

Why PVC piping systems?

by David A. Chasis

Plastics are the fastest growing piping systems in the world and have been for over the last three decades. Why? They are environmentally sound, easy and safe to install, reliable, long-lasting and cost-effective. Today, plastic piping is the preferred material in water mains, sewer lines, irrigation systems, swimming pools, drain-waste-vent lines, water well-casings, chemical and acid drainage systems, natural gas distribution lines, and slip-liners for damaged municipal piping systems to name a few. And of all the plastic pipe materials in use, polyvinyl chloride (PVC) is by far the most popular (estimated PVC usage is over 70 percent for all plastic piping installations). Why?

PVC resin is made (by weight) from 43 percent of petroleum based feedstock and 57 percent from salt. This means PVC production uses less energy, generates fewer emissions and requires fewer natural resources than many other piping materials. And, since salt is a relatively inexpensive compound and one of the most voluminous materials on earth, PVC is more sustainable and price competitive compared to other piping materials.

Another benefit of polyvinyl chloride is that it has a high strength-to-weight ratio compared to other piping materials. This property characteristic allows PVC to have a lesser pipe wall thickness while maintaining a designed working pressure. Two other valuable physical characteristics of PVC are the high modulus of elasticity and low coefficient of thermal expansion compared to many other piping materials. These properties minimize the amount of expansion and contraction of PVC piping systems, allowing reduced piping offsets, loops and expansion joints.

When it comes to installing PVC piping systems, no other piping system incorporates the variety of available joining techniques. By far the most popular and least costly way of joining PVC to PVC in a leak-proof system is by solvent cementing. This joining method has been used for over 60 years and, if done properly, produces a non-leaking, homogeneous, monolithic joint that has a greater pressure rating than either the pipe or fitting. This system requires no fancy or expensive tools either.

Other successfully used joining systems for PVC piping are:

- Flanging
- Threading
- Bell-gasketing
- Rolled or grooved o-ring compression
- Transition adapters
- Heat fusion

Not only does PVC have a variety of joining methods, but the breadth of product line is unmatched. Pipe diameters start at 1/8-inch and are available up to 24-inch and larger. PVC is available in pressure ratings of Schedule 120, 80 and 40 as well as several constant pressure ratings of 250, 200, 160, 100 and 50-psi as well as ducting.

Polyvinyl chloride piping is also available in a multitude of colors, lengths, pipe joining ends as well as specially formulated compounds. These compounds can increase impact resistance, add additional ultraviolet protection, produce a

transparent pipe, or add resistance to the extraction of contaminants for high purity piping systems.

By incorporating the above listed benefits and all the normal cost saving advantages of plastic piping — light weight, optimum flow rates, excellent abrasion resistance, minimum maintenance, outstanding chemical and corrosion resistance, low thermal conductivity, durability, flexibility, reduced freight costs and reduced job-site theft — PVC, when conditions of service are applicable, is unquestionably one of the most reliable and cost effective piping materials ever created. ■

David A. Chasis is president of Chasis Consulting, Inc., author of the book "Plastic Piping Systems," and a member of and consultant to the Plastic Pipe and Fittings Association. Chasis can be reached at Chasis Consulting, Inc., 329 The Hills Drive, Austin, TX 78738 USA; (512) 261-9115, fax (512) 261-3518, e-mail: dchasis@austin.rr.com, www.davidchasis.com.