



**DIAMOND
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**PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT**

Summary Report for: Gemmological Institute of India / Arotek / QChK AdC



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Assessment Dates: June 18, 2019 through July 1, 2019
Testing ID Number: 1910514S-A*
Assessment Testing ID: 1910514-A
Report Date: September 24, 2019

*This report supersedes the test report dated July 16, 2019. The report has been amended to correct the device name.


Approval By:

Judith V Haber

Judith V. Haber
Technical Manager CRS

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	Gemmological Institute of India / Arotek / QChK AdC		
	Date:	September 24, 2019	Testing ID:

Manufacturer's Name: Gemmological Institute of India / Arotek
Instrument Model: QChK AdC
Serial Number: QCHKADC00002
Software Version: 18.01.05
Lab Manager: Winson Wong
Analyst/Operator: Mr. Sandeshane, Dr. Sastry, Joseph Tiburcio

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 (Simple)
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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supp. Set A (>2.00 mm, D-J colour) 249 diamonds	<input checked="" type="checkbox"/>		
Supp. Set AB (>2.00 mm, D-J colour) 49 synthetic diamonds		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supp. Set B (>2.00 mm, K-Z colour) 250 diamonds	<input type="checkbox"/>		
Supp. Set C (1.00-2.00 mm, D-J colour) 737 diamonds and 140 synthetic diamonds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supp. Set D (1.00-2.00 mm, D-J colour) 250 diamonds	<input checked="" type="checkbox"/>		
Supp. Set DE (1.00-2.00 mm, D-J colour) 51 synthetic diamonds		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supp. Set E (0.10-2.00 mm, K-Z colour) 250 diamonds	<input type="checkbox"/>		

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 (%)	94.2	88.6
Synthetic diamond accuracy (%)	88.9	96.3
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	11.1	3.7
Synthetic diamond false positive rate (%)	5.8	11.4
Diamond false negative rate (%)	5.8	11.4
Synthetic diamond false negative rate (%)	11.1	3.7

Notes:

na Not applicable per instrument manufacturer

[1] This instrument does not classify stones as 'Refer'

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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 (%)	98.3	96.4
Synthetic diamond accuracy (%)	87.4	95.8
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	12.6	4.2
Synthetic diamond false positive rate (%)	1.7	3.6
Diamond false negative rate (%)	1.7	3.6
Synthetic diamond false negative rate (%)	12.6	4.2

Notes:

na Not applicable per instrument manufacturer

[1] This instrument does not classify stones as 'Refer'

Results of instrument testing speed assessment - Expert

Rate of Testing Speed Test Method	Average Test Result
<input type="checkbox"/> Test Method A: Fixed number of stones	731 stones per hour
<input type="checkbox"/> Test Method B: Fixed time frame	
<input checked="" type="checkbox"/> Test Method C: Reduced number of stones	


Results of instrument testing speed assessment - Novice

Rate of Testing Speed Test Method	Average Test Result
<input type="checkbox"/> Test Method A: Fixed number of stones	273 stones per hour
<input type="checkbox"/> Test Method B: Fixed time frame	
<input checked="" type="checkbox"/> Test Method C: Reduced number of stones	

Notes:

None

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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 ^[2]	D & DE ^[2]	E & DE
Diamond accuracy (%)	95.1	91.6	na	86.0	96.0	na
Synthetic diamond accuracy (%)	90.0	85.7	na	97.9	92.2	na
Diamond referral rate (%)	na ^[1]	na ^[1]	na	na ^[1]	na ^[1]	na
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]	na	na ^[1]	na ^[1]	na
Diamond false positive rate (%)	10.0	14.3	na	2.1	7.8	na
Synthetic diamond false positive rate (%)	4.9	8.4	na	14.0	4.0	na
Diamond false negative rate (%)	4.9	8.4	na	14.0	4.0	na
Synthetic diamond false negative rate (%)	10.0	14.3	na	2.1	7.8	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 ^[2]	D & DE ^[2]	E & DE
Diamond accuracy (%)	98.7	97.2	na	96.3	96.4	na
Synthetic diamond accuracy (%)	88.0	85.7	na	97.1	92.2	na
Diamond referral rate (%)	na ^[1]	na ^[1]	na	na ^[1]	na ^[1]	na
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]	na	na ^[1]	na ^[1]	na
Diamond false positive rate (%)	12.0	14.3	na	2.9	7.8	na
Synthetic diamond false positive rate (%)	1.3	2.8	na	3.7	3.6	na
Diamond false negative rate (%)	1.3	2.8	na	3.7	3.6	na
Synthetic diamond false negative rate (%)	12.0	14.3	na	2.9	7.8	na

Notes:

na Not applicable per instrument manufacturer

[1] This instrument does not classify stones as 'Refer'


[2] C Stone set and DE Stone set deviates from the standard as a reduced number of stones were analyzed; 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

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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 *****

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