



**DIAMOND
PRODUCERS
ASSOCIATION**



**PROJECT ASSURE
DIAMOND VERIFICATION INSTRUMENT STANDARD REPORT**

Summary Report for: Assessment Report for: Massive Test Lab / G-Certain



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

Received Date: January 15, 2019
Invid Number: 683442
Assessment Dates: March 13, 2019 through March 18, 2019
Testing ID Number: 1904857S-A*
Assessment Testing No: 1904857
Report Date: May 22, 2019

*This report supersedes the test report dated April 3, 2019. The report has been amended to include the combined test results for C and D+DE stone sets. The stone table has been updated to include stone sets C and D+DE as requested by the DPA.

Approval By:

Judith V. Haber

Judith V. Haber
Global Technical Lead Chemistry

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Phone: (781) 821-2200 | Fax: (781) 821-9266 | Website: www.ul.com/consumer-products

| | | | |
|---|-----------------------------|--------------|--------------------|
|  | Massive Test Lab, G-Certain | | |
| | Date: | May 22, 2019 | Testing ID: |

Manufacturer's Name: Massive Test Lab
Instrument Model: NA
Serial Number: MTLG0027018
Software Version: Version 3.0
Lab Manager: Winson Wong
Analyst/Operator: Anthony Tedeschi, Joseph Tiburcio

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 | 0.6 to 14.4 mm (0.001 to 10 ct.) |
| Stone Color Range | Stone Color D to Z |
| Loose / Mounted | Loose and Mounted |
| Single / Batch Stone Testing | Batch |
| 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-Z 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 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

| Test Property | Results for Loose, Polished Stone Test Sets | |
|---|---|---------------------|
| | Primary and A&AB Combined | C and D&DE Combined |
| Diamond accuracy (%) | 99.7 | 99.3 |
| Synthetic diamond accuracy (%) | 69.3 | 95.3 |
| Diamond referral rate (%) | 0.2 | 0.6 |
| Synthetic diamond referral rate (%) | 13.1 | 0.0 |
| Diamond false positive rate (%) | 17.6 | 4.7 |
| Synthetic diamond false positive rate (%) | 0.1 | 0.1 |
| Diamond false negative rate (%) | 0.1 | 0.1 |
| Synthetic diamond false negative rate (%) | 17.6 | 4.7 |

Notes:
None

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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 | 908 Stones per Hour |
| <input type="checkbox"/> Test Method B: Fixed time frame | |
| <input checked="" type="checkbox"/> Test Method C: Reduced number of stones | |

Notes:
None

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 (%) | 99.7 | 99.6 | 100.0 | 99.2 | 99.6 | 94.0 |
| Synthetic diamond accuracy (%) | 70.7 | 65.3 | 59.2 | 97.1 | 90.2 | 90.2 |
| Diamond referral rate (%) | 0.3 | 0.0 | 0.0 | 0.7 | 0.4 | 5.6 |
| Synthetic diamond referral rate (%) | 14.0 | 10.2 | 18.4 | 0.0 | 0.0 | 2.0 |
| Diamond false positive rate (%) | 15.3 | 24.5 | 22.4 | 2.9 | 9.8 | 7.8 |
| Synthetic diamond false positive rate (%) | 0.0 | 0.4 | 0.0 | 0.1 | 0.0 | 0.4 |
| Diamond false negative rate (%) | 0.0 | 0.4 | 0.0 | 0.1 | 0.0 | 0.4 |
| Synthetic diamond false negative rate (%) | 15.3 | 24.5 | 22.4 | 2.9 | 9.8 | 7.8 |

Notes:
None

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. |

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| 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 incorrectly classified as diamond by the specific diamond verification instrument. |
| Synthetic Diamond False Positive Rate | Defined as the fraction of diamonds 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 by the specific diamond verification instrument. |
| Synthetic Diamond False Negative Rate | Defined as the fraction of synthetic diamonds incorrectly classified as 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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