

## Tanzanite.

By Dennis Durham

Tanzanite, named after the country of origin, Tanzania, was first found in that country in the 1960s, and then finding its niche in the world market place in the early 1970s.

The popularity of this gemstone is due to its trichroic colours of blue, purple and pink. The blue colour "table up" is the most sought-after, making orientation of the colours the main point of the cutting process in achieving a pleasing stone.

Cut stones in the size range 1 to 6 carats are the most popular, stones larger than six carats being quite scarce and quite expensive. Tanzanites are currently fetching as much as £500 per carat for the best of the blues.

Because of their relatively low hardness of just over 6 on the Mohs scale, they are really quite unsuitable for everyday wear in gem-set rings as they soon show signs of poor durability. No attempt is made by jewellers to advise purchasers of the weaknesses and the need of careful use. Yet the lovely colours are a magnet to unwitting purchasers to find very shortly afterwards that the sharpness of the crown facets start to become damaged.

Ideally stones should be set as pendants and/or earrings where wear is much less likely to occur. It will come as no surprise that I find myself having to re-create the crowns of Tanzanites because of the frayed facet edges. Seems a shame after spending so much money, that repairs have to be carried out. All too often the jeweller has neither the wherewith-all or skills to do a re-cut and polish and consequently they have to send them back to the cutter involving more cost and mostly to the buyer's account.

Tanzanites, as mined, are mostly muddy blue-green-orangey in colour and are a depressing sight, almost quite unsuitable for cutting a gem worthy of marketing. Consequently it is a "must" that some form of heat treatment is necessary to bring out the fine blue and purple shades.

Heat treatment is accomplished by placing stones buried in dry sand in a small cubicle and heating to a temperature of no more than 500 degrees centigrade in a suitable furnace. It is not necessary to prolong the heating, and the furnace should be shut down on attaining the temperature required and allowed to cool before removing the stones from the furnace. This process can be carried out in the same way for either rough or cut stones.

The transformation in colour wealth is spectacular.

### Cutting Instructions

Without doubt the best looking stones are those cut in emerald styling which gives the opportunity to view the long flashes of blue with an engagement of

purple from the ends. Orientation is vital to achieve the best colours and whilst facet rough comes in an infinite variety of shapes, one must decide to maximise recovery by choosing a "table up blue" or "table up purple", which best suits the rough in hand. Both alternatives should give a pleasing gem, but the cost of waste may be another feature of your decision.

Because of the cost factor, careful trimming of the pre-form will be best accomplished using say, 600 grit lap and all the actual facet cutting done on a 1200 grit lap. Stones such as Tanzanite should not be hurried for obvious reasons and time taken does not enter the picture. Polishing is so easy with a quarter micron diamond powder on a tin lap. Tanzanite is a magnificent gem!

To support the writing of this article I have just worked through and completed a 9.82 carat untreated stone. I now await the result of the heat treatment.

### Physical Properties:

Tanzanite -	calcium aluminium hydroxy silicate expressed as $CA_2AL_3(SiO_4)_3(OH)$
Hardness -	6 to 6.5
Specific Gravity -	3.1 to 3.37
Cleavage -	perfect, one direction
Fracture -	uneven
Cutting angles -	Culet 42 degrees Crown 40 degrees



### Optical Properties:

Crystal system -	Orthorhombic
Heat-treated colours -	blue, purple & pink (trichroic)
Refractive index -	1.69 to 1.70
The Birefringence -	0.006 weak.
Critical angle	35 degrees

Dennis Durham space 17/04/20006

### Editor's note:

These views expressed by Dennis are those formed from his own experiences of cutting and handling Tanzanite and consequently may not be those expressed by others.

END