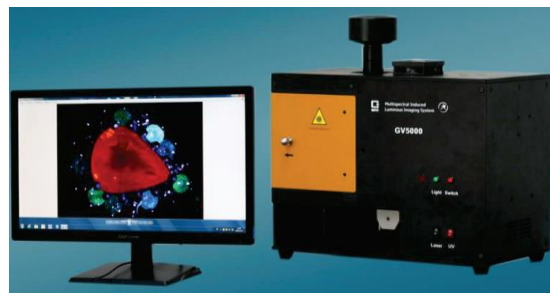




**PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD**

**Summary Report for: NGTC & Nanjing Baoguang Test Technology Co., Ltd /
GV 5000**



Prepared For: Lisa Levinson
Diamond Producers Association Belgium ESV
Hoveniersstraat 22
Antwerp, 2018
Belgium


Received Date: September 17, 2018
Invid Number: 671661
Assessment Dates: January 23, 2019 through February 21, 2019
Preliminary Testing ID: 1817347S-E*
Assessment Testing ID: 1817347A
Report Issue Date: March 1, 2019

*This report supersedes test report dated February 28, 2019. The report has been amended to include the definitions for each category per the DPA's request.

Approval By:

Judith V. Haber
Judith V. Haber
Global Technical Lead Chemistry

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	NGTC & Nanjing Baoguang Test Technology Co., Ltd / Multispectral Induced Luminous Imaging System		
	Date:	March 28, 2019	Testing ID:

Manufacturer's Name: NGTC & Nanjing Baoguang Test Technology Co., Ltd
Instrument Model: GV 5000
Serial Number: NA
Software Version: 2018-08-22
Lab Manager: Winson Wong
Analyst/Operator: Anthony Tedeschi, Joseph Tiburcio

Overview

The stated instrument was evaluated to Diamond Verification Instrument Standard Part 3 – Diamond Verification Instrument for Screening Diamonds, 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 and Synthetic Diamonds
Stone Size Range	0.75 to 13.3 mm (0.002 to 8.0 ct.)
Stone Color Range	D to J
Loose / Mounted	Loose and Mounted
Single / Batch Stone Testing	Batch Stone Testing
Automated / Manual Feed	Manual Feed

Summary of Assessment

The instrument has been verified to be able to screen loose and mounted, round, brilliant cut diamonds and synthetic diamonds in the size range of 0.86 to 3.7 mm (0.003 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) 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		☒	☒

Results of instrument stone assessment testing of Primary and A&AB Combined - Expert


Test Property	Results for Loose, Polished Stone Test Sets
	Primary and A&AB Combined
Diamond accuracy (%)	98.5
Synthetic diamond accuracy (%)	97.5
Diamond simulant accuracy (%)	98.0
Diamond referral rate (%)	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]
Diamond simulant referral rate (%)	na ^[1]
Diamond false positive rate (%)	1.0
Synthetic diamond false positive rate (%)	1.1
Diamond simulant false positive rate (%)	0.6
Diamond false negative rate (%)	1.5
Synthetic diamond false negative rate (%)	2.5
Diamond simulant false negative rate (%)	2.0

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument does not classify stones as 'Refer'

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	NGTC & Nanjing Baoguang Test Technology Co., Ltd / Multispectral Induced Luminous Imaging System		
	Date:	March 28, 2019	Testing ID:

Results of instrument stone assessment testing of Primary and A&AB Combined - Novice

Test Property	Results for Loose, Polished Stone Test Sets
	Primary and A&AB Combined
Diamond accuracy (%)	92.6
Synthetic diamond accuracy (%)	82.9
Diamond simulant accuracy (%)	85.7
Diamond referral rate (%)	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]
Diamond simulant referral rate (%)	na ^[1]
Diamond false positive rate (%)	11.6
Synthetic diamond false positive rate (%)	3.3
Diamond simulant false positive rate (%)	4.3
Diamond false negative rate (%)	7.4
Synthetic diamond false negative rate (%)	17.1
Diamond simulant false negative rate (%)	14.3

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument does not classify stones as 'Refer'

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	296 stones per hour
<input checked="" type="checkbox"/> Test Method B: Fixed time frame	
<input type="checkbox"/> Test Method C: Reduced number of stones	

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Results of instrument stone assessment testing of individual stone sets - Expert

Test Property	Results for Loose, Polished Stone Test Sets					
	Primary	A & AB	B & AB	C	D & DE	E & DE
Diamond accuracy (%)	98.5	98.4	na	TBD	TBD	na
Synthetic diamond accuracy (%)	100.0	89.8	na	TBD	TBD	na
Diamond simulant accuracy (%)	100.0	91.7	na	TBD	TBD	na
Diamond referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Diamond simulant referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Diamond false positive rate (%)	0.0	4.1	na	TBD	TBD	na
Synthetic diamond false positive rate (%)	1.2	0.7	na	TBD	TBD	na
Diamond simulant false positive rate (%)	0.0	2.3	na	TBD	TBD	na
Diamond false negative rate (%)	1.5	1.6	na	TBD	TBD	na
Synthetic diamond false negative rate (%)	0.0	10.2	na	TBD	TBD	na
Diamond simulant false negative rate (%)	0.0	8.3	na	TBD	TBD	na

Results of instrument stone assessment testing of individual stone sets - Novice

Test Property	Results for Loose, Polished Stone Test Sets					
	Primary	A & AB	B & AB	C	D & DE	E & DE
Diamond accuracy (%)	96.1	81.9	na	TBD	TBD	na
Synthetic diamond accuracy (%)	87.3	69.4	na	TBD	TBD	na
Diamond simulant accuracy (%)	97.3	50.0	na	TBD	TBD	na
Diamond referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Diamond simulant referral rate (%)	na ^[1]	na ^[1]	na	TBD	TBD	na
Diamond false positive rate (%)	5.4	30.9	na	TBD	TBD	na
Synthetic diamond false positive rate (%)	2.2	6.4	na	TBD	TBD	na
Diamond simulant false positive rate (%)	1.8	11.7	na	TBD	TBD	na
Diamond false negative rate (%)	3.9	18.1	na	TBD	TBD	na
Synthetic diamond false negative rate (%)	12.7	30.6	na	TBD	TBD	na
Diamond simulant false negative rate (%)	2.7	50.0	na	TBD	TBD	na


Notes:

na Not applicable per instrument manufacturer

TBD To Be Determined

[1] Does not apply because this instrument does not classify stones as 'Refer'

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	Date:	March 28, 2019	Testing ID:

Additional Notes from Assessment Findings

Below is a summary of an additional findings from assessment:

- No additional comments

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.

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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 *****

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