



# Shanghai Gold Exchange Standard

SGEB1-2019

Supersedes SGEB1-2002

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## Gold Ingot

Release: 2019-09-03

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**Release by Shanghai Gold Exchange**

## Preface

This standard is drafted in accordance with the rules of GB/T 1.1-2009.

This standard supersedes *SGE Standard for Gold Ingot SGEB1-2002*. Changes in this revision are as follows:

- Revised the format of the standard;
- Consolidated in Table 2 the external dimensions and deliverable weight for gold ingots; removed the specific provisions on the deliverable weight;
- Updated the tolerance levels for the dimensions of 1 kg gold ingots;
- Changed the rounding requirement for ingot weight from 0.1 g to 0.01 g;
- Updated the requirements for determining the gold content of Au99.99 and Au99.95;
- Updated the requirements for determining the gold content of Au99.9 and Au99.5;
- Removed the provisions on rounding the numerical results of chemical assay tests;
- Added provisions on judging the weighing results.

This standard is proposed, drafted, and released by the Shanghai Gold Exchange.

This standard supersedes the following older standards:

- SGEB1-2002.

# Gold Ingot

## 1. Scope

This standard sets out the product designation, requirements, testing methods, testing rules, markings, packaging, transport, storage, and certificate of quality for gold ingots deliverable through the Shanghai Gold Exchange.

This standard applies to the gold ingots delivered through the Shanghai Gold Exchange.

## 2. Normative References

The following standards are mandatory for the application of this document. For dated references, only the dated version shall apply to this document. For undated references, the latest versions (including all subsequent amendments) shall apply to this document.

- GB/T 8170-2008: Rules of Rounding Off for Numerical Values & Expression and Judgment of Limiting Values
- GB/T 11066 (all parts): Methods for Chemical Analysis of Gold

## 3. Designations and Grades

Gold ingot is classified into four designations according to gold content, see Table 1 for detailed specifications.

Table 1

Designation	Grade	Fineness (%)
Au99.99	Grade I	$\text{Au} \geq 99.99$
Au99.95	Grade II	$99.99 > \text{Au} \geq 99.95$
Au99.9	Grade III	$99.95 > \text{Au} \geq 99.90$
Au99.5	Grade IV	$99.90 > \text{Au} \geq 99.50$

Note: Excessive impurities will lower the designation of the gold ingot to the corresponding grade.

## 4. Requirements

### 4.1 Physical Specifications

4.1.1 Weight of standard gold ingots: 1 kg, 3 kg, 12.5 kg.

4.1.2 1 kg and 3 kg gold ingots should be cuboid in shape; 12.5 kg gold ingots should be rectangular trapezoid in shape.

4.1.3 Requirements on external dimensions and deliverable weight for gold ingots are given in Table 2.

Table 2

Specification		Length (mm)	Width (mm)	Deliverable Weight (g)
1 kg		115 ± 2	52.5 ± 2	1,000 <sup>+0.05</sup> <sub>0.00</sub>
3 kg		320 ± 2	70 ± 2	3,000 ± 50
12.5 kg	Top	258 <sup>+2</sup> <sub>-4</sub>	80 <sup>+2</sup> <sub>-4</sub>	12,500 <sup>+500</sup> <sub>-1500</sub>
	Bottom	236 ± 2	56 ± 2	

4.1.4 The weight of 1 kg gold ingots is invariably treated as 1,000.00 g; negative tolerances are not permitted. The weight of 3 kg and 12.5 kg gold ingots is as indicated by the scale.

4.1.5 The difference in thickness between the two ends and between the two sides of a gold ingot should not be greater than 1 mm.

4.1.6 Ingot weight shall be rounded to nearest 0.01 g per ingot in accordance with GB/T 8170.

4.1.7 Gold ingots of customized specifications can be produced according to transaction needs.

## 4.2 Surface Quality

4.2.1 Surfaces should be smooth, clean, with intact edges and corners, and no flashes or burrs.

4.2.2 Gold ingot should not contain any cavities, interlayers, cracks, excessive shrinkage, or inclusions.

4.2.3 Machining marks (excluding surface markings) are not allowed, but incisions from cutting head are permitted for 3 kg gold ingots.

## 4.3 Chemical Composition

4.3.1 The chemical composition of gold ingots shall conform to the specifications in Table 3.

Table 3

Designation	Grade	Chemical Composition (%)							
		Au ≥	Impurity Content ≤						
			Ag	Cu	Fe	Pb	Bi	Sb	Total
Au99.99	I	99.99	0.005	0.002	0.002	0.001	0.002	0.001	0.01
Au99.95	II	99.95	0.020	0.015	0.003	0.003	0.002	0.002	0.05
Au99.9	III	99.90	-	-	-	-	-	-	0.1
Au99.5	IV	99.50	-	-	-	-	-	-	0.5

4.3.2 The gold content of Au99.99 and Au99.95 is determined by the subtraction method, i.e., 100% minus the measured impurity levels. The impurities to be measured include but are not limited to those

listed in Table 3.

4.3.3 The gold content of Au99.9 and Au99.5 should be directly measured in accordance with GB/T 11066.1.

4.3.4 1 kg gold ingot only has a single grade, Au99.99.

4.3.5 Other compositional requirements may be specified based on transaction needs.

#### **4.4 Inspection and Acceptance**

4.4.1 Manufacturer shall ensure the quality of gold ingots it produces complies with this standard.

4.4.2 Where the gold ingot received by the buyer does not conform to this standard, the buyer and the supplier shall negotiate for a solution. If arbitration is necessary, an SGE-designated quality inspection agency shall be responsible for the testing. The testing results shall form the basis for the ruling.

#### **4.5 Testing Methods**

4.5.1 The arbitration assay of the chemical composition of gold ingot shall be conducted according to the method under GB/T 11066. Other methods are permissible provided the precision and accuracy is no lower than that required by GB/T 11066.

4.5.2 The surface quality of gold ingot shall be determined by visual inspection.

4.5.3 The physical specifications of gold ingot shall be examined with apparatus of appropriate precision levels.

#### **4.6 Testing Rules**

4.6.1 The chemical composition shall be assayed by manufacturing batch, with each batch consisting of gold ingots from the same melt. If necessary, the composition can be assayed ingot-by-ingot.

4.6.2 The surface quality and physical specifications shall be examined ingot-by-ingot.

4.6.3 An arbitration assay shall be conducted in the event of any dispute between the supplier and the buyer regarding the chemical composition of gold ingot.

#### **4.7 Sampling Rules**

4.7.1 Gold ingots are sampled by manufacturing batch, with the samples randomly collected by sheet/bar casting, water quenching, drilling, and other methods.

4.7.2 Sampling in spot-checking and arbitration shall be executed according to the methods specified in Appendix A.

#### **4.8 Judgment Rules**

4.8.1 If the chemical composition of an ingot is inconsistent with Article 4.3 of this standard, all ingots in that batch shall be regarded as nonconforming.

4.8.2 If the surface quality of an ingot is inconsistent with Article 4.2 of this standard, that ingot

shall be regarded as nonconforming.

4.8.3 If the weight of an ingot is inconsistent with Article 4.1 of this standard, that ingot shall be regarded as nonconforming.

## **5. Markings, Packaging, Transport, Storage, and the Certificate of Quality**

### **5.1 Markings**

The surface of each ingot should be casted or stamped with the serial number, trademark, mark of conformity, and designation. 1 kg gold ingots should additionally be stamped with a weight label. All markings should be clear and legible. Refer to Exhibit A for the location of markings on standard gold ingot and Appendix B for rules on serial numbering.

### **5.2 Packaging**

One crate of 1 kg, 3 kg, and 12.5 kg gold ingots should contain 25, 10, and 2 ingots, respectively. Each gold ingot should be wrapped in a clean piece of paper or plastic sheet, then packed into wooden or plastic crates conforming to the dimensional and other requirements specified in Appendix C. The buyer and the supplier may agree on other forms of packaging.

### **5.3 Transport and Storage**

The products shall not be damaged or contaminated during transport and storage.

### **5.4 Certificate of Quality**

Each batch of gold ingots shall be accompanied by a certificate of quality, specifying:

- a) the name, address, and telephone number of the manufacturer;
- b) product name and designation;
- c) batch number;
- d) net weight and count;
- e) all analysis and assay results and the code of the standards used;
- f) seal of the quality inspection agency; and
- g) date of manufacture.

## Appendix A (Normative Appendix)

### Sampling Methods for Arbitration Analysis of Gold Ingot

A.1 This appendix sets out the sampling rules for arbitration analysis of gold ingot

A.2 Requirements

A.2.1 Equipment and reagents

A.2.1.1 A bench/hand drill of a diameter of 5-8 mm

A.2.1.2 Magnet

A.2.1.3 1:1 (by volume) water and HCl solution (G.R.)

A.2.1.4 Ethanol or acetone (G.R.)

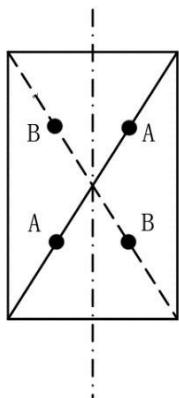
A.2.2 Sampling: Number of samples taken should be equal to 20% of the number of gold ingots in each batch, but no less than one ingot. In special circumstances, sampling should be conducted ingot-by-ingot.

A.2.2.1 Sampling of a single ingot

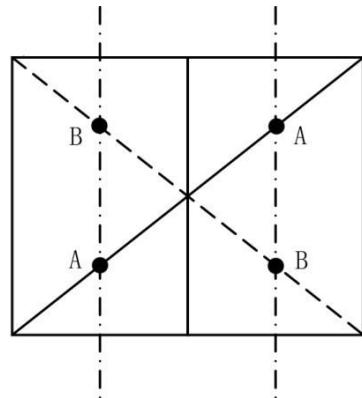
Draw one diagonal line on each of the two largest faces of the ingot; the middle point from the center to each vertex along a diagonal line gives one sampling point, yielding four sampling points in total (Figure A.1).

A.2.2.2 Sampling of two or more ingots

The number of sampling points shall follow the “ $2n$  rule” ( $n$  is the number of ingots). Arrange the gold ingots long-edge-wise into a rectangle, draw a centerline parallel to the long edge on the top and bottom faces of each ingot, and then draw one diagonal line across the top faces of all ingots and one across the bottom faces of all ingots. The points where the centerlines intersect the diagonal lines are the sampling points (Figure A.2).



A: Sampling point on the casting face



B: Sampling point on the bottom face

Figure A.1: Drawing of Sampling Points

Figure A.2: Drawing of Sampling Points

### A.2.3 Preparation of the Samples

A.2.3.1 Use a Ø5-8 mm drill to drill to a depth of not less than two-thirds of the ingot thickness, process the drill samples with the magnet, mix them uniformly, and divide the mixture into six parts by sample quartering. The buyer and the supplier shall keep one part each, and the arbitration agency and manufacturers two parts each.

A.2.3.2 The sample weight for Grade I/II gold ingots shall be at least 30g per part, that for Grade III/IV ingot shall be at least 5g per part.

A.2.3.3 To avoid surface contamination, prior to analysis, the samples can be rinsed in hot hydrochloric acid ( $H_2O:HCl = 1:1$ ) for 5 minutes. After rinsed with water, the samples should be washed twice with alcohol or acetone and dried in an oven at 110 °C.

## **Appendix B**

### **(Normative Appendix)**

#### **Gold Ingot Serial Numbering Rules**

B.1 This appendix sets out the rules for the serial numbering of ingots.

B.2 Requirements

B.2.1 The ingot number contains nine characters.

B.2.1.1 The first character is the company code (A, B, C...) assigned by the Exchange;

B.2.1.2 The second character is the bar weight code (X for 1 kg, Y for 3 kg, and Z for 12.5kg);

B.2.1.3 The third and fourth characters are the year code (e.g., 02 for 2002); and

B.2.1.4 The last five digits are the unique number given to ingots produced by that manufacturer that year (e.g., 00001, 00002...).

## **Appendix C**

### **(Normative Appendix)**

#### **Packing Crate Specifications and Requirements**

C.1 This appendix sets out the specifications and requirements for the packing crates.

C.2 Requirements

C.2.1 Crate for 1 kg ingots shall be made of polyethylene with a wall thickness of 3-5 mm and of the following dimensions (length × width × height): 275 × 135 × 62 mm.

C.2.2 Crate for 3 kg ingots shall be made of solid wood and of the following dimensions (length × width × height): 372 × 190 × 90 mm.

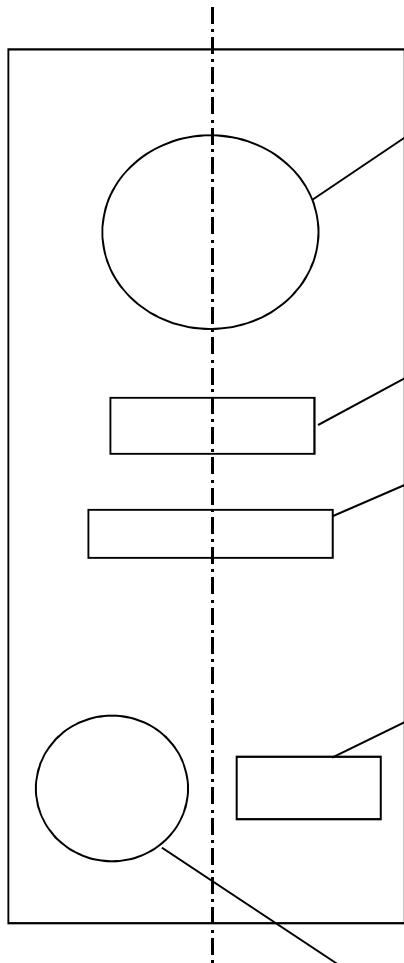
C.2.3 Crate for 12.5 kg ingots shall be made of solid wood and of the following dimensions (length × width × height): 310 × 205 × 90 mm.

C.2.4 Wooden crate requirements: Crate should be made of solid wood with a moisture content of less than 15%, smooth, free of cracks and loose knots, and connected with mortise and tenon joints. Crate should be reinforced with iron sheet on both ends, and secured with iron wire and a round metal seal at the surface. The wire and seal should sink into rather than bulging from the surface. Wood boards should be 20 mm thick.

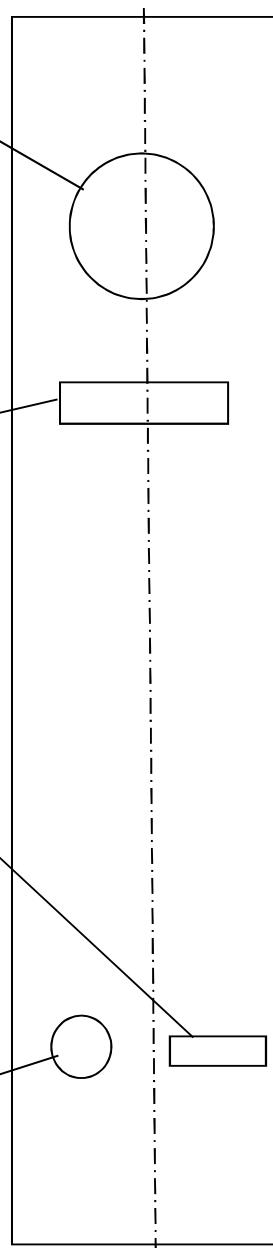
**Exhibit A****Reference Location of Markings on SGE Deliverable Gold Ingots**

Note: There are no uniform rules for the size of various markings, but the letters should be clear and legible. The mark of conformity shown in this Figure is a conformity mark of the Shanghai Gold Exchange; the assay seal of manufacturer can be stamped on the bottom face of the gold ingot or some other appropriate location.

**Figure 1: Location of Markings on 1 KG Gold Ingot**



**Figure 2: Location of Markings on 3 KG Gold Ingots**



**Figure 3: Location of Markings on 12.5 KG Gold Ingots**

