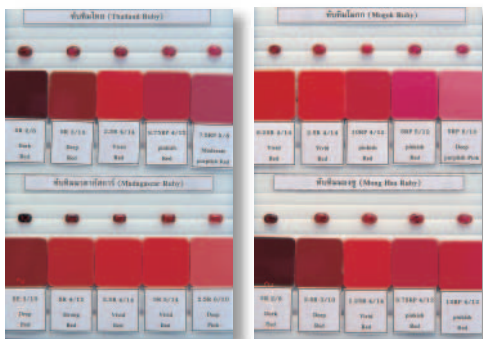


10.3.2 การประชุมร่วมระหว่างสถาบันและสมาคมผู้ค้าอัญมณีไทยและเครื่องประดับในโครงการวิจัยเรื่อง การจัดชั้นหรือเกรดทับทิม



ศาสตราจารย์ศักดา ศิริพันธุ์ ผู้อำนวยการสถาบัน และคณะ ร่วมประชุมหารือกับผู้แทนสมาคมผู้ค้าอัญมณีไทยและเครื่องประดับ เรื่อง การจัดเกรดทับทิม เพื่อจัดตั้งระบบการจัดเกรดทับทิมให้เป็นมาตรฐานกลางของผู้ส่งออกทับทิม ณ อาคารวิจัยและตรวจสอบอัญมณี เมื่อเดือนพฤศจิกายน 2544



การจัดเกรดสีทับทิมเมื่อเทียบกับแถบสีมาตรฐานของระบบ Munsell ภายใต้แสงมาตรฐาน 5000 K และได้มีการเชื่อมโยงรหัสสีของระบบ Munsell กับชื่อสีในระบบ ISCC-NBS เพื่อให้ได้ชื่อสีสามัญของทับทิมมาตรฐานทุกเม็ด และเชื่อมโยงรหัสสีของอัญมณีต้นแบบกับพิกัดสีในระบบสี CIE LUV ซึ่งเป็นระบบที่นิยมใช้ในเครื่องวัดสี (Spectrophotometer หรือ Colorimeter)



Thailand develops own ruby grading system

A ruby grading system aimed at helping gemstone dealers grade rubies and set up a proper pricing standard has been developed by the Gem and Jewelry Institute of Thailand (GIT) in cooperation with the Thai Gem & Jewelry Traders Association.

The grading system lists beauty, quality and value as the three factors governing the assessment of a ruby. Under the beauty criteria, the key factors to consider are colour, brilliance and transparency, the study said (full details will be published in an upcoming issue of JNA).

Professor Sakda Siriphant, head of the GIT, hopes the grading system will be

acknowledged internationally. Rubies submitted to the GIT are now being graded under the new system. Since the new grading system's introduction in January, more than 1,000 ruby grading certificates have to date been issued by the GIT, mostly to Japanese buyers, Professor Sakda said. A certificate costs 1,000 baht or about US\$22 and up, depending on the ruby's weight.

Thailand, the world's leading exporter of rubies, has recently stepped up promotion of the stone. It has declared 2002 Ruby Year, a project under which a promotion blitz targeting the Japanese market is being mounted (see JNA, March 2002, page 36).

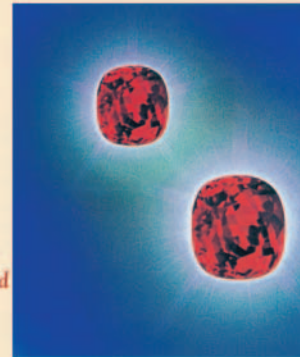
การบรรยายผลงานวิจัยให้แก่ผู้ประกอบการค้าอัญมณีชาวญี่ปุ่น 120 คน (ภาพถ่าย) การเผยแพร่ผลงานวิจัยเพื่อให้เป็นที่รู้จักและยอมรับโดยผลงานวิจัยดังกล่าวได้รับการตีพิมพ์จากนิตยสารระดับนานาชาติ เช่น Jewelry News Asia No.212 (แปลเป็นภาษาอังกฤษ), Business in Thailand (แปลเป็นภาษาอังกฤษ), Taiwan Jewelry No.55 (แปลเป็นภาษาจีน), Kashikey News Vol.11 (แปลเป็นภาษาญี่ปุ่น)



FEATURE | Gems & Jewelry

The new GIT Rubies Grading System

In only four years of operations, the Gem and Jewelry Institute of Thailand has already been recognized world-wide and has introduced objectivity in the highly subjective sector of coloured stones. Massimo-E. Buonaiuto gives us a glimpse into GIT's latest contribution.



Many coloured stones are the most frustrating to deal with by both buyers and traders. If the Four Cs – Cut, Clarity, Colour and Carat – are now well-understood key parameters in diamonds, in all other gems Colour is the most difficult to categorize.

This has contributed to the several difficulties that coloured stone traders' associations have in gaining the same recognition such as Diamond Bourses have.

The main problem is that choices of colours, hues and tones are a matter of both individual and cultural preference. Further, some of them are so rich in tinges and shades that it is made even more difficult to distinguish between main hues. The most awkward colours in gems are red, blue, green and yellow, particularly when they are present in intermediate or indefinite shades.

The Munsell Chart, the only objective reference based on colour saturation, is of relative use because its colours are too dull for gems, as their clarity and brilliance tend to trick the eye.

GIT, in its first year of operations (1999), had already overcome the deficiency in this respect by introducing a more sensitive classification, an instrumental tool which correlates perfectly with the Munsell system but which allows a very precise definition in gems: Prof Sakda Siripant's *Colour-Communication System*. This entailed a building up of a reference collection of master stones against which all gems submitted for grading could be matched.

In this endeavour, GIT received enthusiastic support by the Thai Gem and Jewelry Traders' Association (TGJTA), the largest exporter in the world of rubies and other coloured stones, and by the Tourist Authority of Thailand (TAT); acknowledging that classification leads to an equitable pricing tier – resulting in satisfaction of buyers and more effective exports as these can be customized to targeted countries.

A GIT survey in the Bangkok Gem and Jewelry Fair and among visitors of the GIT Gem Museum has in fact shown validity in the latter area by establishing that there are differences in the choice of rubies between buyers from a diversity of countries.

The new Grading System is the result of an unusual but highly synergic co-operation between chromatology and mineralogy research scientists and has revealed many practical benefits to the gem sector:

- It has introduced objective criteria in sorting qualities and colours, easily applicable throughout; starting from the rough;
- It has begun standardizing gem and colour terminology so that descriptions may be consistent across the sector and can thus be easily understood by both traders and buyers, equally;
- As a corollary, it has begun weeding out all confusing and vague terms that may have different meanings for traders and buyers;
- As a consequence, it will lead to a proper gem education for both.

"As an example, the principal difference between a fine ruby and a lower graded stone is the colour saturation or chroma and intensity of the hue (dominant colour) rather than a colour or hue shift." Prof. Sakda Siripant, GIT Director, comments, "Colour determination in rubies is also very important as it may identify their origin – but more work must be done, especially on origin determination."

The enclosed flow chart shows in synthesis the criteria developed for the classification and grading of rubies, hence we take a look into the terminology.

Beauty

The combination of subjective aesthetic qualities such as *attractiveness* of colour, *brilliance* and *transparency*.

Attractiveness depends on personal taste and discrimination: given by the balance of light and dark tones in a mosaic-like pattern that gives the gem a wonderful three-dimensional appearance, which is the effect of reflection and refraction caused by good and proper faceting.

Brilliance is the result of the play by refracted and reflected light inside and on the surface of a properly faceted gem: as the brilliance increases rubies become more valuable.

Transparency is dictated by the presence/absence of inclusions, blemishes and amorphous zones against the crystal's general background purity.

These three parameters were the basis to select **standard ruby sets**, two each of Thai, Mogok, Mong Hsu and Madagascar rubies, the present main sources for these gems. Each set was carefully selected so that each had 5 red colour levels varying from dark to light. Each stone has a colour code with a specific name based on the **Munsell system** (Hue Value/Chroma), which can be easily perceived and distinguished by the eye.

This set was also used for a successful survey of subjective preferences among Thai, Japanese, Americans, Europeans and Indians. The result was that people from different countries expressed different preferences regarding hue, tone and colour saturation.

Quality

It encompasses the quantitative evaluation of those parameters that contribute to *beauty* in rubies. The quality grading of a ruby depends on 4 independent criteria, namely: *colour grading*, *clarity grading*, *cut grading* and *carat weight*.

- *Colour grading* of a ruby is very difficult and more subjective than when grading diamonds, but it determines at least 50% of its final market value.

GIT's classification provides a meaningful system that is easily understood and used: therefore, this system can be directly related to market price.

The grading is complicated because we must consider three separate components that are both independent and interrelated: *hue*, *tone*, and *saturation* (colour intensity.)

- *Hue* describes the dominant and additional colours in a

gemstone that are visible to the naked eye. A purplish/red (PR) ruby has red as the dominant colour and purple as the secondary colour.

- *Tone* (synonym: value *pro parte*) defines the lightness or darkness of a colour perception.

- *Saturation* or *Chroma* is best described as the strength or intensity of the hue.

The GIT Colour Grading System is based on the Munsell Colour Chart.

- *Colour notations* used in grading are: *dark red* (5R 2/8), *deep red* (5R 3/10), *vivid red* (2.5R 4/14), *strong red* (5R 4/12), *pinkish red* (8.75R 4/12) and *purplish red* (7.5RP 5/8). The number codes are Munsell's - its charts are commercially available to any interested.

Each ruby was matched to the appropriate Munsell colour chip and viewed under a standard 5,000° Kelvin light source (0° K is the absolute zero temperature).

Each stone in the standard sets was assigned a Munsell colour code and name. The results were compared with the ISCC-NBS of the ASTM colour chart. Additionally the Munsell Colour Code can be converted into the colour coordinates of the L*a*b* V* and L*a*b* systems (see: GIT Colour Communication System).

Clarity

It is the second most important factor when evaluating rubies and its weight is 20-30% of the total grading. It is defined as: *excellent* (minute inclusions), *fine* (minor inclusions), *very good* (noticeable inclusions), *good* (moderate inclusions) and *fair* (significant inclusions) (see relative Tables).

Clarity is first determined with naked eyes and then under 10x magnification. Clarity is the assessed by a point system shown in synthesis in the enclosed table. The inclusions that affect it are classified as:

Minute inclusion (MiI): visible at x10 magnifications, very difficult or impossible to see with naked eyes;

Minor inclusion (MiI): Visible with 10x magnification, difficult to see with naked eyes.

Noticeable Inclusion (NI): Easily visible with 10x magnification, just able to see with naked eyes.

Moderate Inclusion (MoI): Very easily seen with 10x magnification, easy to see with naked eyes.

Significant Inclusion (SI): Very easily seen with 10x magnification, very easy to see with naked eyes.

Once it has been determined whether the gemstone is natural or synthetic, then it should be assessed whether the gemstone's colour and clarity are natural or have been altered artificially, (enhanced), as both factors will strongly affect the market value of the gem.



Dr Pornsawat Wathanakul advises that both enhanced and synthetic rubies could be of all hues present in natural rubies and they could be of better quality and show than their natural equivalent.

Therefore, if one is attracted by a particular stone, it is better to get it checked at one of the reputable laboratories.

Cut(ting)

It may be: excellent, fine, very good, good, and fair. It depends on the skills of the cutter to get the best out of a gem. Cut is the third important factor when evaluating rubies. The cut component is worth 10% to 20% of the total grade of a ruby. Its assessment criteria are: *proportion* and *finish*.

- *Proportion* is assessed on the basis of three parameters.

1- *Face-up balance*. When viewed from the top side, the opposite parts of the faceted stone should be exactly the same size and well shaped. The overall effect should be appealing to our eyes.

2- *Profile balance*. When viewed from the side of the table, the culet should be exactly centred, the girdle not wavy, and the pavilion bulge should be even. Total depth percentage (the height of a ruby measured from table to culet, divided by the width and multiplied by 100) should normally be between 60 and 65%. The crown height measured from table to girdle should fall between 1/4 to 1/3 of the total depth. The pavilion depth measuring from girdle to culet should vary between 2/3 to 3/4 of the total depth.

3- *Brilliance*. The light returned to the eye is known as brilliance. As the brilliance increases, rubies become more valuable. When light leakage occurs it is known as windowing; when dark areas are visible, it is known as extinction.

- *Finish* is also determined by three criteria

1- *Polish* gives surface characteristics such as smoothness

2- *Symmetry* takes into account shape, position, and arrangement of facets

3- *Facet arrangement* surveys and assesses the number of facets and their distribution. The facet arrangement should be consistent and harmonious, suitable to the cut style.

Carat

The weight also determines the price of the stone. A large-sized ruby should have a higher price per carat than a smaller-sized ruby of the same quality; smaller stones are easier to find than larger ones.

Virtue (Ar*te) or Value

At present, the term *value* in GIT context means the authenticity of the ruby; where it is actually from, whether its characteristics are natural or are the result of treatment and if so, which treatment; whether the stone is synthetic. For instance, a natural ruby without any treatment and originating from a world famous origin such as Mogok is considered by the trade to be a premium gemstone.

The term *value* has been adopted by the GIT because of its use in the trade but it is mainly used to define the commercial value of a gem and is also encountered in colour classification as a synonym of *tone*. As a result, it is liable to create confusion in the mind of both traders and buyers. Therefore, the term *virtue*, in the sense of the Greek *ar*te*, or the term *ar*te* itself, as is already in the English language, has been suggested as more appropriate, since it encompasses all the properties of the gem, *physical and non-physical*, such as those attributed to its origin by customs and lore, that ultimately determine its commercial value.

References

Siripant S., Pisutha-Armond V., Wathanakul P., Adichart W., Chanthayon P., Leelawattanastik T., Khankaew Y., & Singhabamring S. (2002) - A new Ruby Grading System set up by the Gem and Jewelry Institute of Thailand (GIT) for the Gemstone Industry. *Jl.Gem Jewelry*, 3 (15), pp. 8-14.