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
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Global Technical Lead Chemistry

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.

	Swiss Gemmological Institute – SSEF, ASDI Optics & Single Processing Unit		
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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) 748 diamonds, 150 synthetic diamonds and 148 diamond simulants	☒	☒	☒
Supp. Set A (>2.00 mm, D-J colour) 249 diamonds	☒		
Supp. Set AB (>2.00 mm, D-J colour) 49 synthetic diamonds, 48 diamond simulants		☒	☒
Supp. Set B (>2.00 mm, K-Z colour) 250 diamonds	☐		
Supp. Set C (1.00-2.00 mm, D-J colour) 737 diamonds, 140 synthetic diamonds and 145 diamond simulants	☒	☒	☒
Supp. Set D (1.00-2.00 mm, D-J colour) 250 diamonds	☒		
Supp. Set DE (1.00-2.00 mm, D-J colour) 51 synthetic diamonds, 47 diamond simulants		☒	☒
Supp. Set E (0.10-2.00 mm, K-Z colour) 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[1]	na[1]
Diamond simulant accuracy (%)	na[2]	na[2]
Diamond referral rate (%)	6.4	6.8
Synthetic diamond referral rate (%)	100.0[3]	100.0[3]
Diamond simulant referral rate (%)	100.0[3]	100.0[3]
Diamond false positive rate (%)	0.0	0.0
Synthetic diamond false positive rate (%) Diamond simulant false positive rate (%)	0.0	0.0
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'

[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
☐ Test Method A: Fixed number of stones ☐ Test Method B: Fixed time frame ☒ Test Method C: Reduced number of stones	6511 stones per hour

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[1]	na[1]	na	na[1]	na[1]	na
Diamond simulant accuracy (%)	na[2]	na[2]	na	na[2]	na[2]	na
Diamond referral rate (%)	7.2	4.0	na	6.5	7.6	na
Synthetic diamond referral rate (%)	100.0[3]	100.0[3]	na	100.0[3]	100.0[3]	na
Diamond simulant referral rate (%)	100.0[3]	100.0[3]	na	100.0[3]	100.0[3]	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

Additional Notes from Assessment Findings

Below is a summary of an additional findings from assessment:

- None

Definitions

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

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