

# ASHRAE TC9.9 Data Center Air Quality Report

Report Date: 15.11.2024  
 Sampler ID: 132695  
 Test Start: 01.01.2023  
 Test End: 01.06.2023


**Scope:**

This report shows if data center air quality adheres to ASHRAE TC 9.9 "2011 Gaseous and Particulate Contamination Guidelines For Data Centers" as required by equipment manufacturers and insurers.

This white paper on data center airborne contamination was prepared by ASHRAE TC 9.9, Mission Critical Facilities, Technology Spaces, and Electronic Equipment. The committee's members represent the following IT equipment manufacturers: AMD, Cisco, Cray, Dell, EMC, Hitachi, HP, IBM, Intel, Oracle, Seagate, and SGI. Helpful information for technical and nontechnical readers can be found in Particulate and Gaseous Contaminants in Datacom Environments (ASHRAE 2009b).




 Meets ASHRAE TC9.9 Standard

 Does Not Meet ASHRAE TC9.9 Standard

**Recommended:**

**Information:**


**Corrosion:**

 371 Å/30 days. < 300 Å/30 days

ASHRAE TC 9.9 recommends that copper corrosion be less than 300 Å/month (ANSI/ISA-71.04 level G1 - Mild). This corresponds to the following concentrations of corrosive gases:


Hydrogen Sulfide (H<sub>2</sub>S): 3 - 10 ppb  
 Sulfur Dioxide and Sulfur Trioxide (SO<sub>2</sub>, SO<sub>3</sub>): 10 - 100 ppb  
 Chlorine (Cl<sub>2</sub>): 1 - 2 ppb  
 Nitrogen Oxides (NO<sub>x</sub>): 50 - 125 ppb

**Air Particles:**

 0.07 ug/m<sup>3</sup> < 15 ug/m<sup>3</sup>

ASHRAE TC9.9 recommends that air particle concentrations meet ISO 14644-1 Class 8, which corresponds to <15 µg/m<sup>3</sup>. This test measures the total concentration of all airborne aerosols, including corrosive and biological particulates.

**Total Chlorides, Nitrates & Sulfates:**

 0.14 ug/cm<sup>2</sup> < 5 µg/cm<sup>2</sup>

The 5 µg/cm<sup>2</sup> limit for electronic devices and installations has been established by international organizations and insurers (KSC-STD-C-0001D). ASHRAE TC9.9 states, "When the relative humidity in the data center exceeds the deliquescent relative humidity of corrosion products, such as copper sulfate and cupric chloride, the corrosion-product films become wet, dramatically increasing the rate of corrosion."