

ARKEMA

KYNAR[®]

KYNAR[®] PVDF COMPONENTS **DURABLE SOLUTIONS FOR WATER CHALLENGES**



This plastic might just be tougher than your application. Hear us out . . .

YOUR INVESTMENT IN A KYNAR® PVDF FLUID HANDLING SYSTEM IS AN INVESTMENT IN THE SAFETY, RELIABILITY AND LONGEVITY OF YOUR PROCESS.

The Kynar® business & technical team speaks almost every day with process engineers, maintenance personnel and facility managers - people just like you. When discussing plastics, your most common concerns relate to the chemical resistance, high temperature performance, abrasion resistance, and physical strength of plastics. To be sure, most plastics can only handle non-corrosive chemicals at low temperatures.

But Kynar® PVDF resins are not “most plastics”. You may be surprised to discover that you can use Kynar® polyvinylidene fluoride (PVDF) high performance plastic in many of the applications you once thought were limited to specialty metal alloys or stainless steel.

WHY YOU SHOULD CONSIDER COMPONENTS MADE FROM KYNAR® PVDF INSTEAD OF STAINLESS STEEL OR EXOTIC METAL ALLOYS:

- While metals rust and rouge with age, Kynar® components do not corrode and do not need to be passivated
- Kynar® components are **strong, tough and provide long-lasting, corrosion-free service**
- Kynar® systems have installed costs comparable to stainless steel **without the maintenance costs**
- Kynar® components are **lighter weight and more abrasion resistant** than stainless steel and are easily assembled with heat welding

WHY YOU SHOULD CONSIDER COMPONENTS MADE FROM KYNAR® PVDF INSTEAD OF PVC, POLYPROPYLENE OR CPVC:

- Kynar® systems **can operate at a much higher temperature** – up to 150°C (300°F) in some chemical environments
- Kynar® components are **more resistant to radiation** and to a broader range of chemicals
- Kynar® PVDF contains **no additives** and is suitable for use in high purity applications
- Kynar® components exhibit excellent **flame and smoke characteristics**
- Kynar® systems exhibit **greater mechanical strength**
- A wide range of Kynar® components are available due to its **ease of processing**

COMMON KYNAR® APPLICATIONS:

| APPLICATION | INSTEAD OF | UP TO | FOR |
|---|---|------------------------------------|---|
| Exposure to chlorinated & brominated chemicals | Titanium Alloy 20 PTFE-lined steel PFA-lined steel | 275°F (135°C) | Lower cost Easier installation Lower permeation |
| Exposure to hot acids (eg: HF, HCl, H ₂ SO ₄ , HNO ₃ , chromic, HBr) | Titanium Alloy 20 PTFE-lined steel | 275°F (135°C) | Lower cost Easier installation Chemical resistance to varied concentrations |
| Alcohol + acids/chlorides/hydrocarbons | Polypropylene HDPE | 194°F (90°C) | Broad chemical resistance to varied concentrations |
| High pressure + high temperature | PVC Polypropylene CPVC PFA | 230 psi at RT and 285°F (141°C) | High temperature rigidity High pressure rating Broad chemical resistance |
| Microfiltration & ultrafiltration membranes | Polysulfone (PSU) Polyethersulfone (PES) Cellulose Acetate Polyamide Polypropylene (PP) | 302°F (150°C) | Membrane BioReactors (MBR) Virus Rejection Chemical Resistance Protein Bacteria Spores Sediment |
| UPW, DI water, potable water | HDPE PP PVC Stainless Steel Metal Alloys | 302°F (150°C) | Resistance to Sterilization Techniques Low Biofilm Build Up Low Leachables |

COMMON MARKETS

- **FILTRATION** - Hollow Fiber Membranes, filter housings, Electrospun non-wovens, supported and unsupported flat sheet membranes, multi and monofilament wovens, non-wovens, fabrics, and mesh screens
- **DISINFECTION** - Chemical injection systems for chlorine gas, chlorine, dioxide, sodium hypochlorite, ozone, etc., and UV systems
- **TRANSFER** - Components including pipes, tubes, valves, pumps, nozzles, spigots, lined steel pipe, and lined steel vessels for transferring Potable, Deionized, and Ultra Pure Water

CHEMICALS HANDLED

| | |
|----------------------|----------------------|
| Acetic acid (<60%) | Iodine |
| Acid mixtures | Metallic chlorides |
| Biodiesel | Methyl alcohol |
| Bromine | Methyl chloroform |
| Bromine water | Nitric acid |
| Bromobenzene | Ozone |
| Brominated salts | Peracetic acid |
| Chlorinated salts | Phosphoric acid |
| Chlorine | Plating |
| Chlorine dioxide | chemistries |
| Chlorobenzene | Salicylic acid |
| Chromic acid | Salt water |
| Deionized (DI) water | Sodium hypochlorite |
| Fuel mixtures | Sulfuric acid (<98%) |
| Hot sugars | |
| Hydrocarbons | |
| Hydrobromic acid | |
| Hydrochloric acid | |
| Hydrofluoric acid | |

STERILIZATION TECHNIQUES:

Steam, irradiation, ozone, ultraviolet (UV), alcohols, and chemical.

For more detailed information about the chemical resistance of Kynar® components, including corresponding operating temperatures, please visit the Literature section of www.kynar.com and download our **Kynar® Chemical Resistance Chart**.

VESSELS¹

| TYPE | DESCRIPTION | TEMPERATURE ² | PRESSURE ¹ | AVAILABLE SIZES | POLYMER LAYER THICKNESS |
|--------------------|--|--------------------------|---|-------------------------------|------------------------------------|
| Sheet-lined steel | Fabric-backed Kynar® or Kynar Flex® sheet is applied to all fluid contact surfaces and welded in place to form a continuous corrosion and purity barrier | Up to 225°F (107°C) | Up to the limit of the steel vessel | Any size tank can be lined | 59 mil - 197 mil (1.5 mm - 5 mm) |
| Spray-coated steel | Kynar® or Kynar Flex® powder or liquid is applied to metal surface in layers and baked to form a continuous layer | Up to 200°F (93°C) | Full vacuum up to the limit of the steel vessel | Up to 6.5' x 20' (2m x 6m) | 25 mil - 90 mil (0.64 mm - 2.29mm) |
| Dual-laminate | Kynar® or Kynar Flex® sheet is formed into the shape of the container and wrapped with fiberglass reinforced plastic (FRP) | Up to 257°F (125°C) | Up to 150 psi (1.03 Mpa) | Up to 20' x 100' (6m x 30.5m) | 79 mil - 197 mil (2mm - 5 mm) |
| Solid | Solid Kynar® or Kynar Flex® vessels are either injection-molded (generally small sizes), welded or rotomolded | Up to 284°F (140°C) | Typically atmospheric | Any size can be fabricated | 1/8" - 4" (3 mm - 101 mm) |

PIPE, VALVES & FITTINGS¹

| TYPE | DESCRIPTION | TEMPERATURE | PRESSURE ¹ | AVAILABLE DIAMETERS | JOINING METHODS |
|-------------|--|---------------------|--------------------------------------|-----------------------------------|--|
| Solid | Uncovered extruded, machined or injection-molded Kynar® or Kynar Flex® components | Up to 284°F (140°C) | Full vacuum up to 580psi (4 MPa) | 1/2" - 16" (20 - 400 mm) | Butt fusion, socket fusion, mechanical, threaded, flanged, IR, smooth inner bore, bead and crevice free, electrofusion |
| FRP-wrapped | Extruded or machined Kynar® or Kynar Flex® components, covered with a thick layer of fiberglass reinforced plastic | Up to 284°F (140°C) | Full vacuum up to 150 psi (1.03 MPa) | Almost any size can be fabricated | Butt fusion, flanged |
| Lined steel | Extruded Kynar Flex® lining surrounded by carbon steel | Up to 275°F (135°C) | Full vacuum up to 475 psi (3.28 MPa) | 1" - 10" (25 - 254 mm) | Welded, flanged, extruded, molded |
| Fittings | Machined or Injection molded solid Kynar or Kynar Flex components | Up to 284°F (140°C) | Full vacuum up to 580psi (4 MPa) | All sizes | Butt fusion, socket fusion, mechanical, threaded, flanged, IR, smooth inner bore, bead and crevice free, electrofusion |

Solid Kynar® valves and Kynar®-lined steel valves are available in many forms, such as ball, diaphragm, butterfly, ball check, relief, check and plug valves.

TUBES & FITTINGS¹

| TYPE | TEMPERATURE ² | PRESSURE ¹ | AVAILABLE DIAMETERS |
|-----------------|--------------------------|--|-------------------------------|
| Flexible tubing | Up to 225°F (107°C) | Rating up to 300 psi (2.07 MPa) | 1/16" - 2" (1.6 - 50.8 mm) |
| Rigid tubing | Up to 250°F (121°C) | Vacuum rating up to 230 psi (1.59 MPa) | 1/8" - 12-3/4" (3.2 - 324 mm) |

FILTER FIBERS & TEXTILES

| TYPE | TEMPERATURES | TENACITY (cn/tex) | AVAILABLE DENIER |
|----------------------|----------------------|-------------------|------------------|
| Multi-filament Fiber | Up to 302° F (150°C) | >26 | 10-40μ * |
| Textiles | Up to 302° F (150°C) | >26 | 10-40μ * |

*Fiber down to 1μ have been produced using Kynar® 705 PVDF resin.

Tubes are joined by compression or push-in fittings and are available in the following forms, among others:

- Threaded adaptors, barbed elbows & nipples
- Reduction couplers
- Leak-proof couplers, elbows, tees, Y's and threaded plugs

JOINING OF KYNAR® SYSTEMS

- Mechanical joining using threaded components
- Welding by using

- heat contact,
- hot gas using welding rod,
- ultrasonic,
- hot lamination,
- infrared (IR),
- resistance heating,
- spin
- radio frequency

1- Note that the Kynar® component temperature, pressure and sizing data above are compiled from industry data and are for illustrative purposes only. The actual temperature and pressure ratings of your system, as well as its resistance to chemical attack, are dependent on many environmental factors. Higher operating temperatures will reduce the Kynar® system's maximum operating pressure; higher operating pressures will reduce the system's maximum operating temperature. Higher operating pressures or temperatures may also require increased component wall thickness. Consult your Kynar® component supplier about your system's operating parameters before purchasing a Kynar® system.

2- Kynar® components can withstand continuous temperatures as low as -30°C (-22°F) under certain conditions. Please contact your Kynar® component supplier with specific information about your application to determine the lowest recommended operating temperature of your Kynar® system.

KYNAR® COMPONENTS ARE ALSO AVAILABLE IN THE FOLLOWING FORMS:

- Pumps (centrifugal, sump, ball, diaphragm, chamber, magnetic drive and more)
- Membranes
- Nozzles and ozone injectors
- Foams
- Tower packings
- Mist eliminators
- Filter housings
- Stock shapes (rod, sheet, film)
- Flow meters
- Monofilament fibers
- Multifilament fibers
- Non-woven fibers

WMA

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