

SARAMET®

Austenitic Stainless Steel



**Solutions to everyday corrosion problems
in sulphuric acid plants**

SARAMET®

When originally introduced to the sulphuric acid industry by Aker Solutions' Chemetics operations in 1982, SARAMET® was the first silicon containing stainless steel used to fabricate corrosion resistant process equipment for hot concentrated sulphuric acid service.

The excellent corrosion properties of SARAMET in this most critical of services led to end use patents being granted in many countries around the world.

Recent development initiatives have expanded the original SARAMET alloy into a family of materials through alloying, novel production

methods and new opportunities in other chemical industry sectors.

The SARAMET family of austenitic stainless steels offers outstanding corrosion resistance in strong sulphuric acid. The material manufactured in wrought form has the following typical composition:

Nominal Composition of SARAMET® Austenitic Stainless Steel

Element	Weight %
Chromium	17 – 18
Nickel	17 – 18
Silicon	4.5 – 5.8
Iron and other alloying elements	Balance

When compared to other stainless steels it is the high silicon content of this formulation that endows the material with its remarkable corrosion resistant properties in strong sulphuric acid. SARAMET austenitic stainless steel is produced by special melting and casting techniques, following which it is worked to produce all the normal wrought forms. The finished material is fully weldable using Gas Tungsten Arc Welding (GTAW) and Shielded Metal Arc Welding (SMAW) techniques specifically developed for the alloy to ensure controlled ferrite formation in the weld deposit.



> SARAMET® piping distributor during fabrication



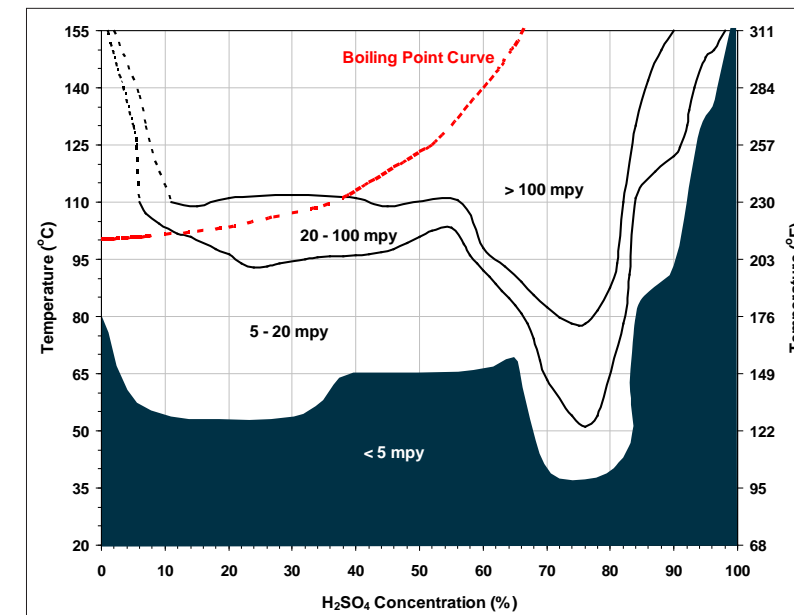
> SARAMET® pipe spool illustrating the benefits of welded construction by elimination of 7 flanged joints



Material improvements

Like materials of similar chemistry, the application of SARAMET has practical temperature & acid concentration limitations. This is particularly true when weaker acids at elevated temperatures are encountered. Recognizing that no one material can satisfy the complete range on acid concentrations, Aker Solutions embarked on the development of a family of alloys to provide superior overall performance throughout the normal operating acid concentration range. SARAMET® 35, the latest member of the family, exhibits excellent corrosion properties across a broad range of acid concentrations.

Extensive field data has also confirmed the exceptional resistance to erosion/corrosion in hot sulphuric acid of both parent metal & weld deposits with velocities exceeding 3 m/sec. free from any indication of weld sensitization.



^ SARAMET® 35 Iso
– Corrosion Chart

Meet the family

SARAMET® 23 – the first silicon stainless steel applied in sulphuric acid production, has accumulated much experience in many different plant applications. Typical applications for SARAMET 23 have included strong acid towers, tanks, piping, distributors, acid coolers, mesh pad mist filters, tower packing, strainers, nozzle inserts and orifices.

SARAMET® 21 – is the grandfather of all silicon-containing stainless steels for sulphuric acid service. Because of its reduced alloy content, SARAMET 21 has diminished strong sulphuric acid corrosion resistance when compared to Alloys 23 and 35, but can offer an economic solution with acceptable performance in many applications.

SARAMET® 35 – the new breed of SARAMET, which through significant modifications to chemistry and improvements in production practice, exhibits dramatically better dilute acid corrosion resistance in applications where process upsets, air/atmospheric moisture ingress and dilute acid formation from strong acid water addition are concerns.

Practical examples of these are drying acid circuits in certain smelter acid plants, where acid strength excursions can occur, gas inlet regions in sulphur burner air drying towers, and strong acid pump tanks under suction and with top entry dip tube style water dilution.



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SARAMET® trough distributor

SARAMET® trough distributor

While pipe distributors have a long service record, trough distribution systems are preferred by many acid plant operators because of the potential to increase the number of distribution points across the tower area and ability to see into the troughs to check for debris.

The SARAMET® trough distributors are designed for ease of installation, simplicity of operating low maintenance and a long service life.

A simple pipe delivery system feeds into the individual troughs which delivery the acid to the downcomer pipes through calibrated orifices. Nests of downcomer pipes, designed for ease of installation, are attached to the underside of the trough.



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