Hygiene-Institut des Ruhrgebiets
Institut für Umwelthygiene und Toxikologie
Director: Dr. Thomas-Benjamin Seiler
Legal Entity: Verein des Hygiene-Instituts des Ruhrgebiets e.V.

Hygiene-Institut · PO Box 10 12 55 · DE 45812 Gelsenkirchen · Germany

Interplast S.A.
Industrial Area of Komotini
69100 KOMOTINI
GREECE

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Rotthauser Str. 21, DE 45879 Gelsenkirchen

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Our reference: W-378630e-23-Sl/Krü
Contact person: Mrs. Dr. Schell

Gelsenkirchen, 20.09.2023

TEST REPORT

Test pursuant to EN 16421: 2014-12, Influence of materials on water for human consumption, Method 2 – Measured by biofilm volume

Client:	Interplast S.A. Industrial Area of Komotini 69100 KOMOTINI GREECE
Ordering date:	26.05.2023

Description of the material:

Test material:	**Aqua Plus PP-R fittings**
Composition:	recipe submitted and checked (12573)
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:	12 pcs. of plastic elbow fittings cutted in half, green, ID: 12.5 cm
Manufacturing:	description submitted by the client, [Lot-No. 0405230816]
Processing conditions:	description submitted by the client
Production Place:	description submitted by the client

This test report consists of 3 pages

Date of receipt of test samples:	17.05.2023
Condition at reception:	individually in box
Storing conditions in the testing lab:	at room temperature, dark, dry

Test conditions:

The tests were performed in accordance with the requirements contained in EN 16421: 2014-12, Method 2. Details regarding testing procedures, as well as testing conditions will be given in said Standard. The surface of the examined test pieces totals to 800 cm^2 each. Using 4 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:**	1st	test period from 21.06.2023 to 19.07.2023
	1b:	2nd	test period from 19.07.2023 to 15.08.2023
	1c:	3rd	test period from 15.08.2023 to 12.09.2023
2-month samples	**2a:**	1st	test period from 21.06.2023 to 15.08.2023
3-month samples	**3a:**	1st	test period from 21.06.2023 to 12.09.2023

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 10.8°C to 12.0°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.

Special observations / deviations:

None

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 800 cm² surface in total, pursuant to EN 16421: 2014-12, Method 2 were as follows:

Volume of surface biomass

(single values and arithmetic mean of 4 test pieces, given in ml / referring to 800 cm²)

Start of test: 21.06.2023		1-month values		2-month values		3-month values
21.06.2023 – 19.07.2023	1a	(< 0.01/< 0.01)				
		-				
	nK	< 0.01	2a	(< 0.01/< 0.01)		
	pK	≥ 1.5		-		
19.07.2023 – 15.08.2023	1b	(< 0.01/< 0.01)	nK	< 0.01	3a	(< 0.01/< 0.01)
		-	pK	≥ 1.5		-
	nK	< 0.01			nK	< 0.01
	pK	≥ 1.5			pK	≥ 1.5
15.08.2023 – 12.09.2023	1c	(< 0.01/< 0.01)				
		-				
	nK	< 0.01				
	pK	≥ 1.5				

Limiting values [ml / 800 cm²] pursuant to KTW-BWGL (as of 7 March 2022)

General application:	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)	≤ (0.05 + 0.02)
Negative Control:	< 0.01 ml	< 0.01 ml	< 0.01 ml
Positive Control:	≥ 1.5 ml	≥ 1.5 ml	≥ 1.5 ml

The Director of the Institute
p.p.

J. Albrecht M. Sc.
Assistant Head of Department Microbiological Material and Hygiene Testings

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Contact person: Mrs. Dr. Schell

Gelsenkirchen, 20.09.2023

TEST REPORT

Test pursuant to EN 16421: 2014-12, Influence of materials on water for human consumption, Method 2 – Measured by biofilm volume

Client:	Interplast S.A. Industrial Area of Komotini 69100 KOMOTINI GREECE
Ordering date:	26.05.2023

Description of the material:

Test material:	**Aqua Plus PPR pipes**
Composition:	recipe submitted and checked (12573)
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:	14 pcs. of hard plastic pipes, green, L.: 99.0 cm, ID: 1.3 cm
Manufacturing:	description submitted by the client, [Lot-No. 2104231457]
Processing conditions:	description submitted by the client
Production Place:	description submitted by the client

This test report consists of 3 pages

Date of receipt of test samples:	19.05.2023
Condition at reception:	together in foil
Storing conditions in the testing lab:	at room temperature, dark, dry

Test conditions:

The tests were performed in accordance with the requirements contained in EN 16421: 2014-12, Method 2. Details regarding testing procedures, as well as testing conditions will be given in said Standard. The surface of the examined test pieces totals to 800 cm^2 each. Using 4 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.

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2-month samples	**2a:**	1st	test period from 21.06.2023 to 15.08.2023
3-month samples	**3a:**	1st	test period from 21.06.2023 to 12.09.2023

The exposure took place in a test module for pipes and hoses filled with ground water of drinking water quality perfused at a continuous flow rate of approx. 20 l/h over a period of three months. The water temperature ranged from 10.5°C to 13.5°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.

Special observations / deviations:

None

Test results:

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19.07.2023 – 15.08.2023	1b	(< 0.01/< 0.01)	nK	< 0.01	3a	(< 0.01/< 0.01)
		-	pK	≥ 1.5		-
	nK	< 0.01			nK	< 0.01
	pK	≥ 1.5			pK	≥ 1.5
15.08.2023 – 12.09.2023	1c	(< 0.01/< 0.01)				
		-				
	nK	< 0.01				
	pK	≥ 1.5				

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