Fact Sheet

GE Infrastructure
Water & Process Technologies

STEAMATE™ NA5640 Condensate Treatment

- Controls corrosion of equipment and piping
- Minimizes deposition of corrosion products in boiler system
- Blended for maximum effectiveness and steam distribution
- Suitable for use in Health Canada and Agriculture Canada regulated plants

DESCRIPTION AND USE

STEAMATE™ NA5640 is a blend of neutralizing amines with selected stability and vaporization characteristics. It volatilizes with the steam and quickly neutralizes the acidic components of steam. The unique characteristics of STEAMATE NA5640 provide controlled protection at points of initial condensation and in the extended areas of a complex steam condensate system. This reduces the pickup of copper and iron corrosion products. STEAMATE NA5640 is approved for use in Health Canada and Agriculture Canada regulated plants where steam is used for sterilization or contacts food or food products. It is not approved for use in systems where the steam contacts milk or milk products.

TECHNOLOGY

Corrosion in steam condensate systems is frequently a problem. Carbon dioxide is the most common cause of corrosion, with oxygen a close second. The influence of oxygen can be insidious because traces of oxygen catalyze the corrosivity of carbon dioxide and do not reflect the characteristics commonly associated with oxygen attack.

The feedwater alkalinity is the chief source of carbon dioxide because bicarbonate and carbonate break down at elevated temperatures to form carbon dioxide gas. The reactions are as follows:

(1) $2NaHCO_3 + \text{heat} \rightarrow Na_2CO_3 + CO_2 + H_2O$

(2) $Na_2CO_3 + H_2O + \text{heat} \rightarrow 2NaOH + CO_2$

The first reaction is 100 percent complete; however, the decomposition shown in the second reaction proceeds to only about 80 percent completion.

At points of condensation, carbon dioxide dissolves in water to form carbonic acid. This depresses the pH and causes etching of the metal. The characteristic acidic corrosion shows up as thinning and grooving of the metal at and below the water level.

DISTRIBUTION RATIO

The effectiveness of a neutralizing amine treatment depends on how well it is distributed throughout the steam condensate system. The amine must be present in the condensate to neutralize the carbon dioxide as it dissolves. The distribution ratio is a comparison of the amine concentration in the steam to the concentration in the condensate, and is a measure of its ability to enter the water phase.

Blending makes it possible to take advantage of these properties and maximize the distribution of the amine treatment.

TREATMENT AND FEEDING REQUIREMENTS

Proper treatment levels for STEAMATE NA5640 depend on many factors particular to a given installation. Although the condensate pH is usually maintained in a noncorrosive, alkaline range of 8.0 to 8.5, the product should be used in accordance with control procedures that GE Betz establishes for a specific application.

STEAMATE NA5640 should be mixed with softened makeup, condensate, or feedwater to make a chemical feed solution of any convenient strength. The product is also compatible with most boiler water treatment formulations; however, when mixed with other boiler treatments, the combined solution strength should not exceed ten percent by weight.

PACKAGING INFORMATION

STEAMATE NA5640 is a liquid blend, available in a variety of containers and delivery methods. Contact your GE Betz representative for details.

STORAGE

Store STEAMATE NA5640 at moderate temperatures and protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

SAFETY PRECAUTIONS

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