

PMI Research Project Request for Proposal

Flow Rate and Pathogen Growth

Background:

Regulators and other organizations continue to push to institute lower and lower flow rates in plumbing systems and end-point devices. There has been little or no scientific research into the unintended consequences of these actions. Also, there has been no research into what a “safe” lower limit can be, and there has not even been a good definition of what is “safe”. The general belief is that there is a lower limit at which unsafe conditions will occur and the public will be at greater risk. A couple examples of the potential risks may be the quality of the water on the potable side and drain-line carry on the sanitary waste side to name just two. Drain line carry is already being systematically studied. The impact on the quality of water due to continually lowering flow rates needs more research. The proposed project is to study one small aspect of this potential issue.

Scope:

The scope of this project is to begin to understand the impact of flow rate on the propensity for proliferation of opportunistic pathogens in potable water. This project will look at the impact of various flow rates under experimental laboratory conditions. This phase is not intended to address all the factors in a complex premise plumbing system, the focus should be solely on the changes in the quality of water based on changes in flow rates.

Hypothesis:

Lower flow rates will yield a greater proliferation of opportunistic pathogens in potable water.

Experimental Considerations:

- Experimental setup must be reproducible.
- Water source chemistry must be controlled.
- Source of opportunistic pathogens must be controlled.
- Experimental procedure must be as simple as possible, eliminating all variables except flow rate.
- The flow ranges need to represent the extreme low end and the high end that is typical of premise plumbing systems.
- The experiment needs to be run long enough to achieve steady state.

Deliverables:

- A fully defined test protocol, including budget requirements.
- All measured test parameter data log over the life of the project.
- Influent and effluent sampling of water at prescribed intervals.
- Biofilm sampling at prescribed location and times during the testing.
- Project report including the charted data, a description of any anomalies observed during the testing and a summary of the findings versus the original hypothesis.

Contractual Terms:

- Other contractual terms to be determined upon receipt of test protocol and budget.