

Chloramine and Its Effects on Rubber

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Chloramines, or monochloramines, are used as a secondary disinfection process to treat drinking water by water utility companies. Chloramines are a disinfectant typically formed when ammonia is added to chlorine treated water.

Chlorine is a primary disinfection process that is effective and quick at killing infectious diseases, however, chlorine treating loses its effectiveness over time and because of this is not effective at killing bacteria and viruses as the water moves through pipes. Chloramine is more stable and is more effective than chlorine at killing bacteria and viruses found in the pipes that are used to transfer water. Chloramines are not effective as a primary disinfectant because they take much longer to kill harmful organisms making it impractical for most water utilities.

Chloramines have become an issue in the past several years as its use as a disinfectant in drinking water increases. Chloramines can deteriorate rubber and plastic and corrode metal, all found in faucets, shower heads, toilet valves and other applications.

There are elastomers that are chloramine resistant. Peroxide cured silicones and fluorocarbons do well but can be a costly alternative to standard sulfur cured nitrile and EPDM compounds. Peroxide cured EPDM have shown to do well with chloramines and are only moderately more expensive than its sulfur cured equivalent. Chloramine testing can be performed on elastomers, however, this testing is expensive costs around \$2,500 for a 3 week test and \$5,000 for a 6 week test.

ASTM D6284, Standard test Method for Rubber Property – Effects of Aqueous Solutions with Available Chlorine and Chloramine, is the designated specification for testing the effects of chloramine on rubber. Basically the test has you mix a solution, in this case a 50ppm monochloramine solution, and soak samples for a designated period of time. Weekly testing can be performed on the samples to record the hardness, mass and volume changes as well as note any degradation of the material. Most common test is 3 weeks, however, some compounds have shown not to significantly change until around 4 weeks or more. Therefore, we recommend a 6 week test be performed.

Call the experts at Satori Seal for your chloramine resistant sealing requirements.

References:

1. <http://www.epa.gov>
2. <http://www.usbr.gov>
3. ASTM D6284-17, Standard test Method for Rubber Property – Effects of Aqueous Solutions with Available Chlorine and Chloramine