



Cut – The Least Understood “C”

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A good place to start examining the importance and evaluation of cut in polished diamonds is with the “Four Cs”. This phrase refers to a diamond’s Carat weight, Clarity, Color, and Cut (listed from simplest to most complicated to understand). Although all of these value factors have been around as long as diamonds have been polished, grouping them together into a descriptive concept such

as the Four Cs was the idea of GIA founder Robert M. Shipley for De Beers, and was intended as an educational tool for consumers and jewelers. It was their hope that by organizing a diamond’s value factors into simple categories, individuals would be better able to understand the variables that are most important in the evaluation of a polished diamond. Awareness of the Four Cs also helps individuals understand and appreciate the rarity of a diamond in terms of the combination of the value factors it represents.

Each of the Four Cs affects the appearance of a diamond in different, yet identifiable, ways. Three of the Cs (carat weight, clarity, and color) currently have widely accepted grading scales or methods of measurement in the diamond trade. Cut has historically been the most difficult value factor for which to develop a scale of evaluation, and this can be seen by the lack of a universally accepted cut grading system. GIA is engaged in a long-term research project to explore how the face-up appearance of a round brilliant cut (RBC) diamond is related to its proportions. We believe this research will provide a more scientific basis for evaluating cut in diamonds, thereby helping members of the trade reach a consensus. In the end, the Four Cs are also about choice. A consumer with a fixed budget may lower the “grade” of one value factor in order to raise the “grade” of another – for example, a buyer may choose to sacrifice some clarity to purchase a weightier (larger) diamond. Although many are familiar with this

process in terms of carat weight, clarity, and color, recently the choice of cut has become a larger part of this purchasing decision.

THE OTHER THREE Cs

Carat Weight: Let’s start our examination of the Four Cs with carat weight since, out of the four value factors, it can be measured most objectively, using an electronic balance. The visual effect of carat weight on a diamond’s appearance seems fairly obvious: the more a diamond weighs, the larger it will look. However, this is not always the case. As most people in the trade already know, cut proportions can also affect the perceived size of a diamond.

Carat weight is directly related to a diamond’s value because (all else being equal) larger diamonds are rarer than smaller ones. As a result, larger diamonds cost more per carat than smaller diamonds (e.g., a 2.00 ct diamond of the same quality can cost more than twice the amount of a 1.00 ct diamond). In addition, diamond prices do not always increase in even linear increments (e.g., a 0.97 ct diamond of the same quality sells for much less than a 1.00 ct diamond). The weight-to-value relationship is one factor that consumers have to take into account when purchasing a diamond.

Clarity: Unlike carat weight, clarity has both objective considerations (e.g., diamonds that are flawless at 10x magnification are rarer than those that are not flawless), and those that rely on experience and judgment. These latter

GIA CLARITY SCALE	
FLAWLESS	VERY VERY SLIGHTLY INCLUDED
INTERNALLY FLAWLESS	
VVS ₁	VERY SLIGHTLY INCLUDED
VVS ₂	
VS ₁	SLIGHTLY INCLUDED
VS ₂	
S ₁	INCLUDED
S ₂	
I ₁	
I ₂	INCLUDED
I ₃	

Figure 1. GIA’s Clarity Scale



considerations are mostly centered on visual observations. While there are accepted standards in the diamond trade for grading clarity (figure 1), the actual grading of a diamond’s clarity is not assessed through a machine’s measurement but rather by the observations of trained gemologists.

Using controlled viewing conditions, these gemologists make judgments based on the size, number, position (location), color/relief, and nature of clarity characteristics (e.g., feathers, clouds, or other inclusions) seen at 10x magnification with a binocular microscope or loupe. Eye visibility of clarity characteristics is also a factor in determining a diamond's clarity grade. At the GIA Gem Laboratory, the consistent application of standards, decision making through consensus among very experienced gemologists, and ongoing education over the last 50 years have allowed this grading system to be effective and reliable.

Another factor in the evaluation of clarity has to do with the visual acuity of consumers. Since clarity is graded at 10x magnification, differences that affect the value of a diamond may not be eye-visible. This gives the consumer room to balance clarity considerations along with the other value factors when purchasing a diamond. Consumers who choose higher clarity grades are willing to pay for this indication of rarity even if there is little or no effect on the diamond's appearance as seen without magnification.

Color: The third diamond value factor is color. It requires the same mix of objective considerations, experience, and judgment as clarity. Diamonds located at the extremes of the color scale (that is, colorless diamonds or diamonds with strong, saturated colors) are more rare than those in the middle (diamonds with pale colors). Like clarity, color is also graded by trained observers (under specialized lighting conditions) and has some distinctions that are not visible table-up.

At the GIA Gem Laboratory, different grading procedures are used for colorless-to-light-yellow or brown diamonds than for colored diamonds (such as pink or blue). GIA’s D-to-Z scale assesses the relative absence of color while its system for grading fancy-color diamonds judges the presence of color.

Consistency in the application of these two systems allows the diamond industry to reach a grading consensus in terms of color and value. Color is another value factor that presents consumers with a choice: They may lower their color expectations of a near-colorless diamond in order to obtain more carat weight or a higher clarity grade.

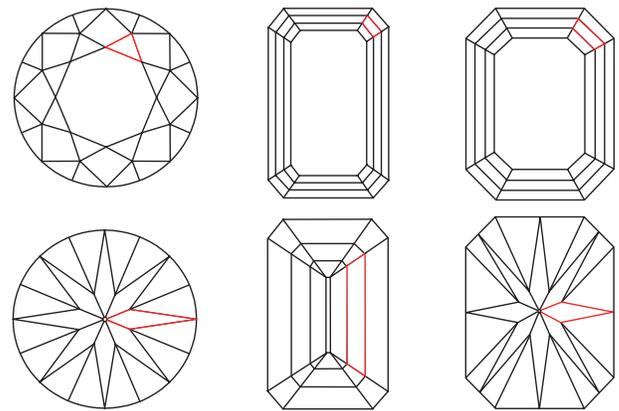


Figure 2. Cutting Styles: Brilliant (left), Step-cut (center), and Mixed (right)

The Last C-Cut: We now arrive at the last, and perhaps least understood, of the diamond value factors: cut. First, it is important to establish the difference between the *cut* of a diamond and its *shape*. When referring to diamonds, the term *shape* is used to describe the girdle outline (e.g., round, oval, pear, square, rectangular, or heart-shaped). Another important term, *cutting style*, describes the types of faceting: brilliant cut (which refers to an arrangement with several types of triangular and kite-shaped facets; figure 2, left), step cut (which

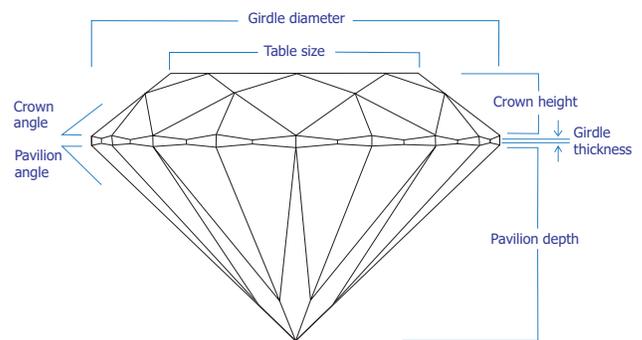


Figure 3. Some RBC diamond proportions



refers to an arrangement with many trapezoidal facets; figure 2, center), or mixed cut (which is a mixture of brilliant and step faceting; figure 2, right)¹.

The term *cut* (sometimes referred to as *make*) should be used in reference to the proportions (generally considered in relation to the girdle diameter) and finish of a diamond. Some proportions of a polished RBC diamond are table size, crown height, pavilion depth, crown angle, and pavilion angle (figure 3).

Girdle thickness is described in terms of minimum and maximum thickness. It is also noted whether the girdle is bruted (with a granular finish), polished, or faceted. The finish of a diamond includes its symmetry (the exactness of shape and placement of the facets) and the quality of polish on the facets. Since finish is easier to understand, we will review that before discussing proportions.

At the GIA Gem Laboratory, trained gemologists evaluate finish on a scale from excellent to poor, using consistent observation procedures. Symmetry is assessed as the evenness of the outline of a diamond and the shape and placement of the facets. (Although symmetry is assessed visually, these evaluations may be supported by an optical measuring device.) Polish is assessed as the quality of the surface condition of the fashioned diamond. For example, visible polish lines or burn marks may affect the polish grade, as will blemishes (such as scratches or abrasion) created after the cutting process.

Diamond proportions are not yet graded on a single scale that is accepted by the majority of the industry. Most cut grading scales that are promoted in the marketplace today are based on two assumptions: (1) only a limited set of proportions yield a good-looking RBC diamond; and (2) the greater the deviations from each of these proportions, the worse the diamond will look. Because the different grading systems tend to disagree as to which is the “best set” of proportions, and there may be in reality many sets of proportions that produce good-looking diamonds, the assumptions on which these cut-grading systems are based have come into question.

Perhaps this overstates the issue just a bit. Most viewers can agree on some cuts that yield an unattractive appearance (figure 4) – such as those that cause “fisheyes” (RBC diamonds with shallow pavilions that

display the girdle’s reflection in the diamond’s table) and “nailheads” (RBC diamonds with pavilions so deep that their tables look dark) – or those that promote easy chipping of the girdle (such as diamonds with extremely thin to very thin girdles and crown angles that are very shallow; see figure 5). But the appearance of diamonds that fall in acceptable

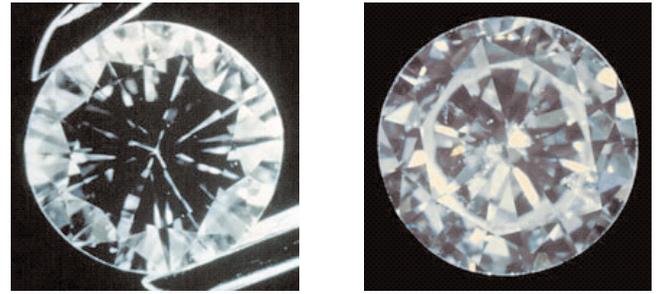


Figure 4. “Fisheye” (left) and “Nailhead” (right) diamonds

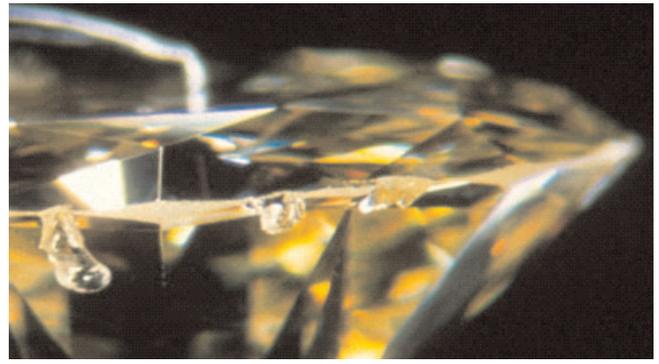


Figure 5. Close-up of chipped girdle

categories of cut is much more difficult to evaluate.

It is also important to remember that a diamond’s proportions are often determined by the size and shape of the diamond rough. When we consider diamond cutting theoretically, it is easy to assume that any piece of rough can yield well-proportioned diamonds. In the real world, however, this is not always the case. When faceting a diamond from a piece of rough, a cutter often has to balance aversions (e.g., removing or minimizing the effects of inclusions) with desires (e.g., creating well-cut proportions and retaining weight from the rough). Cutters also have to consider what shapes and proportions will readily sell in the market. Among desirable out-



comes, cutters continually have to decide whether to cut a better-proportioned diamond, or retain more weight from the rough. Often, those diamonds that are considered well cut retain less original weight in order to achieve their proportions, and therefore cost more per carat to manufacture. This price difference is usually passed on to the consumer, which is why cut has become another important choice to consider when purchasing diamonds.

This brings us back to the question of cut evaluation and worth. Proportion measurements of a diamond do not automatically translate into a direct measure of appearance. There has not yet been sufficient scientific testing of different cut proportions (either on actual diamonds or with computer modeling) to support the assertion that any one set of proportions is the absolute best performer in terms of brilliance, fire, scintillation, or a combination of all three. More research will be needed before the trade reaches this point.

In the end, some choices of proportions will always depend on an individual’s tastes and preferences – for example, the preference for larger tables (figure 6). One of the oldest pieces of advice in the diamond industry is: “You should always see and evaluate the diamond with your own eyes.” The relationship between *numbers* (i.e., proportion measurements) and *visual appearance* is still not fully understood. It is one of the aspects of diamond appearance that GIA is currently studying.



Figure 6. Some people find diamonds with larger tables (left) more attractive than those with smaller tables

CONCLUSION

Perhaps the most important thing to remember when evaluating the quality of a diamond, is that all four Cs interact in intricate ways to affect the appearance and value of that diamond. For example, a diamond’s cut may affect the appearance of that diamond’s size, the visibility of that diamond’s clarity characteristics, and the obviousness of that diamond’s color. Combinations of these four value factors also determine a diamond’s rarity, and therefore affect its price. Manufacturers, dealers, retailers, and consumers must take all of these factors into consideration when making choices about cutting, selling, and purchasing diamonds.

We hope that you enjoyed this article, and invite any feedback or comments that you may have. You may contact us by e-mail at DiamondCut@gia.edu ■

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¹The GIA Gem Laboratory uses universal terms in its reports to describe the diamond’s shape and cutting style (e.g., “round brilliant cut,” “rectangular step cut,” or “cut-cornered square mixed cut”).