

# AGRULINE large diameter piping system

THE DURABLE PE-PIPING  
SYSTEM FOR HIGH  
VOLUME FLOW





## The Plastics Experts.

The AGRULINE product group offers a complete, high-quality product range of pipes, fittings, valves and customized components made from polyethylene for safe and environmentally friendly supply of gas, potable water and wastewater transport. Years of experience, a highly knowledgeable staff and state-of-the-art manufacturing equipment are the cornerstones for our high quality products.

The AGRU success story has been unfolding now for around seven decades. Founded back in 1948 by Alois Gruber senior, nowadays the company is one of the world's most important single-source suppliers for piping systems, semi-finished products, concrete protection liners and lining systems made from engineering plastics. Our ability to supply everything from a single source sets us apart. We use only top-grade thermoplastic polymers as our raw materials. When it comes to application-technical consulting, we are your best partner in the field.



### Quality

At AGRU, customer satisfaction comes first. Technical consultations, training courses, welding instruction and expert supervision on site are essential parts. The AGRU quality assurance system is compliant with ISO 9001:2008 and its environmental management system fulfils ISO 14001:2004. This in turn ensures that the products comply with international norms, as monitored and evaluated on an ongoing basis by independent testing agencies standards.

The start-to-finish attention to quality ensures that the products meet and beat the strictest technical specifications, providing safe operation within gas, water and wastewater infrastructures.

# AGRULINE large diameter piping system

## Cost and time saving installation and operation

Made from PE 100 or PE 100-RC, the AGRULINE large diameter piping system offers the most economic solution when it comes to high volume flow applications. The better long term hydraulic properties, which save operation costs, are based on a high resistance to corrosion, wear & tear and UV radiation. Together with its fast and easy installation, this is the perfect system both on- and offshore.

### Outstanding life span

#### **polyethylene never corrodes**

Less operating costs compared to other solutions

- based on a high resistance to corrosion, abrasion and UV radiation
- long lasting smooth internal surface reduces biogrowth / incrustations
- proofed maintenance-free operation

### Fast and easy installation

#### **polyethylene is flexible, lightweight and easy to weld**

Superior laying properties

- allowing various installation methods
- fast & safe sinking processes at offshore installation
- due to an extensive range of pipe diameters and fittings
- time saving butt welding provides durability and leak tightness
- a high fatigue strength prevents damages during installation & operation

### Heavy-duty dimensioned

**pipes available between OD 20 mm and OD 2500 mm from SDR 41 up to SDR 7,4  
(for larger pipe sizes up to SDR 17)**

Designed for highest demands

- perfect for power plants with large required quantities of cooling water
- withstands water hammers and pressure surges
- wide application range (sewage, mining, cooling, desalination, irrigation,...)





## AGRULINE large diameter pipes



### Smooth internal pipe surface

- Reduces biological growth and incrustations
- Is corrosion resistant and non toxic
- Provides high abrasion resistance
- Offers the best long-term hydraulic properties
- Permanent low head loss
- Results in lower pumping costs
- Provides excellent chemical resistance

## High fatigue strength

- Proven good resistance to seismic forces (impact and soil settlements)
- Safer handling compared to other materials
- Withstands water hammers and pressure surges
- Allows direction changes without elbows
- Prevents damages during installation and operation



## Large diameter pipes

- Are lightweight despite their enormous size, cutting down transport and installation costs on-site
- Feature a high roundness and uniform wall thickness for hassle-free installation
- Are equally suitable for heavy-duty on- and offshore applications
- Are simply the most economic solution for high volume flow applications







### Offshore installation

The AGRULINE large diameter piping system is the first choice for offshore installations. It is easy to tow the pipes to the installation site because of their buoyancy in water. Later, the safe and fast sinking process allows lowering the pipeline to the seabed in a flash, utilizing the PE pipe flexibility.

In conjunction with the PE intake head and diffuser solutions AGRU provides a complete system for durable offshore pipe installation. Chlorination piping solutions designed for the transported chlorination media are also offered whereby various piping materials (PE 100 RC, ECTFE) are available.

## AGRULINE large diameter pipes Applications



### Onshore installation

The wear and tear resistance and easy joining methods make the installation fast and safe. No heavy lifting and sophisticated equipment is necessary on-site. Thus, transport costs are significantly lower compared to other pipe materials. Pipe joining can be done outside and inside the trench. Up to OD 1400mm also EF-couplers for tie in joints are available.



### Relining

Alternate methods for restoration are sliplining, swagelining and sublining with AGRU PE pipes. This is a proven cost-effective method that provides a new pipe structure with minimum disruption of service, surface traffic, or property damage that would be caused by extensive excavation.

## High production standards

AGRU manufactures and tests large diameter pipes according to EN 12201/ISO 4427. Minimal ovality, uniform wall thickness and outstanding life span are the outcome.

Highest quality and state of the art PE 100 / PE 100-RC resins in combination with unique production technology are further important features of the AGRULINE large diameter piping system. Stringent QC in our test labs which are also fully equipped for testing large diameter pipes ensure top quality.



## One stop shop

AGRULINE large diameter pipes are available from our extensive stock in various dimensions and sizes. As a one stop shop supplier, AGRU also offers a wide range of fittings. Furthermore, optimized diameters and pipe lengths can be produced according project requirements.



## Logistics adopted for site requirements

The density of just 0,95 g/cm<sup>3</sup> results in light weight which facilitates the handling. Significant savings on transport costs can be achieved this way. Possibility of temporary storage and just-in-time delivery to the construction site reduces storage costs and space requirements on site.







# AGRULINE large diameter piping system

## Connection methods

### Various connection methods for ease of installation

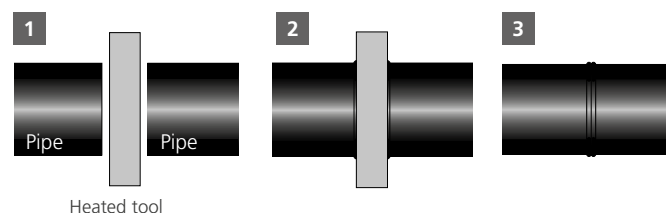
Four different connection methods are suitable and offered for joining AGRULINE large diameter pipes: Heated tool butt welding, electro-socket welding, saddle welding and flange connection.

The heat fusion process results in a monolithic piping system that is as strong and leak free as the pipe itself.



### 1. Heated tool butt welding

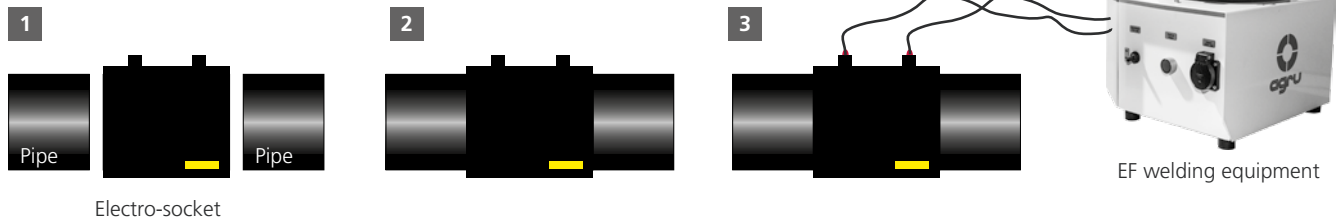
Heated tool butt welding is applicable up to OD 2500. The two pipe components are clamped in the welding machine and pipe ends are planned. The welding area is heated up with the heating tool and then joined together with a defined welding pressure. This ensures high-quality joints with excellent reproducibility under site conditions.





## 2. Electro-socket welding

Up to a diameter of 1400 mm the electro-socket welding method is an alternative. The repeatability of welding quality is similar as known for the butt fusion method. At the electro-socket welding, the scraped and cleaned pipes are placed into electro-sockets and then welded on both sides of the socket. The advantage is the small amount of space needed for performing this welding method as well as the easy handling of the small and lightweight welding machine.



## 3. EF saddle welding

Saddle welding is an efficient solution to create branches on existing or new pipelines (such as manholes, intake head connections and diffuser outlets). Saddles are clamped onto a scraped and cleaned pipe and welded by electrofusion welding. Branches in different positions on the main pipe can be created by this from AGRU offered method quick and easy. Also factory welded branches are offered from AGRU by this method.



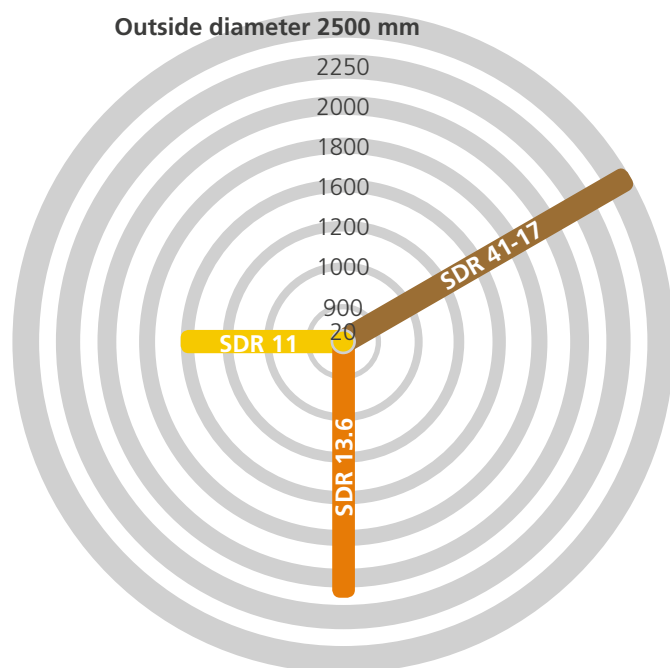
## 4. Flange connection

To connect two pipe segments without welding equipment, a flange connection can be chosen. Flange connections are detachable and thus provide easy access for e.g. cleaning or for the connection of prefabricated pipe spools. AGRU supplies stub ends, backing rings, blind flanges and suitable gaskets according DIN, ASTM (ASME) and AWWA standard up to OD 2500 mm.





## AGRULINE large diameter piping system



### Supply range PE 100 (-RC) pipe

AGRULINE large diameter pipes can be produced up to a diameter of 2500 mm with a wall thickness up to 150 mm. For special projects the wall thickness of the pipe can be tailor-made to provide the optimal solution for the clients at reduced costs.

SDR	max. working pressure (bar)
41	4
33	5
26	6.3
21	8
17	10
13.6	12.5
11	16

Further pressure ratings are available on request.

Applicable for 20°C / 50 years, safety factor  $c = 1.25$ , medium water (according to EN 12201)



## Chlorination pipes

Chlorination pipes are an essential part for offshore installed sea water intake systems. AGRU does provide a complete solution of chlorination pipes, fittings and valves which can be installed offshore. Depending on the transported chlorination chemical and working conditions PE 100-RC, PVDF, ECTFE or PFA pipes can be offered. For the safe and fast installation of these products AGRU also offers state of the art joining systems ( e.g. infrared fusion for PVDF and ECTFE piping). For detailed information please consult with AGRU Austria.



## Intake heads, diffusers and manholes

An intake head is fixed on a pipeline which transports water from the source (e.g sea, lake, river) to a chamber or directly to a pumping station. This special fitting prevents the intake of marine life forms and larger objects. AGRU can provide various solutions adopted for the project in PE. Diffusers are part of a piping system, which feeds back warmed up cooling water into the sea. The diffusers spread the hot water volume over a variety of outlets, allowing a fast and environmentally friendly adaptation to the ambient temperature. Headers and diffusers made in PE do offer many advantages in installation and operation.



Also large structures, such as manholes, can be fabricated out of PE piping components. Easy combination with the main pipes (e.g by welding) as well good hydraulic and corrosion resistance properties are an essential feature for onshore and offshore installations.





## AGRULINE large diameter piping system

### PE 100 (-RC) fittings

AGRU manufactures a wide range of standard fittings (machined and fabricated version). Using most modern workshop machines AGRU is able to provide special fittings and pre-fabricated spools according to the requirements of the clients.

In house design, state of the art fabrication and AGRU's one stop shop philosophy enable the client to get from one source a complete solution.



### Large diameter EF-couplers

AGRU produces large diameter EF-couplers from OD 560 up to OD 1400 mm using state of the art production technology which grants high product and welding quality. They feature:

- Maximum security due to completely embedded heating wire
- Bifilar welding system enables pre-installation of the EF-couplers outside the trench for mobile and space-saving application
- Available in SDR 11 and 17
- Perfectly suitable for tie in joints
- Weldable depending on the OD with pipes ranging from SDR 33 up to SDR 11



## Spigot saddle Topload

AGRU offers machined spigot saddles system "Topload" for large diameter pipes. The specially developed clamping system ensures a cost effective installation suitable for tight space configurations. They feature:

- Fully embedded heating wire
- Absolutely pressure resistant design
- Spigot connection by butt or electro-socket welding
- Easy mounting for specially developed clamping device
- Spigot adjustable in any position on the main pipe

### SUPPLY RANGE CODE 289

#### Dimensions STS 355-2500







Dimension main [mm]	Dimension spigot [mm]
355 - 1400	90, 110, 125, 160, 180, 200, 225
450 - 1400	250, 280
450 - 2500	315
710 - 2500	355, 400, 450, 500
1600 - 2500	560, 630, 710, 800, 900
Special dimensions not listed are available on request.	



## Supply range PE 100 (-RC) fittings

AGRU manufactures full pressure resistant fittings out of round- and hollow bars. Furthermore fittings, segmented out of pipes like bends and tees can be provided.

### SUPPLY RANGE PE 100 RC FITTINGS

						
	<b>Bend 30°, 45°, 90°</b>	<b>Tee</b>	<b>Reduced Tee</b>	<b>Stub flange</b>	<b>Reduction</b>	<b>End Cap</b>
SDR 41 - 11 SDR 41-13,6 SDR 41 - 17	800	800	800/≤ 700	800	800/630/800/710	800
	900	900	900/≤ 800	900	900/710/900/800	900
	1000	1000	1000/≤ 900	1000	1000/900	1000
	1200	1200	1200/≤ 1000	1200	1200/1000	-
	1400	1400	1400/≤ 1200	1400	1400/1200	-
	1600	1600	1600/≤ 1400	1600	1600/1400	-
	1800	1800	1800/≤ 1600	1800	1800/1600	-
	2000	2000	2000/≤ 1800	2000	2000/1800	-
	2250	2250	2250/≤ 2000	2250	2250/2000	-
	2500	-	2500/≤ 2250	2500	2500/2250	-



### Offshore/onshore installation

Sea water intake pipe (PE 100 OD 2500 mm SDR 26) connected to the onshore intake building

## AGRULINE large diameter piping system References



### Installation without sand bed

PE 100-RC is crack resistant and allows onshore installation without cost intensive sand bedding.



### Giant cooling water piping system

AGRU provided PE 100 large diameter pipes (OD 2500 mm, SDR 26) for a cooling water intake and outfall in a large scale power plant.





The Plastics Experts.

Your distributor

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**AGRU Kunststofftechnik GmbH**  
Ing.-Pesendorfer-Strasse 31  
4540 Bad Hall, Austria

T. +43 7258 7900  
F. +43 7258 790 - 2850  
office@agru.at

