

# OptiSpense\* HP5495

## internal boiler treatment

- Outstanding protection against metal oxide deposition and caustic corrosion.
- Optimum control with tailored sodium to phosphate ratio
- Easy to handle liquid formulation

### description and use

OptiSpense HP5495 is an alkaline blend of phosphate and polymeric dispersant. The products buffering capacity is determined by its specific sodium to phosphate ratio.

OptiSpense HP5495 is used in boilers that are fed with high quality water such as demineralised, mixed bed, double pass RO, EDI and condensate.

A separate feed of an organic oxygen scavenger and neutralising amine may be required to give a complete boiler water treatment programme.

All the ingredients in OptiSpense HP5495 are listed in FDA 21CFR173.310 - boiler water additives for use in the preparation of steam that will contact with food.

### problem description

As the demand for high purity boiler feedwater increase the potential for caustic corrosion also increases. The major contaminants are typically iron and copper oxides. Iron deposits are very porous, and this porosity makes the road to caustic corrosion possible.

Boiler water migrates through the deposit toward the tube surface. As the water rapidly absorbs heat, steam escapes through the deposit forming a "sculpture chimney effect." If sodium hydroxide is present in the boiler water it can then concentrate under the deposit. This can then result in caustic gouging.

### protection against caustic corrosion

OptiSpense HP5495 fights caustic corrosion in two ways:

Firstly, it reduces the sites where caustic can concentrate by minimising metal oxide deposition on the boiler tube surfaces.

OptiSpense HP5495 controls metal oxide deposition with a synthetic polymer. This polymer is extremely effective in coating and dispersing iron and copper oxide particles entering the boiler, so they stay finely dispersed in the boiler water and don't adhere to metal surfaces.

Secondly, the phosphate buffer neutralises any free caustic in the boiler water to reduce the potential for a corrosive environment.

The theory of coordinated phosphate/pH control tell us that as long as boiler water pH is maintained between 9.2 and 10.2, all phosphates added will naturally convert to the  $\text{HPO}_4^{2-}$  species in the boiler; and as long as sufficient  $\text{HPO}_4^{2-}$  is present in the boiler water, it will neutralise any free hydroxide present according to the following reaction.



### treatment and feeding requirements

**Feed point** - OptiSpense HP5495 should be fed to the boiler drum. Alternatively it may be fed to the boiler feedwater line after the attemperation spray water take off point. Check with your local SUEZ representative to determine the specific conditions in your system in order to define the optimum dosing point.

Find a contact near you by visiting [www.suezwatertechnologies.com](http://www.suezwatertechnologies.com) and clicking on "Contact Us."

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**Feed rate** - Sufficient OptiSperser HP5495 should be fed to maintain the recommended boiler water phosphate residual. The product is formulated for specific operating conditions. The feed rate depends upon operating pressure, heat transfer rate and feedwater quality.

**Dilution** - OptiSperser HP5495 can be fed neat or diluted to any convenient strength using demineralised water or condensate. When the product is fed direct to the boiler drum it must be diluted.

### general properties

The physical properties of OptiSperser HP5495 are shown on the Safety Data Sheet, a copy of which is available on request.

### packaging information

OptiSperser HP5495 is a liquid blend and is available in a wide variety of customised containers and delivery methods. For more information please contact your SUEZ representative.

### safety precautions

A Material Safety Data Sheet containing detailed information about this product is available on request.