

# Selection of materials

## Chemical resistance



### Chemical resistance of the piping material

Plastics are widely used not only for water, but also to handle aggressive chemicals. Consequently the determination of the fluid to be carried is therefore one of the prime concerns in the selection process. Other factors, such as the installation environment, also need to be considered. However, the usual starting point for most applications is to determine which material provides the best chemical resistance performance.

The chemical resistance of thermoplastic piping against a broad range of commonly used chemicals can be found in the chemical resistance tables, however we would recommend that in case of doubt that you contact our technical department for clarification. The data shown is based on immersion tests and is given as a guide only as no guarantees can be given in respect of the information shown. Where there is any concern over the suitability of a material, it is recommended to test using the specific working conditions in a pilot installation.

In all cases the suitability of the piping materials, jointing methods and sealing materials (elastomer for 'O' rings, and flange gaskets), must be verified before the commencement of an installation.

When referring to the chemical resistance tables, the classifications Resistant, Conditionally Resistant and Not Recommended are shown using the symbols +, 0 and - respectively. Whilst the terms Resistant and Not Recommended are self explanatory, the term Conditionally Resistant indicates that the medium can attack or cause swelling in the material. The service life is usually shortened and may be restricted by pressure and/or temperature.

Note that the data in the tables is based on information from the raw material suppliers, gained using direct contact between the chemical and the un-processed raw material. The resistance of any of the finished products against these media has not been verified. There is no given or intended legally binding assurance of material properties or of suitability for a specific purpose. Materials must be tested under actual service conditions to determine the suitability for a specific application.

### Chemical resistance of solvent cement welded joints

The chemical resistance of the joints in a solvent welded piping system are the same as the material itself. However, PVC-U or PVC-C solvent welded joints in systems handling the following chemicals can be degraded and require the use of Weld On 724 solvent cement to ensure chemical compatibility:

- Hydrochloric Acid 25%+ concentration
- Nitric Acid 20%+ concentration
- Sulphuric Acid 70%+ concentration
- Hydrofluoric Acid in any concentration



### Chemical resistance of fusion welded joints

Thermoplastic piping systems in polypropylene, polyethylene, ECTFE or PVDF are made with fusion-welded joints using either socket fusion, electrofusion and IR or butt fusion welding techniques. Correctly made fusion joints will have the same chemical resistance as the pipe itself, however in situations where the piping material may be susceptible to stress cracking from the media, the joint itself may be subject to increased risk.

### Chemical resistance of valves

In most cases, valves are manufactured from the same parent material as the pipe-fittings and it can therefore be regarded that their chemical resistance matches that of the piping material. However, valves will usually incorporate elastomer materials that will be exposed to the media during normal operation. Care should be taken to check the chemical resistance of the elastomer seals against the chemical to be used in the chemical resistance tables.







