LETTERS

New Spectral Evidence for GE POL Diamond Detection

We have read with interest the article titled "Spectroscopic Evidence of GE POL HPHT-Treated Natural Type IIa Diamonds," by David Fisher and Raymond Spits from De Beers, in the Spring 2000 issue of *Gems & Gemology*. We congratulate the authors on this excellent work.

This letter is to advise your readers that our team has reached both comparable and complementary results to those of Fisher and Spits. The SSEF Swiss Gemmological Institute is using a Renishaw Raman microspectrometer operated with an argon-ion 514.5 nm laser in conjunction with a cryogenic sample stage. While our preliminary results published in *Revue de Gemmologie* (No. 138/139, 1999, pp. 2–11) and *Journal of Gemmology* (Vol. 27, No. 2, 2000, pp. 73–78) were based on room-temperature Raman measurements, we now have analyzed 21 GE POL diamonds and 31 untreated type IIa diamonds at liquid nitrogen temperature. Our results confirm the criterion based on the ratio of 637/575 nm luminescence proposed by Fisher and Spits.

We introduce here a new and related criterion that, when combined with the 637/575 ratio, can be used to further confirm the identification of GE POL diamonds. It is based on the shape of the 637 nm peak in type IIa diamonds: The *full width at half maximum* (FWHM; figure 1) of this peak is at or below 11 cm^{-1} in untreated diamonds, while that of GE POL diamonds is at or above 13 cm^{-1} (figure 2), as determined by J.-P. Chalain using a standard computer program. This criterion was applicable for 20 of the 21 GE POL samples and 21 of the 31 untreated diamonds; the remaining stones did not show any 637 nm peak. The FWHM of the peak is a measure of the residual strain in the diamonds, and the implication of this difference is that the HPHT processing increases the strain slightly (A. T. Collins, pers. comm., 2000).

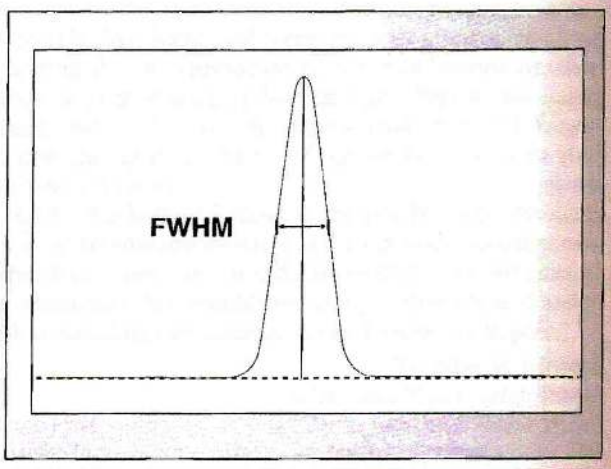
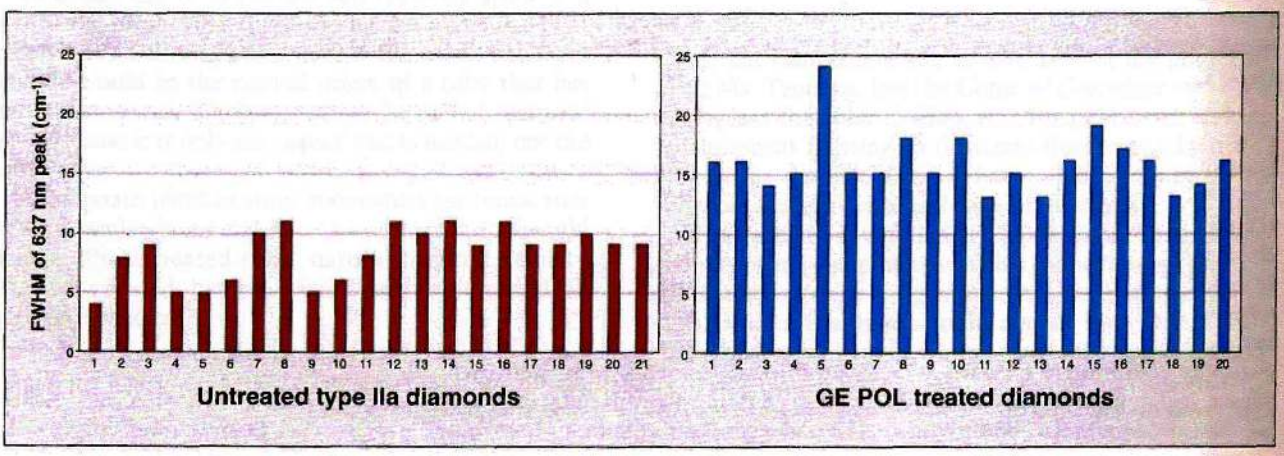


Figure 1. The full width at half maximum (FWHM) of a peak is the measurement of its width at a position equal to half its height. For the current photoluminescence study, FWHM is expressed in cm^{-1}.

Figure 2. The FWHM of the 637 nm luminescence peak measured at liquid nitrogen temperature is at or above 13 cm^{-1} in GE POL diamonds, while that of untreated type IIa diamonds (both colorless and brown) is at or below 11 cm^{-1}.



We feel that these results, together with further spectroscopic features, confirm the ability of a well-equipped gemological laboratory to identify GE POL diamonds.

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J.-P. Chalain, DUG
Director of SSEF Diamond Department
Dr. E. Fritsch
Professor, University of Nantes

What Is "Natural"?

On reading the article on emerald enhancement in the Winter 1999 issue (by S. F. McClure, T. M. Moses, M. Tannous, and J. I. Koivula, pp. 176–185), I was horrified to see the statement "Conclusion . . . NATURAL EMERALD" on the new GIA Gem Trade Laboratory "Emerald Report." This statement, printed in bold lettering, is misleading, contradicts information in finer print, and damages credibility.

A "reasonable person" may have no knowledge about gem treatments, but will believe she understands what is meant by a *natural* item. To the public, the declaration of an item as natural means that the condition of the object is as natural as the object's origin.

If the question arises as to whether a lady's hair is natural, the issue is not just whether it grew on her (or any other human's) head, but whether the curls and/or the color are artificially altered. Everyone understands that cutting a lady's hair does not preclude it from being termed *natural* because cutting of hair, to make it easier to wear and to show it to best advantage, is entirely expected. It is also expected that most gems will be cut to make them easier to wear and show them to their best advantage, so cut gemstones can be called "natural" if they are not treated.

Wording that distracts attention from treatment with the excuse of emphasizing the origin of the untreated raw material—which is no longer untreated, so does not qualify as natural—is misleading even if done innocently. At worst it could be deliberate misrepresentation.

Of course the word *natural* can correctly apply in a more limited way when it is referring to a particular characteristic of an object, rather than to the object itself. An example would be the natural origin of a ruby that has been heat treated. This should not be called "natural ruby" because it is only one aspect that is natural, not the entire stone.

Appropriate identification statements for items that are not completely natural in origin and condition would include: "heat treated ruby, natural origin," "clarity enhanced emerald, natural origin," and "cultured black pearl, natural color."

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In Reply

Although Mr. Cartier has raised some interesting points, we feel his interpretation of the word *natural* is too strict.

The wording of the conclusions on Identification Reports (e.g., "Natural Ruby. Evidence of heat treatment is present.") has been used for decades at the GIA Gem Trade Laboratory, and I believe similar wording is used by most major labs that issue identification reports on gem materials. We have had very few comments, if any, regarding the interpretation of the conclusions on the hundreds of thousands of Identification Reports we have issued over the years. We know that many of these Reports end up in the hands of consumers, also with virtually no confusion.

GIA's fundamental mission for nearly seven decades has been to educate jewelers and to provide gemological research in support of our industry—ultimately protecting the consumer. We would not compromise these beliefs with misleading conclusions on our Laboratory Reports.

Thomas M. Moses
GIA Gem Trade Laboratory
New York

Photo Enhancement?

The photographs by Maha Tannous in the recent article on color-change garnets (K. Schmetzer and H.-J. Bernhardt, Winter 1999, pp. 196–201) are truly outstanding.

Besides merely solving the problem of different colored backgrounds resulting from the use of fluorescent and incandescent light sources—which has vexed all previous photographers—it was solved in a manner which duplicated every single reflection from every single facet.

Such an accomplishment truly deserves the accolades of all who have struggled with gemstone photography. I believe an explanation of the camera, film, and lighting techniques used to accomplish these data would surely be a contribution to gemology.

W. Wm. Hanneman, Ph.D.
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In Reply

Okay, Dr. Hanneman, you caught us—not the photographer, Ms. Tannous, but the *Gems & Gemology* staff. We did replace the color in the garnet image that we had for incandescent lighting to illustrate fluorescent lighting. Nor is this the first time we have modified an image to show our readers the *actual* color of the stone.

The problem is very basic: The cameras, films, lights, and processing equipment available cannot always capture the distinctive color of a gem material. For example, many synthetic emeralds routinely appear blue when photographed, regardless of who photographs them. We add

Continued on page 188