

INTRODUCTION

A cleanroom for United Canada was constructed previously and testing is needed to be performed to certify its ISO 8 classification. This test was performed by ACH Engineering's contractor as per IEST-RP-CC006.3 standard on January 27, 2021 at 111 Granton Dr Unit 412, Richmond Hill, ON L4B 1L5. For an ISO 8 cleanroom, an air change per hour between 5-48 is required.

RESULTS AND DISCUSSION

Airflows were measured on January 27, 2021 at each of the diffusers in one anteroom and one cleanroom.

Ante room (1 Diffuser)	
Room Area, ft²	58
Room Height, ft	7'10"
Room Volume, ft³	455

Cleanroom (5 Diffusers)	
Room Area, ft²	412
Room Height, ft	7'10"
Room Volume, ft³	3229

Air Flow Test (Anteroom)

Diffuser (refer to room layout)	CFM
1	406
Total Main Room CFM	406

Air Flow Test (Cleanroom)

Diffuser (refer to room layout)	CFM
1	152
2	161
3	132
4	130
5	156
Total Main Room CFM	731

Air Change per Hour (ACH)

$$\text{Air Change Per Hour} = \frac{\text{Supply CFM} * 60}{\text{Volume of Room}}$$

	ACH (As per test 03-Mar-2020)
Anteroom	54
Cleanroom	14

According to FS 209E and ISO 14644 classifications guideline and IEST-RP-CC006.3 standard, an ISO 8 (Class 100,000) cleanroom should have an ACH rate from 5 to 48. Both the rooms **PASS** the ISO 8 standard based on the actual reading.

Particle Count Survey

The particle count was tested at 10-12 locations evenly distributed within the cleanrooms. The average particle count based on the 10-12 locations meets the requirement for ISO 8. The limit for amount of particles inside the clean room is 3.5 million and the test results show there were <1 million. This **passes** the particle count test.

	Limit (/m ³)	Actual Average (concn/m ³)	Result
≥0.5 μm Particles in Anteroom (3 Locations)	3,520,000	93,879.30	PASS

	Limit (/m ³)	Actual Average (concn/m ³)	Result
≥0.5 μm Particles in Cleanroom (10 Locations)	3,520,000	549,588.0	PASS

Pressure Differential Test

A pressure test was performed to see the direction of airflow and to insure the cleanrooms had a positive pressure compared to the outside corridor. All the pressures were positive and **passes** the pressure differential test.

Room "From to To"	" W.C.	Pascals	Remarks
Cleanroom to Anteroom	+0.0301	7.5	
Anteroom to unclassified	+0.0610	15.19	

The pressure differential reading showed good movement of air flow throughout the cleanrooms. The return grill in cleanroom was covered 80% to achieve adequate pressure.

HEPA Leak Test

A HEPA filter leak test was performed to see the integrity of the HEPA filters. There was no leak observed. Air volume readings were taken off the diffuser in the room. All HEPA found ok in functionality.



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CONCLUSIONS & RECOMMENDATIONS

Conclusions

The cleanrooms at United Canada PASSES the requirement for an ISO 8 Cleanroom. The Air changes were more than the minimum required of 5.

The particle counts were well below the maximum limit for both the cleanrooms. There were no concerns with the leak test of the HEPA filters and the air was flowing in the right direction according to the pressure tests.

Recommendations

To have annual tests to ensure United Canada meets the ISO 8 requirements.

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