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EN 1186-9

MATERIALS AND ARTICLES IN CONTACT WITH FOODSTUFFS OVERALL MIGRATION INTO AQUEOUS FOOD SIMULANTS BY ARTICLE FILLING

Program: SQ-1580.V4

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1. FOREWORD

This report summarizes the results of the **SQ-1580.V4** proficiency testing program on the determination of the overall migration from one surface only of plastics articles in the form of containers. This program is conducted in a bilateral format, following the “split-sample” design described in clause A.4.2 of ISO/IEC 17043: 2023 (Alternative interlaboratory comparisons).

South Quality conducted the testing program in April 2026 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
 Statistics: Lic. Manuel Tozaki
 Supervision: Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is the determination of the overall migration from one surface only of plastics articles in the form of containers, using the following standard:

Standard
EN 1186-9: 2002

For verification, batches of plastic articles have been selected.

Participants in this program have not been previously informed about the expected values or value ranges of the samples they receive.

4. PARTICIPANT

Company: **TÜV SÜD PSB Pte Ltd**
 Laboratory: **Chemical Centre**
 Country: Singapore
 Client ID: S333
 Contact person: Ser Ling Tan
 Senior Technical Executive
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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: **150 units**

Tested samples from each batch: **30 units**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LCH2848	BATCH: LCH2849	BATCH: LCH2850
Overall migration (<i>M</i>)	YES	NO	YES

Samples for this program are taken from selected batch identified as **LCH2848**.

For the batch indicated, the values determined in the homogeneity study are used as assigned values.

Analysis of this test data indicated that the selected samples were sufficiently homogeneous for the program and 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:	LCH2848
Sample ID:	12
Characteristics:	Plastic thermo mug (Reusable) - 280 ml - 5 units

7. IMAGES



8. ASSIGNED VALUES

PARAMETER	BATCH: LCH2848
OVERALL MIGRATION RESULT (M) (mg/dm ²)	< 0.5

9. PARTICIPANT RESULTS (SEE APPENDIX B)

PARAMETER	CODE: LCH2848-12
OVERALL MIGRATION RESULT (M) (mg/dm ²)	< 1.0

10. STATISTICS

The results must be treated as both qualitative and quantitative.

For qualitative results (Values below the limit of quantification, LOQ or not detected), the comparison will be made directly against the assigned values, so any difference will be evaluated as **Unsatisfactory**. In cases where the participant's LOQ is greater than the reference, it will be considered **Satisfactory** if the reference value is below the participant's LOQ.

For quantitative results the comparison is made according to B.4.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values.

The results can be compared using **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

BATCH	OVERALL MIGRATION RESULT (M) (mg/dm ²)		PERFORMANCE RESULT
	PARTICIPANT RESULT	ASSIGNED VALUE	
LCH2848	< 1.0	< 0.5	SATISFACTORY

12. CONCLUSIONS

The overall performance on this **SQ-1580.V4** program from the participant laboratory **TÜV SÜD PSB Pte Ltd - Chemical Centre**, is **SUFFICIENT** based on expected results.

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

- **SUFFICIENT** performance: No unsatisfactory result was obtained.
- **INSUFFICIENT** performance: An unsatisfactory result was obtained.

APPENDIX A

INSTRUCTIONS



INSTRUCTIONS

PROGRAM:	Materials and articles in contact with foodstuffs Overall migration into aqueous food simulants by article filling
CODE:	SQ-1580
VERSION:	4
STANDARD:	EN 1186-9
COORDINATOR:	Eng. Erika Brest (ebrest@ptsouthquality.com)

1 - General

This document serves as a guide for managing the results of the **SQ-1580.V4** program.

2 - Standard

EN 1186-9: 2002

3 - Tests involved

TEST
Determination of the overall migration from one surface only of plastics articles in the form of containers Overall migration (<i>M</i>)

4 - Samples

CODE	SAMPLE	QUANTITY
LCH2848-12	Plastic thermo mug (Reusable) - 280 ml	5

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 1186-9.
- 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.

6 - Test conditions

PARAMETER	VALUE
Temperature	70°C
Duration	2 h
Simulant	A

PHOTOGRAPHS

APPENDIX B

PARTICIPANT RESULTS (TEST REPORT)

METHOD OF TEST

1. Preparation of Test Specimen

The sample was tested as received.

As the articles is intended for repeated use, thus the test was conducted on three times on a single sample using fresh portion of food stimulant on each occasion. Each extractive result are relevant for assessment.

2. Overall Migration Content with Aqueous Food Simulant (Distilled Water)

According to BS EN 1186-9:2002 – Test Methods for overall migration into aqueous food simulants by article filling.

RESULTS

Table 1 : Overall Migration Content with Food Simulant (after 1st, 2nd & 3rd extraction) for "Plastic thermo mug (Reusable) -280ml" Sample

Type of Simulant	Testing Condition ^{*1}	Total Surface Area (dm ²)	Volume of Extractant (ml)	Overall Migration Result (mg/dm ²) ^{*2}			Stability ^{*3}	Commission Regulation (EU) No 10/2011 Requirement for Overall Migration Content (mg/dm ²)
				1 st	2 nd	3 rd		
1. Distilled Water	70°C, 2 hours	1.99	280	<1.0	<1.0	<1.0	Comply	<10

^{*1} The testing conditions were specified by client.

^{*2} Analytical tolerance is 2 mg/dm² or 12 mg/kg for aqueous simulants.

^{*3} According to Regulation (EU) 2020/1245, it does not comply when the 2nd migration exceeds the level observed in the 1st migration, and the 3rd migration exceeds the level observed in the 2nd migration, even in case the migration limit is not exceeded in any of the test result.

Based on the above results, the "Plastic thermo mug (Reusable) -280ml" sample met the overall migration requirement under Commission Regulation (EU) 2020/1245 amending Regulation (EU) No 10/2011 – "Plastic materials and articles shall not transfer their constituents to foodstuffs in quantities exceeding 10 milligrams of total constituents released per dm² of food contact surface (mg/dm²) (overall migration limit)".

APPENDIX

Sample (as received)	Picture
Plastic thermos mug (Reusable) – 280ml	

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