

**ABF II Statement  
December 21, 2010**

Allied Tube & Conduit and Tyco Fire Suppression & Building Products previously reported that it became aware of a small number of sites with environmental stress cracking (ESC) failures of CPVC pipe and fittings. At that time, some customers expressed concerns that chemical components in Allied ABF® II coated steel pipe may be causing the leaks. As responsible leaders in the fire sprinkler industry, Tyco assembled a team of scientists and industry experts to investigate. Allied and Tyco want to update our customers and the industry on its testing and provide factual information to alleviate concerns regarding our products.

The team of experts evaluated a host of chemical and mechanical stress factors at the reported sites, as well as other sites with CPVC leaks using a variety of industry-recognized tests. In addition, the team constructed and operated an intermediate scale steel-CPVC fire sprinkler hybrid system containing ABF II coated pipe and Blazemaster® CPVC pipe and fittings. This hybrid system and its operation were representative of real-world fire sprinkler systems and were specifically designed to test for any potential detrimental effects of ABF II coating on CPVC pipe and fittings. Samples of exposed CPVC pipe in this system were evaluated using several industry-recognized testing methods, including sustained pressure testing and tensile creep rupture testing. The team also developed and validated new test protocols to understand the interaction between various materials and CPVC, including the interaction of components of the ABF II coating and various ancillary materials typically used in construction of sprinkler systems, such as cutting oils.

The expert team's testing, investigation and analysis during the past year fully supports that ABF II coated pipe poses little risk of creating ESC failures in fire sprinkler systems using good quality CPVC pipe, absent other risk factors. The tests demonstrate that in real-world conditions, ABF II has at most a mild effect on CPVC pipe and fittings. In most cases, only trace amounts of ABF II are found downstream after the system filling process. In the tests, samples of exposed CPVC pipe from the intermediate scale, real-world hybrid system were evaluated using the same sustained pressure testing required of new, never installed CPVC fire sprinkler pipe. All of the samples passed the tests. Samples of exposed CPVC pipe from this system also were evaluated using the tensile creep rupture test, which is a recognized test to evaluate chemical compatibility of materials with CPVC. This test showed that CPVC pipe exposed to ABF performed as well as CPVC pipe exposed to other ancillary products that appear on the Lubrizol FGG/BM/CZ compatibility list.

Based on these findings, Tyco has concluded that ABF II, carried by normal water transit in a typical hybrid system, poses no more ESC risk than a variety of compatible cutting oils and other ancillary materials. Absent other significant factors, the occurrence of ESC in a hybrid system that contains ABF II coated steel pipe does not indicate that ABF II caused the ESC.

Tyco believes the results of these tests explain why the overwhelming majority of installations of ABF II coated steel pipe with CPVC pipe and fittings have provided trouble-free service without incident for so many years. For example, our investigation of several hybrid system sites with ESC-induced leaks in CPVC has uncovered serious and measurable quality problems with the CPVC pipe from a single CPVC manufacturer.

It is important to note that the investigation of a leak in CPVC is particularly complex, and requires a comprehensive study of numerous mechanical and chemical factors. There are a variety of different causes for CPVC leaks, many of which have nothing to do with chemical compatibility. ESC is one type of leak mechanism that can result from certain chemical exposure in combination with applied stress over a period of time. Each ESC leak in CPVC is different, and there is no single, simple explanation for all ESC CPVC leaks.

In multi-component, hybrid systems containing CPVC pipe and fittings, the risk factors that can contribute to ESC are primarily outside the control of any single product manufacturer, system designer or installer. As industry leaders, Allied and Tyco will continue to drive the fire sprinkler industry to adopt comprehensive, system-level integration standards to mitigate ESC risks in hybrid systems that include CPVC. However, until such standards are implemented, Tyco reiterates its previous recommendation that Allied ABF II coated pipe not be installed in new fire sprinkler systems containing CPVC. Tyco believes this action will help the industry better focus on the many factors that can create ESC risk in hybrid fire sprinkler systems with CPVC pipe.

For additional information or questions, and to review a white paper describing Tyco's tests and results in more detail, visit [alliedtube-sprinkler.com/cpvc](http://alliedtube-sprinkler.com/cpvc) or call 1-888-890-2278 in the United States or 1-708-339-1610, extension 7301 outside the United States.

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