

# ECTFE System

THE PREMIER  
LEAGUE



# Products made of ECTFE

PERFECT FOR HIGHEST  
REQUIREMENTS



**„It would seem that perfection is attained not when no more can be added, but when no more can be removed.“** Antoine de Saint-Exupéry

## Competence in plastics

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

In order to protect humans and the environment in critical application areas an extremely resistant material is a prerequisite especially for media with a high potential to oxidise.

AGRU is the only supplier in the plastic sector with an extensive delivery program of the thermoplastic fluoropolymer ECTFE - also known under the name of HALAR®.

## Performance in practice

### Lining of tanks:

93% - 96% sulphuric acid at 60°C to 70°C, no corrosion for 12 years.

### Heat exchanger:

98% sulphuric acid at up to 70°C, smooth handling for 15 years.

### Piping systems

for the transport of contaminated wastewater in the pharmaceutical industry operating for > 5 years.



The Plastics Experts.

## Application range

ECTFE is primarily used in the chemical, semiconductor, photovoltaic, pharmaceutical and petrochemical industries for following application areas:

- Supply systems for chemicals
- Process equipment and distribution piping systems
- Hot ultra-pure water systems
- Double containment piping systems
- $\text{H}_2\text{SO}_4$  injection piping for sewage treatment plants
- Ventilation piping for aggressive exhaust air
- Heat exchanger for highly aggressive media and high-purity media
- Lining as corrosion-protection for steel, FRP and concrete tanks



## Safe handling of highly aggressive substances

ECTFE shows a remarkable hardness and excellent chemical resistance to most organic and inorganic chemicals (pH-value 0 to 14, max. 140°C) as well as solvents (max. 120°C). This is valid for:

- Sulphuric acid  $\text{H}_2\text{SO}_4$  (98 %)
- Hydrochloric acid  $\text{HCl}$  (37 %)
- Hydrofluoric acid  $\text{HF}$  (90 %)
- Sodium hydroxide  $\text{NaOH}$  (50 %)
- Hydrogen peroxide  $\text{H}_2\text{O}_2$  (60 %)
- Nitric acid  $\text{HNO}_3$  (65 %)
- Solvents
- Chlorine and chlorine compounds



## Top features

- Stable and highly resistant to crack growth
- Ultra pure and flame resistant (FM 4910 tested raw material; UL94-V0)
- Physiologically non-toxic application

## Resistant to:

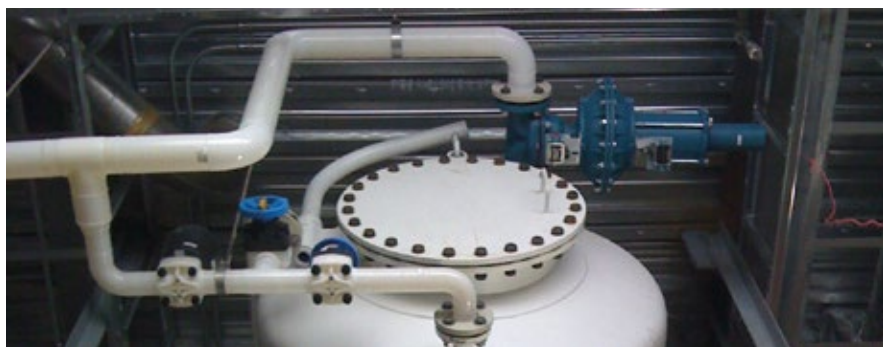
- High pressure
- UV and gamma radiation
- Diffusion and permeation

## An outstanding material ...

The special combination of ECTFE product properties predestines the polymer for the long-term use in highly critical applications. The positive characteristics hardly change over a broad temperature range.

## ... with added value!

AGRU has many years experience of processing ECTFE into high-quality plastics systems. Therefore the outstanding features of the material can be utilised to maximum advantage, resulting in long lasting, economic systems.







## Our quality standard

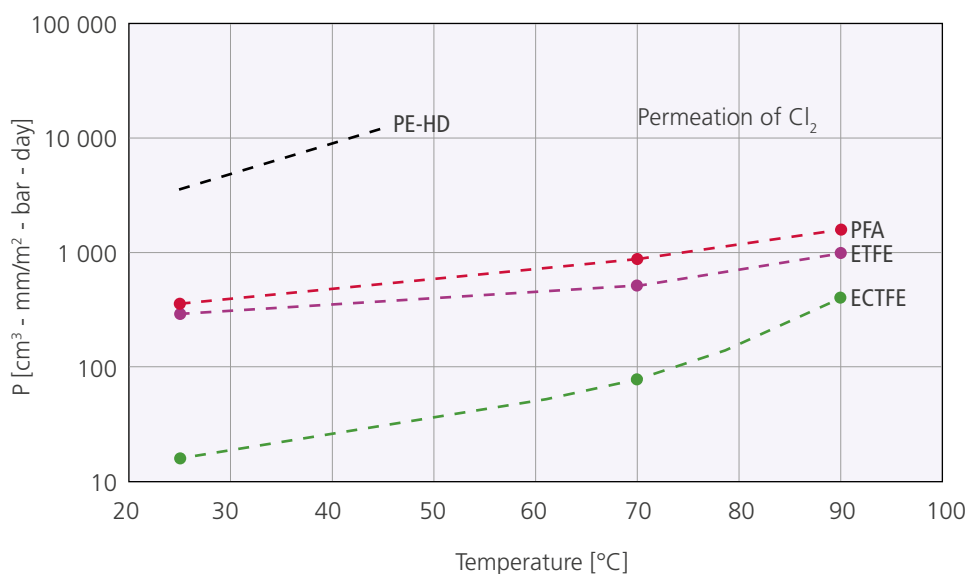
We have installed a quality management system with internal and external quality controls to ensure that our products prove themselves in practice in the long-term. We are an ISO 9001:2008 certified enterprise who produces according to well-established international standards.

This is proven by means of company and inspection certificates according to EN 10204.



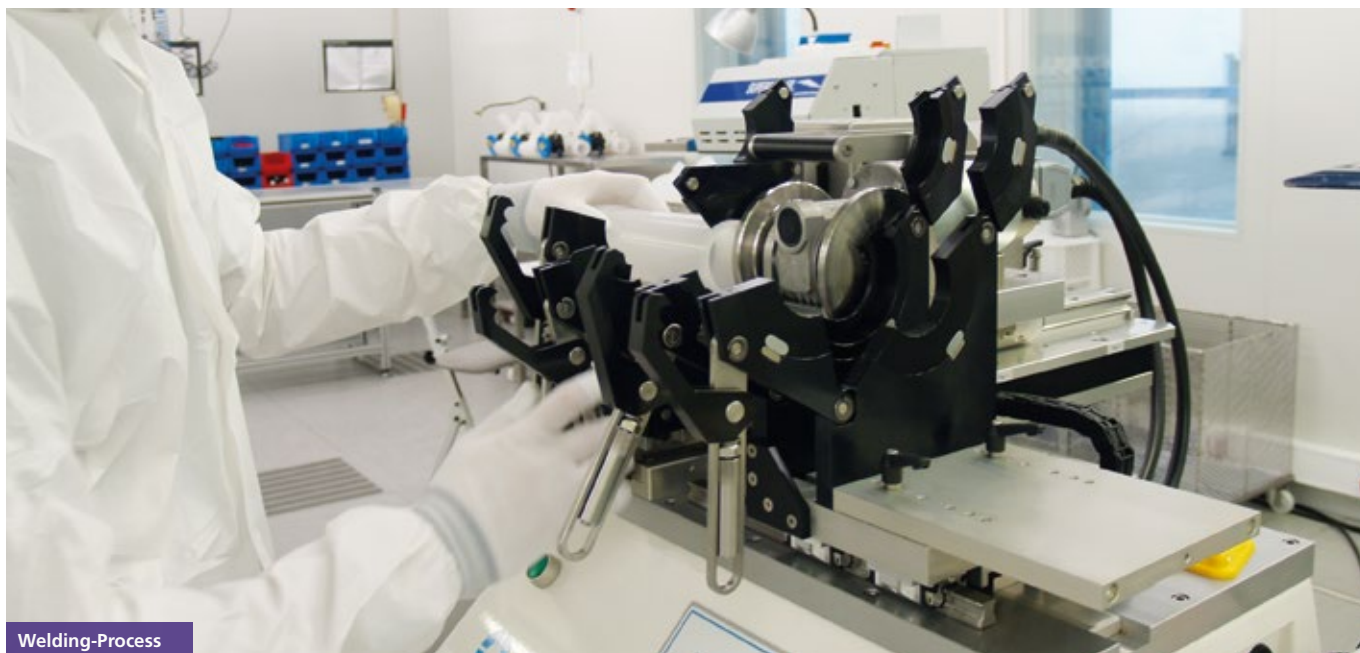
## ECTFE in comparison

ECTFE is distinguished from other materials by its barrier properties. The permeation of oxygen, carbon dioxide, chloric gas or hydrochloric acid is 10 to 100-times better compared to e.g. PTFE or FEP.



## In comparison to PFA:

- Cost efficient in material and installation
- Smoother surface
- Higher permeation resistance
- Larger dimension range (up to 110 mm / 4")
- Lower heat expansion



## Infrared welding technology

Piping components made out of ECTFE can be joined by infrared welding. The SP welding machine series by AGRU represent an innovative IR-welding technology. The SP 110-S, SP 250-S and SP 315-S are unique in their precision, the repeatability of the welding process and easy operation sequence. The fully automated infrared welding guarantees very short welding times and therefore significantly faster installation of piping systems. Optimised small bead sizes are a further important feature of this technology.

## ECTFE connection technologies

- Infrared welding
- Butt welding
- Hot gas welding
- Union connection
- Flange connection
- Thread connection
- Flare connection



Weldingmachine  
SP 110-S



Weldingmachine  
SP 315-S

## Complete ECTFE system from one source

AGRU offers a broad, perfectly synchronised product range of pipe components, semi-finished products and connection technologies.

### SUPPLY RANGE

| Category                      |                                      | from to   |          |
|-------------------------------|--------------------------------------|-----------|----------|
|                               |                                      | (mm)      | (mm)     |
| <b>Pipes</b>                  | Pipes                                | 20        | 160      |
| <b>Fittings</b>               | MULTI-Bends 90°                      | 20        | 110      |
|                               | Tees                                 | 20        | 110      |
|                               | Stub flanges (DIN & ANSI)            | 20        | 110      |
|                               | Elbows 45°                           | 20        | 63       |
|                               | Unions                               | 20        | 32       |
|                               | Reductions, concentric               | 25 / 20   | 110 / 90 |
|                               | Adaptors (R-thread, male and female) | 20        | 32       |
|                               | End caps, elongated                  | 20        | 63       |
|                               | Transition fittings (Flare link)     | 20 / 1/4" | 32 / 1"  |
| <b>Diaphragm valves</b>       | manual or pneumatic                  | 20        | 63       |
| <b>Semi-finished products</b> | Sheets, extruded                     | 2,3       | 3        |
|                               | Sheets, pressed                      | 10        | 30       |
|                               | Welding rods                         | 3         | 4        |
|                               | Round bars                           | 25        | 65       |







The Plastics Experts.

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