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Service Conditions Determine The Material.

Why pay extra to install bronze instead of brass? After all, MSS standards are the same for either material. Simply stated, bronze and brass valves are **not** the same, and are **not** considered interchangeable. The differences in these metals are real and service conditions can greatly affect their performance. And all too often, selection is based strictly on the lower price of brass products.

Brass products are more susceptible to damage from dezincification under certain water conditions. Bronze valve alloys are more rugged, and are proven to be less likely to have corrosion issues. When utilized properly, either brass or bronze will render excellent service. Both materials are available from Milwaukee

Valve for their extensive lines of ball, gate, globe, and check valves. Every one of these valves have been designed with the specific materials of construction in mind.

Knowing when and where to use these materials is key to the decision process. While that may be difficult, help is available. Please take a few moments to read an article entitled [**Brass or Bronze, Minimizing Life Cycle Cost**](#). While originally published eleven years ago in **PM Engineer** magazine, the information has not changed. For more information, visit www.MilwaukeeValve.com or contact your Milwaukee or Hammond sales representative.



Case Histories
2012 *two thousand and twelve*

Brass or bronze: Minimize life cycle cost by selecting the correct valve

When a plumbing contractor or system designer has the option to install brass valves or to use more expensive bronze, and the decision is based on cost, the decision will swing to brass. But, when it's the brass products will, in most cases, give good service and perform nearly as well as bronze, it is equally correct that in some small percentage of installations brass will degrade earlier than expected, causing a host of problems and additional costs for the property owner.

The challenge for the plumbing contractor or system designer is to better understand the conditions where brass valves may not perform, and to specify and install bronze valves to eliminate the potential problems in these water environments.

What problems are we describing? In a word, dezincification, concentration in a corrosive medium, usually acid, preferentially corrodes or dissolves out of a copper alloy, leaving the remaining substrate (in this case, bronze) with voids where the lost metal was. Clearly, that's not acceptable for a device meant to contain pressurized fluid. Dezincification can result in early valve failure, cause flaking and leakage, the rest of the plumbing system by introduction of corrosion byproducts. These byproducts can clog narrow flow passages and otherwise cause system failure.

Some companies state that when zinc content of a zinc-bearing copper alloy is above 15%, there is risk for dezincification, and when it is below 15%, you are safe. Actually, dezincification can occur in any zinc-bearing copper alloy, depending on the circumstances, and when it happens it can be disastrous even when the starting concentration of zinc is fairly low.

Beyond that, the alloy is only one piece of the puzzle. It's just as important to consider the makeup of water passing through the valve, because when it comes to dezincification all water is not the same. Many potable water supplies (TDS below 500 ppm) are still very corrosive to brass. Levels of corrosive potential can greatly be affected by other factors in the water chemistry, such as temperature.

For example, identical valves in hot and cold water systems might experience corrosion only in the cold system. A comprehensive water analysis is the best starting point in understanding the risk for corrosion problems. In evaluating alternatives, it is best to act on the side of caution.

If there is a single factor present for dezincification, such as a known history in the geographical area, a water analysis of the location showing a negative Langelier Saturation Index, or a salt-based softening system present, in some cases a few examples, the contractor or system designer should specify bronze valves to mitigate the risk. The overall project cost will not increase significantly even though the cost of the individual valve might be substantially higher when moving from brass to bronze.

It's important to realize that each valve and material combination has a reason for being, and not every valve or valve material can do everything. Given the wide variety of configurations and materials available, some applications need a little extra attention to ensure the correct valve and material selection are made. When deciding between brass and bronze for water valves, consider the slight increase in cost for the bronze valve might be well worth the security of eliminating the potential of a serious problem, albeit in a fairly small percentage of cases.

Think out capable, US-based manufacturers who can properly support your requirements before and after the sale. With more than 120 years of experience, back to Milwaukee Valve for expertise in making sure your systems needs are properly addressed. We have reliable valves backed with responsive installation and knowledgeable product support.



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