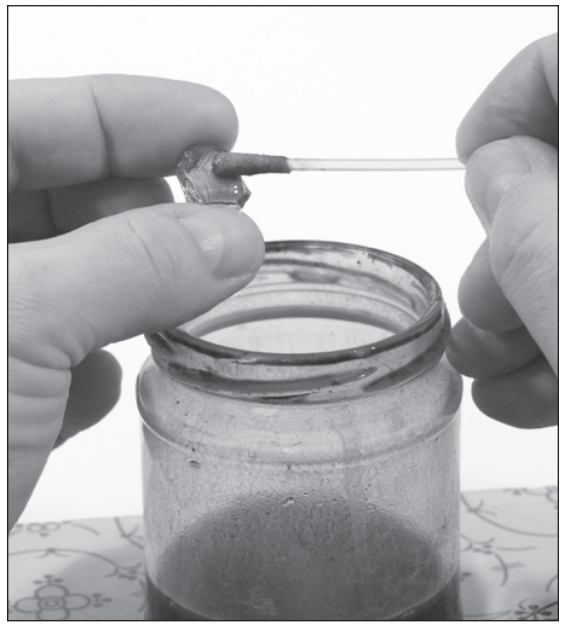
Dopping the Rough for Cutting the Pavilion

With an obvious target – the future table location – in view, you are now ready to begin the actual dopping process itself. Clean the stone with alcohol, paint the table area with shellac-alcohol mixture, and let it dry (Figure 5-15).

Figure 5-14 Coarse-ground flat at the location of the future table facet.

While the stone is drying, clean the flat dop with alcohol and examine it for any damage. Dip the tip of the dop into the shellac-alcohol mix, and then place it in the transfer fixture to dry (Figure 5-16).

After a few minutes, the shellac should have dried sufficiently to ensure a good bond. Note that even when dry, the shellac may remain somewhat sticky, particularly if your mixture is somewhat old (see page 92). You can test this by touching your fingertip to the side of the dop. Don't touch the bonding surface itself, since finger oils can reduce adhesion.



Fire up your alcohol lamp and begin warming a stick of dop wax over – not in! – the flame (Figure 5-17). Don't rush things here. Watch the wax carefully and learn how the wax behaves as it slumps then flows. Too much heat can cause excessive melting, and in extreme cases, boiling and even burning of the wax. Boiling is bad since it can weaken the bond, and fire is bad because, well, fire is just bad.

After a moment or two, a droplet will flow and form on the underside of the wax stick. Make sure that it doesn't drip on anything sensitive, such as you.

Figure 5-15 Paint the future table area with the shellac-alcohol mixture. A cotton swab makes a convenient, disposable brush.

Keep the transfer jig and dop nearby. As the droplet grows and begins to drip off the wax stick, bring the dop up to the wax and capture a blob on the tip of the dop (Figure 5-17 inset).

Extinguish the alcohol lamp and set the transfer jig down on your heat-proof surface. Don't forget that the wax is still hot and sticky! When things have cooled down, remove the dop from the jig.

Center the gem rough, table side up, on one side of the transfer fixture. A small piece of putty will help you find and maintain the correct position (Figure 5-18). Install the flat dop on the other side of the jig, with its brand new wax blob facing the stone (it was obviously pointing the wrong way in Figure 5-16).

Slide the dop against the stone to check that the rough is well aligned. You can also use a larger dop stick, *i.e.* one that has a diameter similar to the final gem, in order to ensure proper centering (Figure 5-18).

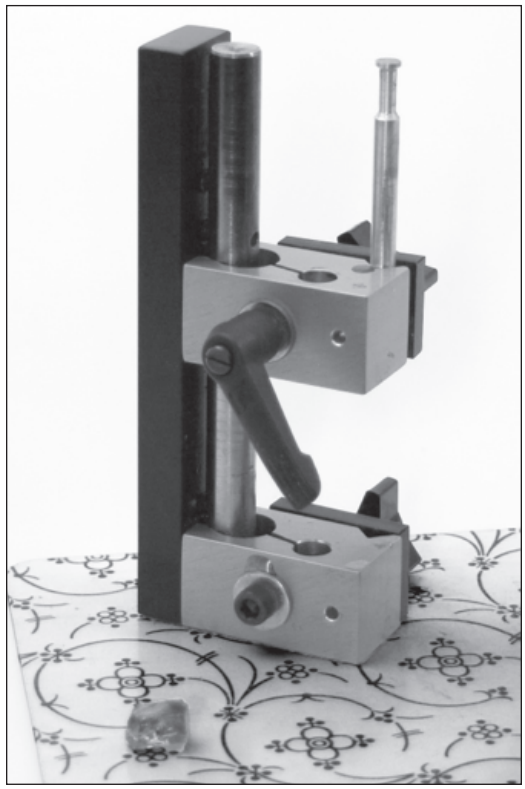


Figure 5-16 Shellac drying on the stone and dop. Note the heat-proof work surface.

Note that your transfer jig may look quite different to the one pictured here. Nevertheless, you should be able to adapt this technique to your equipment. If not, you might consider acquiring a more flexible transfer fixture. As you will learn, a good jig is useful for all kinds of tasks beyond transferring gemstones (see Chapter 4.16).

Take your time getting the rough accurately centered. Look from all sides to ensure that both the location and orientation of the stone are correct. Centering is particularly important for good yield with smaller (< 5 mm) gems – see Section 7.8.

Some faceting machines use keyed dops, which either favour or require a certain orientation when inserted in the quill and transfer jig. If you use this feature, you must orient the stone to the correct rotation before dopping (see page 243 and Section 5.5.1 for more). For what it's worth, I don't use or recommend keyed dops, and they are certainly not a prerequisite to excellent results. Chapter 4.4.1 addresses the pros and cons of dop keying systems.

With everything in place, you can now begin gently heating the dop and wax. The alcohol lamp works well, but I prefer the pinpoint heat and greater control of a small butane torch (Figure 5-19).

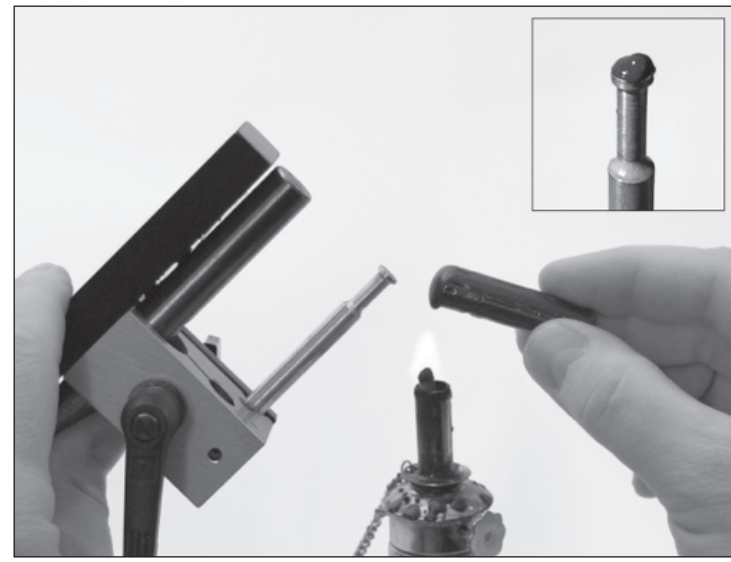
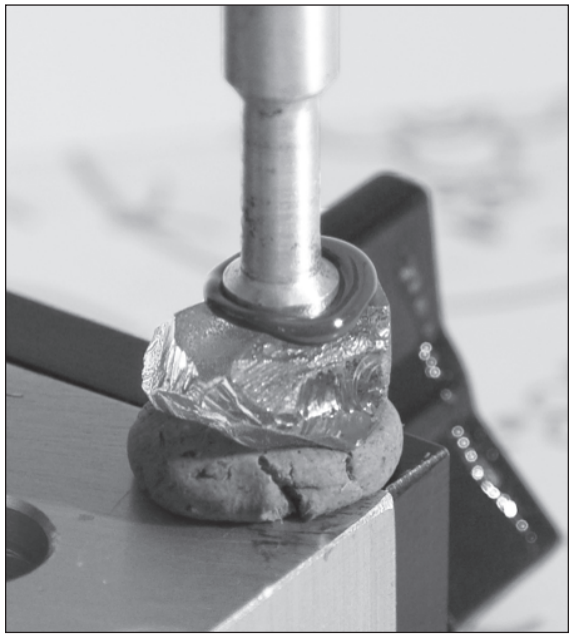


Figure 5-17 Warm the dop wax above the flame and capture a blob of wax on the tip of the flat dop (inset).

As before, you will see the blob of wax slump and begin to flow. When it is quite liquid, but not yet dripping off, remove the heat and bring the dop and stone together. Don't push too far, or you may knock the gem out of alignment. The wax should squeeze out from between the dop and stone, forming a convex bead (Figure 5-20). If it doesn't, you either used insufficient heat or not enough wax (or both). In this instance, you should raise the dop and try again.

Figure 5-18 The gem rough embedded in putty. Note the large diameter dop to check centering

You can now begin the final stage of dopping by gently heating the area of the wax joint with the alcohol lamp (Figure 5-22). Again, take things slowly here and observe the wax. Rotate the transfer jig to ensure uniform heating on all sides.



The convex shape of the wax is a sure sign of a "cold joint." This indicates that either the wax or stone was not hot enough to ensure smooth flow and strong adhesion. This is perfectly normal at this stage – you will be fixing things in a moment or two.

The joint requires additional wax to ensure a durable bond. With the dop and stone locked in place, begin warming more wax over the alcohol lamp. As the wax slumps and flows, transfer it to the area of the existing joint. This will very likely be a bit messy – don't worry about it.

The result will be an irregular mass of wax in the general area of the dop-stone bond and probably more than a couple of unwanted drips on your work surface (Figure 5-21).

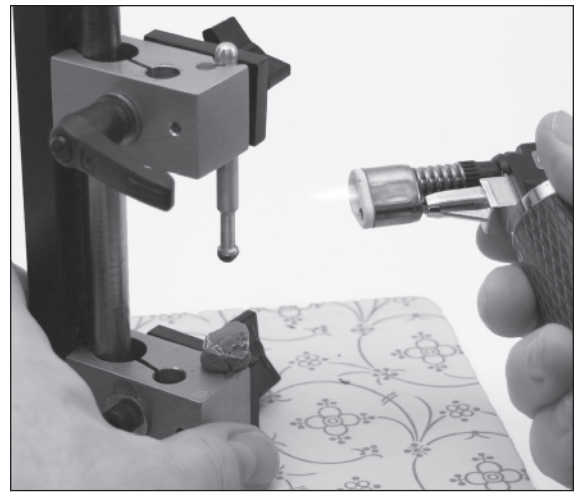


Figure 5-19 Heat the dop to melt the wax.

As the joint warms up, the wax will begin to flow across the surface of the stone and dop, making a smooth, non-convex bond. This may happen on one side of the stone before the other (Figure 5-23). Keep working your way around with gentle heat to ensure a proper bond.

It helps to keep the heat concentrated on the dop, and to a lesser extent, the wax. Try to avoid direct flame on the stone. While quartz and beryl are insensitive to heat, at least if they are free of internal flaws, other gem ma-

Figure 5-20 Note how the wax has squeezed out from between the dop and stone.