SOUTH QUALITY

PROFICIENCY TESTING PROVIDER

REPORT No 11543

Date of issue: *January 19, 2026*

Status: FINAL REPORT

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EN 71-3

SAFETY OF TOYS

PART 3: MIGRATION OF CERTAIN ELEMENTS

Program: SQ-3004.V1

****

Prepared by:	Reviewed by:	Approved by:
cn=Mateo Giovanni, o=PT SOUTH QUALITY SAS, ou=SOUTH QUALITY, email=tech@ptsouthquality.com, c=AR 2026.01.19 15:56:47 -03'00'	cn=ERIKA BREST, o=PT SOUTH QUALITY SAS, ou=SOUTH QUALITY, email=ebrest@ptsouthquality.com, c=AR 2026.01.20 10:57:24 -03'00'	cn=Emiliano Medina, o=SOUTH QUALITY, ou=PT SOUTH QUALITY SAS, email=quality@ptsouthquality.com, c=ES 2026.01.20 16:38:43 -03'00'
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1. FOREWORD

This report summarizes the results of the **SQ-3004.V1** proficiency testing program on the determination of migration of certain elements from toys materials. This program is conducted in a bilateral format, following the A.3.3 classification of the ISO 17043 standard ("Split-sample testing schemes").

South Quality conducted the testing program in December 2025 with the aim of assessing the laboratory's ability to competently perform the designated tests.

2. ORGANIZATION

Program Coordinator:	Eng. Erika Brest
Assistant Technician:	Mateo Giovanni
Statistic:	Lic. Manuel Tozaki
Supervision:	Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine the quantity of certain elements using the following standard:

Standard
EN 71-3: 2019 + A2: 2024

To verify this, batches of crayons, liquid paint, and plastic toys have been selected.

Participants in this program have not been previously informed about the expected behavior of the samples they receive.

4. PARTICIPANT

Company:	**TÜV SÜD PSB Pte Ltd**
Laboratory:	**Elemental Analysis**
Country:	Singapore
Client ID:	S333
Contact person:	Dr. Songbai Tang Chemical & Materials songbai.tang@tuvsud.com

5. HOMOGENEITY

Several batches were prepared identically by the staff at South Quality.

Subsequently, a homogeneity study was conducted with an ISO 17025 accredited laboratory.

The control process followed ISO 33405: 2024, clauses 7.4.1.1 / 7.4.1.2. Stratified random sampling was applied, and samples were selected using random number generation software.

The results of this test are presented below:

Size of each batch: **50 units** Tested samples from each batch: **15 units**

DETERMINATION	BLUE LIQUID PAINT - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LKS2259	BATCH: LKS2260	BATCH: LKS2261
Migration of certain elements	YES	NO	YES

Size of each batch: **80 units** Tested samples from each batch: **20 units**

DETERMINATION	PINK PLASTIC BLOCK - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LKS2301	BATCH: LKS2302	BATCH: LKS2303
Migration of certain elements	NO	YES	YES

Size of each batch: **50 units** Tested samples from each batch: **15 units**

DETERMINATION	BLUE CRAYON - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LKS2943	BATCH: LKS2944	BATCH: LKS2945
Migration of certain elements	YES	YES	YES

Size of each batch: **50 units** Tested samples from each batch: **15 units**

DETERMINATION	RED CRAYON - HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LKS2956	BATCH: LKS2957	BATCH: LKS2958
Migration of certain elements	YES	YES	NO

Samples for this program are taken from the selected batches identified as **LKS2259**, **LKS2303**, **LKS2945** and **LKS2957**.

For the indicated batches, the values determined in the homogeneity study are utilized as the assigned values.

The analysis of the test data indicated that the selected samples exhibited sufficient homogeneity for the program. Therefore, the results of participants identified as outliers cannot be attributed to sample variability.

6. SAMPLE INFORMATION

The following samples were sent for testing:

Batch:	LKS2259
Sample ID:	12
Characteristics:	Blue liquid paint (2.5g)

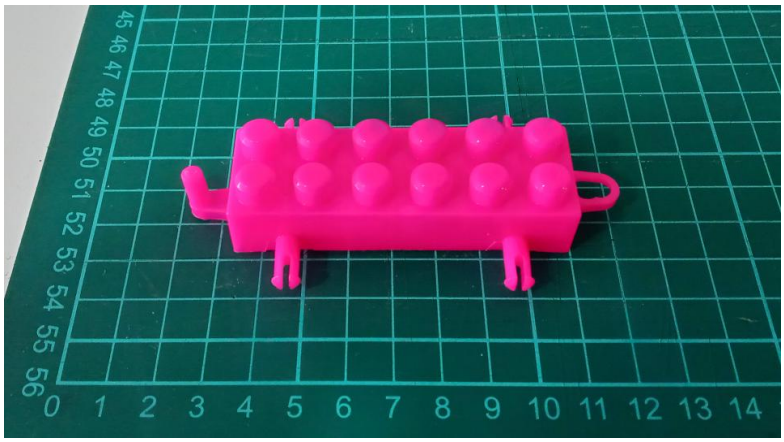
Batch:	LKS2303
Sample ID:	10
Characteristics:	Pink plastic block

Batch:	LKS2945
Sample ID:	08
Characteristics:	Blue crayon

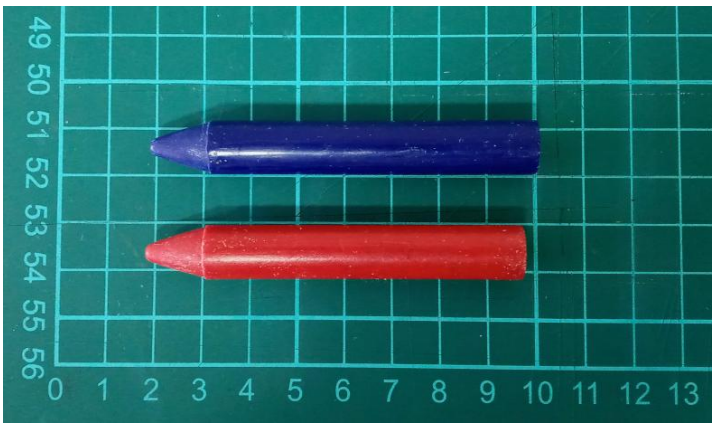
Batch:	LKS2957
Sample ID:	06
Characteristics:	Red crayon

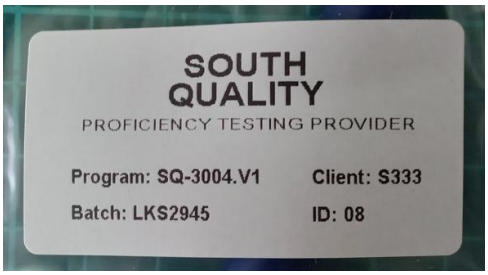
7. IMAGES

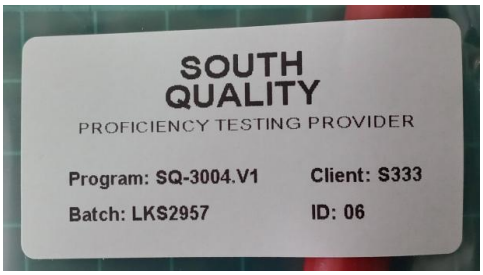
SAMPLES


SAMPLES







8. ASSIGNED VALUES

	Al	Sb	As	Ba	B	Cd	Cr	Co	Cu
LOD (mg/kg)	0.5	0.7	0.05	0.8	0.7	0.05	0.001	0.5	0.8

	Pb	Mn	Hg	Ni	Se	Sr	Sn	Zn
LOD (mg/kg)	0.05	0.7	0.05	0.7	0.8	0.8	0.05	0.5

BATCH	**M (mg/kg) (Standard deviation)**								
	Al	**Sb**	**As**	**Ba**	**B**	**Cd**	**Cr**	**Co**	**Cu**
LKS2259	19.2 (3.4)	< 0.7	< 0.05	< 0.8	< 0.7	< 0.05	0.55 (0.09)	< 0.5	< 0.8
LKS2303	< 0.5	3.90 (0.19)	< 0.05	< 0.8	< 0.7	< 0.05	0.009 (0.003)	< 0.5	< 0.8
LKS2945	< 0.5	< 0.7	0.08 (0.04)	< 0.8	< 0.7	< 0.05	0.022 (0.003)	< 0.5	< 0.8
LKS2957	< 0.5	< 0.7	0.08 (0.04)	4.76 (0.43)	< 0.7	0.23 (0.015)	0.005 (0.0007)	< 0.5	< 0.8

BATCH	M (mg/kg) (Standard deviation)							
	Pb	Mn	Hg	Ni	Se	Sr	Sn	Zn
LKS2259	90.6 (0.47)	< 0.7	< 0.05	< 0.7	< 0.8	< 0.8	< 0.05	< 0.5
LKS2303	< 0.05	7.27 (0.19)	< 0.05	< 0.7	< 0.8	< 0.8	< 0.05	< 0.5
LKS2945	0.20 (0.02)	< 0.7	< 0.05	< 0.7	< 0.8	1.58 (0.08)	< 0.05	< 0.5
LKS2957	< 0.05	< 0.7	< 0.05	< 0.7	< 0.8	1.91 (0.05)	< 0.05	< 0.5

9. PARTICIPANT RESULTS (SEE APPENDIX B)

CODE	M (mg/kg)								
	Al	Sb	As	Ba	B	Cd	Cr	Co	Cu
LKS2259-12	18.1	< 1	< 0.1	< 1	< 1	< 0.1	0.61	< 1	< 1
LKS2303-10	< 1	4.11	< 0.1	< 1	< 1	< 0.1	0.007	< 1	< 1
LKS2945-08	< 1	< 1	0.11	< 1	< 1	< 0.1	0.018	< 1	< 1
LKS2957-06	< 1	< 1	0.10	4.22	< 1	0.21	0.006	< 1	< 1

CODE	M (mg/kg)							
	Pb	Mn	Hg	Ni	Se	Sr	Sn	Zn
LKS2259-12	90.0	< 1	< 0.1	< 1	< 1	< 1	< 0.1	< 1
LKS2303-10	< 0.1	7.50	< 0.1	< 1	< 1	< 1	< 0.1	< 1
LKS2945-08	0.23	< 1	< 0.1	< 1	< 1	1.63	< 0.1	< 1
LKS2957-06	< 0.1	< 1	< 0.1	< 1	< 1	1.86	< 0.1	< 1

10. STATISTICS

The results must be treated as qualitative as quantitative.

For qualitative results (Values below the limit of detection, LOD), the comparison will be made directly against the assigned values, so any difference will be evaluated as **Unsatisfactory**. In cases where the participant's LOD is greater than the reference, it will be considered **Satisfactory** if the reference value is below the participant's LOD.

For quantitative results the comparison is made according B.3.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values. The results can be compare using percent difference ***z score***.

$$z = \frac{x - X}{\hat{\sigma}}$$

x is the participant's result

X is the assigned value

$\hat{\sigma}$ is the standard deviation

The performance evaluation of each sample is carried out with the following criteria:

$|z| \leq 2.0$ indicates "satisfactory" performance and generates no signal;

$2.0 < |z| < 3.0$ indicates "questionable" performance and generates a warning signal;

$|z| \geq 3.0$ indicates "unsatisfactory" performance and generates an action signal;

11. EVALUATION OF PERFORMANCE

A - QUALITATIVE RESULTS

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	PERFORMANCE RESULT
LKS2259	Sb	< 1	< 0.7	SATISFACTORY
	As	< 0.1	< 0.05	SATISFACTORY
	Ba	< 1	< 0.8	SATISFACTORY
	B	< 1	< 0.7	SATISFACTORY
	Cd	< 0.1	< 0.05	SATISFACTORY
	Co	< 1	< 0.5	SATISFACTORY
	Cu	< 1	< 0.8	SATISFACTORY
	Mn	< 1	< 0.7	SATISFACTORY
	Hg	< 0.1	< 0.05	SATISFACTORY
	Ni	< 1	< 0.7	SATISFACTORY
	Se	< 1	< 0.8	SATISFACTORY
	Sr	< 1	< 0.8	SATISFACTORY
	Sn	< 0.1	< 0.05	SATISFACTORY
	Zn	< 1	< 0.5	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	PERFORMANCE RESULT
LKS2303	Al	< 1	< 0.5	SATISFACTORY
	As	< 0.1	< 0.05	SATISFACTORY
	Ba	< 1	< 0.8	SATISFACTORY
	B	< 1	< 0.7	SATISFACTORY
	Cd	< 0.1	< 0.05	SATISFACTORY
	Co	< 1	< 0.5	SATISFACTORY
	Cu	< 1	< 0.8	SATISFACTORY
	Pb	< 0.1	< 0.05	SATISFACTORY
	Hg	< 0.1	< 0.05	SATISFACTORY
	Ni	< 1	< 0.7	SATISFACTORY
	Se	< 1	< 0.8	SATISFACTORY
	Sr	< 1	< 0.8	SATISFACTORY
	Sn	< 0.1	< 0.05	SATISFACTORY
	Zn	< 1	< 0.5	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	PERFORMANCE RESULT
LKS2945	Al	< 1	< 0.5	SATISFACTORY
	Sb	< 1	< 0.7	SATISFACTORY
	Ba	< 1	< 0.8	SATISFACTORY
	B	< 1	< 0.7	SATISFACTORY
	Cd	< 0.1	< 0.05	SATISFACTORY
	Co	< 1	< 0.5	SATISFACTORY
	Cu	< 1	< 0.8	SATISFACTORY
	Mn	< 1	< 0.7	SATISFACTORY
	Hg	< 1	< 0.8	SATISFACTORY
	Ni	< 1	< 0.7	SATISFACTORY
	Se	< 0.1	< 0.05	SATISFACTORY
	Sn	< 1	< 0.5	SATISFACTORY
	Zn	< 1	< 0.8	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	PERFORMANCE RESULT
LKS2957	Al	< 1	< 0.5	SATISFACTORY
	Sb	< 1	< 0.7	SATISFACTORY
	B	< 1	< 0.7	SATISFACTORY
	Co	< 1	< 0.5	SATISFACTORY
	Cu	< 1	< 0.8	SATISFACTORY
	Pb	< 0.1	< 0.05	SATISFACTORY
	Mn	< 1	< 0.7	SATISFACTORY
	Hg	< 0.1	< 0.05	SATISFACTORY
	Ni	< 1	< 0.7	SATISFACTORY
	Se	< 1	< 0.8	SATISFACTORY
	Sn	< 0.1	< 0.05	SATISFACTORY
	Zn	< 1	< 0.5	SATISFACTORY

B - QUANTITATIVE RESULTS

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	| z score |	PERFORMANCE RESULT
LKS2259	Al	18.1	19.2	**0.32**	SATISFACTORY
	Cr	0.61	0.55	**0.67**	SATISFACTORY
	Pb	90.0	90.6	**1.28**	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	| z score |	PERFORMANCE RESULT
LKS2303	Sb	4.11	3.90	**1.11**	SATISFACTORY
	Cr	0.007	0.009	**0.67**	SATISFACTORY
	Mn	7.50	7.27	**1.21**	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	| z score |	PERFORMANCE RESULT
LKS2945	As	0.11	0.08	**0.75**	SATISFACTORY
	Cr	0.018	0.022	**1.33**	SATISFACTORY
	Pb	0.23	0.20	**1.50**	SATISFACTORY
	Sr	1.63	1.58	**0.62**	SATISFACTORY

BATCH	ELEMENT	PARTICIPANT RESULT M (mg/kg)	ASSIGNED VALUE M (mg/kg)	| z score |	PERFORMANCE RESULT
LKS2957	As	0.10	0.08	**0.50**	SATISFACTORY
	Ba	4.22	4.76	**1.26**	SATISFACTORY
	Cd	0.21	0.23	**1.33**	SATISFACTORY
	Cr	0.006	0.005	**1.43**	SATISFACTORY
	Sr	1.86	1.91	**1.00**	SATISFACTORY

12. CONCLUSIONS

The overall performance of this **SQ-3004.V1** program from the participant laboratory **TÜV SÜD PSB Pte Ltd - Elemental Analysis**, is **SUFFICIENT** based on expected results.

The criteria used for the evaluation of the overall performance is the following:

- **SUFFICIENT** performance: No unsatisfactory/questionable results were obtained.
- **ALMOST SUFFICIENT** performance: No unsatisfactory results were obtained, but one questionable result was found.
- **INSUFFICIENT** performance: An unsatisfactory result or two questionable results were obtained.

APPENDIX A

INSTRUCTIONS

INSTRUCTIONS

PROGRAM:	Migration of certain elements
CODE:	SQ-3004
VERSION:	1
STANDARD:	EN 71-3
COORDINATOR:	Eng. Erika Brest (ebrest@ptsouthquality.com)

1 - **General**

This document serves as a guide for managing the results of the **SQ-3004.V1** program.

2 - **Standard**

EN 71-3: 2019 + A2: 2024

3 - **Tests involved**

TEST
Determination of migration of certain elements **(Al; Sb; As; Ba; B; Cd; Cr(III); Cr(VI); Co; Cu; Pb; Mn; Hg; Ni; Se; Sr; Sn; Sn-org; Zn)**

4 - **Samples**

CODE	SAMPLE	QUANTITY
LKS2259-12	Blue liquid paint (2.5g)	1
LKS2303-10	Pink plastic block	1
LKS2945-08	Blue crayon	1
LKS2957-06	Red crayon	1

5 - **Notes**

a) Being a bilateral program, there is no deadline for submitting results.
b) The participant must submit the results using the usual report employed by their laboratory.
c) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to EN 71-3.
d) Samples must be retained until the end of the program, which concludes with the submission of the final report.
e) To review the results, test images would be appreciated. Images can be attached at the end of this document or sent by email.

PHOTOGRAPHS

APPENDIX B

PARTICIPANT RESULTS (TR # PT3-CHM25-CQ)

Test Report No. PT3-CHM25-CQ

Date: 22 DEC 2025 Email: songbai.tang@tuvsud.com

Client's Ref:

Add value.
Inspire trust.

Note: This report is issued subject to the Testing, Certification, Validation and Verification Regulations (TCVVR) of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

SUBJECT

Safety of toys – Part 3: Migration of certain elements in accordance to EN 71-3 : 2019+A2:2024

CLIENT

PT Test supplied by South Quality

SAMPLE SUBMISSION / TEST DATE

16 Sep 2025 / 20 Oct – 04 Nov 2025

DESCRIPTION OF SAMPLE

Four samples as below were received for Bilateral PT Scheme, SQ-3004.V1 (Client S333).

TÜV SÜD PSB

Laboratory:
TÜV SÜD PSB Pte. Ltd.
15 International Business Park
TÜV SÜD @ IBP
Singapore 609937

Phone : +65-6778 7777
E-mail: info.sg@tuvsud.com
https://www.tuvsud.com/sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
15 International Business Park
TÜV SÜD @ IBP
Singapore 609937

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Test Report No. PT3-CHM25-CQ
22 DEC 2025

METHOD OF TEST

EN 71-3:2019+A2:2024, Safety of toys - Part 3: Migration of certain elements, followed by analysis using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS).

RESULTS

Test Parameters	Batch: LKS2957 ID: 06 Red crayon, Categrory I (mg/kg)	Batch: LKS2945 ID: 08 Blue crayon, Categrory I (mg/kg)	Table 2 – Migration limits from toy materials Category I (mg/kg)
Aluminium, Al	Less than 1	Less than 1	2 250
Antimony, Sb	Less than 1	Less than 1	45
Arsenic, As	0.10	0.11	3.8
Barium, Ba	4.22	Less than 1	1 500
Boron, B	Less than 1	Less than 1	1 200
Cadmium, Cd	0.21	Less than 0.1	1.3
Total Chromium, Cr *	0.006	0.018	Chromium (III), 37.5 Chromium (VI), 0.02
Cobalt, Co	Less than 1	Less than 1	10.5
Copper, Cu	Less than 1	Less than 1	662.5
Lead, Pb	Less than 0.1	0.23	2.0
Manganese, Mn	Less than 1	Less than 1	1 200
Mercury, Hg	Less than 0.1	Less than 0.1	7.5
Nickel, Ni	Less than 1	Less than 1	75
Selenium, Se	Less than 1	Less than 1	37.5
Strontium, Sr	1.86	1.63	4 500
Total Tin, Sn **	Less than 0.1	Less than 0.1	Tin, 15 000 Organic Tin, 0.9
Zinc, Zn	Less than 1	Less than 1	3 750

Note: * Total Cr includes both Chromium (III) and Chromium (VI).
**Total Sn includes both Tin and organic Tin.
The lab only tests total Cr and total Sn.
Detection limit: 0.002 mg/kg for total Cr,
0.1 mg/kg for As, Cd, Pb, Hg, total Sn,
1 mg/kg for all other elements.

Test Report No. PT3-CHM25-CQ
22 DEC 2025

Test Parameters	Batch: LKS2259 ID: 12 Blue liquid paint , Categrory II (mg/kg)	Table 2 – Migration limits from toy materials Category II (mg/kg)
Aluminium, Al	18.1	560
Antimony, Sb	Less than 1	11.3
Arsenic, As	Less than 0.1	0.9
Barium, Ba	Less than 1	375
Boron, B	Less than 1	300
Cadmium, Cd	Less than 0.1	0.3
Total Chromium, Cr *	0.61	Chromium (III), 9.4 Chromium (VI), 0.005
Cobalt, Co	Less than 1	2.6
Copper, Cu	Less than 1	156
Lead, Pb	90.0	0.5
Manganese, Mn	Less than 1	300
Mercury, Hg	Less than 0.1	1.9
Nickel, Ni	Less than 1	18.8
Selenium, Se	Less than 1	9.4
Strontium, Sr	Less than 1	1 125
Total Tin, Sn **	Less than 0.1	Tin, 3 750 Organic Tin, 0.2
Zinc, Zn	Less than 1	938

Note: * Total Cr includes both Chromium (III) and Chromium (VI).
**Total Sn includes both Tin and organic Tin.
The lab only tests total Cr and total Sn.
Detection limit: 0.002 mg/kg for total Cr,
0.1 mg/kg for As, Cd, Pb, Hg, total Sn,
1 mg/kg for all other elements.

Test Report No. PT3-CHM25-CQ
22 DEC 2025

Test Parameters	Batch: LKS2303 ID: 10 Pink plastic block, Categrory III (mg/kg)	Table 2 – Migration limits from toy materials Category III (mg/kg)
Aluminium, Al	Less than 1	28 130
Antimony, Sb	4.11	560
Arsenic, As	Less than 0.1	47
Barium, Ba	Less than 1	18 750
Boron, B	Less than 1	15 000
Cadmium, Cd	Less than 0.1	17
Total Chromium, Cr *	0.007	Chromium (III), 460 Chromium (VI), 0.053
Cobalt, Co	Less than 1	130
Copper, Cu	Less than 1	7 700
Lead, Pb	Less than 0.1	23
Manganese, Mn	7.50	15 000
Mercury, Hg	Less than 0.1	94
Nickel, Ni	Less than 1	930
Selenium, Se	Less than 1	460
Strontium, Sr	Less than 1	56 000
Total Tin, Sn **	Less than 0.1	Tin, 180 000 Organic Tin, 12
Zinc, Zn	Less than 1	46 000

Note: * Total Cr includes both Chromium (III) and Chromium (VI).
**Total Sn includes both Tin and organic Tin.
The lab only tests total Cr and total Sn.
Detection limit: 0.002 mg/kg for total Cr,
0.1 mg/kg for As, Cd, Pb, Hg, total Sn,
1 mg/kg for all other elements.

MS CHEN QIAN
CHEMIST
ELEMENTAL ANALYSIS
CHEMICAL CENTRE

DR TANG SONGBAI
PRODUCT MANAGER
ELEMENTAL ANALYSIS
CHEMICAL CENTRE

Test Report No. PT3-CHM25-CQ
22 DEC 2025

Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.

2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.

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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, 15 International Business Park TÜV SÜD @ IBP Singapore 609937.

6. The tests carried out by TÜV SÜD PSB and this report are subject to TÜV SÜD PSB's General Terms and Conditions of Business and the Testing, Certification, Validation and Verification Regulations (TCVVR) of the TÜV SÜD Group.

Effective 27 March 2024

----- END OF REPORT -----