



**DIAMOND  
PRODUCERS  
ASSOCIATION**



**PROJECT ASSURE  
DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT**

**Summary Report for: Gemometrics / GemPen**



**Prepared For:** Lisa Levinson  
Diamond Producers Association Belgium ESV  
Hoveniersstraat 22  
Antwerp, 2018  
Belgium

Received Date: September 17, 2018  
Invid Number: 671440  
Assessment Dates: February 21, 2019 through February 22, 2019  
Preliminary Testing ID: 1903505S-B\*  
Assessment Testing ID: 1903503  
Report Date: May 23, 2019

\*This report supersedes the test report dated March 26, 2019. The report has been amended to include combined results for the C and D+DE stone sets. The stone table has also been updated to stone sets C and D+DE as requested by the DPA.

Approval By:

*Judith V. Haber*

Judith V. Haber  
Global Technical Lead Chemistry

LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.

UL Verification Services, Inc., 85 John Road, Canton, MA 02021  
Phone: (781) 821-2200 | Fax: (781) 821-9266 | Website: [www.ul.com/consumer-products](http://www.ul.com/consumer-products)

	Gemometrics, GemPen		
	Date:	May 23, 2019	Testing ID:

**Manufacturer's Name:** Gemometrics  
**Instrument Model:** NA  
**Serial Number:** 00000014  
**Software Version:** N/A  
**Lab Manager:** Winson Wong  
**Analyst/Operator:** Julie Mason, Anthony Tedeschi

### 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	Diamond and Synthetic diamonds
Stone Size Range	No limitation provided in the manual
Stone Color Range	Stone Color D to J
Loose / Mounted	Loose and Mounted
Single / Batch Stone Testing	Single Stone Testing
Automated / Manual Feed	Manual

### Summary of Assessment

The instrument has been verified to be able to screen loose and mounts, round, brilliant cut diamonds and synthetic diamonds in the size range of 0.86 to 3.7 mm (0.003 to 0.20 ct.) and D to J color range.

LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.

	Gemometrics, GemPen		
	Date:	May 23, 2019	Testing ID:

**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 and 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 (%)	98.7	99.5
Synthetic diamond accuracy (%)	84.9	95.3
Diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>
Synthetic diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>
Diamond false positive rate (%)	15.1	4.7
Synthetic diamond false positive rate (%)	1.3	0.5
Diamond false negative rate (%)	1.3	0.5
Synthetic diamond false negative rate (%)	15.1	4.7

Notes:

na Not applicable per instrument manufacturer

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

*LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.*

	Gemometrics, GemPen		
	Date:	May 23, 2019	Testing ID:

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 (%)	99.7	99.9
Synthetic diamond accuracy (%)	85.4	93.7
Diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>
Synthetic diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>
Diamond false positive rate (%)	14.6	6.3
Synthetic diamond false positive rate (%)	0.3	0.1
Diamond false negative rate (%)	0.3	0.1
Synthetic diamond false negative rate (%)	14.6	6.3

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	813 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	594 stones per hour
<input type="checkbox"/> Test Method B: Fixed time frame	
<input checked="" type="checkbox"/> Test Method C: Reduced number of stones	

*LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.*

	Gemometrics, GemPen				
	Date:	May 23, 2019	Testing ID:	1903503S-B	

### 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 (%)	99.6	96.0	na	99.6	99.2	na
Synthetic diamond accuracy (%)	85.3	83.7	na	98.6	86.3	na
Diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>	na	na <sup>[1]</sup>	na <sup>[1]</sup>	na
Synthetic diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>	na	na <sup>[1]</sup>	na <sup>[1]</sup>	na
Diamond false positive rate (%)	14.7	16.3	na	1.4	13.7	na
Synthetic diamond false positive rate (%)	0.4	4.0	na	0.4	0.8	na
Diamond false negative rate (%)	0.4	4.0	na	0.4	0.8	na
Synthetic diamond false negative rate (%)	14.7	16.3	na	1.4	13.7	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 (%)	99.6	100.0	na	100.0	99.6	na
Synthetic diamond accuracy (%)	86.0	83.7	na	95.0	90.2	na
Diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>	na	na <sup>[1]</sup>	na <sup>[1]</sup>	na
Synthetic diamond referral rate (%)	na <sup>[1]</sup>	na <sup>[1]</sup>	na	na <sup>[1]</sup>	na <sup>[1]</sup>	na
Diamond false positive rate (%)	14.0	16.3	na	5.0	9.8	na
Synthetic diamond false positive rate (%)	0.4	0.0	na	0.0	0.4	na
Diamond false negative rate (%)	0.4	0.0	na	0.0	0.4	na
Synthetic diamond false negative rate (%)	14.0	16.3	na	5.0	9.8	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

*LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.*

	Gemometrics, GemPen		
	Date:	May 23, 2019	Testing ID:

**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 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>Diamond False Positive Rate</b>	Defined as the fraction of synthetic diamonds incorrectly classified as diamond by the specific diamond verification instrument.
<b>Synthetic Diamond False Positive Rate</b>	Defined as the fraction of diamonds incorrectly classified as synthetic diamonds by the specific diamond verification instrument.
<b>Diamond False Negative Rate</b>	Defined as the fraction of diamonds incorrectly classified as synthetic diamond by the specific diamond verification instrument.
<b>Synthetic Diamond False Negative Rate</b>	Defined as the fraction of synthetic diamonds incorrectly classified as 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 \*\*\*\*\*

*LETTERS & REPORTS: UL Verification Services, Inc. (UL) letters and reports are issued for the exclusive use of the clients to whom they are addressed. No quotations from reports or use of the UL name is permitted except as expressly authorized in writing. Letters and reports apply only to the specific materials, products or processes tested, examined or surveyed and are not necessarily indicative of the qualities of apparently identical or similar materials, products or processes. The liability of UL with respect to services rendered shall be limited to the amount of consideration paid for such service and not include any consequential damages. This report or certificate does not relieve sellers/suppliers from their contractual responsibility with regard to the quality/quantity of this delivery, nor does it prejudice clients' right to claim towards sellers/suppliers for compensation for any apparent and/or hidden defects not detected during our random inspection or testing. UL has not performed a complete analysis of the product. The results contained in this report indicate that the product has passed or failed the specific tests only. These test results, even if rated as "Passed," do not indicate or certify that the product is safe for commercial or consumer use.*