SOUTH QUALITY

PROFICIENCY TESTING PROVIDER

# REPORT No 11658

***Date of issue:*** *March 28, 2026*

***Status: FINAL REPORT***

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# ASTM D93

# FLASH POINT BY PENSKY-MARTENS CLOSED CUP TESTER

# Program: SQ-1554.V2

**********



| Prepared by: | Reviewed by: | Approved by: |
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## 1. FOREWORD

This report summarizes the results of the **SQ-1554.V2** proficiency testing program on the determination of the flash point of petroleum products. 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 February 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 |
| Statistic: | Lic. Manuel Tozaki |
| Supervision: | Eng. Emiliano Medina |

## 3. OBJECTIVE

The objective of this proficiency testing program is to determine the corrected flash point, using the following standard:

| Standard |
|---|
| ASTM D93 - 25 |

To verify this, batches of petroleum-derived lubricating oils have been selected.

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

## 4. PARTICIPANT

| | |
|---|---|
| Company: | **TÜV SÜD PSB Pte Ltd** |
| Laboratory: | **Elemental Analysis Lab** |
| Country: | Singapore |
| Client ID: | S333 |
| Contact person: | Dr. Songbai Tang<br>Product Manager<br>songbai.tang@tuvsud.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: **50 units** Tested samples from each batch: **5 units**

| DETERMINATION | HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES | | |
|---|---|---|---|
| | BATCH: LCH3240 | BATCH: LCH3241 | BATCH: LCH3242 |
| Corrected flash point | YES | NO | YES |

Size of each batch: **50 units** Tested samples from each batch: **5 units**

| DETERMINATION | HOMOGENEITY OF RESULTS IN THE ANALYZED SAMPLES | | |
|---|---|---|---|
| | BATCH: LCH3258 | BATCH: LCH3259 | BATCH: LCH3260 |
| Corrected flash point | YES | YES | YES |

Samples for this program are taken from the selected batches identified as **LCH3240** and **LCH3259**.

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:

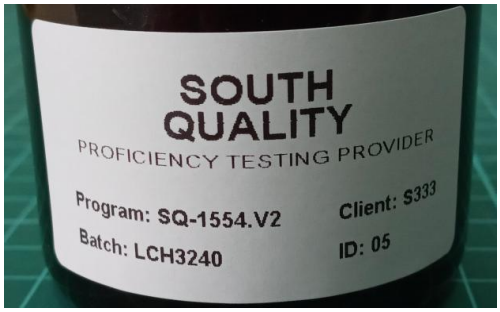
| | |
|---|---|
| Batch: | LCH3240 |
| Sample ID: | 05 |
| Characteristics: | Mineral oil - 250ml |

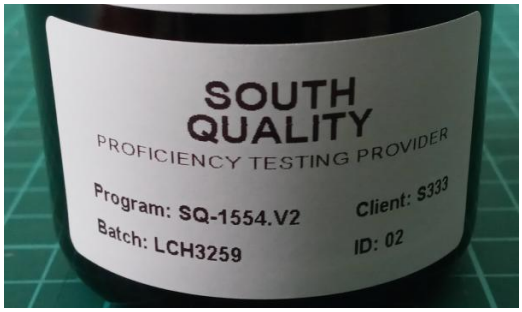
| | |
|---|---|
| Batch: | LCH3259 |
| Sample ID: | 02 |
| Characteristics: | Synthetic oil - 250ml |

## 7. IMAGES

**SAMPLES**





## 8. ASSIGNED VALUES

| BATCH | FLASH POINT - AVG | |
|---|---|---|
| | ( °C ) | SD |
| LCH3240 | 215.2 | 0.89 |
| LCH3259 | 94.3 | 0.98 |

## 9. PARTICIPANT RESULTS (SEE APPENDIX B)

| CODE | FLASH POINT - AVG ( °C ) |
|---|---|
| LCH3240-05 | 214.5 |
| LCH3259-02 | 93.5 |

## 10. STATISTICS

The results must be treated as quantitative.

The comparison is made according to B.3.1.3 of ISO 17043 and the appropriate technique is to compare participant results with the assigned values. The results can be compared 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 | FLASH POINT - AVG ( °C ) | | \| z score \| | PERFORMANCE RESULT |
|---|---|---|---|---|
| | PARTICIPANT RESULT | ASSIGNED VALUE | | |
| **LCH3240** | 214.5 | 215.2 | **0.79** | **SATISFACTORY** |
| **LCH3259** | 93.5 | 94.3 | **0.82** | **SATISFACTORY** |

## 12. CONCLUSIONS

The overall performance on this **SQ-1554.V2** program from the participant laboratory **TÜV SÜD PSB Pte Ltd - Elemental Analysis Lab**, 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

## INSTRUCTIONS

SOUTH QUALITY
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# INSTRUCTIONS

| | |
|---|---|
| **PROGRAM:** | Flash point by pensky-martens closed cup tester |
| **CODE:** | SQ-1554 |
| **VERSION:** | 2 |
| **STANDARD:** | ASTM D93 |
| **COORDINATOR:** | Eng. Erika Brest ( ebrest@ptsouthquality.com ) |

## 1 - General

This document serves as a guide for managing the results of the **SQ-1554.V2** program.

## 2 - Standard

**ASTM D93 - 25**

## 3 - Tests involved

| TEST |
|---|
| Determination of the flash point of a petroleum product<br>( Corrected flash point ) |

## 4 - Samples

| CODE | SAMPLE | QUANTITY |
|---|---|---|
| LCH3240-05 | Mineral oil | 250 ml |
| LCH3259-02 | Synthetic oil | 250 ml |

## 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 ASTM D93 (Procedure A).
**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.

| PHOTOGRAPHS |
| --- |
| |

# APPENDIX B

# PARTICIPANT RESULTS (TEST REPORT # PT1-CHM26-HL)

**Test Report No. PT1-CHM26-HL**

Date: 06 FEB 2026 Email: songbai.tang@tuvsud.com

Client's Ref:

Add value.
Inspire trust.

**Note:** This report is issued subject to the Testing, Certification, Validation and Verification Regulations (TCVVR) of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

**SUBJECT**

Flash point analysis of petroleum products in accordance with ASTM D3278-21

**CLIENT**

PT Test supplied by South Quality

**SAMPLE SUBMISSION / TEST DATE**

19 JAN 2026 / 28-29 JAN 2026

**DESCRIPTION OF SAMPLE**

Two samples as below were received for Bilateral PT Scheme, SQ-1554.V2 (Client S333).


**Sample 1:**

Sample ID: 02
Sample Name: ELAION MOTO 2T
Batch: LCH3259

**Sample 2:**

Sample ID: 05
Sample Name: ELAION MI 2050
Batch: LCH3240

TÜV SÜD PSB

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Singapore 609937

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**Test Report No. PT1-CHM26-HL**
**06 FEB 2026**

## METHOD OF TEST

ASTM D3278-21: Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus.

(Note: The lab facility and accredited method is ASTM D3278-21. No facility for standard ASTM D93-25: Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester. The participating lab Just uses the same PT samples to do the rest, in accordance with standard ASTM D3278-21, as indicated during enquiry of registration. It is expected the test results of same samples are close to each other although different standards and instrument. The participating lab understands the test results will be compared to known flash point values, in accordance with ASTM D93-25.)

## RESULTS

**Table 1. Flash point results of the samples.**

| Sample Names | Test 1 (°C) | Test 2 (°C) | Test 3 (°C) | Average (°C) | Uncertainty (°C) |
|---|---|---|---|---|---|
| Sample ID: 02<br>Sample Name:<br>ELAION MOTO 2T<br>Batch: LCH3259 | 93.5 | 93.5 | 94.0 | 93.5 | 0.5 |
| Sample ID: 05<br>Sample Name:<br>ELAION MI 2050<br>Batch: LCH3240 | 214.5 | 214.5 | 214.5 | 214.5 | 1.0 |

Note: Temperature resolution of the instrument: 0.5 °C.

**MS TAN HUI LIN**
CHEMIST
ELEMENTAL ANALYSIS
CHEMICAL CENTRE

**DR TANG SONGBAI**
PRODUCT MANAGER
ELEMENTAL ANALYSIS
CHEMICAL CENTRE

**Test Report No. PT1-CHM26-HL**
**06 FEB 2026**

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Effective 27 March 2024

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