



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

**Summary Report for: Dharmanandan Research Centre's (DRC Techno)
/ D-Secure Plus**



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Testing ID Number: 1908524S-A*
Assessment Testing ID: 1908524
Report Date: August 16, 2019

*This report supersedes the test report dated May 28, 2019. The report was amended to correct the stone color to D-K and the stone size to 0.86mm+(0.003 ct.+).

Approval By:

Judith V Haber

Judith V. Haber
Global Technical Lead Chemistry

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	DRC Techno, D-Secure		
	Date:	August 16, 2019	Testing ID:

Manufacturer's Name: DRC Techno
Instrument Model: D-Secure Plus
Serial Number: 20087DP18
Software Version: 1.0.0.4
Lab Manager: Winson Wong
Analyst/Operator: Joseph Tiburcio, Ramesh Pasupleti, 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+ (0.003 ct.+)
Stone Color Range	Stone Color D to K
Loose / Mounted	Loose
Single / Batch Stone Testing	Batch
Automated / Manual Feed	Manual Feed

Summary of Assessment

The instrument has been verified to be able to screen loose, 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-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 (%)	94.7	96.4
Synthetic diamond accuracy (%)	85.9	96.9
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	14.1	3.1
Synthetic diamond false positive rate (%)	5.3	3.6
Diamond false negative rate (%)	5.3	3.6
Synthetic diamond false negative rate (%)	14.1	3.1

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 (%)	94.7	95.2
Synthetic diamond accuracy (%)	87.4	96.3
Diamond referral rate (%)	na ^[1]	na ^[1]
Synthetic diamond referral rate (%)	na ^[1]	na ^[1]
Diamond false positive rate (%)	12.6	3.7
Synthetic diamond false positive rate (%)	5.3	4.8
Diamond false negative rate (%)	5.3	4.8
Synthetic diamond false negative rate (%)	12.6	3.7

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	948 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	600 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 (%)	94.4	95.6	na	96.1	97.2	na
Synthetic diamond accuracy (%)	85.3	87.8	na	97.9	94.1	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 (%)	14.7	12.2	na	2.1	5.9	na
Synthetic diamond false positive rate (%)	5.6	4.4	na	3.9	2.8	na
Diamond false negative rate (%)	5.6	4.4	na	3.9	2.8	na
Synthetic diamond false negative rate (%)	14.7	12.2	na	2.1	5.9	na

Notes:

na Not applicable per instrument manufacturer

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

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 (%)	97.1	87.6	na	95.4	94.8	na
Synthetic diamond accuracy (%)	88.7	83.7	na	97.1	94.1	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 (%)	11.3	16.3	na	2.9	5.9	na
Synthetic diamond false positive rate (%)	2.9	12.4	na	4.6	5.2	na
Diamond false negative rate (%)	2.9	12.4	na	4.6	5.2	na
Synthetic diamond false negative rate (%)	11.3	16.3	na	2.9	5.9	na

Notes:

na Not applicable per instrument manufacturer

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

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 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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