

# AGRULINE PE 100-RC Fittings

FOR OUTSTANDING  
CRACK RESISTANCE



# The Plastics Experts.

AGRULINE fittings made of innovative material PE 100-RC are used to create connections that are permanently leakproof in PE 100 (-RC) piping systems. The resilient material means AGRULINE fittings can be installed without time- and cost expensive sand bedding. Universal welding machines are used to connect pipes made of PE 80, PE 100 and PE 100-RC with AGRULINE fittings to create joints that are permanently leakproof.

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 of 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 regulations and 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.

# Multiple layers of safety for your piping system

All AGRULINE fittings are now made of PE 100-RC (RC = resistant to cracks). Modified PE 100, which until recently was only used for special, customer-specific applications, is now used throughout the entire AGRULINE product range. The main technical advantage of PE 100-RC is that it is significantly more resistant to slow crack growth. This saves costs during installation, improves safety, and extends the service life of the entire piping system.

## Higher service life under extreme conditions

### than PE 100 fittings

PE 100-RC offers greater operating safety thanks to

- its excellent resistance to point loads and the stress cracks resulting from these
- its effective protection against slow crack growth

## Cost-efficient

### installation without sand embedding possible

Resilient AGRULINE fittings

- can be installed in virtually any subsoil, which saves costs
- are ideal for trenchless installation
- are extremely resistant to point loads, such as stones

## Maximum safety in welded joints

### with electro-socket or heated tool butt welding of PE 100-RC

Long-term creep tests prove

- that welded joints have a significantly longer service life under extreme conditions
- that welded joints have an enormous load-bearing capacity, even long-term
- that PE 100-RC is easy to weld with PE 100 and PE 80

## One-stop shopping

### A complete piping system for gas, water, waste water and chemical media

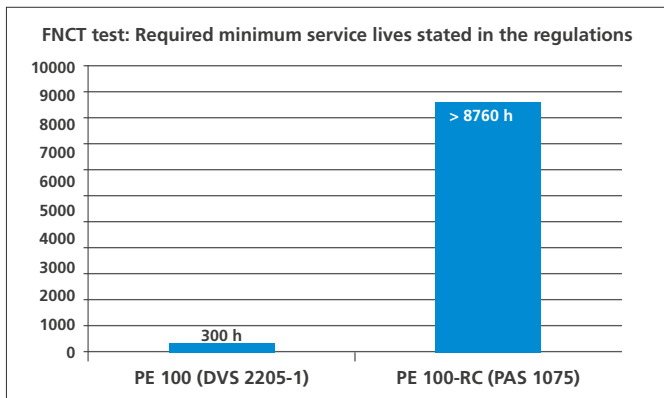
The AGRULINE piping system made of PE 100-RC

- is resilient to pressure surges and seismic activity
- can be supplied in dimensions between OD 20 mm - OD 3260 mm
- comes with DIBT, FM, DNV... approval



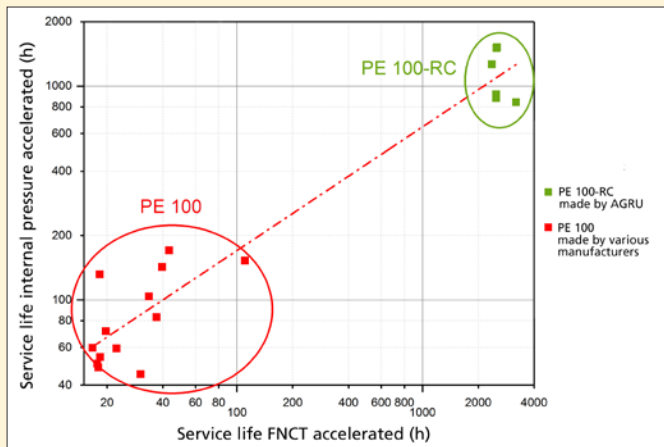
# PE 100-RC

## A new dimension of reliability



### PE 100-RC material requirements

The full-notch creep test (FNCT as per ISO 16770) is a recognised test method for determining resistance to slow crack growth in polyethylene. After a wetting agent has been applied, a notched test specimen is exposed to tensile stress at a high temperature (80 °C). The minimum service life for PE 100-RC fittings must be > 8760 hours acc. to PAS 1075. In contrast to this, the required minimum service life for PE 100 components acc. to DVS 2205-1 is just 300 hours. The excellent quality and operating safety of AGRULINE fittings has now been substantially improved once again through the new PE 100-RC.



Source: HESSEL Ingenieurtechnik GmbH

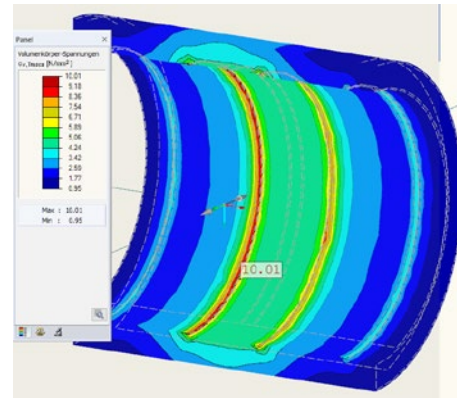
### Standing times up to 10 times longer

In a comprehensive series of tests, the renowned HESSEL Ingenieurtechnik GmbH test institute impressively demonstrated that the service life of PE 100-RC E-couplers is many times longer than that of PE 100 E-couplers currently available on the market. The vertical axis shows the service life in an accelerated internal pressure test (90 °C, test pressure of 9.2 bar and wetting agent 2% NM5 in deionised water). The horizontal axis shows the correlating service life of corresponding test specimens in a full-notch creep test (FNCT), which were also subjected to accelerated test conditions.

**The results of these tests proof a service life of up to ten times longer for PE 100-RC electro-socket fittings under identical test conditions!**

## Inseparable joints

High operating pressures, as well as expansion and contraction caused by temperature fluctuations, especially in piping systems installed above ground, are hard on the welded joints. The edge of the welding zone at the centre of the coupling faces the highest exposure to tension and internal pressure loads. It has been proven that higher resistance to slow crack growth therefore leads to better long-term results. The use of AGRU fittings and pipes which are now completely manufactured using PE 100-RC achieves considerable improvements in electrosocket and heated tool butt welded joints. This enhances the long-term safety of underground and above-ground piping systems.



Simulation of stress peaks occurring around the edges of the weld under test conditions as per DIN EN 1555-3 and DIN EN 12201-3. Source: HESSEL Ingenieurtechnik GmbH



## Convenient installation

Thanks to their extremely high resilience to occurring point loads caused by objects such as stones, AGRULINE PE 100-RC fittings can be installed on virtually any terrain without an expensive sand bed.

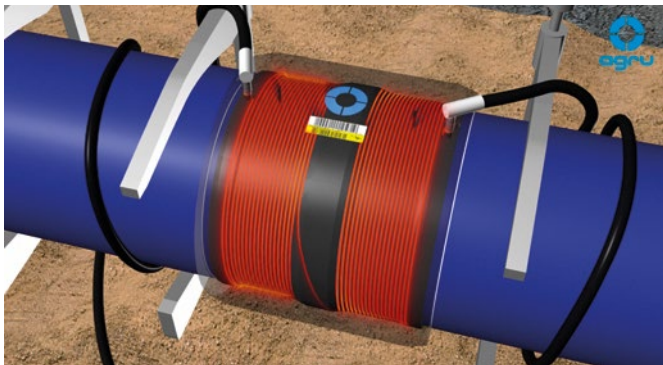


## Maximum operational reliability

Temperature and pressure differences cause tensile stress in piping systems installed above ground. In heated element butt welded joints, PE 100-RC also prevents stress-induced notching around the edge of the weld bead.



## AGRULINE electro-socket fittings Easy installation - more safety



### Electro-socket welding

- This method involves connecting using a fitting with an embedded heating wire. When heat is applied, the plastic in the welding zone plasticises and connects the pipe to the electro-socket fitting homogeneously.
- AGRU electro-socket fittings have offered best-in-class weld quality for 30 years. This is ensured by the stable position of the embedded heating wire and the excellent gap closing ability.
- External-temperature-driven welding times also achieve best-in-class results at low temperatures (down to -10 °C).



### Smooth weld surfaces

Embedded heating wire ensures smooth, easy-to-clean internal surfaces. Also, the heating wire is protected against installation damage and corrosion during operations. Large, installation-friendly inner diameters allow stress-free welding, as required by DVS. The resulting annular gap is automatically closed on welding.

# AGRULINE electro-socket fittings made of PE 100-RC

E-Coupler injection moulded  
(monofilar up to OD 500 mm)  
and machined  
(bifilar from OD 560 – OD 1400 mm)  
SDR 11 OD 20 mm – OD 900 mm  
SDR 17 OD 90 mm – OD 1400 mm



E-Elbow 45°  
SDR 11 OD 20 mm – OD 225 mm  
Monofilar



E-Reducer  
SDR 11 OD 20 mm – OD 225 mm  
Monofilar



E-Elbow 90°  
SDR 11 OD 20 mm – OD 225 mm  
Monofilar



E-Tee  
SDR 11 OD 20 mm – OD 225 mm  
Monofilar



E-End Cap  
SDR 11 OD 20 mm – OD 225 mm  
Monofilar



Gas flow guard  
SDR 11 OD 20 mm – OD 63 mm  
Monofilar



E-Adaptor Socket  
SDR 11 20 x 1/2 - 63 x 2  
Monofilar



E-Tee reduced  
SDR 17-11  
OD 25/20 mm – OD 160/125 mm  
Monofilar





## AGRULINE saddles and valves

### Spigot saddles - an affordable alternative for branches

affordable solution for installation of branches on main lines

- easy installation and flexible adjustment on the main pipe
- injection-moulded version up to Dim 355 mm
- machined version from 355 - 3500 mm
- simplified installation of the „Topload“ system through specially engineered clamping system



#### SPIGOT SADDLES INJECTION-MOULDED

Dim of main [mm]	Dim of spigots [mm]
90	20, 32, 40, 63
110	20, 32, 40, 63
125	20, 32, 40, 63
160	32, 40, 50, 63, 90, 110
180	32, 40, 50, 63, 90, 110
225	32, 40, 50, 63, 90, 110
250	63, 90, 110
280	50, 63, 90, 110
315	63, 90, 110
355	63, 90, 110

#### SYSTEM TOPLOAD, MACHINED

Dim of main [mm]	Dim of spigots [mm]
355-1400	90, 110, 125, 160, 180, 200, 225
450-1400	250, 280
450-2500	315
710-2500	355, 400, 450, 500
1600-3500	560, 630, 710, 800, 900, 1200



# Hot-Tapping - tapping under pressure

## Tapping saddles - creating branches by hot tapping

Creating branches (e.g. house connections) on main pipes during operation

- quick and easy installation through mounting belt
- gas-tight through patented telescoping tapping system
- clean, leak-tight tapping without chips or residues
- extra long spigots for 2x electrofusion
- tapping system allows pressure test
- to be combined with a gas flow guard

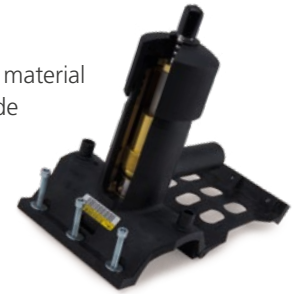


TAPPING SADDLES	
Dimension of main [mm]	Dimension of spigots [mm]
40	20, 25, 32
63	20, 25, 32, 40, 63
90	25, 32, 40, 63
110	20, 25, 32, 40, 63
125	20, 25, 32, 40, 63
160	20, 25, 32, 40, 63
180	25, 32, 63
200	20, 25, 32, 40, 63
225	25, 32, 63
250	32, 63
315	63

## Pressure tapping valves - creating branches by hot tapping with valve function

Creating branches (e.g. house connections) on main pipes during operation with integrated valve function

- rapid opening and closing with maximum 10.5 rotations
- reduced flow loss thanks to optimised component design
- enduring quality thanks to PE 100-RC material and integrated valve components made of lead-free brass and stainless steel
- extra long spigots for 2x electrofusion



PRESSURE TAPPING VALVES	
Dimension of main [mm]	Dimension of spigots [mm]
63	32, 40, 50, 63
90	32, 40, 50, 63
110	32, 40, 50, 63
125	32, 40, 50, 63
160	32, 40, 50, 63
180	32, 40, 50, 63
225	32, 40, 50, 63
250, 280, 315, 355	63

## Stop-Off-Saddle - shutting off PE Gas pipeline sections

Stop-Off-Saddle is used wherever damage to gas pipes must be repaired quickly and when there are no valves to shut off.

- fully embedded heating coil - easy to clean welding surfaces, protection against corrosion, even and gentle heat distribution in the welding zone
- high quality material PE 100-RC - highest resistance to slow crack growth, cost savings by omitting the sand bed
- special construction features - quick installation with fixation straps and screws and little need for space
- guaranteed traceability of each component - due to continuous serial number and traceability code

STOP-OFF-SADDLE	
Dimension of main [mm]	Dimension of spigots [mm]
90 mm	2 1/2"
110 mm	2 1/2"
125 mm	2 1/2"
160 mm	2 1/2"
200 mm	2 1/2"
225 mm	2 1/2"
315 mm	2 1/2"





## AGRULINE fittings for heated tool butt- and electro-socket welding



### Heated tool butt welding

The planed facing surfaces of the pipe and fitting are matched under pressure onto the heating element to build up a weld bead and then heated virtually without any pressure. After the heating, the bonding surfaces are released and the heating element is removed. The pipe and fitting are pressed together for the jointing time at a specified jointing pressure.



### Heated tool socket welding

Like in electro-socket welding, the pipe and fitting are welded together in an overlapping position. The two parts need to be heated to the required temperature using a heated spigot and a heated coupler. Then the two parts are bonded taking the welding parameters temperature and welding time into consideration.

## Multi-bends - multi-functional

- stable bends suitable for butt- and electro-socket welding
- top flexibility – can be used as a long-spigot or, when cut, as a short-spigot fitting



### PRODUCT RANGE

#### Dimensions

SDR 17	OD 63 mm - 315 mm
SDR 11	OD 20 mm - 315 mm



## Elongated fittings - improved flexibility during welding

- compatible with butt welding and electro-socket welding for flexibility in applications
- low-stress thanks to optimised gate system



### PRODUCT RANGE

#### Dimensions

SDR 17	OD 63 mm - 500 mm
SDR 11	OD 20 mm - 500 mm



## Short-spigot fittings - for heated tool butt welded pipelines

- outstanding rupture strength thanks to cutting-edge injection moulding technique
- for pipeline installations with serious space restrictions
- easy to handle on-site thanks to low weight and compact component dimensions



### PRODUCT RANGE

#### Dimensions

SDR 33	OD 110 mm - 500 mm
SDR 17	OD 63 mm - 500 mm*
SDR 11	OD 20 mm - 500 mm*

\*Stub flanges up to OD 710 mm





### Heated tool socket fittings - in small dimensions

- compact fittings for fast connections using heated tool socket welding
- easy to handle, even at limited space conditions
- affordable solution and affordable welding equipment



#### PRODUCT RANGE

##### Dimensions

OD 20 mm - 110 mm



### Sweep bends - improved flow resistance

- unimpeded flow of media thanks to smooth inner surface and large radius
- bent but stable pipes - available in many dimensions and angles
- full pressure resistance
- for gas and water
- suitable for heated tool butt welding and electro-socket welding



#### PRODUCT RANGE

##### Dimensions

SDR 17 OD 90 mm - 800 mm

SDR 11 OD 90 mm - 800 mm

11°, 22°, 30°, 45°, 60°, 90°

other SDR levels available on request



### FM 1613 approved pipes and fittings - for reliable underground fire protection lines

- FM 1613 approved for top reliability in emergency situations
- corrosion-free, eliminating threat of sprinkler clogging
- subject to 3,2 x maximum operating pressure during certification to ensure top safety



#### PRODUCT RANGE

##### Dimensions

218 psi OD 63 mm - 630 mm

250 psi OD 63 mm - 500 mm

## AGRU SDR 7.4 pipes and fittings - for high-pressure applications

- higher wall thickness can handle water pressure up to 25 bar
- extensive range of products, including injection-moulded fittings
- strong static ratings for maximum safety in practical applications
- fit SDR 7.4 pipes in dimensions from 63 – 500 mm



### PRODUCT RANGE

#### Dimensions

SDR 7.4	OD 63 mm - 500 mm
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## Segmented fittings - also available in special dimensions

- segmented fittings are available in dimensions up to OD 3260 mm and are designed and harmonised to the customer's specific specifications
- solutions with or without pressure derating-factor available
- top flexibility, as pieces are produced to meet the customer's requirements
- expert workmanship and strict QA ensure identical performance to standard fittings



### PRODUCT RANGE

#### Dimensions

SDR 41	OD 560 mm - 3500 mm
SDR 33	OD 560 mm - 3500 mm
SDR 26	OD 560 mm - 3500 mm
SDR 17	OD 560 mm - 2500 mm
SDR 11	OD 560 mm - 1600 mm



## Customized fittings - in accordance with your needs

- customized fittings are available in dimensions up to OD 3500 mm
- designed according to customer requirements to ensure a perfect fit
- reduced overall costs through perfect integration in any construction plans
- pressure-rated versions available by request



### PRODUCT RANGE

#### Dimensions

Available in various pressure ratings up to OD 3500 mm, by request





## References

Pipes and fittings made of PE 100-RC also show their strengths in high alpine terrain. Time and cost-saving installation is possible without a sandbed.



Pipes and fittings made of PE 100-RC in the diameter OD 280 mm in SDR 17 installed above ground to connect cooling towers and cooling units.

For special projects, AGRU manufactures solutions that meet the requirements of the application from the high-performance plastic PE 100-RC.



For now, AGRU fittings made of PE 100-RC are the pinnacle of more than 50 years of development work. High-precision manufacturing, full pressure and point load resistance open up new dimensions in PE piping system building.



As a single-source supplier, AGRU also provides the matching pipes in PE 100-RC for all PE 100-RC fittings. For more details on our complete system, see our AGRULINE, Large Diameter Piping System, FM Approved and Custom Parts brochures.



The Plastics Experts.

Your distributor

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