

Risk Control Engineering's regular ongoing bulleting on construction, fire protection, equipment hazards and all things risk management.

POLYBUTYLENE PIPING SYSTEMS (POLY-B)

Polybutylene piping, commonly abbreviated as Poly-B, was a common domestic piping material employed in cold and hot water applications. It is identifiable by the light grey-blue color of the piping (common to many brands) as well as the copper or plastic "crimp" fittings that are used to assemble it. In addition, the piping will be marked with material listings codes and will usually include the letters "PB" in the printed string. Both are shown in the image to the right.

Polybutylene was most commonly used from the 1970's until around 1997 when a high failure rate reduced the material's popularity. It was ultimately removed from the National Plumbing Code of Canada in 2005 and is no longer a permitted material. Common industry estimates hold that Poly-B piping is present in as many as 700,000 homes in Canada.



Common failures with Poly-B piping center around the polybutylene material's sensitivity to both temperature and chlorine, both common in hot water systems. Over time the piping is chemically degraded (weakened) and fails under system pressure. This degradation occurs on the inside wall of the pipe, meaning piping can be dangerously degraded, but look perfectly normal on the outside.

The other common failure mode in the piping relates to the crimp connectors shown above. Many of the connection components in the system were thin wall plastic pieces and the over-crimping (or tightening) of the connection rings by installers created micro-cracking. This lead inevitably to failure at these connections. Both failure modes are relatively problematic for home owners and inspectors as nearly all piping is hidden within walls or enclosed spaces and is not available for inspection.

Polybutylene, abbreviated as Poly-B, was a domestic water piping material used until 2005 in Canada. It is prone to unusually high rates of failure due to issues with heat, chlorine and cracked "crimp" fittings.

Buildings with Poly-B piping can try to slow degradation of pipes and lower likelihood of failures in existing system by reducing temperature and pressure. Owners of Poly-B systems should operate their plumbing at reduced pressures (below 60 psi) and reduced temperatures (55-60°C). This can help slow the

degradation of the piping, but cannot avoid inevitable failure. Re-piping of the water system with chemically stable material such as cross-lined polyethylene (PEX) is considered the only permanent fix for this exposure.