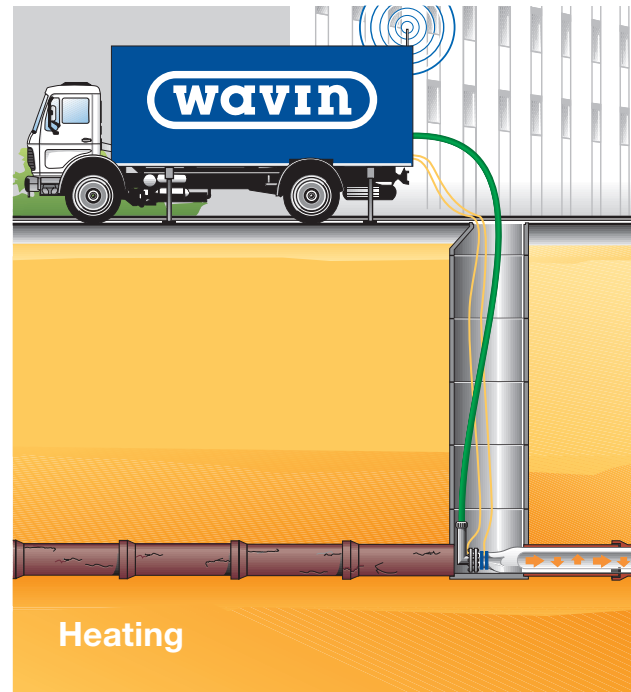
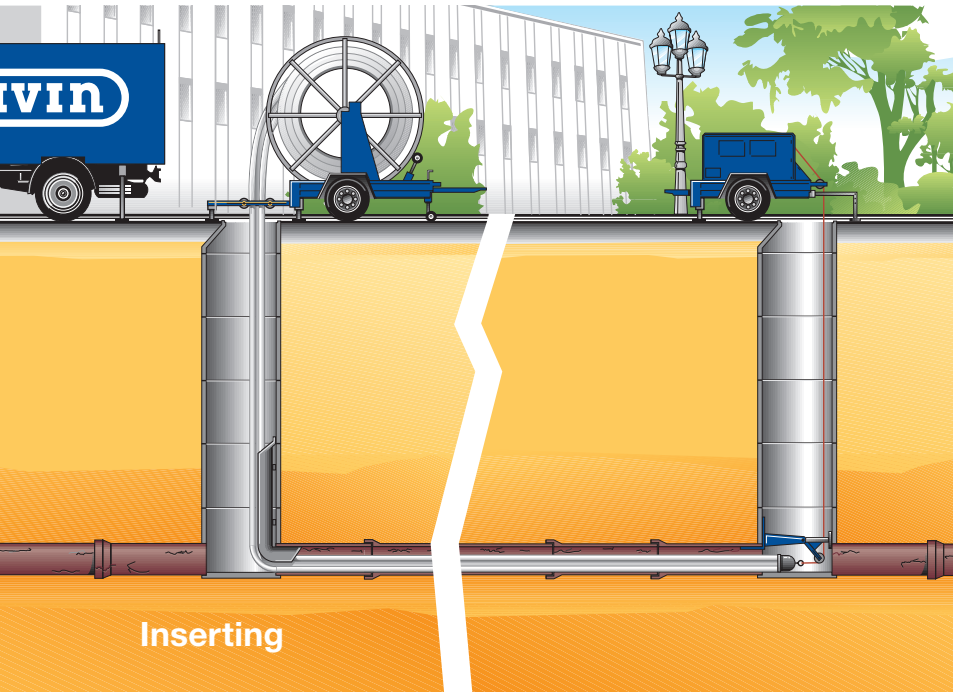
Directional changes in the pipe route can be achieved as follows:

Type of change	Angle in °	Min. radius of old line
Bends and forks	< 22.5°	no restrictions
Bends	< 45°	5 x DN Compact Pipe®
Bends	< 90°	8 x DN Compact Pipe®

The Wavin webtool [www.wavin-onlineberechnung.de](http://www.wavin-onlineberechnung.de) can be used to calculate the application limits, dimensioning principles and maximum achievable flow characteristics after installation of Compact Pipe® PE pipes.



# Functional principle



## Memory effect

The Compact Pipe® system is based on a production process developed by Wavin. In this process, a circular PE pipe is axially pre-deformed into a C shape during the extrusion process, thereby considerably reducing its cross-section. The pipe is then coiled onto a drum in this shape and delivered to the installation site. It can quickly and easily be inserted into the old pipeline via existing manholes or small insertion pits.

The inserted pipe is then heated by steam and reverts to its original circular shape (memory effect). Due to the effect of compressed air applied while it is cooling, the Compact Pipe® is pushed tight against the wall of the old pipe (close-fit). The result of the close-fit process is a statically independent and strong pipe with the quality and lifespan of a new pipeline.



## Installation sequence

1. Making the insertion and target pits or preparing the manholes.
2. Camera inspection, cleaning and calibration.
3. Pulling in the pipe. (Fig. 1, Fig. 2)
4. Sealing the pipe and heating it with steam. The pipe „remembers“ and reverts to its original circular cross-section (memory effect). (Fig. 3)
5. Expanding and cooling the pipe (reversion) using compressed air. The pipe is pressed tight against the wall of the old pipe and fixed (close-fit). (Fig. 4)
6. Fixing the pipe ends by fusing PE pipe segments onto the pipe.
7. Connecting to existing sections of the pipeline.
8. Making the service connections.

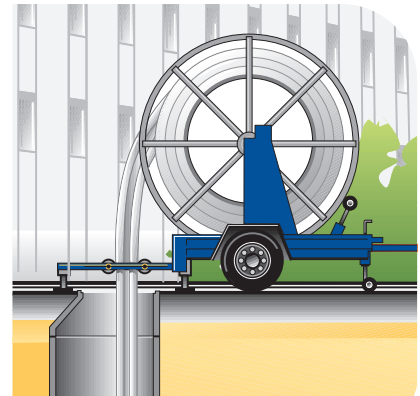
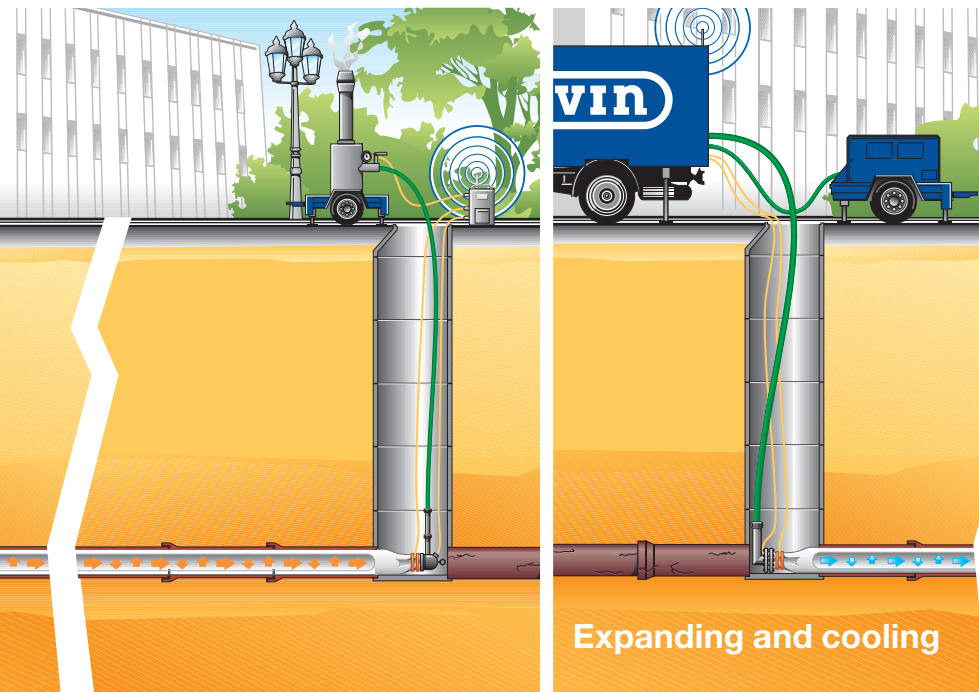


Fig. 1: Insertion from the drum trailer

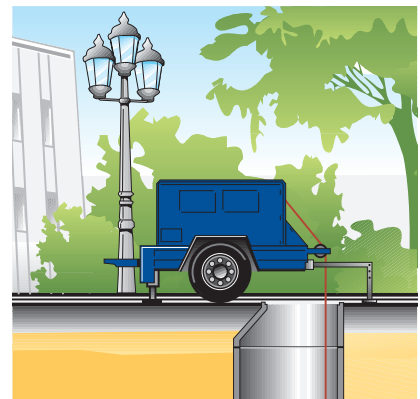


Fig. 2: Winch on the target shaft



Fig. 3: Steam unit with integral process control

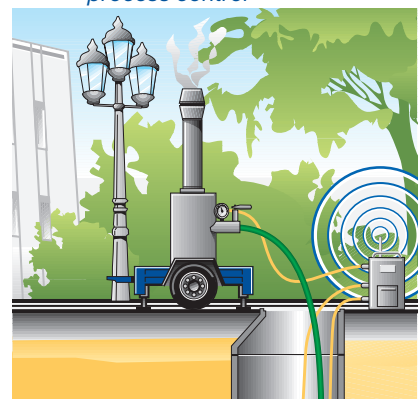


Fig. 4: Steam/water separator and data storage unit

### Labelling

Compact Pipe® PE pipes are labelled as follows: manufacturer, product name, application, material, nominal width, SDR class, production date, linear metres, machine number, shift/material code.

**Example:** WAVIN COMPACT-PIPE water GZ DVGW DW-8428AU2109  
 DIN EN ISO 11298 DN300 SDR17 PE100 MRS10 003 PN10 Nordic Polymark Logo/  
 DS Logo 220115 00100 34 730

### Installation

The only civil engineering work required to install Compact Pipe® is digging of small insertion and target pits and no work at all is necessary for sewer rehabilitation, since the existing manholes can be used. The work site does not take up much space and does not usually disrupt traffic flow.

# Product portfolio



Hausham, Wastewater, DN300, SDR26, trenchless rehabilitation, Max Bögl

## Sewer pipes and pressurized effluent pipelines

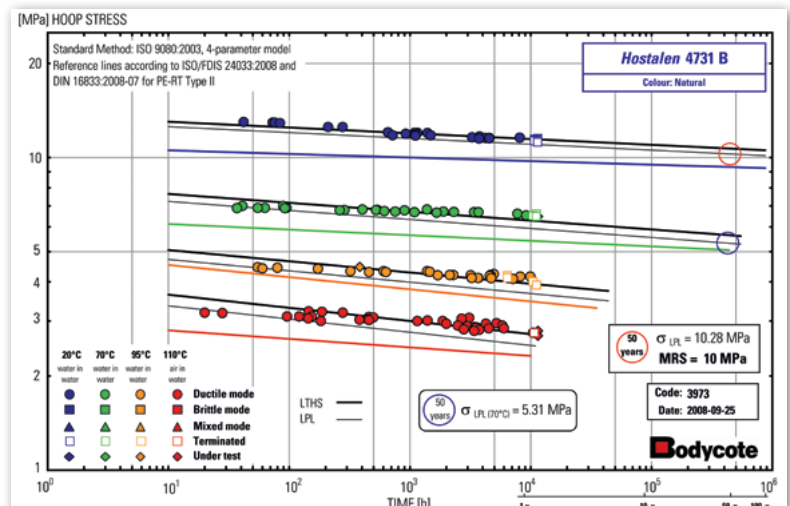
Wavin offers **PE 100-RT Compact Pipe®** in off-white for construction work performed by local authorities. The PE 100-RT material used (Raised Temperature) is capable of far more, however, which is why we also use this version for industrial sites. Compact Pipe® in PE 100-RT quality (Raised Temperature) meets the requirements of ISO 24033, PE-RT Type 2 for a sustained temperature of 70 °C in high-temperature water transportation. Compact Pipe® has been approved by the DIBt (Deutsches Institut für Bautechnik) for use in the renovation of underground effluent pipelines and meets the requirements of EN ISO 11296-3.

The off-white colour is semi-anechonic and has been optimized for TV inspections.


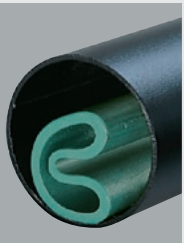

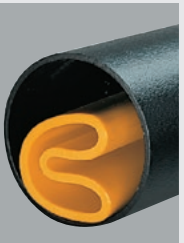
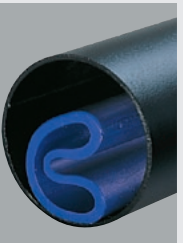

**Compact Pipe® made of PE 100**, which comes in green, is also available for sewer pipes and produced in accordance with the requirements of EN ISO 11296-3 and EN ISO 11297-3 (pressurized effluent pipes). In accordance with the SKZ/TÜV-LGA quality guideline (Pipes, shafts and components in landfills) of September 2013, Compact Pipe® pipes in PE 100 display the required FNCT value of > 1,600 h.

The Compact Pipe® has been approved by the DIBt for use in the renovation of underground effluent pipelines.

Compact Pipe® PE 100-RT from Basell Hostalen 4731 B, Illustration from brochure der Basell Polyolefine GmbH.





	Wavin Compact Pipe® PE 100-RT	Wavin Compact Pipe® PE 100 Wastewater	Wavin Compact Pipe® PE 100 Potable water	Wavin Compact Pipe® PE 100 Gas	Wavin Compact Pipe® PE 100-RC Potable water	Wavin Compact Pipe® PE 100-RC Gas
						
<b>Material</b>	PE 100-RT	PE 100	PE 100	PE 100	PE 100-RC	PE 100-RC
<b>RC material test</b>					PAS 1075 cert.	PAS 1075 cert.
<b>Manufacture as per</b>	DIN EN 11296-3	DIN EN 11296(7)-3	DVGW certificate DIN EN 11298-3	DVGW certificate DIN EN 11299-3	DVGW certificate DIN EN 11298-3	DVGW certificate DIN EN 11299-3
<b>Special protective properties</b>	No	No	No	No	Yes	Yes
<b>Installation process</b>	Trenchless installation via manhole	Trenchless installation via manhole	Trenchless installation via manhole	Trenchless installation via pit	Trenchless installation via pit	Trenchless installation via pit
<b>DN (mm)</b>	150 – 500 as per product range	150 – 500 as per product range	150 – 500 as per product range	150 – 500 as per product range	150 – 500 as per product range	150 – 500 as per product range
<b>Pressure class (bar)</b>	8	10	10	6/4	10	6/4
<b>SDR</b>	26/32*	17/26/32*	17/26*	17.6/26	17/26*	17.6/26
<b>Operational reliability</b>	80 years	80 years	80 years	80 years	100 years	100 years

\* on request

## Pressure pipelines for water

A new version of Wavin Compact Pipe® is now available in PE 100-RC grade for trenchless installation of water supply pipes. This will withstand any long-term loadings such as fractures of the old pipe, sandbed-free trench backfill with all classes of soil and additional point loadings.

In line with DVGW worksheet GW 335 A2 and in compliance with DIN EN 12201-2 and the PAS 1075 guidelines, Compact Pipe® PE 100-RC is produced in royal blue. Compact Pipe® PE 100-RC water pipes are PAS 1075 certified by DIN Certco. This certifies operational reliability of 100 years for trenchless installation.

Compact Pipe® continues to be available in PE 100 Standard.

## Pressure pipelines for gas

Wavin GmbH also offers a solution for trenchless installation of gas pipes with its Wavin Compact Pipe® PE 100-RC.

In line with DVGW worksheet GW 335 A2 and in compliance with DIN EN 1555 and the PAS 1075 guidelines, Compact Pipe® PE 100-RC is produced in orange. Compact Pipe® PE 100-RC gas pipes are PAS 1075 certified by DIN Certco. This certifies operational reliability of 100 years for trenchless installation.

Compact Pipe® PE 100-RC can withstand external damage and long-term point loadings. Compact Pipe® PE 100-RC is independent of the surrounding, and possibly defective, old pipe and independent of the trench backfill using sandbed-free excavated material.

Compact Pipe® continues to be available in PE 100 Standard.

# Product range

Wavin Compact Pipe® · PE 100 · PE 100-RC · Water pipes



Wavin PE 100 Compact Pipe®  
One-layer Pipe

## Please note:

Wavin Compact Pipe® PE 100 and PE 100-RC are delivered in the same delivery form. No differences in length, wall thickness and DN related dimensions.

### Wavin Compact Pipe® Water › SDR 26 › PN 6 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	138	5,8	600
175	170 – 179	160	6,7	600
200	194 – 204	183	7,7	440
225	217 – 230	206	8,7	440
250	241 – 255	229	9,7	370
280	280 – 296	257	10,8	250
300	289 – 306	276	11,6	210
(350)*	340 – 357	321	16,7	150
(400)*	385 – 408	366	19,1	93
(450)*	436 – 459	413	21,5	93
(500)*	485 – 510	459	23,9	90

Other dimensions on request.

\*Only available in SDR 21 [8 bar].

### Wavin Compact Pipe® Water › SDR 17 › PN 10 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	130	8,9	600
175	170 – 179	153	10,3	600
200	194 – 204	175	11,8	400
225	217 – 230	197	13,3	400
250	241 – 255	219	14,8	330
280	280 – 296	245	16,5	250
300	289 – 306	262	17,7	190
350	340 – 357	306	20,6	150
400	385 – 408	350	23,6	93

Other dimensions on request.

# Wavin Compact Pipe® · PE 100 · PE 100-RC · Gas pipes



**Wavin PE 100 Compact Pipe®**  
One-layer Pipe

## Please note:

Wavin Compact Pipe® PE 100 and PE 100-RC are delivered in the same delivery form. No differences in length, wall thickness and DN related dimensions.

### Wavin Compact Pipe® Gas\* › SDR 26 › PN 4 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	138	5,8	600
175	170 – 178	160	6,7	600
200	194 – 204	183	7,7	440
225	217 – 229	206	8,6	440
250	241 – 255	229	9,6	400
280	280 – 295	257	10,8	250
300	289 – 306	276	11,5	210
(350)**	340 – 357	321	16,7	on request
(400)**	385 – 408	366	19,1	on request
(450)**	436 – 459	413	21,5	93
(500)**	485 – 510	459	23,9	90

Other dimensions on request.

\*Gas, PN [bar] as per DIN EN ISO guidelines.

\*\*Only available in SDR 21 [5 bar].

### Wavin Compact Pipe® Gas\* › SDR 17,6 › PN 6 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	130	8,6	600
175	170 – 178	153	10,3	600
200	194 – 204	175	11,4	400
225	217 – 229	197	12,8	400
250	241 – 255	219	14,3	330
280	280 – 295	245	16,0	250
300	289 – 306	262	17,1	190
350	340 – 357	306	19,9	150
400	385 – 408	350	22,8	93

Other dimensions on request.

\*Gas, PN [bar] as per DIN EN ISO guidelines.

# Product range

Wavin Compact Pipe® · PE 100 · Sewer and pressurized effluent pipes



**Wavin PE 100 Compact Pipe®**  
One-layer Pipe

**Wavin Compact Pipe® Sewer and pressurized effluent pipes**  
› SDR 26 › PN 6 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	138	5,8	600
175	170 – 178	160	6,7	600
200	194 – 204	183	7,7	440
225	217 – 229	206	8,7	440
250	241 – 255	229	9,7	370
280	280 – 296	257	10,8	250
300	289 – 306	276	11,6	210
350	340 – 357	321	13,5	160
400	385 – 408	366	15,3	135
(450)*	436 – 459	413	21,5	93
(500)*	485 – 510	459	23,9	90

Other dimensions on request.

\*Only available in SDR 21 [8 bar].

**Wavin Compact Pipe® Sewer and pressurized effluent pipes**  
› SDR 17 › PN 10 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 153	130	8,9	600
175	170 – 178	153	10,3	600
200	194 – 204	175	11,8	400
225	217 – 229	197	13,3	400
250	241 – 255	219	14,8	330
280	280 – 296	245	16,5	250
300	289 – 306	262	17,7	190
350	340 – 357	306	20,6	150
400	385 – 408	350	23,6	93

Other dimensions on request.

## Wavin Compact Pipe® · PE 100-RT · Gravity sewer pipes



**Wavin PE 100-RT Compact Pipe®**  
One-layer Pipe

### Wavin Compact Pipe® Gravity sewer pipes

› SDR 26 › PN 6 › on drum

DN	Rehabilitation range	Compact Pipe® Di (c.) on installation on DN nominal	Wall-thickness DN/SDR	Standard lengths
mm	mm	mm	mm	m
150	145 – 155	138	5,8	600
175	175 – 180	160	6,8	600
200	194 – 206	183	7,7	440
225	217 – 232	206	8,7	440
250	241 – 258	229	9,7	370
280	280 – 299	257	10,8	250
300	289 – 309	276	11,6	210
350	340 – 360	321	13,5	160
400	385 – 412	366	15,4	135
(450)*	436 – 463	413	21,5	93
(500)*	485 – 515	459	23,9	90

Other dimensions on request.

\*Only available in SDR 21.

# Joining methods and network integration



Berlin, Friedrichshain,  
trenchless rehabilitation,  
DN300, SDR26 and CPZA® 2012 ,  
Stehmeyer und Bischoff, Berlin

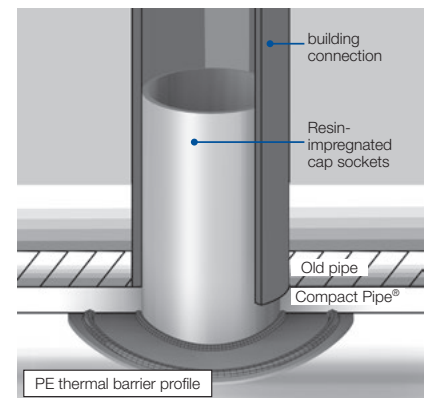
## Trenchless feed line connection CPZA® 2012

Following installation of Compact Pipe® pipes in defective, unpressurized old pipes, existing feed lines can be connected in a trenchless process using the CPZA® 2012 system (Compact Pipe® feed line connection). A perfectly fitting CPZA® 2012 is connected to the PE liner with the same material and longitudinally locked under defined conditions.

CPZA® 2012 consists of a PE thermal barrier profile and a resin nozzle for trenchless integration of service connections. The PE profile is equipped with a reinforced connecting element to ensure same material connection to the PE liner and with an additional seal against water pressure. An additional outer foil in the c. 30-cm-long nozzle area guarantees a defined resin content and prevents decomposition in the groundwater region.

Standard DN 100 – DN 200 feed lines can be connected in Compact Pipe® DN 250 – DN 500 pipes.

There is also an option to connect the feed line by grouting with appropriate reactive resins.



CPZA® 2012, industrial photograph



CPZA® 2012



Grouting



*FRIALEN® and FRIAFIT® – use of electrofusion welded fittings to integrate Compact Pipe® into the network*

### Leak-tight joints using flexible moulded parts

Wavin Compact Pipe® pipes connect to existing pipelines using moulded parts. Electrofusion fittings, such as electrofusion couplers but also mechanical couplers, are commonly used on longitudinal connections. In little to no time, and without any extensive effort, long-term, leak-tight joints can be created for gas, potable water, sewer and pressurized effluent pipelines.

Relining couplers can be supplied to transition Compact Pipe® to a PE standard pipe. These come with a pre-heat barcode, which enables them to reduce any gaps between the sleeve and the pipe. FRIALEN® relining couplers, for example, are fitted with exposed heat coils to ensure maximum heat transfer, added insertion depths, wide fusion zones and cold zones at the end and in the middle to prevent the flow of molten material.

Where pressurized pipelines are concerned, the service connections and branches can be achieved using special top-loading saddles. This approach often prevents the need for complicated component installation procedures using T-pieces. To enable every pipe diameter to be adjusted to Compact Pipe® as needed, clamping units, such as the FRIATOOL®, are used. The result: perfectly fitting connections that, with defined welding parameters, can be used as pressure tapping valves. Electrofusion fittings are available with extra-long outlet sockets, spigot saddles, tapping ball valves, transition saddles as well as shut-off saddles.



# Joining methods and network integration



Hausham, Wastewater, DN 400,  
SDR26, Max Bögl

## Direct connections using coupling and repair parts

Coupling and repair parts that directly connect Compact Pipe® to steel, cast iron, ductile iron, fibre cement and PVC pipes are also available. On our Compact Pipe® website, you will find the full range of Aliaxis Friatec parts along with their diameter tolerances, possible angular offsets, and material specifications.

## Anchor points for secure installation

To secure the installation in the trench, anchor points are welded on to the Compact Pipe®. Here, the pipe segments serve as anchor points. These are longitudinally connected to the Compact Pipe® pipeline using welding or heating mats. Ready-to-use anchor points can be purchased from moulded parts manufacturers.

## Connecting to PE manhole systems

If concrete manhole structures are replaced by PE manholes (Wavin Tegra), Compact Pipe® can be fused directly onto the PE nozzles on the manhole. In this application, Compact Pipe® is installed first of all. The old manhole is then demolished and the new PE manhole is positioned. Standard electrofusion couplers connect the PE manhole into the new Compact Pipe® pipe run.



FRIAGRIP® – use of mechanical connections for Compact Pipe®





# Quality Assurance

## Comprehensive Quality Management

As in the manufacture of standard PE pipes, all the tests required for quality control e.g. tensile tests or tests to determine density and moisture content are performed on the raw material. Creep rupture tests are performed on the finished Compact Pipe® to check its quality.

The flow diagram (right) shows the sequence of QA steps. The memory effect of the pipe is tested on the "M" (manufactured) product immediately after extrusion. Expansion of Compact Pipe® is simulated in the laboratory (batch test) for the "I" (installed) product. Only if it passes this test, is the Compact Pipe® dispatched.

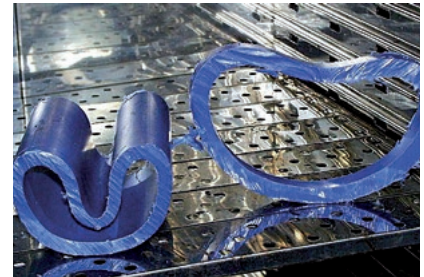
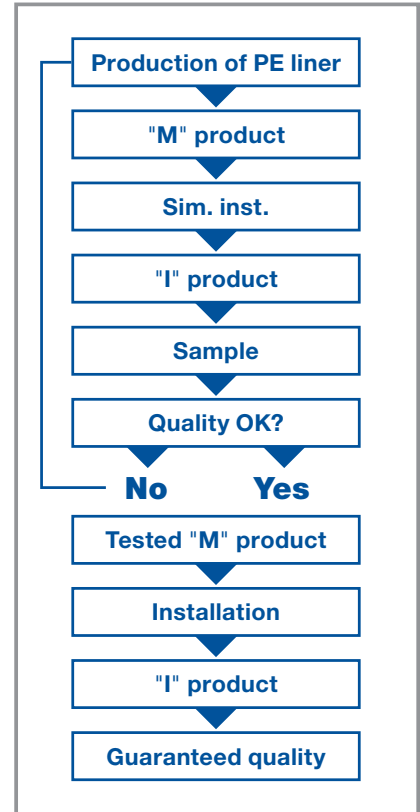
## High-quality material

Wavin Compact Pipe® is produced in compliance with regulations 11296-3 – 11299-3. These regulations cover the media: wastewater, industrial effluent, fresh water and gas. The "M" (manufactured) and "I" (installed) states are specified in the standards. Only pure PE 100 is used to produce Wavin Compact Pipe®. Preliminary checks are carried out on receipt of the raw material. Compact Pipe® is initially extruded as a standard PE pipe and then pre-deformed. The temperature of the material is very important in achieving the desired memory effect. Specimens are used to check whether the necessary memory effect has been achieved. Only after passing this test are the pipes coiled onto drums ("M" state). The subsequent expansion test performed in the laboratory simulates the on-site installation process. In this way, it is possible to guarantee that the end product produced by the factory meets the necessary high quality standards.

Prior to installing Compact Pipe®, the customer is provided with a static calculation.

## Chemical resistance

Based on PE material for municipal wastewater, the chemical resistance of Compact Pipe® is determined for pH values of between pH2 (acidic) and pH12 (alkaline). For industrial effluent, please see the chemical resistance table published by Wavin (available for download at [www.wavin.de](http://www.wavin.de)), in accordance with SKZ/TÜV-LGA quality guideline "Pipes, shafts and components in landfills", September 2013, Compact Pipe® PE 100 pipes, green, display the required FNCT value of > 1,600h. Compact Pipe® PE 100-RC material is stabilized up to the max. FNCT level of 8,760 hours.



Memory effect



Industrial pipelines

# Licensed installers



Firms contracted to install pipe using the Compact Pipe® process must have the necessary qualification and provide proof of this to the customer. This qualification can only be obtained by attending regular dedicated training courses delivered and certificated by Wavin.

# Your contacts

*Berlin, Wastewater, DN 250, SDR 26,  
Stehmeyer + Bischoff Berlin*



*Malaysia, Kuala Lumpur, Smart Pipe Technology  
Sdn. Bhd., DN 250, drinking water*



## Sales Team Compact Pipe®



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# Qualified installation – worldwide



**Colombia**

*Columbia,  
Medellin,  
DN400/450,  
Wastewater*



*South Africa, Durban,  
DN250, sewer rehabs*



*Japan, Osaka, DN250, Potable Water*

Wavin GmbH issues installation licences and provides knowledge training for licensees for the installation of Compact Pipe® conduits. The corresponding installation and equipment specifications have been designed for application in procedures involving sewer and pressurised-pipe conduits.

Worldwide, a total of 25 building companies are currently licensed to carry out Compact Pipe® procedures. Wavin's Competence Center Compact Pipe ensures the proper application of procedural instructions and the provision of on-site assistance, along with the provision of subsequent process-relevant updates. This allows clients worldwide to rely on the uniform processing parameters of our close-fit installations.



*Japan, award for Compact Pipe® PE 100, green*

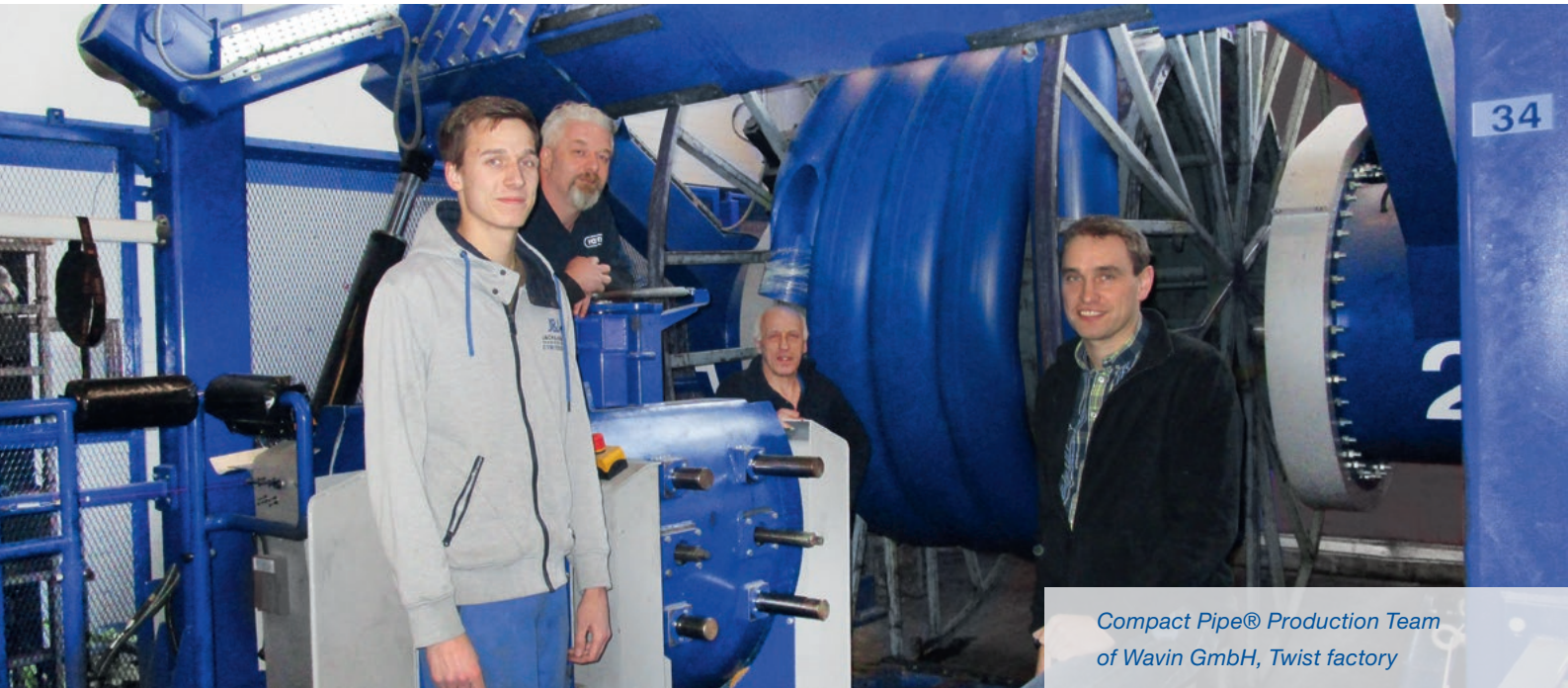
The strategies used to refurbish pipeline networks differ widely from country to country. Local authority and industrial network operators determine the respective fields of operation of our licensees. Virtually all our partners are multi-skilled and capable of installing Compact Pipe® as sewer conduits, drinking-water mains and gas pipes.

Truly outstanding results have been achieved again and again all over the world. These include the prize awarded to our Japanese Compact Pipe® licensee in 2016 by the State Ministry of Infrastructure and Transport situated in Tokyo. Koji Maeda (President of FRP Contractors Co. + Chairman of PE Association) and Toshio Kusagi (Executive Director Contractor Okumura Doro) received the Sustainability Award for Compact Pipe® PE 100 (green).

*Japan, Hong Kong, DN 145, Potable Water*



# Production and Logistics



*Compact Pipe® Production Team  
of Wavin GmbH, Twist factory*

With its Production and Logistics teams in the Twist factory, Wavin GmbH coordinates deliveries of Compact Pipe® to anywhere in the world. The product range for Wavin's global network of licensees is produced on two production lines. Drum lengths can also be purpose-made for the site and special drum dimensions are available for carriage by road and sea. Standard lengths and dimensions are always in stock. However, production is usually purpose made for the installation and delivered directly to the construction site. Compact Pipe® PE can be stored outdoors for two years after the date of production.

If it is not possible to install the Compact Pipe® system, Wavin offers other products for modern installation processes. PE 100-RC grade pressure pipe systems are available for trenchless installations in single pipes, pipe ducts and for burst lining.



*Transport for BONEX Building Co. Ltd.*



*Transport for Willen GmbH*



*Worldwide shipments by containers*



## Wavin TS DOQ®

Premium quality for burst lining and pipe duct lining

- ⦿ Material: PE 100-RC
- ⦿ Three-layer pipe\* with protective characteristics as per PAS 1075
- ⦿ Additional quality certification (PE 100-RC + DOQ grade) for all installation techniques
- ⦿ OD32–OD500 mm, SDR 11/17\*



## Wavin SafeTech RC<sup>n</sup>

RC pipe for burst lining and pipe duct lining

- ⦿ Material: PE 100-RC
- ⦿ Two-layer pipe\* with protective characteristics as per PAS 1075
- ⦿ Suitable for all installation techniques
- ⦿ OD32–OD500 mm, SDR 11/17\*



## Tegra shaft systems

Sewer shafts DN425 – DN 1250

- ⦿ Material: PE or PP
- ⦿ Long lifespan of up to 100 years, even under extreme conditions
- ⦿ High flexibility due to integral ball joints
- ⦿ High sealing performance (up to 2.5bar)
- ⦿ Quick and easy installation



\*according to product range

## Discover our broad portfolio at [wavin.com](http://wavin.com)

Hot & Cold Water  
Indoor Climate  
Soil & Waste

Foul Water  
Storm Water

Gas & Water Mains  
Geotextiles



Wavin is part of Orbia, a community of companies working together to tackle some of the world's most complex challenges. We are bound by a common purpose: To Advance Life Around the World.



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