Japan Food Research Laboratories

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REPORT

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Requested by: ROVAL CORPORATION
6-41-1 Ikuno, Katano-shi, Osaka 576-0054, Japan

Received date of sample(s): September 22, 2010

Fungus Resistance Test

1. Samples
   1) ROVAL
   2) ROVAL SILVER
   3) ROVAL ALPHA
   4) Anti-fungal paint S
   5) Anti-fungal paint K

2. Purpose
   This test aims to determine fungus resistance of the samples.

3. Outline of methods
   The fungus resistance of the samples was determined by the method of Japanese Industrial Standards (JIS) Z 2911: 2010 "Methods of test for fungus resistance", Annex A (Regulation), Test method for plastic products, Method B. The incubation was done at 29 °C ± 1 °C.

4. Results
   Table 1 shows the test results. The results were obtained according to the criteria of Table 2. Photos 1 to 5 are the samples after incubation.

Table 1. Results of fungus resistance test

Sample	Fungus resistance after incubation			
	1 week	2 weeks	3 weeks	4 weeks
1)	2	2	2	2
2)	2	2	2	2
3)	2	2	2	2
4)	2	3	3–4	4
5)	2	2	2	4

Table 2. Assessment of fungal growth

Evaluation	Intensity of growth
No growth apparent to the naked eye or even under a microscope.	0
No growth visible to the naked eye, but clearly visible under the microscope.	1
Growth visible to the naked eye, covering less than 25 % of the test surface.	2
Growth visible to the naked eye, covering 25 to 50 % of the test surface.	3
Considerable growth, covering more than 50 % of the test surface.	4
Heavy growth, covering the entire test surface.	5

5. Method in detail

1) Test fungus

Aspergillus niger NBRC 105649
Penicillium pinophilum NBRC 33285
Paecilomyces variotii NBRC 33284
Trichoderma virens NBRC 6355
Chaetomium globosum NBRC 6347

2) Preparation of spore suspensions

Each of the test organisms was grown on oatmeal-malt extract agar at 29 °C ± 1 °C, and the grown spores (conidia) were suspended in mineral-salt/wetting agent solution (mineral-salt solution* containing 0.01 % N-methyl taurine). Then, the suspension was filtered through sterile gauze, and the filtrate was centrifuged. After the supernatant solution was discarded, the residue was again suspended in mineral-salt solution and centrifuged. After the supernatant solution was discarded, the residue was suspended in mineral-salt solution added with 30 g/l of glucose to contain about 10^6 spores per ml.

The suspensions of the spores were mixed together in equal volume to make a mixed spore suspension.

* Composition of mineral-salt solution

$NaNO_3$	2.0 g
KH_2PO_4	0.7 g
K_2HPO_4	0.3 g
KCl	0.5 g
$MgSO_4 \cdot 7H_2O$	0.5 g
$FeSO_4 \cdot 7H_2O$	0.01 g
Purified water	1,000 ml
pH	6.0–6.5

3) Preparation of test media

To the mineral-salt solution, 30 g/l of glucose and 20 g/l of agar were added. The mixture was poured into a petri dish (diameter 90 mm) and allowed to solidify.

4) Preparation of test specimens

The samples themselves (about 3 cm × 3 cm, about 1 mm thick) were used as the test specimens.

5) Procedures

The test specimen was placed at the center of the test media with the test surface specified by the client up. The mixed spore suspension (0.1 ml) was uniformly spread onto the test specimen and the incubation surface. After covering it with the lid, the test specimen was incubated at 29 °C ± 1 °C and a relative humidity of 95 % or more. After one, two, three and four weeks of incubation, the growth of hyphae was evaluated according to the criteria of Table 2.

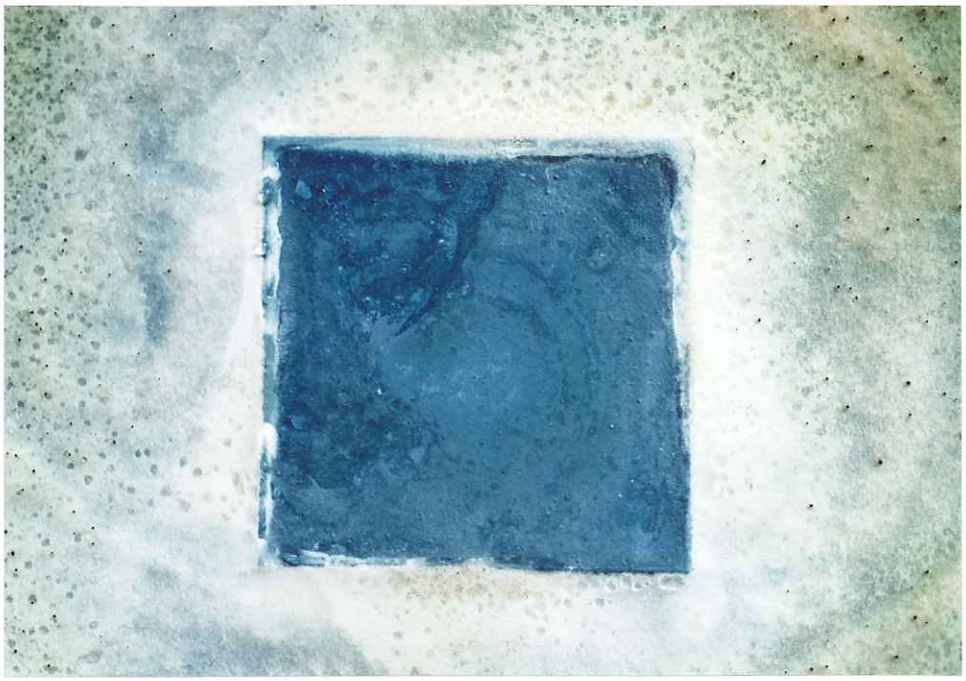

Photo. 1:　Sample 1), after 4 weeks of incubation

Photo. 2:　Sample 2), after 4 weeks of incubation

Photo. 3: Sample 3), after 4 weeks of incubation

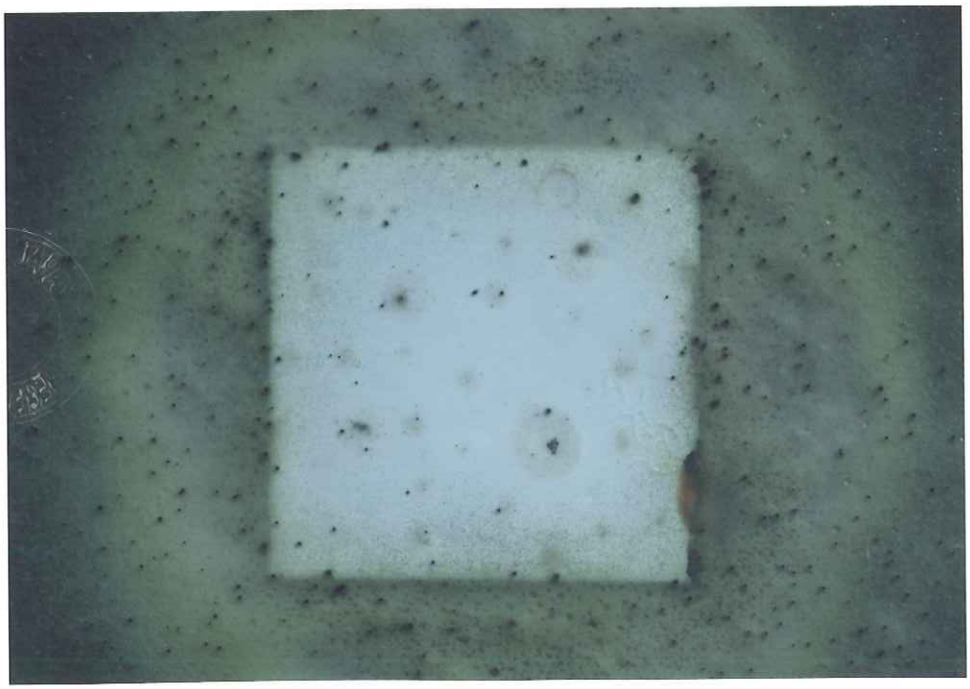

Photo. 4: Sample 4), after 4 weeks of incubation

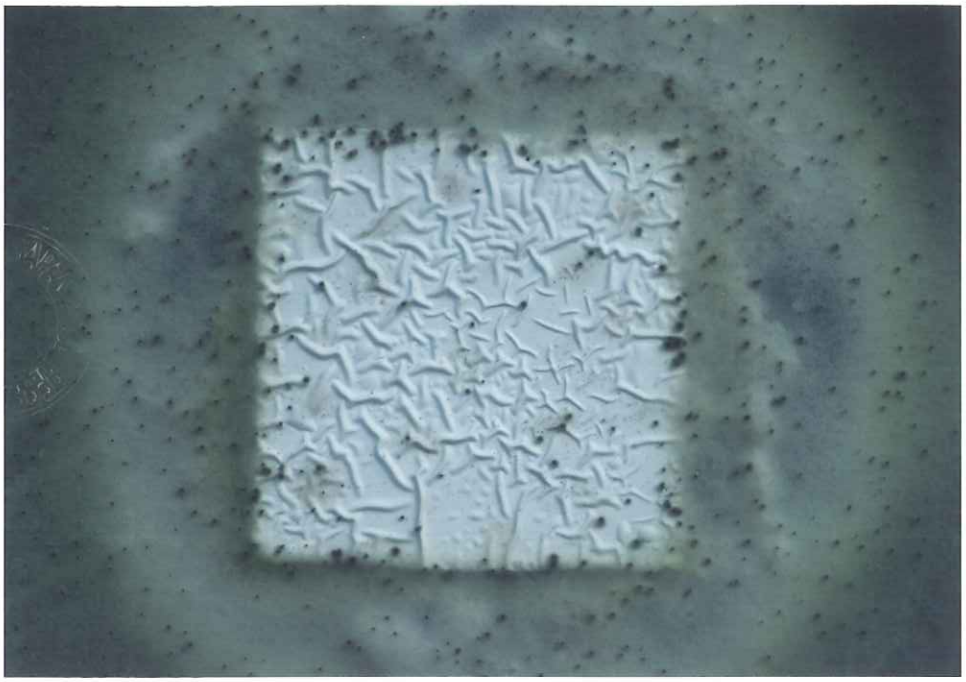

Photo. 5: Sample 5), after 4 weeks of incubation

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