

# ANSI/ISA-71.04 Silver Reactivity

## SAMPLER DATA:

**Sampler/Kit ID:** 130384  
**Test Start (dmy):** 30.12.2019 16:30:00  
**Test End (dmy):** 16.01.2020 15:00:00  
**Test Length:** 16 days, 22 hours, 30 minutes

## SCOPE:

Test results correspond to ANSI/ISA-71.04-2013 which is an internationally accepted standard that categorises environmental conditions in relation to the deployment and reliability of electronic equipment.

## TEST RESULTS:

**Silver:** 32 Angstroms/30 Days  
Test result corresponds to severity level G1 - Mild (European standard EN 60721-3-3 Level 3C1). An environment sufficiently well controlled such that corrosion is not a factor in determining equipment reliability.

## ANSI/ISA-71.04 Classes:

Severity Level	Silver Corrosion	Description
G1 - Mild	<200 Angstroms / 30 days	Sufficiently well controlled, corrosion is not a factor.
G2 - Moderate	<1000 Angstroms / 30 days	Effects of corrosion are measurable and may be a factor.
G3 - Harsh	<2000 Angstroms / 30 days	High probability that corrosive attack will occur.
GX - Severe	>2000 Angstroms / 30 days	Only specially designed and packaged equipment would be expected to survive.

## INFORMATION:

This report shows the actual amount of corrosion measured on the metal coupon. The corrosion of metals is caused by both gaseous and particle contaminants and is accelerated by heat and moisture. Gases which cause metal corrosion include hydrogen sulfide, sulfur and nitrogen oxides, chlorine and hydrogen fluoride; as well as caustic gases, such as ammonia and oxidizing gases, such as ozone. Aerosols containing chlorides (salt) can also corrode metals.

Metal corrosion can weaken the integrity of structures and indicate the presence of pollutants that endanger human health. Metal corrosion in electronic equipment can cause needles or nodules to grow out of electronic components including silver solder causing short circuits. Corrosion can also cause metal plated surfaces to flake thereby causing short circuits. Metal corrosion can also cause failure of electrical contacts as well as thermal related failures.

The switch to lead-free (RoHS compliance) manufacturing affects almost all electronic products, and some of the more common materials used as replacements were more sensitive to common atmospheric pollutants than lead-based materials. Manufacturers of industrial process control equipment have used ISA-71.04 since its initial publication for warranty compliance because they understood that their equipment had to be protected due to the corrosive nature of the environments in which it would be used (see "Gaseous and Particulate Contamination Guidelines For Data Centers" – ASHRAE.org).

\* Source: "Gaseous and Particulate Contamination Guidelines For Data Centers" - by ASHRAE TC 9.9 (ashrae.org)