Plastic Material Digest

PVC
(Polyvinyl Chloride) conforming to ASTM D-1784 Class 12454-B, formerly designated Type 1 Grade 1, PVC is the most frequently specified of all thermoplastic materials. It has been used successfully for over 30 years in such areas as chemical processing, industrial plating, chilled water distribution, deionized water lines, chemical drainage, and irrigation systems. PVC is characterized by high physical properties and resistance to corrosion and chemical attack by acids, alkalies, salt solutions and many other chemicals. It is attacked, however, by polar solvents such as ketones, some chlorinated hydrocarbons and aromatics. The maximum service temperature of PVC is 140°F. With a design stress of 2,000 PSI, PVC has the highest long term hydrostatic strength at 73°F of any of the major thermoplastic being used for piping systems. PVC is joined by solvent cementing threading or flanging.

CPVC
(Chlorinated Polyvinyl Chloride) conforming to ASTM D-1784 Class 23447-B, formerly designated Type IV, Grade 1, CPVC has physical properties at 73°F similar to those of PVC, and its chemical resistance is similar to that of PVC. CPVC, with a design stress of 2,000 psi and maximum service temperature of 210°F has, over a period of about 25 years, proven to be excellent material for hot corrosive liquids, hot and cold water distribution and similar applications above the temperature range of PVC. CPVC is joined by solvent cementing, threading or flanging.

Polypropylene
(PP) Polypropylene homopolymer, conforming to ASTM D-4101 Class PP110 B67154, formerly designated Type 1, is a member of the polyolefin family of plastics. Although PP has less physical strength than PVC, it is chemically resistant to organic solvents as well as acids and alkalies. Generally, polypropylene should not be used in contact with strong oxidizing acids, chlorinated hydrocarbons and aromatics. Polypropylene has gained wide acceptance where its resistance to sulfur-bearing compounds is particularly useful in salt water disposal lines, crude oil piping, and low pressure gas gathering systems. Polypropylene has also proved to be an excellent material for laboratory and industrial drainage where mixtures of acids, bases and solvents are involved. Polypropylene is joined by the thermo-seal fusion process, threading or flanging.

PVDF (Kynar®)
(Polyvinylidene Fluoride) PVDF is a strong, tough, and abrasion resistant fluoro carbon material. It resists distortion and retains most of its strength to 280°F. It is chemically resistant to most acids, bases, and organic solvents and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other solid thermoplastic piping components can approach the combination of strength, chemical resistance and working temperatures of PVDF. PVDF is joined by the thermo-seal fusion process, threading or flanging.

FRP
FIBERGLASS REINFORCED PLASTICS commonly manufactured by hand lay up (HLU) in accordance with CGSB-41-GP-22 in Canada and NBS PS 15-69 in the United States. Also manufactured according to ASTM D-3299 for machine made Filament Wound (FW) construction. FRP constructions are on a custom designed basis allowing the designer to select many different resin systems and laminate constructions. As an engineered system FRP generally displays higher physical properties than thermoplastics with a wide chemical and temperature resistance. Joining methods are by Flanging, Butt and Strap joined or bell and spigot connection.

FRP Reinforced Thermoplastics
These plastics commonly referred to as thermoplastic lined FRP such as PVC, CPVC, PP, PVDF, FEP, ECTFE chemically or mechanically bonded to an FRP structural overlay. This custom engineered system offers the unique properties of the thermoplastic liner with the superior physical properties of the FRP. Joining methods include Flanging, Fusion and Solvent Cementing of the LINER and OVERLAYING WITH FRP.

FPM (Viton® or Florel®)
(Fluoroelastomer) FPM is inherently compatible with a broad spectrum of chemicals. Because of extensive chemical compatibility which spans considerable concentration and temperature ranges, fluorocarbons have gained wide acceptance as a material of construction for butterfly valve O-rings and seats. Fluorocarbons can be used in most applications involving mineral acids (with the exception of HCI), salt solutions, chlorinated hydrocarbons and petroleum oils.

EPDM (EPT)
EPDM is a terpolymer elastomer made from ethylene-propylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attack by oils and is not recommended for applications involving petroleum oils, strong acids (with the exception of HCI), or strong alkalines.

Teflon®
PTFE (Polytetrafluoroethylene) has outstanding resistance to chemical attack by most chemicals and solvents. PTFE has a temperature rating of -200°F to +500°F. PTFE, a self-lubricating compound, is used as a seat material in Fabco Ball Valves.

Neoprene® (CR)
Neoprene® was the first commercial synthetic rubber. It is a moderately oil-resistant material with good ozone-resisting properties. Neoprene is not recommended for use with aromatic hydrocarbons or chlorinated solvents. It is specifically recommended for use with higher concentrations of sodium hydroxide. It can be used in continuous service up to 180°F.