

Ruby And Sapphire Grading Tools

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When someone wants to buy a gemstone or piece of gem-set jewelry, common questions include:

- Is it a genuine stone?
- Has it undergone any treatments?
- What is its quality?
- Is the price fair?

Proper answers to such questions are crucial for creating consumer confidence. This article addresses one of those questions, that of defining quality.

The prices of gems do not always reflect the underlying quality because prices are influenced by many factors completely apart from objective quality. For example, a piece might be priced high if it was bought at a time when the market price was higher; similarly a gem

might be priced lower if the seller is in need of money. Thus prices do not necessarily reflect quality.

That said, the gem trade has long used certain criteria for evaluating quality. In order to refine these criteria to improve consumer confidence, the Gem and Jewelry Institute of Thailand (GIT) has conducted in-depth research on the subject, specifically on gem corundum varieties. The objective is to create standards that provide an accurate, reliable measure for colored stones' quality.

Methodology

Both diamonds and colored stones are traditionally graded according to four important quality factors (4Cs): Color, Clarity, Cut and Carat Weight. But the impact of each factor on pricing differs from one variety to another. For example, the clarity of yellow sapphire is, on the average,

higher than blue sapphire, and blue sapphire is typically of higher clarity than ruby. Hence, clarity defects in ruby have less of an impact on price than the same defects in blue sapphire.

GIT's quality assessment system for gem corundum has been developed and continually refined through consultations with both gem traders and gemologists (Janthayot *et al.*, 2001, 2003a, 2003b, 2003c, 2004, 2007; Siripant 1999; Siripant *et al.*, 2001 and 2003). The institute has established colored stone master sets for eight varieties of gem corundum, i.e., ruby, blue sapphire, padparadscha, yellow sapphire, pink sapphire, purple sapphire, orange sapphire and green sapphire. All master stones are oval shaped and of at least 0.50 ct each.

GIT's standards are based on the Munsell system. Common Thai color



The three most famous varieties of gem corundum: ruby, blue sapphire and yellow sapphire. Photos: Wimon Manerotkul (left and center) and Vlad Yavorsky (right)

names were first converted into Munsell color codes, and then modified so that they can be better understood by relying on the color code charts of the ISCC-NBS (Inter-Society Color Council-National Bureau of Standards) system.

Quality factors of ruby and sapphire were determined by polling gem dealers and gemologists, both at GIT and at international gem shows. The resulting data was then used as a foundation to establish the eight primary sets of master stones.

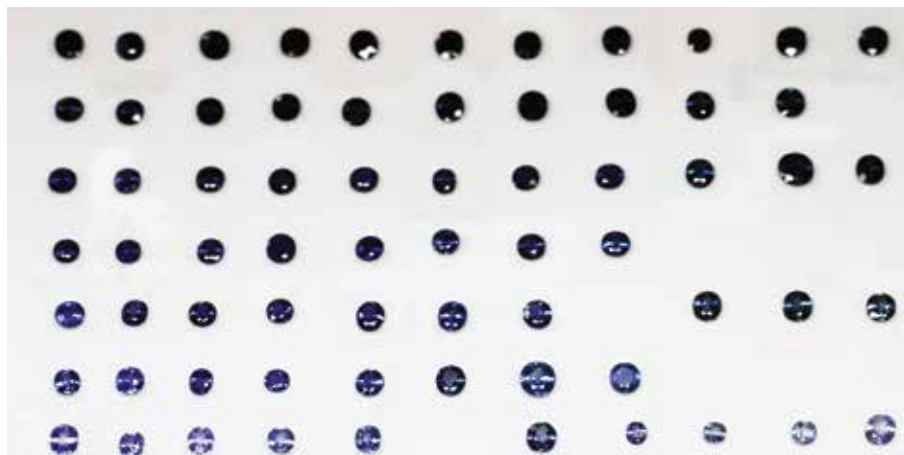
Color grading methodology is as follows. Stones must be placed



Examples of the primary masters that have been prepared, based on the Munsell color communication system. (Photos: GIT)



25 cm from the standard light source, which consists of a Gretag Macbeth 5000° Kelvin lamp with an intensity of 1200 lux). This lamp is designed to simulate north daylight. Stones are visually graded in the face-up position at a distance of 30 cm. Hue, tone, and saturation of the stones are considered; dispersion and scintillation are excluded. Overall stone quality was also taken into account, with stones chosen to be used in the standard sets needing to be similar in clarity, size and cutting style.



GIT's master sets of ruby and blue sapphire. (Photos: GIT)



Top quality samples of ruby (left) and blue sapphire (right). (Photos: Wimon Manerotkul)

Notable Colors: Pigeon's Blood and Royal Blue

Among the 4 C's factors, color has the greatest impact on price, particularly at the high end of the price scale.

In former times, the finest colors of ruby and sapphire were referred

to by ill-defined terms such as pigeon's blood red, royal blue and cornflower blue.

"Pigeon's blood" (ko-twe in Burmese) has been variously compared to drops of blood from the nose of a freshly-slain pigeon, to the color of the eye of a

white pigeon. The famous British gemologist, J.F. Halford-Watkins, who lived many years in Mogok, described it as a rich crimson without any trace of blue overtones (Hughes, 1997).

Typical terms for sapphire include "royal blue" and "cornflower blue".



Examples of well cut natural rubies and blue sapphires selected for master stones. (Photos: Jirapit Jakkrawanvibul)

Corundum Color Master Sets: Pigeon's Blood Ruby and Royal Blue Sapphire

Because of the ambiguity of these color terms, GIT set out to create master sets to define them (Janthayot et al., 2001, 2003a and 2007). These master sets were created by consultations with both gem dealers and gemologists. Each

master set comprises eight master stones in a range of vivid red or blue with intense color and medium to dark tone.

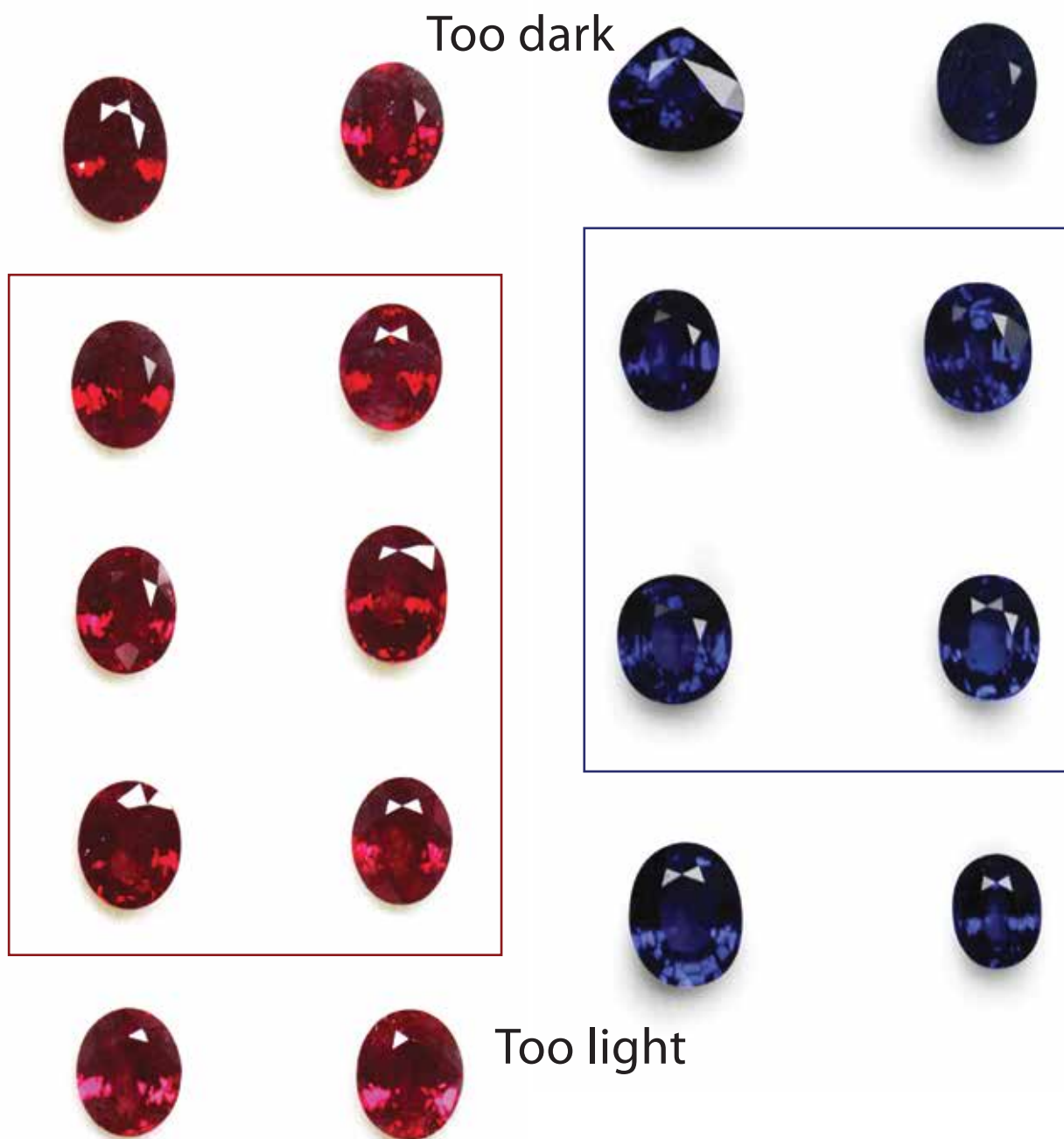
These master stone sets for "Pigeon's Blood" and "Royal Blue" colors illustrate, and identify common colors used in the gem trade. By standardizing such color definitions, it is hoped that this will

help consumer confidence.

Other Master Sets

GIT has also conducted research on clarity and cut grading standards for ruby and blue sapphire.

"Cut" is defined by a gemstone's proportions and finish. Proportion refers to the dimensions and overall symmetry of a gemstone, while finish



Pigeon's blood ruby and royal blue sapphire master sets. (Photo: GIT)



Ratios of crown-to-pavilion profile proportion in ruby. Proportion ratios of 1:3 to 1:4 enhance light return. (Photo: GIT)

describes the precision and neatness of the facets and polishing quality. Symmetrical face-up and profile symmetry, combined with crown-to-pavilion proportion ratios of about 1:3 to 1:4 leads to higher cutting grades.

Unfortunately, due to very high value of such stones, cutters are forced to maximize weight retention. Hence, very few stones possess ideal proportions.

Clarity is another factor that influences the value of ruby and sapphire. Clarity is determined based on the size, number, position, color and nature of inclusions. Ruby is rarely loupe-clean or even eye-clean. In contrast, sapphire generally features fewer inclusions, and thus loupe-clean or eye-clean stones are the standard in the trade.

Conclusion

GIT's ruby and sapphire quality evaluation system is intended to be used as a general standard in the gem and jewelry industry. The ultimate goal is to use these standards as tools for promoting the colored stone trade and building consumer confidence. 16

Acknowledgements

GIT would like to thank all of the gem traders, experts and researchers who have contributed to this project.

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