

# REPORT No 11413

*Date of issue: October 16, 2025*

*Status: FINAL REPORT*

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## ISO 844

### RIGID CELLULAR PLASTICS

### - DETERMINATION OF COMPRESSION

### PROPERTIES -

### Program: SQ-0615.V1

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## 1. FOREWORD

This report summarizes the results of the **SQ-0615.V1** proficiency testing program on the determination of the compression properties of rigid cellular 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 September 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 determination of the compression properties of rigid cellular plastics, using the following standard:

Standard
ISO 844: 2021

To verify this, batches of rigid cellular plastics have been selected.

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

## 4. PARTICIPANT

Company: **TENARIS CONFAB**  
Laboratory: **Coating Laboratory**  
Country: Brazil  
Client ID: C083  
Contact person: Wanilson da Silva  
QUALIDADE  
[wanilsonrosa@tenaris.com](mailto:wanilsonrosa@tenaris.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: **40 samples (3 units each)**      Tested samples from each batch: **15 samples**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES (PROCEDURE A)		
	BATCH: LP3103	BATCH: LP3104	BATCH: LP3105
Compressive strength	NO	YES	YES
Compressive stress at 10 % nominal relative deformation	NO	YES	YES
Nominal relative deformation	YES	YES	YES

Size of each batch: **40 samples (3 units each)**      Tested samples from each batch: **15 samples**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES (PROCEDURE A)		
	BATCH: LP3156	BATCH: LP3157	BATCH: LP3158
Compressive strength	YES	NO	YES
Compressive stress at 10 % nominal relative deformation	YES	NO	YES
Nominal relative deformation	NO	NO	YES

Samples for this program are taken from the selected batches identified as **LP3105** and **LP3158**.

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 to be tested:

Batch:	LP3105
Sample ID:	06
Characteristics:	Expanded polystyrene (EPS) - 15 x 15 x 5 cm - 3 Units

Batch:	LP3158
Sample ID:	04
Characteristics:	HDPE foam - 15 x 15 x 5 cm - 3 Units

## 7. IMAGES



## 8. ASSIGNED VALUES

BATCH: LP3105			
	COMPRESSIVE STRENGTH ( MPa )	COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	NOMINAL RELATIVE DEFORMATION ( % )
AVG	0.0998	0.0998	10.07
SD	0.0025	0.0025	0.03

BATCH: LP3158			
	COMPRESSIVE STRENGTH ( MPa )	COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	NOMINAL RELATIVE DEFORMATION ( % )
AVG	0.0173	0.0173	10.02
SD	0.0018	0.0018	0.03

## 9. PARTICIPANT RESULTS (SEE APPENDICES B, C AND D)

CODE: LP3105-06			
	COMPRESSIVE STRENGTH ( MPa )	COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	NOMINAL RELATIVE DEFORMATION ( % )
AVG	0.0993	0.0993	10.04

CODE: LP3158-04			
	COMPRESSIVE STRENGTH ( MPa )	COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	NOMINAL RELATIVE DEFORMATION ( % )
AVG	0.0150	0.0150	10.07

## 10. STATISTICS

The results must be treated as quantitative.

According B.3.1.3 of ISO 17043 the appropriate technique is to compare participant results with the assigned values. The results can be compare 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: LP3105				
PARAMETER	PARTICIPANT RESULT	ASSIGNED VALUE	z score	PERFORMANCE RESULT
COMPRESSIVE STRENGTH ( MPa )	0.0993	0.0998	0.20	SATISFACTORY
COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	0.0993	0.0998	0.20	SATISFACTORY
NOMINAL RELATIVE DEFORMATION ( % )	10.04	10.07	1.00	SATISFACTORY

BATCH: LP3158				
PARAMETER	PARTICIPANT RESULT	ASSIGNED VALUE	z score	PERFORMANCE RESULT
COMPRESSIVE STRENGTH ( MPa )	0.0150	0.0173	1.28	SATISFACTORY
COMPRESSIVE STRESS AT 10 % NOMINAL RELATIVE DEFORMATION ( MPa )	0.0150	0.0173	1.28	SATISFACTORY
NOMINAL RELATIVE DEFORMATION ( % )	10.07	10.02	0.67	SATISFACTORY

## 12. CONCLUSIONS

The overall performance on this **SQ-0615.V1** program from the participant laboratory **TENARIS CONFAB - Coating Laboratory**, 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 and one questionable result were obtained.
- **INSUFFICIENT** performance: An unsatisfactory result was obtained or two questionable results were obtained.



# APPENDIX A

## PARTICIPANT RESULTS

### (Results form)



## INSTRUCTIONS

<b>PROGRAM:</b>	Rigid cellular plastics Determination of compression properties
<b>CODE:</b>	SQ-0615
<b>VERSION:</b>	1
<b>STANDARD:</b>	ISO 844
<b>COORDINATOR:</b>	Lic. Esther Casas ( <a href="mailto:ecasas@ptsouthquality.com">ecasas@ptsouthquality.com</a> )

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## 1 - General

This document is a guide for managing the results of the **SQ-0615.V1** program.

## 2 - Standard

**ISO 844: 2021**

## 3 - Tests involved

TEST	PARAMETERS TO DETERMINE
Determination of the compression properties of rigid cellular plastics	- Compressive strength - Compressive stress at 10 % nominal relative deformation - Nominal relative deformation

## 4 - Samples

CODE	SAMPLE	QUANTITY
LP3105-06	Expanded polystyrene (EPS) - 15 x 15 x 5 cm	3
LP3158-04	HDPE foam - 15 x 15 x 5 cm	3

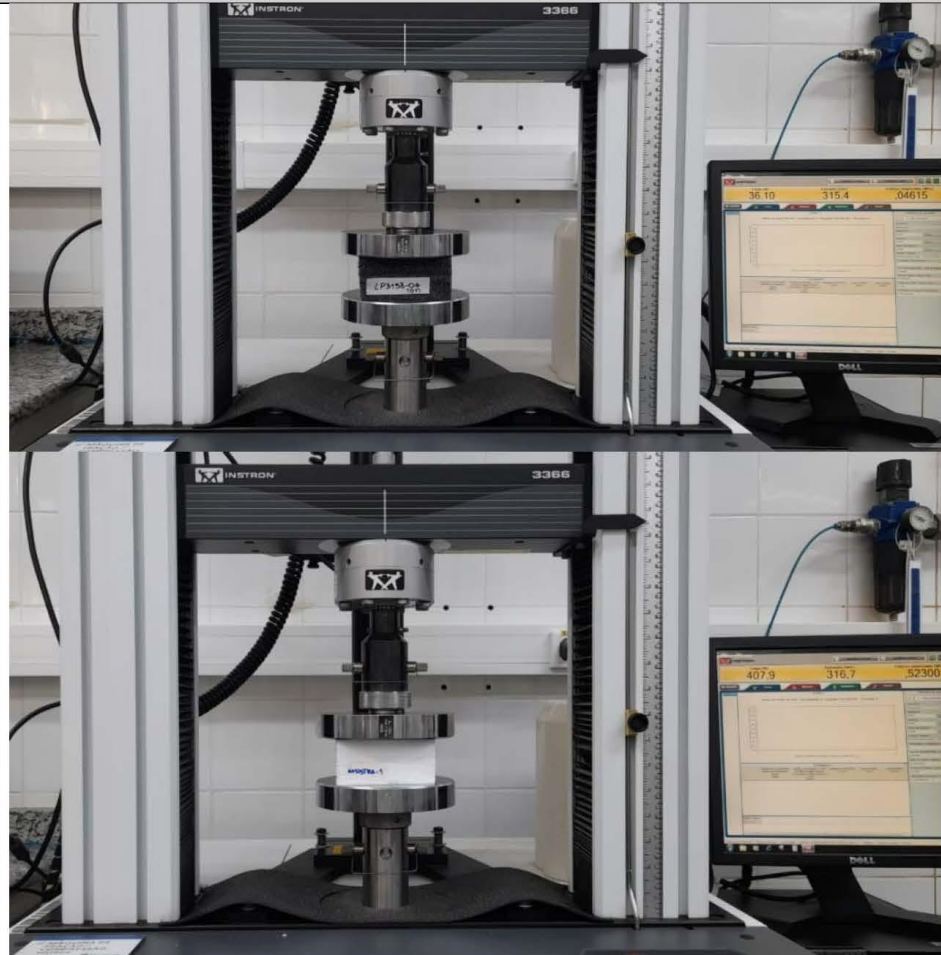
## 5 - Notes

- Being a bilateral program there is no deadline to accomplish sending results.
- Participants must submit the results in the usual report used by their laboratory.
- The samples must be kept until the end of the program, which closes with the submission of the final report.
- 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.

## 6 - Test conditions

BATCH	PROCEDURE
LP3105	A
LP3158	A

# PHOTOGRAPHS



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# APPENDIX B

## PARTICIPANT RESULTS (TEST REPORT - LP3105)

	<b>RELATÓRIO DE ENSAIO DE COMPRESSÃO DE MATERIAIS</b> Report Materials Compression Test	IDM : PRD 19996
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Cliente / Client	SOUTH QUALITY
Pedido de Ensaio / Request for Test	SQ-0615
Projeto / Project	BILATERAL
Obra / Job	-
Dimensões / Dimensions	-
Tipo de Revestimento / Type of Coating	Expanded polystyrene (EPS)
Espessura Revestimento/Coating Thickness	-
Data do Ensaio / Date of Test	02/09/2025
Horário do Teste / Test of Time	16:07
Temperatura do Teste/Test Temperature	23°C
Velocidade de Ensaio / Test Speed	5,00 mm/min

Norma do Ensaio ISO 844 - Procedimento A / Standard Test ISO 844 - Procedure A



	Tensão de Compressão Máxima/Compressive Stress [MPa]	Tensão Compressão a 10% de Deformação/Tension Compression Deformation of a 10% [MPa]	Espessura/Thickness [mm]	Largura/Width [mm]	Altura/Height [mm]
1	0,097	0,097	101,38000	99,84000	49,32
2	0,100	0,100	100,43000	99,43000	49,25
3	0,101	0,101	100,27000	100,96000	49,54
Média / Mean	0,099	0,099	100,69333	100,07667	49,37
D.P / S.D	0,002	0,002	0,60003	0,79198	0,15

Observações/Remarks:

<b>Técnico de Laboratório</b> Laboratory Technician	<b>Coordenador Socotherm</b> Socotherm Coordinator	<b>Fiscalização</b> Surveillance	<b>Cliente</b> Client
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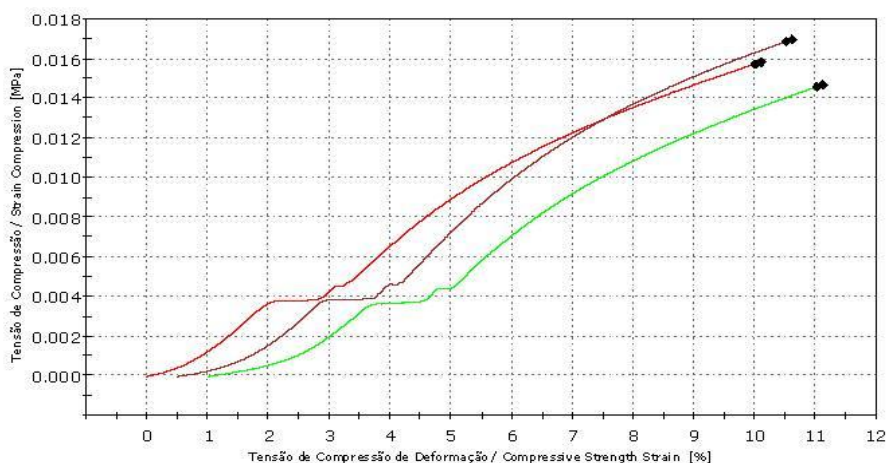
# APPENDIX C

## PARTICIPANT RESULTS (TEST REPORT - LP3158)

	<b>RELATÓRIO DE ENSAIO DE COMPRESSÃO DE MATERIAIS</b> Report Materials Compression Test	IDM : PRD 19996
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Cliente / Client	SOUTH QUALITY
Pedido de Ensaio / Request for Test	SQ-0615
Projeto / Project	BILATERAL
Obra / Job	-
Dimensões / Dimensions	-
Tipo de Revestimento / Type of Coating	HDPE foam
Espessura Revestimento/Coating Thickness	-
Data do Ensaio / Date of Test	02/09/2025
Horário do Teste / Test of Time	16:25
Temperatura do Teste/Test Temperature	23°C
Velocidade de Ensaio / Test Speed	5,00 mm/min

Norma do Ensaio ISO 844 - Procedimento A / Standard Test ISO 844 - Procedure A



	Tensão de Compressão Máxima/Compressive Stress [MPa]	Tensão Compressão a 10% de Deformação/Tension Compression Deformation of a 10% [MPa]	Espessura/Thickness [mm]	Largura/Width [mm]	Altura/Height [mm]
1	0,016	0,016	101,12000	101,12000	48,04
2	0,017	0,017	101,19000	99,66000	47,85
3	0,015	0,015	101,47000	102,78000	48,06
Média / Mean	0,016	0,016	101,26000	101,18667	47,98
D.P / S.D	0,001	0,001	0,18520	1,56107	0,12

Observações/Remarks:

<b>Técnico de Laboratório</b> Laboratory Technician	<b>Coordenador Socotherm</b> Socotherm Coordinator	<b>Fiscalização</b> Surveillance	<b>Cliente</b> Client
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# APPENDIX D

## PARTICIPANT RESULTS (SUMMARY RESULTS)

Code	Sample	Nominal relative deformation (%)	Compressive Stress [MPa]	Tension Compression Deformation of a 10% [MPa]
LP3105-06	1	10,08	0,0970	0,0970
	2	10,03	0,1000	0,1000
	3	10,01	0,1010	0,1010
LP3158-04	1	10,05	0,0160	0,0160
	2	10,03	0,0170	0,0170
	3	10,07	0,0150	0,0150

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