

LAB INFORMATION CIRCULAR

Synthetic Moissanite Roars Again!



Figure 1: Synthetic moissanite - loose and in jewellery

Synthetic Moissanite, when first launched in the market in the year 1997 by C3 Inc created a lot of concern and confusion in the trade, especially with respect to its identification and separation from diamonds. The main reason behind this was its thermal conductivity, which is as good as diamond and hence, jewellers relying mainly on thermal probe or 'diamond testers' failed to identify this man-made product, ending up making it a convoluted affair. On the other hand, it was, and is one of the straightforward diamond simulant to identify and differentiate. However, since then, synthetic moissanite and its jewellery became quite popular amongst the jewellers and consumers alike, because of its excellent durability as against any other diamond simulant. In addition, moissanite's lustre, fire and brilliance (more than double to that of diamond's) made it a very attractive gem, although the 'colourless' varieties tend to be slightly greenish, especially in sizes more than 0.50 carats. Until 3-4 years back, everything was settled down and synthetic moissanite established its own identity, posing no threat to the diamond industry and developed a multimillion-dollar industry of its own. Today, this man-made gem is marketed as Charles & Colvard created Moissanite.

In the last 3-4 years, synthetic moissanite has roared back, affecting the diamond industry. The development of black counterpart, which is often mixed in parcels of black diamond, has proved to be fatal, especially for the beading industry. Since last few years, we have been observing mixtures of black diamonds and black

moissanites in bead necklaces. This not only applies for beads but also for faceted stones, especially in smaller sizes. This was followed by the availability of moissanites in colour range of fancy green, brown, blue, purple, pink, etc. In the recent times, it has been observed that the greenish or yellowish tinted moissanites are now available in much purer to almost colourless with very slight tints of colour. And then recent encounter of colourless moissanites in jewellery, sold as diamond, has prompted us to cover this man-made gem in this edition of Lab Information Circular - just to buzz an alarm!

Synthetic Moissanite got its name from the discoverer, Dr. Henry Moissan, who in 1905 found tiny grains of silicon carbide in a meteorite impact in Arizona. However, natural moissanite is very rare and is found only as tiny grains. This is to be noted that, this material was first synthesized in 1893 for industrial uses.

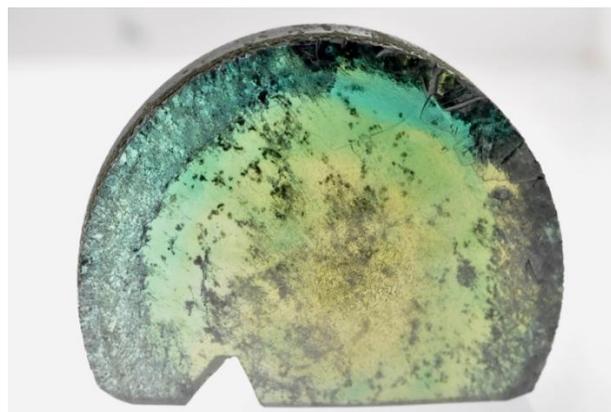


Figure 2: A slice of rough moissanite, weighing 348 carats

Initially, only cut and polished moissanites were available in the market, but now even rough is available, that too in fancy colours. The rough however, no where looks like a diamond, and is usually available as slices cut from a cylindrical crystal or a 'boule' (figure 2), in sizes as large as 348 carats. So, one can estimate the size of cut moissanite which can be produced from such sizes of rough.

Identifying synthetic moissanite.....

As stated previously, identification and separation of synthetic moissanite from diamond is straightforward and should not pose any problem even for a jeweller.

Say no to fancy testers; pick up your 10x loupe!

Many jewellers have been relying on fancy testers for separating diamond and synthetic moissanite and most of them are judging it wrong. We, ourselves procured one such fancy tester for the same purpose and did some reality check. The results were amazing - our moissanite became diamond! And it was not simply a diamond tester (thermal probe), but a moissanite tester. Therefore, instead of buying these fancy testers at some fancy prices, pick up your loupe to observe:

The Brilliance, which is much higher in a moissanite than a diamond. The value of dispersion is more than double in moissanite (0.104) than that in a diamond (0.044). As a result, the intensity of colour flashes visible in moissanite are much higher than in a diamond.

Double Refraction or doubling of facet edges is visible in a synthetic moissanite, while no such effect is seen in a diamond. When a particular facet edge/s are viewed from opposite direction, these appear as double, rather than a single image or edge. This is due to the high birefringence of 0.043 in moissanite, while diamond is singly refractive and hence lacks this property. This is the best and most effective method of separating the two. However, please ensure that the stone is observed from all sides and not only from the table. When viewed from table, doubling effect will not be visible due to the orientation of the 'c' or the 'optic' axis. The best angle is to view the culet through the crown facets.

What about black moissanites? These of course, do not display any of the features described above, except the lustre, hence, identification becomes lot more challenging. Black moissanite is usually opaque and display a granular texture or fine grains of silicon, which

appears reflecting, while black diamond usually displays some degree of transparency, especially in a fibre-optic light or a pen torch, with black colour present as patches or as concentrations along feathers or cracks.

And, what about the parcels?

Separating a mixture of diamond and moissanite by observing doubling of facet edges or high fire in each and every piece is practically not possible, especially when the sizes are too small, such as 'melee'. In such cases, the only requirement is a small bottle of Methylene Iodide (Di-iodomethane). This liquid, when stabilised, has specific gravity (SG) of 3.33, while diamond's SG is 3.50-3.52 and that of moissanite is 3.23. However, SG of black moissanite can go as low as 3.05. When a packet containing diamonds and moissanites is immersed into methylene iodide liquid, all diamonds will sink while all moissanites will float on the surface of the liquid. The fastest test to separate the packet! This test becomes more important in case of black moissanite, as the colour and transparency restricts to perform other tests. This test can however, be performed for single large stones also where one is not sure about the doubling of facet edges.

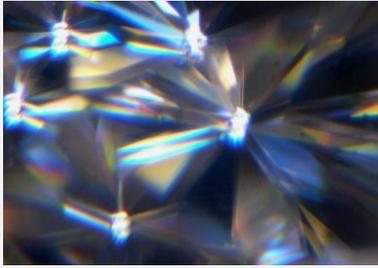
A strict no-no to hardness testing!

We have seen many specimens coming in for identification with some large scratches on their table, reminiscent of hardness testing. This is basically killing the polish of a gem, whether diamond or a moissanite. Please note, a diamond can scratch diamond! Hence, if a specimen under test is scratched by a fragment of diamond or culet of a faceted diamond, both moissanite as well as diamond will show a scratch, thereby damaging the specimen; therefore, it should be avoided in every possible situation, especially on cut and polished stones.

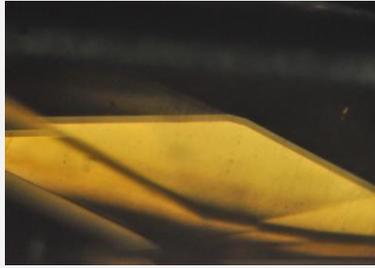
Although, synthetic moissanite is present in the market for quite a long time and has established its own identity, it is still presented as diamond, as in a recent encounter, and in various colours including the 'cheap' black. The confusion on its identification, especially with a 'probe' or a 'moissanite tester' still exists, which has to be cleared out. Look for the features described in this article - a 10x loupe along with specific gravity test is good enough to separate the moissanite from diamond.

See Box A for identification features of moissanite.

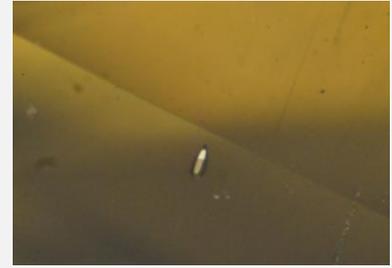
Box A: Features observed in synthetic moissanite



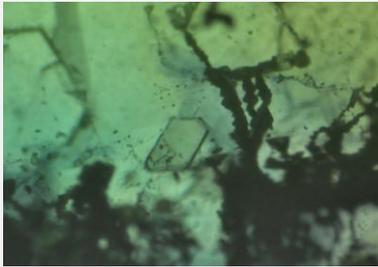
a. Doubling of culet and facet edges in this round brilliant cut moissanite



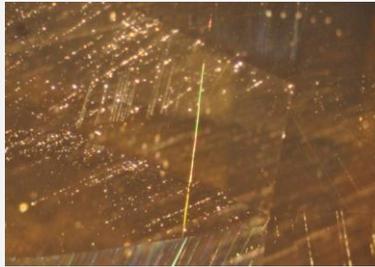
b. Doubling of facet edges in a rose-cut moissanite



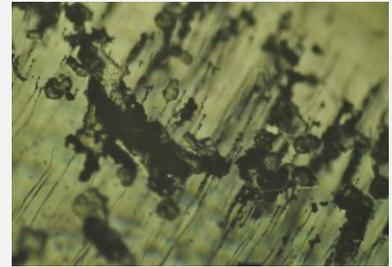
c. Moissanite often contains elongated transparent crystals



d. Platy pseudo-hexagonal crystals are also common in synthetic moissanite



e. Long etch channels or tubes are quite common in moissanites



f. Etch channels or tubes are usually attached to tiny crystals which are removed during cutting and polishing

For further help on separation of moissanite from diamond, feel free to visit the laboratory for discussions (with prior appointment)

Recently, Mr. Abdul Hafiz of Jaipur showed us a crystal of sapphire, reportedly from the legendary source, Kashmir. The crystal weighed 41 ct (8.2 grams) and measured approximately 38.50 mm in length and 11.75 mm in its maximum width.

The bipyramidal crystal (a) displayed subtle horizontal striations and a strong degree of colour zoning along the basal plane. When viewed from top, the colour appeared to be restricted along the edge, while the centre was colourless to white (b). This pattern of colour zoning is typically associated with the sapphires from Kashmir region, however, is also seen in those from Sri Lanka.

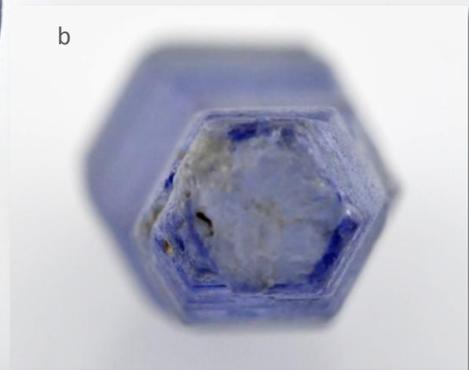
Although, the crystal was of remarkable size and of fine colour, it lacked the transparency to make an exceptional quality gem. It contained numerous cloudy inclusions, fingerprints, milky zones, which were visible through a small fractured surface.

No attempt was made to prove scientifically, the origin of this crystal.



a

SAPPHIRE CRYSTAL FROM KASHMIR



b



Gem Testing Laboratory announces the launch of Diamond Jewellery Certification

After serving the gem & jewellery trade for more than 40 years with dedication and integrity, the Gem Testing Laboratory is pleased to announce the launch of certification of diamond jewellery. This will mainly include the grading of diamonds on the basis of well established criteria of colour and clarity. The laboratory's tradition of presenting the facts will remain applicable to the grading results also, without compromises. We will continue to follow the policy of 'neutral' and 'unbiased' reporting of the facts on our identification or grading reports of jewellery. However, grading results are affected due to mounting limitations, and hence same shall be considered while evaluating the grades. These reports shall be issued on 'smart cards', rather than an A4 -sized standard reports.

The client needs to fill in the 'Client Declaration Form' while submitting a piece of jewellery.

Separate form has to be filled for each individual piece of jewellery. The form can be downloaded from the laboratory's website (<http://gtljaipur.info/pdf/GTL-Jaipur-Client-Declaration-Form.pdf>) and can also be obtained from the office.

Fees

Rs. 300 per carat or Rs. 500 per item, whichever is higher. These rates include service tax of 12.36%. Members of the Gem & Jewellery Export Promotion Council (GJEPC) can avail a discount of 20% on the above mentioned charges. While, we have also introduced a 'Corporate

Discount Membership', under which the membership holders can save 30% on certification charges. This membership shall be given to those clients who submit a minimum guarantee of 1000 carats per year and against a security deposit of Rs. 15,000 per year. The membership will expire on 31st March every year and if desired by the client, the security amount shall be carried forward to the next financial year. In case, a client takes the membership in middle of the year, guarantee of minimum quantity of diamonds submitted for grading shall be considered on pro-rata basis.

The discount of 30% will be applicable from the date of receipt of security deposit. The discount of 30% shall be applicable on every bill thereon. The security amount may be refunded to client on completion of target of 1000 carats. Please note, this membership is applicable only

for jewellery certification and not for loose diamonds or gemstones.

If a client is unable to complete the target of 1000 carats, the security amount of Rs. 15,000 will be forfeited, which will include service tax.

To apply for the 'Corporate Discount Membership', please submit the duly filled downloaded form (<http://gtljaipur.info/pdf/GTL-Jaipur-Corporate-Discount-Membership-Application-Form.pdf>) along with security deposit to the office. *For further details, feel free to contact GTL office.*

GJEPC INDIA
GEM TESTING LABORATORY
(Project of The Gem & Jewellery Export Promotion Council)

Diamond Jewellery Report

Ref no: **XXXXXXXXXXXX**
Date: **00/00/0000**

Article: **Diamond pendant in white and yellow gold**

Gross Weight : **2.2Gms**
Metal Purity¹ : **18K**
Diamond Weight¹ : **0.20 Cts**
Shape and Cut : **Round Brilliant**
Colour² : **H-I**
Clarity² : **VVS-VS**
Finish² : **Very Good**
Comments: **N/A**
Note: 1. As provided by the client
2. Grading subject to mounting limitations

See Disclaimer & security histogram at back

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