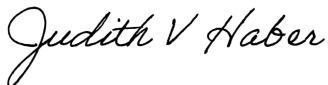# PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD
Assessment Report for: GIA® iD100™

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Received Date: April 19, 2023
Invid Number: 6018307
Assessment Dates: May 09, 2023, through May 17, 2023
Testing ID Number: 1001919524
Report Date: August 7, 2023
Approved by:

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DIAMOND VERIFICATION INSTRUMENT

Manufacturer's Name: GIA®
Instrument Model: iD100™
Serial Number: A00372200
Software Version: 3.13.0.1
Lab Manager: Winson Wong
Analyst/Operator: Julie Mason

Manufacturer stated diamond verification instrument description and features

- Distinguishes natural diamonds from potentially synthetic diamonds and diamond simulants
- Manual stone feed
- Automatic stone classification
- Manual stone sorting

Manufacturer stated diamond verification instrument limitations

- Loose and Mounted stones
- Any stone shape
- Stone size of 0.9 mm (0.005 ct.) or greater
- Stone color of D to J
- Stone clarity - no limitation specified in the user manual

INSTRUMENT PERFORMANCE ASSESSMENT

ASSESSMENT CRITERIA

The ASSURE testing methodology and performance metrics are dependent on the operational capabilities of the diamond verification instrument being tested. These are defined by the following three categories:

Category 1 – Screen diamonds from synthetic diamonds. This category of device is intended for the discrimination of diamonds from synthetic diamonds. It cannot distinguish diamonds from diamond simulants and therefore requires stones to be pre-screened to ensure no simulants are introduced into the device.

Category 2 – Screen diamonds from synthetic diamonds and diamond simulants. This category of device is intended for the discrimination of diamonds from synthetic diamonds _and_ diamond simulants. This device _cannot_ distinguish synthetic diamonds from diamond simulants.

Category 3 – Screen diamonds from synthetic diamonds from diamond simulants. This category of device is intended for the discrimination of diamonds, synthetic diamonds, and diamond simulants from each other. This device _can_ distinguish synthetic diamonds from diamond simulants.

Instrument performance for classifying the different kinds of stones was assessed against:

☐ Diamond Verification Instrument Standard Part 1 – Diamond Verification Instrument for Screening Diamonds from Synthetic Diamonds (09-11-2021)

☒ Diamond Verification Instrument Standard Part 2 – Diamond Verification Instrument for Screening Diamonds from Synthetic Diamonds and Diamond Simulants (November 9, 2021)

☐ Diamond Verification Instrument Standard Part 3 – Diamond Verification Instrument for Screening Diamonds, Synthetic Diamonds, and Diamond Simulants (November 9, 2021)

as referenced in sections 7.3 and 7.4 of the Diamond Verification Instrument Standard – General Requirements for Evaluation Diamond Verification Instruments (November 9, 2021). Any deviations from the Standard are noted below:

None

DEFINITIONS

Diamond Accuracy	*Diamond* test stones correctly classified as *Diamond*.
Synthetic Diamond Accuracy	*Synthetic Diamond test stones correctly classified as non-diamond (Synthetic Diamond / Diamond Simulant).*
Diamond Simulant Accuracy	*Diamond Simulant* test stones correctly classified as *non-diamond (Synthetic Diamond / Diamond Simulant).*
Diamond Referral Rate	*Diamond* test stones classified as *Referral*.
Synthetic Diamond Referral Rate	*Synthetic Diamond* test stones classified as *Referral*
Diamond Simulant Referral Rate	*Diamond Simulant* test stones classified as *Referral*.
Diamond False Positive Rate	*Synthetic diamond and/or Diamond Simulant* test stones incorrectly classified as *Diamond.*
Diamond False Negative Rate[*]	*Diamond* test stones incorrectly classified as *non-diamond (Synthetic Diamond / Diamond Simulant).*
Synthetic Diamond False Negative Rate	S*ynthetic Diamonds* incorrectly classified as *Diamond.*
Diamond Simulant False Negative Rate	*Diamond Simulants* incorrectly classified as *Diamond.*
Testing Speed	Average speed at which the diamond verification instrument evaluates the stones in the PRIMARY loose sample set, including set-up time (if any).
Operating Speed	For auto-loading diamond verification instruments only; the average speed at which stones are evaluated once the instrument achieves a steady-state. Does not include set-up time.

[*] NOTE: Diamond False Negative Rate is equivalent to the Synthetic Diamond / Diamond Simulant False Positive Rate for diamond verification instruments of Operation Category 2 (ASSURE Standard Part 2, Section 12).

(UL)	GIA® iD100™		
	Date: August 7, 2023	Testing ID:	1001919524

TEST STONE SETS USED FOR EVALUATION

Loose, Polished Stone Test Sets	Diamond	Synthetic Diamond	Diamond Simulant
Primary Sample Set (>2.0 mm, D-J color)	☒	☒	☒
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	☒	☒	☒
Mounted, Polished Stone Test Sets	**Diamond**	**Synthetic Diamond**	**Diamond Simulant**
Primary Sample Set (>2.0 mm, D-J color)	☒	☒	☒
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	☒	☒	

Notes:
None

CLEANING PROCEDURE OF STONES PRIOR TO TESTING

Test stone sets are cleaned in an ultrasonic bath of isopropanol for two minutes and dried using an ionizer prior to testing to reduce grease and electrostatic charge, as per Section 8 of ASSURE Standard.

LABORATORY CONDITIONS AT THE TIME OF ASSESSMENT

Condition	Requirement	Actual
Temperature (°C)	18 to 25°C	21.0 to 21.5°C
Humidity (%)	50 to 65%	54 to 55%

RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – LOOSE STONES

Performance Metric	Primary	Uncertainty	Smalls	Uncertainty
Diamond accuracy (%)	89.6	1.3	86.4	1.8
Synthetic diamond accuracy (%)	NA[1]	NA[1]	NA[1]	NA[1]
Diamond simulant accuracy (%)	NA[1]	NA[1]	NA[1]	NA[1]
Diamond referral rate (%)	10.4	1.3	13.6	1.8
Synthetic diamond referral rate (%)	100.0[2]	0.0[2]	100.0[2]	0.0[2]
Diamond simulant referral rate (%)	100.0[2]	0.0[2]	100.0[2]	0.0[2]
Diamond false positive rate (%)	0.0	0.0	0.0	0.0
Diamond false negative rate (%)	NA[1]	NA[1]	NA[1]	NA[1]
Synthetic diamond false negative rate (%)	0.0	0.0	0.0	0.0
Diamond simulant false negative rate (%)	0.0	0.0	0.0	0.0

Notes:

NA means "Not Applicable".

Uncertainty is based on the proportion of sample stones that don't repeat in the same category for the three trials.

[1] Does not apply because this instrument does not classify stones as 'Synthetic Diamond' or 'Diamond Simulant'.

[2] This instrument is designed to classify synthetic diamonds and diamond simulants as 'Refer'. All "Refer" stones were analyzed a minimum of five times.

RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – MOUNTED STONES

Performance Metric	Primary	Smalls
Diamond accuracy (%)	92.6	95.7
Synthetic diamond accuracy (%)	NA[1]	NA[1]
Diamond simulant accuracy (%)	NA[1]	NA[3]
Diamond referral rate (%)	7.4	4.3
Synthetic diamond referral rate (%)	100.0[2]	100.0[2]
Diamond simulant referral rate (%)	100.0[2]	NA[3]
Diamond false positive rate (%)	0.0	0.0
Diamond false negative rate (%)	NA[1]	NA[1]
Synthetic diamond false negative rate (%)	0.0	0.0
Diamond simulant false negative rate (%)	0.0	NA[3]

Notes:

NA means "Not Applicable".

Uncertainty is based on the proportion of sample stones that don't repeat in the same category for the three trials.

[1] Does not apply because this instrument does not classify stones as 'Synthetic diamond' or 'Diamond Simulant'.

[2] This instrument is designed to classify synthetic diamonds and diamond simulants as 'Refer'. All "Refer" stones were analyzed a minimum of five times.

[3] The Smalls sample set of mounted stones (jewelry) does not include diamond simulant stones.

INSTRUMENT TESTING SPEED ASSESSMENT

Testing Speed approximates the usage turnaround time that could be expected by a novice user of the diamond verification instrument and is determined by the time required to evaluate the performance of the diamond verification instrument on the Primary Loose stone test set:

- Testing Speed accounts for the time directly associated with stone assessment including loading stones, programming any applicable instrument measurement parameters, analyzing the stones, and segregating the analyses stones into respective instrument classified groups.

- Testing Speed does not include the time to initially warm up the diamond verification instrument (if applicable) nor the time to separate diamonds from synthetic diamonds for each of the instrument classified groups of analyzed stones.

- Testing Speed does not include the time associated with interruptions to the testing process.

Diamond verification instruments that continuously load and analyze stones (i.e., autoloading diamond verification instruments) shall also be assessed for a steady-state Instrument Operating Speed.

- Operating speed is the number of stones that can be analyzed per hour while the diamond verification instrument is operating in a steady state.

Testing Speed, and instrument Operating Speed if applicable, are measured in triplicate. The mean value is reported in the Speed Test Results table below. The Uncertainty reflects the absolute +/- range of the results measured over the three trials.

SPEED TEST RESULTS

Category	Stones per hour	Uncertainty (stones/hr)
Testing Speed	208	6
Operating Speed	NA[1]	NA[1]

Notes:

When turning on the iD100, the instrument guides the user through an initial calibration process. Following calibration, individual stones (loose or mounted) can be tested using the provided probe without any further set-up. The iD100 does not require the user to place the stones into the device.

The Testing Speed is based on testing the loose stones from the Primary sample set.

[1] Operating Speed is measured on auto-feed devices only.

ADDITIONAL FINDINGS

No additional findings were reported.

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