

PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD
TEST RESULTS

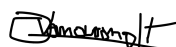
Assessment Report for: DIAMTECH RESEARCH CENTRE / J-Detect Pro



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DIAMOND VERIFICATION INSTRUMENT

Manufacturer's Name:	Diamtech Research Centre Private Limited
Instrument Model:	J-Detect Pro
Serial Number:	JDPR22036G
Software Version:	1.0.0.3
Lab Manager:	Quinten Van Avondt
Testing Manager:	Cindy De Plukker

Manufacturer stated diamond verification instrument description and features:

- Manual stone feed
- Automated test results (referral) /user interpretation (natural diamond or referral)
- Multiple stone testing
- Results: natural or referral

Manufacturer stated diamond verification instrument limitations:

- Loose stones and stones mounted in jewelry
- Any shape stones, unfinished stones
- Stones from 0.003 ct (0.8 mm) and larger
- Stones with D through J-K color

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 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 discrimination of diamonds from synthetic diamonds and diamond simulants. This device cannot distinguish synthetic diamonds from diamond simulants.

Category 3 – Screen diamond from synthetic diamonds from diamond simulants. This category of device is intended for 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 (09 11 2021)
- Diamond Verification Instrument Standard Part 3 – Diamond Verification Instrument for Screening Diamonds, Synthetic Diamonds, and Diamond Simulants (09 11 2021)

as referenced in sections 7.3 and 7.4 of the Diamond Verification Instrument Standard – General Requirements for Evaluation Diamond Verification Instruments (09 11 2021). Any deviations from the Standard are noted below:



DEFINITIONS

Diamond Accuracy	<i>Diamond</i> test stones correctly classified as <i>Diamond</i> .
Synthetic Diamond Accuracy	<i>Synthetic Diamond</i> test stones correctly classified as <i>Synthetic Diamond</i> .
Diamond Referral Rate	<i>Diamond</i> test stones classified as <i>Referral</i> .
Synthetic Diamond Referral Rate	<i>Synthetic Diamond</i> test stones classified as <i>Referral</i>
Diamond False Positive Rate	<i>Synthetic Diamond</i> test stones incorrectly classified as <i>Diamond</i> .
Synthetic Diamond False Positive Rate	<i>Diamond</i> test stones incorrectly classified as <i>Synthetic Diamond</i>
Diamond False Negative Rate	<i>Diamond</i> test stones incorrectly classified as <i>Synthetic Diamond</i>
Synthetic Diamond False Negative Rate	<i>Synthetic Diamond</i> test stones incorrectly classified as <i>Diamond</i> .
Testing Speed	The 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.

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)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mounted, Polished Stone Test Sets	Diamond	Synthetic Diamond	Diamond Simulant
Primary Sample Set (>2.0 mm, D-J color)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Notes: None

CLEANING PROCEDURE OF STONES PRIOR TO TESTING

Test stones sets are cleaned in an ultrasonic bath of isopropanol for 2 minutes and dried prior to testing to reduce grease and electrostatic charge, as per Section 8 of ASSURE Standard.



LABORATORY CONDITIONS AT TIME OF ASSESSMENT

Condition	Requirement	Actual
Temperature (°C)	18 to 25°C	21 °C
Humidity (%)	50 to 65%	53 %

RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – LOOSE STONES

Performance Metric	Primary	Uncertainty ^[1]	Smalls	Uncertainty ^[1]
Diamond accuracy (%)	78.4	5.1	80.5	2.4
Synthetic diamond accuracy (%)	N/A ^[2]	N/A ^[2]	N/A ^[2]	N/A ^[2]
Diamond referral rate (%)	21.6	5.1	19.5	2.4
Synthetic diamond referral rate (%)	97.7 ^[2]	1.2 ^[2]	97.7 ^[2]	1.5 ^[2]
Diamond false positive rate (%)	2.3	1.2	2.3	0.5
Synthetic diamond false positive rate (%)	N/A ^[2]	N/A ^[2]	N/A ^[2]	N/A ^[2]
Diamond false negative rate (%)	N/A ^[2]	N/A ^[2]	N/A ^[2]	N/A ^[2]
Synthetic diamond false negative rate (%)	2.3	1.5	2.3	0.5

Notes:

- ^[1] Uncertainty is expressed as absolute +/- range and reflects the consistency of the instrument’s classification of stones for each of the three trials performed with the ASSURE sample.
- ^[2] All Synthetic Diamonds are classified as Referral for this instrument

RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – MOUNTED STONES

Performance metric	Primary	Small
Diamond accuracy (%)	76.7	66.0
Synthetic diamond accuracy (%)	N/A ^[1]	N/A ^[1]
Diamond referral rate (%)	23.3	34.0
Synthetic diamond referral rate (%)	93.5 ^[1]	100.0 ^[1]
Diamond false positive rate (%)	6.5	0.0
Synthetic diamond false positive rate (%)	N/A ^[1]	N/A ^[1]
Diamond false negative rate (%)	N/A ^[1]	N/A ^[1]
Synthetic diamond false negative rate (%)	6.5	0.0

Notes:

- ^[1] All Synthetic Diamonds are classified as referral for this instrument.

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 analyzed 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 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.

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 (PRIMARY LOOSE SAMPLE)

Category	Stones per hour	Uncertainty
Testing Speed (all devices)	238	30
Operating Speed (auto-loading devices)	n/a ^[1]	n/a ^[1]

Notes: ^[1] not applicable for this device , the device has manual feed

ADDITIONAL FINDINGS

None

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