

## CHIP MSDS Companion Sheet #1

Boiler Water Treatment

This summary sheet may be used to identify which class of chemicals your product belongs to and what the product or its ingredients do. This information should assist you in comparing alternative products and identifying incomplete material safety data sheets. The health information below is intended for general information only. The effects of chemical ingestion are not included.

Prevention of Scales and Deposits

**Lime-soda softening:** Generally means lime (calcium oxide) and soda ash (sodium carbonate). May also use alum (aluminum sulfate) or sodium aluminate (aluminum sodium oxide). Lime is a caustic and irritating material to living tissue. Sodium carbonate is a skin and eye irritant. Alum, when mixed with water, can form some sulfuric acid which acts as a irritant, particularly to the lungs. Sodium aluminate is a moderate irritant to skin, eyes, and mucous membranes; can be corrosive.

**Zeolite or other ion exchangers** (e.g. crosslinked sulfonated polystyrene).

**Phosphates** such as disodium phosphate (sodium monohydrogen phosphate, mild skin and eye irritant), metaphosphates (e.g. Calgon, trimetaphosphate), polyphosphates (sodium tripolyphosphate, moderate skin irritant), pyrophosphates, tripolyphosphates; organic phosphates or phosphonates such as nitrilo tris (methylene phosphonic acid) (AMP), 1-hydroxyethylidene 1,1-diphosphonic acid (HEDP), and phosphate esters.

**Magnesium salts.**

**Silica scavengers:** Ferric sulfate, magnesium oxide (possible tumor-causing agent in animals; inhalation of fine dust or fumes can produce feverish reaction and flu-like symptoms), or magnesium hydroxide.

**Dispersants:** tannins (experimental suspect carcinogens), sulfonated lignins, starch.

Prevention of Corrosion

**Oxygen scavengers:** sodium sulfite, hydrazine (may cause skin sensitization as well as poisoning; may cause liver damage and destruction of red blood cells; animal positive carcinogen as per IARC of lung, nervous system, liver, kidney, hematopoietic organs, breast, subcutaneous tissue), octadecylamine (a skin irritant).

**Carbon dioxide scavengers:** ammonia (irritant of eyes, nose, and airways) or amines such as cyclohexylamine (can cause dermatitis, convulsions), morpholine (diethyleneimide oxide, irritant to skin, eyes, and mucous membranes, has produced kidney damage in experimental animals).

Prevention of Steam Contamination

**Tannins** (experimental suspect carcinogens) and lignins.

**Foaming inhibitors** such as polyamides and polyoxyalkylene glycol derivatives.

Boiler Lay-Up

Products containing hydrochloric acid (muriatic acid; irritating to skin, eyes, and mucous membranes of respiratory tract. Severe exposures result in damage to lung tissue).

DEPENDING UPON WHAT CHEMICALS YOU USE, BOILER BLOWDOWN  
WILL HAVE ITS OWN HAZARDS.

• Cornell University, Chemical Hazard Information Program •

● PREVENTION OF SCALES AND DEPOSITS



- Lime-soda softening
- Zeolite or other ion exchangers
- Phosphates
- Magnesium salts
- Silica scavengers
- Dispersants

● PREVENTION OF CORROSION

- Oxygen scavengers
- Carbon dioxide scavengers

● PREVENTION OF STEAM CONTAMINATION

- Tannins and lignins
- Foaming inhibitors

● BOILER LAY-UP

- Products containing hydrochloric acid

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