



**DIAMOND  
PRODUCERS  
ASSOCIATION**



**PROJECT ASSURE  
DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT**

**Summary Report for: Swiss Gemmological Institute / ADSI Optics & Single Processing Unit**



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Assessment Dates: April 6, 2019  
Testing ID: 1906500S-B\*  
Assessment Testing ID: 1906500-A  
Report Issue Date: May 24, 2019

\*This report supersedes the test report date May 15, 2019. The report has amended to include the combined results for C and D+DE stone sets. The stone table has been updated to include stone sets C and D+DE as requested by the DPA.


Approval By:

*Judith V. Haber*

Judith V. Haber  
Global Technical Lead Chemistry

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|   |   |              |                    |
|---|---|--------------|--------------------|
|  | Swiss Gemmological Institute – SSEF, ASDI Optics & Single Processing Unit |              |                    |
|   | <b>Date:</b>  | May 24, 2019 | <b>Testing ID:</b> |

**Manufacturer's Name:** Swiss Gemmological Institute  
**Instrument Model:** ASDI Optics & Single Processing Unit  
**Serial Number:** SP 909e  
**Software Version:** Revision 3.2.7, Dec. 2014  
**Lab Manager:** Winson Wong  
**Analyst/Operator:** Julie Mason

## Overview

The stated instrument was evaluated to Diamond Verification Instrument Standard Part 2 – Diamond Verification Instrument for Screening Diamonds from Synthetic Diamonds and Diamond Simulants (30 January 2019) as referenced by the Diamond Verification Instrument Standard – General Requirements for Evaluation Diamond Verification Instruments (30 January 2019).


## Manufacturer's Claims for Instrument Capability

| Sample Composition           |  |
|------------------------------|--|
| Type of Stones               | Diamonds, Synthetic Diamonds and Diamond Simulants |
| Stone Size Range             | 0.003 ct. to 0.2 ct. (0.86 mm to 3.80 mm)          |
| Stone Color Range            | Stone Color D to J                                 |
| Loose / Mounted              | Loose  |
| Single / Batch Stone Testing | Batch Stone Testing                                |
| Automated / Manual Feed      | Automated Feed                                     |

## Summary of Assessment

The instrument has been verified to be able to screen loose, round brilliant cut diamonds, synthetic diamonds and diamond simulants in the size range of 1.0 to 3.7 mm (0.006 to 0.2 ct.) and D to J color range.

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**Results of Performance Testing to the Diamond Verification Instrument Standard**

**Test Stone Sets used to Assess Performance**

| Loose, Polished Stone Test Sets  | Diamond | Synthetic Diamond | Diamond Simulant |
|--|---------|-------------------|------------------|
| Primary Set (>2.00 mm, D-J colour)<br>748 diamonds, 150 synthetic diamonds and 148 diamond simulants     | ☒       | ☒                 | ☒                |
| Supp. Set A (>2.00 mm, D-J colour)<br>249 diamonds   | ☒       |                   |                  |
| Supp. Set AB (>2.00 mm, D-J colour)<br>49 synthetic diamonds, 48 diamond simulants                       |         | ☒                 | ☒                |
| Supp. Set B (>2.00 mm, K-Z colour)<br>250 diamonds   | ☐       |                   |                  |
| Supp. Set C (1.00-2.00 mm, D-J colour)<br>737 diamonds, 140 synthetic diamonds and 145 diamond simulants | ☒       | ☒                 | ☒                |
| Supp. Set D (1.00-2.00 mm, D-J colour)<br>250 diamonds   | ☒       |                   |                  |
| Supp. Set DE (1.00-2.00 mm, D-J colour)<br>51 synthetic diamonds, 47 diamond simulants                   |         | ☒                 | ☒                |
| Supp. Set E (0.10-2.00 mm, K-Z colour)<br>250 diamonds   | ☐       |                   |                  |

**Results of instrument stone assessment testing of Combined Stone Sets**


| Test Property                             | Results for Loose, Polished Stone Test Sets |                      |
|---|---|----------------------|
|   | Primary and A&AB Combined                   | C and D&DE Combined  |
| Diamond accuracy (%)                      | 93.6  | 93.2                 |
| Synthetic diamond accuracy (%)            | na <sup>[1]</sup>                           | na <sup>[1]</sup>    |
| Diamond simulant accuracy (%)             | na <sup>[2]</sup>                           | na <sup>[2]</sup>    |
| Diamond referral rate (%)                 | 6.4   | 6.8                  |
| Synthetic diamond referral rate (%)       | 100.0 <sup>[3]</sup>                        | 100.0 <sup>[3]</sup> |
| Diamond simulant referral rate (%)        | 100.0 <sup>[3]</sup>                        | 100.0 <sup>[3]</sup> |
| Diamond false positive rate (%)           | 0.0   | 0.0                  |
| Synthetic diamond false positive rate (%) | 0.0   | 0.0                  |
| Diamond simulant false positive rate (%)  |   |                      |
| Diamond false negative rate (%)           | 0.0   | 0.0                  |
| Synthetic diamond false negative rate (%) | 0.0   | 0.0                  |
| Diamond simulant false negative rate (%)  | 0.0   | 0.0                  |

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument does not classify stones as ‘Synthetic diamond’

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- [2] This instrument is designed to classify Simulant Diamonds and Diamonds with strong luminescence or which are not clean in the same bin
- [3] This instrument is designed to classify synthetic diamonds as ‘Refer’ and does not distinguish between Simulant Diamonds and Diamonds with strong luminescence or which are not clean

**Results of instrument testing speed assessment**

| Rate of Testing Speed Test Method   | Average Test Result  |
|---|----------------------|
| <input type="checkbox"/> Test Method A: Fixed number of stones              | 6511 stones per hour |
| <input type="checkbox"/> Test Method B: Fixed time frame                    |                      |
| <input checked="" type="checkbox"/> Test Method C: Reduced number of stones |                      |


**Results of instrument stone assessment testing of individual stone sets**

| Test Property                             | Results for Loose, Polished Stone Test Sets |                      |        |                      |                      |        |
|---|---|----------------------|--------|----------------------|----------------------|--------|
|   | Primary                                     | A & AB               | B & AB | C*                   | D & DE*              | E & DE |
| Diamond accuracy (%)                      | 92.8  | 96.0                 | na     | 93.5                 | 92.4                 | na     |
| Synthetic diamond accuracy (%)            | na <sup>[1]</sup>                           | na <sup>[1]</sup>    | na     | na <sup>[1]</sup>    | na <sup>[1]</sup>    | na     |
| Diamond simulant accuracy (%)             | na <sup>[2]</sup>                           | na <sup>[2]</sup>    | na     | na <sup>[2]</sup>    | na <sup>[2]</sup>    | na     |
| Diamond referral rate (%)                 | 7.2   | 4.0                  | na     | 6.5                  | 7.6                  | na     |
| Synthetic diamond referral rate (%)       | 100.0 <sup>[3]</sup>                        | 100.0 <sup>[3]</sup> | na     | 100.0 <sup>[3]</sup> | 100.0 <sup>[3]</sup> | na     |
| Diamond simulant referral rate (%)        | 100.0 <sup>[3]</sup>                        | 100.0 <sup>[3]</sup> | na     | 100.0 <sup>[3]</sup> | 100.0 <sup>[3]</sup> | na     |
| Diamond false positive rate (%)           | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |
| Synthetic diamond false positive rate (%) | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |
| Diamond simulant false positive rate (%)  | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |
| Diamond false negative rate (%)           | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |
| Synthetic diamond false negative rate (%) | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |
| Diamond simulant false negative rate (%)  | 0.0   | 0.0                  | na     | 0.0                  | 0.0                  | na     |

Notes:

- \* C Stone set, and DE Stone set deviates from the standard as a reduced number of stones were analyzed; Set C deviation – the standard calls for 1048 mixed stones to be tested, 1022 stones were tested; Set DE deviation – the standard calls for 99 synthetic/simulant stones to be tested, 98 stones are tested
- na Not applicable per instrument manufacturer
- [1] Does not apply because this instrument does not classify stones as ‘Synthetic diamond’
- [2] This instrument is designed to classify Simulant Diamonds and Diamonds with strong luminescence or which are not clean in the same bin
- [3] This instrument is designed to classify synthetic diamonds as ‘Refer’ and does not distinguish between Simulant Diamonds and Diamonds with strong luminescence or which are not clean

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**Additional Notes from Assessment Findings**

Below is a summary of an additional findings from assessment:

- None

**Definitions**

|  |  |
|--|--|
| <b>Diamond Accuracy</b>                      | Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as diamond.                                    |
| <b>Synthetic Diamond Accuracy</b>            | Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as synthetic diamond.                          |
| <b>Diamond Simulant Accuracy</b>             | Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as diamond simulant.                           |
| <b>Diamond Referral Rate</b>                 | Defined as the fraction of diamonds that could not be classified by the specific diamond verification instrument and requires further.                     |
| <b>Synthetic Diamond Referral Rate</b>       | Defined as the fraction of synthetic diamonds that could not be classified by the specific diamond verification instrument and requires further testing.   |
| <b>Simulant Referral Rate</b>                | Defined as the fraction of diamond simulants that could not be classified by the specific diamond verification instrument and requires further testing.    |
| <b>Diamond False Positive Rate</b>           | Defined as the fraction of synthetic diamonds and/or diamond simulants incorrectly classified as diamond by the specific diamond verification instrument.  |
| <b>Synthetic Diamond False Positive Rate</b> | Defined as the fraction of diamonds and/or diamond simulants incorrectly classified as synthetic diamonds by the specific diamond verification instrument. |
| <b>Diamond Simulant False Positive Rate</b>  | Defined as the fraction diamond and/or synthetic diamonds incorrectly classified as diamond simulants by the specific diamond verification instrument.     |
| <b>Diamond False Negative Rate</b>           | Defined as the fraction of diamonds incorrectly classified as synthetic diamond and/or diamond simulant by the specific diamond verification instrument.   |
| <b>Synthetic Diamond False Negative Rate</b> | Defined as the fraction of synthetic diamonds incorrectly classified as diamond and/or diamond simulant by the specific diamond verification instrument.   |
| <b>Diamond Simulant False Negative Rate</b>  | Defined as the fraction of diamond simulants incorrectly classified as diamond and/or synthetic diamond by the specific diamond verification instrument.   |
| <b>Rate of Testing Speed</b>                 | Defined as the average speed at which the diamond verification instrument evaluates unknown stones.  |

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

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