INTERNATIONAL STANDARD

ISO 8442-7

First edition
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Materials and articles in contact with foodstuffs — Cutlery and table holloware —

Part 7: Requirements for table cutlery made of silver, other precious metals and their alloys

Matériaux et objets en contact avec les denrées alimentaires — Coutellerie et orfèvrerie de table —

Partie 7: Exigences relatives à la coutellerie de table en argent massif, autres métaux précieux et leurs alliages

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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.

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 member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 8442 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 8442-7 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 186, *Cutlery and table and decorative metal hollow-ware*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

ISO 8442 consists of the following parts, under the general title *Materials and articles in contact with foodstuffs — Cutlery and table holloware*:

— *Part 1: Requirements for cutlery for the preparation of food*

— *Part 2: Requirements for stainless steel and silver-plated cutlery*

— *Part 3: Requirements for silver-plated table and decorative holloware*

— *Part 4: Requirements for gold plated cutlery*

— *Part 5: Specification for sharpness and edge retention test of cutlery*

— *Part 6: Lightly silver-plated table holloware protected by lacquer*

— *Part 7: Requirements for table cutlery made of silver, other precious metals and their alloys*

— *Part 8: Requirements for silver table and decorative holloware*

Annexes A to C form a normative part of this part of ISO 8442. Annex D is for information only.

Contents

Foreword

The text of EN ISO 8442-7:1999 has been prepared by Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 186 "Cutlery and table and decorative metal hollow-ware ".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

Attention is drawn to the European Community Directives relative to materials in contact with foodstuffs, in particular Directive 89/109/EEC

EN ISO 8442 consists of the following parts:

Part 1:Requirements for cutlery for the preparation of food
Part 2: Requirements for stainless steel and silver-plated cutlery
Part 3: Requirements for silver-plated table and decorative holloware
Part 4: Requirements for gold-plated cutlery
Part 5: Specification for sharpness and edge retention test of cutlery
Part 6: Lightly silver plated table holloware protected by a lacquer
Part 8: Requirements for silver table and decorative holloware

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies material and performance requirements for table cutlery made of silver, other precious metals and their alloys (knives with stainless steel blades, forks, spoons, carving sets, ladles and other pieces).

It does not include requirements for design, size, type of finish, blade flexibility, or similar characteristics which are matters of personal choice or which can be readily assessed by the purchaser at the point of sale. No sampling provisions are included in this standard, the requirements specified are applicable for each and every item produced.

2 Normative references

This European Standard incorporates by dated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision (including amendments).

ISO 4481: 1977 Cutlery and flatware - Nomenclature
ISO 6508: 1986 Metallic materials - Hardness test - Rockwell test (scales A - B - C - D - E -F -G - H - K)
EN 10088-1: 1995 Stainless Steels, Part 1: List of stainless steels
prEN 1904:1995 Precious metals - Solders used with precious metal jewellery alloys

3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in annex of ISO 4481: 1977 apply together with the following.

3.1
unsharpened knives
knives with an unsharpened blade used for cutting soft foods

NOTE They are not made of martensitic stainless steel. Examples are butter knife, fish serving knife, ice cream knife, fish knife, spreading knife, cheese knife.

4 Materials

4.1 General

The table cutlery shall be made of silver, other precious metals and their alloys with a minimum standard of fineness of 800 (expressed in parts per thousand) that enable the finished product to meet all of the performance requirements of this standard and which shall be neither detrimental to health nor have any detrimental organoleptic effects.

4.2 Metals

4.2.1 Silver plating

Any parts of silver table cutlery may be plated with a fine silver coating.

4.2.2 Soldering

Precious metals in an article shall be soldered according to prEN 1904:1995.

4.2.3 Stainless Steels

Knife blades and any parts of the table cutlery, which have to fulfil special requirements e.g. carving items, shall be made of stainless steels according to Table 1.

Table 1 — Stainless steel for table cutlery, limiting requirements

Application	Name	number of materials	structure
Carving items	X6CrMo 17-1	1.4113	ferritic
Knife blades	X2OCr 13	1.4021	martensitic
The chemical composition shall be in accordance with EN 10088-1 : 1995			

4.3 Non-metals

Non-metal parts of table cutlery may be made of such materials as glass, ceramics, plastics or similar materials provided that the finished cutlery complies with the relevant performance requirements of 4. 1.

5 Construction

5.1 Alignment, uniformity and absence of defects

5.1.1 All surfaces shall be free from cracks, pits and other defects.

5.1.2 All cutlery shall be essentially straight and symmetrical except when the lack of straightness or symmetry is an intentional feature of the design.

5.1.3 Identical items within a batch shall, as far as is practicable, show no significant variation in dimension or form.

5.1.4 All edges, including the edges of spoons, forks, ladles and the insiders of fork prongs, shall be free from burrs and the roughness of blanked edges shall have been removed by a suitable operation.

5.1.5 Table knives shall be balanced such that when the knife is pivoted on its bolster, or at the junction of the handle and blade if no bolster is present, the handle shall be heavier than the blade.

5.1.6 Compliance with the requirements for 5.1.1 to 5.1.5 shall be checked by touch or by visual inspection

5.2 Hollow handles

The seams joining hollow handles together shall be watertight.

5.3 Knife edges

The cutting edge of sharpened table knives shall be either scalloped or serrated or shall be whetted to an included angle not greater than 60 °.

The cutting edges of a carving knife blade shall be whetted to an included angle not greater than 40° and shall not be thicker than 0,46 mm when measured 1 mm from the edge.

6 Precious metal-plating

6.1 Hardness of hard gold coatings

Gold coatings claimed to be hard shall contain 0,2 % minimum Co or Ni or Fe or any other element which increases the hardness.

6.2 Adhesion of precious metal coatings

When tested in accordance with annex A coatings shall show no signs of flaking, blistering or peeling.

NOTE Alternative methods of determining the adhesion of coatings may be used provided the results obtained are in correlation with those given by ball burnishing.

6.3 Fineness of precious metal coatings

The fineness of precious metal coatings should not be less than 925 ‰.

7 Performance

7.1 Resistance to corrosion

The surfaces of stainless steel parts of table cutlery shall comply with the requirements a) to c) when tested in accordance with the method described in annex B:

a) no transverse cracks shall have developed and no longitudinal cracks of a length exceeding 1,5 mm shall have developed;

b) there shall not be more than three pits or zones of intergranular corrosion each having an area greater than a circle of 0,4 mm diameter on the handle, and not more than three pits each having an area greater than a circle of 0,4 mm diameter (0,126 mm^2) elsewhere;

c) there shall be no pits or zones of intergranular corrosion having an area greater than a circle of 0,75 mm (0,442 mm^2) on any part.

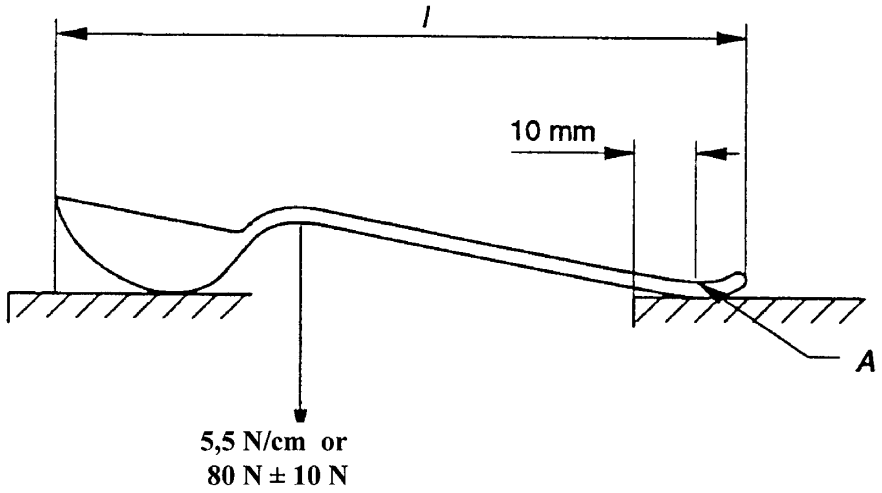
7.2 Strength

7.2.1 Knives with martensitic stainless steel blades

A knife shall not crack or break and shall not acquire a permanent deformation of more than 3° ± 0,5 ° when tested in accordance with the method described in annex C. In addition, the handle blade joint shall not become loose.

7.2.2 Spoons, forks, ladles and unsharpened knives

An item shall not have a permanent deformation of more than 1mm when tested as follows; an item shall be laid on a plane with the highest point of the handle facing upward. A force shall be applied equivalent to 5,5 N for each centimetre of overall length or 80N ± 10 N whichever is the lesser for 10 s (see figure 1 for a spoon). During the application of this force the point of rest of the handle (A in figure 1) shall not be more than 10 mm from the edge of the supporting surface.



Key

l length
A point of rest

Figure 1 — Strength test for a spoon

7.2.3 Firmness of handle attachment

Handles that are not an integral part of the rest of the item shall be attached by a method that prevents the handle turning relative to the rest of the item or pulling away from the blade when, immediately after being immersed for 10 min in water at a temperature of $(100\ ^{0}_{-5})$°C, the item is subjected to

a) a pulling force of $180\ ^{0}_{-10}$ for 10 s;

b) a torque of $(4{,}5\ ^{0}_{-0{,}2})$ Nm for items whose handles have a surface area of 37 cm^2 or more, or a torque of $(3{,}7\ ^{0}_{-0{,}2})$ Nm for items whose handles have a surface area of less than 37 cm^2. The torque shall be applied for 10 s.

The pulling force and torque shall be applied successively.

7.3 Hardness of knife blades

Knife blades made from martensitic stainless steel shall have a minimum hardness of 48 HRC when tested in accordance with ISO 6508:1986. Readings shall be taken not less than 40 mm from the handle.

Carving knife blades shall have a minimum of 52 HRC.

8 Marking and labelling

Each item of cutlery shall be legibly and indelibly marked with the name and/or trade mark or other means of identifying the manufacturer or responsible supplier.

The following information shall be made available at the point of sale:
- the number of this European Standard,
- a statement that the cutlery meets the requirements of the standard.

This information may be provided as leaflets on the packaging or by means of labelling or on a display card or in any other suitable form.

Annex A
(normative)

Method of test for adhesion of precious metal coating

A.1 Principle

Cutlery items are examined after burnishing with steel balls by rotation in a rubber-lined drum containing soap solution.

A.2 Apparatus and materials

A.2.1 Rotatable drum, rubber-lined of hexagonal cross section measuring 250 mm ± 20 mm across the flats capable of rotating at 25 r/min ± 2 r/min and preferably fitted with transverse dividing panels so that compartments shorter than the items to be tested can be formed within the drum to prevent entanglement of the test items. The drum is half filled with hardened steel balls in the following size proportions (to prevent geometric bunching):

4,8 mm diameter: 50 % by mass;
4,0 mm diameter. 25 % by mass;
5,6 mm diameter: 25 % by mass.

A.2.2 Soap solution, 1,2 g of soap per litre of demineralized or distilled water.

A.3 Procedure

Sufficient cold soap solution (A.2.2) is added to the drum to cover the steel balls

NOTE The soap inhibits corrosion of the steel balls.

Place the test items in the drum (A.2. 1) and rotate it at 25 r/min ± 2 r/min for 40 min.

Remove the test items from the drum and carefully examine them

A.4 Expression of results

Report any signs of peeling or flaking of the coating.

Annex B
(normative)

Method of test for corrosion resistance of knife blades

B.1 Principle

The test samples are intermittently immersed in a solution of sodium chloride (NaCl) maintained at 60° C ± 2° C for 6 h. The number and size of any pits that have formed are measured visually with the aid of a microscope lens.

B.2 Reagents

Sodium chloride solution with a mass fraction of 1 % consisting of one part by mass sodium chloride in 99 parts demineralized/distilled water.

During the test, unless otherwise stated, use only reagents of recognised analytical grade and only distilled water or water of equivalent quality.

B.3 Apparatus

A suitable apparatus is shown in figure B.1, and comprises a glass or plastics container and a cover, which may be glass or plastics, and a plastics specimen rack with means to raise and lower this into the container.

NOTE Other methods of specimen support may be used provided that there is a minimal contact of the specimen with the supporting means.

Calibrated microscope or lens of at least 4 times magnification.

B.4 Procedure

B.4.1 Wash the selected samples thoroughly in hot soapy water. Thoroughly rinse and then degrease the samples in acetone or methylated spirits.

B.4.2 Fill the container with the sodium chloride solution (see B.2) using at least 1 litre of solution for every square decimetre of area of the stainless steel parts of the samples. Bring the container and contents to 60°C ± 2°C. Maintain at this temperature. Do not allow the temperature of the solution to exceed 62 °C at any time, even before the start of the test. Use a fresh sodium chloride solution for each test.

NOTE The temperature of the sodium chloride solution can be conveniently maintained at 60°C ± 2°C by positioning the apparatus in a thermostatically controlled water bath, the level of which is maintained at approximately the same level as that of the sodium chloride solution.

B.4.3 Place the sample in the rack and replace the cover.

B.4.4 Completely immerse and completely withdraw the samples from the solution at the rate of from two to three times per minute for 6 h.

B.4.5 At the conclusion of the test period, thoroughly wash and rinse the samples and examine for corrosion.

NOTE:Products of corrosion that impede visual examination of corrosion pits can be removed by hand rubbing the surface of the cutlery with a stainless steel polishing paste applied with a soft cloth.

B.5 Expression of results

Assess the size of pits and the length of longitudinal cracks per test specimen visually with the aid of a calibrated microscope or lens of at least four times magnification. Where two pits have obviously merged together they shall be assessed as two separate pits.

NOTE The use of wires of diameter 0,4 mm and 0,75 mm respectively, placed in contact with the sample surface, provides a convenient method of assessing the size of pits with a hand lens.

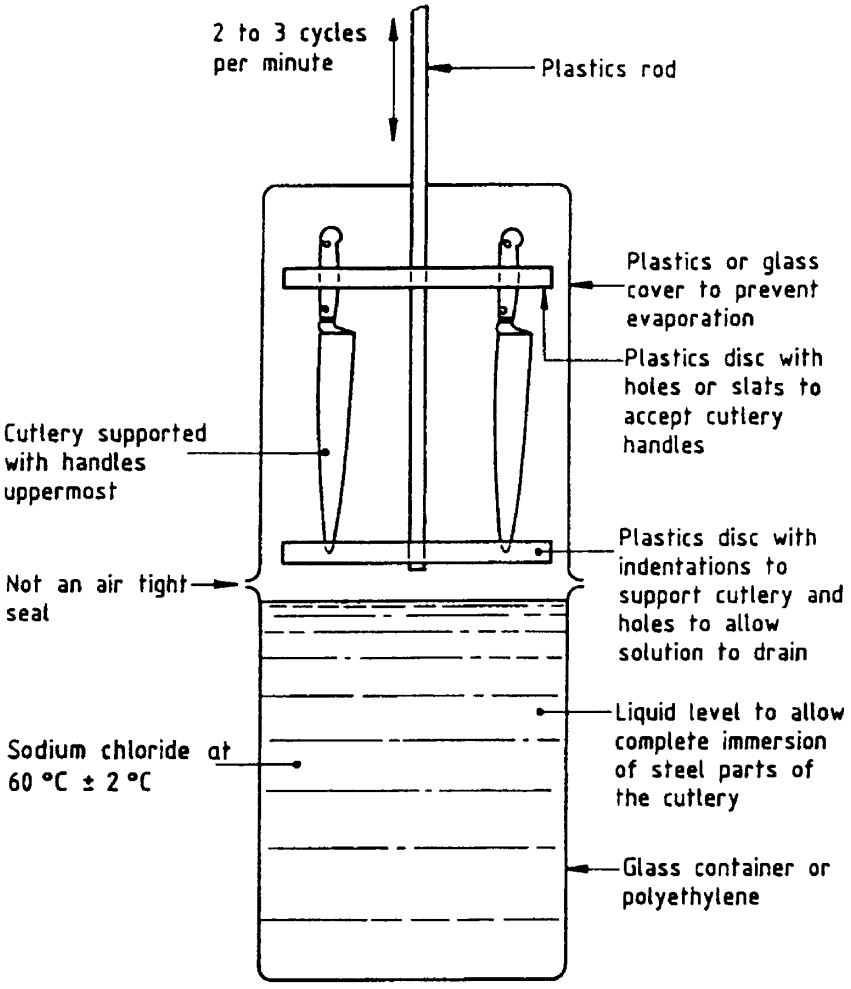


Figure B.1 — Apparatus for corrosion test

Annex C
(normative)

Test method for strength of knives with martensitic stainless steel blades

C.1 Principle

The knife, clamped at the handle and loaded at the blade or prong tip, is raised until the load is just lifted. The angle of permanent deformation after release of the load is measured.

C.2 Apparatus

Apparatus suitable for carrying out the test as shown in figure C.1.

NOTE The hand lever shown in figure C.1 should not be attached before both scales are set to zero and should be removed before the angle of permanent set is measured; otherwise the hand lever exerts a torque on the pivoted clamp which will result in false measurements of permanent set.

C.3 Procedure

C.3.1 Clamp the handle of the sample to be tested in the pivoted clamp. Position the handle in the clamp so that during the test the tip of the blade, or carving fork prongs, and the end of the handle will remain in essentially the same horizontal plane.

C.3.2 Clamp the blade to the unloaded tip clamp, ensure that the hand lever is removed from the apparatus and then set both scales to zero.

C.3.3 Connect a test load of 30 N ± 1 N to the tip clamp and rotate the shaft of the pivoted clamp by means of the hand lever until the tip clamp just rises from the guide rails. Maintain it in this position for 10 s. Return the hand lever to a position of rest and remove the hand lever. Remove the load from the tip clamp and read off the angles of deflection, *a* and *b* from the relevant scales. Add these two angles to give the angle of permanent deformation (see figure C.2).

C.3.4 Turn the sample over and repeat the test in the opposite direction.

C.4 Expression of results

Calculate the permanent deformation as the average of the angles of permanent deformation in the two directions.

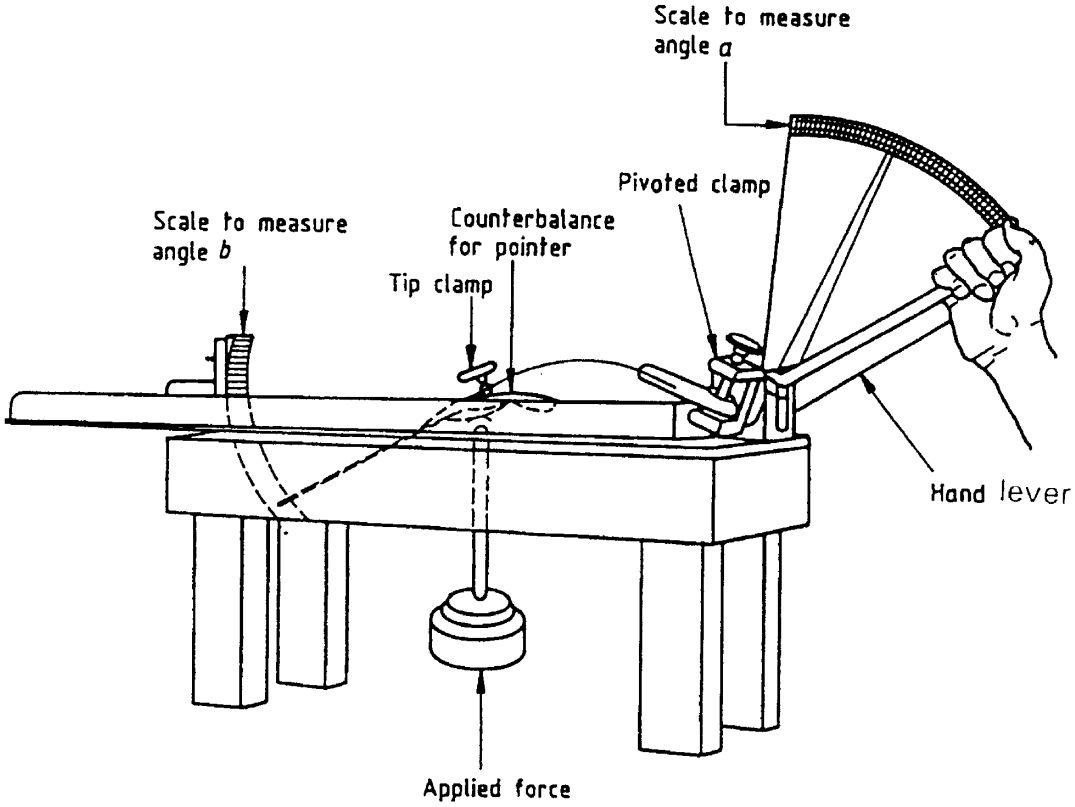


Figure C.1 — Strength test apparatus for knives

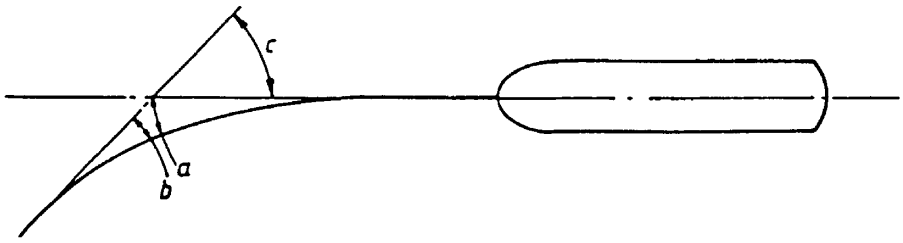


Figure C.2 — Determination of angle of permanent deformation

Annex D
(informative)

A-deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC member.

This European Standard does not fall under any Directive of the EU. In the relevant CEN/CENELEC countries these A-deviations are valid instead of the provisions of the European Standard until they have been removed.

Clause	Deviation
Table 1	**France** Arrêté du 13 Janvier 1976 relatif aux matériaux et objets en acier inoxydable au contact des denrées alimentaires: Article 2 Where the minimum chromium content given in EN 10088-1:1995 is less than 13,00%, replace with “13,00% min. Cr”
4.2.2	**United Kingdom** Hallmarking act 1973: Chapter 43 Section 4 Subsection 3 paragraph (b)(ii) The minimum fineness of solders used with silver articles shall be 650.
4.2.2	**Denmark** Order governing the activities of the Precious Metals Inspectorate 1995: Section 3 Subsection 8 Paragraph b) The minimum fineness of solders used with silver articles of fineness 925 shall be 650.
8	**United Kingdom** Hallmarking Act 1973 Chapter 43 Section 1 Subsection 1 Any article offered for sale described as wholly or partly made of Gold, Silver or Platinum must carry an approved hallmark.

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