Japan Food Research Laboratories

Japan Food Research Laboratories
Authorized by the Japanese Government
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May 14, 2012

REPORT

Client: Mitsubishi Electric Corporation
3-18-1 Oshika, Suruga-ku, Shizuoka-shi, Shizuoka 422-8528, Japan

Sample(s): Air conditioner (Purifier device: on)
Model: MSZ-FH35

Title: Floating Mold Spores Removal Performance Test

Received date of sample(s): April 16, 2012

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May 22, 2012

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Principal Investigator

Date

JAPAN FOOD RESEARCH LABORATORIES

Floating Mold Spores Removal Performance Test

1. Client

Mitsubishi Electric Corporation

2. Sample

Air conditioner (Purifier device: on)
Model: MSZ-FH35

3. Outline of methods

1) Test date

April 17, 2012

2) Test facility

Osaka Branch, Japan Food Research Laboratories
3-1 Toyotsu-cho, Suita-shi, Osaka 564-0051, Japan

3) Test procedure

Penicillium citrinum spore suspension was sprayed in a test chamber (capacity: 25 m^3) equipped with the sample. With operating the sample under the conditions specified by the client, floating spores in the air sucked from the test chamber were collected to gelatin filters over time. Then, the number of viable cells in the washing solution of each gelatin filter was counted.

The sample was operated by the client.

4. Results

Tables 1 and 2 as well as Figures 1 to 3 show the test results.

Table 1: Test results of the viable cell counts on the gelatin filters

Test bacterium	Conditions	Viable cell count*1 (per one piece of filter)			
		Initial	After 60 min	After 120 min	After 180 min
Penicillium citrinum	Natural decline*2	9.0×10^5 (6.0)	5.5×10^5 (5.7)	2.8×10^5 (5.4)	1.6×10^5 (5.2)
	Sample operation*3	1.3×10^6 (6.1)	3.9×10^4 (4.6)	1.6×10^3 (3.2)	80 (1.9)

*1 Numbers in the parentheses are logarithms (logs).
*2 The sample was not operated.
*3 Operating conditions: Airflow 12.6 m^3/min, Device: ON
Amount of collected air to a gelatin filter: 2.5 m^3/h × 2 min = 83.34 L

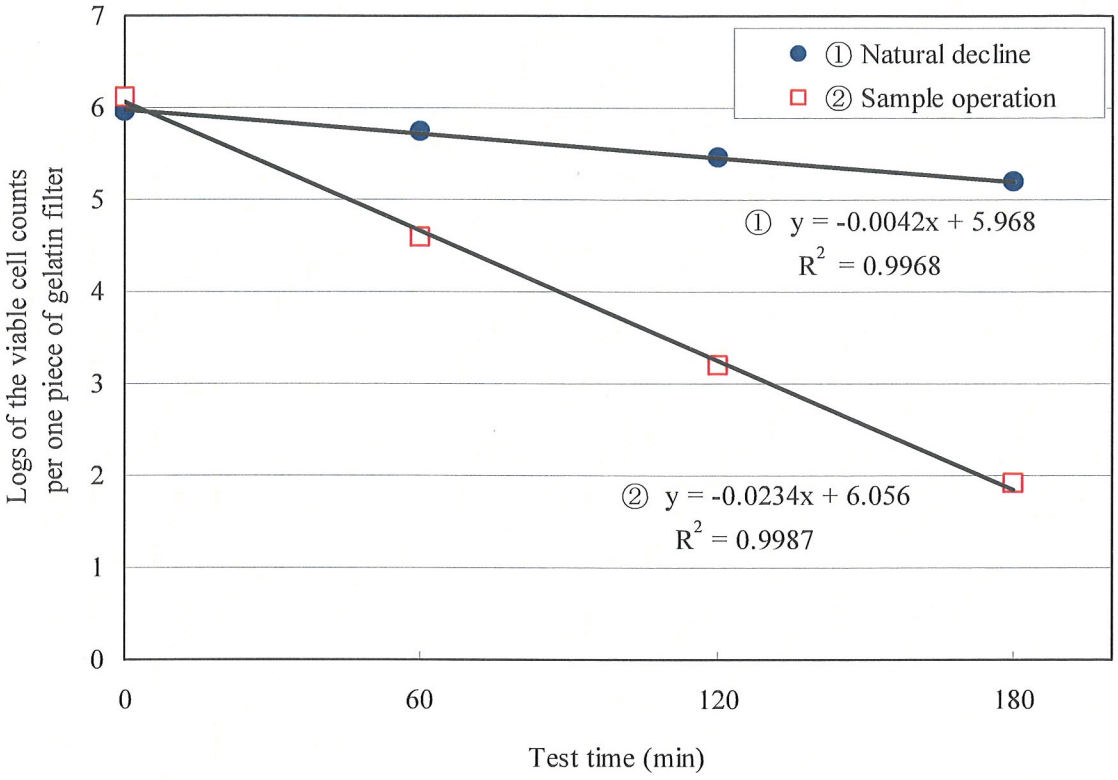

Figure 1: Graph obtained from the approximate expression

Table 2: Temperature and humidity

Conditions	Temperature (°C)		Humidity (%RH)	
	Start of test	End of test	Start of test	End of test
Natural decline*1	26	26	40	40
Sample operation*2	25	26	40	40

*1 The sample was not operated.
*2 Operating conditions: Airflow 12.6 m^3/min, Device: ON

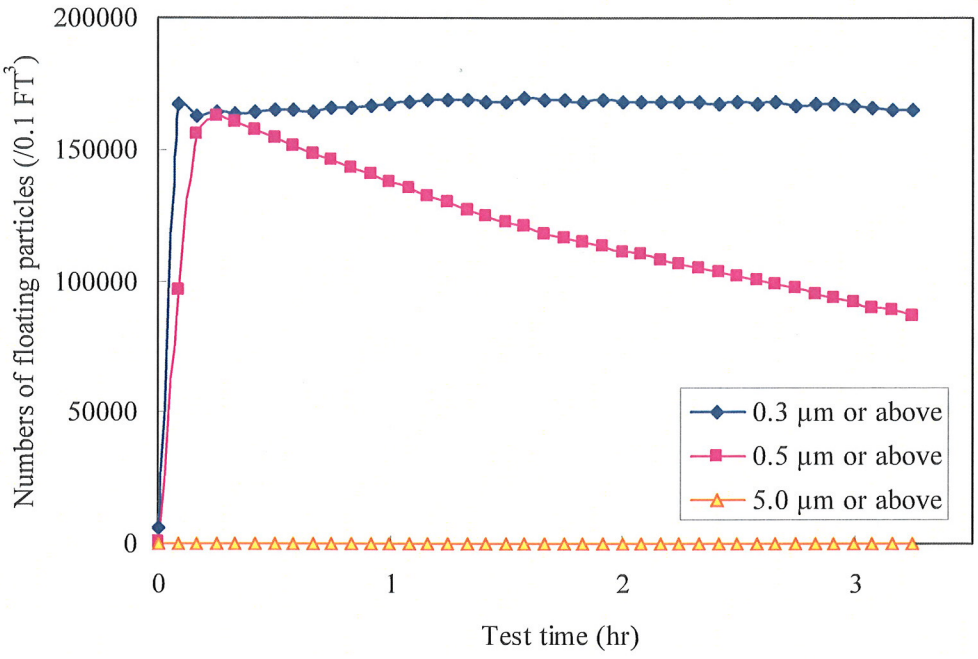

Figure 2: Measurement results of the numbers of floating particles (Natural decline)

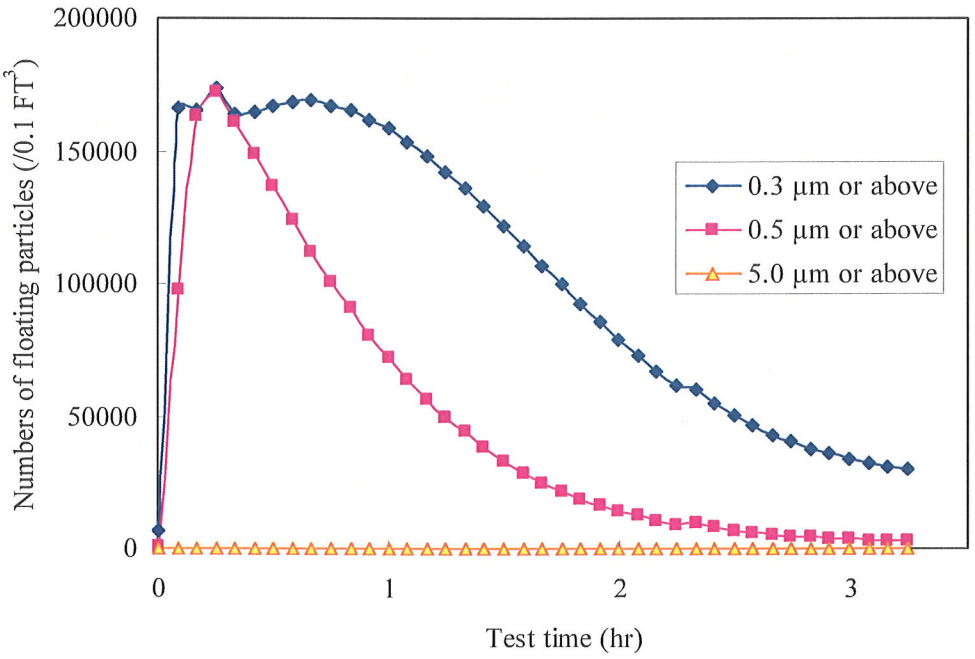

Figure 3: Measurement results of the numbers of floating particles (Sample operation)

5. Test methods

1) Test organism

Penicillium citrinum NBRC 6352

2) Preparation of spore suspension

The test organism was incubated on potato dextrose agar (Difco) at 25 C° ± 1 C° for 7 to 10 days. The cultured spores were suspended in 0.005 % dioctyl sodium sulfosuccinate solution to obtain about 10^8 spores/mL, which was used as a spore suspension.

3) Test procedures

The spore suspension was sprayed using a nebulizer (OMRON Corporation) in a test chamber (capacity: 25 m^3) equipped with the sample, with operation a fan for circulating air. The spray conditions were set at 0.4 mL/min for 10 minutes. After 2 minutes of the spray, floating spores were collected to a gelatin filter using an air sampler, and the number of viable cells on the filter was counted, which was defined as the measurement result at the initial point. Next, with operating the sample under the conditions specified by the client, the numbers of the viable cells on gelatin filters were counted after 60, 120 and 180 minutes.

To determine the natural decline in the numbers of the viable cells, the similar procedure was performed but without operating the sample.

The temperature, the humidity, and the number of floating particles were measured.

4) Collection of floating spores and measurement of viable cell counts

The Sartorius MD8 AirScan air sampler (SARTORIUS K.K.) was operated at 2.5 m^3/h for 2 minutes, and 83.34 L of air was sucked from the test chamber. Then, floating spores in the air was collected to a gelatin filter and washed out with physiological saline (10 mL for each filter). The viable cells in the washing solution were counted by pour plate method using potato dextrose agar (Eiken Chemical Co., Ltd.). The incubation was conducted at 25 °C ± 1 °C for 7 days. The measurement values were converted to the counts per one piece of filter.

5) Measurement of temperature and humidity

The temperature and humidity were measured using Ondotori TR-72Ui (T & D Corporation).

6) Measurement of floating particles

The number of floating particles was counted using Hand held laser particle counter (Kanomax Japan Incorporated).

End of Report