HARRINGTON
*Process Solutions since 1959*
14480 Yorba Avenue • Chino, CA 91710
(909) 597-8641 • Fax (909) 597-9826

# Basic Joining Techniques

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There are several recommended methods of joining thermoplastic pipe and fittings, each with its own advantages and limitations:

**SOLVENT CEMENTING**

The most widely used method in Schedule 40 PVC, Schedule 80 PVC and CPVC piping systems as described in ASTM D-2855. The O.D. of the pipe and the I.D. of the fitting are primed, coated with special cement and joined together, (described in detail below.) Knowledge of the principles of solvent cementing is essential to a good job. These are discussed in the Solvent Welding Instructions Section. NOTE: The single most significant cause of improperly or failed solvent cement joints is lack of solvent penetration or inadequate primer application.

**THREADING**

Schedule 80 PVC, CPVC, PVDF, and PP can be threaded with special pipe dyes for mating with Schedule 80 fittings provided with threaded connections. Since this method makes the piping system easy to disassemble, repair, and test, it is often employed on temporary or take-down piping systems, as well as systems joining dissimilar materials. Threaded pipe must be derated by 50% from solvent-cemented systems. (Threaded joints are not recommended for PP pressure applications.)

**FLANGES**

Flanges are available for joining all thermoplastic piping systems. They can be joined to the piping either with solvent cemented or threaded connections. Flanging offers the same general advantages as threading and consequently is often employed in piping systems that must frequently be dismantled. The technique is limited to 150 psi working pressure.

**SOCKET FUSION**

This technique is used to assemble PVDF and polypropylene pipe and fittings for high-temperature, corrosive-service applications. (See each manufacturer's data for recommended joining techniques.)


**BUTT FUSION**

This technique is used to connect all sizes of polypropylene (Proline), PVDF (Purad™) and other larger diameter materials. Butt fusion is an easy, efficient fusion method especially in larger diameters.

**IR (INFRARED)**

Fusion Improving upon conventional butt fusion, IR welding uses a noncontact method. IR welding uses the critical welding parameters of heat soak time, change over time, and joining force as found with butt fusion. By avoiding direct contact with the heating element, IR fusion produces a cleaner weld with more repeatable and smaller bead sizes. The end result is a superior weld for high-purity applications.

**HPF Fusion**

The HPF welding technology is an electric socket fusion system that joins Purad™ PVDF piping components, providing a smooth internal surface.

**SMOOTH INNER BORE (S.I.B.)**

S.I.B. offers state-of-the-art technology for sanitary piping systems construction. The “smooth” interior surface of the weld eliminates all beads, crevices and intrusions into the fluid system. Materials cannot become entrapped, and the possibility of bacterial growth and contamination is virtually eliminated. S.I.B. reduces pressure loss due to friction and improves system hydraulics. Available in Kynar® (PVDF) and polypropylene.

**ELECTROFUSION**

Electrofusion fittings are manufactured with an integral resistance wire, molded in place using a proprietary manufacturing process. The wire is electrically heated by means of a microprocessor controlled control unit. This results in fusion and bonding of the pipe to the fitting.

**MECHANICAL JOINT**

Traditionally mechanical joint polypropylene and PVDF drainage systems are used extensively for accessible smaller sized piping areas. The system, as the name implies, is a mechanical sealed joint that consists of a seal-ring and nut. It is quick and easy to install and can be disconnected just as easily. This joining method is most suitable for under-sink and under-counter piping.

**SANITARY MECHANICAL JOINT**

The Sani-Tech Division of Saint-Gobain Performance Plastics offers a sanitary mechanical joint similar to the Ladish® tri-clamp sanitary joint systems found in the pharmaceutical, food and beverage industries. This system requires that rigid tubing (pipe) and fittings are formed with a sanitary flange and gasket be joined together with a special mechanical clamp.