



# Master Brewers Safety Toolbox Talk

## Chemical Effects to Hose and Tubing

### Overview

Service life of your brewery hose and tube can be greatly affected by the chemicals you use as well as the equipment they are connected to for cleaning and sanitizing. This "Toolbox Talk" will discuss examples of chemicals and their effect on hose and tubing.

### Common Chemicals used in cleaning and sanitizing equipment.

Caustic, Acid, Sanitizer/Disinfectant and Sterilizers.

- Sodium Hydroxide
- Chlorinated Potassium Hydroxide
- Nitric, Phosphoric, Peracetic and Citric Acid
- Iodine Sanitizer

### Common Brewery Hose Tubing Types

- Chlorobutyl - Hose
- UHMW (Ultra High Molecular Weight Polyethylene) - Hose
- PVC - Tube
- EPDM - Hose

### Recommended Hose Cleaning / CIP

Whether you are calculating in mS (millisiemens) or PPM (Parts per million) in some processes it is not uncommon for the concentration levels of your cleaning solutions to be at the wrong levels. It is recommended that these levels be reviewed at your brewery from time to time for proper concentration. Care must be taken to ensure that the chemicals used do not affect the hose tube. Therefore, the temperature of the cleaning and the chemical concentrate of the product used are critical. (See examples below)

### HOSE AND TUBE SPECIFICATIONS

- **Chlorobutyle:** Range 150-250psi. Temperature Range -40 to 240F (CIP Range 240-266F)
- **UHMW:** 250psi Temperature Range: -40 to +250F
- **PVC:** Reinforced and Non-Reinforced. +25 to 150F. PSI can vary between reinforced and non.

[Recommended CTD \(Concentration, Temperature and Duration\) Rubber Hose](#)

- **Caustic:** 2% Concentration, Room Temperature. 30Min.

**Nitric Acid:** 0.5%, Room Temperature, 30Min.

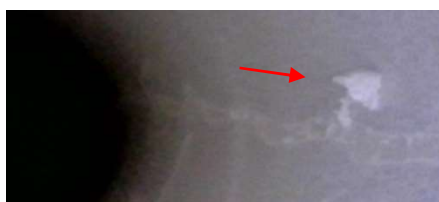
**CAUTION:** Never run pressurized water above 212Deg.F through brewery hose. Hoses are not designed for steam. This will cause severe damage to yourself and other brewery staff.

### Effects to hose with high chemical concentrations in the brewing system.

When using a chlorobutyl tube type hose over time the tube can start to breakdown. You may notice a white ring forming inside the wall of your tanks or particles on your fittings. A white substance that you cannot be remove easily from stainless-steel. This is chlorobutyl and can be removed with a highly concentrated cleaner. If you discover this in your system, it is highly recommended that you check your hoses. This can happen in newer hoses, but most found in older brewery hoses that have been subjected to long term CIP cleaning and high temperature processes.

It is always recommended that brewery hose and tubes be flushed with water after cleaning and stored properly to allow water to drain and allow the inner tube to dry properly.

### Illustrations of chemical damage and results



**Chlorobutyl flaking in hose tuber. (Short term damage)**



**Long term damage**



**Chlorobutyl close-up on reservoir tank**



**Chlorobutyl ring of inner wall of tank**

### Final Notes

It is always recommended that you contact your cleaning chemical supplier for correct dosing levels and use the correct temperatures that comply with the hose manufacturers temperature ranges. Elevated temperature can potentially change the characteristics of the chemical and cause premature wear and damage to your hose system.

Providing your hose supplier with the SDS sheets for the chemicals you are using to clean are always advised so that your hose system is compatible with the chemicals used in the cleaning process.

[LEARN MORE!](#)

[Food Hose Cleaning](#)

[Fluid Handling Solutions](#)

FOR MORE INFORMATION ON BREWERY SAFETY, PLEASE VISIT THE MBAA BREWERY SAFETY WEBSITE AT:

<http://www.mbaa.com/brewresources/brewsaet>

If you have any questions regarding this, please see your supervisor/ manager or a member of the Safety Committee.