

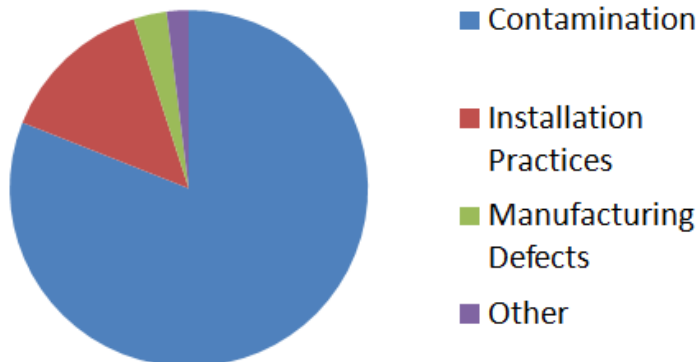


Why Do CPVC Pipes Fail?

Summary

For over 30 years CPVC pipes have been extensively utilized in fire sprinkler systems due to ease of installation, corrosion resistance, and relatively low failure rate. However, in the past 48 months the failure rate of CPVC pipes and fittings has increased. Plastic Failure Labs has been extensively involved in trying to determine the cause behind the failure increase. In the 5 years our investigations indicate that contamination is the root cause of most (>80%) of the failures. The second most common cause of failure is poor installation practices followed by manufacturing defects in pipes and fittings

Main Causes of CPVC Failure



Until recently we (like most forensic labs) utilized infrared spectroscopy (IR) for contaminant identification in failed CPVC pipe samples. However, IR was not detecting anything unusual inside many of the failed pipes even though the failure mode was clearly environmental stress cracking (ESC) due to contamination on the inside of the pipes. We therefore explored alternate forensic contaminant identification techniques. We found that GC-MS worked exceptionally well and we successfully developed a protocol for pipe and water sample analysis. Using GC-MS we identified traces of amines in some failed pipes and fittings. Further work allowed us to determine that certain antimicrobial lined steel pipes were the source of the amines. Our discovery of the amines and the antimicrobial lined metal pipe source has not been without controversy, primarily because most other forensic labs were not detecting the chemicals.

This article is being written to help educate the Fire Sprinkler Industry about the amine contamination issue. Also we are trying to help educate installers about installation errors to watch out for.

To request copy of Dr. Priddy's complete article (12 pages), please email article2@plasticfailure.com

Disclaimer: While the information presented in this document is believed to be reliable, no guarantee, warranty, or representation is made, intended, or implied as to the correctness or sufficiency of any information provided herein.