

PVC and CPVC Tru-Bloc® True Union Vented (Bleach) Ball Valve, Model D

The Problem

Sodium hypochlorite, used in water treatment, aquatic centers, and paper and textile applications, can become trapped in the body cavity of a closed ball valve and create conditions that may result in damage to the valve or system as a result of unstable chemical decomposition.

The Chemtrol Solution

The Vented Ball Valve is a special factory modification to a PVC or CPVC True Union Ball Valve that effectively vents sodium hypochlorite out-gassing to the pressure port. In addition, the inner valve surfaces are kept constantly wetted to ensure problem-free use of the ball valves in bleach transfer and injection applications.

Background

In the search for a safer alternative to chlorine vacuum gas injection, fresh and wastewater treatment, paper and textile plants, and aquatic centers are converting to the use of sodium hypochlorite as a disinfectant or bleaching agent. A high pH level characterizes commercial bleach, which consists of a nominal 15% solution of sodium hypochlorite along with approximately 1-2% of sodium hydroxide to act as a chemical stabilizer. Known as a good oxidizer, the solution has been found to cause stress cracking in polyethylene and polypropylene materials. And metallic materials react, causing rapid decomposition of the "hypo." However, PVC and CPVC, with fluorocarbon rubber (FKM) seals, have been successfully used for years to handle this aggressive chemical solution.

Some system design considerations are important, though. Heat, time, and positive ions are enemies of bleach stability. When a ball valve is closed in periods of inactivity, the bleach will decompose over time liberating oxygen gas. The decomposition rate is increased by heat absorbed from sun shining on exposed piping, or by reaction heat resulting from debris trapped in a ball valve body between the ball and its seats. Gas pressure may slowly build in the closed valve cavity, or quite rapidly in the reactive case. Such conditions may result in damage to the valve or system.

Also, evaporation of sodium hypochlorite in the ball cavity can lead to the formation of crystalline residue that eventually embeds in the PTFE seats of a ball valve and significantly raises the turning torque due to excessive wear on the ball by fouled seats. Such conditions may result in a broken valve stem, frozen valve ball, or other damage to the valve or system.

The Chemtrol® Vented Ball Valve offers a viable solution for sodium hypochlorite transfer and injection applications. Our unique factory-assembled bleach ball valve has effectively eliminated the problems associated with these uses. By ensuring that all inner surfaces of the valve are kept constantly wetted and vented to the upstream side when the valve is in the closed position, we have eliminated the conditions required for gas accumulation and caustic crystallization in the body cavity.

