INSTITUT FÜR LUFTHYGIENE
Luft und Wasser: Planung, Analysen, Sanierungskonzepte

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Test report BM 09/16-03

1. Subject

Examination of the microbial metabolic potential of the sample material according to DIN EN ISO 846

2. Customer

Henkel Norden AB
Gustavslundsvägen 151 A
167 51 Bromma
Sweden

3. Contractor

Institut für Lufthygiene
Kurfürstenstraße 131
10785 Berlin

4. Material tested

Teroson MS 937*, color grey
The samples were hardened for four weeks.

Dimensions of the test material: 1.590 mm^2 x 2 mm

* according to the customer

5. Examination Period 28th October 2016 – 24th November 2016

6. Procedures

VDI 6022-1 (07/2011) requires that sealants and sealing materials used in air-ducting zones in HVAC systems must not create breeding grounds for microorganisms. Furthermore, it also requires that materials used in air ducting zones, in which high relative humidity or water is likely to occur, also must not create breeding grounds for microorganisms. A test must be carried out in accordance with DIN EN ISO 846 in order to determine this. The tested materials have been classified as breeding grounds for microorganisms as from Evaluation level 2 under DIN EN ISO 846. The characteristics of materials that create breeding grounds for microorganisms as well as their microbial metabolic potential have been identified in this test report.
The tests that were carried out make no mention of any of the other material characteristics required under VDI 6022-1 (07/2011), such as emissions from substance harmful to health, prevention of deposits and attachment to the surface of the materials, porosity or the absorption of moisture.

The examination of the resistance of the samples to fungi and bacteria was undertaken in accordance with DIN EN ISO 846 “Plastics – Evaluation of the action of microorganisms”, method A and C, by visual examination. The material has been examined to determine whether it remains inert or if it is a nutritious substance for the growth of fungi (method A) or bacteria (method C).

Resistance to fungi (method A)

The samples were placed separately on a medium containing mineral-salt, no carbon and they were then sprayed with a spore suspension of the following fungi:

Aspergillus niger DSM 1957
Penicillium funiculosum DSM 1944
Paecilomyces variotii DSM 1961
Gliocladium virens DSM 1963
Chaetomium globosum DSM 1962

10 samples were tested, they were incubated for four weeks at 24±1°C and at a relative humidity of > 95%. After periods of two and four weeks they were examined for visible fungal growth to the naked eye and to a stereoscopic microscope (at a magnification of x 50).

Resistance to bacteria (method C)

To determine the resistance of the samples to bacteria, a liquid mineral-salt agar containing no carbon and cooled to 45°C was mixed with a bacteria cell suspension and placed in sterilised Petri dishes. When the agar had solidified a sample was placed on the culture medium and the bacteria inoculated agar was poured on to the sample to cover it to a depth of 1 mm. For this test *Pseudomonas aeruginosa* was used, 10 samples of the material were tested.

The samples were incubated at 29±1°C and > 95% relative humidity for four weeks. After two and four weeks the samples were examined with the naked eye and with a stereoscopic microscope (at a magnification of x 50).

7. Assessment

The intensity of microbiological growth has been evaluated in table 1:

Table 1: Evaluation of microbiological growth:

Intensity of growth	Evaluation
0	No growth apparent under the microscope.
1	No growth visible to the naked eye, but clearly visible under the microscope.
2	Growth visible to the naked eye, covering up to 25% of the test surface (fungi) or the surrounding agar (bacteria).
3	Growth visible to the naked eye, covering up to 50% of the test surface (fungi) or the surrounding agar (bacteria).
4	Considerable growth, covering more than 50% of the test surface (fungi) or the surrounding agar (bacteria).
5	Heavy growth, covering the entire test surface (fungi) or the surrounding agar (bacteria).

The results have been interpreted as shown in table 2:

Table 2: Interpretation of results:

Intensity of growth	Interpretation
0	The material is not a nutritious medium for microorganisms (it is inert, fungistatic or bacteriostatic)
1	The material contains nutritious substances or is contaminated to such a small degree that it permits only slight growth
2 to 5	The material is not resistant to fungal or bacterial attack and contains nutritious substances suitable for the development of microorganisms

8. Results of the examinations

The results of the examinations are summarised in table 3:

Table 3: Results of the examinations

No.	Material tested	Intensity of microbiological growth as shown in table 1	
		Fungi	***Bacteria***
1	**Teroson MS 937, color grey**	0	0
2		0	0
3		0	0
4		0	0
5		0	0
6		0	0
7		0	0
8		0	0
9		0	0
10		0	0

On the surface of material **Teroson MS 937, color grey** fungal growth was not visible under the microscope. Also bacterial growth was not visible under the microscope.

9. Conclusion

In accordance with the examination carried out, the test material **Teroson MS 937, color grey fulfils the requirements** from the VDI 6022, Part 1 (07/2011) **regarding microbial metabolic potential** and is **suitable** for use in HVAC-systems relating to this examination of its **microbial metabolic potential**.

Berlin, 30th November 2016

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10. Photo documentation

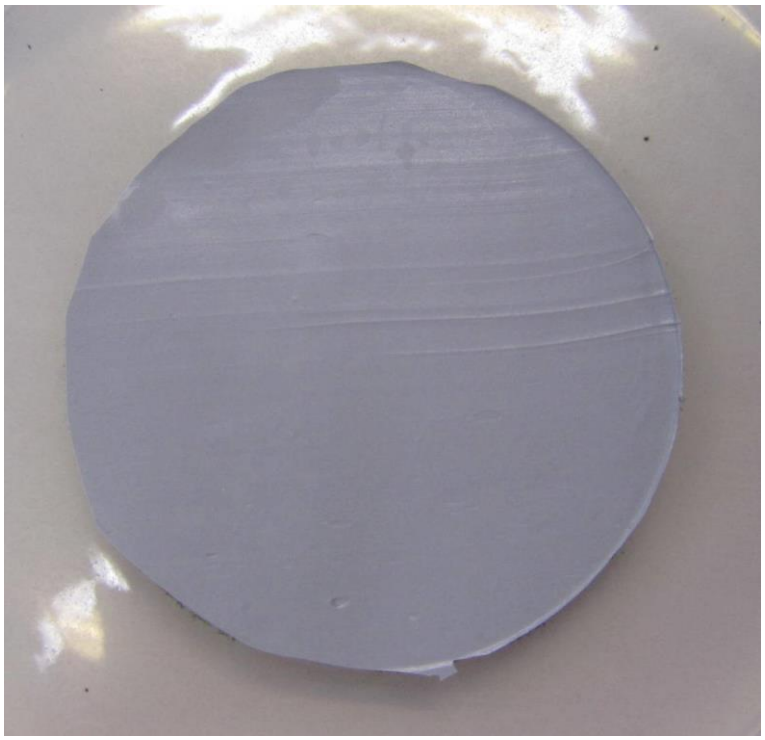

Photo 1: Material **Teroson MS 937, color grey**
after an incubation period of 28 days without visible fungal growth

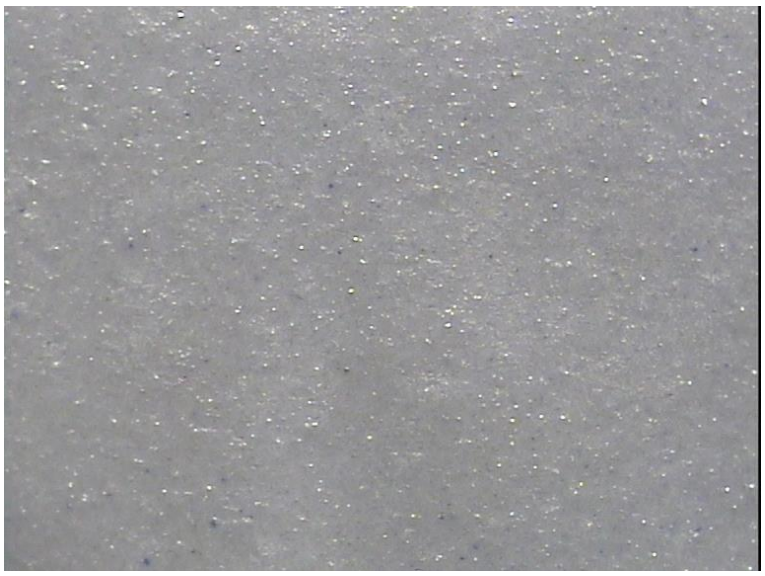

Photo 2: Material **Teroson MS 937, color grey** (at a magnification of x 50)
after an incubation period of 28 days without fungal growth