PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT

Summary Report for: BiaoQi Optoelectronics Technology Development Co. Ltd. / GLIS-3000

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Assessment Dates:	October 30, 2019 through November 8, 2019
Testing ID Number:	1917800S
Assessment Testing ID:	1917800
Report Date:	November 14, 2019

Approval By:

Judith V Haber

Judith V. Haber
Technical Manager CRS

	BiaoQi Optoelectronics Technology Development Co., Ltd.			
	Date:	November 14, 2019	Testing ID:	1917800

Manufacturer's Name: BiaoQi Optoelectronics Technology Development Co. Ltd.
Instrument Model: GLIS-3000
Serial Number: GLIS-1902088
Software Version: NA
Lab Manager: Winson Wong
Analyst/Operator: Charles Qin, Anthony Tedeschi

Overview

The stated instrument was evaluated to Diamond Verification Instrument Standard Part 1 – Diamond Verification Instrument for Screening Diamonds from Synthetic Diamonds (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	All Sizes
Stone Color Range	Stone Color D to J
Loose / Mounted	Loose and Mounted (Studded Jewelry Only)
Single / Batch Stone Testing	Batch
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 that are loose in the size range of 0.86 to 3.7 mm (0.003 to 0.2 ct.) and D-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	☒	☒	☐
Supp. Set A (>2.00 mm, D-J colour) 249 diamonds	☒		
Supp. Set AB (>2.00 mm, D-J colour) 49 synthetic diamonds		☒	☐
Supp. Set B (>2.00 mm, K-Z colour) 250 diamonds	☐		
Supp. Set C (1.00-2.00 mm, D-J colour) 737 diamonds and 140 synthetic diamonds	☒	☒	☐
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		☒	☐
Supp. Set E (0.10-2.00 mm, K-Z colour) 250 diamonds	☐		

Results of instrument stone assessment testing of Combined Stone Sets - Expert

Test Property	Results for Loose, Polished Stone Test Sets	
	Primary and A&AB Combined	C and D&DE Combined
Diamond accuracy (%)	95.3	93.3
Synthetic diamond accuracy (%)	83.4	96.3
Diamond referral rate (%)	0.6	0.0
Synthetic diamond referral rate (%)	0.5	0.0
Diamond false positive rate (%)	16.1	3.7
Synthetic diamond false positive rate (%)	4.1	6.7
Diamond false negative rate (%)	4.1	6.7
Synthetic diamond false negative rate (%)	16.1	3.7

Notes:
None

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Results of instrument stone assessment testing of Combined Stone Sets - Novice

Test Property	Results for Loose, Polished Stone Test Sets	
	Primary and A&AB Combined	C and D&DE Combined
Diamond accuracy (%)	94.5	98.4
Synthetic diamond accuracy (%)	83.9	95.8
Diamond referral rate (%)	0.0	0.0
Synthetic diamond referral rate (%)	0.0	0.0
Diamond false positive rate (%)	16.1	4.2
Synthetic diamond false positive rate (%)	5.5	1.6
Diamond false negative rate (%)	5.5	1.6
Synthetic diamond false negative rate (%)	16.1	4.2

Notes:
None

Results of instrument testing speed assessment - Expert

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	1183 stones per hour

Results of instrument testing speed assessment - Novice

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	870 stones per hour

Notes:
None

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[2]	D & DE[2]	E & DE
Diamond accuracy (%)	94.8	96.8	na	92.5	95.6	na
Synthetic diamond accuracy (%)	84.0	81.6	na	97.1	94.1	na
Diamond referral rate (%)	0.8	0.0	na	0.0	0.0	na
Synthetic diamond referral rate (%)	0.7	0.0	na	0.0	0.0	na
Diamond false positive rate (%)	15.3	18.4	na	2.9	5.9	na
Synthetic diamond false positive rate (%)	4.4	3.2	na	7.5	4.4	na
Diamond false negative rate (%)	4.4	3.2	na	7.5	4.4	na
Synthetic diamond false negative rate (%)	15.3	18.4	na	2.9	5.9	na

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

Test Property	Results for Loose, Polished Stone Test Sets					
	Primary[1]	A & AB	B & AB	C[1]	D & DE[1]	E & DE
Diamond accuracy (%)	97.5	85.5	na	98.4	98.4	na
Synthetic diamond accuracy (%)	84.0	83.7	na	97.1	92.2	na
Diamond referral rate (%)	0.0	0.0	na	0.0	0.0	na
Synthetic diamond referral rate (%)	0.0	0.0	na	0.0	0.0	na
Diamond false positive rate (%)	16.0	16.3	na	2.9	7.8	na
Synthetic diamond false positive rate (%)	2.5	14.5	na	1.6	1.6	na
Diamond false negative rate (%)	2.5	14.5	na	1.6	1.6	na
Synthetic diamond false negative rate (%)	16.0	16.3	na	2.9	7.8	na

Notes:

na Not applicable per instrument manufacturer

[1] Primary Stone set, C Stone set and DE Stone set deviates from the standard as a reduced number of stones were analyzed; Primary Set deviation – the standard call for 748 diamonds to be tested, 747 diamonds were tested; Set C deviation – the standard calls for 900 mixed stones to be tested, 877 stones were tested; Set DE deviation – the standard calls for 52 synthetic stones to be tested, 51 stones were tested.

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 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.
Diamond False Positive Rate	Defined as the fraction of synthetic diamonds incorrectly classified as diamond by the specific diamond verification instrument.
Synthetic Diamond False Positive Rate	Defined as the fraction of diamonds incorrectly classified as synthetic diamonds by the specific diamond verification instrument.
Diamond False Negative Rate	Defined as the fraction of diamonds incorrectly classified as synthetic diamond by the specific diamond verification instrument.
Synthetic Diamond False Negative Rate	Defined as the fraction of synthetic diamonds incorrectly classified as 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 **********