

**PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD
TEST RESULTS**

Assessment Report for: GemTrue Apex




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Hoveniersstraat 22
2018 Antwerpen

Testing ID Number:
Report Date: 20/01/2026
Approved by:

Didier Backaert
Lab Manager

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 Bonas Group DIAMONDS & GEMSTONES	GemTrue Apex		
	Date:	20/01/2026	Testing ID: Category 3-1

DIAMOND VERIFICATION INSTRUMENT

Manufacturer's Name: GemTrue
Instrument Model: APEX (DK10300)
Serial Number: n/a
Software Version: n/a

Lab Manager: Didier Backaert
Analyst/Operator : Nathan De Decker

Manufacturer-stated diamond verification instrument description and features:

The GemTrue APEX (DK10300) is a handheld colorless Lab-Grown and Simulant diamond tester that features advanced optical and thermal conductivity technology, helping you make informed decisions whether you're at the counter, in the lab or at a trade show. Key features include:

- Detects Cubic Zirconia (CZ), Glass, Simulant (Gemstones), CVD/HPHT, Type IIa Synthetic Diamonds, Natural Diamonds and Moissanite (including low conductivity moissanite)
- Capable of testing loose and mounted stones as small as 0.05CT
- Designed for round brilliant-cut stones. Fancy-shaped stones may cause inaccurate results.
- Provides instant visual and audio feedback for quick decision-making
- Built-in 2,200mAh Li-ion Polymer battery, rechargeable using USB-C
- Optimized for polished stones in D to M color range

Manufacturer-stated diamond verification instrument limitations:

- APEX does not distinguish between Type IIa natural diamonds and synthetic diamonds.
- APEX is not suitable for diamonds with colors of M or darker.
- APEX is not suitable for rough diamonds.

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.

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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 (18 03 2024)
- ☐ Diamond Verification Instrument Standard Part 2 – Diamond Verification Instrument for Screening Diamonds from Synthetic Diamonds and Diamond Simulants (18 03 2024)
- ☒ Diamond Verification Instrument Standard Part 3 – Diamond Verification Instrument for Screening Diamonds, Synthetic Diamonds, and Diamond Simulants (18 03 2024)


as referenced in sections 7.3 and 7.4 of the Diamond Verification Instrument Standard – General Requirements for Evaluation Diamond Verification Instruments (18 03 2024). Any deviations from the Standard are noted below:

Notes:

DEFINITIONS:

Diamond Accuracy	<i>Diamond test stones correctly classified as Diamond.</i>
Synthetic Diamond Accuracy	<i>Synthetic Diamond test stones correctly classified as Synthetic Diamond.</i>
Diamond Simulant Accuracy	<i>Diamond Simulant test stones correctly classified as Diamond Simulant.</i>
Diamond Referral Rate	<i>Diamond test stones classified as Referral.</i>
Synthetic Diamond Referral Rate	<i>Synthetic diamond test stones classified as Referral</i>
Simulant Referral Rate	<i>Diamond simulant test stones classified as Referral</i>
Diamond False Positive Rate	Synthetic Diamond / Diamond Simulant test stones incorrectly classified as <i>Diamond</i> .
Synthetic Diamond False Positive Rate	Diamond / Diamond Simulant test stones incorrectly classified as Synthetic Diamond.
Diamond Simulant False Positive Rate	Diamond / Synthetic Diamond test stones incorrectly classified as Diamond Simulants.
Diamond False Negative Rate	Diamond test stones incorrectly classified as Synthetic Diamonds or Diamond simulants.
Synthetic Diamond False Negative Rate	Synthetic Diamond test stones incorrectly classified as Diamonds or Diamond simulants
Diamond Simulant False Negative Rate	Diamond Simulant test stones incorrectly classified as Diamonds or Synthetic Diamonds
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.

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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 checked="" type="checkbox"/>
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supplementary Ultra Smalls Sample Set (0.5mm > , < 1.0mm)	<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>
Supplementary Smalls Sample Set (1.0-2.0 mm, D-J color)	<input type="checkbox"/>	<input type="checkbox"/>	

Notes: Smalls Sample set not tested given limitation of GemTrue APEX to test stone of at least 0.5ct. Stones less than 0.5ct were removed from the Primary Sample set.


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	23 °C
Humidity (%)	50 to 65%	57 %

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RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – LOOSE STONES

Performance Metric	Primary ^[1]	Uncertainty ^[2]	Smalls ^[3]	Uncertainty ^[2]	Ultra-Smalls ^[5]
Diamond accuracy (%)	93.1	1.4	n/a	n/a	n/a
Synthetic diamond accuracy (%) ^[4]	n/a	n/a			
Diamond simulant accuracy (%)	100.0	0.0			
Diamond referral rate (%) ^[4]	6.9	1.4			
Synthetic diamond referral rate (%) ^[4]	100.0	0.0			
Diamond simulant referral rate (%)	0.0	0.0			
Diamond false positive rate (%)	0.0	0.0			
Synthetic diamond false positive rate (%) ^[4]	n/a	n/a			
Diamond simulant false positive rate (%)	0.0	0.0			
Diamond false negative rate (%)	6.9	1.4			
Synthetic diamond false negative rate (%)	n/a	n/a			
Diamond simulant false negative rate (%)	n/a	n/a			


- Notes:
- ^[1] Primary set comprised of round brilliant loose stones with diameters of >2.5 mm D-J color.
 - ^[2] 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.
 - ^[3] Smalls set comprised of round brilliant loose stones with diameters of 1.0–2.0 mm D-J color.
 - ^[4] Stones categorized as Type IIa / CVD / HPHT are considered referrals and should be further tested.
 - ^[5] Ultra-Smalls (<1.0mm diameter) is only included for devices with fully automated feed.

RESULTS OF INSTRUMENT PERFORMANCE ASSESSMENT – MOUNTED STONES

Performance metric	Primary ^[1]	Smalls ^[2]
Diamond accuracy (%)	92.6	n/a
Synthetic diamond accuracy (%) ^[3]	n/a	
Diamond simulant accuracy (%)	100.0	
Diamond referral rate (%) ^[3]	4.1	
Synthetic diamond referral rate (%) ^[3]	94.5	
Diamond simulant referral rate (%) ^[3]	0.0	
Diamond false positive rate (%)	0.0	
Synthetic diamond false positive rate (%) ^[3]	n/a	
Diamond simulant false positive rate (%)	5.5	
Diamond false negative rate (%)	3.3	
Synthetic diamond false negative rate (%)	n/a	
Diamond simulant false negative rate (%)	n/a	

- Notes:
- ^[1] Primary sample set has stones with diameters of >2.5 mm D-J color.
 - ^[2] Smalls sample set has stones from 1.0 – 2.0 mm in diameter D-J color.
 - ^[3] Stones categorized as Type IIa / CVD / HPHT are considered referrals and should be further tested.

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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)	236	7
Operating Speed (auto-loading devices)	N/A	N/A

Notes: While using the GemTrue APEX it is important to wait until the temperature of the thermal probe has returned to the normal range by waiting until the previous result has cleared from the screen before proceeding with the next test. The speed test results reflect the time required between tests.

ADDITIONAL FINDINGS

- It is important to position the tip of the probe above the center of the table and touch the surface at a perpendicular angle.
- Wait 10-15 seconds between tests on the same stone to ensure stone doesn't heat up.

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

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