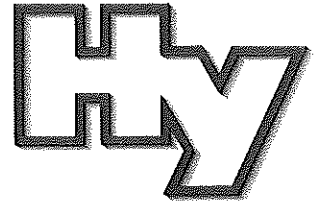


Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



Hygiene-Institut · Postfach 10 12 55 · 45812 Gelsenkirchen

LATI Industria Termoplastici S.p.A.
Mr. Citterio
Via Francesco Baracca, 7
21040 VEDANO OLONA (VA)
ITALY

Visitors/ postal address:

Rotthausen Str. 21, 45879 Gelsenkirchen,
Germany

Switchboard (0049209) 9242-0
Phone (0049209) 9242-230
Fax (0049209) 9242-222
E-Mail c.schell@hyg.de
Internet www.hyg.de

Reference: W-298181ae-18-SI/to
Contact person: Mrs. Dr. Ch. Schell

Gelsenkirchen, 14.05.2018

Test according to DVGW Technical Standard W 270 of different materials

Your order dated 07.11.2017

Dear Mrs. Citterio,

please find enclosed the test reports and the combined test certificate **W-298181e-18-SI/to** for the following materials:

- **LATAMID 66 H2 G/30 NAT. F:0003 [Lot:99590] (W-298181e-18-SI/to)**
- **LATAMID 66 H2 G/30 NAT. F:0003 [Lot:98691] (W-298182e-18-SI/to)**

Also attached is the appropriate invoice.

Best regards

The Director of the Institute

p.p.

Dr. Ch. Schell

Head of Laboratory

Department of Water Hygiene and Environmental Microbiology

Enclosure

Our General Terms and Conditions (GTC) apply exclusively (<http://www.hyg.de>).

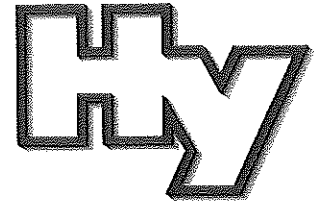
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: **VR 519** Amtsgericht Gelsenkirchen, USt-ID: **DE125018356**
Vorstand: Prof. Dr. Werner Schlake (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Grün, Dr. Dirk Waider, Prof. Dr. Lothar Dunemann (geschäftsführ. Vorstand)

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Internet www.hyg.de

Reference: W-298181e-18-SI/to
Contact person: Mrs. Dr. Ch. Schell

Gelsenkirchen, 08.05.2018

TEST REPORT

Enhancement of Microbial Growth on Materials to Come into Contact with Drinking water
Test pursuant to DVGW Technical Standard W 270, November 2007

Client: LATI Industria Termoplastici S.p.A.
Via Francesco Baracca, 7
21040 VEDANO OLONA (VA)
ITALY

Ordering date: 07.11.2017

Description of the material:

Test material: **LATAMID 66 H2 G/30 NAT. F:0003**
[Lot:99590] (Resin#1)

Composition: recipe submitted and checked (7979a)

Processing instructions: for specifications, consult the client

Field of application: for specifications, consult the client

Quantity of material per area unit: for specifications, consult the client

Test samples:

Nature and property: 80 pcs. of hard plastics white, 12 cm x 8 cm

Manufacturing: carried out by the client (description submitted)

Processing conditions: carried out by the client (description submitted)

Date of receipt of test samples: 10.11.2017

Storing conditions in the testing laboratory until start of test: at room temperature

This test report consists of 3 pages.

The test results and assessments refer exclusively to the examined test specimens and all applicable statutory regulations. The validity of the document expires in case of modifications in the composition of the material or the processing conditions. This present document may only be published and reproduced unabridged and unaltered. This document is no DVGW certification.



DAKKS

Deutsche
Akkreditierungsstelle
D-PL-13042-02-00

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: VR 519 Amtsgericht Gelsenkirchen, USt.-ID: DE125018356
Vorstand: Prof. Dr. Werner Schlake (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Grün, Dr. Dirk Waider, Prof. Dr. Lothar Dunemann (geschäftsführ. Vorstand)

Test conditions:

The tests were performed in accordance with the recommendations contained in DVGW Technical Standard W 270 as of November 2007. Details regarding testing procedures, as well as testing conditions will be given in said Technical Standard. The surface of the examined test pieces totals to approx. 760 cm² each. Using eight test items per test period the following test scheme was applied:

- monthly sampling of surface biomass (test period 3 months altogether)
- sampling after 2 months (test period 2 months altogether)
- sampling after 3 months (test period 3 months altogether)

Prior to testing, the test specimens were placed in running tap water for 20 hours, followed by a disinfection procedure using 1% chlorine bleach for 30 ± 5 minutes and then rinsed with drinking water.

Time of exposure:

1-month samples	1a:	1 st	test period from 07.02.2018 to 07.03.2018
	1b:	2 nd	test period from 07.03.2018 to 04.04.2018
	1c:	3 rd	test period from 04.04.2018 to 02.05.2018
2-month samples	2a:	1 st	test period from 07.02.2018 to 04.04.2018
3-month samples	3a:	1 st	test period from 07.02.2018 to 02.05.2018

The exposure took place in containers filled with ground water of drinking water quality at a continuous flow rate of approx. 20 l/h over a period of three months. The water temperature ranged from 8.9°C to 10.6°C.

After one, two and three months the surfaces of the test pieces, as well as the corresponding negative reference samples (stainless steel) and positive reference samples (paraffin) were scraped clean in order to examine for biofilm formation. Afterwards, the surface biomass was transferred to suitable centrifuge tubes. The subsequent centrifugation was carried out at 3.000 x g for 10 minutes followed by the determination of the volume of the sediment.

Test results:

The positive reference sample (pK) showed a pronounced formation of biofilm during all test periods. There was no formation of surface biomass on the negative reference sample (nK).

The results of the analyses of the single specimens of approx. 760 cm² surface in total, pursuant to DVGW Technical Standard W 270 were as follows:

Volume of surface biomass

(single values and arithmetic mean of 8 test pieces, given in ml / referring to 800 cm²)

Start of test: 07.02.2018		1-month values		2-month values		3-month values
07.02.2018 – 07.03.2018	1a	(<0.01/<0.01)		(0.02/0.03) 0.03		
	nK pK	< 0.01 > 1.5	2a			
07.03.2018 – 04.04.2018	1b	(<0.01/0.01)		< 0.01 > 1.5	3a	(0.01/<0.01)
	nK pK	< 0.01 > 1.5	nK pK		nK pK	< 0.01 > 1.5
04.04.2018 – 07.05.2018	1c	(<0.01/<0.01)				
	nK pK	< 0.01 > 1.5				

Limiting values [ml / 800 cm²] pursuant to DVGW Technical Standard W 270 (11/2007)

General application: arithmetic means	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)
Large surface seals (D 1): arithmetic means	≤ (0.12 + 0.03) whereas 1c ≤ 1b	≤ (0.12 + 0.03)	≤ (0.12 + 0.03) whereas 3a ≤ 2a
Small surface seals (D 2): arithmetic means	≤ (0.20 + 0.03) whereas 1c ≤ 1b	≤ (0.20 + 0.03)	≤ (0.20 + 0.03) whereas 3a ≤ 2a
Negative Control:	< 0.01 ml	< 0.01 ml	< 0.01 ml
Positive Control:	≥ 1.5 ml	≥ 1.5 ml	≥ 1.5 ml

Assessment:

Provided that it is applied correctly, the material

LATAMID 66 H2 G/30 NAT. F:0003 [Lot:99590]

is suitable for the use in drinking water systems according to the results of the microbiological examinations pursuant to DVGW Technical Standard W 270 (11/2007).

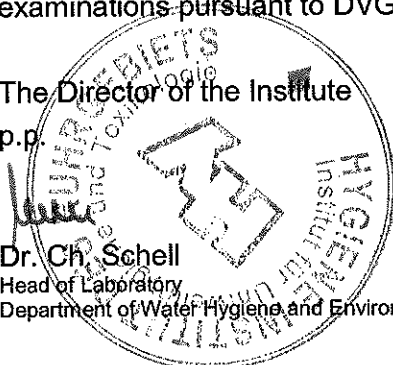
The Director of the Institute

p.p.

Dr. Ch. Schell

Head of Laboratory

Department of Water Hygiene and Environmental Microbiology

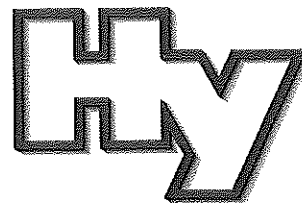


Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



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E-Mail c.schell@hyg.de
Internet www.hyg.de

Reference: W-298182e-18-SI/to
Contact person: Mrs. Dr. Ch. Schell

Gelsenkirchen, 08.05.2018

TEST REPORT

Enhancement of Microbial Growth on Materials to Come into Contact with Drinking water
Test pursuant to DVGW Technical Standard W 270, November 2007

Client: LATI Industria Termoplastici S.p.A.
Via Francesco Baracca, 7
21040 VEDANO OLONA (VA)
ITALY

Ordering date: 07.11.2017

Description of the material:

Test material: LATAMID 66 H2 G/30 NAT. F:0003
[Lot:98691] (Resin#2)

Composition: recipe submitted and checked (7979)

Processing instructions: for specifications, consult the client

Field of application: for specifications, consult the client

Quantity of material per area unit: for specifications, consult the client

Test samples:

Nature and property: 80 pcs. of hard plastics white, 12 cm x 8 cm

Manufacturing: carried out by the client (description submitted)

Processing conditions: carried out by the client (description submitted)

Date of receipt of test samples: 10.11.2017

Storing conditions in the testing laboratory until start of test: at room temperature

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Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: VR 519 Amtsgericht Gelsenkirchen, USt.-ID: DE125018356
Vorstand: Prof. Dr. Werner Schlake (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Grün, Dr. Dirk Waider, Prof. Dr. Lothar Dunemann (geschäftsführ. Vorstand)

Test conditions:

The tests were performed in accordance with the recommendations contained in DVGW Technical Standard W 270 as of November 2007. Details regarding testing procedures, as well as testing conditions will be given in said Technical Standard. The surface of the examined test pieces totals to approx. 760 cm² each. Using eight test items per test period the following test scheme was applied:

- monthly sampling of surface biomass (test period 3 months altogether)
- sampling after 2 months (test period 2 months altogether)
- sampling after 3 months (test period 3 months altogether)

Prior to testing, the test specimens were placed in running tap water for 20 hours, followed by a disinfection procedure using 1% chlorine bleach for 30 ± 5 minutes and then rinsed with drinking water.

Time of exposure:

1-month samples	1a:	1 st	test period from 07.02.2018 to 07.03.2018
	1b:	2 nd	test period from 07.03.2018 to 04.04.2018
	1c:	3 rd	test period from 04.04.2018 to 02.05.2018
2-month samples	2a:	1 st	test period from 07.02.2018 to 04.04.2018
3-month samples	3a:	1 st	test period from 07.02.2018 to 02.05.2018

The exposure took place in containers filled with ground water of drinking water quality at a continuous flow rate of approx. 20 l/h over a period of three months. The water temperature ranged from 8.9°C to 10.6°C.

After one, two and three months the surfaces of the test pieces, as well as the corresponding negative reference samples (stainless steel) and positive reference samples (paraffin) were scraped clean in order to examine for biofilm formation. Afterwards, the surface biomass was transferred to suitable centrifuge tubes. The subsequent centrifugation was carried out at 3.000 x g for 10 minutes followed by the determination of the volume of the sediment.

Test results:

The positive reference sample (pK) showed a pronounced formation of biofilm during all test periods. There was no formation of surface biomass on the negative reference sample (nK).

The results of the analyses of the single specimens of approx. 760 cm² surface in total, pursuant to DVGW Technical Standard W 270 were as follows:

Volume of surface biomass

(single values and arithmetic mean of 8 test pieces, given in ml / referring to 800 cm²)

Start of test: 07.02.2018		1-month values		2-month values		3-month values
07.02.2018 – 07.03.2018	1a	(<0.01/<0.01)		(0.03/0.03) 0.03		
	nK	< 0.01	2a			
	pK	> 1.5				
07.03.2018 – 04.04.2018	1b	(0.01/0.01) 0.01	nK	< 0.01	3a	(0.01/0.01) 0.01
	nK	< 0.01	pK	> 1.5	nK	< 0.01
	pK	> 1.5		pK	> 1.5	
04.04.2018 – 07.05.2018	1c	(<0.01/<0.01)				
	nK	< 0.01				
	pK	> 1.5				

Limiting values [ml / 800 cm²] pursuant to DVGW Technical Standard W 270 (11/2007)

General application: arithmetic means	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)
Large surface seals (D 1): arithmetic means	≤ (0.12 + 0.03) whereas 1c ≤ 1b	≤ (0.12 + 0.03)	≤ (0.12 + 0.03) whereas 3a ≤ 2a
Small surface seals (D 2): arithmetic means	≤ (0.20 + 0.03) whereas 1c ≤ 1b	≤ (0.20 + 0.03)	≤ (0.20 + 0.03) whereas 3a ≤ 2a
Negative Control:	< 0.01 ml	< 0.01 ml	< 0.01 ml
Positive Control:	≥ 1.5 ml	≥ 1.5 ml	≥ 1.5 ml

Assessment:

Provided that it is applied correctly, the material

LATAMID 66 H2 G/30 NAT. F:0003 [Lot:98691]

is suitable for the use in drinking water systems according to the results of the microbiological examinations pursuant to DVGW Technical Standard W 270 (11/2007).

The Director of the Institute

p.p.



Dr. Ch. Schell

Head of Laboratory

Department of Water Hygiene and Environmental Microbiology

