

Scheme measurement

Tab. 1: Requirements for cleanliness air according to ČSN EN ISO 14644-1 and Decree No. 84/2008 Coll.

Cleanliness classes of air (at rest)	Number of particles in 1m ³ of air	
	≥ 0,5 μm	≥ 5,0 μm
4	352	-
5	3 520	29

Tab. 2: Measured values of the number of solid aerosol particles in the operating field where the luminaires *FILA-N-LED-2,21-OP-10000-236-4K*, *NORD-N-LED-CG-5100-236-G2-4K*, *NORD-N-LED-OPG-10000-236-G2-4K* were placed (3.11.2022).

Before installing the luminaire				After installing the luminaire			
A1		A2		A1		A2	
Number of particles in 1ft ³ of size and larger 0,5 μm		Number of particles in 1ft ³ of size and larger 0,5 μm		Number of particles in 1ft ³ of size and larger 0,5 μm		Number of particles in 1ft ³ of size and larger 0,5 μm	
5,0 μm		5,0 μm		5,0 μm		5,0 μm	
4	0	6	1	3	0	4	1
5	1	8	1	3	0	4	1
4	0	2	0	6	0	6	1
3	0	2	0	4	0	2	0
4	1	4	1	3	1	3	0
4	0	4	1	4	0	4	1
Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³	
141	14	145	21	125	10	125	21

Note: Due to the very low measured values and the nature of test, uncertainty of measurement was not determined.



Tab. 3: Measured values of the number of solid aerosol particles in the operating field where the luminaires *BORDER-N-LED-SQ-OP-7000-4K*, *ODIS-LED-SQ-OP-7600-4K*, *HOOVER/3-LED-SQ-MP-7100-4K* were placed (3.11.2022).

Before installing the luminaire				After installing the luminaire			
A1		A2		A1		A2	
Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm	
0,5 µm	5,0 µm	0,5 µm	5,0 µm	0,5 µm	5,0 µm	0,5 µm	5,0 µm
5	0	8	1	3	0	4	0
6	1	6	0	3	0	7	2
4	0	2	0	1	0	7	1
3	0	4	2	4	0	3	0
5	1	3	0	8	1	2	0
5	0	5	1	5	0	5	1
Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³	
171	14	153	21	171	10	153	21

Note: Due to the very low measured values and the nature of test, uncertainty of measurement was not determined.

Tab. 4: Measured values of the number of solid aerosol particles in the operating field where the luminaires *HOOVER/3-LED-SQ-GLM-7100-4K*, *HOOVER4-LED-SQ-OP-6100-4K*, *HOOVER4-LED-SQ-MP-6100-4K* were placed (4.11.2022).

Before installing the luminaire				After installing the luminaire			
A1		A2		A1		A2	
Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm	
0,5 µm	5,0 µm	0,5 µm	5,0 µm	0,5 µm	5,0 µm	0,5 µm	5,0 µm
6	0	2	0	3	0	4	0
4	1	3	0	3	0	2	1
2	0	2	0	2	0	2	1
3	0	3	0	4	0	3	0
5	0	2	1	6	1	3	0
4	0	2	0	4	0	3	0
Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³	
141	7	85	7	128	10	99	14



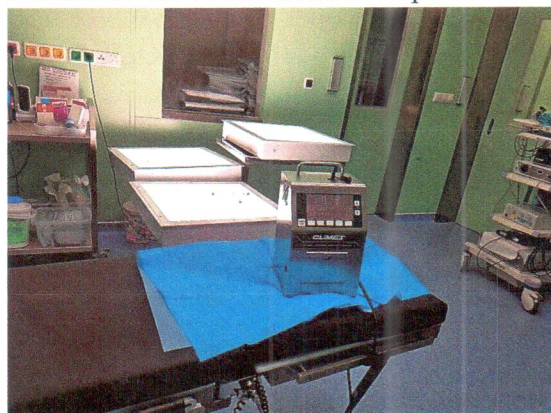
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Tab. 5: Measured values of the number of solid aerosol particles in the operating field where the luminaires *HOOVER4-LED-SQ-GLM-6100-4K*, *HOUND/3-MAG-LED-SQ-GLM-5100-4K*, *HOUND4-MAG-LED-SQ-GLM-5300-4K* were placed (4.11.2022).

Before installing the luminaire A1		Before installing the luminaire A2		After installing the luminaire A1		After installing the luminaire A2	
Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm		Number of particles in 1ft ³ of size and larger 0,5 µm	
5,0 µm		5,0 µm		5,0 µm		5,0 µm	
4	0	7	1	3	1	4	0
6	1	2	1	3	0	6	0
2	0	5	0	1	0	6	2
3	0	1	0	4	0	2	0
5	1	4	1	6	1	3	1
5	0	4	1	3	0	4	1
Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³		Number of particles in 1 m ³	
171	14	138	21	113	14	148	21

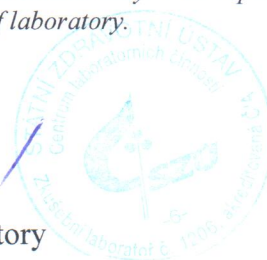
Measurement of the number of particles of determinate aerosol in air



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Date: 8. 12. 2022

Prepared by and approved: Ing. Z. Mathauserová
Technical head of Laboratory



END OF TEST REPORT



Statement on the Test Report No. 1.6/MKL/22/19

Measurement of the number of particles of determinate aerosol in air for the purpose of verification of luminaires manufactured by VYRTYCH a.s. for clean rooms

Expertise No.: EX 221361, SZÚ/15078/2022

Date of measurement: 3. – 4. 12. 2022

CONCLUSION

Installed luminaires FILA-N-LED-2,21-OP-10000-236-4K, NORD-N-LED-CG-5100-236-G2-4K, NORD-N-LED-OPG-10000-236-G2-4K, BORDER-N-LED-SQ-OP-7000-4K, ODIS-LED-SQ-OP-7600-4K, HOOVER/3-LED-SQ-MP-7100-4K, HOOVER/3-LED-SQ-GLM-7100-4K, HOOVER4-LED-SQ-OP-6100-4K, HOOVER4-LED-SQ-MP-6100-4K, HOOVER4-LED-SQ-GLM-6100-4K, HOUND/3-MAG-LED-SQ-GLM-5100-4K, HOUND4-MAG-LED-SQ-GLM-5300-4K were not a source of pollution of clean room, during their operation did not release any solid aerosol particles into the clean room air. Due to its identical construction, used materials and the installation procedure into the ceiling of the clean room are recessed luminaires of the entire product type FILA-N-LED, NORD-N-LED, BORDER-N-LED, HOOVER/3-LED, HOOVER4-LED, HOUND/3-MAG-LED, HOUND4-MAG-LED, ODIS-LED suitable for use in all types of clean rooms.

8. 12. 2022

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