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.

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

2. Normative References

The provisions of the following documents are incorporated as part of this standard by reference. For dated reference documents, any and all subsequent amendments (excluding the content of corrigenda) or revisions shall not apply to this standard, but the parties that reached an agreement according to this standard shall be encouraged to discuss whether the latest versions of such reference documents should apply. For undated reference documents, the latest versions shall apply to this standard.

GB/T 8170-1987	Rules for Rounding Off Numerical Values
GB/T 1250-1989	Rules for Expression and Judgment of Limiting Values
GB/T 11066-1989	Methods for Chemical Analysis of Gold

3. Grades and Designations

Gold ingot is classified into four designations according to chemical composition.

Designation	Grade	Fineness (%)
Au99.99	Grade I	Au ≥ 99.99
Au99.95	Grade II	99.99 > Au ≥ 99.95
Au99.9	Grade III	99.95 > Au ≥ 99.90
Au99.5	Grade IV	99.90 > Au ≥ 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 Weight of deliverable gold ingots: $1{,}000^{+0.05}$ g; 3000_{-50}^{+50} g; $12{,}500_{-1500}^{+500}$ g.

4.1.3 Negative tolerances are not allowed in 1 kg gold ingots. The weight of 1 kg gold ingots is

set to 1,000.00 g; that of 3 kg and 12.5 kg gold ingots is determined by the actual weight.

4.1.4 1 kg and 3 kg gold ingots should be cuboid in shape; 12.5 kg gold ingots should be cuboid or rectangular trapezoid in shape.

4.1.5 Gold Ingot Dimensions (mm):

Specification		Length	Width
1 kg		115 ± 1	52.5 ± 1
3 kg		320 ± 2	70 ± 2
12.5 kg	Top	258 (+2; -4)	80 (+2; -4)
	Bottom	236 ± 2	56 ± 2

4.1.6 The difference between the two ends and the sides of gold ingot shall not be greater than 1 mm.

4.1.7 Ingot weight shall be rounded to nearest 0.1 g per ingot in accordance with GB/T 8170.

4.1.8 Gold ingots of special 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, interlayer, cracks, excessive shrinkage, or inclusions.

4.2.3 Machining marks are not allowed, but incisions 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 the table below:

Designation	Grade	Chemical Composition (%)							
		Au ≥	Impurity Content Not More Than						
			Ag	Cu	Fe	Pb	Bi	Sb	Total
Au99.99	Grade I	99.99	0.005	0.002	0.002	0.001	0.002	0.001	0.01
Au99.95	Grade II	99.95	0.020	0.015	0.003	0.003	0.002	0.002	0.05
Au99.9	Grade III	99.90	-	-	-	-	-	-	0.1
Au99.5	Grade IV	99.50	-	-	-	-	-	-	0.5

Notes:

1. The gold content of Au99.99 and Au99.95 is 100% minus the measured content of impurities listed in the table.

2. The gold content of Au99.9 and Au99.5 should be measured directly.

4.3.2 Au99.99 is the unique variety designation for 1 kg gold ingots.

4.3.3 Other composition 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 Exchange-designated quality inspection agency shall be responsible for the assaying; the assay results shall form the basis for the ruling.

4.5 Examination 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 is no lower than that required by this standard.

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 Examination Rules

4.6.1 The chemical composition shall be assayed by 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 quality dispute between the supplier and the buyer regarding the chemical composition of gold ingot.

4.7 Sampling Rules

4.7.1 Gold ingot of a manufacturer shall be subject to batch sampling, with the samples randomly collected from 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 Judgement 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 Numerical value rounding off of the chemical composition assay results shall be performed in accordance with Chapter III of GB/T 8170-1987.

5. Marks, Packaging, Transport, Storage, and the Certificate of Quality

5.1 Marks

5.1.1 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 marks should be clear and legible. Refer to Figure A for the location of marks 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.)

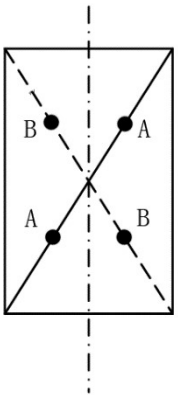
A.2.2 Sampling: Number of samples taken should be equal to 20% of the number of gold ingots in each batch, but no less than one ingot. In special circumstances, sampling should be conducted ingot-by-ingot.

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).

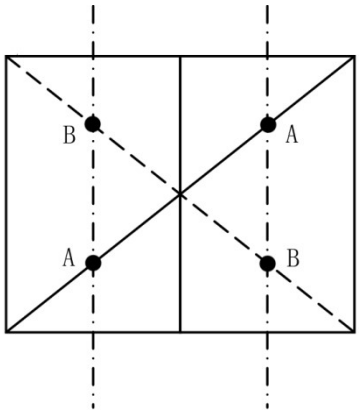
A.2.2.2 Sampling of two or more ingots

The number of sampling points shall follow the "2*n* 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

Figure A.1: Drawing of Sampling Points



B: Sampling point on the bottom face

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 30 g per part, that for Grade III/IV ingot shall be at least 5 g 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 12.5 kg);

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.

Figure A

Reference Location of Marks on SGE Deliverable Gold Ingots

Note 1: There are no uniform rules for the size of various marks, 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 Marks on 1 KG Gold Ingot

Figure 2: Location of Marks on 3 KG Gold Ingots

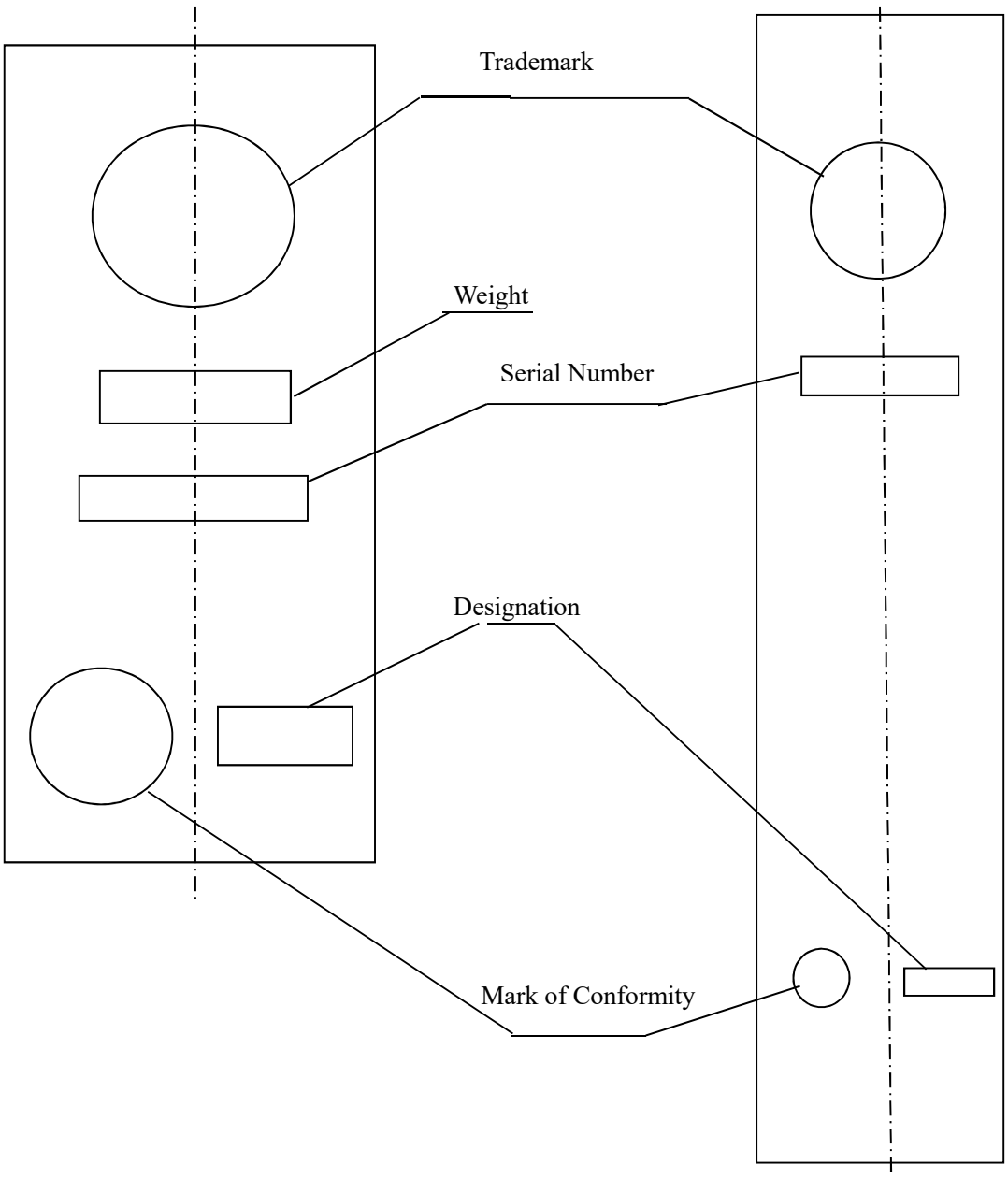


Figure 3: Location of Marks on 12.5 KG Gold Ingots