



PROJECT ASSURE DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT

Summary Report for: Dharmanandan Research Centre's (DRC Techno) / J-mini

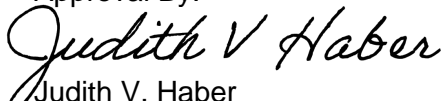


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Received Date: April 29, 2019
Invid Number: 696434
Assessment Dates: May 7, 2019 through May 13, 2019
Testing ID Number: 1907906S-A*
Assessment Testing ID: 1907906
Report Date: August 16, 2019

*This report supersedes the test report dated May 22, 2019. The report was amended to correct the stone size to 0.86mm+(0.003 ct.+).

Approval By:


Judith V. Haber
Global Technical Lead Chemistry

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	DRC Techno, J-mini		
	Date:	August 16, 2019	Testing ID:

Manufacturer's Name: DRC Techno
Instrument Model: N/A
Serial Number: 0400183M019
Software Version: 1.0.0.1
Lab Manager: Winson Wong
Analyst/Operator: Joseph Tiburcio, Vignesh Kevadiya

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	0.86 mm+ (0.0.003 ct.+)
Stone Color Range	Color Range D to K
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 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 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 (%)	93.9	77.0
Synthetic diamond accuracy (%)	84.4	98.4
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	15.6	1.6
Synthetic diamond false positive rate (%)	6.1	23.0
Diamond false negative rate (%)	6.1	23.0
Synthetic diamond false negative rate (%)	15.6	1.6

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 (%)	99.9	98.6
Synthetic diamond accuracy (%)	75.9	91.1
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	24.1	8.9
Synthetic diamond false positive rate (%)	0.1	1.4
Diamond false negative rate (%)	0.1	1.4
Synthetic diamond false negative rate (%)	24.1	8.9

Notes:

na Not applicable per instrument manufacturer

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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	935 stones per hour
<input checked="" type="checkbox"/> Test Method B: Fixed time frame	
<input 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	660 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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	Date:	August 16, 2019	Testing ID:	1907906S-A	

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 (%)	96.7	85.5	na	77.7	74.8	na
Synthetic diamond accuracy (%)	84.7	83.7	na	98.6	98.0	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 (%)	15.3	16.3	na	1.4	2.0	na
Synthetic diamond false positive rate (%)	3.3	14.5	na	22.3	25.2	na
Diamond false negative rate (%)	3.3	14.5	na	22.3	25.2	na
Synthetic diamond false negative rate (%)	15.3	16.3	na	1.4	2.0	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 synthetics to be tested, 51 stones were tested.

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 (%)	99.9	100.0	na	98.1	100.0	na
Synthetic diamond accuracy (%)	76.7	73.5	na	91.4	90.2	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 (%)	23.3	26.5	na	8.6	9.8	na
Synthetic diamond false positive rate (%)	0.1	0.0	na	1.9	0.0	na
Diamond false negative rate (%)	0.1	0.0	na	1.9	0.0	na
Synthetic diamond false negative rate (%)	23.3	26.5	na	8.6	9.8	na

Notes:

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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 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 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.
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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