AIR QUALITY SCIENCES

EXECUTIVE SUMMARY

Project Description

Air Quality Sciences, Inc. (AQS) is pleased to present the results of its clean room evaluation of a general construction material from Armstrong World Industries identified as Clean Room Grid With Part No. 868 Ceiling Tiles Without Hold Down Clips, Field Applied, for WAVE. Testing of the ceiling panel system was conducted in an environmental chamber that is within the specification of a Class 5 or greater Cleanroom (for measured particles ≥ 0.5 µm and ≥ 5.0 µm respectively) according to ISO 14644-1:1999, "Cleanrooms and associated controlled environments-Classification of air cleanliness". Environmental chamber operating conditions during the test period are presented in Table 1.

Although this standard does not apply to equipment or supplies for use within clean rooms, it does allow for establishment of clean room status of a particular environment with a product in place.

Methodology

The chamber was purged and monitored for particles to establish the background level prior to installation of the ceiling panel system. Particle number concentrations (number of particles/m^3) were determined for the size ranges ≥ 0.5 µm and ≥ 5.0 µm.

Particle monitoring utilized a Climet Micropro 400 Particle Analyzer. The background particle levels (mean " SD) in the chamber were 536 " 217 particles/m^3 for particles ≥ 0.5 µm, and below the detection limit of 35 particles/m^3 for particles ≥ 5.0 µm. According to ISO 14644-1:1999, this established the chamber as a Class 4.2 clean room for ≥ 0.5 µm particles prior to introduction of the ceiling panel system.

The ceiling panel system was placed in the chamber with dynamic operating conditions as presented in Table 1. Following a 24.0 hour equilibration period with the ceiling system in the chamber, particle measurements were made at 1 minute intervals for a one hour period.

Results

One hour of monitoring particles in the chamber (with the ceiling panel system present) resulted in particle measurements of 189 " 101 particles/m^3 for particles ≥ 0.5 µm and below the detection limit of 35 particles/m^3 for particles ≥ 5.0 µm. This demonstrates that having the ceiling panel system in place does not impact the chamber Cleanroom status, according to the ISO Cleanroom classification for cleanliness. This product is qualified for installation and use in Cleanrooms established as Class 4.2 or greater.

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TABLE 1

ENVIRONMENTAL CHAMBER TEST PARAMETERS FOR CLEAN ROOM TESTING

PREPARED FOR: WAVE

Product Description:	GENERAL CONSTRUCTION MATERIALS; Clean Room Grid With Part No. 868 Ceiling Tiles Without Hold Down Clips
AQS Sample Identification:	AQS11823-020AA
Environmental Chamber:	IC2
Product Loading:	1 Ceiling Panel System
Test Conditions:	1.00 ACH 50.0% RH " 5.0% RH 23.0ºC " 2.0ºC
Test Period:	01/07/04 - 01/08/04
Pollutant Emissions Evaluated:	Particles (≥ 0.5 µm and ≥ 5.0 µm)

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