Recognition No of AHC

GENERIC QUALITY MANUAL

[According to IS 15820:2024]

of

…….. Assaying & Hallmarking Centre
Address
City
State
India
Pin

Telephone No
Fax
Email
Website

Document No.	
Issue Number	
Issue Date	
Prepared & Issued by Quality Manager	
Approved by CEO	
Copy No.	MASTER COPY
Copy Holder	QUALITY MANAGER

Section: 1	… .....Assaying & Hallmarking Centre **Contents**	AHC Recognition No

1.2 Distribution Record

A controlled copy of this Quality Manual is issued to key persons of the centre/stakeholder.

The following are the authorized holders of the '**CONTROLLED COPY'** of Quality Manual.

Controlled Copy No.	Name and Designation of the Copyholder
01	Shri/Smt ..... , Chief Executive Officer
02	Shri/Smt ....., Quality Manager
03	Shri/Smt ……., Assaying In-charge
04	Bureau of Indian Standards

1.3 Amendment Record

Each copy holder of this Quality Manual shall be given a copy of the amendment as well as this Amendment Record. The copy holder shall ensure that the Manual is kept up to date with respect to amendments and obsolete page(s) of the Manual is/are duly returned to the Quality Manager.

Amend-ment No.	Page No.	Section/ Clause/ Sentence	Date	Details of Amendment	Justification for amendment	Signature of Quality Manager

1.4 Scope of M/s..... Assaying and Hallmarking Centre

M/s ..... Assaying and Hallmarking Centre (hereinafter is mentioned as "Centre" or "the Centre') is a small organization having its major field of activity as assaying of gold/silver samples and offers services of providing technically valid test results and hallmarking. The management system has covered all operations of the Centre, namely:

For Gold: (a) Receiving (b) XRF examination (c) Sampling (d) Fire Assay (e) Reporting the results (f) hallmarking and /or

For Silver: (a) Receiving (b) XRF examination (c) Sampling (d) Gravimetric/Potentiometric method of test (e) Reporting the results (f) Hallmarking.

The working is based according to the requirements specified in IS 15820:2024.

1.5 References

This Quality Manual has been prepared by the Centre complying with the requirements of following Indian Standards (ISs) and their amendment(s), wherever applicable:

Sl. No.	IS No.	Title
01	IS 15820:2024	Establishment and Operation of Assaying and Hallmarking Centres – General Requirements
02	IS 1417:2016	Gold and Gold Alloys, jewellery/artefacts – Fineness & Marking - Specification
03	IS 1418:2009	Determination of Gold in Gold Bullion, Gold Alloys & Gold jewellery/artefacts – Cupellation (Fire Assay) Method
04	IS 2112:2014	Silver and Silver Alloys, jewellery/artefacts – Fineness & Marking - Specification
05	IS 2113:2014	Assaying Silver in Silver and Silver Alloys – Methods

1.6 Definitions

Term	Definition
Articles	Jewellery/artefacts
Assaying	The method of accurate determination of precious metal content in a sample.
BIS	Bureau of Indian Standards
Customer	BIS registered jewellers and consumers
Global Customer	Exporter of gold/silver articles

Centre/the Centre	XYZ Assaying & Hallmarking Centre
Hallmarking	The accurate determination and official recording of the proportionate content of the precious metal in precious metal articles
Product	Assay & Hallmarking services for gold/silver articles

1.7 Abbreviations

Abbreviated Term	Expanded Form	Term	Full Form
A/c	Accounts	ML	Master List
ADM	Administration	NABL	National Accreditation Board for Testing and Calibration Laboratories
ALB	Assay Laboratory	NC	Non-conformity
BIS	Bureau of Indian Standards	OL	Obsolete
CH	Charts	PAD	Personnel & Administration
CD	Compact Disc	PL	Policy
CEO	Chief Executive Officer	PPT	Parts Per Thousand
DEO	Document of external origin	PSL	Personnel
FM	Format	PUR	Purchase
GR	General Records	QAC	Quality Assurance
HRD	Human Resource Development	QM	Quality Manual
IA	Internal Audit	QR	Quality Records
ID	Identification	QSY	Quality System
IGM	India Government Mint	QMS	Quality Management System
ISO	International Organization of Standardization	RCV	Receiving
IS	Indian Standard	SP	Support Procedure
LBT	Laboratory Technician	SPL	Sampling
LS	List	TR	Technical Records
MGT	Management	TM	Test Methods
MKT	Marketing	WI	Work Instruction

Section 2: GENERAL REQUIREMENTS	…..... Assaying & Hallmarking Centre	AHC Recognition No

(Clause No. 4 of IS 15820:2024)

2.1 Impartiality

2.1.1 The centre's activities are undertaken impartially and structured and managed so as to safeguard impartiality. The work allocation of the employees is done in such a way that impartiality is ensured.

2.1.2 The centre's management is committed to impartiality.

2.1.3 The centre does not allow commercial, financial or other pressures to compromise impartiality. The management and personnel are required to maintain the integrity in their work.

2.1.4 The centre identifies risks to its impartiality on an on-going basis. This includes those risks that arise from its activities, or from its relationships, or from the relationships from its personnel.

2.1.5 If a risk to impartiality is identified, the centre eliminates or minimizes such risks.

2.2 Confidentiality

2.2.1 The centre ensures the protection of its customer's confidential information and proprietary rights, including protecting the electronic storage and transmission of results. In case centre intends to place the information of customer in the public domain it shall inform the customer in advance.

2.2.2 When the centre is required by law or authorized by contractual arrangements to release confidential information, the customer concerned is notified of the information provided (unless prohibited by law).

2.2.3 Information about the customer obtained from sources other than the customer is confidential between the information provider and our centre. The provider of this information is confidential to the centre and is not shared with the customer, unless agreed by the source.

2.2.4 Personnel, including any committee members, contractors, personnel of external bodies, or individuals acting on the centre's behalf, keep confidential all information obtained or created during the performance of laboratory activities, except as required by law.

2.2.5 The Centre's policy is to ensure the protection of its customers information and proprietary rights confidentially. The customer's confidential and proprietary rights are defined as (a) Details of articles hallmarked and/or their HUID; (b) Rejections; (c) Details of articles (weight and quantity) sent for Hallmarking and (d) Pattern and Design of Articles. However, BIS will be furnished with the details on demand. The procedure followed is as described below:

i) All personnel have been informed that confidentiality shall be always maintained and honestly protected. Noncompliance will be dealt with very seriously by the management.

ii) An undertaking is taken in written form from all employees working in receiving, sampling,

XRF tester, assaying personnel, technicians, Laser operator, delivery staff to protect confidential information and proprietary rights of all customers.

iii) Under no circumstances the results of assay be made known to any third party without the written consent of the customer. The exclusion is BIS, who shall be furnished with details on demand.

iv) Report shall not be sent by fax to any customer or BIS without management's prior approval.

Section 3: STRUCTURAL REQUIREMENTS	…..... Assaying & Hallmarking Centre	AHC Recognition No

(Clause No. 5 of IS 15820:2024)

3.1 Organization

Sl. No.	PROFILE	
i.	Name of the Centre	XYZ ASSAYING & HALLMARKING CENTRE
ii.	Date of establishment.	dd-mm-yyyy
iii.	Name of Parent Firm	M/s _____
iv.	Type & details of Firm	Partnership Firm involved in refining of gold and/or Operating the Assaying & Hallmarking Centre.
v.	Management [Promoter(s)] composition including their business activities, if there is any	1. Mr/Mrs 2. .. 3. .. (*The management as shown above has the overall responsibility for the centre*)
vi.	Statement	a) XYZ Assaying and Hallmarking Centre is a legal entity. The promoters of this centre do not have any linkages with manufacturing or retailing of gold/silver jewellery/artefacts. b) The centre carries out assaying and Hallmarking activities complying with requirements of IS 1418/2113 and IS 15820. It has been set up to meet the needs of the centre's customers. The relevant statutory and regulatory requirements are to be complied with.
vii.	Managed & controlled by	…....., CEO
viii.	Address	…….., PIN ……., State……., India The centre does not carry out its activities at any other facility/facilities except at the location/(s) covered under the scope of recognition.
ix.	Communication details	☎: + 91- 🖷: + 91- **E-mail**: Web Site: www.
x.	Legal status	Proprietorship/Partnership/ROC Firm Registration No. SSI Registration No.
xi.	Scope of Business	Gold and/or Silver Assaying and Hallmarking
xiii.	GST Registration No.	
xiv.	Building	Receiving, XRF, sampling, weighing, fire assay/testing of silver, hallmarking and administration office facilities.

xv.	Test/assay facility	XRF and assaying of gold in gold bullion, gold alloys and articles – Cupellation (Fire Assay) method according to IS 1418. List of equipments for gold is given at Annex I(a). Methods of assaying silver in silver and silver alloys according to IS 2113:2014. List of equipments for silver is given at Annex I (b).
xvi.	Quality management aspects	➢ Competent Quality Manager, Assaying In-Charge and key personnel ➢ Accuracy and sensitivity of instruments and equipment ➢ In-depth practical knowledge of samplers about manufacturing of articles and skill (aptitude) in sampling ➢ Strict adherence to specified and documented fire assay method ➢ Quality control of critical operations, laboratory consumables ➢ Training of personnel ➢ Work discipline ➢ Continual improvement
xvii	Work environment	➢ Facilities for correct performance of all steps commencing from receiving to delivery
xviii	Customer	➢ Jeweller registered under BIS and other entity who purchase Hallmarked articles
xix.	Input to Centre	➢ Articles, namely articles made up of gold and/or silver for testing/assaying and Hallmarking
xx.	Output from Centre	➢ Hallmarked articles ➢ Cornets of gold samples ➢ Test Reports ➢ Delivery Voucher
xxi.	Security matters	➢ Closed circuit TV with back up facility of minimum 30 days storage ➢ Strong room/safe for storage of gold articles, certified reference materials, cornets etc.
xxii.	Quality Manager	
xxiii.	Assaying In-charge	
xxiv.	Overall responsibility of technical operations	
xxv.	Protecting confidentially the customer's needs.	

3.1.1 Needs of Customer

Sl No	Needs of the Customer
i.	Assaying of articles shall be carried out as per IS 1418 and/or 2113.
ii.	Hallmarking Charges shall be as approved by BIS.
iii.	Residual test sample (cornet) shall be returned after testing along with Articles
iv.	Articles to be returned as per delivery voucher/invoice without any damage in proper packing.

The Organizational Structure is given at **Annex II** describing the interrelationship between Centre's personnel. The centre ensures that:

a) Communication takes place regarding the effectiveness of the management system and the importance of meeting customer's and other requirements.
b) The integrity of the management system is maintained when changes to the management system are planned and implemented.

Section 4: RESOURCE REQUIREMENTS	…..... Assaying & Hallmarking Centre	AHC Recognition No

(Clause No. 6 of IS 15820:2024)

4.1 General

4.1.1 The center has the personnel, facilities, equipment, systems, and support services required to conduct its laboratory activities.

4.2 Personnel

4.2.1 All personnel of the centre, either internal or external, that could influence the centre activities act impartially, are competent and work in accordance with the laboratory's management system.

4.2.2 The competence requirements for each function influencing the results of centre activities, including requirements for education, qualification, training, technical knowledge, skills and experience has been documented in **Annex III.**

4.2.3 The centre ensures that the personnel have the competence to perform laboratory activities for which they are responsible and to evaluate the significance of deviations, through following means, where appropriate, but not be limited to:

a) Qualification
b) Training
c) Experience
d) Monitoring

4.2.4 Instructions have been issued to all personnel who manage, perform or verify work affecting the quality of the tests and assay to ensure that each of them is aware of the extent and limitations of his areas of responsibility and authority. The centre has provided authority and resources to each individual to initiate action to prevent or minimize any deviation in their respective areas. The centre ensures that all staff are adequately qualified and experienced to perform the duties assigned to them with respect to their position.

4.2.5 The Centre's management has assigned the Quality Manager with responsibility for ensuring that Management System is implemented in the Centre and followed at all times. The Quality Manager has direct access to the highest level of the Centre's management, namely the CEO for decisions on policy and/or resources.

4.2.6 The Assaying In-charge has been assigned with overall responsibilities of technical operations of the Centre as a whole and provision of resources to ensure the required quality and time management.

4.2.7 The Centre has appointed following deputies for key managerial personnel:

Sl. No.	Person	Deputy to
1	Name of deputy Assaying In-charge	Assaying In-charge
2	Name of Deputy Quality Manager	Quality Manager

4.3 Facilities and environmental conditions

4.3.1 The facilities and environmental conditions available in the centre are suitable for the centre's activities and do not adversely affect the validity of results.

4.3.2 The Centre follows procedure to facilitate correct performance of the test by means of providing appropriate facilities for assaying and hallmarking, including but not limited to energy sources, lighting and environmental conditions.

4.3.3 The Centre has a well-maintained building with facilities for continuous supply of electricity and running water, suitably illuminated and ventilated. The environmental conditions suitable for working shall be maintained. It also has effective separation between area with incompatible activities, closed circuit TV systems for security and verification of activities ensuring capturing of all activities being carried out in the centre, ergonomically designed work tables, sitting arrangements and up-to-date communication outfits and arrangements. These facilities are to ensure correct performance of tests.

4.3.4 The Centre monitors, controls and records environmental conditions as required by the relevant specifications, methods and procedures or where they influence the quality of the results. Due attention shall be paid, for example, to following:

i Contamination, dust, electromagnetic disturbances, radiation, humidity, electrical supply, temperature in the entire Centre, with specific reference to sound and vibration levels in microbalance, XRF machine and laser marking machine;
ii Proper exhaust arrangement for furnaces and parting chamber.
iii Proper treatment of exhaust fumes before discharge into the atmosphere.
iv Uninterrupted power supply arrangement / power backup arrangement.

Conditions for Accommodation and Environment.

Sl. No.	Description	XRF Room	Sampling Room	Balance Room	Fire Assay Room	Hallmarking Room
Accommodation						
1.	Ergonomically designed seating arrangements and work tables.	✓	✓	✓	--	✓
2.	Appropriate lighting on each work station	✓	✓	✓	✓	✓
3.	Weighing Balances	✓	✓	✓	--	--
4.	Vibration free work tables	--	--	✓	--	✓
5.	Furnaces with temperature controllers	--	--	--	✓	--
6.	Furnaces with exhaust system and arrangements for treatment of fumes before discharge	--	--	--	✓	--
7.	Fuming hood with scrubber system	--	--	--	✓	--
8.	Personal protective equipment for Lab. Technicians as per need	--	--	--	✓	--

9.	Uninterrupted power supply arrangement	✓	✓	✓	✓	✓
Environment						
10.	Dust Free Atmosphere	✓	✓	✓	✓	✓
11.	Humid Free Atmosphere	✓	✓	✓	✓	✓

4.3.5 The infrastructure and test equipment are daily verified by the Quality Manager and the person is empowered to stop activity when any defect/break-down in the system is noticed which may give rise to adverse environmental conditions jeopardizing the results of activities. The Quality Manager is also empowered for taking quick corrective measures.

4.3.6 Weigh-in room, the most sensitive area of the Centre where high precision balances are installed, is effectively separated against any type of incompatible activities and vibrations.

4.3.7 Access to areas of the Centre's facility is restricted except the receipt and delivery areas, waiting areas and wash rooms. However, these areas (except inside of wash rooms) are under CCTV.

4.3.8 Technical staff will have access to various areas of the Centre. Security personnel will be engaged to manage security aspects of the entire centre.

4.3.9 The centre has installed CCTV cameras with a minimum recording of 30 days to ensure that all the activities are captured day and night for the purpose of security as well as verification of the activities.

4.4 Equipment

4.4.1 The centre has access to equipment that is required for the correct performance of centre's activities and that can influence the results.

4.4.2 The centre does not use equipment outside its permanent control.

4.4.3 Conformity of the equipment to specified requirements before being placed or returned into service is verified.

4.4.4 The equipments are procured as per the required measurement accuracy and/or measurement uncertainty to provide a valid result and used after verification.

4.4.5 Measuring equipments are calibrated when:

4.4.5.1 The measurement accuracy or measurement uncertainty affects the validity of the reported results, and/or

4.4.5.2 Calibration of the equipment is required to establish the metrological traceability of the reported results.

4.4.6 Calibration programme is established, reviewed and adjusted as necessary in order to maintain confidence in the status of calibration**.**

4.4.7 All calibrated equipments have been provided with label to readily identify the status of calibration or period of validity.

4.4.8 Equipment that has been subjected to overloading or mishandling, gives questionable results, or has been shown to be defective or outside specified requirements, is taken out of service. It is clearly labelled as being out of service/order, until it has been

repaired/corrected and verified to perform correctly.

4.4.9 Internal checks are performed as per the frequency recommended in Annexure-D of the IS 15820:2024**.**

4.4.10 Wherever calibration and reference material data include reference values or correction factors, it is ensured that reference values and correction factors are updated and implemented, as appropriate, to meet specified requirements.

4.4.11 Unintended adjustment of equipment, which may invalidate results, is prevented by use of equipment by authorized personnel only.

4.4.12 The record of the equipment/s which can influence centre's activities is maintained.

4.5 Metrological traceability

4.5.1 The centre has established and maintains metrological traceability of its measurement results by means of a documented unbroken chain of calibrations, each contributing to the measurement uncertainty, linking them to an appropriate reference.

4.5.2 The centre ensures that measurement results are traceable to the International System of Units (SI) through:

4.5.2.1 Calibration provided by a competent IS 17025 accredited calibration centre, having requisite scope of accreditation; and

4.5.2.2 Certified values of certified reference materials provided by a competent producer IS 17034 accredited reference material producer (RMP) or IS 17025 accredited centre having accredited scope/BND.

4.6 Externally provided products and services

4.6.1 The centre ensures that only suitable externally provided products, such as cupels, water, reagents-acids, proof gold, silver, copper, lead, nickel, palladium, XRF standards, reference weights and services such as calibration services, annual maintenance contract etc that affect centre's activities are used, when such products and services:

a) are intended for incorporation into the centre's own activities; and

b) are used to support the operation of the centre.

4.6.2 The centre has a procedure and retains records for:

a) Defining, reviewing and approving the centre's requirements for externally provided products and services;

b) Defining the criteria for evaluation, selection, monitoring of performance and re- evaluation of the external providers;

c) Ensuring that externally provided products and services conform to the centre's established requirements, or when applicable, to the relevant requirements of this document, before they are used or directly provided to the customer; and

d) Taking any actions arising from evaluations, monitoring of performance and re- evaluations of the external providers.

4.6.3 Communication with external providers are done for:

a) The products and services to be provided;

b) The acceptance criteria;

c) Competence, including any required qualification of personnel; and

d) Activities that the centre, or its customer, intends to perform at the external provider's premises.

4.6.4 The centre follows the following procedure for purchase of products and services that affect the quality of assaying and hallmarking activities. The procedure covers purchase, receipt and storage of reagents, consumable materials relevant to assaying and hallmarking.

1. Quality Manager and Assaying In-charge are jointly responsible for selection and purchase of services and supplies the Centre uses that affect the quality of the tests which require to be consistently complying with standard specifications.

2. Selection and fixing up of suppliers for capital goods like test equipment, accessories, precision instruments, hand tools etc. Authorizing selection and fixing up of services providers for calibration of equipment is done based on NABL accreditation.

3. The centre evaluates suppliers of all critical consumables, supplies and services which affect the quality of assaying & hallmarking, based upon their overall past performance on quality delivery, price and pre and post purchasing services, and maintains records of these evaluation and list approved suppliers and service providers.

4. Quotations are usually invited telephonically and through emails, reviewed and the terms of supplies are negotiated before purchase. Assaying In-charge prepares Purchase Order for items which may affect the quality of testing, with data types like, class, grade, precise identification, specification, inspection instructions, the quality required and other technical details as applicable which describes the services or supplies ordered. CEO reviews this Purchase Order and approves prior to release.

5. The Centre inspects or otherwise verifies and thus ensures that all critical purchased supplies and reagents and laboratory consumable materials that affect the quality of the testing are not used until verified as complying with defined specifications maintained in the Purchase Order and records of actions taken to demonstrate compliance are maintained.

6. Quality Manager takes action for identification, segregation of substandard purchased item(s) if any nonconformance is observed during inspection and record is maintained. Assay In-charge maintains records of such inspection/verification.

7. CEO is responsible for authorizing purchases of capital goods, laboratory consumables including certified reference materials e.g. Au. Ag, Cu, Pb, Acids etc.

8. Records of all purchases are kept.

Section 5: PROCESS REQUIREMENTS	…..... Assaying & Hallmarking Centre	AHC Recognition No

(Clause No. 7 of IS 15820:2024)

5.1 Review of requests, tenders and contracts

5.1.1 CEO is responsible for marketing activity and signing contract with customers. The procedure is as follows:-

1. Quality Manager/receptionist reviews the customer's request sent along with the articles and communicates to customer about deviations and carries out amendment of the contract as may be required.
2. The centre ensures that the hallmarking is done for articles received only from those jewellers registered by BIS. Records of such BIS registered jewellers whose articles are received for hallmarking are maintained. The centre has internet facility to access the BIS website for ascertaining the current status of the registered jewellers.
3. The Centre accepts only such articles which are capable of being hallmarked.
4. The Centre hallmarks and returns the articles to customers within 48 hours at First come First serve (FIFO) basis.
5. The Centre undertakes to perform assaying of articles/samples of Hallmarked articles from consumers on priority. Assay Report shall be issued, based on the relevant Indian Standard, as per the guidelines for testing of consumer gold.
6. The centre reviews the requests for hallmarking. The established procedure is to examine the request as well as each article in the consignment to check for the following:
   i. Whether request is received from a BIS registered jeweller;
   ii. The scope and validity of submitted licence;
   iii. Markings on the articles (articles with any marking will not be accepted);
   iv. Quantity in numbers, corresponding weight with respective declared fineness;
   v. Design for articles (medallions/coins resembling currency of any country will not be accepted for Hallmarking);
   vi. The capability in respect of available of CRMs;
   vii. The capability in respect of meeting delivery time schedule;
   viii. Delivery Mode & Charges, if any;
   ix. Hallmarking charges applicable; and

7. Records of reviews, including any significant changes is maintained. Record is also maintained of pertinent discussion with a customer relating to the customer’s requirements or the results of the work during the period of execution of the contract.
8. The customer is informed of any deviation from the contract.
9. If a contract needs to be amended after work has commenced, the same contract review process is repeated and amendments are communicated to all affected personnel.

5.2 Selection and verification of methods

5.2.1 The Centre uses test methods as described in the latest valid version of relevant testing method standards (IS 1418:2009 for gold jewellery and/or IS 2113:2014 for silver jewellery) and has documented procedures/work instructions for all activities of centre such as.

a) Receiving;

b) Preliminary examination for homogeneity check and segregation;

c) Sampling;

d) Assaying;

e) Laser marking;

f) Verification of marking and damages incurred;

g) Packaging and return of cornets, if any; and

h) Final dispatch delivery.

5.2.2 All methods, procedures and supporting documentation, such as instructions, standards, manuals and reference data relevant to the centre's activities, is up to date and readily available to personnel.

5.2.3 The centre ensures that it uses the latest valid version of a method unless it is not appropriate or possible to do so. When necessary, the application of the method is supplemented with additional details to ensure consistent application.

5.2.4 The centre verifies that it can properly perform methods before introducing them by ensuring that it can achieve the required performance. Records of the verification is retained. If the method is revised by the issuing body, verification shall be repeated to the extent necessary.

5.2.5 The Assaying In-charge is responsible for all tests and assay works including maintenance and control of associated data and records.

5.3 Sampling

The sampling is done in accordance with the requirements mentioned below:-

a) The centre carries out sampling as per sampling plan given in Annex E and guidelines for sampling as given in Annex F of IS 15820 : 2024.

b) The centre carries out sampling using special tools to get a representative sample as per relevant testing method standards and documented instructions maintained by assaying and hallmarking centre;

c) The centre retains records which include the sampling method used, identification of samples data to identified lot/sub lot from which representative sample has been taken and the sampling personnel, date and time of sampling;

d) Samples have identifiable traceability with the lot and the test result; and

e) The sampling plan and method is available at the site where sampling is undertaken.

5.4 Handling of Test or Calibration Items

The procedure for handling of test items is as follows:

5.4.1 The centre accepts the hallmarked gold jewellery from customers for verifying its fineness.

5.4.2 Lots of individual items shall be segregated, for example rings, ear tops, bangles etc.

5.4.3 A receipt of the lot shall be issued to the jeweller, simultaneously allotting a unique code number. This code number shall be maintained throughout the processing, storage and handling of the lot till its assay results have been finalized.

5.4.4 A room with safe is available with adequate locking arrangements in the Centre for storage of articles during working hours and overnight.

5.4.5 Security system with closed circuit TV and monitoring system is available for keeping round-the-clock watch centrally about internal activities and also about nearby surroundings of the centre as a preventive measure.

5.4.6 The centre has taken insurance for articles / articles under process / stock and high cost equipments for minimum amount of Rs. 40 lakhs depending on the jewellery present in the centre at any time.

5.4.7 The centre shall return cornets of jewellery articles along with hallmarked jewellery/rejected jewellery articles. The hallmarking process shall be completed in 48 hours, any deviation from the same shall be recorded with justification.

5.4.8 The centre has taken professional indemnity insurance to cover the liability of hallmarked jewellery/artefacts with respect to purity/fineness for a minimum amount of Rs. 2 Lakh.

5.5 Packaging

5.5.1 The Centre ensures identity of the lot during final packaging for:

a) Un-assayed article~~s~~ / articles after first stage of sampling;
b) Hallmarked article~~s~~ / articles;
c) Rejected article~~s~~ / articles and
d) Cornets (left after assaying of gold articles)

5.5.2 Items are suitably protected in final packaging for transportation (if required) delivery.

5.6 Technical Records

5.6.1 The centre ensures that technical records for each activity which contain the results, report and sufficient information to facilitate, if possible, identification of factors affecting the measurement result and its associated measurement uncertainty and enable the repetition of the centre activity under conditions as close as possible to the original.

5.6.2 All records including that for jewellery/artefacts hallmarked for each of the Bureau of Indian Standards licensee shall be retained for a period of minimum 3 years.

5.6.3 The centre ensures that amendments to technical records can be tracked to previous versions or to original observations. Both the original and amended data and files shall be retained, including the date of alteration, an indication of the altered aspects and the personnel responsible for the alterations.

5.6.4 Assaying In-Charge is responsible for maintaining and controlling all technical records, which result from carrying out tests.

5.6.5 Centre records observations data and calculations at the time they are made and ensures that they are identifiable to the specified task. Centre ensures that when mistakes occur in records, each mistake is crossed out and not erased, made illegible or deleted and the correct value entered alongside. All such alterations to records are signed or initialed by the person making the correction.

5.7 Evaluation of Measurement Uncertainty

5.7.1 The contributions to measurement uncertainty are identified and all contributions that are of significance are taken into account using appropriate methods of analysis, while evaluating measurement uncertainty.

5.7.2 The centre evaluates measurement uncertainty. Where the test method precludes rigorous evaluation of measurement uncertainty, an estimation shall be made based on an understanding of the theoretical principles or practical experience of the performance of the method as per **Annex-IV**

5.8 Ensuring the Validity of Results

5.8.1 The monitoring of the validity of results is planned and reviewed and includes, where appropriate, but not limited to:

a) Use of reference materials or quality control materials;

b) Functional check(s) of measuring and testing equipment;

c) Use of check or working standards with control charts, where applicable;

d) Intermediate checks on measuring equipment;

e) Replicate tests using the same or different methods;

f) Retesting of retained items; and

g) Review of reported results;

5.8.2 The centre monitors its performance by comparison with results of other centre, where available and appropriate. This monitoring shall be planned and reviewed and shall include, but not be limited to, the following:

5.8.2.1 The centre participates in at least one Proficiency testing (PT) every year and ensure that grades nearest to 995‰, 916.0‰, 750.0‰ & 585.0‰ as well as white gold are covered on rotational basis in period of three years. In case of silver the centre participates in proficiency testing of one grade of silver alloys, with finenesss as close as possible to grades specified in IS 2112.

5.8.2.2 In addition to Proficiency testing, the centre makes efforts to initiate/participate in Inter laboratory comparisons (ILC) every year. However, in case PT provider for a specific grade is not available, ILC shall be mandatorily undertaken.

5.9 Reporting of Results

5.9.1 The test report as well as delivery challan for gold and/or silver samples is generated through the BIS hallmarking portal.

5.9.2 The centre is responsible for all the information provided in the report, except when information is provided by the customer. Data provided by a customer shall be clearly identified.

5.9.3 ***Laser Marking***

5.9.3.1 The centre carries out marking using laser marking machines and on articles which are conforming to the requirement of IS 1417 or IS 2112. The markings are legible and durable.

5.9.3.2 Marking on the gold and/or silver items shall be as mentioned in IS 1417 or IS 2112 respectively.

5.9.3.3 The permissible sizes (height) of the hallmark are:

Sl No.	*Gold* mm	*Silver* mm

(1)	(2)	(3)
i)	1.5	4.0
ii)	1.0	2.0
iii)	0.75	1.5
iv)	0.50	1.0

NOTE — In case of gold articles below 2 gms marking size (height) of 0.3 mm is also permitted

5.9.3.4 Marking is done on all parts which are detachable and can be easily removed or replaced.

5.9.3.5 Marking is done only on those articles which are permitted in IS 1417/IS 2112 and in the way mentioned in these standards.

5.9.3.6 The laser marking machine shall be used through a password to avoid unauthorized use. Vigilance shall be maintained to prevent any misuse of the password.

5.10 Complaints

5.10.1 The centre has a documented process to receive, evaluate and make decisions on complaints.

5.10.2 The procedure for receiving, recording, investigating and resolution of customer complaints is as follows:

a) Complaints shall be received by the Quality Manager and recorded, including those conveyed telephonically. CEO shall examine each complaint, carry out necessary investigation and take appropriate action for quick redressal of the complainant. Complaints shall be resolved within one month wherein progress reports and the outcome are provided to the complainant. In case a complaint is not resolved within given time frame, the same shall be brought to the knowledge of BIS.

b) If the complaint is challenged, the final authority for resolving the same lies with BIS.

c) When a complainant or any stakeholder including BIS raises doubt concerning the Centre's compliance with the laid down policies and procedures, or with the requirements of this Manual or otherwise concerning the quality of assaying and hallmarking, the Centre shall ensure that those area of activity and responsibility involved are promptly audited in accordance with laid down procedures. Quality Manager shall plan the audit and convey the findings/report for management review.

5.10.3 A description of the handling process for complaints shall be available to any interested party on request. Upon receipt of a complaint, the centre shall confirm whether the complaint relates to centre activities that it is responsible for and, if so, shall deal with it. The centre shall be responsible for all decisions at all levels of the handling process for complaints.

5.10.4 The outcomes to be communicated to the complainant are made by, or reviewed and approved by, individual(s) not involved in the activities in question.

5.11 Nonconforming Work

5.11.1 The centre has developed this procedure to identify non-conformity at any stage of assaying and hallmarking and to prevent it from further processing. It covers from receiving, XRF analysis, sampling, assaying, Hallmarking and delivery and to take necessary action based on detected nonconformity. The procedure for control of non-conforming testing work shall be as follows. Centre has identified the potential non-conformities as follows:

- Fineness is less than declared value in Hallmarked article (customer sample testing);
- Presence of prohibited elements in Hallmarked article;
- Error in reporting of results;
- Weight of gold is less than declared for the Hallmarked article;
- Error in weighing balances;
- Certified reference material is of lower purity;
- Hallmark is not distinct/legible;
- Spurious Hallmarking done;

- Equipment out of calibration;
- Error in sampling;
- Assaying and/or Hallmarking Staff not competent;
- Unsatisfactory performance reported by BIS during its assessment;
- Sample of hallmarked article drawn by BIS during market surveillance at jeweller failed ~~on~~ in test at BIS laboratory;
- Internal audit not done;
- Management review is found having not covered all aspects under review.

5.11.2 CEO shall examine and evaluate whether any one or more of the above-mentioned non-conformities or others are occurring or in existence. Significance of non-conformity shall be determined. Correction shall immediately be done. Some corrections may be, for example any incoming material found nonconforming shall be rejected and returned to supplier. Later, root cause analysis shall be done and corrective action shall be taken.

5.11.3 Fresh sampling shall be done under supervision of Quality Manager in case improper sampling was the cause of non-conformity. Fresh sampling and testing shall be done if any flaw is observed in the fire assay process. The particular sample or whole batch shall be repeated.

5.11.4 Quality Manager/Assay In-charge shall be responsible for implementing the procedure. CEO shall be responsible for all corrections. Corrective actions in case of repeated non-conformances are reported. Product may be recalled from the jeweller with advance notification if non-conformity is noticed in the system post facto delivery of Hallmarked article.

5.11.5 The centre retains records of nonconforming work and actions specified above.

5.12 Control of Data and Information Management

5.12.1 The centre has access to the data and information needed to perform centre activities.

5.12.2 The centre uses the BIS hallmarking portal for the collection, processing, recording, reporting, storage or retrieval of data which is implemented centrally for all BIS Recognised AHCs. Whenever there are any changes, including centre software configuration or modifications to the software, they shall be authorized, documented and validated before implementation.

5.12.3 The hallmarking portal used by the centre is:

a) protected from unauthorized access;

b) safeguarded against tampering and loss;

c) operated in an environment that complies with BIS requirements

5.12.4 The centre ensures that personnels operating the system comply with all applicable requirements of this document.

5.12.5 The centre ensures that instructions, manuals and reference data relevant to the BIS hallmarking portal are made readily available to its personnel.

5.12.6 Calculations and data transfers are checked in an appropriate and systematic manner.

Section 6: MANAGEMENT SYSTEM REQUIREMENTS	…..... Assaying & Hallmarking Centre	Recognition No of AHC

(Clause No. 8 of IS 15820:2024)

6.1 Management System

1. The organization has established, documented, implemented and maintains a management system appropriate to assaying and hallmarking as per IS 15820:2024. The Centre's management system is appropriate to the scope of its activities and in accordance with IS 15820:2024.
2. The Centre's quality policy, objectives, roles and responsibilities of key personnel have been framed and given in this manual. The Quality Policy statement is signed by Chief Executive Officer who also takes decisions on the resources. The statement includes the following:

a) commitment in relation to quality of centre's assaying and hallmarking services and to provide its customers at all times with a service complying with recognized standard of practice as given in relevant Indian Standards;
b) purpose of management system related to quality;
c) statement that all staff have familiarized themselves with the content of the Quality Manual and comply with the laid down policies and procedures and associated documentation at all times in their work; and
d) commitment to compliance with IS 15820:2024 and continually improve the management effectiveness.

3. Top management of the Centre has ensured that the Quality Policy is communicated to and understood by those personnel who are responsible for maintaining the quality management system at all ~~the~~ levels.
4. Top management provides evidence of commitment to the development and implementation of the management system and continually improving its effectiveness by following the documents of all levels meticulously including carrying out internal audit and management review meeting, handling customer's complaint, discussion on improvement
5. The top management communicates to the employees the importance of the meeting customer's requirements as well as statutory ~~&~~ and regulatory requirements.
6. The supporting procedures and technical procedures have been included in this Manual explaining their actual implementation. No separate documentation has been prepared.

7. The procedures have been integrated with individual clauses where reference has been made in the Indian Standard. Standalone Procedure has not been developed and implemented.
8. The management system of the centre addresses the following:
   a) Management system documentation;
   b) Control of management system documents (6.2);
   c) Control of records (6.3);
   d) Actions to address risks and opportunities; improvement (6.4);
   e) Corrective actions (6.5);
   f) Internal audits (6.6); and
   g) Management reviews (6.7).

QUALITY POLICY

XYZ Assaying & Hallmarking Centre is totally committed to comply with the requirements of IS 15820:2024 to facilitate smooth operation of Bureau's Hallmarking Scheme with high degree of credibility, integrity, competence, impartiality and consistent operation.

The centre is, therefore, committed to provide timely and efficient services to meet the following objectives:-

1) to consistently serve, meet and exceed overall expectations of customer about quality of assaying and hallmarking with error free and technically valid results;

2) to pursue better professional practices and continually improve the services and systems;

3) to periodically train key technical persons and employees whose services may affect the quality of Centre's performance, thereby enhance satisfaction of customers;

4) to continuously endeavor to build and maintain reputation of the Centre being absolute trustworthy in eyes of its valued customers who are primarily jewelers; and

5) to familiarize all personnel concerned with testing activity with the quality documentation and implement the policies and procedures in their work.

6) to perform testing activity in accordance with methods prescribed in relevant Indian Standards.

Place: [Chief Executive Officer]
Date :

[This Quality Policy is communicated to all employees, explained to them so that it is understood and accepted by each individual as a prime responsibility while delivering the services.]

QUALITY OBJECTIVES

In order to meet the commitments made in the Quality Policy, following quality objectives have been framed:

- Maintain our current status of a leading, quality conscious Assaying and Hallmarking Centre which operates as a technically competent service provider; quality system;

- To maximize creation of value and satisfaction of all customers;

- Provide conducive and growth-oriented environment to employees through HRD activities and thereby develop the centre as the role model for others;

- Continue to further strengthen and maintain a reputation for being always absolutely trustworthy.

Place: [Chief Executive Officer]
Date :

6.2 Control of Management system documents

1. The centre has established and maintained procedures to control all documents (both internal and external) which form part of the management system from receipt to delivery of articles. The Quality Manager is responsible for documentation and establishing, maintaining control of all documents in the Centre. The various types of documents required by the Centre are as follows:

Documents of Internal Origin

i. Quality Policy
ii. Quality Manual
iii. Forms
iv. Reports
v. Records

Documents of External Origin

i. Indian Standards
ii. Guidelines/Policy/Instructions/Circulars from BIS
iii. Other regulations, namely Standards of Weights & Measures Act
iv. Calibration certificates
v. Test Reports on Certified Reference Materials
vi. Software used - XRF, Laser Marking, Others
vii. Copies of registration from jewelers
viii. Copies of insurance
ix. Copies of clearance from applicable regulatory authorities
x. Operating Manuals of equipment

2. The procedure to control all documents (internal or external origin) is described as follows:

- The Quality Manager is authorized to prepare documents and issue them with prior review and approval by CEO including changes / amendments in existing documentation.
- A Master List of all documents (internal or external origin) identifying the current revision status and distribution is available with Quality Manager to avoid use of invalid and/or obsolete documents.
- The Quality Manager ensures that only authorized edition of appropriate document is available at workstation where operations essential for effective functioning of the Centre.
- Periodic review of documents is done to ensure continuous suitability and compliance with applicable requirements.
- Any invalid or obsolete document is promptly removed from all points of use. Only one copy of such document is kept with Quality Manager after putting stamp of 'OBSOLETE DOCUMENT" and assuring any unintended use. Obsolete documents when retained for either legal or knowledge preservation are marked with stamp 'FOR REFERENCE ONLY".
- Each document is uniquely numbered. Master Copy of each document is maintained indicating date of issue, revision status, page numbering etc. If necessary, due to any special reason, primarily related to testing and/or assay of samples, the views of Assay In-charge will be taken while reviewing the existing documentation and maintaining appropriate records.

6.3 Control of Records

1. Quality Manager is overall responsible for implementing in the Centre the procedure for control of records, which includes identification, collection, indexing, access, filing, storage, maintenance and disposal of quality and technical records. The responsibility of centre's management is to maintain and control of records pertaining to management system and technical activities and maintain confidentiality, protect and ensure security of records, especially records in the computers. A list of records available at **Annex V** include reports from internal audits and management reviews as well as records of corrective and preventive actions etc. Technical records includes original observations, derived data, internal / external calibration records, staff records, a copy of each assay report, contracts, external and internal test reports, customers papers and feedbacks and personnel responsible for the sampling, performance of test and checking of results.
2. CEO is responsible for maintaining and controlling other records such as contracts, rate card, Moral agreements etc.
3. Assaying In-Charge is responsible for maintaining and controlling all technical records, which result from carrying out tests.

4. Quality Manager continually educates centre's personnel to maintain legibility of all records and these records are stored and retained in a safe cupboard in an orderly manner so that they are readily retrievable. The records are indexed as per utility such as (a) date wise; (b) customer / unique identification wise; (c) batch wise etc. When files of records are full they are collected and appropriately numbered and stored in safe cupboard. The Centre provides the safe area with clean, dust and termite free environment in order to prevent damage or deterioration and the cupboard is kept under lock and key to prevent loss and unauthorized access to or amendment of these records.
5. Centre also maintains records in electronic form with a system of password protection to avoid loss or change of original data.
6. All confidential records are kept in a safe cupboard under lock and key.
7. Technical records are collection of data and information which result from carrying out tests and which include whether specified quality or process is achieved. They may include forms, contracts, work registers, check sheets, control graphs, external and internal test reports and calibration certificates, customer's notes, papers and feedback.
8. Centre carefully retains records of original observations, signed documents, derived data and sufficient information to establish an audit trail, calibration records, staff records and for a defined period after completion of the work involved.
9. Centre ensures that the Assay Note (record) for each test contains sufficient information to enable the test to be repeated under condition as close as possible to the original. The records generated include all test data and the test results, identity of personnel responsible for the performance of each test and checking of result, hallmarking and delivery.
10. Centre records observations data and calculations at the time they are made and ensures that they are identifiable to the specified task. Centre ensures that when mistakes occur in records, each mistake is crossed out and not erased, made illegible or deleted and the correct value entered alongside. All such alterations to records are signed or initialed by the person making the correction.
11. All records including that for articles hallmarked for each registered jeweller shall be maintained for a period of minimum three years. Quality Manager will collect all records after retention time is over and dispose them off through burning them out or deleting them from the computer files in case of stored in electronic media.

6.4 Actions to Address Risks and Opportunities

The centre identifies the risks at all levels of management system and explore the measures to address them for their non-occurrence and non-recurrence. The centre continuously plans and implements the actions to address the risks and opportunities for maintaining the effectiveness of the management, achieving the improvement and to prevent the adverse effects. Any effects on impartiality, management of nonconformance work, conformity assessment and improvement are considered as risks of higher level. Quality Manager is responsible for Risk management in the Quality related issues and the Assay in charge is responsible for the risk management in the technical matters. The Quality Manager and Assay in charge shall evaluate the identified risks and explore the opportunities and take appropriate actions to address them with the approval of the CEO. The centre considers the risks and opportunities associated with the laboratory activities in order to:

a. Give assurance that the management system achieves its intended results;
b. Enhanceopportunitiestoachievethepurposeandobjectivesofthelaboratory;
c. Prevent or reduce, undesired impacts and potential failures in the laboratory activities;
d. Achieve improvement.

The centre takes the actions to address risks and opportunities proportional to the potential impact on the validity of centre results.

6.5 Improvement

The Centre has prepared following plan for continually improve the effectiveness of its management system. The method as will be followed is explained below:

i) Centre's personnel have been assigned responsibility for accomplishing particular Quality Objectives;
ii) Internal audit will be periodically conducted covering all operations included in its management system. The audit report will be discussed in management review;
iii) All operational data will be collected and analyzed including trends and risk analysis;
iv) All observed nonconformities shall be given priority taking corrective action to resolve and prevent recurrence;
v) Plan to take preventive action to prevent occurrence of potential nonconformity; and
vi) Management review shall be periodically conducted to discuss reports of internal and external audits, nonconformities, complaints. Improvement actions will be decided with assigning responsibility and fixing time bound targets. Regular monitoring by CEO shall be done.

The Centre seeks feedback, both positive and negative, from its customers. The feedback shall be analyzed and used to improve the management system, laboratory activities and customer service.

6.6 Corrective action

The Centre has established following procedure and has designated Quality Manager with responsibility for planning the corrective actions:

1. Assaying In-charge will be responsible for implementing and monitoring appropriate corrective actions when nonconforming work or departures from the procedures in the management system or technical operations have emanated as a result of daily operations, internal or external audits, management reviews, feedback from customer and/or staff observations, complaints.
2. Quality Manager or his authorized person will investigate the various types of non-

conformances observed/reported and determine the root cause(s) in each of the identified problems.

3. Assaying In-charge will initiate corrective action/s where needed. The corrective action shall be to a degree appropriate to the magnitude and the risk of the problem. The technical operations of the Centre are not complex; therefore, elaborate method of root cause analysis is normally not required.
4. CEO shall oversee that action(s) being taken will eliminate the problem and prevent recurrence(s). He will monitor the results to ensure that the corrective actions taken have been effective. Otherwise, the procedure will be repeated with different alternatives till expected and satisfactory results are accomplished.
5. All such cases shall be appropriately recorded and discussed at management review meeting for effecting continual improvement. Results shall also be monitored regularly to ensure effectiveness of corrective action.

6.7 Internal Audits

1. The Centre's policy is to conduct an internal audit of its all activities once in a year, in accordance with a predetermined schedule to verify that its operations continue to comply with the requirements of the documented management system based on IS 15820:2024 in order to continually improve its effectiveness. The procedural details are described below.

2. Quality Manager will be responsible for planning and organizing of internal audit [IA] and coordinating the corrective actions. An annual program for internal audit will be prepared to verify that the Centre’s operations continue to comply with the requirements of the documented management system and IS 15820:2024. The Centre will have its own trained internal auditors. However, in order justify impartiality of audited function, the management may obtain the services of a trained external auditor to effectively carry out internal audit as per pre - determined schedule.

3. Quality Manager will provide overall supervision while the audit is being conducted. All concerned personnel will be informed well in advance about programme. Documents like Audit Check List, Observation & Finding Form, Nonconformance Report will be provided to each auditor for recording the audit findings and corrective actions that arise from them. Auditors will be independent of the activity to be audited.

4. The Centre is committed to take timely corrective actions and notify the customers orally/ in writing, if the audit finding cast doubt on the effectiveness of the operations or on the correctness/validity of test results.

5. A follow up audit of activities may be required when nonconformance was reported to verify implementation and effectiveness of the corrective action taken and record the same and finally closing the non-conformity.

6.8 Management Review

1. The Centre is committed to conduct a review at least once a year with CEO in chair of its management system and assaying and hallmarking to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review may also be done at any time depending of need of any situation that may arise as a result of audit by BIS, customer complaints etc.

2. The inputs to management review shall be recorded and shall include information related to the following:

a) Changes in internal and external issues that are relevant to the centre;
b) Fulfillment of objectives;
c) Suitability of policies and procedures;
d) Status of actions from previous management reviews;
e) Outcome of recent internal audits;

f) Corrective actions;
g) Assessments by external bodies;
h) Changes in the volume and type of the work or in the range of centre activities;
j) Customer and personnel feedback;
k) Complaints;
m) Effectiveness of any implemented improvements;
n) Adequacy of resources;
o) Results of risk identification;
p) Outcomes of the assurance of the validity of results; and
q) Other relevant factors, such as monitoring activities and training.

3. During the meeting CEO will explain the quality policy and overall objectives in order to have in-depth clarity about customer requirements and as well as statutory and regulatory requirements.

4. The Quality Manager will be responsible to convene the management review meeting and ensure that finding from management reviews and the actions that arise from them has been appropriately recorded and those actions identified during the review are implemented within the agreed timescale by the concerned persons.

ANNEXURE-I

LIST OF EQUIPMENT, CHEMICALS/REAGENTS FOR ASSAYING AND HALLMARKING

a) For Gold

Sl No.	Name of Equipment and Instruments	Least Count/Sensitivity	Range
(1)	(2)	(3)	(4)
A-1	**LIST OF EQUIPMENTS**		
i)	Cupellation furnace	—	up to 1150 °C
ii)	Annealing furnace	—	up to 900 °C
iii)	Weighing balance (to be installed in dust free room antivibration platform)	0.002 mg for 990 fineness and 0.001 mg for more than 990 fineness	
iv)	Laser machine (capable of marking as per IS 1417)		
v)	XRF machine (capable to detect Cd, Pb, Ir, Ru, Os and other platinum group elements)		
vi)	Air conditioner		
vii)	Generator (for uninterrupted power supply to the cupellation furnace		
viii)	Balling plier		
ix)	Cupels		
x)	Cleaning brush		
xi)	Hammer and anvil (hammer of 400 g) or power press		
xii)	Scrapping tools (different type of scrappers, micro drills, chisels, etc		
xiii)	Magnifying glass (10 X)		
xiv)	Emery paper (different grades)		
xv)	Aluminium and stainless steel tray		
xvi)	Thermometer		110 °C
xvii)	Hydrometer		1.0 to 2.0 SG
xviii)	Parting tray with thimbles of Pt or Pt/Ir or Pt/Rh or unglazed silica (The bottom surface of the base of the parting tray shall not touch the base of the parting container)		
xix)	Crucible (pure graphite crucible for melting of scrapings)		
xx)	Hot plate		
xxi)	Jeweller's roll		
xxii)	Scarification dishes (dia 50 mm required for testing of white gold)		

xxiii)	Tongs and forceps		
xxiv)	Anti-vibration table/platform for high accuracy balance		
xxv)	Numbering device/number punch		
xxvi)	Fume-hood with scrubber		
xxvii)	Furnace for melting scrapping		1050 °C
xxviii)	Micrometer	0.01 mm	
xxix)	Reference gold sample of 585, 750,833, 916, 958 and 995 fineness for internal checks		
A-2	**LIST OF REAGENTS**		
	Borax, anhydrous Pure Gold for Check (Proof) Samples Lead Foil or Foil + Lead Bids Pure Copper (foil/wire/disc), Silver, Nickel, Palladium Parting Acid No. 1 Parting Acid No. 2 Distilled Water		

b) For silver

Sl No.	Name of the Equipments and Instruments	Least Count/ Sensitivity	Range
(1)	(2)	(3)	(4)
B-1	**LIST OF EQUIPMENTS**		
i)	XRF machine (capable to detect Cd and Pb)		
ii)	Laser machine (capable of marking large article also)		
iii)	Weighing balance (to be installed in dust free room and anti- vibration platform)	0.01 mg	
iv)	Air conditioner (to make the atmosphere dust free and to maintain room temp)		
v)	Hot plate (convenient size for silver assaying)		250 °C
vi)	Drying oven electrical		200 °C
vii)	Hammer		1 kg
viii)	Rolling mill (capable of rolling buttons into strip)		
ix)	Generator for uninterrupted power supply		
x)	Scrapping tools (microdrill, different types of scrappers, scissors and chisels)		
xi)	Magnifying glass (10 X)		
xii)	Burette/dropping pipette (*see* IS 2113)		
xiii)	Metallic tray (for carrying skiff, *see* IS 2113)		
xiv)	Watch glass		75 mm Dia

xv)	Funnel		
xvi)	Glass beaker		25 mm Dia 250 ml
xvii)	Tongs and forceps		
xviii)	Desiccator		
xix)	Filter vacuum pump		
xx)	Sintered glass crucible No.3 (medium porosity) G3 and G4		
xxi)	Anti-vibration table for high accuracy balance		
xxii)	Distilled water/appropriate distillation plant for distilled water		
xxiii)	Glass rods		
xxiv)	Wash bottle with fine jet		
xxv)	Reference silver sample of 800, 850, 925, 970 and 990 fineness		
B-2	**LIST OF REAGENTS**		
	Concentrated Nitric Acid (Specific Gravity 1.42) Concentrated Hydrochloric Acid (Specific Gravity 1.16) Distilled Water		
B-3	**LIST OF APPARATUS**		
i)	Automatic Titrator Machine (capable of delivering increment of 0.05 ml at the equivalence point)		
ii)	Titration Beaker		

ANNEXURE II

[ORGANIZATION STRUCTURE]

ANNEXURE III

COMPETENCE REQUIREMENTS

1.0 Purpose

The purpose is to define competence requirements of personnel for each function influencing the results of centre's activities, including requirements for education, qualification, training, technical knowledge, skills and experience.

2.0 Competence

The CEO shall assess each technical person, namely Assaying In-charge, Deputy Assaying In-charge, Sampler, XRF In-charge and approve their competence.

3.0 Education Qualification & Experience

The assay-in-charge shall be graduate in science or diploma/graduate in metallurgy with chemistry as one of the subjects and shall have undergone training in lab management, sampling, assaying and hallmarking.

The deputy of assay in charge shall be graduate in science/diploma in metallurgy with knowledge of assaying or 12th standard pass with 2 yrs of experience in assaying centres to carry out assaying.

4.0 Training

All personnel in various functional areas, particularly assay in-charge, deputy assay in-charge, XRF in-charge, are adequately trained on job before they are inducted into actual working where they are responsible for testing of samples. Adequacy of training is also assessed before inducting to a new section at the centre whenever assigned /developed. On job training are also imparted from time to time on need basis. The details of training are placed below:

4.1 Centre first selects the person and puts him/her on trial for few days. During this period Assaying In-charge identifies the training needs based upon

(a) basic education
(b) knowledge
(c) current level of skill
(d) grasping power and
(e) overall personality, relevant to the present and anticipated tasks of the centre

4.2 A training program has been prepared and records are maintained;

4.3 Centre puts trainees under close supervision of senior staff member and periodically their progress is reviewed by Assaying In-charge and further fresh inputs are given.

4.4 CEO evaluates effectiveness of the training actions taken.

5.0 PROCEDURE

i. Centre shall assign the responsibility to Quality Manager and Assaying In-charge for providing appropriate training to staff;

ii. CEO selects the Assaying In-charge on the basis of the education, training, experience and

demonstrated skills, as required and maintains the record and supporting documents. He/She undergoes training in lab management, Sampling, Assaying and Hallmarking.

iv. CEO, Assaying In-charge and Quality Manager, who are responsible for giving opinions and interpretations gathers, in addition to the appropriate qualifications, training, knowledge and experience of assaying work, specifically the following:

a) knowledge on technology used for manufacturing gold/silver articles, their testing or the way they are used or intended to be used and of the defects or degradation which may occur during or in service;
b) knowledge of the general requirements expressed in the legislation and standards,
c) understanding of the significance of deviation found with regard to the normal use of gold articles.

5.1 The in-house/on-job training is imparted and evaluated in following manner (as applicable)

(i) Study of the relevant standard/document by the trainee
(ii) Demonstration of the testing by the identified trainer
(iii) Testing by the trainee under supervision of trainer on remnant
(iv) Written/Oral examination conducted by OIC/trainer
(v) Testing of CRM/SRM and/or Re-testing of the samples by trainee independently which has already been tested.

5.2 Record

The record of the training imparted shall be maintained and retained till the person is in the centre by the Quality Manager.

6.0 Supervision of personnel

The Centre obtains a written undertaking from its managerial and other key personnel who are exposed to customer's identity and other details~~,~~ stating that they will never succumb to any type of pressure or influence of customers or internal sources or external commercial, financial and other pressures. In addition, the management keeps strict vigilance and watch over its personnel to ensure that its personnel are free from any undue internal and external influences that adversely affect the quality of their work. The assay results/ test reports are personally scrutinized by CEO/Centre In charge/Quality Manager before they are released. CEO also monitors personally the entire system on his own to prevent any leakage of information.

ANNEXURE IV

Procedure for Measurement Uncertainty evaluation

1. PURPOSE:

1.1 The purpose of this procedure is to evaluate measurement Uncertainty in Determination of Gold in Gold Jewellery - Cupellation (Fire Assay) Method IS 1418

2. PROCEDURE:

2.1 *Specifying measurand*: A clear statement of what is being measured including the relationship between the measurand and input quantities (e.g. measured quantities, constants, calibration standard values etc.) on which it depends, is written down. Corrections for known systematic effects are included, wherever possible.

2.2 *Identification of Uncertainty sources*: Possible sources of Uncertainty are listed, including sources that contribute to the Uncertainty of the parameters in the relationship specified in 4.1 but may include other sources and must include sourcesarising from assumptions.

2.3 *Quantification of Uncertainty components*: The size of Uncertainty componentassociated with each potential source of Uncertainty identified is measured or estimated. It is often possible to estimate or determine a single contribution to Uncertainty associated with a number of separate sources. It is also considered whether available data accounts sufficiently for all sources of Uncertainty and additional experiments and studies are planned carefully in order to ensure that all the sources of Uncertainty are adequately accounted for.

2.4 Before combining, all the Uncertainty contributions are expressed as standard uncertainties, i.e. as Standard Deviations. This involves conversion from some other measure of dispersion. The following rules are followed for converting an Uncertainty component to a Standard Deviation.

2.5 TYPE A Evaluation of Standard Uncertainty by the Statistical Analysis of series of observations.

(i) Type A evaluation of Standard Uncertainty applies to situation when several Independent observations have been made.

(ii) Let us denote by X the repeatedly measured input quantity. With N statistically independent observations (N>1), the estimate of X is $\overline{x}$, the arithmetic mean :

$$\overline{x} = \frac{1}{N} \sum_{i=1}^{N} x_i$$

The Uncertainty of Measurement associated with the estimate $\overline{x}$ is evaluated according to one of the following methods:

(iii) An estimate of the variance of the underlying probability distribution of x is the experimental variance s^2 (x) of values x_i, given by:

$$s^2(x) = \frac{1}{N-1} \sum_{i=1}^{N} (x_i - \overline{x})^2$$

=Variance

(iv) The positive square root of estimated variance is known as experimental standard deviation and characterizes the dispersion of the observed values about the mean

$$s(x_i) = \sqrt{\text{Variance}}$$

Type A Uncertainty is:

$$\mathbf{U_A = \frac{s(x_i)}{\sqrt{N}}}$$

Type A Uncertainty has N-1 degree of Freedom.

2.6 TYPE B evaluation of Standard Uncertainty

The type B evaluation of Standard Uncertainty is the evaluation of the uncertainty based on scientific judgment, all the relevant information available, which is other than statistical analysis of a series of observation.

Values belonging to this category may be derived from:

- ✓ Previous calibration data
- ✓ Experience with or general knowledge of the behavior and properties of relevant materials and instruments
- ✓ Manufacturer's specifications
- ✓ Data provided in calibration and other certificates

The proper use of the available information of standard uncertainty of measurement calls for detailed understanding of the measurement process and associated factors which may attribute to measurement uncertainties.

The component of type B standard uncertainty may follow any of the distribution viz. Normal, Rectangular, Triangular, U-shaped etc. These uncertainty components are designated as A_1, A_2, A_3, etc.

If A_1 follows normal distribution function then the standard uncertainty U_1-A_1/k, where k is the limiting value (value corresponding to ∞ observations). If A_2 follows rectangular probability distribution function then $U_2=A_2/\sqrt{3}$. Similarly, for triangular probability distribution function $U_3=A_3/\sqrt{6}$.

The Rectangular distribution is a reasonable default model in the absence of any other information. But if it is known that values of the quantity in question near the centre of the limits are more likely than values close to the limits, a triangular or a normal distribution may be a better model.

Mathematical expression:

Uncertainty of the equipment used as specified in calibration certificate = A_1**(Normal Distribution)**

Standard Uncertainty, $\mathbf{U_1 = A_1/k}$ (Value of k to be taken from calibration

certificate)

Degree of freedom $v_2 = \infty$

2.7 Combined Uncertainty = U_C

$$U_C = \sqrt{(\text{Type A})^2 + (\text{Type B})^2}$$

$$\%\ U_C = \frac{U_C \times 100}{\bar{x}}$$

2.8 Calculation of coverage factor 'k'

To estimate the value of a coverage factor 'k' corresponding to a specified coverage probability requires that the reliability of the standard uncertainty u(y) of the output estimate y is taken into account.

The procedure for calculating an appropriate coverage factor 'k':

Step 1: Obtain the standard uncertainty associated with the output estimate.

Step 2: Estimate the effective degree of freedom 'v_{eff}' of the standard uncertainty u(y) associated with the output estimate y from the Welch-Satterthwaite formula.

Welch-Satterthwaite formula is as follows:

$$v_{eff} = \frac{(U_C)^4}{\sum_{i=1}^{N} \frac{U_i^4(y)}{v_i}}$$

$$= \frac{(U_C)^4}{\frac{(U_A)^4}{v_1} + \frac{(U_1)^4}{v_2} + \frac{(U_2)^4}{v_3} + \frac{(U_3)^4}{v_4} + \frac{(U_4)^4}{v_5} + \frac{(U_5)^4}{v_6} + \frac{(U_6)^4}{v_7} + \text{-------} + \frac{(U_N)^4}{v_N}}$$

Step 3: Obtain the coverage factor k from the table of values of student 't' distribution. If the value of v_{eff} is not an integer, it is truncated to the next lower integer and the corresponding coverage factor k is obtained from the table.

2.9 Expanded Uncertainty:

Expanded Uncertainty is obtained by multiplying the Standard Uncertainty u(y) of the output estimate y by a coverage factor k.

U = ku(y)

ANNEXURE V

LIST OF RECORDS		
Sl. No.	**Record No.**	**Title**
1.		Quality Plan
2.		Record of Licenses of Jewelers for whom Hallmarking done (List of Clients)
3.		Contract with Jeweller for Assaying & Hallmarking Services (Contract with Clients)
4.		List Measuring Instruments, Assaying Equipment and Devices with Schedule and Record of Maintenance and Calibration
5.		Stock Reference Standard Materials and Their Purity Certificates (except check gold)
6.		Record of Check Gold Consumption and Purity Certificates (Issue, Use and Stock)
7.		Record of Daily Tests (XRF)
8.		Record of Assay (Silver)
9.		Record of Payments Received from Jewellers
10.		Intermediate Checks – Assay Balance
11.		Laboratory Consumable Materials, Including Cupels (Issue, consumption and stock)
12.		List of documents from external sources
13.		Annual Programme - Internal audit
14.		Yearly Schedule - Internal audit
15.		Observations & findings – Internal audit
16.		Nonconformance – Internal audit
17.		Schedule for Management Review Meeting [MRM]
18.		Minutes of Management Review Meeting [MRM]
19.		Schedules of Rates for Assaying & Hallmarking Services – BIS
20.		Preventive Maintenance Plan of Utility Equipment
21.		Purchase Indent
22.		Purchase Order
23.		Goods Receipt cum Inspection Record
24.		Stock Register
25.		Performance of Suppliers
26.		Performance of Service Providers
27.		Approved Suppliers & Service Providers
28.		Incoming Inspection Record - Laboratory consumables (Metals)
29.		Incoming Inspection Record - Laboratory consumables (Nitric Acid)
30.		Incoming Inspection Record – Laboratory Consumables (Distilled Water)

31.		Attendance Log
32.		Record of Training [Needs, Programme, Provided]
33.		List of Employees with Responsibility Matrix
34.		Appointment letters of Quality Manager & Assay In-charge
35.		Authorized specific personnel for particular type of work
36.		Authorized personnel for implementing Corrective actions
37.		Authorized signatories for authenticity and issue of Test Reports
38.		List of Internal auditors
39.		Competence of Key Personnel & Employees
40.		Record of participation in ILC/PT
41.		Record of calculation of Measurement Uncertainty

The above list is not exhaustive. Records to be added as per works done and need.

ANNEXURE VI

[SITE PLAN]