

PVDF (Polyvinylidene fluoride) HP (High Purity) Piping Systems Products for each Application



Semiconductor industry:

Hi-tech semiconductor micro electronic factories run 24/7. It is therefore absolutely essential that the piping systems deliver critical process fluids safely and reliably. Avoiding unnecessary shutdowns is a goal we share with the operators. PVDF piping system components in combination with high quality fusion technology, like Bead and Crevice Free (BCF) jointing methods, the natural smooth surface of the pipe, fittings and valves, have kept the ultrapure water (UPW) systems in semiconductor fabs running round the clock for more than two decades.

The PVDF resins are handled in a clean room environment to prevent contamination and following, while in the cleanroom, the PVDF fittings and valves are cleaned and double backed (CDB). The resistance of PVDF to permeation and water adsorption as compared to other thermoplastics such as PFA, FEP, PTFE, PP and PE is superior, and is equivalent in resistance to PVC-U and PVC-C. The above make the PVDF (BFC) piping systems suitable for the transport of USP Water for Injection (WFI) or USP (Ultra) Purified Water (PW).

+GF+

FIP



Biotechnology, pharmaceutical, Food and Beverage industry:

Biotechnology is changing the pharmaceutical marketplace. Ground-breaking technology provides new methods for producing pharmaceutical products. These innovations require the need for cleaner, better, faster-built, and longer running operations without the need of system shutdowns. The use of PVDF in production systems is the latest advance in reducing costs, with the added benefits of improving operational efficiencies and system purity, for the industry to take advantage of the benefits of this material.

PVDF is non-toxic. It satisfies the requirements of the Food and Drugs Administration (FDA) for use as food packaging and in articles which come into contact with food. PVDF is just as poor a nutrient for micro-organisms as glass. This makes it also suitable for analytic demi-water systems, with the highest quality requirements. These PVDF systems can be cleaned with hot water, chemicals, ozone and steam (sterilization).

For water systems in the pharmaceutical and biotechnology (AP, USP and WFI) PVDF may readily be substituted for 316L stainless steel. Since it may be steam sterilized, PVDF is also a good choice for solution preparations and transfers. This piping system has undergone extensive testing for extractable levels, and the FDA has approved the raw materials for food and pharmaceutical applications. PVDF HP manufacturers can give a certificate which they can valid the applications according to FDA and USP. This makes it also suitable for Food and Beverage applications.





Chemical Process Industry (CPI):

Due to the unique properties of PVDF, such as its high chemical resistance to most corrosive acids, aromatic hydrocarbons, alcohols and halogens (chlorine, bromine, iodine except fluorine), usable over a wide range of temperatures (-20°C to above +140°C), high strength, good impact resistance, high abrasion resistance, flame retardant and its resistance to ambient uv, and rays, makes PVDF the piping system of choice for the applications in the chemical process (CPI) and nuclear industry. The excellent properties of the material and especially its chemical resistance are fully retained by avoiding the use of colour pigmentation.

One of the original and prevalent uses of PVDF was actually as a liner for carbon steel where the system combined the strength of metal and the corrosion resistance of PVDF. As an evolution to lighter weight systems and outside corrosion barrier, systems made from either butt-welded PVDF pipes and fittings or from PVDF piping liners wrapped with fibreglass (polyester, vinylester and epoxy resin systems) have won the approval of engineers for harsh chemical handling, high pressures and temperatures.

Planned Quality Control and packaging

Manufactures use a regulatory approach in both the manufacturing and technical support of its High Purity products. All components are produced under clean room (Class 10.000 according U.S. Fed.Std.209E; Class 7 ISO 14644-1) conditions. Products are cleaned and double bagged (CDB) after production. Pipes are capped and each component is double bagged in a specified inner bag and an outer bag under clean room ISO 14644-1 Class 6 (U.S. Fed.Std.209E; Class 1000) conditions.

A rigorous quality control program ensures that the customer shall receive products as specified and packaged so that they are 100% contamination free. PVDF HP systems are designed around the stringent requirements defined by FDA guidelines and listed in all current codes.

Manufactures produce a quality assurance certificate for each batch of components, which they will furnish to you upon request.

The documentation is in a format that readily translates to protocols for Installation Qualification (IQ) and Operational Qualification (OQ).

Even if the client uses a different protocol format, the information is easily inserted. For greater convenience, an electronic version will be available.

All products come with installation, engineering and validation support. The key to validation is documentation: all the information required by the regulatory agencies for pharmaceutical and biopharmaceutical applications.



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**Bead and Crevice Free (BCF)
Fusion Equipment, Fusion
Training and Certification**

For each type of installation an appropriate type of joining equipment is provided. Joining technology is available in bead free joining (BCF/WNF), automated IR, butt fusion, and socket fusion. For pharmaceutical and biotechnology market, the manufacturers improved special welding technology without beads. The Welding system is the only method on the market that provides practical fusion with a smooth inner surface. Welds can be done quickly in almost any location by the use of remote weld units. The welding system equipment is completely portable making installations, tie-ins, and additions easier to conduct than ever before.





Elimination of Historic System Worries; Total Cost of Ownership

Here are just a few of the notable advantages of employing PVDF piping systems: material and installation costs are lower than with conventional metal systems, such as stainless steel (304-L and 316-L Sch.40) and Hastelloy (C-276 Sch.40); chemical resistance is extremely high; rouging and associated metal contamination problems are nonexistent; and borescoping and passivation are not required. In addition, all materials have smooth surfaces to meet or exceed the standard for Mechanical and Electro polished Stainless Steel. These smooth surfaces and the lower TOC contamination (than stainless steel) are unfavourable for the proliferation of micro organisms.

Safety benefits and reliable fusion methods: fully controlled and monitored fusion process, read-out software, traceability of materials and welds, entirely reproducible fusion, highest fusion factors, low-stress fusion, no bead or crevice (BCF), on site failures of welds in %.

Customer benefits: shorter weld and installation times with IR and BCF (shorter in comparison with traditional butt-weld), quick introduction to machine handling, high, warranted traceability, excellent fusion weld quality, low in maintenance, no corrosion, light in weight and proven and tested technology worldwide.

Comprehensive Product Offering

PVDF – High Purity is available in a complete offering of Ø20 up to Ø315 and valves are also available in zero dead leg (zero static) configurations. In addition to piping, fittings and valves a Vortex Flow Meter is ideal for pharmaceutical operations. The instrument has no moving parts and is crevice free. It may be steam-sterilized and can be installed in Purified Water, Water For Injection, and Solution Preparation Systems. We offer the PP-R piping system for pharmaceutical black utilities (compressed air, potable water, chilled and hot water). If you require sanitary piping and distribution of air, nitrogen, carbon dioxide and other gases (not medical gasses), ERIKS offers a more cost-effective system in comparison to Stainless Steel piping systems. For all systems please contact our technical team for engineering assistance and technical specifications.

