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Latest Findings Document Equal Antimicrobial Performance Between CPVC and Copper

Both Materials Offer Best Protection Against Biofilm Formation

There is no doubt that biofilm formation has become a topic of widespread interest, especially in the healthcare industry where patient health and well-being are top priorities. Biofilm is what forms where bacteria adhere to surfaces in aqueous environments and begin to excrete a slimy glue-like substance that can anchor them to all kinds of materials, such as metals and plastic. Essentially, biofilm may form on any surface exposed to bacteria and some amount of water.

When it comes to biofilm formation, there are many studies using various methodologies and test protocols to produce conflicting results – all of which leads to confusion in the market. Biofilm formation and a piping material's tendency to enhance the multiplication of microorganisms is, for good reason, a well-studied topic and one that has received the attention of laboratories and related organizations around the world. The problem, to date, has been in identifying consistent results that unequivocally prove one pipe's superiority over another with regard to biofilm and bacteria formation.

Leading the effort to mandate consistency and to thoroughly evaluate the effectiveness of the various test procedures has been the Dutch Research and Knowledge Institute for Drinking Water (KIWA). A recognized leader in assessing microbial growth potential in piping materials used for potable water since 1999 when it completed its first comprehensive study of biofilm formation, KIWA has since issued two additional reports—one focused on the need to standardize testing methods and another designed to compare prevailing test methods.

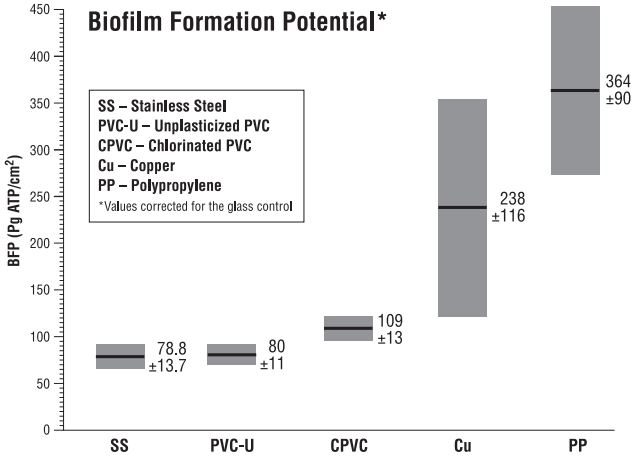
The combined KIWA reports unveiled a number of interesting findings and pinpointed common variables that have created discrepancies in previous test results. Most important, however, is the **conclusion that CPVC compares favorably with other piping materials with regard to its ability to resist the formation of biofilms which harbor potentially deadly bacteria such as Legionella, coliforms and Pseudomonas.**

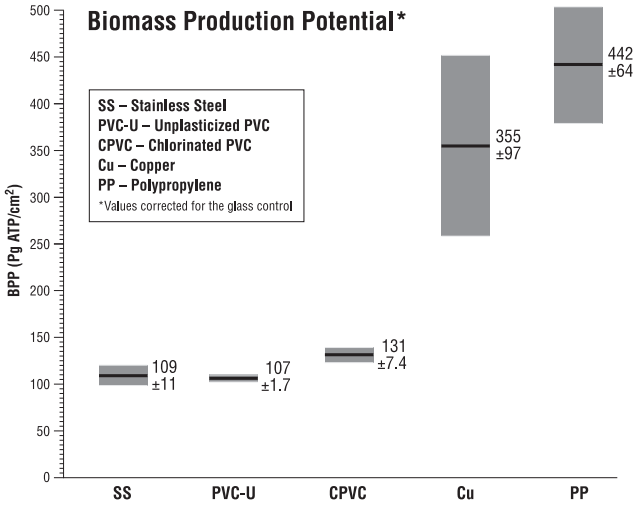
The KIWA research and results have since been reviewed by Dr. Paul Sturman, research professor and industrial coordinator for The Center for Biofilm Engineering at Montana State University (the largest facility dedicated to the study of biofilm in the country). With more than 20 years of experience in the field, Dr. Sturman has devoted much of his career to studying biofilm and developing solutions for the problems it causes. Based on his detailed analysis of the KIWA research, Dr. Sturman **concluded that CPVC consistently outperforms most other non-metallic piping materials with regard to its ability to resist the formation of biofilms. He further confirmed that there is no statistical difference between the antimicrobial performance of CPVC and copper. Both have proven to offer the best protection against biofilm formation.**

Of equal importance is the conclusion that piping materials actually contribute little to the likelihood of biofilm formation over time. In fact, biofilm growth is, more than anything else, a function of water quality. Dr. Sturman has documented that a majority of the organic carbon responsible for biofilm formation already exists in the water being tested before it flows through any piping material. In most cases, the amount of organic carbon in the water is significantly greater than what could leach from the interior of the pipe.

Yes, there have been other studies that suggest contradictory results. But as testing protocols have become more stringent and sophisticated, the deviations in measurements between copper and CPVC have actually decreased, such that no significant differences are evident in recent studies.

These more current tests take into account variables designed to simulate real-world scenarios. For example, water flow, as well as the frequency of water replacement, have a direct impact on biofilm formation potential.





"It's important to consider long-term results, because what happens in the short-term may be very misleading," said Dr. Sturman. "Our job at The Center for Biofilm Engineering is to not only question the validity of test results, but to also evaluate under what conditions the results are valid. Tests must be designed to reflect what is likely to happen in a real-life residential or commercial setting. Chances are water is not going to be sitting in the pipe with no movement for six months at a time. The spigot will likely be turned on, the water will flow and it will be replenished. The more recent test protocols reflect these realities and are, thus, more credible in their conclusions regarding the superior performance of both CPVC and copper."

CPVC Outperforms Copper in Other Key Areas

With the scientific community confirming the equal performance of CPVC and copper in the area of biofilm formation, specifiers can now focus on the many other important criteria for choosing a piping material. Topping the list are cost considerations. A CPVC system not only costs less to install, but also to maintain. Material costs are relatively stable compared to skyrocketing copper prices. Labor costs are also minimized—as much as 50%, depending on the size of the installation—due to a fast and easy solvent cement joining process that replaces the labor-intensive process of soldering copper pipe.

Maintenance costs are reduced as a result of the reliability of a CPVC piping system, which is immune to the effects of pitting, scaling and corrosion. No corrosion means no risk of CPVC leaching into the water supply. Conversely, copper is susceptible to corrosion which can cause copper to leach into the water supply.

A quieter operation is also a key attribute of a CPVC system. An NSF International test confirms, in fact, that FlowGuard Gold® and Corzan® CPVC plumbing systems are four times quieter than a copper water distribution system with their ability to minimize water flow noise and virtually eliminate water hammer.

CPVC piping systems are also more energy efficient than copper in their ability to keep hot water hotter for longer. They also create less condensation. A recent third-party Life Cycle Inventory analysis additionally confirmed the environmental benefits of a CPVC system over copper and other plastics when evaluating its energy production demands and global warming potential.

Most important is the peace of mind afforded by CPVC plumbing systems, which have been successfully installed around the world for more than 50 years in homes, hotels, high-rises, dormitories and healthcare facilities.

For more information on the benefits of a FlowGuard Gold or Corzan CPVC plumbing system from FBC™ Building Solutions, visit www.fbcbuildingsolutions.com. To request a full copy of the 2007 KIWA assessment of microbial growth potential, call 888-234-2436, extension 4477393.