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TEST REPORT

TÜV SÜD Industrie Service GmbH
Department of Chemical Analysis
Ridlerstraße 65
80339 Munich, Germany

Report No.:	**Aquaphor 10/15**
Client:	Westaqua-Invest OU Mr. Valeriy Lavrov – Member of the board Westaqua-Invest OU L. Tolstoi 2A, 40231, Sillamäe, Estonia
Date of order:	01/12/2014
Sample arrival:	15/12/2014
Project:	**4 household water pitcher filters Aquaphor Amethyst, Model P82B25SM, Volume: 2.8 litres with filter cartridges B100-25 / B25 / MAXFOR**
Basis of test:	Microbiological / chemical testing acc. to DIN 10521 – Food hygiene Household water filters which are not connected to the water supply – Household water filters using cation exchange resin and activated carbon
Test period:	06/05/2015 – 11/06/2015
Attachment:	Test Report No L15-13069 by TÜV SÜD ELAB GmbH dated 12/06/15, 6 pages

Date: 2015-06-17

Our reference:
IS-USL-MUC/aj

Document:
Aquaphor_10_15_Cartridge_mibi .docx

This document consists of 2 Pages and 1 attachment
Page 1 of 2

The test results refer exclusively to the units under test.

Munich, 17/06/2015
Department of Chemical Analysis

Gabriele Glomsda

Alla Jurma

Certified System swissTS ISO 9001

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1. Subject of the order

The water filter "Aquaphor" blue with cartridge should be tested and assessed as specified in DIN 10521:2009-02, using two samples in parallel for both microbiological and chemical testing.
The test was performed by another accredited laboratory within the TÜV SÜD company (see attachment).

2. Test samples

Four water filters "Aquaphor"
series: Amethyst
color: blue
volume: 2.8 litres
filter cartridges: B100-25 / B25 / MAXFOR

3. Basis of test and assessment

DIN 10521:2009-02, Household water filters which are not connected to the water supply – Household water filters using cation exchange resin and activated carbon

4. Result

For the test result see the original report No L15-13069 in the attachment.

TÜV SÜD ELAB GmbH· Birlenbacher Str. 14 · 57078 Siegen · Germany

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DAkkS
Deutsche Akkreditierungsstelle
D-PL-14390-01-00

Akkreditiertes Prüflaboratorium
nach DIN EN ISO/IEC 17025

Test report No. L15-13069

Date: 2015-06-12

Our reference: roe

Document:
Test report_DIN10521_TS IS_150612.docx

This document consits of 6 Pages.
Page 1 of 6

The test results refer exclusively to the units under test.

Client:

TÜV SÜD Industrie Service GmbH
IS-USL-MUC
Ridlerstr. 65
80339 München

Order:

Microbiological / chemical testing acc. to DIN 10521 – Food hygiene
Household water filters which are not connected to the water supply –
Household water filters using cation exchange resin and activated carbon

Order number: **L15-13069**

Test object: **Aquaphor® water filters**
Manufacturer: Westaqua-Invest OU
division of Aquaphor Corp.,
L. Tolstoi 2A, 40231, Sillamae,
Estonia

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Sample receipt:	13.04.2015
Description of samples:	4 household water pitcher filters Aquaphor® Amethyst, Model P82B25SM, Volume: 2.8 litres, Manufacturing date: 20.10.2014 with filter cartridges B100-25 / B25 / MAXFOR
Test procedure / reference:	DIN 10521 – Food hygiene Household water filters which are not connected to the water supply – Household water filters using cation exchange resin and activated carbon
Location:	TÜV SÜD ELAB GmbH Birlenbacher Str. 14 D-57078 Siegen - Germany
Test period:	06.05.2015 - 11.06.2015

Summary of the test procedure / Quality assurance:

The test is performed according to DIN 10521:2009-02, using two samples in parallel for both microbiological and chemical testing.

6.2 Microbiological testing:

Test organism:	E. coli DSM 787
Adjusted concentration of E. coli in test water (target range: $1,0 \times 10^1$ to $1,0 \times 10^3$ cfu/100 ml):	$1,2 \times 10^1$ cfu/100 ml (after 25% of usage) $1,6 \times 10^1$ cfu/100 ml (after 100% of usage)

Enumeration of E. coli according to German Drinking Water Regulation, using membrane filtration technique and TTC agar plates (6.2.1).

6.3 Chemical testing:

All test solutions were prepared in accordance with specification of the standard.

Allocations of free chlorine, copper, lead and hardness according to specification by the standard.

The water heaters used (Model: BOMANN WKS 5010 CB) were washed before use with 0.1 M HCl, followed by a determination of the hardness. Significant levels were not found (0.01 mmol / l).

Sampling after 5%, 25%, 50%, 75% and 100% of filter cartridge usage/capacity.

Methods:	
Lead, copper, calcium, magnesium and sodium:	EN ISO 11885-E22 (accredited)
Free Chlorine:	DIN EN ISO 7393-2 (accredited)

Abbreviations:

cfu = *colony forming units (cells)*

Pb = *Lead*

Cu = *Copper*

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Microbiological test results:

Aquaphor® Amethyst Model P82B25SM with filter cartridge B100-25 / B25 / MAXFOR (**Sample # 1**):

Sample	Date	Liter filtered	Day	Sample Volume (ml)	E.coli (1) (cfu/100ml)	E.coli (2) (cfu/100ml)	Average (cfu/100ml)
A Filtrate after doping	18.05.2015	26,6*	0	100	2	1	**2**
Control with substrate			0	100	20	20	**20**
K Control without substrate			0	100	10	13	**12**
B Filtrate after stagnation	19.05.2015	26,6	1	100	0	0	**0**
C Mixed sample (1. + 2. liter)		28,6	1	100	0	0	**0**
Control with substrate			1	100	22	27	**25**
Control without substrate			1	100	7	9	**8**
D Mixed sample (0. + 1. + 2. liter)	20.05.2015	31,6	2	100	0	0	**0**
Control with substrate			2	100	28	31	**30**
Control without substrate			2	100	0	0	**0**
E Mixed sample (0. + 1. + 2. liter)	21.05.2015	34,6	3	100	0	0	**0**
Control with substrate			3	100	62	71	**67**
Control without substrate			3	100	0	0	**0**
*after 25% of the usage volume (100 l)							
A Filtrate after doping	08.06.2015	101,6**	0	100	14	14	**14**
Control with substrate			0	100	53	61	**57**
K Control without substrate			0	100	15	16	**16**
B Filtrate after stagnation	09.06.2015	101,6	1	100	0	0	**0**
C Mixed sample (1. + 2. liter)		103,6	1	100	9	0	**5**
Control with substrate			1	100	120	122	**121**
Control without substrate			1	100	0	0	**0**
D Mixed sample (0. + 1. + 2. liter)	10.06.2015	106,6	2	100	0	0	**0**
Control with substrate			2	100	>200	>200	**>200**
Control without substrate			2	100	0	0	**0**
E Mixed sample (0. + 1. + 2. liter)	11.06.2015	109,6	3	100	8	0	**4**
Control with substrate			3	100	>200	>200	**>200**
Control without substrate			3	100	0	0	**0**
**After 100% of the usage volume (100 l)							

Requirements: a) (B + C + D + E) < 2 K
b) Controls with substrate (cfu/100ml) > K

Results after 25% of usage volume: (B + C + D + E) = 0
2 K = 24 -> 0 < 24 = **true**

Results after 100% of usage volume: (B + C + D + E) = 9
2 K = 32 -> 9 < 32 = **true**

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Aquaphor® Amethyst Model P82B25SM with filter cartridge B100-25 / B25 / MAXFOR (**Sample # 2**):

Sample	Date	Liter filtered	Day	Sample Volume (ml)	E.coli (1) (cfu/100ml)	E.coli (2) (cfu/100ml)	Average (cfu/100ml)
A Filtrate after doping	18.05.2015	26,6*	0	100	0	0	**0**
Control with substrate			0	100	20	20	**20**
K Control without substrate			0	100	10	13	**12**
B Filtrate after stagnation	19.05.2015	26,6	1	100	0	0	**0**
C Mixed sample (1. + 2. liter)		28,6	1	100	0	0	**0**
Control with substrate			1	100	22	27	**25**
Control without substrate			1	100	7	9	**8**
D Mixed sample (0. + 1. + 2. liter)	20.05.2015	31,6	2	100	0	0	**0**
Control with substrate			2	100	28	31	**30**
Control without substrate			2	100	0	0	**0**
E Mixed sample (0. + 1. + 2. liter)	21.05.2015	34,6	3	100	0	0	**0**
Control with substrate			3	100	62	71	**67**
Control without substrate			3	100	0	0	**0**
*after 25% of the usage volume (100 l)							
A Filtrate after doping	08.06.2015	101,6**	0	100	7	10	**9**
Control with substrate			0	100	53	61	**57**
K Control without substrate			0	100	15	16	**16**
B Filtrate after stagnation	09.06.2015	101,6	1	100	0	0	**0**
C Mixed sample (1. + 2. liter)		103,6	1	100	0	0	**0**
Control with substrate			1	100	120	122	**121**
Control without substrate			1	100	0	0	**0**
D Mixed sample (0. + 1. + 2. liter)	10.06.2015	106,6	2	100	0	0	**0**
Control with substrate			2	100	>200	>200	**>200**
Control without substrate			2	100	0	0	**0**
E Mixed sample (0. + 1. + 2. liter)	11.06.2015	109,6	3	100	0	0	**0**
Control with substrate			3	100	>200	>200	**>200**
Control without substrate			3	100	0	0	**0**
**after 100% of the usage volume (100 l)							

Requirements: a) (B + C + D + E) < 2 K
b) Controls with substrate (cfu/100ml) > K

Results after 25% of usage volume: (B + C + D + E) = 0
2 K = 24 -> 0 < 24 = **true**

Results after 100% of usage volume: (B + C + D + E) = 0
2 K = 32 -> 0 < 32 = **true**

Microbiological test results - Summary:

The test procedure meets the predefined quality criteria according to DIN 10521:2009-02 no 6.2.2.4, 6.2.3.2, 6.2.3.3, 6.2.4. The test procedure is valid. The test result is unambiguous according to DIN 10521:2009-02 no. 6.2.3.2. A colonization of the filter with E. coli DSM 787 was not detected.

The product Aquaphor® Amethyst Model P82B25SM with filter cartridge B100-25 / B25 / MAXFOR fulfills the requirements according to DIN 10521:2009-02 with respect to the resistance against a colonization with E. coli.

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Chemical test results:

1 Testing of lead retention capacity (DIN 10521: 2009-02 /6.3.4)

Total Pb of 5 sampling days in not filtered test solution:	0.5021 mg / l
Total Pb of 5 sampling days in filtrate sample filter 1:	0.0076 mg / l
Total Pb of 5 sampling days in filtrate sample filter 2:	0.0080 mg / l

➔ Retention of lead > 98% (Requirement: > 90%)

The product meets the requirements of DIN 10521: 2009-02 with respect to the retention capacity of lead.

2 Testing of chlorine retention capacity (DIN 10521: 2009-02 /6.3.5)

Total free chlorine of 5 sampling days in not filtered test solution:	5.05 mg / l
Total free chlorine of 5 sampling days in filtrate sample filter 1:	0.14 mg / l
Total free chlorine of 5 sampling days in filtrate sample filter 2:	0.14 mg / l

➔ Retention of free chlorine > 97% (Requirement: > 80%)

The product meets the requirements of DIN 10521: 2009-02 with respect to the retention capacity of free chlorine.

3 Testing of carbonate hardness retention capacity (DIN 10521: 2009-02 /6.3.6)

Total hardness of the eluate **raw water** sample Filter 1:	16.6 mmol / l
Total hardness of the eluate **filtrate** sample Filter 1:	0.22 mmol / l

➔ Carbonate hardness filtrate Filter 1 (water heater 1) = 1,3 % (compared to raw water, requirement: < 20%)

Total hardness of the eluate **raw water** sample Filter 2:	15.6 mmol / l
Total hardness of the eluate **filtrate** sample Filter 2:	0.22 mmol / l

➔ Carbonate hardness filtrate Filter 2 (water heater 2) = 1,4 % (compared to raw water, requirement: < 20%)

The product meets the requirements of DIN 10521: 2009-02 with respect to the reduction of carbonate hardness.

4 Testing of copper retention capacity (DIN 10521: 2009-02 /6.3.7)

Total Cu of 5 sampling days in not filtered test solution:	10.16 mg / l
Total Cu of 5 sampling days in filtrate sample filter 1:	0.074 mg / l
Total Cu of 5 sampling days in filtrate sample filter 2:	0.084 mg / l

➔ Retention of copper > 99% (Requirement: > 80%)

The product meets the requirements of DIN 10521: 2009-02 with respect to the retention capacity of copper.

Chemical test results - Summary:

The product Aquaphor® Amethyst Model P82B25SM with filter cartridge B100-25 / B25 / MAXFOR fulfills the requirements according to DIN 10521:2009-02 with respect to the retention capacity of lead, free chlorine and copper and to the reduction of total carbonate hardness.

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Evaluation:

The product Aquaphor® Amethyst Model P82B25SM with filter cartridge B100-25 / B25 / MAXFOR fulfills the requirements according to DIN 10521:2009-02.

TÜV SÜD ELAB GmbH

Dr. Bernd Roesner
Managing Director