5. The Result of No Bacterial Cross Contamination for the Lossnay Core and Determining Resistance of the Lossnay Core to Molds

Test report

This document reports the result that there is no bacterial cross contamination for the Lossnay Core.

(1) Object

The object of this test is to verify that there is no bacterial cross contamination from the outlet air to the inlet air of the Lossnay Core in the heat recovery process.

(2) Client

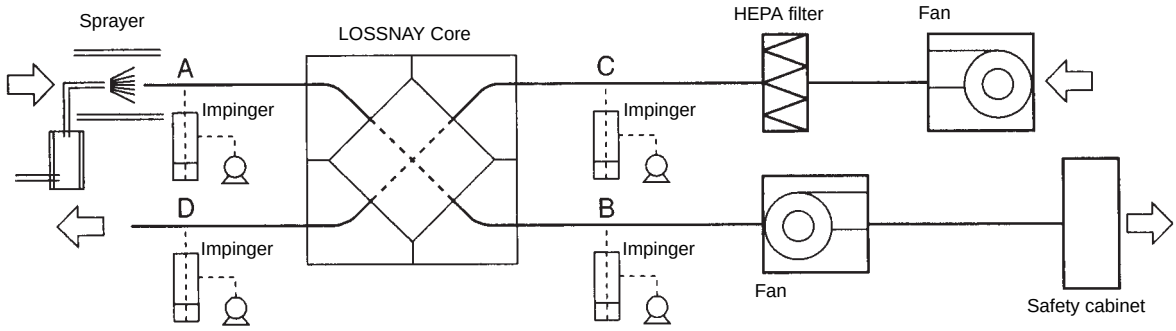
MITSUBISHI ELECTRIC CO. NAKATSUGAWA WORKS.

(3) Test period

April 26, 1999 - May 28, 1999

(4) Test method

The configuration of the test equipment is shown below. The test bacteria suspension is sprayed in the outlet duct at a pressure of 1.5 kg/cm^2 with a sprayer whose dominant particle size is 0.3 - 0.5 µm. The air sampling tubes are installed at the each center of the locations of A, B, C, D, in the Lossnay inlet/outlet ducts so that their openings are directly against the air flow, and then connected to the impinger outside the duct. The impinger is filled with 100 mL physiological salt solution. The airborne bacteria in the duct air are sampled at the rate of 10L air/minute for three minutes.



(5) Test bacteria

The bacteria used in this test are as followed;

Bacillus subtilis IFO 3134

Pseudomonas diminuta IFO14213 (JIS K 3835 Method of testing bacteria trapping capability of precision filtration film elements and modules; applicable to precision filtration film, etc. applied to air or liquid)

(6) Test result

The result of the test with Bacillus subtilis is shown in Table 1.
The result of the test with Pseudomonas diminuita is shown in Table 2.

Table 1 Test result with bacillus subtilis (CFU/30L air)

No.	A	B	C	D
1	5.4×10^4	5.6×10^4	$< 10^3$	$< 10^3$
2	8.5×10^3	7.5×10^3	$< 10^3$	$< 10^3$
3	7.5×10^3	$< 10^3$	$< 10^3$	$< 10^3$
4	1.2×10^4	1.2×10^4	$< 10^3$	$< 10^3$
5	1.8×10^4	1.5×10^3	$< 10^3$	$< 10^3$
Average	2.0×10^4	1.5×10^4	$< 10^3$	$< 10^3$

Table 2 Test result with pseudomonas diminuita (CFU/30L air)

No.	A	B	C	D
1	3.6×10^5	2.9×10^5	$< 10^3$	$< 10^3$
2	2.5×10^5	1.2×10^5	$< 10^3$	$< 10^3$
3	2.4×10^5	7.2×10^5	$< 10^3$	$< 10^3$
4	3.4×10^5	8.4×10^5	$< 10^3$	$< 10^3$
5	1.7×10^5	3.8×10^5	$< 10^3$	$< 10^3$
Average	2.7×10^5	4.7×10^5	$< 10^3$	$< 10^3$

(7) Considerations

Bacillus subtilis is commonly detected in the air and resistant to dry. Pseudomonas diminuita is susceptible to dry and only a few exists in the air. However, it is used in the performance verification of the bacteria trapping filter since the particle size is small (Cell diameter; 0.5 µm: Cell length 1.0 to 4.0 µm).

Both Bacillus subtilis and Pseudomonas diminuta are detected at the location A and B in the outlet side duct where they are sprayed, but neither them are detected at location C (in the air filtered by the HEPA filter) and the location D (in the air crossed in the Lossnay Core) on the inlet side.

Since the number of bacteria in the location A is substantially equal to one in the location B, it is estimated that only a few bacteria are attached to the Lossnay Core on the outlet side. Also, no test bacteria is detected at the location D where the air is crossed in the Lossnay Core. Therefore, it can be concluded that the bacteria attached to the outlet side will not pass through the inlet side even after the heat is exchanged.

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