

AGRU bends

FOR HIGH-EFFICIENCY
PIPING SYSTEMS





The Plastics Experts.

AGRU bends: the perfect curve

It's hard to imagine modern water piping networks without AGRU plastic bends now. Bends give you piping benefits that are often lost due to excessively small radii and sharp changes of direction. With an AGRU bend, you will always have a solution for a variety of uses at your disposal.

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 9001:2015 and its environmental management system fulfils ISO 14001:2015. 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 waste-water infrastructures.

Maximum volumetric flow rate and unparalleled use flexibility

AGRU supplies two different types of bend: sweep bends, which guarantee the highest possible volumetric flow rate, and 90° MULTI-bends, which offer maximum use flexibility. Sweep bends are mechanically and thermally shaped from extruded pipes with a large, flow-optimised bend radius of 1.5 x OD. 90° MULTI-bends are manufactured in special injection moulds with completely homogeneous interior surfaces. Due to their slightly smaller bend radius of 1 x OD, they are similar to 90° bends in terms of compactness, but offer 30 % less flow resistance.

SWEEP BENDS - BENEFITS

Lower operating costs

Sweep bends have the best hydraulic properties

The large bend radius of 1.5 x OD results in

- the highest possible volumetric flow rate, even when there are many changes of direction in the piping network
- reduced energy costs as less pump performance is required
- easier maintenance as the entire piping system is piggable



High dimensional stability conforming to pressure class

Machine-bent AGRULINE PE 100 / PE 100-RC pipes

Sweep bends made of PE 100 / PE 100-RC from AGRU

- enable pressure-class-conforming piping systems without a loss of pressure
- offer great dimensional stability, as the arms are not heated in the manufacturing process
- have FM 1613 approval for underground fire protection systems

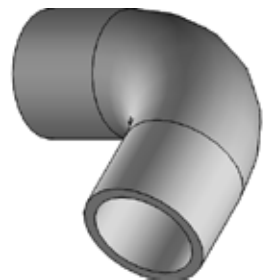
90° MULTI-BENDS - BENEFITS

One bend for all applications

The AGRU 90° MULTI bend combines the benefits of different angles and bends

Injection-moulded 90° MULTI-bends

- can be connected using various welding techniques
- can, when the OD is at least 250 mm (in the case of SDR 11 and 17), be cut to create fully pressure-resistant 45° bends
- are compact and have excellent hydraulic properties



Multifunctional

Developed for transporting gas, water, ultrapure water and chemicals

90° MULTI-bends are extremely flexible, because

- they have 30 % less flow resistance than 90° bends
- their long arms are suitable for infrared, butt and electro-socket welding
- they are available in PE 100-RC, HDPE-el, PP, PVDF-UHP, ECTFE, natural PP, PP-pure (Polypure)



AGRU sweep bends

The innovation in water piping networks



Panta rhei - everything flows

The famous saying by the Greek philosopher Heraclitus also describes the benefits of AGRU sweep bends. They are made in a way that guarantees the highest possible flow rate and are available in dimensions of up to 630 mm. With their long welding ends, they are designed for heated element butt welding or electro-socket welding. The large bend radius of 1.5 x OD ensures optimal flow characteristics and full pressure resistance.

Dimensions

AGRULINE sweep bends made of PE 100-RC are available in the following designs:

PRODUCT RANGE

Pressure class	SDR 7.4, 9, 11 and 17
Angle	11°, 22°, 30°, 45° and 90°
Outside diameter	90, 250, 280, 315, 355, 400, 450, 500, 560 and 630 mm

AGRU is also happy to provide bends in other dimensions and materials on request. The pipe ends are sealed with end caps for delivery. If they are going to be subjected to extended storage durations or long transport routes and high temperatures, AGRU pipe bends can be delivered with angle brackets if requested by the customer.



The AGRU MINELINE product range also includes sweep bends

Sweep bends are manufactured with an abrasion-resistant inner layer (the MINELINE piping system by AGRU) for use in piping systems that transport abrasive media. The bend radius here is 3 x OD for improved slurry transport.



MINELINE II 90 degree r3



MINELINE II 45 degree r3

Sweep bends made of PP

AGRU also makes sweep bends from PP material if these are requested by a customer. PP is perfectly suited for industrial applications involving high temperatures. Sweep bends made of PP are very stiff and have excellent temperature and chemical resistance.









AGRU 90° MULTI-bends Versatile



Always right-angled

The AGRU 90° MULTI bend is an injection-moulded part with excellent dimensional stability. Thanks to state-of-the-art injection moulding technology, the smooth inner surfaces this achieves and a generous bend radius of 1 x OD, the flow resistance can be reduced by 30 % compared to standard bends. Due to their long arms, these bends can be double-clamped for welding. Depending on the material, infrared, butt or electro-socket welding are used for this. When the OD is at least 250 mm in the case of SDR 17, the 90° MULTI bend can be split into two fully pressure-resistant 45° bends.

Dimensions

AGRU 90° MULTI-bends are immediately available from stock in the following designs:

PRODUCT RANGE

Pressure class	SDR 11, 17, 21, 33 (depending on the material)
Material	PE 100-RC, HDPE-el, PP, PVDF-UHP, ECTFE, natural PP, PP-pure (Polypure)
Angle	90°
Outside diameter	available between 20 and 315 mm depending on the pressure class

AGRU is also happy to provide bends in other dimensions and materials on request.



Injection-moulded bends with long arms

The AGRU 90° MULTI bend can be connected perfectly using butt, electro-socket or infrared welding. The long arms also enable double clamping on the welding machine. Due to the use of high-performance injection moulding in the manufacturing process, the ovality of the welded ends is well below the norm. This guarantees extremely precise welding results. The excellent injection moulding quality ensures full pressure resistance as well, which increases safety levels.



It can take the pressure

The optimised design of the AGRU 90° MULTI bend impresses with lower pressure loss and the improved flow properties this entails. The MULTI bend allows flow quantities and flow speeds that are 30 % higher than those allowed by legacy bends and elbows. And it can be used for a wide range of applications thanks to its compact design. The photo shows an ultrapure water system used to supply water for process water pipes in the semiconductor, food and pharmaceutical industries.









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Your distributor

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