

6.4.1 What to Look For

There are some general guidelines which can help. In particular, there are four characteristics of gem rough that should enter your decision making process: colour, clarity, size, and shape.

Colour refers to the overall chromatic appearance of the stone and includes colour zoning (local regions of more or less intense saturation), as well as direction-dependent colouration or pleochroism (see Chapter 12.4). Look for pleasing and vibrant coloured samples that stand out from the rest of the lot. Beginners often make the mistake of evaluating colour by holding the rough up to a source of light. The white paper test (see page 90 of Volume 2) is a much more reliable means of assessing the final gemstone colour and will prevent you from accumulating (as I have) a distressingly large amount of distressingly dark garnet.

Clarity measures how well the gem rough transmits light. Clarity is impacted by all kinds of internal flaws, ranging from diffuse cloudiness to individual inclusions, bubbles, and veils. Note that some of these flaws, such as individual needles in quartz (see “Clearly Superior” below) and horsetail inclusions in demantoid garnet, can actually increase the value of the gem rough substantially.

Clearly Superior

When is less more? Particularly when it comes to gem clarity?

The answer lies in unique inclusions and flaws, which either unquestionably identify a gemstone as authentic or provide unique visual impact.

The case of a single tourmaline needle in quartz provides an arresting example of the latter. I cannot count the number of bins of transparent quartz I have sorted through, looking for that elusive piece with just the right geometry (Figure 6-11).

Why chase down such an oddball piece of rough? Well, if you arrange things right, with the needle exactly down the axis of the stone, you can produce some pretty remarkable gems (Figure 6-12). The striking reflectance pattern results from multiple reflections, particularly near the culet.

Note that Chapter 12.12 contains more advice on identifying and managing inclusions.

Parenthetical remark #1: The optical multiplication evident in Figure 6-12 carries an important lesson for gemstone orientation: except in extraordinary circumstances such as this, you will want to keep internal inclusions and flaws well away from the optical axis of the gem. Section 6.7.1 discusses this further.

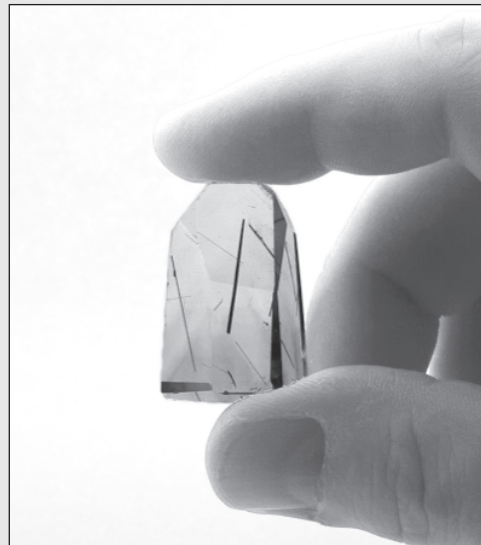


Figure 6-11 A single needle of tourmaline in an otherwise (mostly) perfect quartz crystal.

Parentetical remark #2: The gemstones in Figure 6-12 do not exist in the real world. Finding a suitable piece of quartz proved so challenging that I did not want to experiment with different gem designs on actual stone. These are three dimensional computer renderings which include the actual gemstone and needle geometry, as well as the optical properties of quartz. Turn to Chapter 15.5 to learn how it was done.

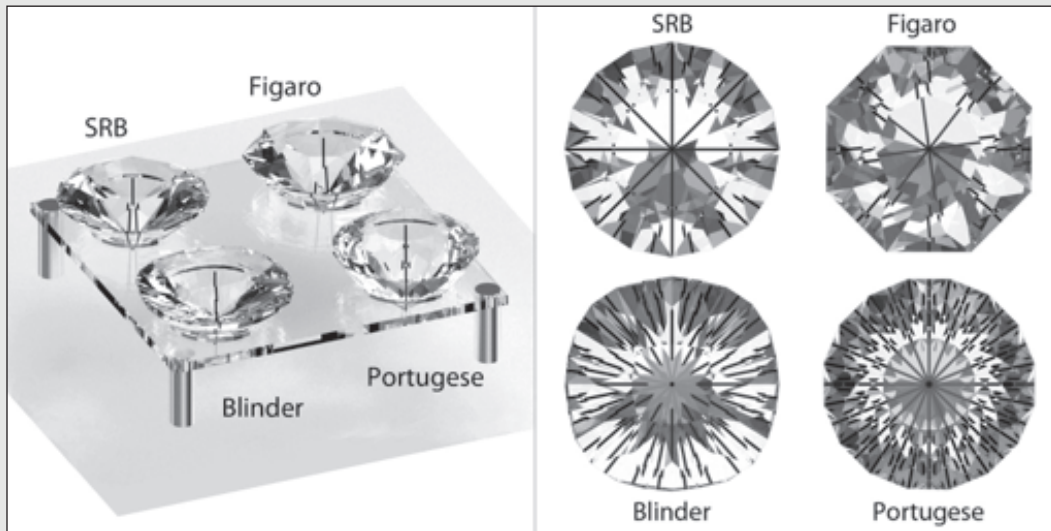


Figure 6-12 A single needle of tourmaline oriented perpendicular to the table of several gemstone designs cut in colourless quartz (left). Seen from above, the facets produce a dynamic, kaleidoscopic effect (right). These computer renderings allow a direct comparison of the optical effects of a needle in various gemstone designs.

Size has a very strong influence on the cost of finished gemstones (see Figure 6-14 in the next section), and this influence naturally appears at the rough stage as well. Beginners should count on losing up to 80% of the initial weight of the stone during the cutting process. Don't let this get you down, however: 20% retention is fairly respectable, and experienced faceters rarely reach 35% in final yield.

Shape is perhaps the most difficult of characteristics to judge for beginning cutters, since it involves visualizing the final gemstone in 3D while accounting for internal flaws, cleavage planes, crystallographic axes, and so on. Generally, rounder, more "chunky" shapes will provide the best match to common gemstone designs and hence produce higher yield. A small plastic ruler or brass caliper can be a real help in assessing the overall shape of a stone prior to purchase. Note that the shape is particularly important for smaller pieces of rough, since accounting for an internal flaw or surface divot will require removal of a proportionately larger fraction of the stone. Sadly, smaller rough usually means the more expensive gem materials.

Governing all these evaluations of colour, clarity, size, and shape is the target gem design. Note, however, that in some circumstances, the gem cut will drive the choice of stone, while in others, a unique sample of gem rough will dictate the best design. See "Cutting to the Rough or Cutting to the Design?" on page 211.