

© CIBJO 2011. All rights reserved.



THE WORLD JEWELLERY CONFEDERATION

**2011-1**

2011-5-1

**CIBJO / GEM MATERIALS 2011-1**

CIBJO / SECTOR A / DIAMOND COMMISSION

## **THE DIAMOND BOOK**

### **Diamonds — Terminology & Classification**

<b>Foreword.....</b>	<b>iv#</b>
<b>Introduction.....</b>	<b>vi#</b>
<b>Diamonds - Terminology and Classification (nomenclature) .....</b>	<b>1#</b>
<b>1.# Scope.....</b>	<b>1#</b>
<b>2.# Normative references.....</b>	<b>1#</b>
<b>3.# Normative Clauses .....</b>	<b>1#</b>
<b>4.1.# Assembled stone.....</b>	<b>4#</b>
<b>4.2.# Carat .....</b>	<b>4#</b>
<b>4.3.# Clarity .....</b>	<b>5#</b>
<b>4.4.# Colour .....</b>	<b>5#</b>
<b>4.5.# Commercial documents.....</b>	<b>5#</b>
<b>4.6.# Coating .....</b>	<b>5#</b>
<b>4.7.# Crown .....</b>	<b>5#</b>
<b>4.8.# Cut.....</b>	<b>5#</b>
<b>4.9.# Culet.....</b>	<b>5#</b>
<b>4.10.# Diamond .....</b>	<b>5#</b>
<b>4.11.# Diamond simulants .....</b>	<b>5#</b>
<b>4.12.# Disclosure .....</b>	<b>5#</b>
<b>4.13.# Dyeing.....</b>	<b>5#</b>
<b>4.14.# Fluorescence .....</b>	<b>5#</b>
<b>4.15.# Foiling.....</b>	<b>6#</b>
<b>4.16.# Fracture filling .....</b>	<b>6#</b>
<b>4.17.# Girdle .....</b>	<b>6#</b>
<b>4.18.# Grading.....</b>	<b>6#</b>
<b>4.19.# Grain .....</b>	<b>6#</b>
<b>4.20.# Grainer.....</b>	<b>6#</b>
<b>4.21.# Heating .....</b>	<b>6#</b>
<b>4.22.# High Pressure High Temperature (HPHT).....</b>	<b>6#</b>
<b>4.23.# Imitations of diamond .....</b>	<b>6#</b>
<b>4.24.# Internal laser drilling .....</b>	<b>6#</b>
<b>4.25.# Irradiation .....</b>	<b>6#</b>

<b>4.26.# Laboratory-created diamond .....</b>	<b>6#</b>
<b>4.27.# Laboratory-grown diamond.....</b>	<b>7#</b>
<b>4.28.# Laser drilling.....</b>	<b>7#</b>
<b>4.29.# Marketing.....</b>	<b>7#</b>
<b>4.30.# Material information .....</b>	<b>7#</b>
<b>4.31.# Millimetres.....</b>	<b>7#</b>
<b>4.32.# Natural mineral .....</b>	<b>7#</b>
<b>4.33.# Pavilion.....</b>	<b>7#</b>
<b>4.34.# Polished diamond .....</b>	<b>7#</b>
<b>4.35.# Representation .....</b>	<b>7#</b>
<b>4.36.# Selling.....</b>	<b>7#</b>
<b>4.37.# Shape.....</b>	<b>8#</b>
<b>4.38.# Special care .....</b>	<b>8#</b>
<b>4.39.# Synthetic diamond .....</b>	<b>8#</b>
<b>4.40.# Table .....</b>	<b>8#</b>
<b>4.41.# Total Weight.....</b>	<b>8#</b>
<b>4.42.# Treated diamond .....</b>	<b>8#</b>
<b>4.43.# Treatment .....</b>	<b>8#</b>
<b>4.44.# Weight.....</b>	<b>8#</b>
<b>Annex A - Contents of diamond grading reports (informative) .....</b>	<b>9#</b>
<b>Annex B - Diamond treatments (informative) .....</b>	<b>10#</b>
<b>Annex C - Parts and facet arrangement of a round brilliant cut (informative).....</b>	<b>11#</b>
<b>Annex D - Corresponding terms for colour grades (informative).....</b>	<b>12#</b>
<b>Annex E - Corresponding terms for clarity grades (informative) .....</b>	<b>13#</b>
<b>References (informative) .....</b>	<b>14#</b>
<b>Index.....</b>	<b>21#</b>

## Foreword

CIBJO is the French acronym for the **Confédération Internationale de la Bijouterie, Joaillerie, Orfèvrerie, des Diamants, Perles et Pierres**, which translates as the International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones (normally shortened to the International Jewellery Confederation). Founded in 1926 as BIBOAH, a European organisation whose mission was to represent and advance the interests of the jewellery trade in Europe, it was reorganised in 1961 and renamed CIBJO, in 2009 it was once again reorganized and officially named “CIBJO, The World Jewellery Confederation”. Today CIBJO, which is domiciled in Switzerland, is a non-profit confederation of national and international trade associations including commercial organisations involved in the jewellery supply chain. It now has members from countries representing all five continents of the world. CIBJO printed its first deliberations on terminology and trade practices in 1968.

It is the task of CIBJO to record the accepted trade practices and nomenclature for the industry throughout the world. The records of the trade practices complement existing fair trade legislation of a nation or in the absence of relevant national laws they can be considered as trading standards. In countries where laws or norms exist, which conflict with the laws, norms or trade practices in other countries, CIBJO will support the national trade organizations to prevent trade barriers developing. The purpose of CIBJO is to encourage harmonization, promote international co-operation within the jewellery industry, consider issues which are of concern to the trade worldwide and to communicate proactively with members. Foremost amongst these the aim is to protect consumer confidence in the industry. CIBJO pursues all of these objectives through informed deliberation and by reaching decisions in accordance with its Statutes. CIBJO relies upon the initiative of its members to support and implement its standards, and to protect the trust of the public in the industry.

The work of CIBJO is accomplished through Committees, Commissions and Sectors. Committees and Commissions consider standards for use in the jewellery supply chain. Sectors represent levels of trade in the jewellery industry. Sectors and commissions advise the Executive Committee on current trade practices and issues that affect the jewellery industry.

Three independent sectors exist within the confederation:

Sector A - The Products Sector

Sector B - The Supply chain Sector

Sector C - The Service Sector

The Executive Committee may appoint Commissions that consider detailed issues. At present these are:

Coloured Stone

Diamond

Ethics

Gemmological

Pearl

Marketing & Education

Precious Metals

World Jewellers Vigilance

The Commissions for Diamonds, Gemstones, Pearls and Precious Metals have collated the guidelines, which present the accepted trade practices for applying descriptions to these materials. It is in the best interest of all those concerned to be aware of them.

The Sectors and Commissions will propose changes in the standards, also known as the Blue Books, to the Executive Committee. After review the Executive Committee will submit the accepted proposals for adoption to the Board of Directors and if approved they will notify the assembly of delegates of the changes at the annual congress. Furthermore it is our mutual responsibility to support these recommendations, which concern all professional people connected with diamonds, gemstones, pearls and precious metals. CIBJO Standards are subject to government regulations in the respective jurisdictions of CIBJO members.

The national umbrella organization for each country represents, in principle, all the national trade organizations involved in the sectors mentioned above. This democratic structure, which has contributed to CIBJO's world-wide recognition also includes international trade and commercial organizations, it provides an international forum for the trade to collectively draw attention to issues and implement resulting decisions.

CIBJO Secretariat:

CIBJO, The World Jewellery Confederation  
Piazzale Carlo Magno, 1  
20149 Milano, Italy

Tel: +39-02-4997-7098 / 7097 / 6187 Fax: + 39 02- 4997-7059

E-mail: [cibjo@cibjo.org](mailto:cibjo@cibjo.org)

Web site: [www.cibjo.org](http://www.cibjo.org)

## **Introduction**

This CIBJO Diamond Standard is designed to assist all those involved in the purchase or sale of diamonds, treated diamond (4.10), synthetic diamonds (4.39) and imitations of diamond (4.23). The standard is non judgmental and the definitions and clauses contained herein are formatted and worded only to ensure that each natural, synthetic and imitation diamond bought or sold is done so with clarity and honesty. The stability of the market place depends upon the use of the proper nomenclature and the declaration of all known facts that ensure a fully informed purchase or sale.

The Scope (1) of the Standard is set out, as are the Normative References (2). The Terms and Definitions (4) are expansive and cross-referenced throughout the Normative Clauses (3) and Annexes. It is important that the reader refers to the relevant Terms and Definitions when consulting each Normative Clause.

President the CIBJO Diamond Commission

July 14, 2010

## Diamonds - Terminology and Classification (nomenclature)

### 1. Scope

The terminology and classification of diamonds (4.10), synthetic (4.39), and imitations of diamonds (4.23) are established with reference to commercial usage, in conformity with the classifications and practices of the international diamond (4.10), synthetic diamond (4.39), , imitation of diamonds (4.23) and jewellery trade. The terminology and classifications of diamond (4.10), synthetic diamonds (4.39), and imitation of diamonds (4.23) shall be used by all traders participating as members of CIBJO member organizations within all member nations.

NOTE – CIBJO recognises that its standards are subject to government regulations in the respective jurisdiction of CIBJO members.

### 2. Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

**The Gemstone Book**, CIBJO, International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, Piazzale Carlo Magno,1, 20149 Milano, Italy. [cibjo@cibjo.org](mailto:cibjo@cibjo.org)

**The Gemmological Laboratory Book**, CIBJO, International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, Piazzale Carlo Magno,1, 20149 Milano, Italy. [cibjo@cibjo.org](mailto:cibjo@cibjo.org)

**The Pearl Book**, CIBJO (International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, Piazzale Carlo Magno,1, 20149 Milano, Italy. [cibjo@cibjo.org](mailto:cibjo@cibjo.org)

**The Precious Metals Book**, CIBJO, International Confederation of Jewellery, Silverware, Diamonds, Pearls and Stones), the World Jewellery Confederation, Piazzale Carlo Magno,1, 20149 Milano, Italy. [cibjo@cibjo.org](mailto:cibjo@cibjo.org)

**PAS 1048**, Grading polished diamonds, Part 1: Terminology and classification - Part 2: Test methods (2005), Beuth Verlag GmbH, Berlin. <http://www.natdiamond.com/pas1048>

### 3. Normative Clauses

The content of the following clauses shall be applied.

#### 3.1. Diamond

a diamond (4.10) can also be called a natural diamond.

#### 3.2. Treated diamond

The fact that a diamond has been treated (4.42 ) shall be disclosed (4.12).

#### 3.3. Description

A treated diamond (4.42) shall be disclosed as either a treated diamond (4.42) or a treated synthetic diamond with specific reference to the particular treatment (4.432) and the description shall be as conspicuous and immediately preceding the word(s) diamond (4.10) or synthetic diamond (4.39) as the case may be.

#### 3.4. Terms designed to disguise

Any term that is designed to disguise that a treatment (4.43) has occurred, or to imply that a treatment is part of the normal cutting and polishing process or that misleads the consumer in any way shall not be used. For example the use of terms such as “improved” shall not be used to describe a treated diamond (4.42).

### **3.5. Special Care**

Any special care (4.38) requirements that the treatment (4.43) creates shall be disclosed.

### **3.6. Names of firms**

Names of firms, manufacturers or trademarks shall not to be used in connection with treated diamonds, unless such names are clearly succeeded by the word treated (4.42) or are otherwise conspicuously and prominently disclosed as treated. For example, a diamond business trading as Bianchi may describe its treated diamonds (4.42) as “Bianchi Treated Diamonds” or “Bianchi Diamonds, treated by [treatment]” but not as “Bianchi Diamonds”.

### **3.7. Synthetic diamond**

The fact that a synthetic diamond (4.39) is wholly or partially synthetic shall be disclosed (4.12).

Only the term “synthetic” (4.39), “laboratory-created” (4.26) or “laboratory-grown” (4.27) shall be used to describe synthetic diamonds (4.39) and these terms shall be equally as conspicuous and immediately precede the word “diamond” (4.10).

NOTE 1 – The usage of the term “synthetic” (4.39) whenever used alone in this book also refers to “laboratory-created” (4.26) or “laboratory grown” (4.27) these three terms are synonymous.

NOTE 2 - The term “synthetic diamond” may be replaced by the terms “laboratory-grown” or ‘laboratory-created’. In the event that the national jewellery association, which is a member of CIBJO, deems that there is no acceptable local direct translation of the English terms ‘laboratory-grown’ or ‘laboratory-created,’ then only the translation of the term ‘synthetic’ should be used.

#### **3.7.1. Misleading terms**

Any terms that are designed to disguise the fact that a stone is a synthetic diamond (4.39), or that mislead the consumer shall not be used. Specifically: The words real, genuine and natural or the term cultured shall not be used to describe any synthetic diamond (4.39).

#### **3.7.2. Names of firms**

Names of firms, manufacturers or trademarks shall not be used as descriptors for synthetic diamonds (4.39), unless such names are clearly succeeded by the terms synthetic. E.g., a business trading as Bianchi must describe its synthetic diamonds as “Bianchi Synthetic Diamonds” but not as “Bianchi Diamonds”.

### **3.8. Simulants of diamond**

An imitation of diamond (4.23), also known as a diamond simulant (4.11) shall always be disclosed either as the mineral or compound that it is or as a diamond simulant or an imitation diamond. The unqualified word diamond shall not be used with diamond simulants (4.11).

Names of firms, manufacturers or trademarks shall not to be used in connection with diamond imitations, unless such names are clearly succeeded by the terms as defined herein. E.g., a diamond business trading as Bianchi may describe its diamond simulants as “Bianchi Cubic Zirconia” or “Bianchi Diamond Simulants” but not as “Bianchi Diamonds”.

### **3.9. Full disclosure**



Full disclosure (4.12) by the vendor to the purchaser of all material information (4.30) shall take place whether or not the information is specifically requested and regardless of the effect on the value of the diamond (4.10), treated diamond (4.42), synthetic diamond (4.39) or imitation of diamond (4.23).

### **3.9.1. Verbal disclosure**

Full verbal disclosure shall take place using clear and understandable language prior to the completion of a sale.

### **3.9.2. Written disclosure**

Full written disclosure shall be conspicuously included on all commercial documents (4.5) in clear and plain language so as to be readily understandable to the purchaser. The disclosure (4.12) shall immediately precede the description of the diamond, treated diamond (4.42), synthetic diamond (4.39) or imitation of diamond (4.23) and shall be equally conspicuous to that description.

## **3.10. Misuses of Terminology**

The misuse of terminology is contrary to the purposes of this document.

### **3.10.1. Misleading and deceptive statements**

It is contrary to the purposes of the this document to make any misleading or deceptive statement, representation (4.35) or illustration that does not conform in all respects with any and all the clauses contained herein, in the selling (4.36), marketing (4.29) or distribution of any diamond, treated diamond (4.42), synthetic diamond (4.39) or imitation of diamond (4.23) defined in this document.

It is contrary to the purposes of the this document to make any misleading or deceptive statement, representation (4.35) or illustration relating to origin, formation, production, condition or quality of any diamond (4.10), treated diamond (4.42), synthetic diamond (4.39) or imitation diamond (4.23) defined herein.

## **3.11. Weight (mass)**

The weight (4.44) of the diamond (4.10) shall be expressed in metric carats (ct) (4.2). The weight of a diamond (4.10) shall be stated in carats to at least two decimal places.

Note: weight may be expressed using the term "point", where a point is 1/100<sup>th</sup> of a carat. Thus a diamond weighing 0.19ct may also be described as a 19 point diamond.

### **3.11.1. Rounding**

The weight of a diamond shall only be rounded-off upwards if the third decimal figure is a nine.

### **3.11.2. Total weight**

If the total weight (4.41) of all the diamonds (4.10) contained in a jewellery piece is given, the weight shall be specified clearly and unambiguously by the terms total weight (4.41) or words of similar importance. Care shall be taken when using total weights not to give the misleading impression that the piece of jewellery contains one stone equal in weight to the total weight (4.41).

### **3.11.3. Total weight (multiple species)**

The total weight (4.41) of diamonds (4.10) and other gems contained in the same article can only be stated providing it is accompanied, with equal emphasis and conspicuousness, by the total separate weight(s) of each variety or species of gem. An unacceptable example: gem and diamond cluster ring, total gem weight 1.00 ct.

### **3.11.4. Fractions**

The weight of a diamond (4.10) or group of diamonds can be represented by a fraction providing the weight meets or exceeds the equivalent decimal carat weight. For example: a diamond described as half carat must weigh at least 0.50 ct.

#### **3.11.5. Weights less than 1.00ct**

Diamonds (4.10) with weights less than 1.00 carat shall be stated with a zero, of equal size and prominence to the other numerals, preceding the decimal point. A correct example would be, 0.25 ct. while an incorrect example would be .25ct.

#### **3.11.6. Weights of less than 0.001ct**

The weight shall not be specified for any diamond(s) (4.10) weighing less than 0.001ct total.

### **3.12. The term grain or grainer**

The terms grain (4.19) or grainer (4.20), as a unit of weight, shall not be used at the retail level for consumers. NB *grain* or *grainer* is acceptable and regularly used by the trade.

### **3.13. Measurements**

#### **3.14. Unit of measurement**

The distance measurements of a diamond (4.10), treated diamond (4.42), synthetic diamond (4.39) or imitation of a diamond (4.23) shall be expressed in millimetres to at least two decimal places.

##### **3.14.1. Round stones**

for round stones the average diameter and depth (total height) are required. The depth shall be the distance between the table facet (4.40) and the culet (4.9).

##### **3.14.2. Fancy shapes**

for fancy shapes the length, width and depth (total height) are required. The length shall be the longer measurement and the width shall be the maximum measurement perpendicular to the length. The depth shall be the distance between the table facet (4.40) and the culet (4.9).

### **3.15. Grading**

CIBJO established a basic grading system for diamonds (4.10) in 1972. There was work done over a number of years with inputs from CIBJO, GIA, IDC and ScanDN to establish a universal grading system. A version of this is now provided in PAS 1048 (2).

See PAS 1048 (2) for comparison between CIBJO, GIA and ScanDN systems. The CIBJO system uses descriptive terms for colour, whereas the GIA one uses symbols (letters).

Note: grading assessments made on diamonds, treated diamonds and synthetic diamonds (4.39) while set in items of jewellery may be inaccurate.

## **4. Terms and definitions**

For the purposes of this CIBJO Standard, the following terms and definitions apply.

### **4.1. Assembled stone**

a stone constructed of two or more parts of which at least one is diamond (4.10), synthetic diamond (4.39), or treated diamond (4.42).

### **4.2. Carat**

unit of weight (4.44) for diamond (4.10), one carat being equivalent to 200mg (1/5 g).

#### **4.3. Clarity**

relative degree to which a diamond (4.10) is free of internal characteristics/inclusions and external characteristics/blemishes.

#### **4.4. Colour**

relative absence (colourlessness) or presence of hue.

#### **4.5. Commercial documents**

commercial documents are those written to record the terms of a sale and purchase price whether actual or pending, e.g., certificates, bills of sale, invoices, memorandums, approbations, offers, receipts, advertisements, appraisals or any other documents of a similar nature or meaning.

#### **4.6. Coating**

a layer of a substance spread over the surface, or part of the surface, of a diamond for protection, colouration or decoration; a covering layer.

#### **4.7. Crown**

see Annex C (a 1 to 4).

#### **4.8. Cut**

Shape, proportions and finish of a diamond (4.10).

#### **4.9. Culet**

see Annex C (7).

#### **4.10. Diamond**

a diamond is a natural mineral consisting essentially of carbon crystallised in the isometric (cubic) crystal system. Its hardness on the Mohs' scale is 10; its specific gravity is approximately 3.52; it has a refractive index,  $n_D$ , of 2.42.

a mineral is a naturally occurring material formed by geological processes.

#### **4.11. Diamond simulants**

see 4.23.

#### **4.12. Disclosure**

disclosure is the complete and total release of all material information (4.30) about a diamond (4.10), synthetic diamond (4.39) or simulant (4.11).

#### **4.13. Dyeing**

the application of a dye or to diamonds to cause colour.

#### **4.14. Fluorescence**

degree of luminescence of a diamond (4.10) when viewed under a long-wave (365nm) ultraviolet (UV) light source.

#### **4.15. Foiling**

a thin leaf of metal silvered and burnished, coated with transparent colors and applied to or near the pavilion facets of a diamond .

#### **4.16. Fracture filling**

to occupy the whole or part of fracture in a diamond with a substance, e.g., glass; to pervade; to spread throughout; to occupy completely; or make full, with the purpose of making the fracture less visible

#### **4.17. Girdle**

See Annex C (f)

#### **4.18. Grading**

to classify cut diamonds (4.10) in accordance with their degree of clarity, presence or absence of colour, cut and other factors that may describe an element of quality.

#### **4.19. Grain**

a unit often used in the trade to approximate the weight of a diamond, a grain is equal to 0.25ct.

#### **4.20. Grainer**

see grain (4.19). A "four grainer" is often used in the trade to describe a 1carat cut diamond (4.10).

#### **4.21. Heating**

modifying the appearance of a diamond by a thermal process, e.g. in a furnace, kiln or other heating apparatus.

#### **4.22. High Pressure High Temperature (HPHT)**

modifying the appearance of a diamond (4.10) through a treatment involving both high pressures and high temperatures.

#### **4.23. Imitations of diamond**

an imitation of diamond (4.10) is any object or product used to imitate the appearance of diamond, or some of its properties, and includes any material, or combination of materials, which do not meet the definition of diamond (4.10). Imitations of diamond are also known as diamond simulants (4.11)

#### **4.24. Internal laser drilling**

use of a laser to heat an inclusion in a diamond (4.10) causing it to expand and create fine surface reaching fractures which in turn allow for a chemical treatment of the inclusion, generally changing the appearance of the inclusion from black to white.

#### **4.25. Irradiation**

exposing a diamond (4.10) to radiation.

#### **4.26. Laboratory-created diamond**

a man-made reproduction of a diamond (4.10) that has essentially the same chemical composition, crystal structure and physical properties as its natural counterpart. Also see synthetic diamond (4.39) and laboratory-grown diamond (4.27)

NOTE – The terms synthetic, laboratory-created and laboratory grown are synonymous

#### **4.27. Laboratory-grown diamond**

a man-made reproduction of a diamond (4.10) that has essentially the same chemical composition, crystal structure and physical properties as its natural counterpart. Also see synthetic diamond (4.10) and laboratory-created diamond (4.26).

NOTE – The terms synthetic, laboratory-created and laboratory-grown are synonymous.

#### **4.28. Laser drilling**

burning a channel from the surface of a diamond (4.10) to meet with an inclusion (generally black) with a laser; the channel being used as a conduit to allow for a chemical treatment of the inclusion, generally changing the appearance of the inclusion from black to white.

#### **4.29. Marketing**

marketing includes directly or indirectly promoting the sale or use of a diamond (4.10), treated diamond (4.42), synthetic diamond (4.39) or imitation of diamond (4.23).

#### **4.30. Material information**

any information that if disclosed would either alter the value, saleability or desirability of a diamond (4.10), treated diamond (4.42), synthetic diamond (4.39), or imitation of a diamond (4.23), including any care, cleaning and/or maintenance requirements.

#### **4.31. Millimetres**

unit of length equal to one thousandth ( $10^{-3}$ ) of a metre , or 0.0394 inch.

#### **4.32. Natural mineral**

a natural mineral is one that has been formed completely by nature without human intervention during the formation process.

#### **4.33. Pavilion**

see Annex C (b 5 and 6).

#### **4.34. Polished diamond**

diamonds (4.10) with a defined cut (4.8).

#### **4.35. Representation**

representation includes illustrations, descriptions, expressions, words, figures, depictions or symbols shown in a manner that may reasonably be regarded as relating to the diamond (4.10), treated diamond, synthetic diamond (4.39), or imitation of diamond (4.23).

#### **4.36. Selling**

selling includes offering for sale, exposing for sale, displaying in such a manner as to lead to a reasonable belief that the product so displayed is intended for sale. For avoidance of doubt this includes the accepted industry practice of memorandums or appraisals, the practice of consigning diamonds (4.10), treated diamonds (4.42), synthetic diamonds (4.39) or imitations of diamond (4.23), normally polished, to clients for potential sale.

#### **4.37. Shape**

outline of a diamond (4.10) when viewed perpendicular to the table facet.

#### **4.38. Special care**

some diamonds (4.10), treated diamonds (4.42), synthetic diamonds (4.39), and imitations (4.23) of diamonds require special care. Examples of advice to be given on special care might be to avoid rough handling and when not in wear, keep the items separate to avoid scratches.

#### **4.39. Synthetic diamond**

a man-made reproduction of a diamond (4.10) that has essentially the same chemical composition, crystal structure and physical properties as its natural counterpart. Also see laboratory-created diamond (4.26) and laboratory-grown diamond (4.27).

NOTE – The terms synthetic, laboratory-created and laboratory grown are synonymous

#### **4.40. Table**

see Annex C (a 1).

#### **4.41. Total Weight**

the combined weight (4.44) of multiple diamonds (4.10), the combined weight of multiple treated diamonds (4.42), the combined weight of multiple synthetic diamonds (4.39), or the combined weight of multiple imitations of diamonds (4.23).

#### **4.42. Treated diamond**

a diamond (4.10) treated by a process, other than cutting, polishing and cleaning, to change the diamonds appearance by coating, filling, heating, irradiation, or any other physical or chemical treatment (4.43).

#### **4.43. Treatment**

treatment means any process, other than the accepted practices of cutting and polishing, that alters the colour and/ or clarity and/ or durability of a diamond (4.10). The use of lasers to cut or inscribe a stone does not constitute a treatment.

#### **4.44. Weight**

mass of a diamond (4.10).

## **Annex A - Contents of diamond grading reports (informative)**

Diamond grading reports generally contain the following

- Reference to the standard used
- Identification of the stone as either 'natural diamond', 'treated diamond', or 'synthetic diamond'
- Weight
- Colour grade
- Long wave ultraviolet fluorescence
- Clarity grade
- Diagrams showing the positions of internal and external features
- Shape of the stone
- Measurements
- Proportions
- Girdle description
- Finish
- Cut
- Reference number
- Date
- A method to show the authenticity of the document.

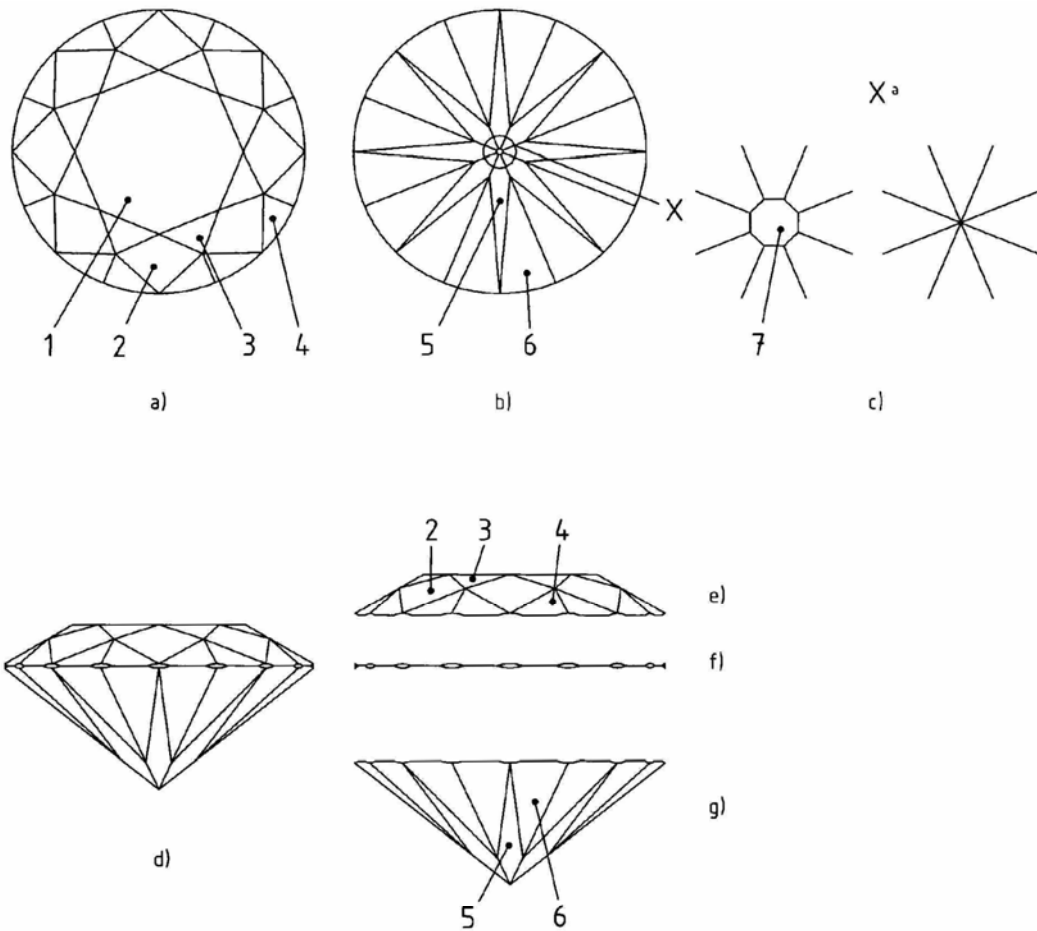
## **Annex B - Diamond treatments (informative)**

Diamond may be treated to alter colour and or clarity by any one, or any combination of, the following techniques.

- Heating (annealing) (4.21)
- Irradiation (4.25)
- Irradiation + annealing (4.25 and 4.21)
- High Pressure High Temperature (HPHT) (4.22)
- Coating (4.6)
- Fracture Filling (4.16)
- Laser Drilling (4.28)
- Internal Laser Drilling (4.24)
- Dying (4.13)
- Foiling (foil-backed) (4.15)



**Annex C - Parts and facet arrangement of a round brilliant cut (informative)**



**Key**

**Designation facets**

- a) Crown view
- b) Pavilion view
- c) Culet (enlarged)
- d) Profile view
- e) Crown
- f) Girdle
- g) Pavillion

**Facet name**

- 1 Table
- 2 Bezel/Upper main
- 3 Star
- 4 Upper girdle/Upper halves
- 5 Pavilion main/Lower main
- 6 Lower girdle/Lower halves
- 7 Culet

**Number of facets**

- 1
- 8
- 8
- 16
- 8
- 16
- 0 or 1

Total number of facets

57 or 58

**Annex D - Corresponding terms for colour grades (informative)**

GIA	CIBJO/IDC						Scan.D.N	
	English	German	French	Italian				
D	Exceptional white +	D Hochfeines Weiss+	D Blanc exceptionnel +	D Bianco extra eccezionale+	D	River	D	
E	Exceptional white	E Hochfeines Weiss	E Blanc exceptionnel	E Bianco extra eccezionale	E	River	E	
F	Rare white +	F Feines Weiss +	F Blanc extra +	F Bianco extra +	F	Top Wesselton	F	
G	Rare white	G Feines Weiss	G Blanc extra	G Bianco extra	G	Top Wesselton	G	
H	White	H Weiss	H Blanc	H Bianco	H	Wesselton	H	
I	Slightly tinted white	I Leicht getöntes Weiss	I Blanc nuancé	I Bianco sfumato	I	Top crystal	I	
J	Slightly tinted white	J Leicht getöntes Weiss	J Blanc nuancé	J Bianco sfumato	J	Crystal	J	
K	Tinted white	K Getöntes Weiss	K Légèrement teinté	K Bianco leggermente colorito	K	Top cape	K	
L	Tinted white	L Getöntes Weiss	L Légèrement teinté	L Bianco leggermente colorito	L	Cape	L	
M		M	M	M	M	Cape	M	
N		N	N	N	N	Cape	N	
O		O	O	O	O	Cape	O	
P		P	P	P	P	Cape	P	
Q		Q	Q	Q	Q	Cape	Q	
R		R	R	R	R	Cape	R	
S		S	S	S	S	Cape	S	
T	Tinted	T Getönt	T Teinté	T Colorito	T	Cape	T	
U		U	U	U	U	Cape	U	
V		V	V	V	V	Cape	V	
W		W	W	W	W	Cape	W	
X		X	X	X	X	Cape	X	
Y		Y	Y	Y	Y	Cape	Y	
Z		Z	Z	Z	Z	Cape	Z	

**Annex E - Corresponding terms for clarity grades (informative)**

<p style="text-align: center;"><b>Flawless (FL)</b></p> <p>FL diamonds shall be free from internal characteristics/inclusions and external characteristics/ blemishes when examined under 10 × magnification.</p> <p>NOTE The following do not disqualify a diamond from the Flawless Grade:</p> <ul style="list-style-type: none"> <li>— an extra facet on the pavilion which cannot be seen face up;</li> <li>— naturals totally confined to the girdle, which neither thicken the girdle nor distort its outline;</li> <li>— internal graining which is not reflective, white or coloured and does not significantly affect transparency.</li> </ul>	<p style="text-align: center;"><b>Loupe Clean (LC)</b></p> <p>LC diamonds shall be free from internal characteristics/inclusions when examined under 10 × magnification.</p> <p>NOTE The following does not disqualify a diamond from the Loupe Clean grade:</p> <ul style="list-style-type: none"> <li>— Internal graining which is not reflective, white or coloured and does not significantly affect transparency.</li> </ul>
<p><b>Internally Flawless (IF)</b></p>	
<p>If diamonds shall be free from internal characteristics/inclusions and shall only possess external characteristics / blemishes when examined under 10 × magnification.</p> <p>NOTE The following does not disqualify a diamond from the Internally Flawless grade:</p> <ul style="list-style-type: none"> <li>— Internal graining which is not reflective, white or coloured and does not significantly affect transparency.</li> </ul>	
<p><b>Very Very Slightly Included/Very Very Small Inclusions (VVS)</b></p>	
<p>VVS diamonds shall contain minute internal characteristics/inclusions when examined under 10 × magnification.</p> <p>VVS1 diamonds shall contain minute internal characteristics/inclusions which shall be extremely difficult to observe when examined under 10 × magnification.</p> <p>VVS2 diamonds shall contain minute internal characteristics/inclusions which shall be very difficult to observe when examined under 10 × magnification.</p>	
<p><b>Very Slightly Included/Very Small Inclusions (VS)</b></p>	
<p>VS diamonds shall contain minor internal characteristics/inclusions when examined under 10 × magnification.</p> <p>VS1 diamonds shall contain minor internal characteristics/inclusions which shall be difficult to observe when examined under 10 × magnification.</p> <p>VS2 diamonds shall contain minor internal characteristics/inclusions which shall be somewhat easy to observe under 10 × magnification.</p>	
<p><b>Slightly Included/Small Inclusions (SI)</b></p>	
<p>SI diamonds shall contain noticeable internal characteristics/inclusions when examined under 10 × magnification.</p> <p>SI1 diamonds shall contain noticeable internal characteristics/inclusions which shall be easy to observe when examined under 10 × magnification.</p> <p>SI2 diamonds shall contain noticeable internal characteristics/inclusions which shall be very easy to observe when examined under 10 × magnification.</p>	
<p><b>Included 1 or Pique 1 (I1/P1)</b></p>	
<p>I1/P1 diamonds shall contain internal characteristics/inclusions which are prominent when examined under 10 × magnification. They shall also be visible face up to the naked eye.</p> <p>NOTE Under certain circumstances, internal characteristics/inclusions may also be visible face up to the naked eye in higher grades.</p>	
<p><b>Included 2 or Pique 2 (I2 / P2)</b></p>	
<p>I2/P2 diamonds shall contain internal characteristics/inclusions which are very prominent when examined under 10 × magnification. They shall also be easily visible face up to the naked eye, slightly reducing the brilliancy of the diamond.</p>	
<p><b>Included 3 or Pique 3 (I3 / P3)</b></p>	
<p>I3/P3 diamonds shall contain internal characteristics/inclusions which are extremely prominent when examined under 10 × magnification. They shall also be very easily visible face up to the naked eye, reducing the brilliancy of the diamond.</p>	

## References (informative)

- Altobelli, C. (1994) Fracture filled diamonds - a question of value. *In Focus*, Spring, 12-13, 36.
- Altobelli, C. (1990) How to value fracture-filled diamonds. *Jewelers' Circular-Keystone*, 322.
- Anderson, B. W. (1943) Absorption and luminescence in diamond: Part I. *The Gemmologist*, 12, 138, 21-22.
- Anderson, B. W. (1935) "Synthetic diamonds". *Gems and Gemology*, 1, 8, 213-216.
- Anderson, B. W. and Payne, C. J. (1956) The spectroscope and its applications to gemmology. *The Gemmologist*, 25, 300, 115-119.
- Anonymous. (1970) G.E. announces first man-made gem-quality diamonds. *Lapidary Journal*, 24, 4, 540-548.
- Anonymous. (1958) Man-made diamonds now available in quantity. *Lapidary Journal*, 12, 3, 356-360.
- Anonymous. (1955) The story of man made diamonds. *Lapidary Journal*, June, 120-126.
- Anonymous. (2002) Study moves GIA closer to cut grade. *Professional Jeweler*, January, 28.
- Anthony, T. R., Casey, J. K., Smith, A. C. and Vagarali, S. S. (2002) Method of detection of natural diamonds that have been processed at high pressure and high temperatures. *U.S. Patent 6,377,340*,
- Bates, R. (2002) HPHT heats up. *Jewelers Circular Keystone*, July, 86-89.
- Bates, R. (1993) Trade fractured over filled stones. *National Jeweler*, 37, 23, 52-55.
- Beesley, C. R. (1989) The Yehuda controversy: A laboratory perspective. *Modern Jeweler*, October, 44-51.
- Bosshart, G. and Smith, C. (2001) Natural and HPHT-annealed pink and blue diamonds. *Jewellery News Asia*, November, 144-145.
- Brown, G. (1994) Clarity-enhanced diamonds: present and future problems? *Jewellery World*, 13, 1, 31-32.
- Chalain, J. P. (2002) La certification des diamants de type II. *Revue de Gemmologie*, 145/146, 37-40.
- Chalain, J. P. (2003) Spectroscopic study of a yellowish green HPHT synthetic diamond. *Journal of the Gemmological Association of Hong Kong*, 24, 61-67.
- Chalain, J. P., Fritsch, E. and Hanni, H. A. (2000) Identification of GE POL diamonds: a second step. *Journal of Gemmology*, 27, 2, 73-78.
- Charette, J. J. (1961) Infrared spectra of synthetic diamond. *Journal of Chemical Physics*, 35, 1906-1907.
- Clark, C. D., Ditchburn, R. W. and Dyer, H. B. (1956) The absorption spectra of irradiated diamonds after heat treatment. *Proceedings of the Royal Society of London*, A237, 75-89.
- Collins, A. T. (2001) The colour of diamond and how it can be changed. *Journal of Gemmology*, 27, 6, 341-359.
- Collins, A. T. (1978) Investigating artificially coloured diamonds. *Nature*, 273, 5664, 654-655.
- Collins, A. T., Kanda, H. and Kitawaki, H. (2000) Colour changes produced in natural brown diamonds by high-pressure, high-temperature treatment. *Diamond and Related Materials*, 9, 113-122.
- Crowningshield, G. R. (1957) Spectroscopic recognition of yellow bombarded diamonds and bibliography of diamond treatment. *Gems and Gemology*, 9, 4, 99-104, 117.

- Crowningshield, R. (1963) Blue-green treated diamond. *Gems and Gemology*, 11, 3, 82-83.
- Crowningshield, R. (1969a) Color banding in treated diamond. *Gems and Gemology*, 13, 3, 92.
- Crowningshield, R. (1977) Diamond observations. *Gems and Gemology*, 15, 11, 346-347.
- Crowningshield, R. (1971a) General Electric's cuttable synthetic diamonds. *Gems and Gemology*, 13, 10, 302-314.
- Crowningshield, R. (1970) Laser beams in gemology. *Gems and Gemology*, 13, 7, 224-226.
- Crowningshield, R. (1971b) More on doublets. *Gems and Gemology*, 13, 12, 375-376.
- Crowningshield, R. (1969b) Orange-brown treated diamond. *Gems and Gemology*, 13, 3, 89-90.
- Crowningshield, R. (1968) Radium-treated diamond. *Gems and Gemology*, 12, 10, 304.
- Crowningshield, R. (1966) Treated red-brown diamond. *Gems and Gemology*, 12, 2, 44-46.
- Crowningshield, R. (1973) Unusual diamond imitations. *Gems and Gemology*, 14, 8, 237.
- Custers, J. F. H. (1954) Artificial coloration of diamond. *The Gemmologist*, 23, 274, 81-85, 105-107.
- Custers, J. F. H. and Dyer, H. B. (1954) Discrimination between natural blue diamonds and diamonds coloured blue artificially. *Gems and Gemology*, 8, 2, 35-37.
- De Weerd, F. and Van Royen, J. (2000) HPHT treated diamonds. *Antwerp Facets*, 34, 36-37.
- Diamond, L. (1994) GIA publishes long-awaited report. *Mazal U'Bracha*, 10, 62, 38-39.
- Diamond, S. L. (1995) GIA explains fracture filled mysteries. *National Jeweler's Basel Fair Newspaper*,
- Dugdale, R. A. (1953) The colouring of diamonds by neutron and electron bombardment. *British Journal of Applied Physics*, 4, 334-337.
- Dyer, H. B. (1957) Artificial coloration of diamond. *The Gemmologist*, 26, 316, 193-199.
- Everhart, J. (1993a) Gem labs see no advantage to laser technique. *Rapaport Diamond Report*, 16, 38, 9-10.
- Everhart, J. (1993b) Jewelry sales down in St. Louis in wake of filled-diamond exposé. *Rapaport Diamond Report*, 9-10.
- Fritsch, E. and Shigley, J. E. (1993) The separation of natural from synthetic gem-quality diamonds on the basis of crystal growth criteria. *Journal of Crystal Growth*, 128, 425-428.
- Fritsch, O. (1948) Colour and colour changes in diamonds. *The Gemmologist*, 17, 209, 328-331.
- Fryer, C. (1981) Colored diamond anomalies. *Gems and Gemology*, 17, 2, 101.
- Fryer, C. (1988a) Diamond cyclotron-treated. *Gems and Gemology*, 24, 1, 48.
- Fryer, C. (1990a) Diamond electron irradiated. *Gems and Gemology*, 26, 3, 220-221.
- Fryer, C. (1985a) Diamond simulants, damage during jewelry repair. *Gems and Gemology*, 21, 3, 172-173.
- Fryer, C. (1990b) Diamond treated green. *Gems and Gemology*, 26, 4, 296.
- Fryer, C. (1988b) Diamond treated pink. *Gems and Gemology*, 24, 2, 112-113.
- Fryer, C. (1985b) Diamond with natural internal irradiation stain. *Gems and Gemology*, 21, 4, 233.
- Fryer, C. (1991a) Electron-treated large diamond. *Gems and Gemology*, 27, 2, 108-109.

- Fryer, C. (1991b) Electron treated, in period jewelry. *Gems and Gemology*, 27, 2, 109.
- Fryer, C. (1993a) Faceted yellow synthetic diamond. *Gems and Gemology*, 29, 4, 280.
- Fryer, C. (1989a) Fancy intense yellow diamond with a green irradiation stain. *Gems and Gemology*, 25, 2, 102-103.
- Fryer, C. (1991c) Fracture filled. *Gems and Gemology*, 27, 2, 109.
- Fryer, C. (1989b) Naturally(?) irradiated diamond rough. *Gems and Gemology*, 25, 2, 103.
- Fryer, C. (1985c) Piggyback diamond. *Gems and Gemology*, 21, 4, 233.
- Fryer, C. (1987a) Synthetic diamond. *Gems and Gemology*, 23, 1, 44.
- Fryer, C. (1993b) Synthetic yellow diamond crystal. *Gems and Gemology*, 29, 3, 200.
- Fryer, C. (1987b) Treated yellow diamond with cape lines. *Gems and Gemology*, 23, 3, 165.
- Galia, W. (1967) Diamant und diamantimitationen - ihre erkennung und unterscheidung mit dem resissions-spektralphotometer. *Zeitschrift der Deutschen Gesellschaft*, 61, 67-74.
- Hainschwang, T., Katrusha, A. and Vollstaedt, H. (2005) HPHT treatment of different classes of type I brown diamonds. *Journal of Gemmology*, 29, 5/6, 261-273.
- Hamilton, J. G., Putnam, T. M. and Ehrmann, M. L. (1952) Effect of heavy charged particle and fast neutron irradiation on diamonds. *American Mineralogist*, 37, 11/12, 941-949.
- Hanneman, W. W. (1977) A practical approach to the characterization of simulated diamonds. *Lapidary Journal*, 31, 3, 846-849.
- Hobbs, J. (1982) Detecting diamond simulants. *International Gemological Symposium - Proceedings 1982 - editor Dianne Eash*, 123-139.
- Hobbs, J. (1981) A simple approach to detecting diamond simulants. *Gems and Gemology*, 17, 1, 20-33.
- Howard, T. (1995) Fracture-filling seeps into small diamonds. *American Jewellery Manufacturers*, 40, 3, 24-30.
- Johnson, M. L. and Koivula, J. I. (1997) A "piggyback" diamond assemblage. *Gems and Gemology*, 33, 2, 142-143.
- Johnson, M. L. and Koivula, J. I. (1999) Synthetic diamonds widely available. *Gems and Gemology*, 35, 1, 47-48.
- Kammerling, R. C., Koivula, J. I., Fryer, C. W., Shigley, J. E. and Liu, Y. (1993) Identifying glass-filled diamonds. *China Gems*, 3, 9, 13-16.
- Kammerling, R. C. and Koivula, J. I. M. S. F. (1995) An update on identifying "Yehuda-treated" diamonds. *Bangkok Gems & Jewellery*, 238-243.
- Kammerling, R. C., McClure, S. F., Johnson, M. L., Koivula, J. I., Moses, T. M., Fritsch, E. and Shigley, J. E. (1995) Detecting filled stones. *Diamond International*, 34, 71-78.
- Kammerling, R. C., McClure, S. F., Johnson, M. L., Koivula, J. I., Moses, T. M., Fritsch, E. and Shigley, J. E. (1994) An update on filled diamonds: Identification and durability. *Gems & Gemology*, 30, 3, 142-177.
- Kammerling, R. C., Shigley, J. E. and Moses, T. M. (1993) Filled diamonds: durability concerns. *Rapaport Diamond Report*, 16, 30, 11-12.
- Kammerling, R. C. M. S. F., Johnson, M. L. K. J. I., Moses, T. M., Fritsch, E. and Shigley, J. E. (1995) GIA updates identification and durability of filled diamonds. *Europa Star*, 209-2,

- Kane, R. E., McClure, S. F. and Menzhausen, J. (1990) The legendary Dresden green diamond. *Gems and Gemology*, 26, 4, 248-266.
- Kaplan, G. R. (1995) Kaplan calls for cut grading. *Rapaport Diamond Report*, 2.
- Kitawaki, H. and Abduriyim, A. (2005) Identification of CVD synthetic diamond.
- Koivula, J. I. (1987) Laser deposition of diamond during laser drilling: a theory. *Transactions - 21st IGC*, 23-23.
- Koivula, J. I. and Fryer, C. W. (1984) Identifying gem-quality synthetic diamonds: an update. *Gems and Gemology*, 20, 3, 146-158.
- Koivula, J. I. and Kammerling, R. C. (1991a) Bluish gray synthetic diamond thin films grown on faceted diamonds. *Gems and Gemology*, 27, 2, 118-119.
- Koivula, J. I. and Kammerling, R. C. (1991b) Gem-quality synthetic diamonds from the USSR. *Gems and Gemology*, 27, 1, 46.
- Koivula, J. I., Kammerling, R. C., Fritsch, E., Fryer, C. W., Hargett, D. and Kane, R. E. (1989) The characteristics and identification of filled diamonds. *Gems and Gemology*, 25, 2, 68-83.
- Koivula, J. I., Kammerling, R. C. and Fryer, C. W. (1989) Visual characteristics of Yehuda-treated stones. *New York Diamonds*, 4, 72-76.
- Kraus, E. H. (1944) Did J.B. Hannay produce "laboratory diamonds" in 1880? *Jeweler's Circular Keystone*, April,
- Krauss, E. H. (1953) Have diamonds ever been made in the laboratory? *A.G.S. Guilds*, 8, 5, 6, 11.
- Kusko, J. (1994) Local and overseas consensus dictates that buyers must be told when diamonds have been treated. *Jewellery World*, 13, 1, 27-30.
- Lampel, M. (1992) Koss clarity enhancement undergoes gemological scrutiny. *New York Diamonds*, 16, 72-73.
- Lang, A. R. and Moore, M. (1991) Cathodoluminescence and X-ray topography of HPHT diamonds. *New Diamond Science and Technology*, 683-694.
- Liddicoat, R. T. (1972) Additional comments on laser drilling of diamonds. *Gems and Gemology*, 14, 3, 89-90.
- Liddicoat, R. T. (1956) Diamond selling practices in America. *Journal of Gemmology*, 5, 6, 310-318.
- Liddicoat, R. T. (1981) The quest for objectivity in diamond grading. *Journal of the Gemmological Society of Japan (18th IGC)*, 8, 1-4, 135-138.
- Liddicoat, R. T. (1969) Treated diamond. *Gems and Gemology*, 13, 4, 125-126.
- Liddicoat, R. T. (1975) An unusual cyclotron - treated diamond. *Gems and Gemology*, 15, 3, 72-73.
- Lonsdale, K., Milledge, H. J. and Nave, E. (1959) X-ray studies of synthetic diamonds. *Mineralogical Magazine*, 32, 185-200.
- Martin, M. J. (1955) General Electric man-made diamonds. *AGS Guilds*, 10, 5, 6, 15.
- Matlins, A. (1994) Hand-held instruments recommended to detect filled diamonds. *Mazal U'Bracha*, 10, 62, 52-53.
- McClure, S. F. (2000) Detecting new laser drilling techniques. *Rapaport Diamond Report*, 23, 16, 1,15,19.
- McClure, S. F. and Kammerling, R. C. (1995) A visual guide to the identification of filled diamonds. *Gems & Gemology*, 31, 2, 114-119.
- Milburn, R. (1995) Fracture-filling splits the diamond market. *Asia Precious*, 44-46.

- Minster, D. (1987) The separation of natural from synthetic diamonds using the Barkhausen effect. *Journal of Gemmology*, 20, 7/8, 458-459.
- Moses, T., Reinitz, I. and McClure, S. F. (1999) Yellow to yellow-green diamonds treated by HPHT from GE and others. *Gems and Gemology*, 35, 4, 203-204.
- Nassau, K. (1979) The size and weight of diamond and diamond imitations. *Gems and Gemology*, 16, 7, 203-204.
- Nassau, K. and Nassau, J. (1979) The history and present status of synthetic diamond. *Journal of Crystal Growth*, 46, 157-172.
- Nassau, K. and Nassau, J. (1978) The history and present status of synthetic diamond - parts 1 and 2. *Lapidary Journal*, 32, 1, 2, 76-96, 490-508.
- Nelson, J. B. (1993) The glass filling of diamonds Part 1: an explanation of the colour flashes. *Journal of Gemmology*, 23, 8, 461-472.
- Nelson, J. B. (1994a) The glass filling of diamonds part 2: a possible filling process. *Journal of Gemmology*, 24, 2, 94-103.
- Nelson, J. B. (1994b) On diamond-filling glasses and Nelson's speculations. *Journal of Gemology*, 24, 4, 281-285.
- Nestlebaum, K. (1996) New AGS lab stakes its claim on cut grade. *Rapaport Diamond Report*, May, 15-17.
- Osugi, J., Arase, T., Hara, K. and Amita, F. (1984) Diamond formation in molten nickel. *High Temperatures - High Pressures*, 16, 191-195.
- Pough, F. H. (1966) Artificial coloration of diamond. *Jewelers' Circular Keystone*,
- Pringsheim, P. (1953) Reversible bleaching of a band in the absorption spectrum of diamond. *Physical Review*, 91, 3, 551-554.
- Ringwood, A. E. and Major, A. (1966) Synthesis of diamonds. *Australian Journal of Chemistry*, 19, 1965-1969.
- Rosen, E. (1995) Appraising the Yehuda controversy. *Rapaport Diamond Report*, 29-35.
- Roskin, G. (1998) Laser drilling another thime bomb? *Jewelers Circular Keystone*, March, 86-90.
- Ross, M. (1989) Fracture filling: a new diamond treatment. *In Focus*, 8, 3, 16-17.
- Rossmann, G. and Kirschvink, J. L. (1984) Magnetic properties of gem-quality synthetic diamonds. *Gems and Gemology*, 20, 3, 163-166.
- Satoh, S. and Tsuji, K. (1990) Purple diamond and method of producing the same. *Diamond Depositions: Science and Technology*, 1, 2, 7.
- Scarratt, K. (2001) Chinese HPHT treated diamonds hit market. *Rapaport Diamond Report*, 24, 6, 123-125.
- Scarratt, K. (1992a) The clarity enhancement of diamonds. *Diamond International*, 19, 45-58.
- Scarratt, K. (1987a) Diamond - light brown color. *Journal of Gemmology*, 20, 6, 358-360.
- Scarratt, K. (1992b) Papering over the cracks? *Retail Jeweler*, 8.
- Scarratt, K. (1987b) Sumitomo synthetic diamond. *Journal of Gemmology*, 20, 7/8, 406-409.
- Scarratt, K. V. G. (1982) The identification of artificial coloration in diamond. *Gems and Gemology*, 18, 2, 72-78.
- Schlüssel, R. (1992) L'identification au microscope des diamants. *Revue de Gemmologie a.f.g.*, 111, 15-17.
- Schmetzer, K. (2000) The treatment of "GE POL diamonds". *Goldschmiede Zeitung*, 98, June, 85-87.



- Schwarz, D. (1983) Farbursachen in den Diamant-Imitationen Zirconia ("KSZ", c-ZrO<sub>2</sub>), YAG (Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>) und Galliant (Gd<sub>3</sub>Ga<sub>5</sub>O<sub>12</sub>). *Uhren, Juwelen, Schmuck*,
- Sechos, B. (1994) Fracture filled diamonds. *Australian Gemmologist*, 18, 12, 379-385.
- Shigley, J. E., Fritsch, E., Kammerling, R. C., Koivula, J. I. and Moses, T. M. (1993) Identifying faceted gem-quality synthetic diamonds. *Rapaport Diamond Report*, 16, 26, 10-13.
- Shigley, J. E., Fritsch, E., Koivula, J. I., Sobolev, N. V., Malinovsky, Y. and Palyanov, Y. (1993) The gemological properties of Russian gem-quality synthetic yellow diamonds. *Gems and Gemology*, 29, 4, 228-248.
- Shigley, J. E., Fritsch, E. and Reinitz, I. (1993) Two near-colorless General Electric type-IIA synthetic diamond crystals. *Gems & Gemology*, 29, 3, 191-197.
- Shigley, J. E., Fritsch, E., Stockton, C. M., Koivula, J. I., Fryer, C. W., Kane, R. E., Hargett, D. R. and Welch, C. W. (1987) The gemological properties of the De Beers gem-quality synthetic diamonds. *Gem and Gemology*, 23, 4, 187-206.
- Shiple, R. M. (1938) The synthetic diamond. *The Gemmologist*, 8, 86, 19.
- Shor, R. (1995) All filled diamonds can be identified, says GIA. *Jewelers Circular Keystone*, 23-24.
- Shor, R. (1994a) Filled diamond case brings more disclosure calls. *Diamant*, 36, 370, 13-14.
- Shor, R. (1993) Filled diamonds - are the tell-tale signs enough? *Jewelers' Circular-Keystone*, 49-51.
- Shor, R. (1994b) Fracture-filled diamond fight flares anew. *Jewelers Circular-Keystone*, 66-69.
- Slawson, C. B. (1957) Hardness of synthetic diamonds. *American Mineralogist*, 42, 3/4, 299-300.
- Strong, H. M., Chrenko, R. M. and Tuft, R. C. (1979) Annealing synthetic diamond type Ib. *US Patent 4174380*, November, 1-2.
- Strong, H. M. and Tuft, R. E. (1978) High pressure reaction vessel for quality control of diamond growth on diamond seed. *U.S. Patent 4,073,380*,
- Thongnopkun, P. and Ekgasit, S. (2005) FTIR spectra of faceted diamonds and diamond simulants. *Diamond & Related Materials*, 14, 1592-1599.
- Unknown. (1993) Crack-filled diamonds. *Antwerp Gems*, 4, 1, 32-33.
- Unknown. (1970) The facts about diamond imitations. *Gems and Gemology*, 13, 8, 245-248.
- Unknown. (1995a) GIA outlines on filled diamonds. *Rapaport Diamond Report*, 4-5.
- Unknown. (1992a) Materials developed for fiber optics fill gletzes in diamonds. *New York Diamonds*, 16, 70-71.
- Unknown. (1995b) Microscopic features of Goldman Oved-filled diamonds. *Jewellery News Asia*, March, 210-216.
- Unknown. (1938a) Supposed synthetic diamonds tested. *Gems and Gemology*, 2, 12, 195-198.
- Unknown. (1938b) Synthetic diamond experiments. *The Gemmologist*, 8, 87, 35.
- Unknown. (1971) Synthetic diamonds presented to Smithsonian Institution. *Lapidary Journal*, 25, 5, 754-758.
- Unknown. (1992b) A tougher stand on disclosure of treatment. *New York Diamonds*, 14-18.
- Van Bockstael, H. G. and Van Royen, J. (1996) How to identify synthetic diamonds today? *Antwerp Facets*, 53-61.
- Van Bockstael, M. (1993) Harmonization of diamond grading standards. *Antwerp Gems*, 4, 1, 5-10.

Vins, V. G. (2005) New radiation induced defects in HPHT synthetic diamonds. *Diamond and Related Materials*, 14, 3/7, 364-368.

Vins, V. G. and Kononov, O. V. (2003) A model of HPHT color enhancement mechanism in natural gray diamonds. *Diamond and Related Materials*, 12, 3/7, 542-545.

Wade, S. (2003) Enhancing the stone: An update on diamond treatments. *AJM*, 48, 5, 33-36.

Wakefield, S. (1993) Fracture-filled diamonds: A ticking time bomb? *AGA Cornerstone*, 1-6.

Wang, X. C., Ma, H. A., Zang, C. Y., Tian, Y., Li, S. S. and Jia, X. P. (2005) Growth of large high-quality type IIa diamond crystals. *Chinese Physics Letters*, 22, 7, 1800-1802.

Ward, A. (1970) G.E. again reassures diamond trade; shows new synthetics to Lazar Kaplan. *Jewelers Circular Keystone*, August, 162-163.

Weldon, R. (2000) The changing nature of diamonds. *Professional Jeweler*, April, 34-36.

Wilson, A. N. (1971) Making synthetic gem diamonds - the alchemist's dream. *International Diamond Annual*, 1, 164-168.

Woods, G. S. (1984) Infrared absorption studies of the annealing of irradiated diamonds. *Philosophical Magazine*, B50, 6, 673-688.

## Index

- advertisements, 5
- annual congress, v
- application, 5
- appraisals, 5
- approbations, 5, 7
- assembly of delegates, v
- Berlin, 1
- Bianchi Cubic Zirconia, 2
- Bianchi Diamonds, 2
- Bianchi Treated Diamonds, 2
- bills of sale, 5
- Blue Books, v
- Board of Directors, v
- certificates, 5
- chemical, 6, 7, 8
- CIBJO, iv, vi, 1, 4
- CIBJO Diamond Commission, vi
- CIBJO Diamond Standard, vi
- CIBJO Secretariat, v
- clarity, vi, 8, 10, 17, 18
- Clarity grade, 9
- classification, 1
- classify, 6
- cleaning, 7, 8
- Coating, 5, 8, 10
- Colour grade, 9
- colourlessness, 5
- commercial documents, 3, 5
- consigning, 7
- crystal structure, 6, 7, 8
- culet, 4
- Cut, 5, 9
- Date, 9
- deceptive, 3
- decimal, 3, 4
- depictions, 7
- depth, 4
- descriptions, 7
- desirability, 7
- diamond simulants, 2, 6, 16, 19
- disclosed, 2
- disguise, 2
- durability, 8, 16
- dye, 5
- Dying, 10
- Executive Committee, v
- expressions, 7
- external characteristics/blemishes, 5
- figures, 7
- filling, 6, 8, 16, 17, 18
- finish, 5, 9
- firms, 2
- Foiling, 6, 10
- Fracture, 6, 10, 14, 15, 16, 17, 18, 19, 20
- Full disclosure, 3
- Full written disclosure, 3
- furnace, 6
- Gemmological Laboratory Book**, 1
- Gemstone Book**, 1
- Girdle, 6, 9
- glass, 6, 16, 18
- government regulations, v
- grading system, 4
- grain*, 4, 6
- grainer*, 4, 6
- harmonization, iv
- Heating, 6, 8, 10
- High Pressure, 6, 10
- High Temperature, 6, 10
- illustration, 3
- illustrations, 7
- imitation, 2, 3, 4, 6, 7
- imitation of diamond, 3
- inclusion, 6, 7
- intended for sale, 7
- internal characteristics/inclusions, 5
- invoices, 5
- Irradiation, 6, 8, 10, 15, 16
- jewellery, 3, 4
- jewellery trades, 1
- jurisdictions, v
- kiln, 6
- Laboratory-created diamond, 6
- Laboratory-grown diamond, 7
- laser, 6, 7, 15, 17
- Laser Drilling, 10
- Law, 1
- length, 4, 7
- Long wave ultraviolet fluorescence, 9
- luminescence, 5, 14
- man-made, 6, 7, 8, 14, 17
- manufacturers, 2
- marketing, 3, 7
- mass, 8
- material information, 3, 5
- Measurements, 9
- memorandums, 5, 7
- metre, 7
- metric carats, 3
- misleading, 3
- misuse, 3
- modifying, 6
- Mohs', 5
- Names of firms, 2
- offers, 5
- PAS 1048**, 1, 4
- Pearl Book**, 1
- perpendicular, 4, 8
- pervade, 6
- physical properties, 6, 7, 8
- Precious Metals Book**, 1
- process, 2, 7, 8, 18
- proportions, 5, 9
- purchaser, 3
- receipts, 5
- Reference number, 9
- refractive index, 5
- rough handling, 8
- saleability, 7
- sectors, iv
- Sectors and Commissions, iv
- selling, 3, 7, 17

Shape, 5, 8, 9  
special care, 2, 8  
specific gravity, 5  
symbols, 4, 7  
synthetic diamond, 1, 2, 3, 4, 5, 7, 9, 14, 16, 17, 18, 19  
synthetic diamonds, vi, 2, 7, 8, 15, 17, 18, 19, 20  
table facet, 4, 8  
terminology, 1  
thermal process, 6  
total height, 4  
total weights, 3  
trademarks, 2  
treated, 1  
treated diamond, vi, 1, 2, 3, 4, 7, 9, 14, 15, 17  
treated diamonds, 2, 4, 7, 8, 15, 18  
treatment, 1, 2, 6, 7, 8, 14, 16, 18, 19  
unacceptable, 3  
value, 3, 7, 14  
verbal disclosure, 3  
weight, 3, 4, 5, 6, 8, 9, 18  
weight of a diamond, 3  
width, 4  
words, 2, 3, 7  
written, 3, 5