

Mold Cooling Maintenance Guidelines

Mold failure caused by water-induced corrosion has become a growing problem for molders. Lack of definition about water requirements and general lack of knowledge or attention to the mold cooling process appears to be at the core of the issue.

In recent years there has been a move away from the use of a glycol and water mixture for mold coolant in favor of running straight water. This is acceptable only if certain guidelines are met: the water must contain an anti-corrosion additive, and can not be high in sulfur, iron, salt, acid or chloride.

Corrosion inhibitors are required for systems using glycol or straight water. These inhibitors are available commercially from sources such as Calgon Corporation, Nalco Chemical Company, Drew Chemical Corporation and equivalent suppliers of water treatment chemicals. (Contact Uniloy Milacron service department if you need additional information about any of the above companies listed.) One of the worst practices is the use of untreated chlorinated city water. Chlorine is one of the most severe corrosive causing chemicals found in molds.

Coolant water must not contain excessive solids, hardness salts, sulfates, or chlorides. Total solids should be 340 ppm max. Total hardness for the calcium carbonates (CaCO₃) should be no greater than 170 ppm. Chloride (Cl) should be 40 ppm max. Sulfate (So₄) should be 100 ppm max. Acidity or pH should be controlled within a range of 6.6 to 8.0. The optimum range of pH is 7.0 to 7.5.

If you are running a glycol water mixture, you must measure the solution for specific gravity, weekly. The glycol concentration needs to be between 30 to 35% by weight. Also the solution needs to be checked for glycol degradation on a quarterly basis. The risk is that the solution will degrade into formaldehyde and acids. It is imperative that the glycol solution contain polymeric dispersants to protect and prevent the formation of deposits on the mold channels. The above requirement covers minimum requirements for glycol specific gravity, your facility may require a greater amount depending on your chilled water temperature, or plant conditions.

Mold exterior surfaces are also subject to corrosion. Wipe down the mold face and cavities using a cotton cloth with denatured alcohol to remove moisture and minimize exterior corrosion. This needs to be done any time a machine is shut down for more than an eight-hour period.

If these steps are followed, you will benefit from a longer life and optimized cooling of your molds. Build up of corrosion within the waterlines will be minimized, which in turn will require less costly, and less frequent repair and reconditioning.