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ASTM E114

ULTRASONIC PULSE-ECHO STRAIGHT-BEAM CONTACT TESTING

Program: SQ-0033

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1. FOREWORD

This report summarizes the results of the **SQ-0033** proficiency testing program on the ultrasonic examination of materials. This program is conducted in a bilateral format, following a sequential participation design as described in clause A.2.3 of ISO/IEC 17043: 2023 (Types of PT schemes).

South Quality conducted the testing program in June 2026 with the aim of assessing the laboratory's ability to competently perform the designated tests.

2. ORGANIZATION

Program Coordinator:	Eng. Alfredo Schmidt
Assistant Technician:	Sergio Andrada
Statistics:	Lic. Manuel Tozaki
Supervision:	Eng. Emiliano Medina

3. OBJECTIVE

The objective of this proficiency testing program is to determine quantity, location and dimensions of discontinuities, using the following standard:

Standard
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To verify this, batches of plates have been prepared which contain perforations in different positions and sizes.

The participants in this program have not been previously informed of the location or approximate area of the perforations, as well as their quantity and/or size.

4. PARTICIPANT

Company:	**CI-Chile SPA**
Laboratory:	**CI-Chile SPA**
Country:	Chile
Client ID:	C073
Contact person:	Constanza Miranda Reyes miranda@cryolab.cl

5. HOMOGENEITY

A homogeneity study is not applicable, as the interlaboratory comparison is carried out on the same item, which is measured by both the participating laboratory and the reference laboratory.

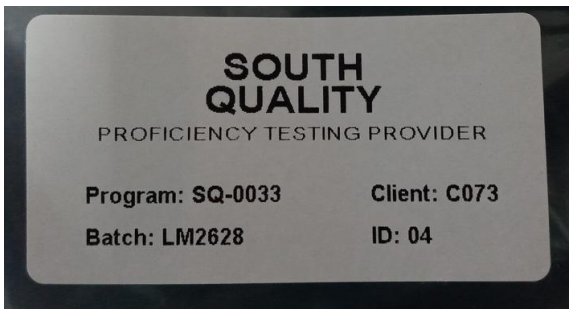
6. SAMPLE INFORMATION

The following sample was sent for testing:

Batch:	LM2628
Sample ID:	04
Characteristics:	Steel plate - 200 x 100 x 10 mm

7. IMAGES

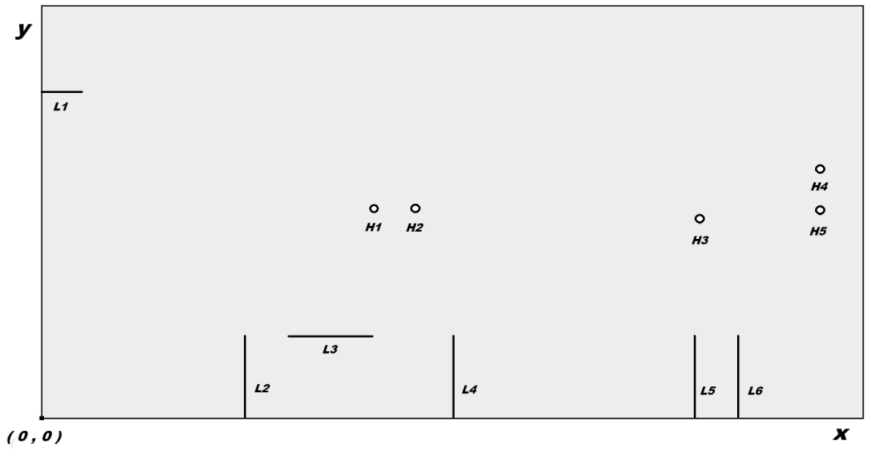
SAMPLE



8. ASSIGNED VALUES

CODE	QUANTITY OF DISCONTINUITIES
LM2628-04	11

LOCATIONS OF DISCONTINUITIES



DISCONTINUITIES					
ID	LOCATION				DISTANCE BELOW SURFACE (mm)
	Origin		Length (mm)	Angle	
	x (mm)	y (mm)			
L1	0	80	10	0	4.5
L2	50	0	20	90	4.5
L3	60	20	20	0	7.5
L4	100	0	20	90	4.0
L5	160	0	20	90	3.5
L6	170	0	20	90	3.5
H1	100	50	-	-	7.0
H2	110	50	-	-	7.0
H3	160	45	-	-	6.0
H4	190	65	-	-	5.0
H5	190	55	-	-	5.0

9. PARTICIPANT RESULTS (SEE APPENDIX)

CODE	QUANTITY OF DISCONTINUITIES
LM2628-04	11

DISCONTINUITIES			
ID (CLIENT ID)	LOCATION		DISTANCE BELOW SURFACE (mm)
	x (mm)	y (mm)	
L1 (16)	10	80	4.59
L2 (15+14)	50	10; 20	4.77; 4.44
L3 (13+12)	70; 80	20	7.22; 8.07
L4 (11+10)	100	10; 20	3.98; 3.55
L5 (7+6)	160	10; 20	3.71; 3.49
L6 (4+3)	170	10; 20	3.66; 3.42
H1 (9)	100	50	6.88
H2 (8)	110	50	7.07
H3 (5)	160	40	5.53
H4 (1)	190	60	4.25
H5 (2)	190	50	4.11

10. STATISTICS

The results must be treated as both qualitative and quantitative.

The evaluation of discontinuity locations will be qualitative and will be based on the judgment of the technical expert.

a) For quantity of discontinuities the results can be compared using difference D.

$$D = (x - X)$$

x is the participant's result

X is the assigned value

The performance evaluation is carried out with the following criteria:

$|D| = 0$ **indicates "satisfactory" performance and generates no signal;**

$|D| = 1$ **indicates "questionable" performance and generates a warning signal;**

$|D| > 1$ **indicates "unsatisfactory" performance and generates an action signal;**

b) For distance of discontinuities below surface the performance is carried out with the following criteria:

$|D_{\%}| < 10\ \%$ **indicates "satisfactory" performance and generates no signal;**

$10\ \% \leq |D_{\%}| < 20\ \%$ **indicates "questionable" performance and generates a warning signal;**

$|D_{\%}| \geq 20\ \%$ **indicates "unsatisfactory" performance and generates an action signal;**

11. EVALUATION OF PERFORMANCE

CODE	QUANTITY OF DISCONTINUITIES		$\lvert D \rvert$	PERFORMANCE RESULT
	PARTICIPANT RESULT	ASSIGNED VALUE		
LM2628-04	11	11	0	SATISFACTORY

CODE	LOCATION OF DISCONTINUITIES (x ; y)			PERFORMANCE RESULT
	ID	PARTICIPANT RESULT	ASSIGNED VALUE	
LM2628-04	L1	(10;80)	(0;80) – (10;80)	SATISFACTORY
	L2	(50;10) – (50;20)	(50;0) – (50;20)	SATISFACTORY
	L3	(70;20) – (80;20)	(60;20) – (80;20)	SATISFACTORY
	L4	(100;10) – (100;20)	(100;0) – (100;20)	SATISFACTORY
	L5	(160;10) – (160;20)	(160;0) – (160;20)	SATISFACTORY
	L6	(170;10) – (170;20)	(170;0) – (170;20)	SATISFACTORY
	H1	(100;50)	(100;50)	SATISFACTORY
	H2	(110;50)	(110;50)	SATISFACTORY
	H3	(160;40)	(160;45)	SATISFACTORY
	H4	(190;60)	(190;65)	SATISFACTORY
	H5	(190;50)	(190;55)	SATISFACTORY

CODE	DISCONTINUITIES DISTANCE BELOW SURFACE (mm)			$\lvert D\% \rvert$	PERFORMANCE RESULT
	ID	PARTICIPANT RESULT	ASSIGNED VALUE		
LM2628-04	L1	4.59	4.5	**2.0**	**SATISFACTORY**
	L2	AVG 4.61	4.5	**2.4**	**SATISFACTORY**
	L3	AVG 7.65	7.5	**2.0**	**SATISFACTORY**
	L4	AVG 3.77	4.0	**5.8**	**SATISFACTORY**
	L5	AVG 3.60	3.5	**2.9**	**SATISFACTORY**
	L6	AVG 3.54	3.5	**1.1**	**SATISFACTORY**
	H1	6.88	7.0	**1.7**	**SATISFACTORY**
	H2	7.07	7.0	**1.0**	**SATISFACTORY**
	H3	5.53	6.0	**7.8**	**SATISFACTORY**
	H4	4.25	5.0	**5.6**	**SATISFACTORY**
	H5	4.11	5.0	**8.7**	**SATISFACTORY**

12. CONCLUSIONS

The overall performance of this **SQ-0033** program from the participant laboratory **CI-Chile SPA**, is **SUFFICIENT** based on expected results.

The criteria used for the evaluation of the overall performance are 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

RESULTS FORM

INSTRUCTIONS
&
RESULTS FORM

PROGRAM:	Ultrasonic pulse-echo straight-beam contact testing
CODE:	SQ-0033
VERSION:	-
STANDARD:	ASTM E114
COORDINATOR:	Eng. Alfredo Shcmidt (aschmidt@ptsouthquality.com)

1 - General

This document serves as a guide for managing the results of the **SQ-0033** program.

Results must be typed, not handwritten.

2 - Standard

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3 - Tests involved

TEST
Ultrasonic examination of materials (Quantity, location and dimensions of discontinuities)

4 - Samples

CODE	SAMPLE	QUANTITY
LM2628-04	Steel - 200 x 100 x 10 mm	1

5 - Notes

a) Being a bilateral program, there is no deadline for submitting results.
b) The tables in this document may be modified by the participant, if desired, to include data or observations.
c) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **ASTM E114**.
d) The point where the two axes intersect shall be considered the origin of coordinates.
e) Samples must be retained until the end of the program, which concludes with the submission of the final report.
f) To review the results, test images would be appreciated. Images can be attached at the end of this document or sent by email.
g) Once this document is completed, it must be converted into a PDF file and sent to the program coordinator.

6 - **Test results**

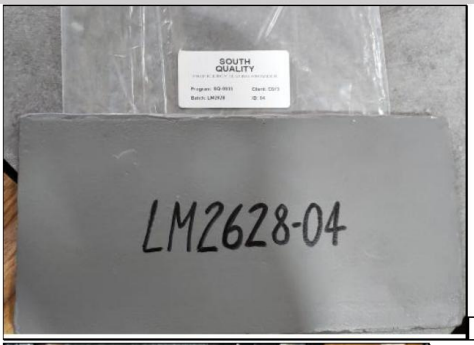
Method:	According to standard
Test date:	03-06-2026

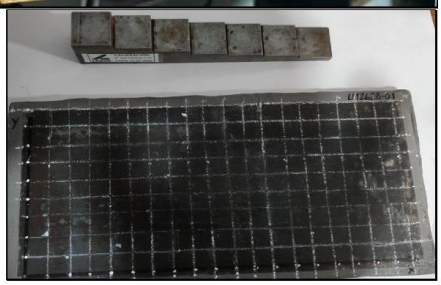
HOLE No (*)	HOLE LOCATION		HOLE DISTANCE BELOW SURFACE (mm)	HOLE SIZE (mm)
	x (mm)	y (mm)		
16	1	8	4,59	15
15	5	1	4,44	10
14	5	2	4,77	10
13	7	2	7,22	15,4
12	8	2	8,07	10
11	10	1	3,98	12
10	10	2	3,55	10
9	10	5	6,88	10
8	11	5	7,07	10
7	16	1	3,71	10
6	16	2	3,49	13
5	16	4	5,53	15
4	17	1	3,66	10
3	17	2	3,42	15
2	19	5	4,11	15
1	19	6	4,25	15

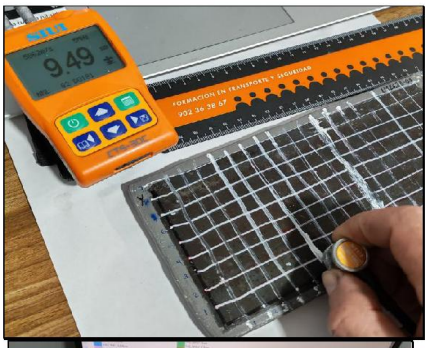
(*) **Add as many rows as holes found**

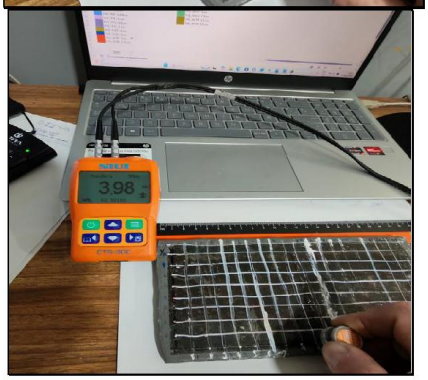
OBSERVATIONS
- Para la evaluación de esta pieza de muestra, se optó por la caracterización de cuadriculas de 1 x 1 cm tomado desde la marca inicial de los ejes X ; Y preestablecidos. - Se utiliza un equipo medidor de espesor Marca Siui, modelo CTS-30C con un transductor dual de 10mm, TGM5-10CL, acoplante usado vaselina en crema. - La evaluación se realiza en primera instancia en forma de barrido para localizar las zonas con indicaciones. - Por la caracterización de las indicaciones, se nota que estas presentan orientación alargadas variando entre 1 y 1,5 cm - Para distinguir las indicaciones localizadas y caracterizar, se evalúa de manera puntual con el haz recto tomando varios puntos por cada cuadricula, resaltando la menor lectura de acuerdo a la profundidad indicada como valor de medida. - Las profundidades de las indicaciones tienen variación en relación al viaje del haz de ultrasonido.

PHOTOGRAPHS









Y																				
10																				
9	9,73	9,61	9,44	9,63	9,58	9,64	9,64	2,95	9,67	9,64	9,67	9,61	9,64	9,61	9,65	9,67	9,64	9,52	9,52	9,48
8	4,59	9,55	9,36	9,58	9,52	9,52	9,54	9,48	9,52	9,52	9,55	9,49	9,57	9,49	9,55	9,52	9,54	9,46	9,52	9,46
7	9,45	9,46	9,43	9,43	9,44	9,45	9,45	9,45	9,46	9,46	9,46	9,43	9,46	9,43	9,44	9,47	9,49	9,52	9,52	9,46
6	9,43	9,43	9,41	9,37	9,43	9,44	9,43	9,43	9,48	9,43	9,49	9,49	9,46	9,43	9,53	9,52	9,52	4,22	4,25	9,45
5	9,42	9,44	9,45	9,37	9,37	9,43	9,43	9,4	9,4	6,88	7,07	9,43	9,46	9,43	9,4	9,49	9,46	9,55	4,11	9,43
4	9,4	9,43	9,42	9,4	9,42	9,42	9,4	9,43	9,43	9,34	9,43	9,41	9,43	9,43	9,41	5,53	9,49	9,4	9,38	7,92
3	9,34	9,4	9,43	9,4	9,37	9,42	9,34	9,37	9,37	9,37	9,43	9,39	9,4	9,39	9,37	9,46	9,37	9,4	9,43	9,52
2	9,34	9,37	9,49	9,37	4,44	9,42	7,22	8,07	8,11	3,55	9,39	9,37	9,4	9,37	9,38	3,49	3,42	9,34	9,64	9,43
1	9,44	9,44	9,58	9,45	4,77	9,49	9,48	9,46	9,36	3,98	9,44	9,49	9,55	9,48	9,4	3,71	3,66	9,49	9,7	9,52
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 X

- Y=8; X=1 ;1,5cm
- Y=1; X=5 ; 1cm
- Y=2; X=5 ; 1cm
- Y=2 ; X=6 ; 1,54cm
- Y=2 ; X=8 ; 1 cm
- Y=1 ; X=1 ; 1,2cm
- Y=2 ; X=2 ; 1 cm
- Y=5 ; X=10 ; 1cm
- Y=5 ; X=11 ; 1cm
- Y=1 ; X=16 ; 1cm
- Y=2 ; X=16 ; 1,3 cm
- Y=5 ; X=16 ; 1,5 cm
- Y=1 ; X=17 ; 1cm
- Y=2 ; X=17 ; 1,5cm
- Y=5 ; X=19 ; 1,5 cm
- Y=6 ; X=19 ; 1,5 cm

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