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Grading polished diamonds —

Part 2: Test methods

Diamants taillés —

Partie 2: Méthodes d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 11211 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11211-2 was prepared by Technical Committee ISO/TC 174, *Jewellery*.

ISO 11211 consists of the following parts, under the general title *Grading polished diamonds — Part 2: Test methods*:

— *Part 1: Terminology and classification*

— *Part 2: Test methods*

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Part 3 of ISO 11211, dealing with the colour of naturally coloured diamonds, is in the course of preparation.

Grading polished diamonds —

Part 2: Test methods

1 Scope

This International Standard specifies methods for the grading of natural unmounted polished diamonds within the D to Z series and the grading criteria, other than for the colour of naturally coloured diamonds.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 11211. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 11211 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 11211-1:2002, *Grading polished diamonds — Part 1: Terminology and classification*
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3 Terms and definitions

For the purposes of this part of ISO 11211, the terms and definitions given in ISO 11211-1 and the following apply.

3.1

first generation masterstone

diamond that has been selected by direct comparison with the relevant masterstone in the set of masterstones originally used to establish the D to Z grades for the International Organization for Standardization, as specified in 7.1.1 of ISO 11211-1:2002 and equal in hue, tone and saturation to the relevant original masterstone

3.2

second generation masterstone

diamond that has been selected by direct comparison with the relevant first generation masterstone (3.1) and equal in hue, tone and saturation to the relevant first generation masterstone

4 Identification

It shall be the responsibility of the examiner to establish that the stone under examination is a diamond before it is graded in accordance with 3.1 of ISO 11211-1:2002, and be aware of the possibilities of the stone being a synthetic diamond, a treated diamond or an assembled stone.

5 Weight and measurements

5.1 Weight

Maintain all balances used to establish the carat weight of diamonds to ensure accuracy. Prior to weighing, all diamonds shall be clean.

5.2 Measurements

Use instruments accurate in millimetres to two decimal places to measure the dimensions of a diamond. Measurement parameters are specified in 6.2 of ISO 11211-1:2002. For round stones, determine minimum and maximum diameters by making at least four measurements at differing points on the diameter of the diamond. Clearly establish minimum and maximum diameter measurements.

For stones other than rounds, determine minimum and maximum diameters by making two measurements (or more if applicable) across the apparent length and width of the diamond. Clearly establish the length and width plus any other descriptive measurements.

For determining depth (total height), make measurements perpendicular to the table facet and record the established maximum figure on the report.

6 Colour and fluorescence

6.1 Cleaning of masterstones

Prior to grading, clean each masterstone with an organic solvent. Masterstones with dirty girdles and encrusted diamonds shall be cleaned by appropriate means (e.g. by boiling in an acid).

Keep the masterstones clean. <https://standards.iteh.ai/catalog/standards/sist/b2bfe20f-dd06-4f77-a12e-e77c3c47c055/iso-fdis-11211-2>

6.2 Masterstones for colour

Use only round, brilliant-cut diamonds for this purpose.

First generation masterstones shall be not smaller than 0,60 ct. Second generation masterstones shall be not smaller than 0,30 ct. Masterstones shall not have internal characteristics that are eye visible under normal or corrected-to-normal vision, or otherwise affect colour or decrease the transparency when viewed through the pavilion. The fluorescence shall be not greater than the grade "Faint". Finish shall be at least "Good". Proportions shall be in the "A range". All stones in a set shall be of similar weight and proportions, and the nature of the girdles shall be the same.

Masterstones shall be of the "yellow series" and shall be positioned either at the higher limit or the lower limit for each grade (with the exception of the "D" grade where there cannot be a masterstone positioned at the higher limit).

All masterstones in any one set shall be positioned either at the higher or the lower limit for each grade.

The second generation of masterstones shall be the last generation that shall be used by laboratories for the issuing of test reports.

Masterstones should be positioned at the lower limit (maximum saturation) for each grade.

6.3 Procedure

6.3.1 Precautions

Do not grade for colour immediately following grading for fluorescence.

Persons colour grading diamonds shall be aware of the “tiring factor” and limit the time spent grading according to their individual capabilities.

6.3.2 Cleaning

Prior to grading, clean each submitted diamond with an organic solvent. Diamonds with dirty girdles and encrusted diamonds shall be cleaned by appropriate means (e.g. by boiling in an acid).

6.3.3 Comparisons

The colour of the diamond to be graded shall be determined by visual comparison with masterstones and shall be observed from the pavilion side between being almost parallel to the level of the girdle to being perpendicular with the pavilion facets (see Figure 1). Place the stone between two of the masterstones and move the stone until the correct position is found. Only view the diamond through the crown side to determine if it is a “coloured diamond” (see ISO 11211-3, in preparation).

6.3.4 Round stones

Round stones shall be examined in several directions within the rotation axis indicated in Figure 1. If different colours are observed, the predominant D to Z grade shall be conclusive.

6.3.5 Fancy shapes

The colour of fancy-shaped diamonds shall be graded in the directions indicated in Figure 2. In the case of cuts with points or corners, these directions shall not be taken into account. If different colours are observed, the predominant D to Z grade shall be conclusive.

6.3.6 Colours

Colours such as brown, brownish-yellow, grey, greyish-yellow (in the D-Z grades) shall be graded as if they were within the same colour series as the masterstones. However, for grades M and below, such stones shall also be evaluated in the face-up position for the description indicating the presence of these hues (see also ISO 11211-3, in preparation).

6.3.7 Lighting

Colour grading shall be carried out under an artificial light source with a stable light output and simulating illuminant $D_{55} - D_{65}$, in a light intensity of approximately 2 200 lx.

NOTE A convenient artificial light source is a commercial tubular fluorescent lamp with colour temperature of 5 500 K to 6 500 K.

The masterstones and the stone to be graded shall be placed with the table down on a dull white background under the central area of the tube. Reflections and distractions from the environment shall be excluded.

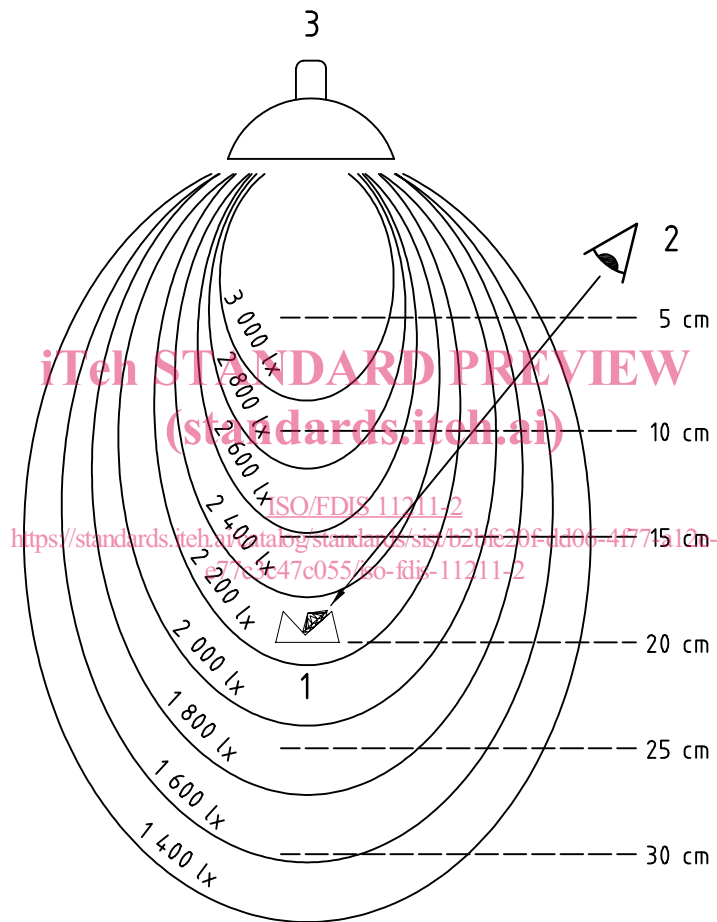
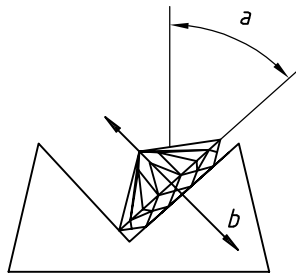
Prevent direct view of the light sources.

6.3.8 Positioning

The diamond being graded and the masterstones shall be placed directly below the light source. For an observer with normal eyesight, the distance between the light source and the diamond being graded shall be approximately 20 cm and the light intensity at that point shall be approximately 2 200 lx (see Figure 1).

6.3.9 The grade

The colour grade shall be given with one full colour grade or colour corresponding term in accordance with 7.1.1 and 7.2 of ISO 11211-1:2002. Combined grades shall be used in accordance with Table 1 of ISO 11211-1:2002.

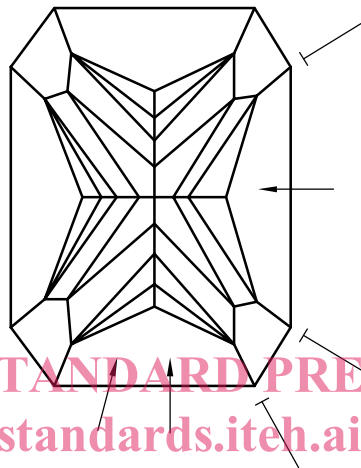
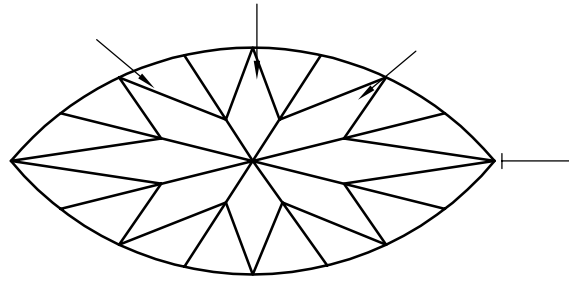


Key

- 1 Colour comparison
- 2 Naked eye
- 3 Light source

- a Viewing angle
- b Rotation axis

Figure 1 — Colour grading criteria



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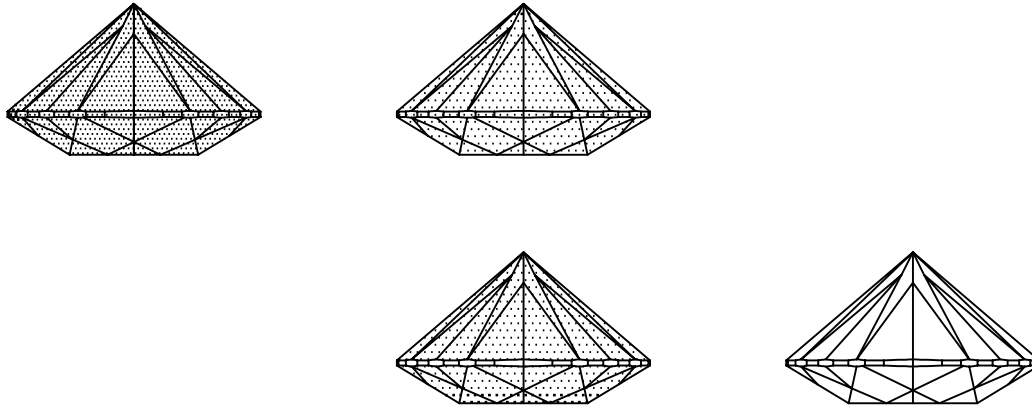
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Example grading direction
Non-grading direction

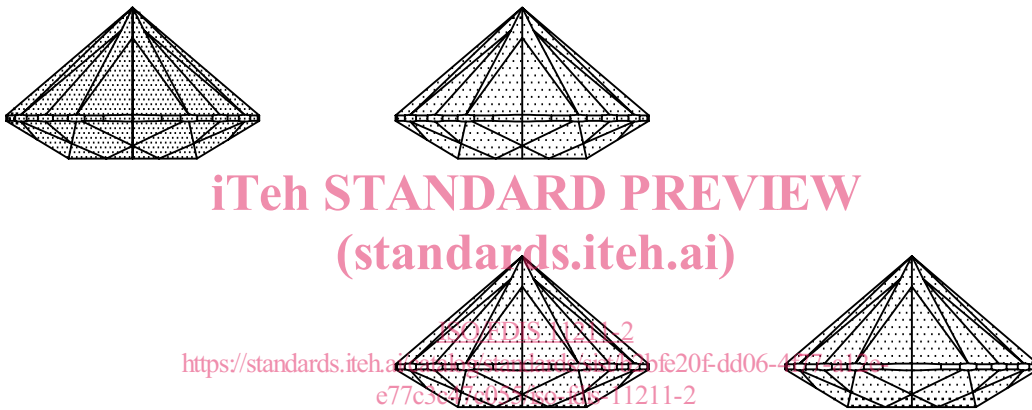
Figure 2 — Examples of colour grading directions and directions in which colour grading shall not be made for fancy-cut diamonds within the D-Z range

6.3.10 Master-eye effect

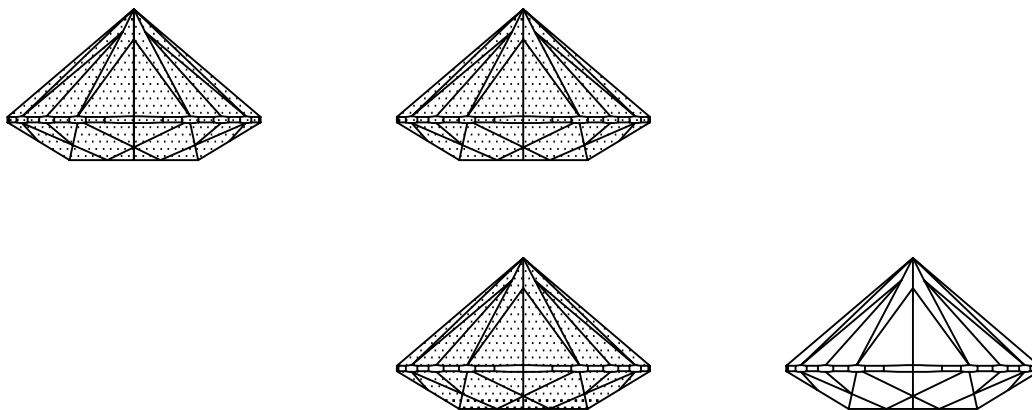
When comparing diamonds with a masterstone, the master-eye effect can occur (see Figure 3).



a) The stone appears darker on the left side of the master and appears equally lighter on the right, the stone is graded the same colour as the masterstone.



b) The stone appears darker on the left and the same as the masterstone on the right, the stone is graded darker than the masterstone.



c) The stone appears to be the same on the left side of the masterstone and lighter on the right, the stone is graded lighter than the masterstone.

Figure 3 — Master-eye effect

6.4 Description of fluorescence

6.4.1 Equipment and references

The fluorescence description of a diamond shall be recorded when the stone is observed under a long-wave UV lamp (approximately 365 nm) that has an output of 4 W to 8 W.

The description shall be made by comparison with a series of masterstones that characterize the intensities “none” or “nil”, “faint” or “slight”, “medium” and “strong” in accordance with 7.4 of ISO 11211-1.

Three masterstones shall be required to achieve the correct fluorescence description for each diamond (see 6.4.2).

The masterstones and the stone under examination shall be positioned on a matt black background.

6.4.2 Masterstones for fluorescence

The masterstones shall be positioned at the maximum intensity of fluorescence for the intensities, “none”, “faint”, and “medium”, and have a blue type fluorescence. The weight of each masterstone shall be a minimum of 0,25 ct, and the shape shall be round.

6.4.3 Working conditions and methodology

The lighting conditions in the room used for comparing the fluorescence of a diamond against the fluorescence masterstones shall not have an effect upon the stone under examination or the masterstones. The stone under examination and the masterstones shall be positioned at a distance of approximately 10 cm from the UV source and examined from the pavilion side from being almost parallel to the level of the girdle to perpendicular with the pavilion facets, and an overall impression is gained.

6.4.4 Fluorescence, other than blue

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If the hue of the fluorescence is other than blue, the intensity shall be considered in relation to the masterstones.

NOTE The hue may also be registered.

7 Clarity

7.1 General

Clarity grading shall be determined in accordance with the example diagrams in 7.3.10, as well as with clause 8 of ISO 11211-1:2002. The practical grading for clarity shall be made with the greatest caution and shall not be made under time pressure. Experience and regular practice shall be required to achieve accurate and consistent results. Before it is graded, the stone shall be properly cleaned (6.3.2). A thorough examination through and on each of the diamond's numerous facets, and along the entire girdle, shall be carried out.

7.2 Apparatus

The basic tool for clarity grading shall be the diamond loupe in accordance with clause 3.15 of ISO 11211-1:2002. A microscope may be used to “find” internal and external characteristics, but only those characteristics seen with the diamond loupe shall determine the grade.

NOTE The use of tweezers is suggested for holding a diamond