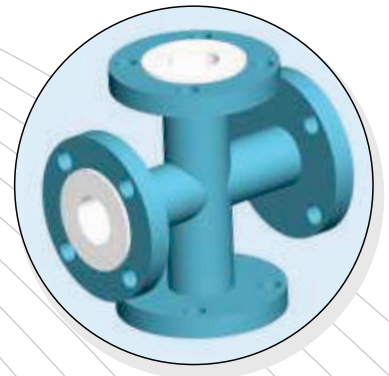
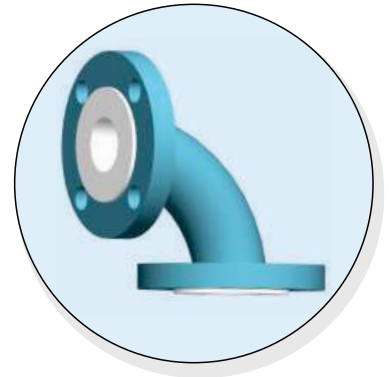
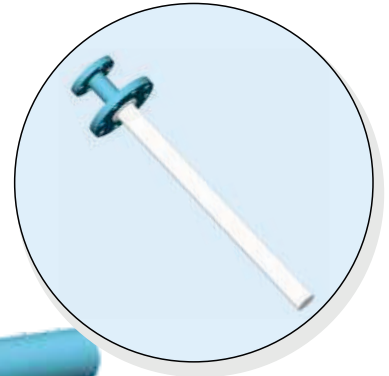
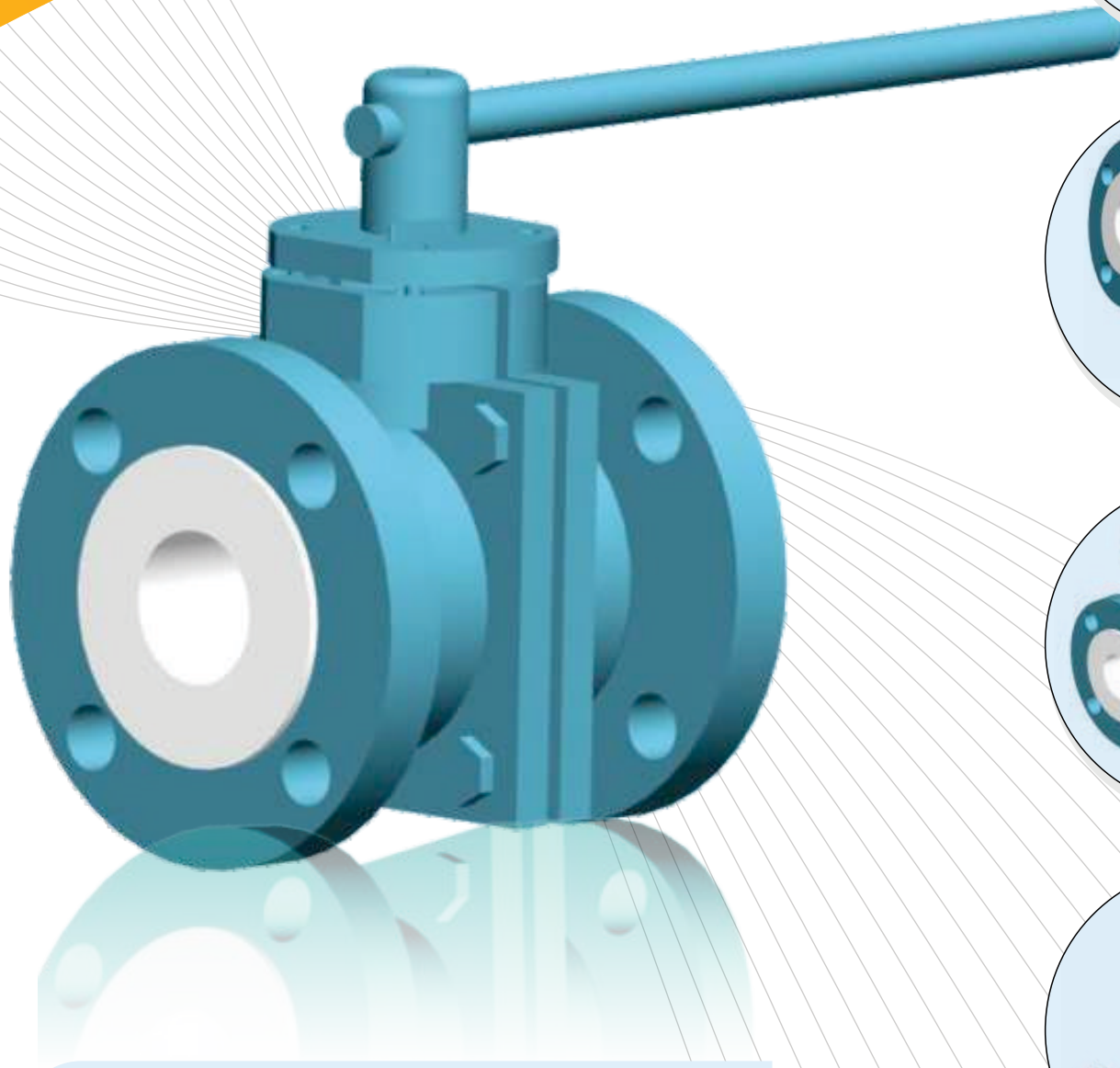
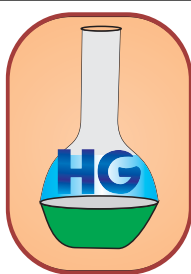


Heta Glass Industries



**ULTIMATE SOLUTION FOR
FLUID TRANSMISSION WORLD...**



SELECTION CRITERIA OF FLUOROPOLYMER

Selection of the right engineering plastic material for hazardous or corrosive fluids is the most essential element in the process industry. Certain special conditions may affect the performance or service life of the fluoropolymer. For the proper selection of plastic lined products, the following information should be taken into consideration.

1. APPLICATION

- Primary chemical and its concentration
- Secondary chemicals and their concentration
- Trace chemicals and Impurities present
- Presence of solids
- Flow rates
- Fluid purity requirements (metal ions, pigments)

2. OPERATING CONDITIONS

- Normal operating temperature and range
- Peak temperature during start ups, shut downs or disturbed conditions
- Mixing Areas (Exothermic or heat of mixing temperature condition)
- Normal operating pressure and range
- Peak pressure during start ups, shut downs or disturbed conditions
- Vacuum conditions and range
- Vacuum conditions during start ups, shut downs or disturbed conditions
- Cyclic conditions from batch operations, start ups, shut downs or disturbed conditions
- Line cleaning method (chemical, steam, high pressure water, pigging)

Selection of fluoropolymer with above guideline is essential to avoid certain phenomenal problems in the plastic lined products like Permeation and Environmental Stress Cracking.

PERMEATION

Permeation is the small molecular transport through the plastic liner. Permeation is a combination of absorption, diffusion, desorption and solution mechanisms. It is a function of several variables including the properties of the permeating species (i.e. molecular size, solubility, parameters, concentration), properties of the plastics (i.e. crystallinity, density, thickness, thermal history) and operation parameters (i.e. temperature pressure gradients and cycling). Permeation data published in literature refers to thin coatings or films and should not be applied to plastic-lined products.

All fluoropolymer lined products are subject to some permeation of certain fluids. Normally PTFE lined products in conjunctions with the fluids having permeation in PTFE are substituted by other type of fluoropolymer to avoid permeation phenomenon.

ENVIRONMENTAL STRESS CRACKING

(ESC) Environmental Stress Cracking is well known but not always well understood phenomenon with plastics. ESC occurs in plastic lined parts when liner is exposed to a chemical under mechanical or thermal stress. ESC can lead to failures at stresses below tensile strength of the plastic material. In some instances, the presence of contaminant may act as accelerator. For example, iron or copper contamination in conc. Sulphuric or hydrochloric acid can result in stress cracking of PP (Polypropylene) liners. All plastics, including PTFE are known to be susceptible to ESC.

The occurrence of ESC is hard to predict. It is dependent on the chemistry of process, operating conditions, physical system layout and quality of field fabrication. If the chosen fluoropolymer may be susceptible to ESC with a specific chemical, that does not mean the particular fluoropolymer will not work, but additional data must be gathered to ensure that the liner is compatible with the chemical.

- This information is for guidance only. No warranty is given for its accuracy

HG

Honesty

Efficiency

Transparency

Ambitions



**Heta Glass
Industries**

Office & Factory :

336/25/A, G.I.D.C., Makarpura, Vadodara-390010

M : 098250 76022, 099789 00795, Ph. : 0265 - 2637622

E-mail : hiren@hetaglass.com • nimesh@hetaglass.com