



Technical Report No. 68.160.14.20336.01A
Dated 2014-05-04

Client: Liveon Industrial Co., Ltd

Address: No.46, Yudong 6 Road, the 4th Industrial Estate, Yangdong, Yangjiang, Guangdong, China

Attn.: Mr.David Chen

Sample Description: 5PCS coating knife set with Acrylic block

Model No.: 0081221

Sample Received Date: 2014-04-17

Test Period: From 2014-04-17 to 2014-04-30

Test Requested: As specified by client, to test below items as regulated by the German Food & Feed Acts LFGB (§ 30 & 31) and Regulation (EC) No.1935/2004,

1. For material: Plastics or coating
 - Overall migration test for compliance with regulation (EU) 10/2011.
2. For material: Plastics or coating
 - Specific Migration of Heavy Metals ((Ba, Co, Cu, Fe, Li, Mn, Zn) for compliance with regulation (EU) 10/2011
3. For material: Plastics or coating
 - Specific Migration of Primary Aromatic Amine for compliance with regulation (EU) 10/2011.
4. For material: Non-stick coating
 - Specific Migration of Phenolic substances
5. For material: Non-stick coating
 - Specific Migration of Formaldehyde
6. For material: Non-stick coating
 - Specific Migration of PFOA and PFOS
7. For material: Non-stick coating
 - Specific Migration of Chromium III, Chromium VI and Lithium
8. For material: Metal and metallic coating except aluminium
 - Extractable Heavy Metal (Lead, Cadmium, Chromium, Nickel, Copper, Cobalt and Antimony)
9. Sensory test
 - With reference to DIN 10955

This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
TÜV SÜD Group
Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint road 2,
Shenzhen 518052, P. R. China

Tel.: (86) 755 88286998
Fax: (86) 755 88285299



Technical Report No. 68.160.14.20336.01A
Dated 2014-05-04

Conclusion: The submitted sample with test part(s) was found to **comply** with the respective requirement(s) for the tested item(s) as stated in the German Food & Feed Acts LFGB (§ 30 & 31) and Regulation (EC) No.1935/2004 (Material in contact with food regulation)

Test Result: Refer to the following page(s)

Remark: --The result relates only to the items tested.









This technical report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
TÜV SÜD Group
Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint road 2,
Shenzhen 518052, P. R. China

Tel.: (86) 755 88286998
Fax: (86) 755 88285299

1. TESTED SUBJECT DESCRIPTION

Sample Number	Item Name	Tested Material Description	Photo
001	Non stick coating	Yellow non-stick coating	
002		Blue non-stick coating	
003		Pink non-stick coating	
004		Red non-stick coating	
005		Green non-stick coating	
006	Blade	Silvery metal	

2. TEST RESULT

2.1 OVERALL MIGRATION TEST FOR PLASTIC

Test method: As specified in Regulation (EU) No. 10/2011; with reference to EN 1186:part 1, part 2, part 3, part 8, part 9 & part 14 :2002.

Simulant Used	Test Condition	Result [mg/dm ²]			Maximum Permissible Limit [mg/dm ²]
		Sample 001	Sample 002	Sample 003	
3% Acetic Acid	70 °C for 2 hours	6.2	6.5	5.2	10
50% Ethanol	70 °C for 2 hours	5.8	5.1	7.5	10
95% Ethanol	60 °C for 2 hours	5.2	4.3	4.9	10
Isooctane	40 °C for 0.5 hours	3.2	4.3	4.0	10

Simulant Used	Test Condition	Result [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
		Sample 004	Sample 005	
3% Acetic Acid	70 °C for 2 hours	5.7	5.7	10
50% Ethanol	70 °C for 2 hours	5.6	6.3	10
95% Ethanol	60 °C for 2 hours	5.3	5.5	10
Isooctane	40 °C for 0.5 hours	< 3.0	5.3	10

Note:

- “°C” denotes degree Celsius
- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than
- The specification was quoted from regulation (EU) 10/2011.

2.2 SPECIFIC MIGRATION OF HEAVY METALS (Ba, Co, Cu, Fe, Li, Mn, Zn) TEST

Test method: As specified in Regulation (EU) No. 10/2011, the sample(s) were migrated with food simulant, followed by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) analysis.

Testing condition and simulant: 3% acetic acid at 70 °C for 2 hours.

Test Item	Result [mg/kg]			Maximum Permissible Limit [mg/kg]
	Sample 001	Sample 002	Sample 003	
Barium (Ba)	<0.10	<0.10	<0.10	1
Cobalt (Co)	<0.05	<0.05	<0.05	0.05
Copper (Cu)	<0.10	<0.10	<0.10	5
Iron (Fe)	<1.00	<1.00	<1.00	48
Lithium (Li)	<0.10	<0.10	<0.10	0.6
Manganese (Mn)	<0.05	<0.05	<0.05	0.6
Zinc (Zn)	<1.00	<1.00	<1.00	25

Test Item	Result [mg/kg]		Maximum Permissible Limit [mg/kg]
	Sample 004	Sample 005	
Barium (Ba)	<0.10	<0.10	1
Cobalt (Co)	<0.05	<0.05	0.05
Copper (Cu)	<0.10	<0.10	5
Iron (Fe)	<1.00	<1.00	48
Lithium (Li)	<0.10	<0.10	0.6
Manganese (Mn)	<0.05	<0.05	0.6
Zinc (Zn)	<1.00	<1.00	25

Note:

- “mg/kg” denotes milligram per kilogram foodstuff
- “<” denotes less than
- The specification was quoted from regulation (EU) 10/2011.

2.3 SPECIFIC MIGRATION OF PRIMARY AROMATIC AMINE TEST

Test method: With reference to EN 1186-1: 2002, followed by Kunststoffe im Lebensmittelverkehr, Book 2, Teil B II, XXI. [Detection limit: 0.01 mg/kg]

Testing condition and simulant: 3% acetic acid at 70°C for 2 hours.

Test Item	Result [mg/kg]			Maximum Permissible Limit [mg/kg]
	Sample 001	Sample 002	Sample 003	
Migration of Primary Aromatic Amine	< 0.01	< 0.01	< 0.01	Not Detected (< 0.01 mg/kg)

Test Item	Result [mg/kg]		Maximum Permissible Limit [mg/kg]
	Sample 004	Sample 005	
Migration of Primary Aromatic Amine	< 0.01	< 0.01	Not Detected (< 0.01 mg/kg)

Note:

- “mg/kg” denotes milligram per kilogram foodstuff
- “<” denotes less than
- The specification was quoted from regulation (EU) 10/2011.

2.4 SPECIFIC MIGRATION OF PHENOLIC SUBSTANCES TEST

Test method: With reference to DIN 53704:1988, the sample(s) were migrated with food stimulant, followed by Ultraviolet–visible Spectrophotometer (UV-Vis) analysis.

Testing condition and simulant: 3% acetic acid at 95°C for 1 hours.

Test Item	Result [mg/dm ²]			Maximum Permissible Limit [mg/dm ²]
	Sample 001	Sample 002	Sample 003	
Migration of Phenolic Substances	< 0.05	< 0.05	< 0.05	0.05

Test Item	Result [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
	Sample 004	Sample 005	
Migration of Phenolic Substances	< 0.05	< 0.05	0.05

Note:

- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than
- The specification was quoted from the Recommendation of the BfR “Kunststoffe im Lebensmittelverkehr” Part LI “Temperature Resistant Polymer Coating Systems for Frying, Cooking and Baking Utensils”

2.5 SPECIFIC MIGRATION OF FORMALDEHYDE TEST

Test method: The sample(s) were migrated with food stimulant, followed by Ultraviolet–visible Spectrophotometer (UV-Vis) analysis.

Testing condition and simulant: 3% acetic acid at 70°C for 2 hours.

Test Item	Result [mg/kg]			Maximum Permissible Limit [mg/kg]
	Sample 001	Sample 002	Sample 003	
Migration of Formaldehyde	< 0.3	< 0.3	< 0.3	15

Test Item	Result [mg/kg]		Maximum Permissible Limit [mg/kg]
	Sample 004	Sample 005	
Migration of Formaldehyde	< 0.3	< 0.3	15

Note:

- “<” denotes less than
- “mg/kg” denotes milligram per kilogram foodstuff.
- The specification was quoted from the Recommendation of the BfR “Kunststoffe im Lebensmittelverkehr” Part LI “Temperature Resistant Polymer Coating Systems for Frying, Cooking and Baking Utensils”

2.6 SPECIFIC MIGRATION OF PFOA AND PFOS TEST

Test method: The samples were tested migrated with food simulant, followed by Liquid Chromatography/Mass Spectrometry (LC-MS) analysis.

Testing condition and simulant: 95% ethanol at 60°C for 3.5 hours.

Test Item	Result [mg/dm ²]			Maximum Permissible Limit [mg/dm ²]
	Sample 001	Sample 002	Sample 003	
Migration of PFOA and PFOS	< 0.002	< 0.002	< 0.002	0.005

Note:

- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than
- The specification was quoted from the Recommendation of the BfR “Kunststoffe im Lebensmittelverkehr” Part LI “Temperature Resistant Polymer Coating Systems for Frying, Cooking and Baking Utensils”

(Continued)

Test Item	Result [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
	Sample 004	Sample 005	
Migration of PFOA and PFOS	< 0.002	< 0.002	0.005

Note:

- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than
- The specification was quoted from the Recommendation of the BfR “Kunststoffe im Lebensmittelverkehr” Part LI “Temperature Resistant Polymer Coating Systems for Frying, Cooking and Baking Utensils”

2.7 SPECIFIC MIGRATION OF CHROMIUM III, CHROMIUM VI AND LITHIUM TEST

Test method: The samples were tested migrated with food simulant, followed by analysis using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES).

Testing condition and simulant: 3% acetic acid at 95°C for 1 hours.

Test Item	Result [mg/dm ²]			Maximum Permissible Limit [mg/dm ²]
	Sample 001	Sample 002	Sample 003	
Migration of Chromium III	< 0.01	< 0.01	< 0.01	0.02
Migration of Chromium VI	N.D.	N.D.	N.D.	Not Detected
Migration of Lithium	< 0.1	< 0.1	< 0.1	0.5

Test Item	Result [mg/dm ²]		Maximum Permissible Limit [mg/dm ²]
	Sample 004	Sample 005	
Migration of Chromium III	< 0.01	< 0.01	0.02
Migration of Chromium VI	N.D.	N.D.	Not Detected
Migration of Lithium	< 0.1	< 0.1	0.5

Note:

- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than
- The specification was quoted from the Recommendation of the BfR “Kunststoffe im Lebensmittelverkehr” Part LI “Temperature Resistant Polymer Coating Systems for Frying, Cooking and Baking Utensils”

2.8 EXTRACTABLE HEAVY METAL CONTENT TEST

Test method: The sample(s) were extracted with food simulant , followed by analysis using Atomic Absorption Spectrometry (AAS) or Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES).

Testing condition and simulant: 3% acetic acid at 70°C for 2 hours.

Test Item	Result [mg/dm ²]	Recommended Limit [mg/dm ²]
	Sample 006	
Extractable Lead	< 0.005	0.01
Extractable Cadmium	< 0.005	0.005
Extractable Chromium	< 0.10	0.40
Extractable Nickel	< 0.01	0.10
Extractable Copper	< 0.10	0.50
Extractable Cobalt	< 0.01	0.10
Extractable Antimony	< 0.005	0.005

Note:

- “°C” denotes degree Celsius
- “mg/dm²” denotes milligram per square decimeter
- “<” denotes less than.
- The recommended limit for Lead, Cadmium, Antimony are determined from Novellierung der Trinkwasserverordnung of May 21, 2001 and 98/83/EC.
- The recommended limit for Cobalt is determined from Deutsche Lebensmittelrundschau/92. Jahrgang/Heft 3/1996/ "Metalllässigkeit von Bestecken aus nichtrostenden Stählen", M.Hausch
- The recommended limit for Nickel, Copper and Chromium are determined from "Council of Europe's policy statements concerning materials and articles intended to come into contact with foodstuffs; Guidelines on metals and alloys used as food contact materials (13.02.2002)"



Technical Report No. 68.160.14.20336.01A
Dated 2014-05-04

2.9 SENSORY TEST

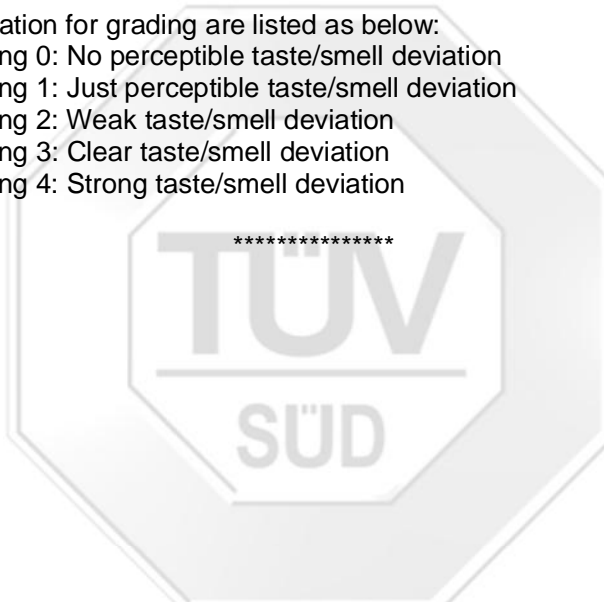
Test method: With reference to DIN 10955: 2004. The submitted sample was treated with food stimulant. After this treatment, treated water was examined by panels with regard to any divergence in smell and taste.

Testing condition and simulant: Distilled water at 70°C for 2 hours

Test Item	Grading Result	Recommended Level
	Sample 001+002+003+004+005+006	
Transfer of Smell	2	< 2.5
Transfer of Taste	2	< 2.5

Note:

- Explanation for grading are listed as below:
 Grading 0: No perceptible taste/smell deviation
 Grading 1: Just perceptible taste/smell deviation
 Grading 2: Weak taste/smell deviation
 Grading 3: Clear taste/smell deviation
 Grading 4: Strong taste/smell deviation



TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
TÜV SÜD Group

Prepared by:

Konnie Zhang
Project Handler



Reviewed by:

Mario Ma
Designated Reviewer

APPENDIX:

Photos of submitted products