

REPORT No 11153

Date of issue: August 20, 2025

Status: FINAL REPORT

ISO 178 DETERMINATION OF FLEXURAL PROPERTIES

Program: SQ-0526.V4

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Prepared by:	Reviewed by:	Approved by:
Berenice Ferrel Assistant Technician	Lic. Esther Casas Physics expert	Eng. Emiliano Medina Quality Assurance Lead

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1. FOREWORD

This report summarizes the results of the **SQ-0526.V4** proficiency testing program on the determination of flexural properties of rigid and semi-rigid plastics. 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 May 2025 with the aim of assessing the laboratory's ability to competently perform the designated tests.

2. ORGANIZATION

Program Coordinator: Lic. Esther Casas
 Assistant Technician: Berenice Ferrel
 Statistic: Lic. Manuel Tozaki
 Supervision: Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine flexural properties of rigid and semi-rigid plastics using the following standard:

Standard
ISO 178: 2019

To verify this, batches of thermoplastic plate samples have been selected.

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

4. PARTICIPANT

Company: **SGS (Thailand) Limited**
 Laboratory: **Eastern Seaboard Industrial Estate**
 Country: Thailand
 Client ID: S351
 Contact person: Chutikarn Pittayapornpong
 QA Coordinator
Chutikarn.Pittayapornpong@sgs.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 Guide 35: 2017, clause 7.4.1.2. Stratified random sampling was employed, and samples were chosen using random number generation software.

The results of this test are presented below:

Size of each batch: **50 units**

Tested samples from each batch: **10 units**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LP3233	BATCH: LP3234	BATCH: LP3235
FLEXURAL PROPERTIES	YES	NO	YES

Size of each batch: **50 units**

Tested samples from each batch: **10 units**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES		
	BATCH: LP3418	BATCH: LP3419	BATCH: LP3420
FLEXURAL PROPERTIES	YES	YES	YES

Samples for this program are taken from the selected batches identified as LP3233 and LP3420.

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

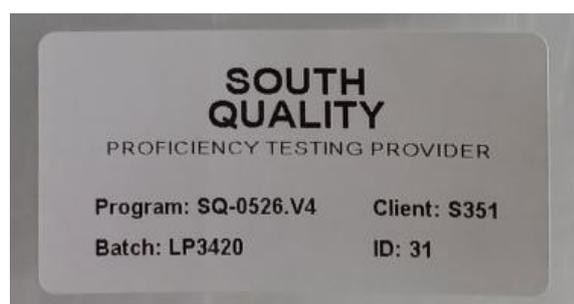
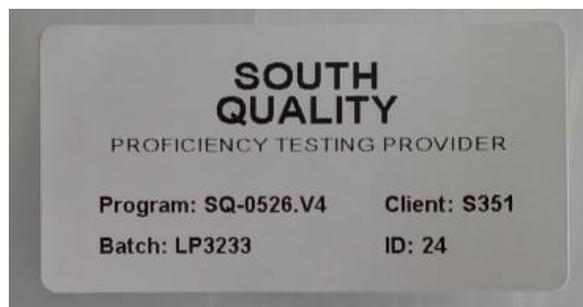
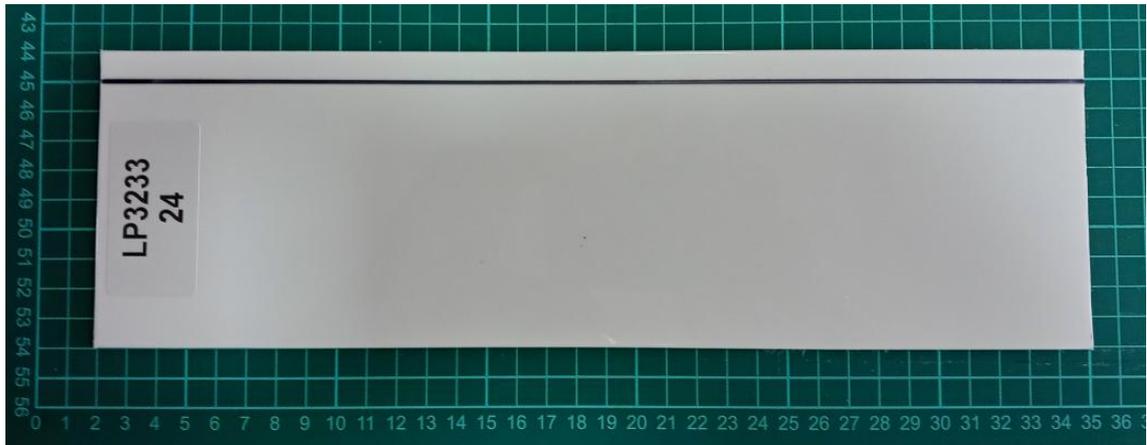
The following samples were sent for testing:

Batch:	LP3233
Sample ID:	24
Characteristics:	Thermoplastic (WHITE) - 330 x 100 x 2 mm

Batch:	LP3420
Sample ID:	31
Characteristics:	Thermoplastic (BLACK) - 330 x 100 x 2 mm

7. IMAGES

SAMPLES



8. ASSIGNED VALUES

BATCH	DIRECTION	FLEXURAL STRENGTH (MPa)	SD	FLEXURAL STRAIN (%)	SD
LP3233	LENGTH	39.25	2.021	8.26	0.135
	WIDHT	30.78	1.721	7.09	0.142
LP3420	LENGTH	80.95	2.412	5.92	0.121
	WIDHT	83.22	2.325	5.81	0.108

9. PARTICIPANT RESULTS (SEE APPENDICES B AND C)

CODE	DIRECTION	FLEXURAL STRENGTH (MPa)	FLEXURAL STRAIN (%)
LP3233-24	LENGTH	40.36	8.43
	WIDHT	31.36	7.2
LP3420-31	LENGTH	82.87	6.02
	WIDHT	84.00	5.88

10. STATISTICS

The results must be treated as quantitative.

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

BATCH	DIRECTION	FLEXURAL STRENGTH (MPa)		z score	PERFORMANCE RESULT
		PARTICIPANT RESULT	ASSIGNED VALUE		
LP3233	LENGTH	40.36	39.25	0.55	SATISFACTORY
	WIDHT	31.36	30.78	0.34	SATISFACTORY
LP3420	LENGTH	82.87	80.95	0.80	SATISFACTORY
	WIDHT	84.00	83.22	0.34	SATISFACTORY

BATCH	DIRECTION	FLEXURAL STRAIN (%)		z score	PERFORMANCE RESULT
		PARTICIPANT RESULT	ASSIGNED VALUE		
LP3233	LENGTH	8.43	8.26	1.26	SATISFACTORY
	WIDHT	7.2	7.09	0.77	SATISFACTORY
LP3420	LENGTH	6.02	5.92	0.83	SATISFACTORY
	WIDHT	5.88	5.81	0.65	SATISFACTORY

12. CONCLUSIONS

The overall performance of this **SQ-0526.V4** program from the participant laboratory **SGS (THAILAND) LIMITED - EASTERN SEABOARD INDUSTRIAL ESTATE**, is **SUFFICIENT** based on expected results.

The criteria used for evaluating the overall performance are as follows:

- **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

INSTRUCTIVE



INSTRUCTIVE

PROGRAM:	DETERMINATION OF FLEXURAL PROPERTIES
CODE:	SQ-0526
VERSION:	4
STANDARD:	ISO 178
COORDINATOR:	Lic. Esther Casas (ecasas@ptsouthquality.com)

1 - General

This document is a guide for managing the results of the **SQ-0526.V4** program.

2 - Standard

ISO 178: 2019

3 - Tests involved

TEST
Determination of the flexural properties of rigid and semi-rigid plastics (Flexural stress / Flexural strain)

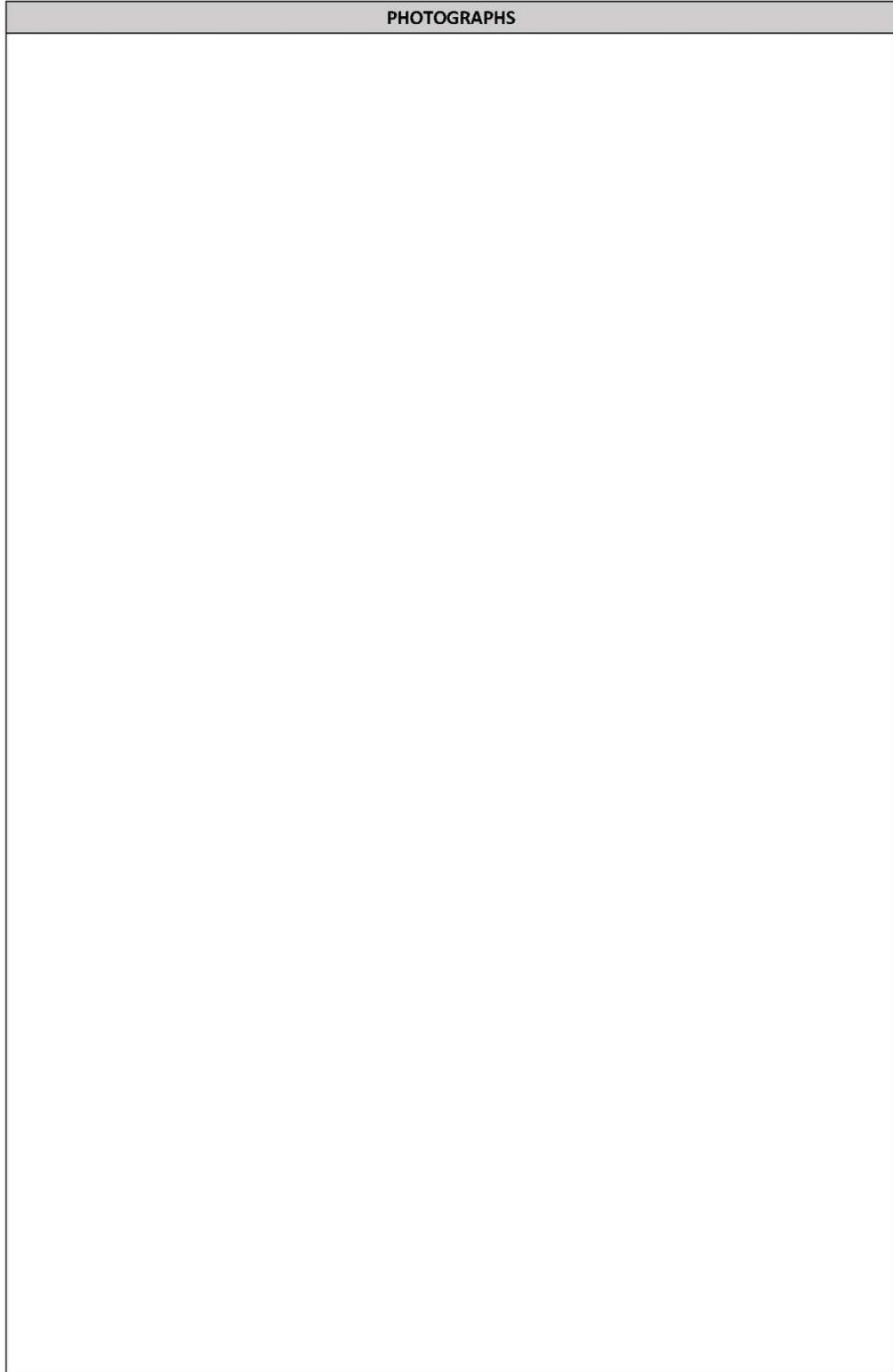
4 - Samples

CODE	SAMPLE	QUANTITY
LP3233-24	Thermoplastic (WHITE) - 330 x 100 x 2 mm	1
LP3420-31	Thermoplastic (BLACK) - 330 x 100 x 2 mm	1

5 - Notes

- a) Being a bilateral program there is no deadline to accomplish sending results.
- b) Participants must submit the results in the usual report used by their laboratory.
- c) The participant must prepare samples in both directions (lengthwise and widthwise).
- d) The applied force must be exerted on the side of the sample identified with a line.
- e) The samples must be kept until the end of the program, which closes with the submission of the final report.
- f) To review the results, sending images of the tests will be appreciated. Images can be attached to the end of this document or inserted into your regular report.

PHOTOGRAPHS



APPENDIX B

PARTICIPANT RESULTS (TEST REPORT # 6219510)



Test Report No. 6219510 Date : 16-May-2025 Page 1 of 8

Client : **PT South Quality SAS**
Pareja 3981 - Villa Devoto Buenos Aires Argentina

The following sample(s) was/were submitted and identified by client as:

Sample Name : LP3233-24 Thermoplastic (WHITE) - 330 x 100 x 2 mm
 Sample Code/Reference : SQ-0526.V4

The following sample(s) was/were identified by SGS as:

SGS Sample No. : 6552350
 Sample Condition : Sample is suitable for testing.
 Quantity Submitted : 1 pc
 Sample Receiving Date : 7-May-2025
 Testing Period : 08-May-2025 to 16-May-2025

Test Method & Results : Please refer to next page(s).

Signed for and on behalf of
 SGS (Thailand) Ltd.



Jaturong Thirachitto
 Senior Technical Engineer

5921223

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Test Report No. 6219510

Date : 16-May-2025

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TEST RESULTS
PLASTICS - DETERMINATION OF FLEXURAL PROPERTIES :
Test method

ISO 178 Sixth edition 2019-04.

Test condition

Preconditioning at 23 degree celsius and 50% RH for 24 hours.

Specimen : 80 mm x 10 mm x 2.08 mm.

Test speed : 1 mm/minute.

Span : 33 mm.

Test result

Direction	Flexural strength (MPa)	Flexural strain (%)
Length	40.36	8.43
Width	31.36	7.20

Note : Test performed as per conditions given by the client.
 Test specimens were cut from the sample.

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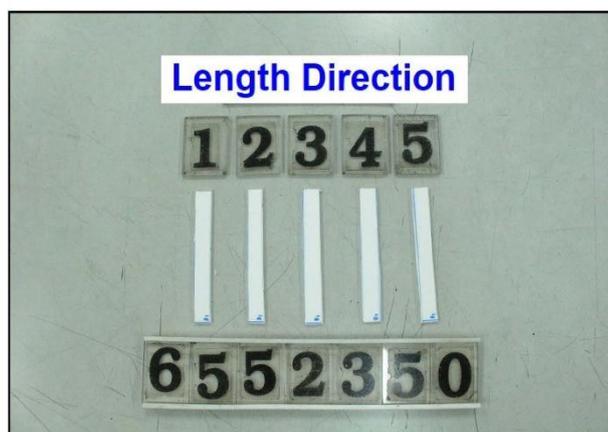


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SAMPLE/ATTACHMENT PICTURE



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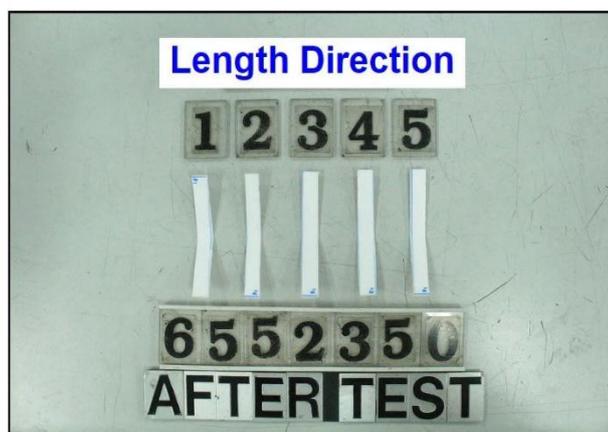


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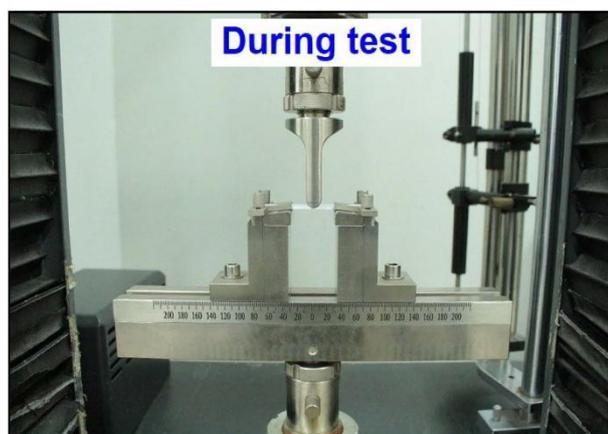


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***** End of Report *****

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APPENDIX C

PARTICIPANT RESULTS (TEST REPORT # 6219511)



Test Report No. 6219511 **Date :** 16-May-2025 **Page 1 of 8**

Client : PT South Quality SAS
Pareja 3981 - Villa Devoto Buenos Aires Argentina

The following sample(s) was/were submitted and identified by client as:

Sample Name : LP3420-31 Thermoplastic (BLACK) - 330 x 100 x 2 mm
Sample Code/Reference : SQ-0526.V4

The following sample(s) was/were identified by SGS as:

SGS Sample No. : 6552351
Sample Condition : Sample is suitable for testing.
Quantity Submitted : 1 pc
Sample Receiving Date : 7-May-2025
Testing Period : 08-May-2025 to 16-May-2025

Test Method & Results : Please refer to next page(s).

Signed for and on behalf of
SGS (Thailand) Ltd.



Jaturong Thirachitto
Senior Technical Engineer

5921224

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Test Report No. 6219511

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TEST RESULTS
PLASTICS - DETERMINATION OF FLEXURAL PROPERTIES :
Test method

ISO 178 Sixth edition 2019-04.

Test condition

Preconditioning at 23 degree celsius and 50% RH for 24 hours.

Specimen : 80 mm x 10 mm x 2.20 mm.

Test speed : 1 mm/minute.

Span : 35 mm.

Test result

Direction	Flexural strength (MPa)	Flexural strain (%)
Length	82.87	6.02
Width	84.00	5.88

Note : Test performed as per conditions given by the client.
 Test specimens were cut from the sample.

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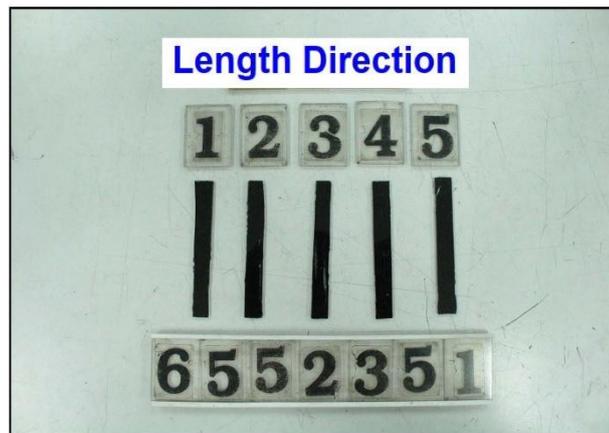


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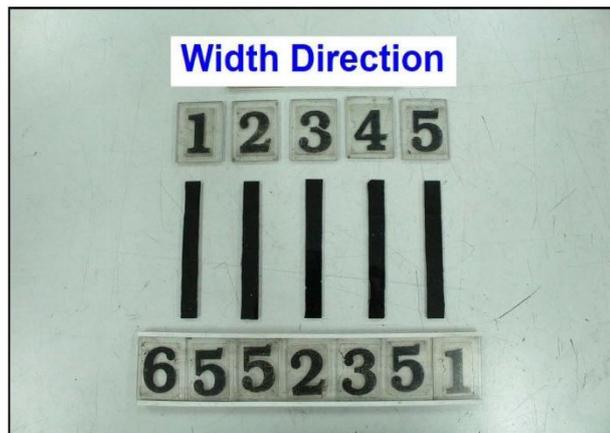


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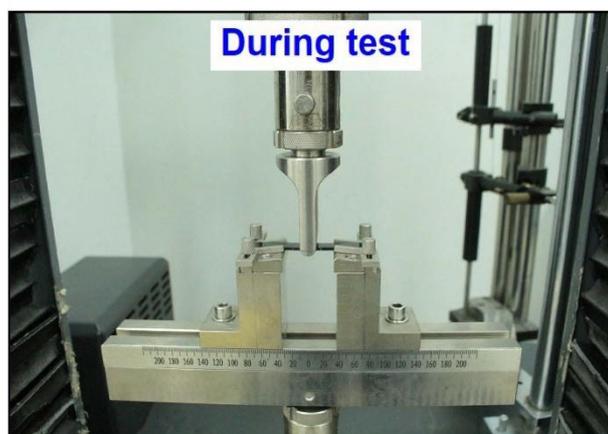


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