

## Tech Note 31: Potable, RO & Purified Waters

**TN.31**

### Applicable Products:

- AusPress Stainless Press-Fit, diameters 15 – 168.3mm.

### Related Documents:

- Tech Note TN.01 Chlorides & Stainless Steel.
- Tech Note TN.03 Media Suitability Chart (Press-Fit).
- Tech Note TN.28 Water Sample Testing.

AusPress Stainless press-fit tube and fittings are suitable for use conveying potable water, deionised, reverse osmosis, rainwater, and other purified water types.

### Benefits of AusPress Stainless & Press-Fit

AusPress Stainless addresses the common considerations of conveying a range of water qualities;

- **No Heat-Affected Zones (HAZ):** Unlike welding, which can deplete chromium at the joints and invite corrosion, press-fitting is a cold-joining process using a press tool to join in seconds. This maintains the corrosion resistance of the 316L throughout the entire length of the tube.
- **Reduced "Rouging" Risk:** In "hungry" deionised or RO water, heat-tinted areas from welding are often the first sites to develop iron oxide (rouging). Press-fit systems eliminate these thermal disturbances, ensuring a consistently passive surface.
- **Maintained Surface Finish:** Mechanical pressing preserves the internal bore's smoothness which is critical for preventing biofilm adhesion and ensuring the system remains "clean" without the need for post-weld pickling or passivation.
- **Rapid, Contaminant-Free Installation:** Because there is no need for open flames, flux, or gas purging, the installation environment remains clean, reducing the risk of airborne particulates entering the high-purity piping during assembly.
- **Ring Seal Selection:** EPDM is supplied as a standard seal, with a FKM seal option recommended for greater performance with purified water types.
- **Material Selection:** Stainless has inherent advantages over other materials including copper and plastics with greater velocity tolerance and surface resistance.

### Annealing and Post-Annealing?

When considering high-spec water, how the system is finished becomes critical. Purified water is inherently more aggressive in how it interacts with the materials in contact with. Risk locations include any locations where pipework is welded or altered which is where post-annealing becomes relevant.

*Post-annealing is a heat treatment process (during manufacturing) that restores the material's optimal corrosion resistance and ductility by dissolving internal stresses and precipitates caused by cold working or welding.*

Stainless tube and press-fittings must be annealed initially to shape (as part of the manufacturing process) however, AusPress tube and fittings are annealed after shaping (post-annealed) in the factory to restore the material. This difference is often overlooked for cost savings and in the case of water purity, is recommended to be specified as a performance requirement. AusPress choose to post-anneal as a standard offering.

### Potable Water - Australian Drinking Water Guidelines (ADWG)

As a WaterMark approved system (AS 3688 & AS 5200.053) including testing to AS 4020, AusPress stainless press-fit is a system that does not, or contribute to, the microbiological characteristics of the drinking water or contaminate it with heavy metals (eg nickel migration) where:

- Water meets or exceeds the minimum requirements of the Australian Drinking Water Guidelines (ADWG); and
- Measured with a pH value greater than 4.0.

Using AusPress Stainless for these applications will not reduce the service life nor effect the warranty when installed to AS 3500 by a licenced plumber in accordance with our installation and technical recommendations.

### Suitable Water Treatment Methods

AusPress Stainless is suitable for water treated by:

- Ozone (wet O<sup>3</sup>) up to 2.0ppm – note this method requires FKM seals, not EPDM;
- Ultraviolet (UV) disinfection;
- Partially demineralised (softened, ion exchange or decarbonised);
- Demineralised (deionised or distilled);
- Membrane (reverse osmosis);
- High purity water with a conductivity less than 0.1µS/cm (10 MΩ.cm);

### Pure Water Types

Purified water is typically classified into three main grades based on the level of ionic and organic contaminants. Each grade requires specific treatment technologies and is used for distinct laboratory or industrial purposes.

Water Type	Resistivity (25°C)	TOC (Organic Carbon)	Typical Applications	Production Method	AusPress Suitability
Type 1: Ultrapure	18.2 MΩ.cm	< 10 ppb	HPLC, LC-MS, cell culture, molecular biology, and trace analysis.	Type 2 + UV Oxidation and ultrafiltration (polishing)	Contact AusPress
Type 2: Pure or Analytical	> 1.0 MΩ.cm	< 50 ppb	General lab chemistry, buffer preparation, and feed for Type 1 systems.	Type 3 + Deionisation (DI)	316L with FKM seal
Type 3: Primary Grade	> 0.05 MΩ.cm	< 200 ppb	Glassware rinsing, autoclaves, and heating baths.	Reverse Osmosis (RO)	316L with FKM or EPDM seal

### Commissioning (& Passivation)

High-purity systems (Type 1 & 2) benefit from a final system passivation before being placed into service. A simple "Clean-In-Place" (CIP) cycle (ie 4-10% citric acid solution, 40-60°C for 30-60 mins as per ASTM A967) is the preferred method; it's suitable for FKM seals while effectively "polishing" the 316L internal surface to its peak corrosion resistance. Followed by a high-purity rinse (until the effluent conductivity matches the influent) as a final step, ensures through rinsed and cleaned system.

This information is for general guidance on material compatibility and does not constitute engineering or legal advice; always verify system designs with a qualified professional and refer to AusPress for product specific data and chemical concentrations for your project.