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Turkish delight

Master gem cutter crawls through remote mine in search of zultanite

By Rudi Wobito



Most specimens of zultanite are heavily included and not good enough to be cut into faceted gems.

From the moment I stepped off the plane in Bodrum, Turkey, I knew I was in a special place. I was invited last year to participate in the making of a Gems TV documentary about zultanite, a rare colour-changing diaspore found only in the remote mountainous area of Anatolia.

Named after the 36 sultans who ruled the region's Ottoman Empire in the late 13th century, zultanite is an extremely rare gemstone (even rarer than alexandrite) that displays dramatic colour changes according to light conditions. With regular indoor lighting, the gemstone appears champagne-coloured. In candlelight, zultanite becomes pink or raspberry, while under sunshine or fluorescent lights, it is kiwi green with dazzling flashes of yellow.

Our trip to the zultanite mine began with a bumpy, though picturesque, two-hour drive from the city of Milas. Located about 11 km from the nearest village, the site sits at an altitude of 1200 m. For Murat Akgun, the mine's owner, one of the biggest challenges mining the gemstone is the lack of electricity and water in the area. While generators supply electricity, all other provisions—including food and water—are trucked to the mine daily.

Given the site's remote location, miners bunk down in comfortable sleeping quarters complete with a kitchen, where a local chef prepares fresh meals daily. Although the Turkish government owns the land the mine sits on and the surrounding area, Akgun's company—Zultanite Gems LLC—is the official permit holder.

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Snowflake-cut zultanite.



Zultanite can display a cat's eye effect.

The search begins

Donning mining hats and flicking on their mounted lights, we ventured into the mouth of the cave, marching single file into the winding tunnel that snaked its way through the mountain. Although it seemed like we were deep inside the mine, we had walked only about 200 m. With the sweltering 45 C weather scorching the landscape outside, we were grateful for the cool surroundings.

While the mine's entrance was tidy, the deeper we went into the tunnel, the more debris we found scattered about, including rotting timbers previously used to shore up its walls. This was a newly discovered gemstone area and miners had yet to properly clean and support this part of the mine. The only sounds we could hear were our own, as the cave's twisting turns made for unusual acoustics. Although we were spaced about 3 m apart, the conversations of those ahead appeared to end abruptly around corners, leaving those behind to hear only the sound of footsteps and breathing.

Prior to our arrival, some of the miners had spent a few weeks preparing the area we were to mine, exposing many of the zultanite crystals and making our task somewhat easier. Sometimes, months go by without the yield of a single crystal. While zultanite was pervasive throughout the mine in the 1970s, the majority of crystals are now found only deeper inside, a testament to the days when the Turkish government mined bauxite from this site. Not knowing the value of what they had found and believing it was degrading the

bauxite, workers would break up the crystals. The government later abandoned the mine altogether due to economic and political reasons.

Coming to a hole about 2 m wide on one side of the cave, the next part of our journey included a 4.5-m climb down a rope ladder. Ducking under low areas, the team worked its way through the tunnel. Some spots were so narrow, we had to crawl on our bellies. I could barely manoeuvre myself through those spots and resorted to shifting my camera bag in front of me to squeeze past. About 40 minutes after entering the mine, we got our first glimpse of a zultanite crystal, a tiny reflection of light peering out from a tunnel wall. Taking up positions along the wall, we began loosening zultanite with our hand picks from the orange-coloured clay-like mud encasing it.

Taking a look inside

In general, most specimens of zultanite are heavily included and not good enough to be cut into faceted gems. While the return of rough on a gem mineral is generally between 20 to 35 per cent, zultanite garners less than two per cent.

With its flat-shaped crystals, zultanite has a tendency to split apart in one direction during the cutting process due to its perfect cleavage, making it one of the most difficult gemstones to cut. For example, while a specimen may have a clean area measuring 20 x 20 mm, it may only be 6 mm thick, which means it would have a maximum width of 9 mm. In all likelihood, part of the gemstone would disintegrate just by sawing it.

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Workers prepare for a Gems TV documentary on zultanite, a rare colour-changing diaspore found in the Anatolia region of Turkey.

Zultanite facts

- Type II gemstone;
- Requires no treatments or enhancement;
- Is usually eye-clean with some inclusions under 10x magnification;
- Can display a cat's eye effect;
- A hardness of '6.5' to '7' on the Mohs scale;
- A refractive index of 1.70 to 1.75; and
- Specific gravity of 3.39.



The cutting process for this gemstone is so delicate, very few will work with it, hence the invitation to participate in this documentary. Zultanite favours long diamond-type facets, as well as bowtie and radiant cuts. Despite the difficulties cutting it, zultanite is one stone that is conducive to our Snowflake cut. This may be due to the fact that we use very fine specialized cutting wheels to cut the grooves.

When making a pre-form, the stone must be ground parallel to the cleavage plane to prevent it from falling apart. The grinding is a slow and meticulous process that requires much patience. When the pre-form is finished, the facets are cut and polished. It is usually necessary to recut four out of five stones due to damage that occurs in the polishing process. However, once the stone is finished, it is quite durable.

Zultanite's rarity isn't just a matter of its scarcity. Accentuating the gemstone's inherent colours tests the skill of even master cutters, who must be careful to correctly orient each crystal to maximize its colour-changing properties. And with a yield of less than two per cent, its rarity is further demonstrated. For this reason, zultanite is extremely precious and hard to find in larger sizes—a five-carat gem is considered exceptionally rare. Recently, my brother Ralph and I cut a 20-carat radiant cut with no inclusions, an extreme rarity to say the least.

Reaching the masses

After about an hour of collecting rough, I finally found a crystal that was good enough to be faceted. In the span of two days, it took the work of more than 20 miners, engineers, the film crew, and myself to extract about 30 kg of rough, 90 per cent of which is likely to weigh less than three carats after cutting.

Although it was first faceted in the late 1970s, zultanite has only recently come into the market, finally making it to the Tucson gem shows in 2006. While it hasn't gotten a lot of press, that's all changing as more people become aware of it. Zultanite is quickly making the rounds with designers, however, it hasn't quite reached the masses.

Properly marketing a gemstone requires enormous amounts of money. Some television shopping networks are just starting to discover its potential and more are expected to offer it during the holiday season. Currently, the price of this gemstone is similar to tanzanite, but it won't be long before that changes. After seeing the amount of work that



Accentuating zultanite's inherent colours tests the skill of master cutters. Each crystal must be oriented correctly to maximize its colour-changing properties.

goes into mining the stone, it's surprising it doesn't cost more. At the moment, one- or two-carat stones can cost up to \$200 a carat wholesale depending on the volume sold. Three- to five-carat stones can go for \$300 to \$500 a carat. Some exceptional museum pieces can cost up to \$3000 per carat.

With several major trade shows a year, Turkey is fast becoming one of the major players in the international jewellery industry. It is the third largest manufacturer of gold jewellery in the world, the second biggest exporter of the precious metal after Italy, and comes a close third after Italy and India in production. The diamond trade is also seeing growth. Earlier this year, the International Diamond Laboratories (IDL) set up a laboratory in the heart of Turkey's diamond and jewellery centre. Located at the Istanbul Chamber of Jewelry (IKO), the lab is the first of its kind in that country and will service 6000 wholesalers and retailers in the Istanbul region.

Clearly, Turkey's booming industry is making itself known to the rest of the world, partly due to emerging facets such as zultanite. Since Akgun took over the mine, the people of Turkey have begun benefiting from these gems as they are now all legally exported and taxed. Thanks to his continuous work over the last 10 years, Turkey now has a gemstone of which it can be proud. ♡

Rudi Wobito and his brother, Ralph, are third-generation master cutters who have won several American Gem Trade Association (AGTA) Cutting Edge awards. Both Rudi and Ralph have been invited to judge the AGTA's Spectrum and Cutting Edge competitions on separate occasions. Their studio is located in Stouffville, Ont. Rudi can be contacted via e-mail at rudi@wobito.com.