

## CONTAMINATION CONTROL CARD

Contamination Control Card provides important benefits, because having under control the Level of Dust in in the Data Center:

- Longer equipment life
- Reduced loss of data and read / write errors
- Reduced maintenance own expense
- Improved reliability of its facilities

Dust can cause irreversible damage to computer systems to obstruct heat sinks and cooling systems that lead to overheat and cause an increased risk of fire hazard. No protection against dust, there is great risk of data loss and hardware failures in data centers. Recommended 1 unit per entry door in Clean Rooms.

## INSTALLATION NEXT TO THE DOORS OF DATA CENTER



The Contamination Control Card must be installed inside the Critical Room, next to the Doors during 6 months to take all dust from the Air.

At the bottom the date must be written to be ready to send us the unit by current mail or courier, in few days we will reply with a PDF Report after 6 months taking environmental samples.

Report includes Corrosion and the Level of Suspended Particles, upon the Standards and Best Practices in Critical Environments.

## DATA CENTER CLEANING STANDARDS

The specific ASHRAE CPD Pollution Control regulations “2011 Gaseous and Particulate Contamination Guidelines For Data Centers” regulates the maximum permissible **Corrosion Level** in Copper and Silver for 1 month period:

- Copper reactivity rate of less than 300 Å / month
- Silver reactivity rate of less than 200 Å / month

Also refers to the **Analysis of Suspended Particles** following the Clean Room Standard ISO 14644-1, class 8.

## SAMPLE OF REPORT INFORMATION

### ANSI/ISA-71.04-2013 Air Corrosivity Report

#### SAMPLER DATA:

**Sampler ID:** 130384  
**Test Start (dmy):** 30.12.2019  
**Test End (dmy):** 16.01.2020  
**Test Length (days):** 17

#### 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. ANSI/ISA-71.04-2013 defines 4 levels of air quality that relate to different rates of reactivity or corrosion of copper and silver: G1, G2, G3 and GX. ASHRAE recommends that data centers maintain Level G1\*.

#### TEST RESULTS:

**Copper:** 221 Angstroms/30 Days  
 Test result corresponds to severity level G1 – Mid (European standard EN 60721-3-3 Level 3C1). An environment sufficiently well controlled such that corrosion is not a factor in determining equipment reliability.

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

#### INFORMATION:

This report shows the actual amount of corrosion measured on the metal coupons. 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. Particulates which corrode metals include chlorides (salt).

Since metals do not react in the same way, it is important to monitor the corrosion rates of different metals (combination corrosion coupon testing). Copper is particularly sensitive to temperature and humidity (water). It is also more sensitive to hydrogen sulfide (H<sub>2</sub>S). Silver is less sensitive to humidity and temperature, and it is more sensitive to sulfur dioxide (SO<sub>2</sub>) than hydrogen sulfide (H<sub>2</sub>S). Copper coupons cannot detect the presence of chlorine, a particularly dangerous contaminant to metals while silver is sensitive to chlorine. Iron (Fe) is particularly sensitive to humidity and aluminium is very sensitive to chlorides (salt).

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)

### ISO 14644-1:2015 Air Particle Report

#### SAMPLER DATA:

**Sampler ID:** 130384  
**Test Start (dmy):** 30.12.2019  
**Test End (dmy):** 16.01.2020  
**Test Length (days):** 17

#### SCOPE:

Test results correspond to ISO 14644-1:2015 which is a widely accepted standard for qualifying indoor air cleanliness. ISO 14644-1:2015 specifies the classification of air cleanliness in terms of concentration of airborne particles. ASHRAE recommends that data centers maintain ISO 14644-1 Class B or lower (see "Gaseous and Particulate Contamination Guidelines For Data Centers" – ashrae.org).

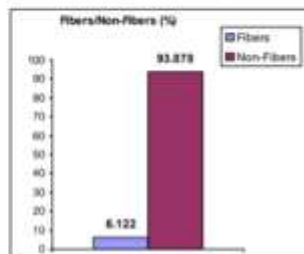
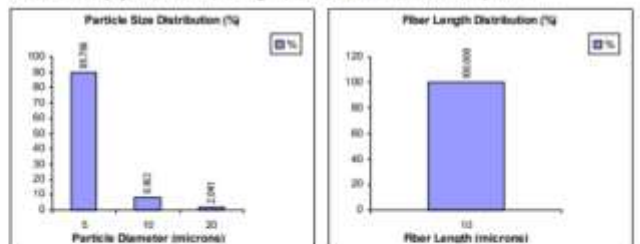
#### TEST RESULTS:

The average test result during the sampling period corresponds to the following ISO 14644-1 Class: **ISO 14644-1 Class B**

Particle Parameter:	Test Result:	Class Limit:
0.5 Micron/m <sup>3</sup>	540341	3,520,000 $\geq 0.5 \mu\text{m}$ particles/m <sup>3</sup> (ISO 14644-1 Class B)
1.0 Micron/m <sup>3</sup>	129277	832,000 $\geq 1 \mu\text{m}$ particles/m <sup>3</sup> (ISO 14644-1 Class B)
5.0 Micron/m <sup>3</sup>	4553	29,300 $\geq 5 \mu\text{m}$ particles/m <sup>3</sup> (ISO 14644-1 Class B)

#### Information:

ISO 14644-1:2015 is an internationally accepted standard that specifies the classification of air cleanliness in terms of the concentration of airborne particles per cubic meter. ISO 14644-1:2015 cannot be used to characterize the physical, chemical, radiological, viable or other nature of airborne particles.



## CONTACT

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