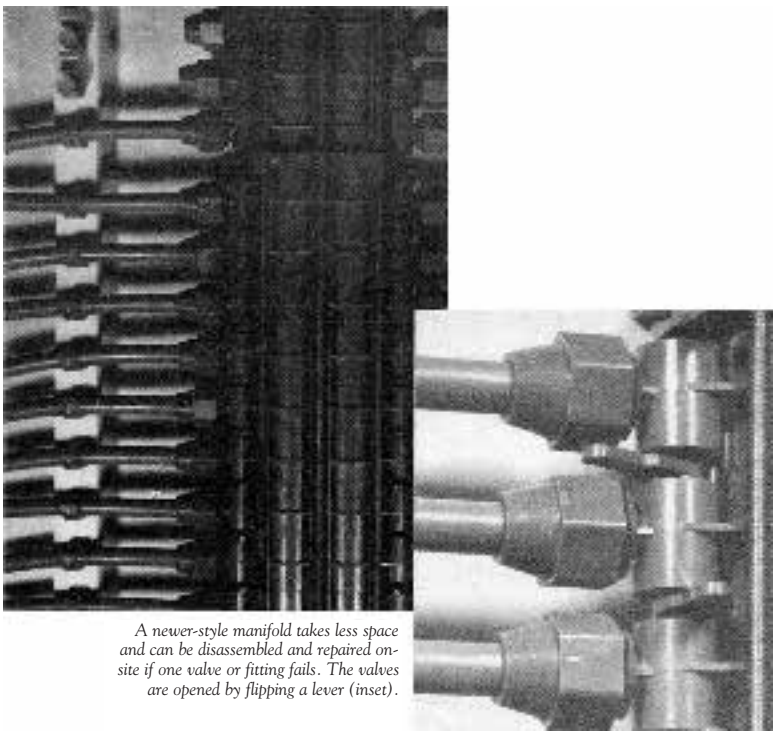
HOME-RUN HOLDS PROMISE

by Ron Bryant

New manifold designs, along with improved fittings, may give plastic plumbing an edge in the market



A newer-style manifold takes less space and can be disassembled and repaired on-site if one valve or fitting fails. The valves are opened by flipping a lever (inset).

Polybutylene plumbing, especially in its newest configurations, has a lot going for it: flexibility, cost, freeze resistance, user convenience, and, we believe, dependability. In light of the lawsuits that have involved polybutylene (PB) plumbing systems, our confidence may seem misplaced. But we think our confidence is justified.

The reasons are simple. First, most lawsuits have cited accessories in the PB system rather than the PB itself. Second, we've had few problems, except with the fittings.

Since we began to install PB ten years ago, we've learned to do some things better and some things not at all. For instance, we no longer run PB lines from the curb to the house unless we slip the line inside a PVC sleeve where it enters the foundation. We make sure the sleeve is on undisturbed soil. Unreinforced PB lines do tend to shear off under the weight of fill, but we've also seen copper lines shear off.

Inside the house, we've learned not to use acetal fittings and valves. Acetal fittings, which according to lawsuits deteriorate internally as chlorinated water flows through them, have been replaced with more durable materials. In truly modern PB systems, most fittings are no longer needed. Where they are used, tees and elbows are copper and are crimped on. Valves are brass or a newer chlorine-resistant plastic called Noryl. They can be crimped on or connected with pressure fittings.

Cost and Labor

Installing what is by now an old-fashioned PB system with tees and elbows will save perhaps 20% of the cost over a similar copper system. The savings come as much from labor as materials. PB systems that are installed with fittings are stepped down much the same way as with copper—from 1-inch or 3/4-inch lines to 3/8-inch lines. As with copper, this assures an adequate supply of water as the lines branch off, and it prevents a drop in pressure. Crimping the joints, rather than sweating, saves time.

These days, however, the trend is away from fittings and toward what is called a "home-run" system. The PB home-run system takes its name from the standard electrical wiring practice where each outlet gets its own line from the source. Savings in PB materials largely disappear with the home-run system, because you're using more pipe. But the time needed to connect fittings also disappears. By the time you're done, time savings are as much as a half-day on a 3,000-square-foot house—less than we thought a few years ago, but still substantial. The final installed cost is about the same for copper.

Plumbing contractors no longer have to find mechanics experienced in sweating pipes to install PB lines, but the plumber will have to train the mechanic in other skills. Training, in fact, is one of the most important ingredients for proper PB installation. If you're a general contractor having a PB system installed, make sure your

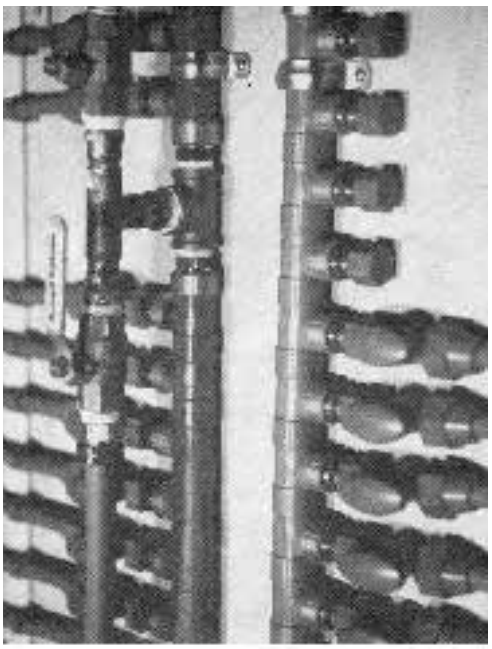


Figure 1. *An older-style, heat-bonded manifold distributes water to hot-water lines on the left and cold-water lines on the right. Once this type of manifold leaked, it had to be replaced.*

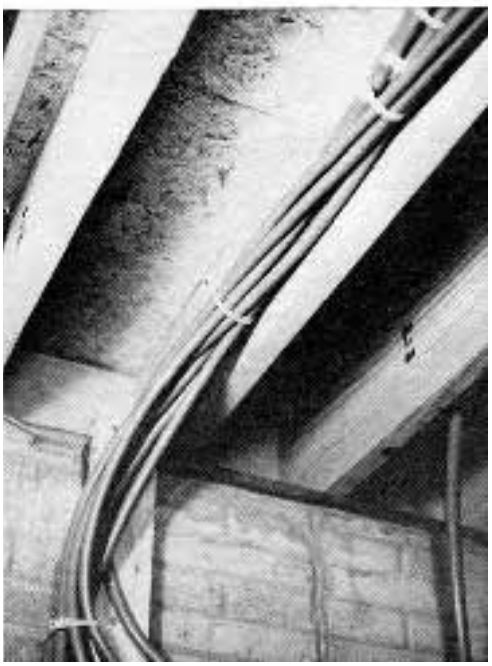


Figure 2. *Plastic hangers suspend a bundle of polybutylene lines between joists in a basement.*

Figure 3. *A plastic insulator protects this polybutylene supply line from damage by the subfloor sheathing. The toilet supply line will get an additional shut-off valve at the fixture before final hookup.*

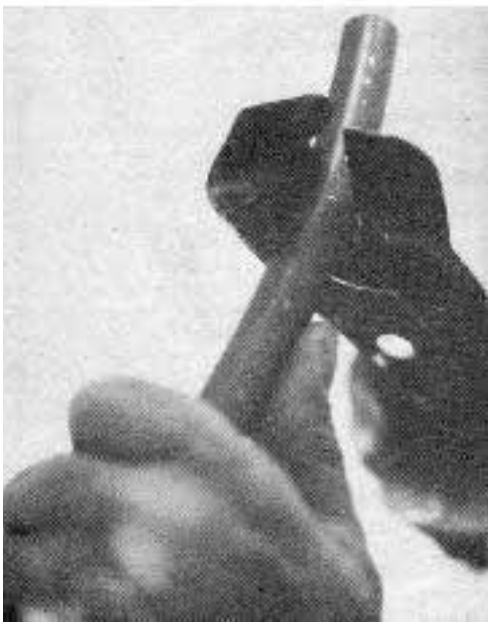


Figure 4. *Hand-held cutters cut PB piping to length.*

plumbing contractor has PB experience and has trained his people well.

The PB mechanic will have to learn how not to overtighten compression fittings. Overtightened plastic fittings can crack internally. These cracks may eventually break through to the outside of the fitting and cause failure. He'll also have to learn that he can't use pipe dope with plastic fittings—it may attack the plastic and cause failure. The plastic is designed to seal its own threads, just as Teflon (which is also plastic) fills the gaps between metal threads.

Installing a Home-Run System

Three things make the home-run system possible: the flexibility of the pipe, its light weight, and the manifold that distributes water to the multiple lines.

Manifolds originally were a series of plastic fittings that were heat bonded, with each outlet getting its own valve and line (see Figure 1). New manifolds are a series of mechanically connected valves made watertight with gaskets (see lead photo). Each line retains its own valve, actuated by a short-throw lever, and the unit is much smaller than the old heat-bonded manifold. In new manifolds, if one valve or fitting fails, the manifold can be disassembled at the site and the defective part replaced without having to scrap the whole manifold. But failures should be minimal.

The homeowner, if a leak occurs, has only to throw the switch controlling a particular line, as he would a breaker on his electrical service. For example, in the photo on the previous page, the second valve from the top is open while the other remains closed. Once a system is connected, we do a chart in the office showing the homeowner and any repair people who may be called which valves service which outlets. We wrap the chart in plastic and attach it to the service panel.

PB lines are bundled and hung from joists (see Figure 2) with plastic hangers. From the bundle they are pulled through holes and fished as electrical cable would be. In the basement, as they approach the box, they are bundled and left hanging at the manifold, just as electrical lines would be for later connection. Hot water is on the left and cold water is on the right. A house always has more cold-water lines because of toilet and outside faucet connections. Manifolds may have capped, untapped outlets for future expansion.

Care must be taken when snaking the lines. Lines that rub against one another or against framing materials can chafe and weaken. Bends can be as tight as 12 times the diameter of the pipe—6 inches with 1/2-inch piping. With that kind of flexibility, the advantage is that you don't have to put in 90° elbows, and the fewer the fittings, the lower the potential for leaks later.

Some municipalities require plastic insulators between wood surfaces and the pipe (see Figure 3). We always use insulators and always recommend their use, regardless of code. The insulators are hammered into place. They can be sized to accommodate single lines or bundles of line.

When a length of pipe is run and snaked or fished, it is trimmed to length with hand-held cutters (see Figure 4). The pipe is rotated while in the jaws of the cutter and snaps off after two or three revolutions.

While each line gets its own valve at the manifold, some lines get additional valves at the outlet. Supply lines always get an additional valve at the toilet, for instance, to facilitate emergency shut-offs and valve adjustments. Lines to outside faucets get brass valves (see Figure 5, next page) crimped in place to allow for winter shut off and drainage. Again, codes differ; some municipalities require valves at the outlet, rather than at the manifold.

The Future of PB

The acceptance of polybutylene won't happen everywhere at once, but it is catching on in more sophisticated markets. In our area outside Washington, D.C., it has more than 35% of the market.

At one time, it might have been viewed with skepticism, but the fear is of the unseen. "This is the plastic piping we've heard the bad things about," people might say. They're usually reacting to only part of the story. PB's first applications were in multi-family, commercial, and manufactured houses, but its greatest acceptance, ironically, is in the higher end. We've installed it in $1 million houses. Those buyers like the conveniences—better, more consistent pressure that eliminates scalding, better temperature control, a resistance to condensation, and the clear organization of the manifold. They even like showing off the high-tech look to friends.

The thing that needs the most work is getting an acceptable, reasonably priced way of making connections to fixtures. Some transition from PB to metal is needed, so connections are usually made with a brass ferrule and nut to the metal threads of the fixture. It's effective, but it costs too much. New materials, especially Noryl, have the potential to offer plastic connections that will cut costs and do the job.

Look at the progress with manifolds. Three years ago, all we had were heat-

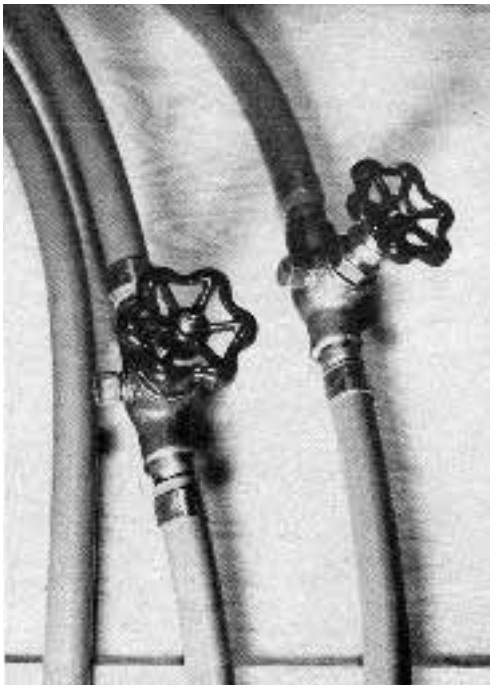


Figure 5. *Brass valves are crimped on to PB lines supplying exterior faucets. Since acetal valves have been pulled off the market, brass valves are the only option where lines must be bled.*

bonded groupings of plastic fixtures that were good until one leaked. That spelled the end of the whole unit. Now we have mechanically assembled units that take half the space and can be broken down and repaired in the field. Our firm helped Vanguard Plastics of McPherson, Kan., design the manifolds we're using today. Some day, those manifolds may be assembled in the field rather than at the factory.

We don't think copper will disappear any time soon, and possibly it never will. But we think polybutylene is here to stay. One steep increase in the ever-fluctuating copper price may be all it takes to assure the future of its plastic rival. ■

Ron Bryant is president of Masters Inc. of Gaithersburg, Md., a large mechanical contracting firm that installs both traditional and plastic plumbing systems. He advised Vanguard plastics on the development of the PB home-run system.