

PURAD

HIGH PURITY PIPING SYSTEMS



agru

Worldwide Competence
in Plastics





Worldwide competence in plastics

The AGRU Kunststofftechnik GmbH is a family-owned, highly productive enterprise, headquartered in Austria with worldwide activities. These include the production and sales of high-quality thermoplastic polymer products.

The PURAD piping system is used for the transport of ultra high purity media and exhaust duct in semiconductor, life science and food industries. Purity, chemical resistance, and safety are the key benefits of the AGRU PURAD product line.

PURAD piping systems have been proved worldwide to fulfil even the most critical applications and safety requirements.

PURAD PIPING SYSTEM



Quality

AGRU's top priority is the satisfaction of its customers. Ongoing development and improvement of our quality management system are based on the ISO 9001:2008 certification. The high precision and performance of AGRU products are defined by international standards which specify properties and requirements. These are verified by permanent internal controls and regular external inspections.

State-of-the-art production technologies, the application of high-grade materials and the unique product design guarantee the best quality for each application. This is proved by company and test certificates according to EN 10204. USP class 6 and FDA conformity are certified for the PVDF and PP material.



Solutions for each requirement

- **PVDF-UHP**
Piping system for the transport of ultra high purity media (UPW, HPW, PW, WFI)
- **PP-Pure (PP high purity)**
Piping system for the transport of high purity media (low quality UPW, HPW, PW)
- **Polypure (PP natural)**
Piping system for the transport of high purity media (low quality UPW, HPW, PW, slurries)
- **ECTFE**
Piping system for the transport of highly aggressive chemicals and ultra high purity media (UPW, WFI, H_2SO_4 , HCl, HF, NaOH, HNO_3 , ...)
- **PVDF-Vent**
Exhaust piping system for the transport of aggressive and contaminated process gases

THIS IS REAL PURITY



High purity production

Purity is the main principle for the production of the components. State-of-the-art production facilities are applied to manufacture high purity products under ISO class 5 cleanroom conditions. AGRU provides a complete range of pipes, fittings, valves, measuring and control technology, as well as special custom-made components. These are designed to offer the best solution for UPW supply systems.

Logistics and service

High production capacities, a large stock of products and raw materials, as well as local warehouses in many countries offer fast availabilities of all products required. Our worldwide distribution network provides competent local service and technical assistance.





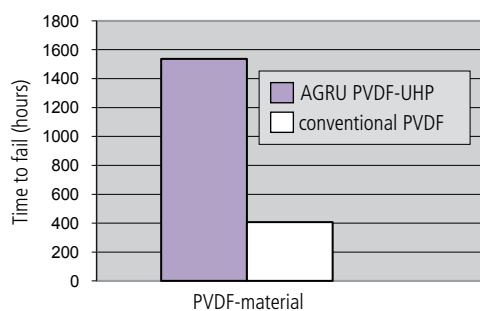
PVDF-UHP piping systems (ultra high purity)

PVDF is an extremely pure polymer and contains no stabilisers (e.g. UV), softeners, lubricants or flame-retardant additives in comparison to a lot of other plastics. It is particularly suitable for ultra pure media constructions and distribution systems in the industry.

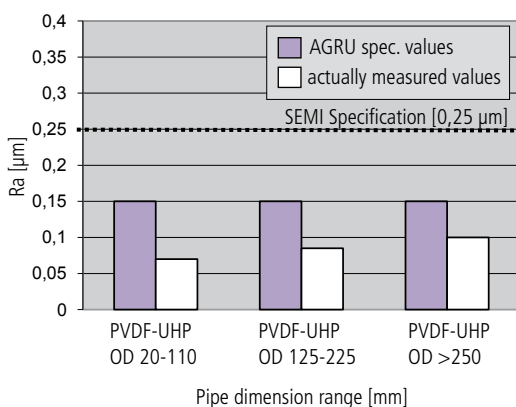
Contamination from the piping system is almost impossible because of the excellent leach-out behaviour of the PVDF material. AGRU PVDF-UHP piping systems have been successfully approved in the semiconductor industry for more than 25 years.

THE RIGHT SOLUTION

Full notch creep test (FNCT) (according to DVS 2203-4)



Surface quality of PVDF-UHP



Advantages of the PURAD PVDF-UHP system

- Best mechanical and physical properties
- Higher safety margin
- Excellent long-term behaviour
- Highest welding joint quality is achievable (IR non-contact, beadless and butt welding)
- Lowest leach-out values at high and low temperatures
- Excellent surface quality (small roughness, no micropores) ensures low risk of biofilms

All piping system components are made of the same PVDF basic material (suspension grade PVDF type II according to ASTM D 3222).

PP-Pure & Polypure piping systems

The PP-Pure (PP-HP grey) and Polypure (PP natural) piping systems are made of especially selected Polypropylene material - PP-R (polypropylene random copolymer). These products do not contain plasticisers and distinguish themselves with low specific weight and excellent processability.

Advantages of the PURAD PP-Pure and Polypure system

- Good mechanical properties, e.g. improved impact strength
- Higher pressure resistance and higher safety in each application
- Very low leach-out behaviour, especially at media temperatures of $<50^{\circ}\text{C}$
- Very good weldability
- Cost-effective solution in comparison to other materials



FOR YOUR APPLICATION



ECTFE piping systems

ECTFE provides excellent chemical resistance and high mechanical strength even at high temperatures. These characteristics enable the use of ECTFE as a cost-effective solution for many applications with ultra pure media.

Advantages of the ECTFE system

- Best product surface of all fluoropolymers
- High purity material also at high operating temperatures
- Excellent weldability with IR-fusion
- Higher safety margin
- Very good chemical resistance to ultra pure media used in the semiconductor and solar cell production
(e.g. H_2SO_4 98 %, HCl 37 %, HF 90 %, NaOH 50 %, HNO_3 65 %, ...)





PVDF-Vent

Highest requirements are demanded from process ventilation piping systems. Irregular operation conditions, e.g. different exhaust concentrations and operating temperatures require a piping system with excellent chemical and mechanical resistance.

Advantages of the PURAD PVDF-Vent system

- Corrosion resistance
- Safe and cost-effective joining method by welding
- FM 4910 specification tested
- Extensive product range designed for this specific application area

SAFE OPERATION

Safe connection

As well as high product quality, correct joining methods and installation are essential factors for the operation of a piping system.

AGRU offers special solutions for welding joints and for the pipe support:

- Infrared welding technology (SP series)
- Butt welding technology
- Beadless welding technology (SP 110-B)
- Mechanical connections (DIN, ANSI and JIS flanges; sanitary joints; unions and adaptors)
- Pipe supports



PURAD system - applicable in many areas

- **Microelectronic industry**
Semiconductor factories
Display factories (LCD, PDP, TFT, LED)
Solar cell production (PV)
LED, OLED production
Printed circuit board production (PCB)
- **Life science industry**
Pharmaceutical industry
Biotechnology
Laboratories and research facilities
Hospitals
Dialysis laboratories
- **Food and beverage industry**
- **Dairies**
- **Ultra pure and pure water systems for power plant construction and for different industries (e.g. petrochemical industry, ...)**



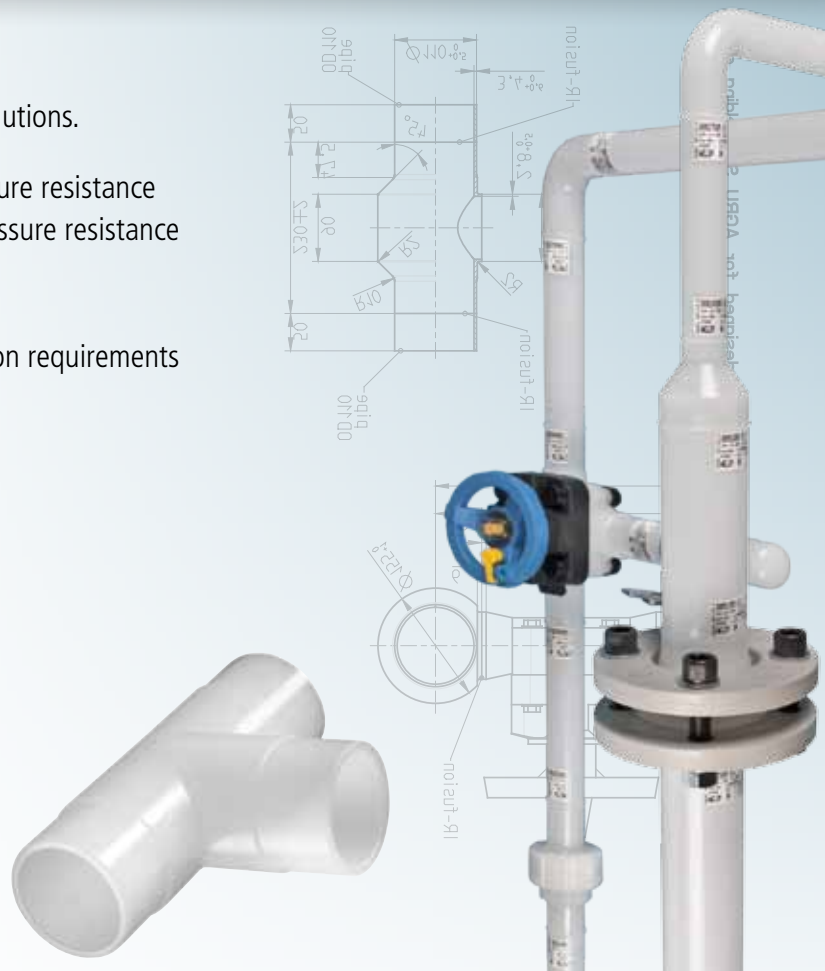
BEST QUALITY AND AVAILABILITY



One-stop shopping

We offer our customers tailor-made system solutions.

- Pipes up to OD 500 mm and 16 bars pressure resistance
- Fittings up to OD 500 mm and 16 bars pressure resistance
- Valves up to OD 140 mm
- Measurement and control technology
- Special components according to application requirements
- ePTFE Seal Clean flange gasket
- Rental and sales of welding equipment
- Project assistance and supervision
- Worldwide distribution network



Welding technologies for your applications

SP SERIES

IR-welding technology at the highest level!

- Shortest welding times
- Highest repeatability of weld quality
- Universal
- Compact construction

SP 110-B

Unique beadless welding technology!

- Smooth inner bore and outer surface
- Highest repeatability of weld quality
- Smallest area required
- Fully automated welding process



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