



**DIAMOND  
PRODUCERS  
ASSOCIATION**



**PROJECT ASSURE  
DIAMOND VERIFICATION INSTRUMENT STANDARD**

**Summary Report for: Gemlogis LEO UV+IR Diamond Segregator**



**Prepared For:** Lisa Levinson  
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Antwerp, 2018  
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Received Date: October 30, 2018  
Invid Number: 676194  
Assessment Dates: December 26, 2018 through January 17, 2019  
Testing ID Number: 1820115S-A\*  
Assessment Testing ID: 1820115-A  
Report Date: March 26, 2019

\*This report supersedes the test report dated February 5, 2019. This report has been amended in the speed test results, reclassify synthetics as 'refer' as well as formatting changes requested by the DPA.


Approval By:

*Judith V Haber*

Judith V. Haber  
Global Technical Lead Chemistry

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	Gemlogis, LEO UV+IR Diamond Segregator		
	Date:	March 26, 2019	Testing ID:

**Manufacturer's Name:** Gemlogis  
**Instrument Model:** GEM-0007-01  
**Serial Number:** 071817020A  
**Software Version:** Not Applicable  
**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 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	1.3 to 15.3 mm (0.01 to 12 ct.)
Stone Color Range	Stone Color D to M
Loose / Mounted	Loose and Mounted
Single / Batch Stone Testing	Single
Automated / Manual Feed	Manual Feed

**Summary of Assessment**

The instrument has been verified to be able to screen loose, round, brilliant cut diamonds, synthetic diamonds and diamond simulants in the range of 1.3 to 3.7 mm (0.01 to 0.20 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	☒	☒	☒
Supp. Set A (>2.00 mm, D-J colour) 249 diamonds	☒		
Supp. Set AB (>2.00 mm, D-J colour) 50 synthetic diamonds, 47 diamond simulants		☒	☒

**Results of instrument stone assessment testing of Primary and A&AB Combined**

Test Property	Results for Loose, Polished Stone Test Sets Primary and A&AB Combined	
	Diamond accuracy (%)	51.6
Synthetic diamond accuracy (%)	na <sup>[1]</sup>	
Diamond simulant accuracy (%)	91.3	
Diamond referral rate (%)	3.7	
Synthetic diamond referral rate (%)	52.3 <sup>[2]</sup>	
Diamond simulant referral rate (%)	0.0	
Diamond false positive rate (%)	4.6	
Synthetic diamond false positive rate (%)	0.0	
Diamond simulant false positive rate (%)	45.2	
Diamond false negative rate (%)	44.7	
Synthetic diamond false negative rate (%)	47.7	
Diamond simulant false negative rate (%)	8.7	


Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument does not classify stones as ‘Synthetic’

[2] This instrument classifies synthetic stones as ‘Type II’ which were reported as ‘Refer’

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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	219 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	D & DE	E & DE
Diamond accuracy (%)	50.3	55.4	na	na	na	na
Synthetic diamond accuracy (%)	na <sup>[1]</sup>	na <sup>[1]</sup>	na	na	na	na
Diamond simulant accuracy (%)	91.9	89.6	na	na	na	na
Diamond referral rate (%)	4.3	2.0	na	na	na	na
Synthetic diamond referral rate (%)	48.0 <sup>[2]</sup>	65.3 <sup>[2]</sup>	na	na	na	na
Diamond simulant referral rate (%)	0.0	0.0	na	na	na	na
Diamond false positive rate (%)	4.4	5.2	na	na	na	na
Synthetic diamond false positive rate (%)	0.0	0.0	na	na	na	na
Diamond simulant false positive rate (%)	46.4	41.3	na	na	na	na
Diamond false negative rate (%)	45.5	42.6	na	na	na	na
Synthetic diamond false negative rate (%)	52.0	34.7	na	na	na	na
Diamond simulant false negative rate (%)	8.1	10.4	na	na	na	na

Notes:

na Not applicable per instrument manufacturer

[1] Does not apply because this instrument does not classify stones as 'Synthetic'


[2] This instrument classifies synthetic stones as 'Type II' which were reported 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**

<b>Diamond Accuracy</b>	Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as diamond.
<b>Synthetic Diamond Accuracy</b>	Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as synthetic diamond.
<b>Diamond Simulant Accuracy</b>	Defined as the fraction of test stones correctly classified by the specific diamond verification instrument as diamond simulant.
<b>Diamond Referral Rate</b>	Defined as the fraction of diamonds that could not be classified by the specific diamond verification instrument and requires further.
<b>Synthetic Diamond Referral Rate</b>	Defined as the fraction of synthetic diamonds that could not be classified by the specific diamond verification instrument and requires further testing.
<b>Simulant Referral Rate</b>	Defined as the fraction of diamond simulants that could not be classified by the specific diamond verification instrument and requires further testing.
<b>Diamond False Positive Rate</b>	Defined as the fraction of synthetic diamonds and/or diamond simulants incorrectly classified as diamond by the specific diamond verification instrument.
<b>Synthetic Diamond False Positive Rate</b>	Defined as the fraction of diamonds and/or diamond simulants incorrectly classified as synthetic diamonds by the specific diamond verification instrument.
<b>Diamond Simulant False Positive Rate</b>	Defined as the fraction diamond and/or synthetic diamonds incorrectly classified as diamond simulants by the specific diamond verification instrument.
<b>Diamond False Negative Rate</b>	Defined as the fraction of diamonds incorrectly classified as synthetic diamond and/or diamond simulant by the specific diamond verification instrument.
<b>Synthetic Diamond False Negative Rate</b>	Defined as the fraction of synthetic diamonds incorrectly classified as diamond and/or diamond simulant by the specific diamond verification instrument.
<b>Diamond Simulant False Negative Rate</b>	Defined as the fraction of diamond simulants incorrectly classified as diamond and/or synthetic diamond by the specific diamond verification instrument.
<b>Rate of Testing Speed</b>	Defined as the average speed at which the diamond verification instrument evaluates unknown stones.

\*\*\*\*\* End of Report \*\*\*\*\*

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