



SUBJECT Chemical Test


TEST LOCATION TÜV SÜD China
TÜV SÜD Products Testing (Shanghai) Co., Ltd.
B-3/4, No.1999 Du Hui Road, Minhang District
Shanghai 201108, P.R. China

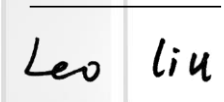
CLIENT NAME First Class NV

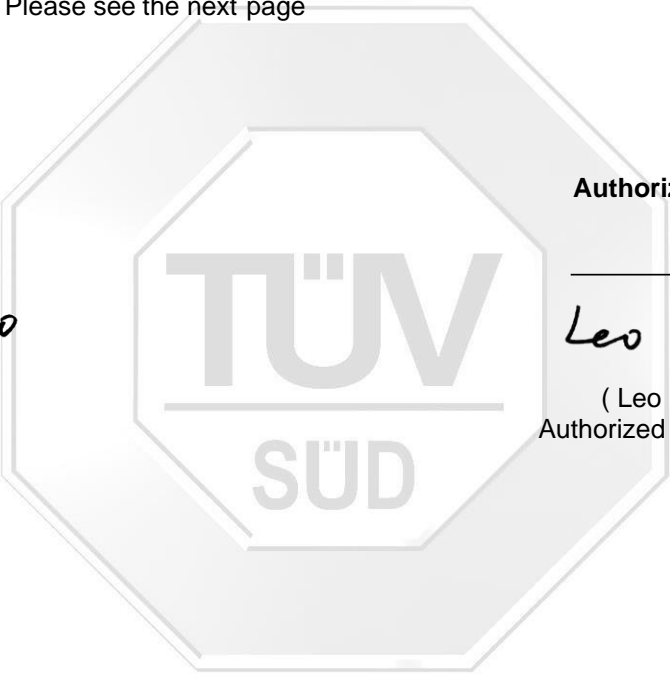
CLIENT ADDRESS No.52 Melkerijstraat 52, 2900 Schoten, Belgium

TEST PERIOD 10-Jun-2020~24-Jul-2020

RESULT SUMMARY Please see the next page

Prepared By

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Authorized By

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Note: (1) General Terms & Conditions as mentioned overleaf. (2) The results relate only to the items tested.(3) The test report shall not be reproduced except in full without the written approval of the laboratory.(4) Without the agreement of the laboratory , the client is not authorized to use the test results for unapproved propaganda.

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RESULT SUMMARY

1. The tested items **complied with** German Food & Feed Acts of September 1, 2005 (LFGB), Section 30 and 31.
- Overall migration test (Distilled water) **003~006 PASS**
 - Extractable components test (Distilled water) **002 PASS**
 - Specific Migration of Heavy metal **003~006 PASS**
 - Specific Migration of Primary Aromatic Amine **002~006 PASS**
 - Peroxide value **002,004~006 PASS**
 - Chromium, Vanadium, Zirconium and Hafnium content **003 PASS**
 - Volatile Organic Matters **002 PASS**
 - Total Platinum **002 PASS**
 - Volatile Organic Components **004~006 PASS**
 - Specific Migration of Acrylonitrile **006 PASS**
 - Specific Migration of 1,3 - Butadiene **006 PASS**
 - Color release (Water) **003~006 PASS**
 - Sensory test **001 PASS**
2. The tested items **complied with** ResAP (2004) 3 on ion exchange and adsorbent resins used in the processing of foodstuffs
- Total Organic Carbon (TOC) test **007 PASS**
3. The tested items **complied with** EN12915-1:2009 (Products used for the treatment of water intended for human consumption - Granular activated carbon - Part 1: Virgin granular activated carbon).
- Particle size distribution **008 PASS**
 - Wettability **008 PASS**
 - Bulk density packed **008 PASS**
 - Ball-pan hardness **008 PASS**
 - Impurities and main by-products **008 PASS**
 - Water-extractable substances **008 PASS**
 - Iodine Number **008 PASS**

RECEIPT DATE / TEST DATE

10-Jun-2020/ 10-Jun-2020

THE FOLLOWING SAMPLE(S) WAS/WERE SUBMITTED


BY/ ON BEHALF OF THE CLIENTS AS

Sample Name: Water filter cartridge and water filter pitcher


Sample Specification: HS-518 tulip;HS-519 rose;HS-520 lily;HS-521 peony;HS-522 fressia;HS-523 jasmine;HS-524 bdaisy;HS-525 canna;HS-526 MARY;HS-527 cosmos;HS-528 pansy;HS-529 iris;HS-530 orchid;HS-531 lotus;HS-532 Sponge;HS-533 yucca;HS-534 PANDY;HS-535 CANDY;HS-536 LOTUS;HS-537 IRISA;F-001;F-006;F-011;F-002;F-007;F-012;F-003;F-008;F-013;F-004;F-009;F-014;F-005;F-010;F-015;AEL01;MDF01;MDF02;MDF03;MDF04;MWF01;MWF02

Batch No./Date: /

Manufacturer: /

SAMPLE NO.	TEST PART	DESCRIPTION	PHOTOGRAPH
721654917-1	001	Whole product	
721654917-2	002	White silicone rubber	
721654917-3	003	White plastic	
721654917-4	004	White plastic	
721654917-5	005	Transparent plastic	
721654917-6	006	Blue plastic	
721654917-7	007	Light yellow particles	

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721654917-8	008	Black particles	
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TEST RESULT(S)

Note: The migration results in this report were tested and expressed based on repeated use articles

1. Overall Migration Test

- Test method: In accordance with REGULATION (EU) No 10/2011 and its amendments on plastic materials and articles intended to come into contact with food.
- As specified in REGULATION (EU) No 10/2011 and its amendments; with reference to EN 1186: Part 3 (Test methods for overall migration into aqueous food simulants by total immersion)/ EN 1186: Part 9 (Test methods for overall migration into aqueous food stimulants by article filling)
- Sample 003, 004, 006 migration ratio(S/V): 10 dm²/L
- Sample 005 migration ratio(S/V): 32.86 dm²/3500ml

Simulant(s) Used	Test Condition	Result(s) [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
		003 ^{1#}	004 ^{2#}	
Distilled water	40°C for 10 days	<0.500	<0.500	10

Simulant(s) Used	Test Condition	Result(s) [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
		005	006 ^{2#}	
Distilled water	40°C for 10 days	<0.500	<0.500	10

- Note:
- 1# denotes the result was calculated by assuming that the sample is used for inner surface of 32.86 dm² food container with a food contact surface of approx. 3.58 dm².
 - 2# denotes the result was calculated by assuming that the sample is used for inner surface of 32.86 dm² food container with a food contact surface of approx. 2.0 dm².

2. Extractable components test

- Test method: Extractable components test for compliance with the Recommendation of the BfR "Kunststoffe im Lebensmittelverkehr" Part XV "Silicone".
- With reference to Bundesgesundheitsbl. 46(2003) 362

Simulant(s) Used	Test Condition	Result(s) [%]	Maximum Permissible Limit [%]
		002	
Distilled water	Reflux for 5 hours	<0.1	0.5



3. Specific Migration: Heavy metal – Al, Ba, Co, Cu, Fe, Li, Mn, Zn, Ni
- Test method: As specified in REGULATION (EU) No 10/2011 and its amendments; with reference to EN13130-1:2004, followed by ICP-MS.
 - Test condition: 10% Ethanol, 40°C for 24 hours
 - Sample 003 migration ratio(S/V): 3.58 dm²/3500ml
 - Sample 004, 006 migration ratio(S/V): 2.6 dm²/3500ml
 - Sample 005 migration ratio(S/V): 32.86 dm²/3500ml

Test Item(s)	Result(s) [mg/kg]		Maximum Permissible Limit [mg/kg]
	003	004	
Aluminum	<0.1	<0.1	1
Barium	<0.1	<0.1	1
Cobalt	<0.05	<0.05	0.05
Copper	<0.5	<0.5	5
Iron	<1.0	<1.0	48
Lithium	<0.1	<0.1	0.6
Manganese	<0.05	<0.05	0.6
Zinc	<1.0	<1.0	5
Nickel	<0.002	<0.002	0.02

Test Item(s)	Result(s) [mg/kg]		Maximum Permissible Limit [mg/kg]
	005	006	
Aluminum	<0.1	<0.1	1
Barium	<0.1	<0.1	1
Cobalt	<0.05	<0.05	0.05
Copper	<0.5	<0.5	5
Iron	<1.0	<1.0	48
Lithium	<0.1	<0.1	0.6
Manganese	<0.05	<0.05	0.6
Zinc	<1.0	<1.0	5
Nickel	<0.002	<0.002	0.02

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4. Specific Migration of Primary Aromatic Amine

- Test method: With reference to EN13130-1:2004, followed by Kunststoffe im Lebensmittelverkehr, Book 2, Teil B II,XXI
- Test condition: 10% Ethanol, 40°C for 24 hours
- Sample 002 migration ratio(S/V): 0.153 dm²/3500ml
- Sample 003 migration ratio(S/V): 3.58 dm²/3500ml
- Sample 004, 006 migration ratio(S/V): 2.6 dm²/3500ml
- Sample 005 migration ratio(S/V): 32.86 dm²/3500ml

Test Item(s)	Result(s) [mg/kg]			Maximum Permissible Limit [mg/kg]
	002	003	004	
Primary Aromatic Amine	<0.01	<0.01	<0.01	0.01

Test Item(s)	Result(s) [mg/kg]		Maximum Permissible Limit [mg/kg]
	005	006	
Primary Aromatic Amine	<0.01	<0.01	0.01

5. Peroxide Value

- Test method: For compliance with the Recommendation of the BfR "Kunststoffe im Lebensmittelverkehr" With reference to Bundesgesundheitsbl. 40 (1997), 412.

Test Item(s)	Result(s)		Maximum Permissible Limit
	002	004	
Peroxide Value	Absent	Absent	Absent

Test Item(s)	Result(s)		Maximum Permissible Limit
	005	006	
Peroxide Value	Absent	Absent	Absent

6. Total Chromium, Vanadium, Zirconium and Hafnium Content

- Test method: For compliance with the Recommendation of the BfR "Kunststoffe im Lebensmittelverkehr" Part VII"
- Microwave digestion, followed by analysis using Atomic Absorption Spectrometry (AAS) or Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES).

Test Item(s)	Result(s) [mg/kg]	Maximum Permissible Limit [mg/kg]
	003	
Chromium content	2.0	10
Vanadium content	<15.0	20
Zirconium content	28.0	100
Hafnium Content	<15.0	100

7. Volatile Organic Matter

- Test method: For compliance with the Recommendation of the BfR "Kunststoffe im Lebensmittelverkehr" Part XV "Silicone"; With reference to Bundesgesundheitsbl. 46 (2003) 362
- Test condition: 40°C for 24 hours

Test Item(s)	Result(s) [%]	Maximum Permissible Limit [%]
	002	
Volatile Organic Matter	<0.05	0.5

8. Total Platinum

- Test method: Microwave digestion, then followed by ICP-OES

Test Item(s)	Result(s) [mg/kg]	Maximum Permissible Limit [mg/kg]
	002	
Total Platinum	<5	50

9. Volatile Organic Compounds

- Test method: For compliance with the the BfR Recommendations on Food L.Contact Materials Copolymers and Graft Polymers of Acrylonitrile; With reference to Bundesgesundheitsbl. 14 (1971) 265.
- Test condition: 90°C for 24 hours

Test Item(s)	Result(s) [mg/dm ²]			Maximum Permissible Limit [mg/dm ²]
	004	005	006	
Volatile Organic Components	3.6	1.25	9.54	15

10. Specific Migration of Acrylonitrile

- Test method: With reference to EN13130-1:2004, with reference to EN 13130-3 Determination of acrylonitrile in food and food stimulants
- Test condition: 10% Ethanol, 40°C for 24 hours
- Sample 006 migration ratio(S/V): 2.6 dm²/3500ml

Test Item(s)	Result(s) [mg/kg]	Maximum Permissible Limit [mg/kg]
	006	
Acrylonitrile	<0.01	0.01

11. Specific Migration of 1,3 - Butadiene

- Test method: With reference to EN 13130-15 Determination of 1,3-butadiene in food stimulants.
- Test condition: 10% Ethanol, 40°C for 24 hours
- Sample 006 migration ratio(S/V): 2.6 dm²/3500ml

Test Item(s)	Result(s) [mg/kg]	Maximum Permissible Limit [mg/kg]
	006	
1,3 - Butadiene	<0.01	0.01



12. Color release

- Test method: With reference to Kunststoffe im Lebensmittelverkehr Book II, Teil B II, IX

Simulant(s) Used	Test Condition	Result(s)		Permissible Limit
		003	004	
Water	50°C for 5 hours	No bleeding	No bleeding	No bleeding

Simulant(s) Used	Test Condition	Result(s)		Permissible Limit
		005	006	
Water	50°C for 5 hours	No bleeding	No bleeding	No bleeding

Note: 1. No bleeding denotes no difference was found between blank and sample
2. Bleeding denotes staining was found from sample

13. Sensory test

- Test method: With reference to DIN 10955.

- The submitted sample was immersed in distilled water at 40°C for 24 hours. After this treatment treated water was examined by panels with regard to any divergence in smell and taste.

Sample(s)	Testing Parameter	Grading result(s)	Recommended level
001	Transfer of taste	2	<3
	Transfer of smell	2	<3

Note: 1. Available grading are listed as follow:

- Grading 0: No perceptible taste/smell deviation
- 1: Just perceptible taste/smell deviation
- 2: Weak taste/smell deviation
- 3: Clear taste/smell deviation
- 4: Strong taste/smell deviation

14. Total Organic Carbon test

- Test method: With reference to the AFNOR test T 90-601 mentioned in ResAP (2004)3 on ion exchange and adsorbent resins used in the processing of foodstuffs

Test Item(s)	Result(s) [mg/L]	Maximum Permissible Limit [mg/L]
	007	
TOC	0.06	1.0

15. Particle size distribution

- Test method: According to EN12902 - Products used for treatment of water intended for human consumption. Inorganic supporting and filtering materials. Methods of test

Items	Content [%]	Maximum Permissible Limit [%]
	008	
1) Oversize particles	1.84	1) +2) ≤ 15
2) Undersize particles	0.02	2) ≤ 5

Note: 1.Oversize denotes more than 0.83 mm as specified by the client
2.Undersize denotes less than 0.25 mm as specified by the client

16. Wettability

- Test method: Immersion of the product in boiling water. Cooling, sedimentation and filtration of the supernatant through a sieve to determine the quantity of material that is not wetted.

Wettability [%]	Minimum Permissible Limit [%]
008	
99.99	99

17. Bulk density packed

- Test method: The bulk density packed of granular activated carbon is determined by measuring the volume packed by a free fall from a vibrating feeder into 100 ml graduated cylinder and weighing the known volume.

Bulk density [kg/m ³]	Minimum Permissible Limit [kg/m ³]
008	
519.4	180

18. Ball-pan hardness

- Test method: A screened and weighed sample of granular activated carbon is placed in a special hardness pan with a number of stainless steel balls, then subjected to a combined rotating and tapping action for 30 min. Degradation of particle size is determined by measuring the mass of granular activated carbon retained by a sieve whose aperture is closest to half the aperture of the sieve that defines the minimum particle size of the original sample.

Hardness [%]	Minimum Permissible Limit [%]
008	
99.1	75

19. Impurities and main by-products

- Test method: According to EN12902 - Products used for treatment of water intended for human consumption. Inorganic supporting and filtering materials. Methods of test.

Impurity	Results [%]	Maximum Permissible Limit [%]
	008 ^{#1}	
Ash	0.54	15
Water ^{#2} (at the time of packing ^{#3})	0.79	5
Water – soluble material	1.38	3
Zinc	<0.001	0.002

- Note:
- #1 Expressed on a dry basis
 - #2 Higher or lower values can be necessary for certain applications.
 - #3 The water content can increase after packing; e.g. during transportation

20. Water-extractable substances

- Test method: According to EN12902 - Products used for treatment of water intended for human consumption. Inorganic supporting and filtering materials. Methods of test.

Substances	Results [$\mu\text{g/L}$]	Maximum Permissible Limit in the extraction water [$\mu\text{g/L}$]
	008	
Arsenic(As)	<1	10
Cadmium(Cd)	<0.5	0.5
Chromium(Cr)	<1	5
Mercury(Hg)	<0.1	0.3
Nickel(Ni)	<1	15
Lead(Pb)	<1	5
Antimony(Sb)	<1	3
Selenium(Se)	<1	3
Cyanide(CN)	<2	5
PAH#1	<0.02	0.02

Note: #1 Polycyclic Aromatic Hydrocarbons: the sum of the detected concentrations of fluoranthene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene.

21. Iodine

- According to EN12902 - Products used for treatment of water intended for human consumption. Inorganic supporting and filtering materials. Methods of test.

Iodine Number [mg/g]	Minimum Permissible Limit [mg/g]
008	600
1197	

Note: This report is for internal use only such as internal scientific research ,education, quality control, product R&D.

-END OF THE TEST REPORT-