

More Stringent Testing Ensures High Performance

To obtain FM Global and ASTM approvals and Underwriters Laboratories (UL) Listings, CPVC piping undergoes rigorous testing and is subject to extreme scrutiny. The performance tests including the following.

Hydrostatic pressure tests confirm the system won't leak even after being exposed to 375-pounds-per-square-inch continuous pressure at 150°F for 1,000 hours.

Pressure cycling tests subject the pipe and fittings to pressures ranging from zero to twice the rated pressure (350 psi) for 3,000 cycles. This test sample then is subjected to 875 psi for one minute.

Temperature cycling tests subject the pipe and fittings to temperatures ranging from 35°F to the rated temperature (150°F). Five temperature cycles are conducted with the pipe and fittings being held for 24 hours at each temperature, for a total of 10 days. This test sample then is subjected to 875 psi for one minute.

Quick-burst tests ensure that the pipe can meet a minimum 1,000 psi of pressure at room temperature.

Actual performance testing under fire conditions also is conducted.

With specific regard to fire performance, a number of misperceptions must be rectified before CPVC can accurately be considered a safe material option. Consider the following facts.

CPVC has a high flash ignition temperature of 900°F. This is the lowest temperature at which sufficient combustion gas is evolved that can be ignited by a small external flame.

CPVC resists burning due to its high limiting oxygen index (LOI). LOI is the percentage of oxygen needed in an atmosphere to support combustion. This means CPVC will not sustain burning because of its high LOI of 60. Since the Earth's atmosphere is only 21 percent oxygen, CPVC will not burn unless a flame is constantly applied. It stops burning when the ignition source is removed.

CPVC offers low smoke toxicity. Testing at UL of Canada has shown that CPVC produces only one-third the smoke of kiln-dried wood.

CPVC has a low flame/smoke spread development rating. It is allowed within air plenums if the specific CPVC pipe meets the required values for flame spread index and smoke density index when tested in accordance with UL 1887.

CPVC features low thermal conductivity. Since it is an insulator, CPVC pipe will not transport heat from one room to another and it will not propagate a flame.

Firestopping is as easy to achieve and as economical with CPVC as any other accepted piping material. All firestopping systems must comply with ASTM E814 standards. Even if a fire spreads beyond the control of the CPVC sprinkler system, the intumescent seal of the firestop would expand to seal off the area around the pipe—CPVC or metal—and protect the building, its contents, and its occupants.

—by Matthew Kuwatch, executive director and vice chairman of the Steering Board for the Ohio Fire Safety Coalition and the global marketing manager for BlazeMaster CPVC Fire Sprinkler Systems