

TRADE ALERT: ARTIFICIAL RESIN IN RUBIES

Rubies often contain fissures, mostly due to geological conditions in which they formed, but also due to their brittleness, supported by the incorporation of chromium traces (responsible for the beautiful red colour of ruby) into their crystal structure. Especially rubies which formed in marbles, such as the famed deposits in the Mogok Stone Tract, but also similar rubies from Vietnam, Tajikistan, Afghanistan, and even East Africa (e.g. Kenya, Tanzania) are prone to containing rather large fissures, thus reducing the clarity and apparent beauty of such stones.

It is not astonishing that such a ruby – as for any gemstone containing fissures – is traditionally filled with colourless oil, to modify and enhance its clarity. A timely reminder of this often neglected fact was described in detail in the last issue of the SSEF Facette in 2017 (No. 23, page 16).

Very recently however, we came across a series of fine Burmese rubies (Mogok-type), which were treated with artificial resin (polymer-type) to modify the clarity of these fissured stones (Figure 1). Having seen in the past decades at SSEF only a very small number of rubies which showed small glued chips, this new find at the laboratory is rather alarming. These newly treated stones show fine and deep fissures, which are filled with a polymer of assumingly very liquid consistency (similar to the ExCel™ treatment of emeralds), which was then hardened to stabilise the filler. The visual effect of this clarity modification is quite noticeable, as the resin-filled fissures are rather difficult to see. Under the microscope, this observation is confirmed as these resin-filled fissures show distinctly reduced reflection effects compared to unfilled (or oil-filled) fissures. Furthermore, these fissures reveal few small, but structured air bubbles (see Figure 2) and occasionally tiny worm-like dendrites located mostly entirely within the fissures (see Figure 3). These structured dendrites are clearly different from the delicate rounded dendritic patterns (floral aspect) known from oil-filled fissures. An unambiguous detection of this filler type is provided by infrared spectroscopy (FTIR, see Figure 4), indicating the same pattern of absorption peaks known and described in scientific gemmological literature for artificial resin (polymers) in emeralds (Kiefert et al. 1999).

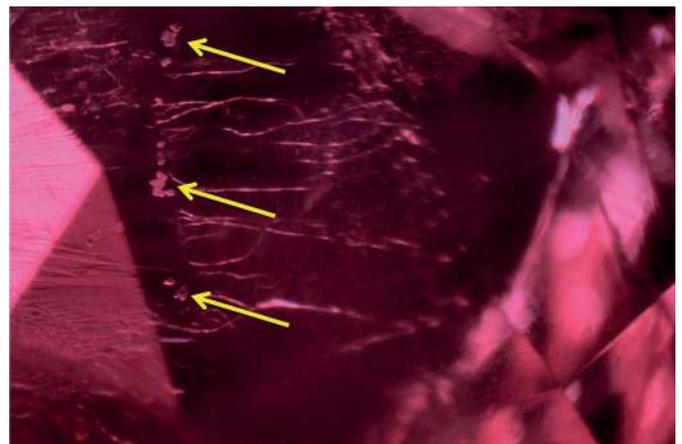
To reassure the trade, we would like to add that from a lab's perspective, the detection of artificial resin in rubies is possible using well established analytical procedures. As we follow a strict full disclosure policy at SSEF, such artificial resin fillers in rubies are identified and quantified in the comments section of our SSEF reports (see Figure 5) whenever present in a ruby (or any other gemstone!).

On a more general level we think that this issue has to be properly addressed by the trade and as early as possible. So far, the ruby trade – at least in the high-end segment- has been spared the turmoil and problems which have shaken the emerald market for years because of

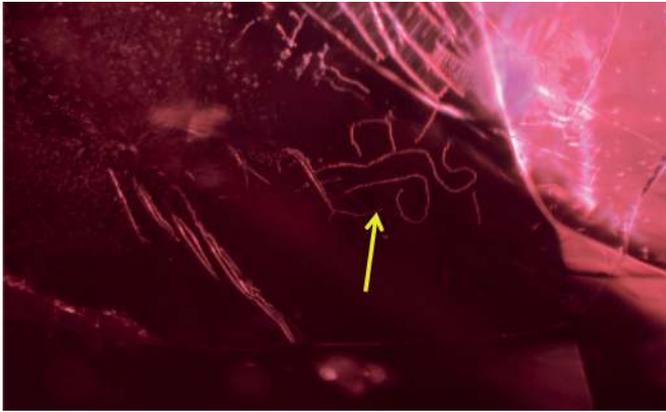
undisclosed filler substances. With this new and alarming find, we urge the ruby trade and producers to take strong action against this new practice of using artificial resin in rubies (of high quality) and against anybody involved in this treatment issue with the aim of protecting the image of rubies as valuable gemstones and to maintain the confidence of consumers in the ruby trade. * **Dr. M.S. Krzemnicki, SSEF**



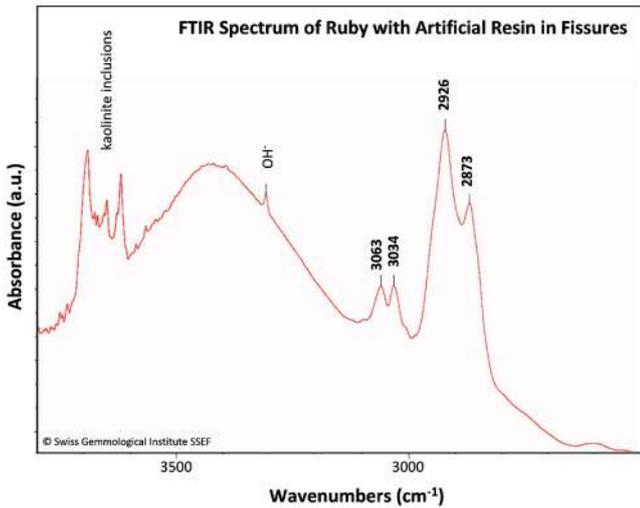
△ **Figure 1:** Series of rubies (2.5 - 4.5 ct) all containing fissures filled with artificial resin. Photo: V. Lanzafame, SSEF



△ **Figure 2:** Small structured air bubbled (yellow arrows) in a ruby fissure filled with artificial resin. Photo: M.S. Krzemnicki, SSEF



△ Figure 3: Fine structured worm-like dendrites (yellow arrow) in a ruby fissure filled with artificial resin. Photo: M.S. Krzemnicki, SSEF



△ Figure 4: FTIR spectrum of a ruby with peaks (labelled) indicating the presence of artificial resin in fissures. The sharp peaks at about 3600 cm⁻¹ are related to fine kaolinite-type (clay mineral) inclusions naturally occurring in many rubies. Spectrum: SSEF

magnification 2.0x

Gemstone Report No. SPECIMEN

Weight:	4.986 ct
Shape & cut:	oval, brilliant / step cut
Measurements:	10.08 x 9.29 x 4.97 mm
Colour:	red of medium strong saturation
Identification:	R U B Y (variety of natural corundum)
Comments:	The analysed properties confirm the authenticity of this transparent ruby.
	No indications of heating.
	Moderate amount of artificial resin in fissures at the time of testing
	Origin: Burma (Myanmar)

Important Note: The conclusions on this Gemstone Report reflect our findings at the time it is issued. A gemstone could be modified and/or enhanced at any time. Therefore, the SSEF can at any time be released if it does not correspond with the Gemstone Report. Only the report with the valid original signature, embossed stamp and Proof Tag label affixed on to the surface of the laminated report is a valid document. PDF copies and copies of a Gemstone Report are not legally binding. See terms and conditions on reverse side and www.ssef.ch/terms-conditions. © The Gemstone Report is copyright © 2018.

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△ Figure 5: Specimen of an SSEF report indicating the presence and quantity of artificial resin in fissures.