

Test report BM 08/14-12

1. Subject

Examination of the bio-deterioration of the sample material according to DIN EN ISO 846

2. Customer

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3. Contractor

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4. Material tested

Würth Acetatsilikon Lebensmittel,
color transparent / whity*

Dimensions of the test material: 40 mm x 40 mm x 2,4 mm

* According to the customer

5. Examination Period 10. August 2014 - 06. September 2014

6. Procedures

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 $24\pm 1^\circ\text{C}$ 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 micro-organisms (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

Nr.	Material tested	Intensity of microbiological growth as shown in table 1	
		<i>Fungi</i>	<i>Bacteria</i>
1	Würth Acetatsilikon Lebensmittel, transparent / whity	1	1
2		1	1
3		1	1
4		1	1
5		1	1
6		1	1
7		1	1
8		1	1
9		1	1
10		1	1

On the surface of material **Würth Acetatsilikon Lebensmittel, color transparent/ whity** fungal and bacterial growth was only visible under the microscope.

9. Conclusion

In accordance with the examination carried out, the test material **Würth Acetatsilikon Lebensmittel, color transparent/ whity** fulfils **the requirements** from the VDI 6022, Part 1 (07/2011) **in microbial inertness** and is suitable for use in HVAC-systems relating to this examination of microbial inertness.

Berlin, 6th October 2014

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10. Photo documentation

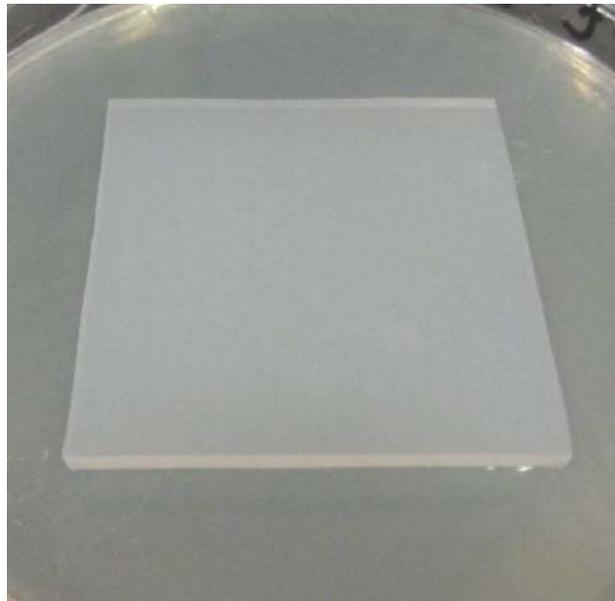


Photo 1: Material **Würth Acetatsilikon Lebensmittel, color transparent/ whity** after an incubation period of 28 days fungal growth was not visible to the naked eye



Photo 2: Material **Würth Acetatsilikon Lebensmittel, color transparent/ whity** after an incubation period of 28 days with low fungal growth (at a magnification of x 50)