

# REPORT No 12095

*Date of issue: September 18, 2026*

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## ASTM B117

### STANDARD PRACTICE FOR OPERATING SALT SPRAY (FOG) APPARATUS

### Program: SQ-0021.V14

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|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                      |
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## 1. FOREWORD

This report summarizes the results of the **SQ-0021.V14** proficiency testing program on the determination of corrosion resistance of metallic materials. 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 August/September 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 assess the determination of corrosion resistance in metallic materials in accordance with the following standard:

| Standard       |
|----------------|
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To verify this, batches of metallic sheets were selected.

Participants in this program were not informed in advance of the expected time or time range for the first appearance of corrosion, or of the expected change in mass of the samples received.

## 4. PARTICIPANT

Company: **Intertek Testing Services Taiwan Ltd.**  
Laboratory: **Hardlines**  
Country: Taiwan  
Client ID: G421  
Contact person: Celine Chuang  
QA Supervisor  
[celine.chuang@intertek.com](mailto:celine.chuang@intertek.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: **100 samples**

Tested samples from each batch: **25 samples**

| DETERMINATION  | HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES<br>- ORGANIC COATED METALLIC SHEET - |               |               |
|----------------|-------------------------------------------------------------------------------------|---------------|---------------|
|                | BATCH: LM2459                                                                       | BATCH: LM2460 | BATCH: LM2461 |
| FSC            | YES                                                                                 | YES           | YES           |
| Change in mass | YES                                                                                 | YES           | YES           |

Size of each batch: **100 samples**

Tested samples from each batch: **25 samples**

| DETERMINATION  | HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES<br>- METALLIC SHEET - |               |               |
|----------------|----------------------------------------------------------------------|---------------|---------------|
|                | BATCH: LM2597                                                        | BATCH: LM2598 | BATCH: LM2599 |
| FSC            | NO                                                                   | YES           | YES           |
| Change in mass | NO                                                                   | YES           | YES           |

Samples for this program are taken from the selected batches identified as **LM2459**, and **LM2599**.

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:

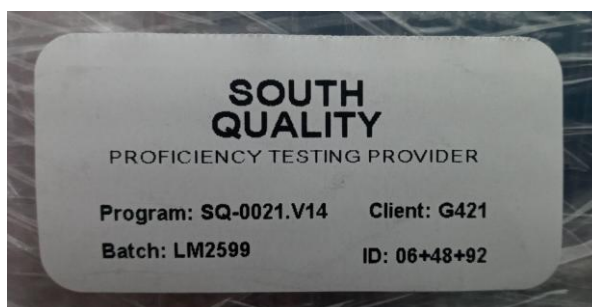
|                  |                                                           |
|------------------|-----------------------------------------------------------|
| Batch:           | LM2459                                                    |
| Sample ID:       | 15 + 59 + 85                                              |
| Characteristics: | Organic coated metallic sheet (Black) - 150 x 100 x 0.5mm |

|                  |                                            |
|------------------|--------------------------------------------|
| Batch:           | LM2599                                     |
| Sample ID:       | 06 + 48 + 92                               |
| Characteristics: | Steel sheet (SAE 1010) - 150 x 100 x 0.7mm |

## 7. IMAGES



## SAMPLES



## 8. ASSIGNED VALUES

| PROPERTY                            | LM2459 - AVG      |
|-------------------------------------|-------------------|
| FSC (h):                            | No rust/corrosion |
| CHANGE IN MASS (g/m <sup>2</sup> ): | 45.58             |
| CHANGE IN MASS (SD):                | 4.265             |

| PROPERTY                            | LM2599 - AVG |
|-------------------------------------|--------------|
| FSC (h):                            | 12           |
| CHANGE IN MASS (g/m <sup>2</sup> ): | 29.49        |
| CHANGE IN MASS (SD):                | 2.435        |

## 9. PARTICIPANT RESULTS (SEE APPENDIX)

| PROPERTY                            | LM2459 - AVG |
|-------------------------------------|--------------|
| FSC (h):                            | -            |
| CHANGE IN MASS (g/m <sup>2</sup> ): | 52.67        |

| PROPERTY                            | LM2599 - AVG |
|-------------------------------------|--------------|
| FSC (h):                            | 24           |
| CHANGE IN MASS (g/m <sup>2</sup> ): | 32.67        |

## 10. STATISTICS

The results must be treated as qualitative and quantitative.

According to B.4.1.3 of ISO/IEC 17043: 2023, the appropriate technique is to compare participant results with the assigned values

a) For the variable **FSC** the comparison is made through the difference **D** (B.1 - ISO/IEC 17043: 2023).

$$D = (x - X)$$

$x$  is the participant's result

$X$  is the assigned value

The performance evaluation is carried out with the following criteria:

**$|D| \leq 12$  h** indicates “satisfactory” performance and generates no signal;

**$12 \text{ h} < |D| \leq 24$  h** indicates “questionable” performance and generates a warning signal;

**$|D| > 24$  h** indicates “unsatisfactory” performance and generates an action signal;

In those samples where there is no degradation of the material, the result is treated as qualitative and must match with the assigned value to be considered **satisfactory**, otherwise, it is evaluated as **unsatisfactory**.

b) For the variable **CHANGE IN MASS** the comparison is made through **z score** (B.3 - ISO/IEC 17043: 2023).

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

$x$  is the participant's result

$X$  is the assigned value

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

The performance evaluation 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  | FSC<br>(h)            |                   | $ D $ | PERFORMANCE RESULT |
|--------|-----------------------|-------------------|-------|--------------------|
|        | PARTICIPANT<br>RESULT | ASSIGNED<br>VALUE |       |                    |
| LM2459 | -                     | No rust/corrosion | -     | SATISFACTORY       |
| LM2599 | 24                    | 12                | 12    | SATISFACTORY       |

| BATCH  | CHANGE IN MASS<br>(g/m <sup>2</sup> ) |                   | $ z \text{ score} $ | PERFORMANCE RESULT |
|--------|---------------------------------------|-------------------|---------------------|--------------------|
|        | PARTICIPANT<br>RESULT                 | ASSIGNED<br>VALUE |                     |                    |
| LM2459 | 52.67                                 | 45.58             | 1.7                 | SATISFACTORY       |
| LM2599 | 32.67                                 | 29.49             | 1.3                 | SATISFACTORY       |

## 12. CONCLUSIONS

The overall performance in this **SQ-0021.V14** program from the participant laboratory **Intertek Testing Services Taiwan Ltd. - Hardlines**, is **SUFFICIENT** based on expected results.

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

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

# APPENDIX

## PARTICIPANT RESULTS

### (Results form)



# INSTRUCTIONS & RESULTS FORM

|                     |                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------|
| <b>PROGRAM:</b>     | Standard practice for operating salt spray (Fog) apparatus                                               |
| <b>CODE:</b>        | SQ-0021                                                                                                  |
| <b>VERSION:</b>     | 14                                                                                                       |
| <b>STANDARD:</b>    | ASTM B117                                                                                                |
| <b>COORDINATOR:</b> | Eng. Alfredo Schmidt<br>( <a href="mailto:aschmidt@ptsouthquality.com">aschmidt@ptsouthquality.com</a> ) |

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## 1 - General

This document serves as a guide for managing the results of the **SQ-0021.V14** program.

Results must be typed, not handwritten.

## 2 - Standard

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## 3 - Tests involved

| TEST                                                     |
|----------------------------------------------------------|
| Assessment of corrosion resistance of metallic materials |

## 4 - Samples

| CODE      | SAMPLE                                  | QUANTITY |
|-----------|-----------------------------------------|----------|
| LM2459-XX | Coated metal sheet - 150 x 100 x 0.5 mm | 3        |
| LM2599-XX | Metallic sheet - 150 x 100 x 0.7 mm     | 3        |

## 5 - Notes

- Being a bilateral program, there is no deadline for submitting results.
- The tables in this document may be modified by the participant, if desired, to include data or observations.
- The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **ASTM B117**.
- The identification of the samples is located on the backside.
- The samples must be kept until the end of the program, which concludes with the submission of the final report.
- To review the results, the submission of images of the tests is appreciated. These images can be attached at the end of this document or sent via email.
- Upon completion of this document, please convert it to a PDF file and send it to the program coordinator.

## 6 - Preparation of tests specimens

- A) Samples shall be properly cleaned, ensuring they are not recontaminated after cleaning due to excessive or careless handling.
- B) Apply an X scribe on the test panels in accordance with **ASTM D1654**.
- C) Weigh the samples to the nearest 1 mg (**m1**).
- D) The back side and cut edges must be adequately protected by coating them with a suitable material that remains stable under test conditions, such as paint, wax, or adhesive tape. The protective edges on the front face must be straight and parallel to the sample edges, leaving a rectangular area of the material exposed.
- E) Determine the exposed material area (**A**) in cm<sup>2</sup>.

## 7 - Test conditions

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| Procedure:               | According to standard                                                        |
| Duration of test:        | 72 h                                                                         |
| Inspection frequency:    | Max: 24 h                                                                    |
| Parameters to determine: | - First sign of corrosion ( <b>FSC</b> ) - Red or with rust<br>- Mass change |
| Final measurement:       | Weigh the specimens to the nearest 1 mg ( <b>m2</b> )                        |

## 8 - Test results

| SAMPLE    | A ( cm <sup>2</sup> ) | m1 ( mg ) | m2 ( mg ) | FSC ( h ) |
|-----------|-----------------------|-----------|-----------|-----------|
| LM2459-15 | 50                    | 73170     | 73320     | -         |
| LM2459-59 | 50                    | 73720     | 74380     | -         |
| LM2459-85 | 50                    | 74080     | 74060     | -         |
| LM2599-06 | 50                    | 93810     | 93920     | 24        |
| LM2599-48 | 50                    | 93670     | 93940     | 24        |
| LM2599-92 | 50                    | 92360     | 92470     | 24        |

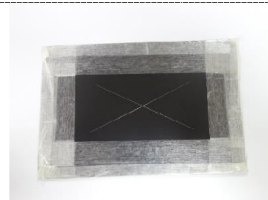
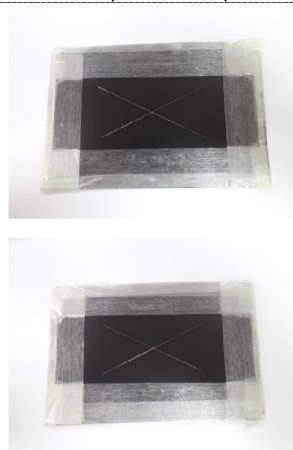
## 9 - Observations

| OBSERVATIONS<br>(According clause 15)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>OBSERVATIONS (IN ACCORDANCE WITH CLAUSE 15)</p> <p>1. Exposure Period (Clause 15.6)<br/>The specimens were exposed to the salt spray environment for a total duration of 72 hours, starting from 2026/06/16 10:00 to 2026/06/19 10:00.</p> <p>2. Interruptions in Exposure (Clause 15.7)<br/>There were no interruptions during the entire exposure period. The test was conducted continuously.</p> <p>3. Results of Inspections (Clause 15.8)<br/>Periodic inspections were performed, and the surface conditions of the specimens were recorded as follows:</p> <ul style="list-style-type: none"> <li>- At 24 Hours:           <ul style="list-style-type: none"> <li>* Specimen IDs CODE: LM2459-15, LM2459-59, and LM2459-85: No visible corrosion or blistering was observed on the significant surfaces.</li> <li>* Specimen IDs CODE: LM2599-06, LM2599-48, and LM2599-92: Severe red rust covered the surfaces of the specimens, exceeding 5% of the total surface area.</li> </ul> </li> <li>- At 48 Hours:           <ul style="list-style-type: none"> <li>* Specimen IDs CODE: LM2459-15, LM2459-59, and LM2459-85: No visible corrosion or blistering was observed on the significant surfaces.</li> <li>* Specimen IDs CODE: LM2599-06, LM2599-48, and LM2599-92: Severe red rust covered the surfaces of the specimens, exceeding 5% of the total surface area.</li> </ul> </li> <li>- At 72 Hours:           <ul style="list-style-type: none"> <li>* Specimen IDs CODE: LM2459-15, LM2459-59, and LM2459-85: No visible corrosion or blistering was observed on the significant surfaces.</li> <li>* Specimen IDs CODE: LM2599-06, LM2599-48, and LM2599-92: Severe red rust covered the surfaces of the specimens, exceeding 5% of the total surface area.</li> </ul> </li> </ul> |

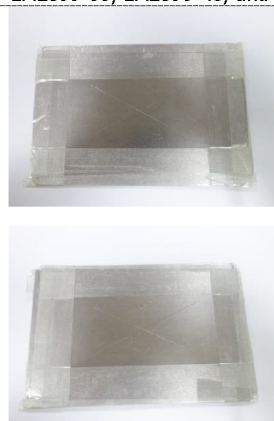
# PHOTOGRAPHS

Before testing:

- LM2459-15, LM2459-59, and LM2459-85:

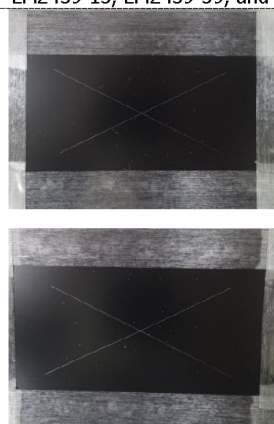


- LM2599-06, LM2599-48, and LM2599-92:



After testing:

- LM2459-15, LM2459-59, and LM2459-85:



- LM2599-06, LM2599-48, and LM2599-92:



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