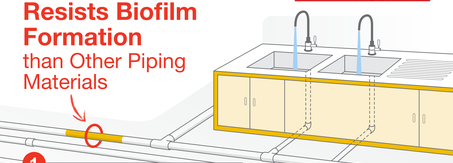
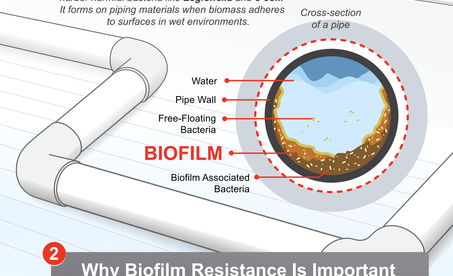
How CPVC Better Resists Biofilm Formation than Other Piping Materials

FLOWGUARD® PIPE & FITTINGS



1 What Are Biofilms?

Biofilms are a slimy glue-like substance that can harbor harmful bacteria like **Legionella** and **e-coli**. It forms on piping materials when biomass adheres to surfaces in wet environments.

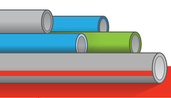


2 Why Biofilm Resistance Is Important

*Biofilm resistance is a key to keeping water **safe** and **free of harmful contaminants**.*

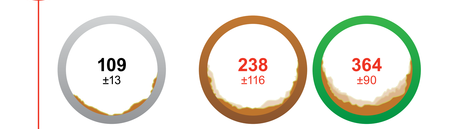
It reduces the risk of:

- *Accumulation of microorganisms which may cause health problems.*
- *Impaired water quality, including taste and smell.*
- *Bacterial growth, including multiplication of **Legionella** and **Pseudomonas** as well as increased counts of **Coliform** bacteria.*



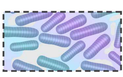
3 CPVC Resists Biofilm Formation Better than Alternatives

Biofilm Formation Potential (Pg ATP/cm²)



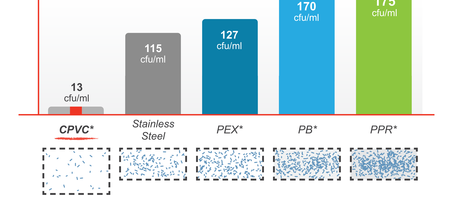
Number of Legionella Bacteria from Piping Materials

FLOWGUARD® *CPVC permits much less Legionella bacteria growth than other materials. **Legionella** is a type of bacteria that can lead to a serious, potentially deadly, infection. It is transmitted through water vapor, which makes it dangerous when steam is emitted during a shower.*



Legionella bacteria

Average after 8, 12 and 15 weeks - Static Test, No Flow.
**Average of 2 Samples*



kiwa

*The **Kiwa Assessment**, and multiple other international studies, confirm that **CPVC consistently outperforms alternatives**, including PPR (polypropylene), when it comes to resisting biofilm formation.*

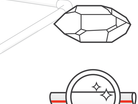
FLOWGUARD® *CPVC has been approved for potable water applications by major international agencies including:*

kiwa NSF WRAS APPROVED PRODUCT

*"**CPVC** consistently outperforms most other non-metallic piping materials with regard to its ability to resist the formation of biofilms."*

– Dr. Paul Sturman
Research Professor and Industrial Coordinator for The Center for Biofilm Engineering at Montana State University

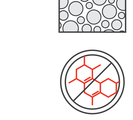
4 How CPVC Resists Biofilm Formation



CPVC is made of 67% salt, which is a medium not suitable for bacterial growth.

Smoother interior pipe surface and superior corrosion resistance.

*Corrosion creates pockets on the pipe surface for biofilm and bacteria to latch onto. **PPR** is prone to corrosion from chlorine and chlorine dioxide in water.*



Higher Density Material.

Less bacterial attachment by reducing the contact area between bacteria cells and pipe surface.

Contains no plasticizers.

*In plastics, plasticizers and other additives offer a nutrient source to fungus. **FlowGuard CPVC** contains no additives for fungus to feed on.*

NSF

***FlowGuard CPVC** is **NSF 61 Annex G certificated**, which verifies the weighted average lead content within the piping material is less than 0.25%.*

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REFERENCES:
https://cdn2.hubspot.net/hubfs/4206233/KIWA%20Assessment%20for%20Water.pdf
https://www.cdc.gov/legionella/about/signs-symptoms.html