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- *LAB ALERT: FIRST colourless melee-sized (1.6 mm) CVD synthetic detected in a parcel of natural diamonds*

On March 20th – during the DiamondShow in Basel – GGTL Laboratories has detected the first high-quality colourless CVD synthetic diamond in a parcel of melee diamonds. It is an as-grown (= untreated) type IIa diamond of F colour and IF clarity.

After several years of rumours and fear of the trade of colourless CVD synthetic diamonds polluting parcels of natural colourless diamonds and after 10% of ≈15 million colourless melee diamonds tested in the past 5 years at our laboratories, GGTL Laboratories has finally found the very first undeclared melee-sized colourless CVD synthetic diamond in a parcel of ≈6'000 natural diamonds that have been purchased in India. This diamond was found during the DiamondShow in Basel, where we were exhibiting with our DFI Mid-UV Laser^{+} fluorescence system.

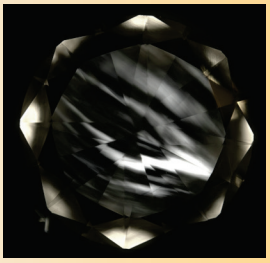

Figure 1: The first melee-sized (1.6 mm diameter) colourless CVD synthetic diamond, not treated post growth, as seen under crossed polarizing filters. The gray to black lamellar extinction bands are characteristic for CVD synthetic diamonds.

GGTL Laboratories is testing large amounts of colourless and coloured melee diamonds for the watch and jewellery industry and has recently detected the very first undeclared melee sized CVD synthetic diamonds of vivid yellow colour in a parcel of melee diamonds originating from Hong Kong (see our Newsletter #4 from March 20th 2015, or The Journal of Gemmology *LINK*, Vol. 34, No. 4, 2014, pp. 300–302).
The discovery of the first colourless CVD diamond in melee parcels was much anticipated but it finally took unusually long for the first undeclared melee sized stone to be actually found in the market.
This tiny (1.6mm diameter) CVD synthetic diamond was graded F colour, had no inclusions at 10x and hence was graded IF clarity. Under crossed polarizing filters, immersed in methylene iodide, the stone exhibited distinct gray to black lamellar extinction, typical for CVD synthetic diamond (Figure 1). When not familiar with this more lamellar appearing pattern, one may confuse this with the so-called Tatami strain pattern, so typical for natural (and HPHT treated natural) type IIa and low nitrogen type Ia diamonds.

Main characteristics of the colourless CVD diamond:

- Type IIa.
- Transparent to UV.
- Rich in silicon defects.
- F colour, IF clarity, untreated (« as-grown »).
- Many defects characteristic for CVD diamond observable in photoluminescence spectroscopy.
- Typical strain patterns under crossed polarizing filters.

The stone was detected using the DFI Mid-UV Laser+ fluorescence imaging and spectroscopy system, because it showed uncommon “greenish” orange luminescence combined with a strong Si-centre and distinct 467 nm emission in the luminescence spectrum (Figure 2).
The laser excited photoluminescence spectrum recorded with a 532 nm laser at 77K confirmed what was clearly indicated by the DFI system, and the stone was unambiguously identified as an as-grown CVD synthetic diamond, high in silicon-vacancy defects (Si center) (Figure 3).

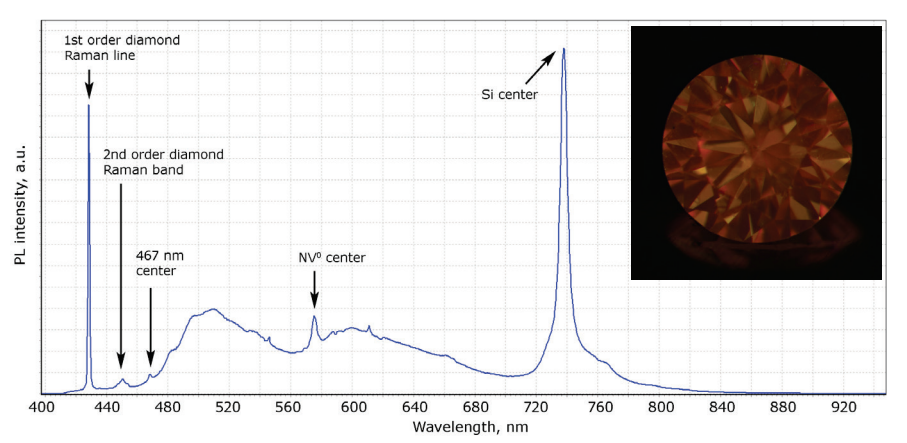

Figure 2:
The luminescence image and spectrum (recorded with the DFI system) of this colorless CVD synthetic diamond. The spectrum is strongly dominated by the Si center peak. With exception of the NV^0 center emissions all other features are characteristic of CVD synthetic diamond.

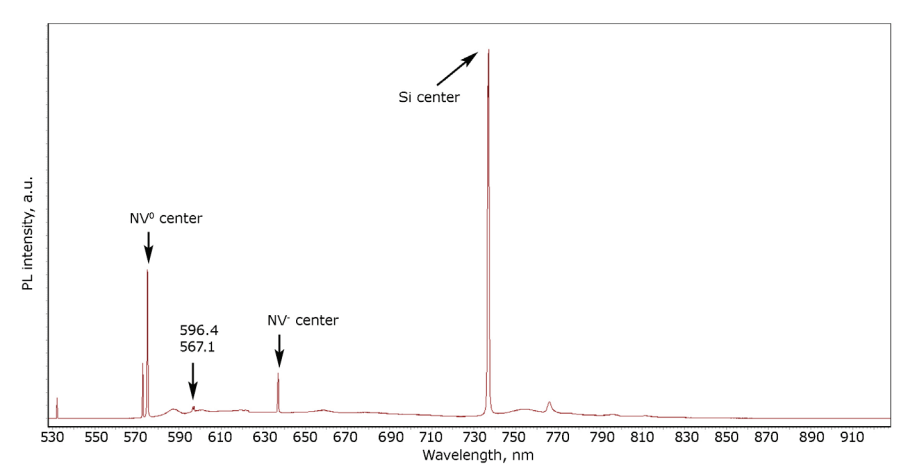

Figure 3:
The laser photoluminescence spectrum recorded using a 532 nm laser confirms the findings of the DFI system and clearly identifies the stone as a CVD synthetic diamond.

This small diamond is thus the very first published confirmed melee-sized CVD synthetic diamond that has been discovered by a laboratory in a parcel of natural diamonds submitted by a client for testing.
We have to point out though, that in millions of diamonds we have not found one single synthetic stone and that for the time being this CVD synthetic diamond described here has the same “exotic” status like the yellow CVD diamond discovered in a parcel in autumn 2014.
Until these cases occur repetitively and in higher percentages than 0.016% (1 stone in 6000) there is no reason to believe that high-quality melee-sized colourless CVD synthetic diamonds are currently a major problem of the diamond market.

Your GGTL Laboratories team

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