HRD Antwerp | Europe's leading authority in diamond certification

Screening and detection of (near) colourless synthetic diamonds

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1. INTRODUCTION

Considering the rapid advances currently being made in diamond technology, the main task of the HRD Antwerp Research Department is to diligently monitor and conduct in-depth investigations on the latest developments in diamond synthesis and colour treatments. The research conducted by our team of experienced scientists is vital to safeguarding consumer confidence and key to developing new detection protocols for diamonds that are potentially synthetic or have been subject to colour enhancement.

We conduct all our research using exclusively non-destructive techniques so we do not damage the stones. We implement a variety of spectroscopic techniques that provide us with detailed information at a diamond's atomic level. HRD Antwerp continuously invests in its research department in order to ensure the laboratory is equipped with the state-of-the-art instruments required for cutting-edge diamond examination.

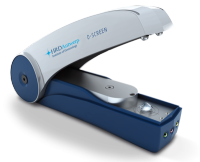
When synthetic diamonds are submitted to HRD Antwerp under disclosed conditions, HRD Antwerp can deliver a detailed "Laboratory Grown Diamond Report".

Photo: *HRD Antwerp Laboratory Grown Diamond Report*

2. HRD ANTWERP SCREENING INSTRUMENTS

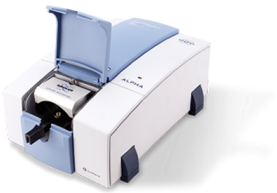
HRD Antwerp offers three different screening instruments to determine which diamonds require more thorough analysis.

D-Screen



The D-Screen is a portable diamond screening device specifically developed by HRD Antwerp. It distinguishes natural stones from stones that are possibly synthetic or HPHT colour enhanced. We use it to screen all types of loose polished diamonds, ranging from 0.2 ct to 10 ct, with D to J colour.

Alpha Diamond Analyzer



The Alpha Diamond Analyzer has been designed to perform reliable diamond detection and type screening. The latter enables the user to identify stones that are potentially synthetic or HPHT colour enhanced. The device is used for a wide range of shapes and sizes, for loose as well as mounted diamonds, and is applicable to any colour.

M-Screen

The M-Screen is a superfast automated melee screening device that screens round brilliant diamonds from 0.01 ct to 0.20 ct, with D – J colour, for potentially synthetic diamonds, potentially HPHT colour-enhanced diamonds and simulants. It automatically

feeds, screens and sorts the diamonds at a superfast speed of no less than three diamonds per second, which enables the screening of entire parcels instead of requiring sampling.

M-Screen Plus *(in development)*
In order to meet market demand, HRD Antwerp is currently developing the M-Screen Plus, which will be launched in January 2017. The device includes the same features as the M-Screen, with the main difference being that it can screen diamonds within the 0.01 ct to 0.20 ct range at a speed of up to 5 stones per second.

3. DETECTION INSTRUMENTS

DiamondView™
The growth structures in a diamond provide vital information concerning the origin of a diamond. The DiamondView™ instrument makes it possible to distinguish natural diamonds from synthetic diamonds based on characteristic growth features in the diamond.

IR Spectroscopy
In addition to the screening instruments, IR spectroscopy is used to verify the diamond type.

UV-VIS and PL spectroscopy
These two spectroscopic techniques are used to determine if defects characteristic of *HPHT* and *CVD* diamonds are present in the diamond being examined.

Advanced research
The HRD Antwerp Research department was established when the company was founded in 1974, as even then there was a profound need for a dedicated research unit. The rapid advances in diamond technology mean that the HRD Antwerp research department must continue to diligently monitor the latest developments in diamond synthesis and colour treatments. Staying ahead of the curve when it comes to detecting synthetic or potentially colour-enhanced diamonds is vital to safeguarding consumer confidence.

4. REPORT AND SCREENING DOCUMENTS

Laboratory Grown Diamond Certificate
After a complete analysis in the lab following the above mentioned screening/detection procedure, HRD Antwerp issues a Laboratory Grown Diamond Report. The average turnaround time to obtain the Report varies between 10 – 15 days. Each lab-grown diamond examined by HRD Antwerp will have a laser inscription matching the corresponding HRD Antwerp Laboratory Grown Diamond Report.

Screening melee-size diamonds
HRD Antwerp offers a screening service for parcels of round, melee-size brilliant diamonds. The parcels are analysed with the M-Screen and Alpha Diamond Analyzer in order to separate natural diamonds from potentially synthetic or HPHT colour-enhanced diamonds. The parcel is returned to the customer after 2 days, with the natural diamonds and possibly synthetic or HPHT colour-enhanced diamonds in separate sealed bags. Furthermore, a corresponding screening document is added to the parcel.

For more information concerning HRD Antwerp's products & services visit ***www.hrdantwerp.com***