



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

Summary Report for: PJSC ALROSA / ALROSA DIAMOND INSPECTOR



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Preliminary Testing ID: 1911677S-A*
Assessment Testing ID: 1911677-A
Report Issue Date: July 23, 2019

*This report supersedes the test report dated July 17, 2019. The report has been amended as requested by the client to correct the name of the instrument and correct the applicable notes to include how the instrument defined synthetic diamonds as 'Ila, refer to lab'.

Approval By:

Judith V Haber
Judith V. Haber
Global Technical Lead Chemistry

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	PJSC ALROSA, ALROSA DIAMOND INSPECTOR		
	Date:	July 23, 2019	Testing ID:

Manufacturer's Name: PJSC ALROSA
Instrument Model: ALROSA DIAMOND INSPECTOR
Serial Number: IDA 04.88.333
Software Version: DIP 2.0
Lab Manager: Winson Wong
Analyst/Operator: Julie Mason

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 in sections 7.3 and 7.4 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, Synthetic diamonds and Diamond simulants
Stone Size Range	2.0 – 14.4 mm (0.03 – 10.0 ct.) Flat Facet ≥1.5 mm in diameter
Stone Color Range	Stone Color D to J
Loose / Mounted	Loose and Mounted
Single / Batch Stone Testing	Single 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 from synthetic diamonds in the size range of 2.0 to 10.0 mm (0.03 to 3.8 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	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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, 48 diamond simulants		<input checked="" type="checkbox"/>	<input checked="" 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, 140 synthetic diamonds and 145 diamond simulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supp. Set D (1.00-2.00 mm, D-J colour) 250 diamonds	<input type="checkbox"/>		
Supp. Set DE (1.00-2.00 mm, D-J colour) 51 synthetic diamonds, 47 diamond simulants		<input 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

Test Property	Results for Loose, Polished Stone Test Sets	
	Primary and A&AB Combined	C and D&DE Combined
Diamond accuracy (%)	96.4	na
Synthetic diamond accuracy (%)	na ^[1]	na
Diamond simulant accuracy (%)	100.0	na
Diamond referral rate (%)	3.6	na
Synthetic diamond referral rate (%)	100 ^[2]	na
Diamond simulant referral rate (%)	0.0	na
Diamond false positive rate (%)	0.0	na
Synthetic diamond false positive rate (%)	0.0	na
Diamond simulant false positive rate (%)	0.0	na
Diamond false negative rate (%)	0.0	na
Synthetic diamond false negative rate (%)	0.0	na
Diamond simulant false negative rate (%)	0.0	na

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument as it defines synthetic diamonds as 'Ila, refer to lab'

[2] This instrument classifies synthetic diamonds as 'Ila, refer to lab'

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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	24 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 stone assessment testing of individual stone sets

Test Property	Results for Loose, Polished Stone Test Sets					
	Primary	A & AB	B & AB	C ^[2]	D & DE ^[2]	E & DE
Diamond accuracy (%)	96.4	96.4	na	na	na	na
Synthetic diamond accuracy (%)	na ^[1]	na ^[1]	na	na	na	na
Diamond simulant accuracy (%)	100.0	100.0	na	na	na	na
Diamond referral rate (%)	3.6	3.6	na	na	na	na
Synthetic diamond referral rate (%)	100 ^[2]	100 ^[2]	na	na	na	na
Diamond simulant referral rate (%)	0.0	0.0	na	na	na	na
Diamond false positive rate (%)	0.0	0.0	na	na	na	na
Synthetic diamond false positive rate (%)	0.0	0.0	na	na	na	na
Diamond simulant false positive rate (%)	0.0	0.0	na	na	na	na
Diamond false negative rate (%)	0.0	0.0	na	na	na	na
Synthetic diamond false negative rate (%)	0.0	0.0	na	na	na	na
Diamond simulant false negative rate (%)	0.0	0.0	na	na	na	na

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument as it defines synthetic diamonds as 'Ila, refer to lab'

[2] This instrument classifies synthetic diamonds as 'Ila, refer to lab'

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 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.
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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