

CHLORIDES

THE CONCERN WITH CHLORIDES

The primary concern with chlorides is corrosion. Elevated levels of chlorides will contribute to corrosion of ferrous metals. Cast iron is very susceptible to chloride corrosion while higher grade steels and stainless steel will be more resistant. As a rule of thumb, when chlorides are between 250 and 300 parts per million (ppm), the potential for corrosion is greatly increased. At that level and above, the system should be monitored for corrosion.

CHLORIDES AND WHERE THEY COME FROM

Chlorides are simply negatively charged ions of the chlorine atom. The most common source of chlorides in an industrial environment is from water. The amount of chlorides can vary greatly depending on the source of the water (wells, rivers, lakes, etc.) and the region of the country.

The distillation effect plays a large role with chlorides. The distillation effect occurs when water evaporates from a system and leaves its minerals behind. When additional make up water is added to the system to compensate for the evaporation, additional chlorides are added to the system. Over time, this effect causes chlorides to build up in a system.

Chlorides are also found in a variety of chemicals used in industry. Some water treatment chemicals use chlorine-based chemicals, similar to bleach or pool shock, as biocides. Water softeners use sodium chloride or potassium chloride in brine solutions to regenerate the resin beds. While using water from a water softener will generally not increase chlorides significantly, the brine solution, if not discarded during regeneration will contribute to chlorides.

Some additives used in metalworking fluids may also contain a small amount of chlorides. Many of the Castrol SYNTILO® synthetic metalworking fluids contain such an additive. A five percent dilution of a Castrol SYNTILO® will typically contribute 70 to 80 ppm of chlorides.

CORRECTIVE ACTIONS

Unfortunately, chlorides cannot be practically removed from a metalworking system. If the chlorides are at a level of concern, tank side additives may be effective in preventing corrosion, but this is usually a temporary fix. A partial to full dump and recharge of the system, which reduces the chloride level, is a better option.

If the make up water is the source of the chlorides, pre-treating the water with a distillation, deionizing (DI), or a reverse osmosis (RO) unit will remove the chlorides from the water prior to use.

Corrosion can also occur due to several different conditions with metalworking fluids. The fluid concentration, pH, hardness, dirt load, and bacteria levels can all contribute to corrosion. It is important to consider all parameters of a fluid's condition prior to making corrective actions.

The information in the paper is provided for guidance and informational purposes only. The information contained herein has been compiled from sources deemed reliable and it is accurate to the best of our knowledge and belief.

However, Castrol cannot guarantee its accuracy, completeness, and validity and cannot be held liable for any errors or omissions, as the results change depending on the working condition/environment.

The content, website and information within the paper are not intended to provide investment, laboratory or manufacturing process advice.

Changes are periodically made to this information and may be made at any time. All information contained herein should be independently verified and confirmed.