CHAPTER 7

DIAMOND GRADING

A PRACTICAL GUIDE TO DIAMOND GRADING

- *Grading principles*
- *Evaluating the cut*
- *Fancy cut diamonds*
- *Fancy coloured diamonds*
- *Colour and clarity enhancements*

The value of a diamond is mainly determined by its beauty and its rarity. It is generally accepted that the more a diamond "sparkles", the more beautiful it is. We will see in later sections that the proportions of a diamond determine its sparkle.

The rarity of a diamond is determined by a number of factors, such as its size, colour and the size and number of inclusions it hosts. In order to arrive at a diamond's value, its relative rarity and beauty need to be determined. We call this the grading process.

Today, most of the larger and better-quality diamonds are accompanied by grading reports that have been issued by independent laboratories. It is up to the jeweller to understand these reports and to be able to determine whether a specific report belongs to a specific diamond.

GRADING PRINCIPLES

1. DESCRIPTION

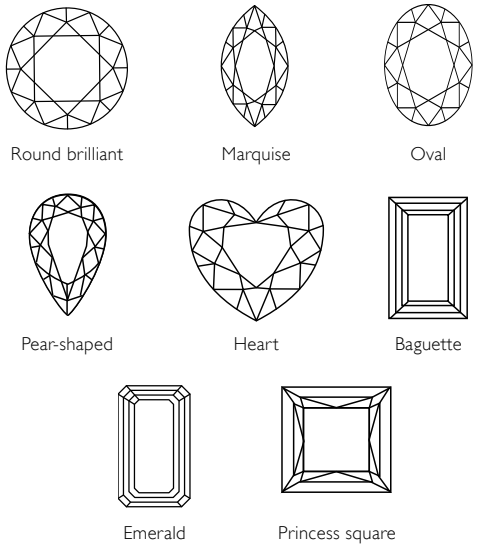
The grading report will state if the diamond is of a natural or synthetic origin. Most grading laboratories do not grade synthetic diamonds. Those who do, issue a certificate that looks quite different from the certificate they issue for natural diamonds, and which states very clearly that the diamond is of synthetic origin. Some synthetic diamonds will have a maker's mark, such as "GEMESIS", laser-inscribed on their girdles. Unfortunately, this identification mark can be polished off.

2. CARAT WEIGHT

The first and easiest parameter to be determined is the weight of a diamond. This is normally done by using an electronic diamond scale. The unit of measurement is the carat (which is equal to one-fifth of a gram) and which is subdivided by 100 points. A 75-pointer diamond weighs three-quarters of a carat. Diamond weights are normally rounded off to the nearest point, ie, a weight of 1.696ct would be rounded to 1.70ct, and a 1.995ct would be rounded to 2.00ct. A weight of 0.684ct would be stated as 0.68ct.

3. SHAPE AND CUTTING STYLE

Among the various shapes into which diamonds are fashioned, the 58-facetted modern round brilliant is the most popular, and also, per carat, the most expensive. A large number of variations of the brilliant and other cutting styles have been developed recently. Most of these variations have been patented under specific brand names, eg, "Hearts and Arrows" , "Hearts on Fire", "Lily" and "Royal" cuts. There are literally a hundred or more branded diamond cuts available worldwide. Grading laboratories will normally not use a brand name to describe the shape and cutting style of a diamond.

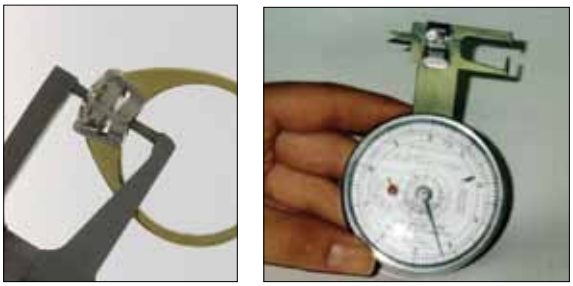


A selection of modern diamond-cutting styles

4. MEASUREMENTS (DIMENSIONS)

This is normally done by using a millimetre gauge (the Leveridge Gauge is the model best known) or modern digital measuring devices which display readings of up to one-hundredth of a millimetre.

No round diamond is perfectly round and a maximum and minimum diameter needs to be determined. The depth of the stone is important and is always stated last. For example, 5.57 x 5.59 – 4.41mm.



Using a millimetre gauge to measure dimensions of a set diameter (left) and a loose one (right).

It is important to be able to measure diamond dimensions properly, even when mounted in jewellery, because these dimensions can be used to identify the stone and/or to calculate its weight. See Part III, page 240, on how to calculate a diamond's weight from its measured dimensions.

5. COLOUR

Diamonds come in many colours. The normal colour range is from colourless to yellow or brown and 95% of all diamonds fall within this range.

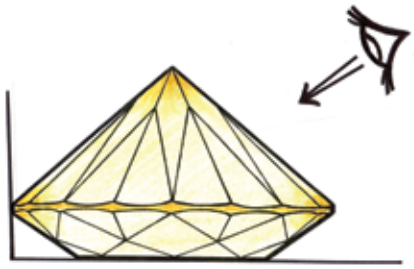
A colour grading scale developed by the Gemological Institute of America (GIA) is the one most widely used. It ranges from D (colourless) to Z (light yellow or brown). Each letter represents a range of colour that is based on a combination of tone (darkness or lightness) and saturation (intensity of the colour). The combination is called depth of colour, which is an indication of how noticeable a colour is.

Increasing colour grades in diamonds, with two fancy colours on the right.

Why not an A colour? When GIA developed its grading scale, others in the industry were already using letters such as A, double A or AAA, or terms such as "blue white" or "fine white". In order to have a truly unique system, GIA started its colour scale with D (which is very appropriate for a diamond, it can be said!).

- **Method of grading**

Diamonds are colour graded under specific lighting conditions by comparing them with diamonds of known colour, called master stones. The stones are compared with their tables down in a special white display tray under daylight-equivalent fluorescent light. Colour grading is one of the most difficult parts of diamond grading. As no two master sets are alike - and because it is difficult to compare the colour of two diamonds if they are not similar in size and cut - it may happen that two graders have a different opinion on the colour of a stone.



A face-down diamond concentrates colour in the girdle and culet area.

- **Fluorescence**

Many diamonds glow with a visible colour when exposed to ultraviolet light. This is called fluorescence. About 35% of all diamonds fluoresce in mainly a faint or darker blue colour.

Other possible fluorescent colours include white, yellow and orange. Sunlight contains ultraviolet light and a yellow diamond with strong blue fluorescence may appear less yellow and somewhat "milky" in direct sunlight.

Diamonds showing fluorescence under ultraviolet light.

COLOUR GRADING SYSTEMS

	Traditional terms		Description
GIA EGL	South Africa	Europe	
D	finest white	Jager	
E	(blue white)	River	colourless
F	fine white		
G		Top Wesselton	face-up colourless
H	white	Wesselton	
I	commercial white	Top Crystal	small stones look colourless face-up, large ones are tinted
J	top silver Cape	Crystal	
K			face-up a faint colour
L	silver Cape	Top Cape	is visible
M			
N	light Cape	Cape	mounted stones
O-R	Cape	Low Cape	visibly yellow
S-Z	dark Cape		very light yellow
Fancy colours			darker than Z

6. CLARITY

The rarity of a diamond also depends on how free it is of internal inclusions and external blemishes. These imperfections are identified under 10x magnification and plotted on the grading report. The diamond is then allocated a clarity grade which is determined by the size, number, type, positions and visibility of these imperfections.

A loupe is the most convenient magnifier to determine clarity, while a gemmological microscope is often used for the grading of high-quality stones.

The table on the right gives the symbols that are used to describe the clarity grade.

- **Plotting symbols and abbreviations**

The grading report will indicate the type and position of imperfections that can be seen under 10x magnification. These symbols are of great help in identifying a diamond and a jeweller should know how to read a diamond plot. External characteristics are normally indicated in green, while internal characteristics are plotted in red. Herewith an example of such a plot and the terminology normally used is given on the next page.

CLARITY GRADING SYSTEM

Flawless (FL) - no internal or external imperfections can be seen by the trained eye under 10x magnification (used by GIA)

Internally Flawless (IF) - no internal imperfections under 10x magnification (used by EGL and others)

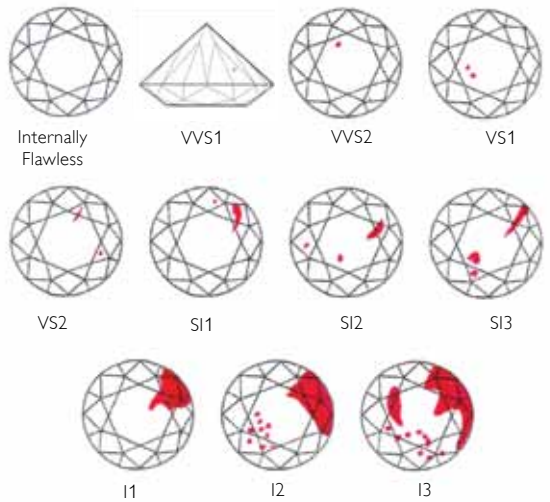
Very, Very Slightly Included (VVS1, VVS2) - very difficult to see with 10x loupe

Very Slightly Included (VS1, VS2) - difficult to see with 10x loupe

Slightly Included (SI1, SI2, SI3) - easy to see with 10x loupe, sometimes visible with the naked eye (GIA does not use SI-3 grade)

Included (I1, I2, I3) - imperfections visible with the naked eye, seriously affecting the stone's brilliance

(In Europe, the term "pique" is used for an included stone and the symbols P-1, P-2, P-3 are used)

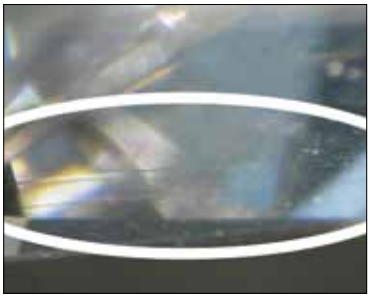


Relative size of inclusions for VVS1-I3 clarity grades

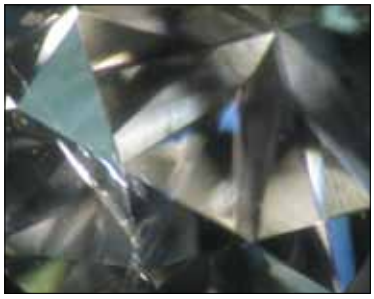
SI-2

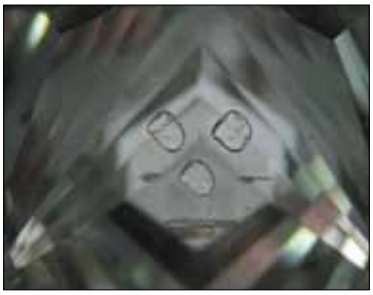
I-1

TYPICAL INCLUSIONS IN POLISHED DIAMONDS, PHOTOS: EGL

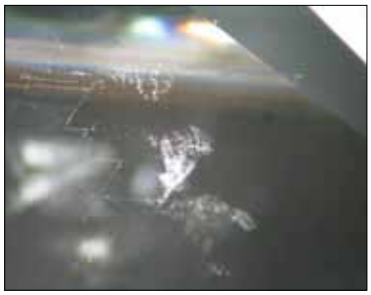

External graining.

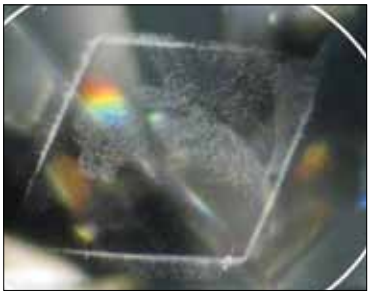

Diamond octahedron in diamond.

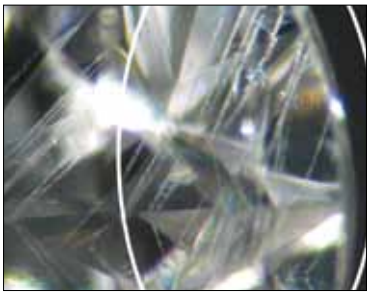

Typical fracture in diamond (S1-2)


The same inclusion being reflected three times.


Pinpoint inclusion.


Zig-zag inclusions.


Octahedral ghost cloud.


String-like imperfections.

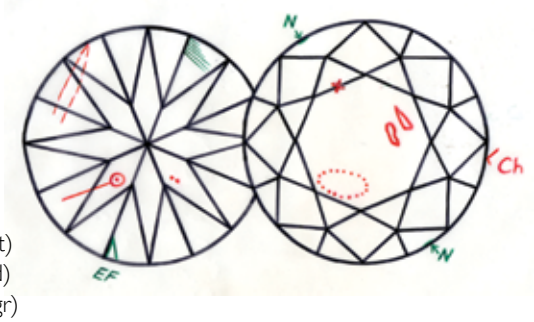

Hair-like inclusions.

PLOTTING SYMBOLS AND ABBREVIATIONS

The grading report will indicate the type and position of imperfections that can be seen under 10X magnification. These symbols are of great help in identifying a diamond and a jeweller should know how to read a diamond plot.

External characteristics

- Bearded girdle (Br)
- Bruise (Br)
- Cavity (Cv)
- Chip (Ch)
- Cleavage (Clv)
- Cloud (Cld)
- Crystal (Cr)
- Feather (F)
- Grain centre (Grncnt)
- Natural indent (Nind)
- Internal graining (Intgr)
- Knot (K)
- Laser drill hole (Ldh)
- Needle (Ndl)
- Pinpoint (Pp)
- Twinning (Tw)



Internal characteristics

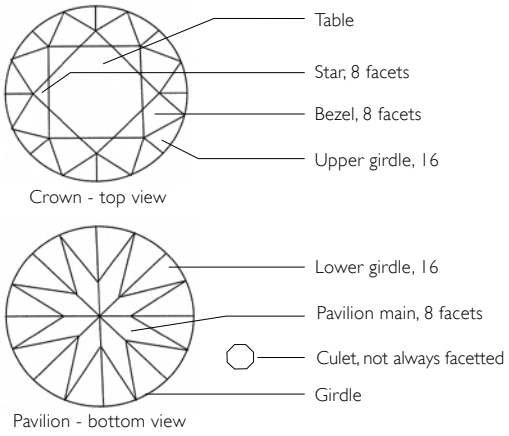
- Abrasions (Abr)
- Extra facet (Ef)
- Natural (N)
- Nick (Nic)
- Pit (Pit)
- Polish line (Pl)
- Polish swirls (Psw)
- Scratch (Scr)
- Surface graining (Sgr)

- Naturals and extra facets are always plotted, as they are of great help in identifying a diamond.
- If the diamond is mounted, the metalwork is indicated by dashed black lines.

7. CUT

The modern round brilliant cut has 58 facets, named and arranged as shown herewith.

We know that the cut, ie, the proportions of a diamond, influences its sparkle. For many years, diamond-cutters have argued about which set of proportions provide the best sparkle. With the advent of branding, these arguments got worse because brands normally claim that *their* proportions are superior.



In recent years independent gemmological laboratories conducted extensive research on how effective diamonds of different proportions reflect and refract incoming light. Various aspects such as brilliance, fire and scintillation were analysed through computer modelling and observation testing. These laboratories each devised their own proprietary system by which they grade the cut of a polished diamond.

These systems also take into account aspects such as the weight and durability of a diamond (ie, overweight stones and those with extremely thin girdles), as well as the quality of the finish (ie, the polish and symmetry of the facets).

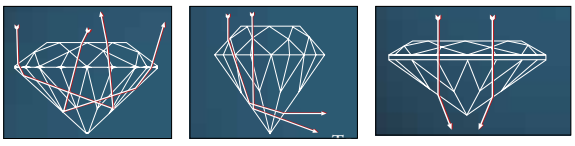
It is now known that every facet of a diamond contributes to its overall "look". Also, that the historically accepted set of proportions used for "ideal cuts" are just one of many sets of proportions that can produce maximum sparkle.

Furthermore, the type of light source, the angle of incidence of light and the reflection of large objects play significant roles in the overall appearance of the stone.

EVALUATING THE CUT OF A DIAMOND

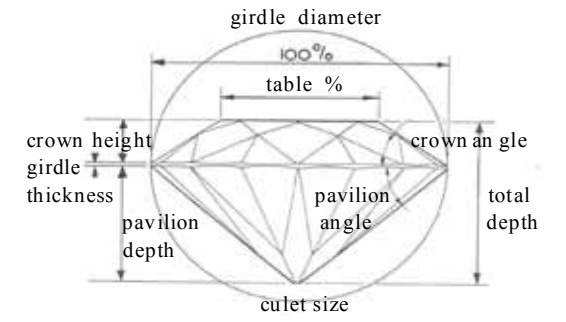
IMPORTANCE OF PROPORTIONS

The following sketches explain the importance of a diamond's proportions. Although this is an extreme simplification of the way in which a diamond handles light, it allows the client to quickly grasp the importance of a diamond's proportions.



Ideal proportions. Too deep. Too shallow.

The proportions of a polished diamond are described below.



MEASUREMENT OF PROPORTIONS

Most jewellers use a manual reticule (microgauge) and/or an electronic millimetre gauge to measure and then calculate the proportions of a diamond. These proportions can also be easily measured with a calibrated eyepiece that fits most microscopes or with the proportion scope.

Modern grading laboratories employ a computerised optical instrument to measure the proportions and to assign a cut grade to polished diamonds.

With practice, a jeweller can estimate a diamond's proportions and evaluate its cut by using a variety of visual observations, as described below.

ASSESSING PROPORTIONS

While most grading laboratories prefer to use their own terminology in describing and evaluating the quality of a diamond's cut, they do, however, base their assessment on the same parameters, which are:

I. The visual appearance of the stone,
II. Value aspects, and
III. The cutter's craft

I. VISUAL APPEARANCE

This is due to a combination of three optical effects, namely:

1. **Brightness**, ie, the total reflection of white light.
2. **Fire**, ie, flashes of colour.
3. **Scintillation**, ie, the twinkling of areas of light and dark.

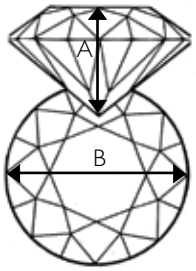
1. Brightness

This is mainly determined by the stone's depth %, table %, its crown angle and its pavilion angle. The latter two proportions, with its girdle thickness, determine the stone's depth %.

These parameters are measured or estimated as follows:

- Depth %

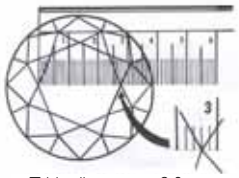
Is calculated by dividing the average diameter of a round stone by its depth, or the width of fancy shaped diamond by its depth. This percentage normally varies between 58-60%.



$$\frac{A}{B} \times 100 = \text{depth \%}$$

- Table diameter %

This parameter is measured with a calibrated micro gauge under magnification. The largest table measurement is divided by the average diameter. Opinion differs as to the ideal table percentages. From 56% to 62% is normally acceptable.

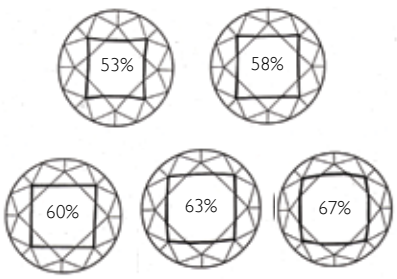


Hand-held micrometer

Using the microscope to measure table diameter (in mm) with a hand-held micrometer

Table diameter = 2.8mm

A quicker method is by observing the bowing of the line running from the point of one star facet, along the table edge and to the point of another star facet. See below.



Estimating the table % by using the bow method

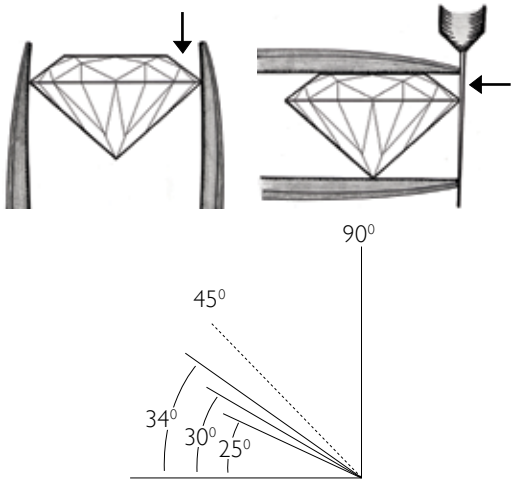
- Crown angle and height

The higher the crown, the greater the crown angle. Most diamonds have crown angles between 30-35 degrees. Diamonds with crown angles less than 30 degrees can be quite brilliant, but normally have extremely thin girdles which are susceptible to damage.

Crown angles are estimated by looking at the profile of the table and bezel facets and estimating the angle. See sketches below.

The crown height is measured by a calibrated microgauge and is expressed as a % of the diameter.

ESTIMATING CROWN ANGLES



- Pavilion depth %

Is expressed as a percentage of average girdle diameter and can be judged visually, or measured and calculated as in the sketches on the following page.

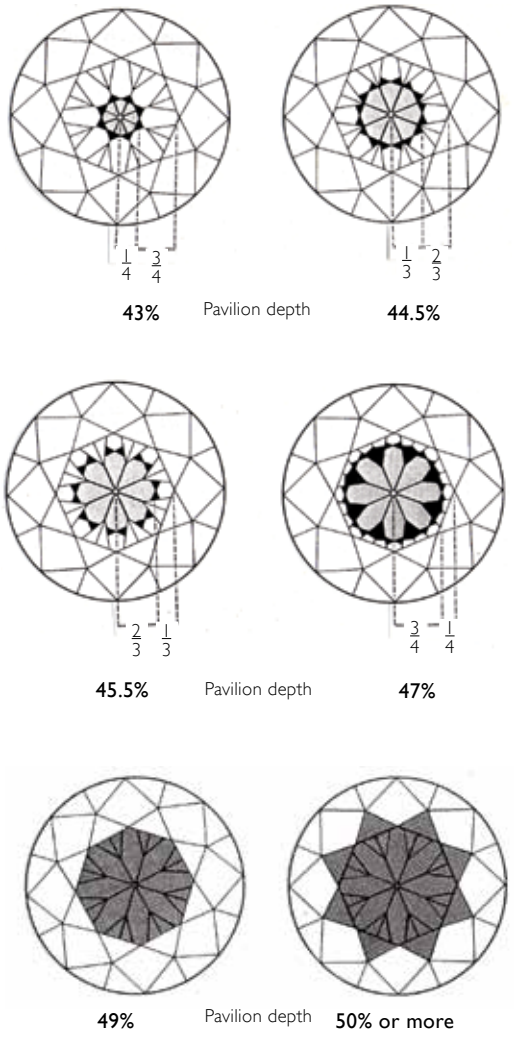
Pavilion depth normally varies between 41-45%. In stones with a pavilion depth of 40% and less (a shallow pavilion), an unattractive, greyish reflection of the girdle can be seen under the table. This is called a *fish-eye* effect. It renders the stone lifeless and dull. When the pavilion is too deep, the diamond will be dark in the centre. This is called a *nailhead*.

Fish eye: Grey reflections of the girdle just inside the table, due to incorrect girdle thickness, table % and pavilion angle. Gut grade poor to fair.

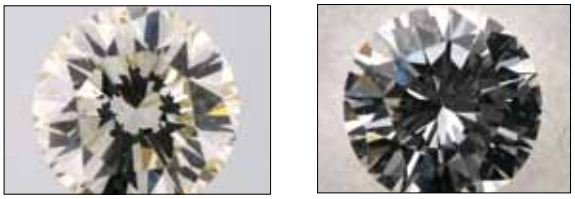
Nailhead - a dark area in the centre, resulting from too-steep pavilion angles.

DETERMINING PAVILION DEPTH BY IDENTIFYING THE TABLE REFLECTION

Look for small "bow-ties" and their position in the table



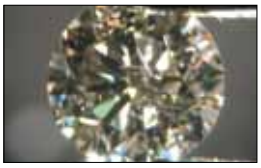
An incorrect pavilion depth also negatively affects the fire of a diamond.



Brightness under fluorescent light. Left: Excellent. Right: With many dark areas, poor brightness.

2. Fire

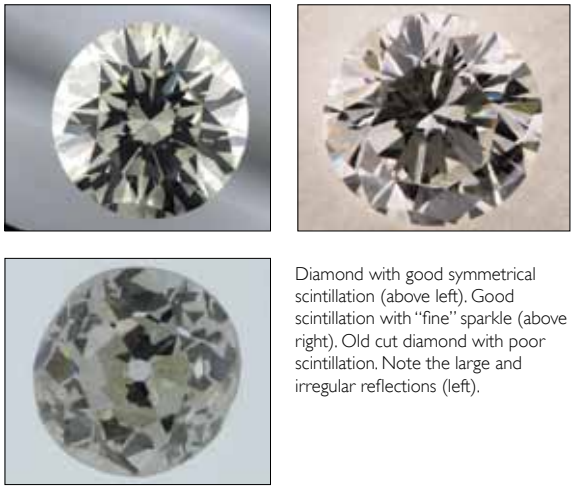
The flashes of colour you see in a diamond are called its fire and are the result of white light being dispersed into its various spectral colours. Fire is difficult to assess, especially in small stones, and is best seen under a spotlight. The more colour flashes, the better.



3. Scintillation

The flashes of light and the contrasting areas of darkness that constantly change (sparkle) as the light source, the observer or the diamond is moved, is called its scintillation. The quality of scintillation is determined by a combination of the scintillation is determined by a combination of the stone's sparkle and the pattern which the contrasting dark and light areas form. The dark areas are normally areas of light leakage (loss) or reflections of dark objects near the stone.

The pattern of flashes should be spread evenly and balanced over the face of the stone and the contrast between dark areas and bright flashes should be crisp. Scintillation is best seen under fluorescent light.



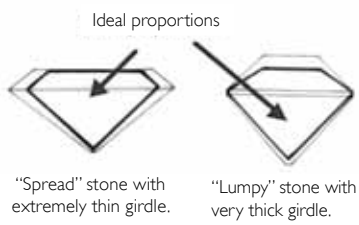
Diamond with good symmetrical scintillation (above left). Good scintillation with "fine" sparkle (above right). Old cut diamond with poor scintillation. Note the large and irregular reflections (left).

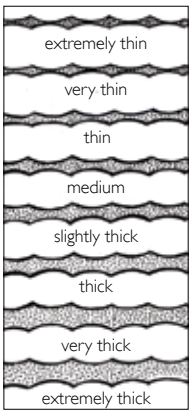
Please note: The brightness, fire and scintillation are individually assessed and each described as either "*Excellent*", "*Very Good*", "*Good*", "*Fair*" or "*Poor*".

II. VALUE ASPECTS

1. Weight ratio

A diamond's physical dimensions in relation to its weight are an indication of whether it was made "heavier" by fashioning a too-thick girdle, a very large culet or incorrect crown and pavilion angles. "Heavy" stones thus look lumpy and face up smaller than those with the correct weight ratio. On the other hand, a "spread" stone looks bigger than it should and normally has a very thin girdle that makes it vulnerable to damage. The prices of spread or lumpy stones are thus adjusted downwards.





2. Girdle thickness

Is expressed as a percentage of the depth measurements and is normally described as "*Extremely*" or "*Very Thin*", "*Thin*", "*Medium*", "*Slightly Thick*" or "*Extremely Thick*".

A very thin girdle can break, affecting durability, while a very thick girdle will make the stone look smaller than it should and could create fuzzy, grey reflections in the stone.

3. Culet size

Most fancy cuts have culets, while round brilliants may not. The purpose of the culet is to protect the bottom of the stone against abrasion. It is visually estimated and normally described as "*None*", "*Small*", "*Medium*", "*Large*", "*Very Large*" or "*Abraded*".

CULET DESCRIPTION

None	No polished surface visible
Small	Barely visible under 10x magnification.
Medium	Octagonal outline is visible under magnification.
Large	Just visible to the naked eye.
Very large	Octagonal outline is clearly visible to the naked eye.

III. THE CUTTER'S CRAFT

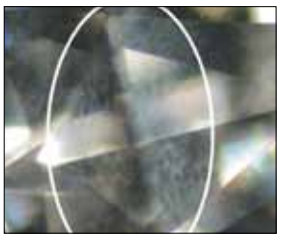
This parameter comprises two factors - **polish and symmetry** - and gives an indication of the care and skill with which the cutter manufactured the final product.

1. The polish

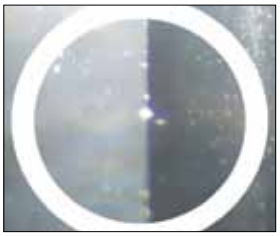
The polish is described and graded as "*Excellent*", "*Very Good*", "*Good*", "*Fair*" or "*Poor*".

Obvious polish lines on several facets will result in a fair grade, while the presence of only faint polish lines in an inconspicuous place will give a good grade. An abraded culet, bearded girdle, pits on the surface and a very rough girdle are other aspects that could influence the clarity or polish grade of a diamond.

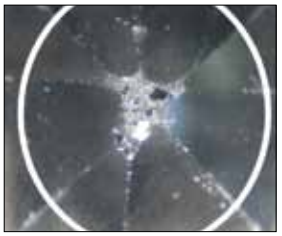
Polishing scratch marks.



Burn marks on a polished diamond.



Small percussion marks on pavilion facet edge.



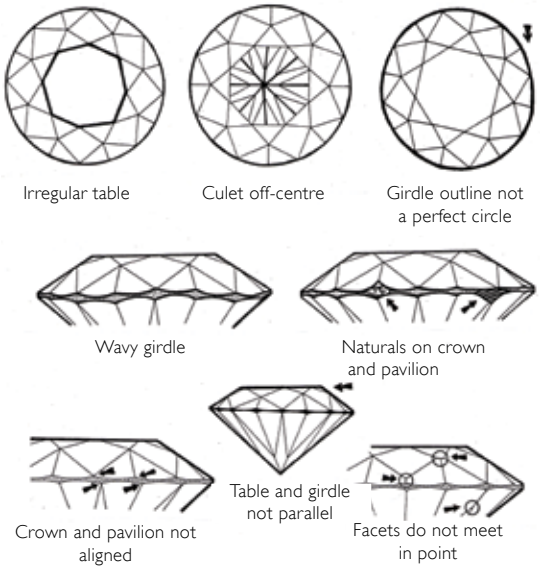
Culet and pavilion facet abrasion.

2. The symmetry

The symmetry is also graded as "*Excellent*", "*Very Good*", "*Good*", "*Fair*" or "*Poor*".

This gives an indication of how symmetrically the facets are aligned in the cut stone. Aspects such as an off-centre culet or table, a wavy girdle or a large difference between minimum and maximum diameters will influence the symmetry.

SYMMETRY CHARACTERISTICS IN ROUND BRILLIANT CUTS



Perfectly round.

Out of round.

ASSIGNING AN OVERALL CUT GRADE

In the table below a range is proposed within which each proportion parameter should fall in order for it to be considered either excellent, very good, good, fair or poor. These ranges are rounded off to the nearest percentage point. If more than 70% of the various proportions of a diamond fall within a certain grade, that grade may be assigned as an overall cut grade. It is possible that the individual proportions of a diamond can fall into three or more different grade categories. In such a case, average out the different grade categories to arrive at an overall cut grade. For instance: if among the eight different proportions there are 2 x excellent / 3 x very good / 3 x good grades, the overall grade should be very good. If the diamond has 1 x very good / 2 x good / 3 x fair / and 2 x poor proportion parameters, the overall cut grade should be fair. Gemmological laboratories may differ slightly in their opinion of these ranges and how to "average" an overall cut grade.

COMMENTS

Any other important characteristic which the grader has noted will be indicated in the "comments" section of the grading report. Typically, slight girdle bearding, graining or minor finish blemishes are noted here. These characteristics are useful in identifying a diamond and, if severe, will significantly influence its clarity grade.

Cut grade	Poor	Fair	Good	Very good	Excellent	Very good	Good	Fair	Poor
Total depth %	<52	52-54	54-56	56-58	58-65	65-67	67-69	69-71	>71
Table %	<44	44-49	49-51	51-53	53- 62	62-65	65-68	68-72	>72
Crown angle	<26	26-28	28-31	31-32	32-36	36-37	37-38	38-42	>42
Crown height %	<7	7-9	9-11	11-13	13-15	15-17	17-19	19-21	>21
Pavilion depth %	<39	39-40	40-41	41-42	42-45	45-47	47-48	48-49	>49
Pavilion angle	<38	38-39	39-40	40-42	42-43	43-44	44-45	45-46	>46
Girdle thickness %		0.5-2.0	2-2.4	2.5-3.5	3.5-4.5	4.6-5	5.5-6.5	6.5-9	>9
Girdle description		very thin	thin	thin-med	slightly thick	thick	very thick	extremely thin	extra thick
Culet size	extra large	very large	large	none-med	none-small	none-med	med	very large	extra large

Please note:

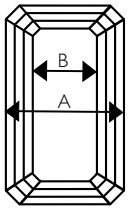
- For a diamond to receive an overall excellent cut grade, its brightness and fire should be high and the pattern of its face-up reflections must be, even with strong contrasts between bright and dark areas, and;
- Its symmetry and polish must also be of an excellent grade.
- A software program called *Facetware* is available at www.diamondcut.gia.edu that allows users to estimate the overall cut grade once the stone's proportions have been measured.

FANCY CUT DIAMONDS

The rules for grading fancy cut diamonds are similar to those of round brilliants, except for the following differences:

1. **Inclusions** are easier to see in step cuts than in fancy brilliants.
2. **Colour** is often concentrated in the tips of marquise, pear and oval. If it looks darker face-up than in the table-down position, the colour is lowered to that of the face-up position.

3. **Table width** % is calculated as:



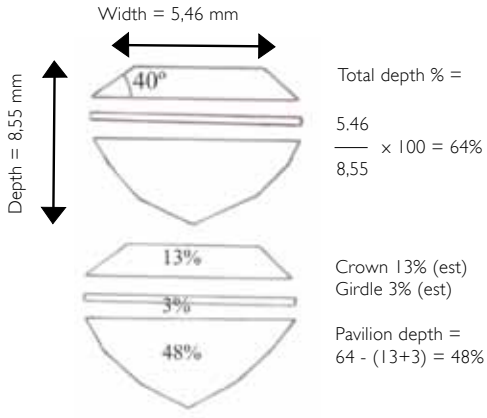
$$\frac{\text{table width B}}{\text{stone width A}} \times 100 = \text{table \%}$$

4. **Crown angle** is estimated as with round brilliant cuts, but by looking at the stone's lengthwise profile.

5. **Total depth** % and **pavilion depth** %

First measure and calculate the stone's total depth as:

$$\frac{\text{stone depth (measured)}}{\text{stone width (measured)}} \times 100 = \textbf{total depth \%}$$



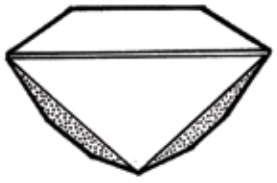
View the stone in profile and estimate the crown height and girdle thickness. Then calculate as follows:

Total depth % - (estimated crown height % + estimated girdle thickness %) = **pavilion depth %**

Describe the total depth % and the pavilion depth % as *"Acceptable", "Slightly shallow", "Very shallow", "Slightly deep" or "Very deep".*

6. **Bow ties and bulges**

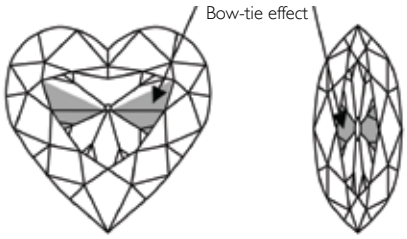
For **step cuts**, describe their **bulge factor**:



The bulge of the pavilion of a fancy cut diamond.

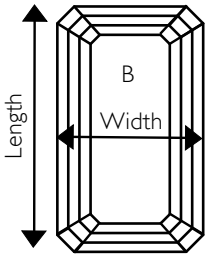
Obvious bulges will detract from the value.

For fancy brilliants, describe the bow-tie:



7. **The length to width ratio**

This is measured as shown below, and calculated as follows:



$$\frac{\text{length}}{\text{width}} = \text{ratio}$$

This ratio is expressed as, for example 1.52 : 1 (note: this ratio means that the length of the stone is 1.52 times longer than its width).

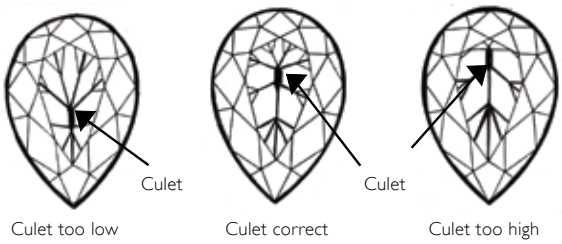
The length to width ratio is described as "*slightly noticeable*","*obviously long*" or "*obviously short*", using the table below.

PREFERRED LENGTH TO WIDTH RATIO FOR VARIOUS FANCY SHAPES

Shape	Preferred	Too long	Too short
Emerald	1.50-1.75 : 1	>2.00 : 1	1.25-1.10 : 1
Heart	1.00: 1	>1.25 : 1	<1.00 : 1
Triangle	1.00 : 1	>2.50 : 1	<1.00 : 1
Marquise	1.75 - 2.25 : 1	>2.50 : 1	<1.50 : 1
Oval	1.33-1.66 : 1	>1.75 : 1	1.25-1.10 : 1
Pear	1.50-1.75 : 1	>2.00+ : 1	<1.50 : 1

8. **Culet size and position**

Fancies often have an elongated culet. Observe only the width of the culet and assess the same as with rounds.



9. **Symmetry aspects**

Because of the many shape variations possible with fancy cuts, there are a few extra symmetry issues that need to be judged under X10 magnification, such as:

- the position of the culet;
- uneven wings and shoulders;
- non-parallel edges;
- and uneven bulges.

Please note: Trust your instinct. If you like what you see when observing a fancy cut diamond face-up, believe your eyes. What you like, others will like too.

Uneven fancy cut.

FANCY COLOURED DIAMONDS

Diamonds that exhibit colours other than yellow or brown - and those yellow and brown stones with a colour more intense than Z - are called fancy coloured diamonds or "fancies". They also come in other more unusual colours, such as red, green, purple and blue, etc. In natural diamonds the intensity of these unusual colours is normally quite weak. However, if these unusual colours are intense, they are normally indicative of a synthetic, man-made diamond or of a natural diamond whose colour has been enhanced in the laboratory. See the section on enhancements at the end of this chapter.

NATURAL FANCY COLOURED DIAMONDS

Diamonds with a natural red, pink, blue or green colour are extremely rare and fetch astronomical prices. These colours are normally quite pale compared with the intense yellow some natural diamonds exhibit. In the '90s, an exceptional red diamond was sold for US$92 600/ct while vivid fancy pinks from the Argyle mine in Australia are annually put on auction and bought by collectors at prices ranging from US$30 000-200 000/ct.

Small pale pinks and blues are readily available and have become a fashionable item in fine jewellery.

Natural fancy yellow diamonds are more readily available. They exhibit a vast range of colours - from "canary" (pure yellow) to orangy-yellow, greenish-yellow to brownish-yellow, which makes pricing them a specialist art. The pure yellow stones with no other colour modifiers are the most expensive. Half-caraters of such colour can be bought from US$2 000-5 000/ct.

Brown diamonds have been produced in large volumes at the Argyle mine in Australia. They come in colours described as "*beer bottle*", "*champagne*" or "*cognac*", which are quite affordable. Combined with white diamonds, they make beautiful jewellery, especially for men.

A selection of natural fancy coloured diamonds (rough).

NOMENCLATURE FOR FANCY COLOURS

Grading laboratories have developed their own individual system for describing and grading fancy coloured diamonds. This is confusing, because certificates from two laboratories may differ widely in their description of the same stone. Fancy coloured diamonds should not be valued on the description of one laboratory only, but rather on what the eye sees.

The following colour grading system for "fancies" is preferred.

Yellow and brown colours

Yellow or brown coloured diamonds with a colour stronger than the Z master stone is described with a "fancy" prefix and with increase in colour as follows: "*Fancy Light*", "*Fancy*", "*Fancy Intense*", "*Fancy Dark*", "*Fancy Deep*", "*Fancy Vivid*".

For example : Fancy Light greenish-yellow natural diamond, or, Fancy Intense orangy-brown synthetic diamond.

EGL South Africa describes brown diamonds as "*Champagne*" and indicates the intensity of colour on a scale ranging from C-1 (light) to C-7 (very dark).

All other colours

Diamonds with a colour other than yellow or brown normally exhibit a colour of much less intensity. A diamond's characteristic colour, ie, blue, pink, green, steel, purple, etc, is modified by the following terms: "*Faint*", "*Very Light*" or "*Light*".

For example: Very Light green fancy coloured diamond, or Faint blue fancy coloured diamond.

BLACK DIAMONDS - fact or fantasy?

Experts have long believed that there are no true black diamonds and that they exist only in folklore and detective stories. There are, however, three kinds of diamonds that are often referred to as black.

One type is actually very dark brown or a gunmetal-coloured diamond with so many specks of dark mineral inclusions (believed to be graphite) that they appear black to the unaided eye.

The other type is a dark yellow or dark brown diamond that has been artificially irradiated to produce a dark greenish diamond that looks black.

The only true black diamond is one which does not transmit any light. Even the thinnest sliver (when held up to a very brightest source of light) will not transmit any light. Such diamonds, if untreated, are extremely rare.

Because black diamonds are extremely difficult to polish, they often show polishing drag lines and cracks across facets that are visible to the naked eye. Their girdles are normally chipped.

V. COLOUR AND CLARITY ENHANCED DIAMONDS

COLOUR ENHANCEMENT

Intense yellow, green, blue and even pink colours can be **induced** in a natural diamond by a combination of radiation, heat treatment and/or special surface coatings. Such stones cost a fraction of those with a comparable natural colour. Also, the colour of a yellowish-brownish type IIb diamond can be **removed** by a high-pressure/high-temperature (HP/HT) process, rendering a beautiful white stone.

Fortunately, most gem laboratories can identify the artificial nature of a diamond's colour.

Some grading reports will indicate NCNA, an acronym for **N**atural **C**olour **N**ot **A**uthenticated. This means that the laboratory has not established whether the colour is natural or not. It is therefore of prime importance to have coloured diamonds certified by a reputable laboratory before they are sold to the public.

Please note:

- Be careful with pale green or pale blue diamonds - it is difficult to distinguish a pale natural colour from a pale colour induced by man. Natural vivid greens and blues are extremely scarce and, if available, will most probably be the result of laboratory enhancement.
- You should be aware that some fancy coloured diamonds which have been treated - especially the yellows, browns and blues - will change colour under a jeweller's torch. A normal repair job like tipping claws could cause a blue stone to turn green, resulting in a very unhappy client.

CLUES FOR DETECTING TREATED DIAMONDS

- A medium to dark, vivid green, blue- green or blue body colour.
- Darker green or brown naturals or surface spots.
- Umbrella effect - a coloured pattern following facet junctions.
- Disc-like inclusions.
- Colour zoning in the culet.

Please note: Natural blue diamonds will conduct electricity. Treated blues do not.

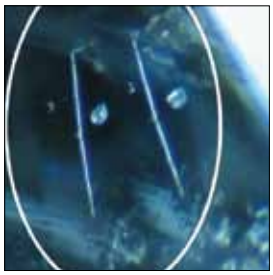
CLARITY ENHANCEMENT

There are techniques available to improve a diamond's clarity, for instance:

- **Laser drilling**

A laser beam is used to drill an extremely thin tube into a dark inclusion or a stained crack. A strong acid, which is forced down the tube, dissolves the inclusion or stain, rendering the imperfection less visible. The laser hole is often filled with a colourless resin. Grading laboratories will disclose whether a diamond has been laser drilled to improve its clarity. Laser drill holes are quite easy to detect under magnification.

Laser drill hole into an acid wash inclusion.

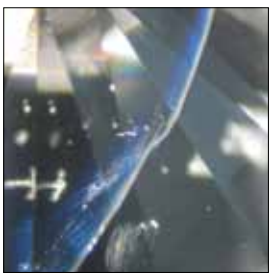


Laser drill holes in a diamond.

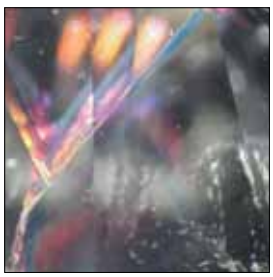
- **Fracture filling**

Modern techniques are availably whereby a special glassy resin with a RI similar to that of a diamond and with a low melting point (similar to the material used to repair windscreens) is sucked under vacuum into cracks that reach the surface of a polished diamond. Under the microscope, it requires some expertise to identify small bubbles that may be trapped in the fill material. By using dark field illumination a colourful feature, called the "flash effect", can be seen which is indicative of a fracture-filled diamond. Such filling makes a crack less visible to the naked eye and may improve the clarity of a diamond by one or more grades.

Most gemmological laboratories will not grade fracture-filled stones, as the treatment is not permanent. A goldsmith's flame may cause the fill material to melt and leak from the crack.



Blue colour flash in a fracture-filled diamond.



Orange flash in a fracture-filled diamond.

Please note:

The diamond grading principles as described herein are guidelines only. They will assist the jeweller in assessing a grading report, as well as in the valuation of diamonds. The jeweller must realise that the grading report is worth only as much as the reputation of the organisation which issued it. Also, that the diamond itself is the only real thing of value.

Diamond grading is a specialised skill and much experience is needed before a true grade can be attached to a particular stone. In professional grading laboratories, more than one grader must independently arrive at the same grade before a report is issued.

The author assumes no responsibility if, by using the guidelines herein, losses are suffered in the valuation of diamonds and other precious gems.