



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Federal Department of Finance FDF
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Hallmarking Convention (HMC) – Technical Aspects

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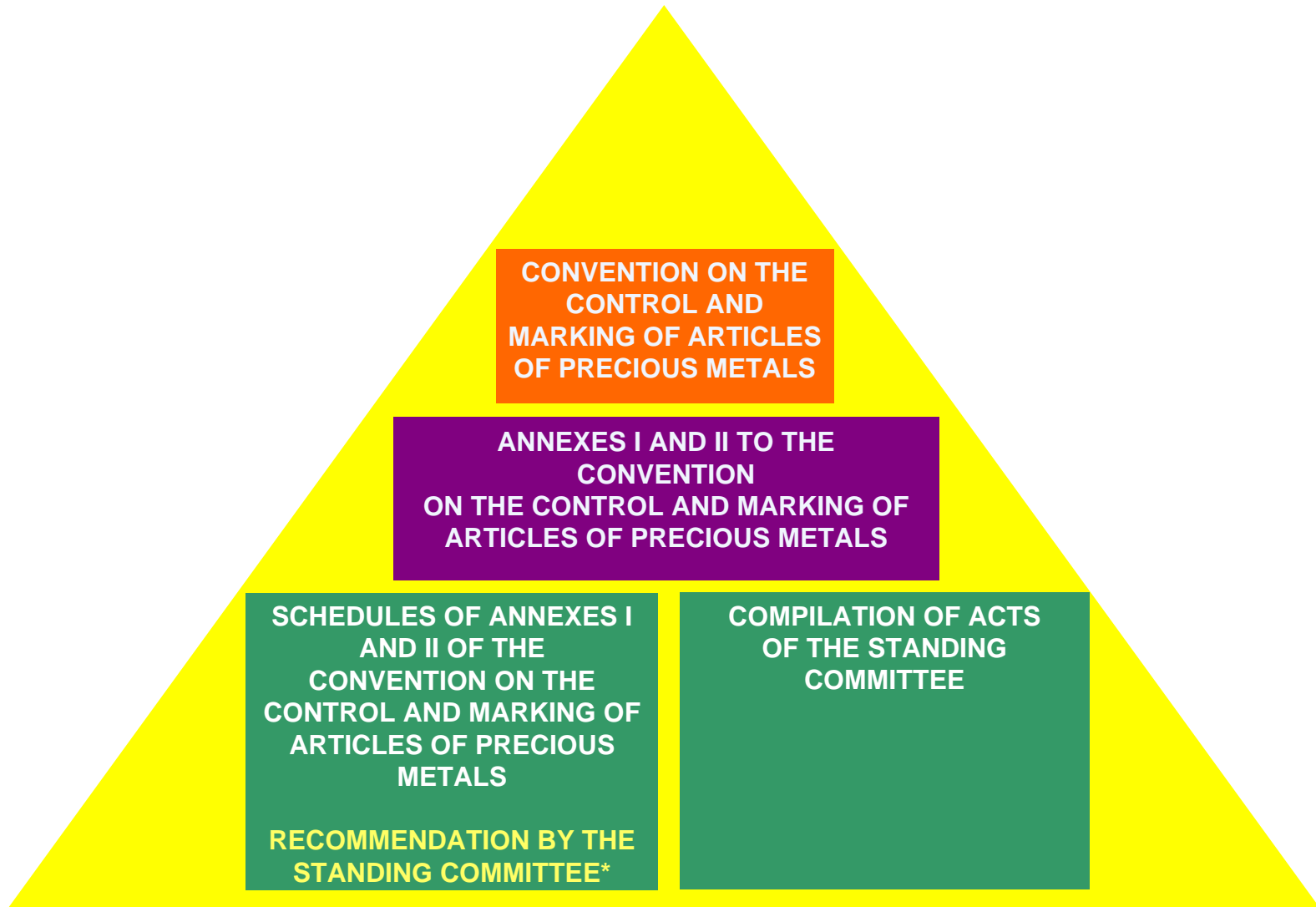


Topics

- Basic Documents
- Basic Exigencies
 - Responsibilities Member States
 - Requirements for Authorized Assay Offices
- Finenesses
- Sampling and Testing - Methods and Procedures
- Marking with the Common Control Mark
- Advantages and Benefits for Manufacturers
- Trends and Developments
 - “Off-Site” Marking procedures



Basic documents of the Convention





Responsibilities of Member States

- **Legal Responsibilities of the Member State :**
 - provides a national law that
 - defines legal tenders (metals and finesses)
 - foresees technical provisions on the marking and the composition of articles (rules for marking, exceptions, solders, surface treatments ...)
 - creates a system for registration of responsibility marks
 - defines national marks (hallmarks)
 - foresees consequences for the abuse of provisions
 - foresees protection for official marks (e.g. the Common Control Mark CCM)
 - authorizes qualified Assay Offices (AO) to apply the CCM
- **Further Commitments :**
 - paying the annual membership fee
 - participating on meetings of SC



Requirements of authorized Assay Offices

(proved) Technical Competence

Organisation

- Independence
- Integrity
- Impartiality
- Quality Management System (e.g. ISO 17025)

Personnel

- Qualification (training and experience)

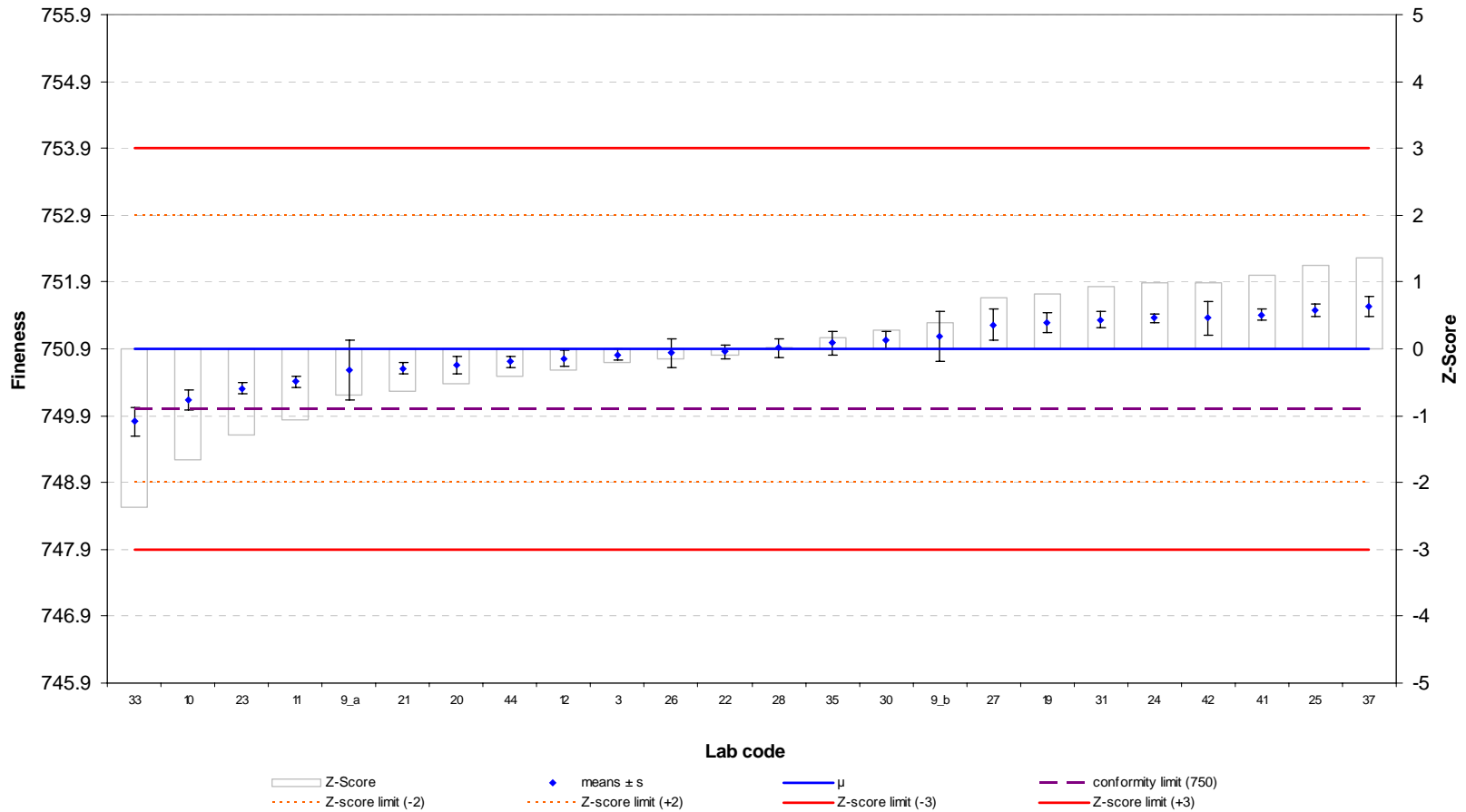
Infrastructure

- Facilities
- Equipment
- Reference material, ...



Prove of Competence by means of Proficiency Testing (Round Robins)

Convention Round Robin 2006
RR13 (white gold 750 Pd125)





Sampling (I)

Three confidence levels for screening

$$QL = \left[1 - \frac{\Sigma(\text{articlesrejected})}{\Sigma(\text{articlesubmitted})} \right] \times 100\%$$

Rejected Article = Articles which do not conform with the material and technical requirements of the Convention.

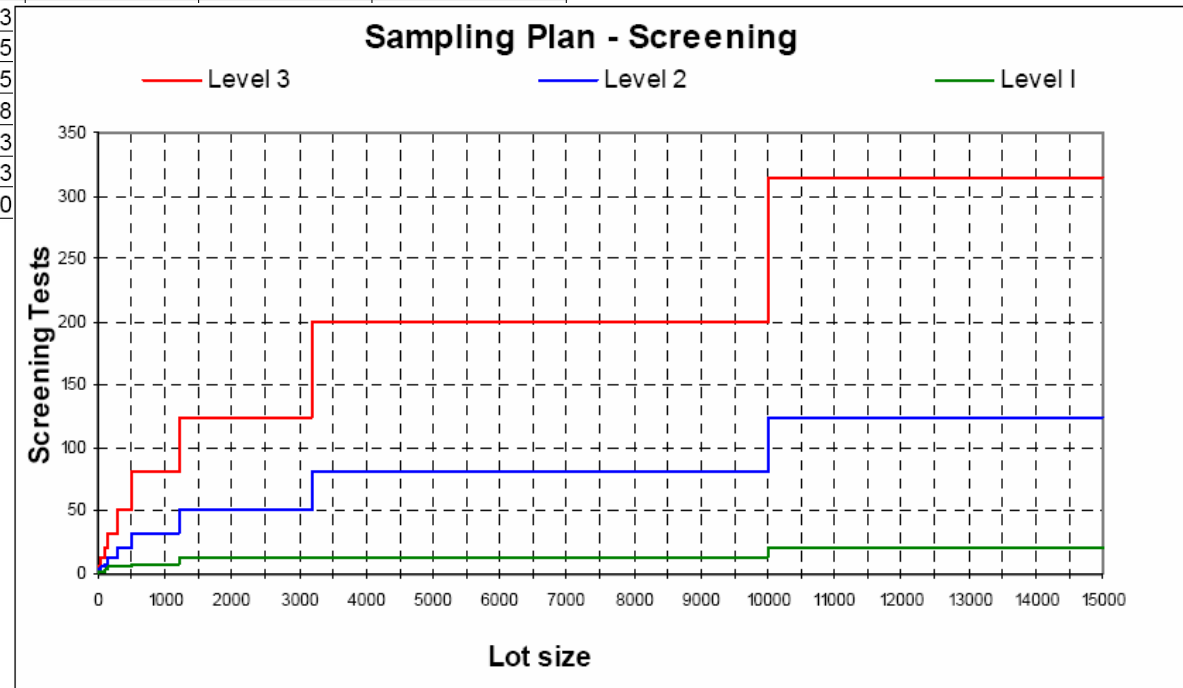
| | | | |
|---------|------------|--------------------------|--------------------------|
| Level 3 | 0 – 94.9% | Lowest confidence level | Most screening required |
| Level 2 | 95 – 98.9% | Normal confidence level | |
| Level 1 | + 99% | Highest confidence level | Least screening required |



Sampling and Testing (II)

The Sampling Plan

| LOT SIZE | SCREENING* | | | Recommended ASSAYS |
|------------------|------------|---------|---------|--------------------|
| | Level I | Level 2 | Level 3 | |
| 1 | 1 | 1 | 1 | 1 |
| 2 to 8 | 2 | 2 | 2 | 1 |
| 9 to 15 | 2 | 2 | 3 | 1 |
| 16 to 25 | 2 | 3 | 5 | 1 |
| 26 to 50 | 2 | 5 | 8 | 1 |
| 51 to 90 | 2 | 5 | 13 | 1 |
| 91 to 150 | 3 | | | |
| 151 to 280 | 5 | | | |
| 281 to 500 | 5 | | | |
| 501 to 1,200 | 8 | | | |
| 1,201 to 3,200 | 13 | | | |
| 3,201 to 10,000 | 13 | | | |
| 10,001 to 35,000 | 20 | | | |





Recognised semi-quantitative screening methods

| Gold | Silver | Platinum | [Palladium]* |
|--|--|--|--|
| <ul style="list-style-type: none">• Touchstone testing | <ul style="list-style-type: none">• Touchstone testing | <ul style="list-style-type: none">• Touchstone testing | <ul style="list-style-type: none">• Touchstone testing |
| <ul style="list-style-type: none">• ED-XRF | <ul style="list-style-type: none">• ED-XRF | <ul style="list-style-type: none">• ED-XRF | <ul style="list-style-type: none">• ED-XRF |

ED-XRF Energy Dispersive X-Ray Fluorescence Spectrometry

* Shall apply only after the entry into force of the amendment to Article 2 of the Convention



Recognised quantitative testing methods

| Gold | Silver | Platinum | [Palladium]* |
|---|---|--|---|
| <ul style="list-style-type: none">Cupellation method (EN 31426 / ISO 11426: 1997) | <ul style="list-style-type: none">Potentiometric titration using KBr (ISO 11427) | <ul style="list-style-type: none">Gravimetric using NH₄Cl (ISO 11210) orGravimetric using Hg₂Cl₂ (ISO 11489) | <ul style="list-style-type: none">Gravimetric using dimethylglyoxim (ISO 11490) |
| <ul style="list-style-type: none">ICP-OES (ISO/WD 11493) | <ul style="list-style-type: none">Potentiometric titration using KCl or NaCl (ISO 13756) | <ul style="list-style-type: none">ICP-OES (ISO/DIS 11494) | <ul style="list-style-type: none">ICP-OES (ISO/DIS 11495) |
| <ul style="list-style-type: none">XRF**, fully validated in-house method according to ISO 17025 | <ul style="list-style-type: none">XRF**, fully validated in-house method according to ISO 17025 | <ul style="list-style-type: none">Atomic absorption (ISO/WD 11492) | <ul style="list-style-type: none">XRF**, fully validated in-house method according to ISO 17025 |
| | | <ul style="list-style-type: none">XRF**, fully validated in-house method according to ISO 17025 | |

XRF** X-Ray Fluorescence Spectrometry, wavelength or energy dispersive, with comparable measurement uncertainty (foreseen in the amended Annexes)

ICP-OES Inductively Coupled Plasma Optical Emission Spectrometry

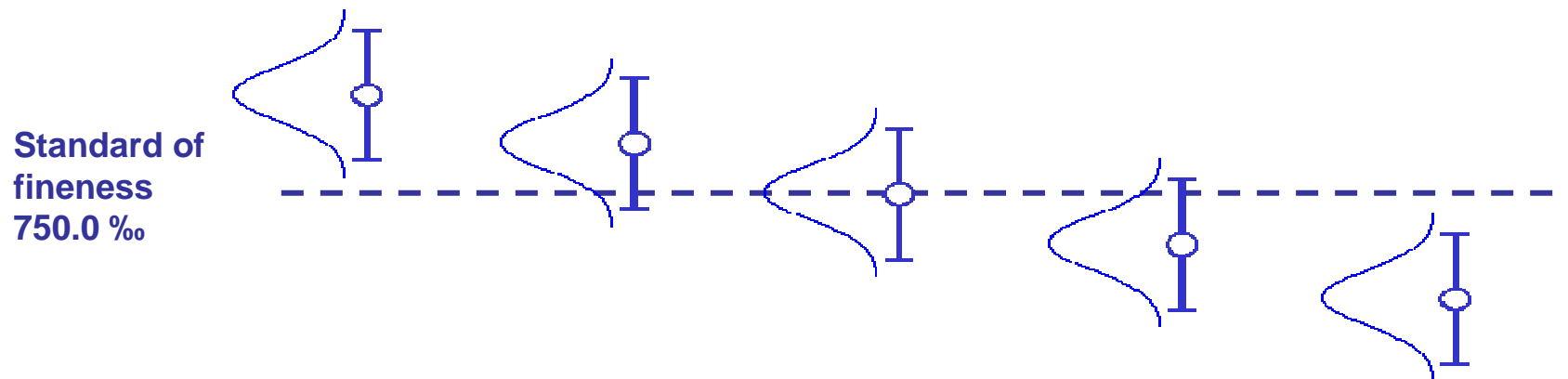


Application of the Measurement Uncertainty

« *shared risk principle = no negative tolerance* »

Exemple:

Fineness: 750 ‰
Measurement uncertainty: ± 0.3 ‰
Negative tolerance: None

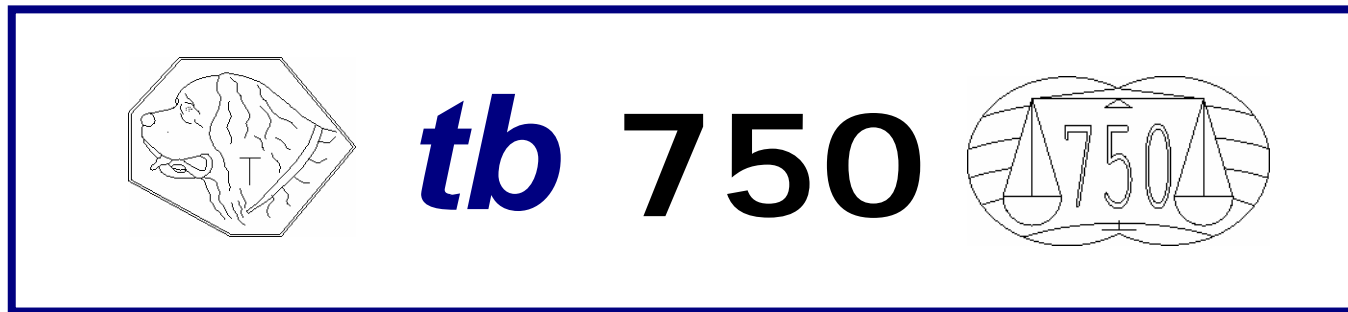


| | | | | | |
|----------------|---------|---------|---------|-------------|-------------|
| Means: | 750.5 ‰ | 750.2 ‰ | 750.0 ‰ | 749.8 ‰ | 749.5 ‰ |
| Result: | conform | conform | conform | not conform | not conform |



Marking with the Common Control Mark

1. Assay Office Mark (e.g. CH the National Mark)
2. Registered Responsibility Mark
3. Fineness Mark
4. Common Control Mark





Advantages and Benefits for Manufacturers

- Clear rules (Basic Documents) for conformity
- No technical obstacles during import-export
- No costly re-marking in the target countries
- No damaged articles during re-marking
- More confidence of the customers
- Additional quality mark

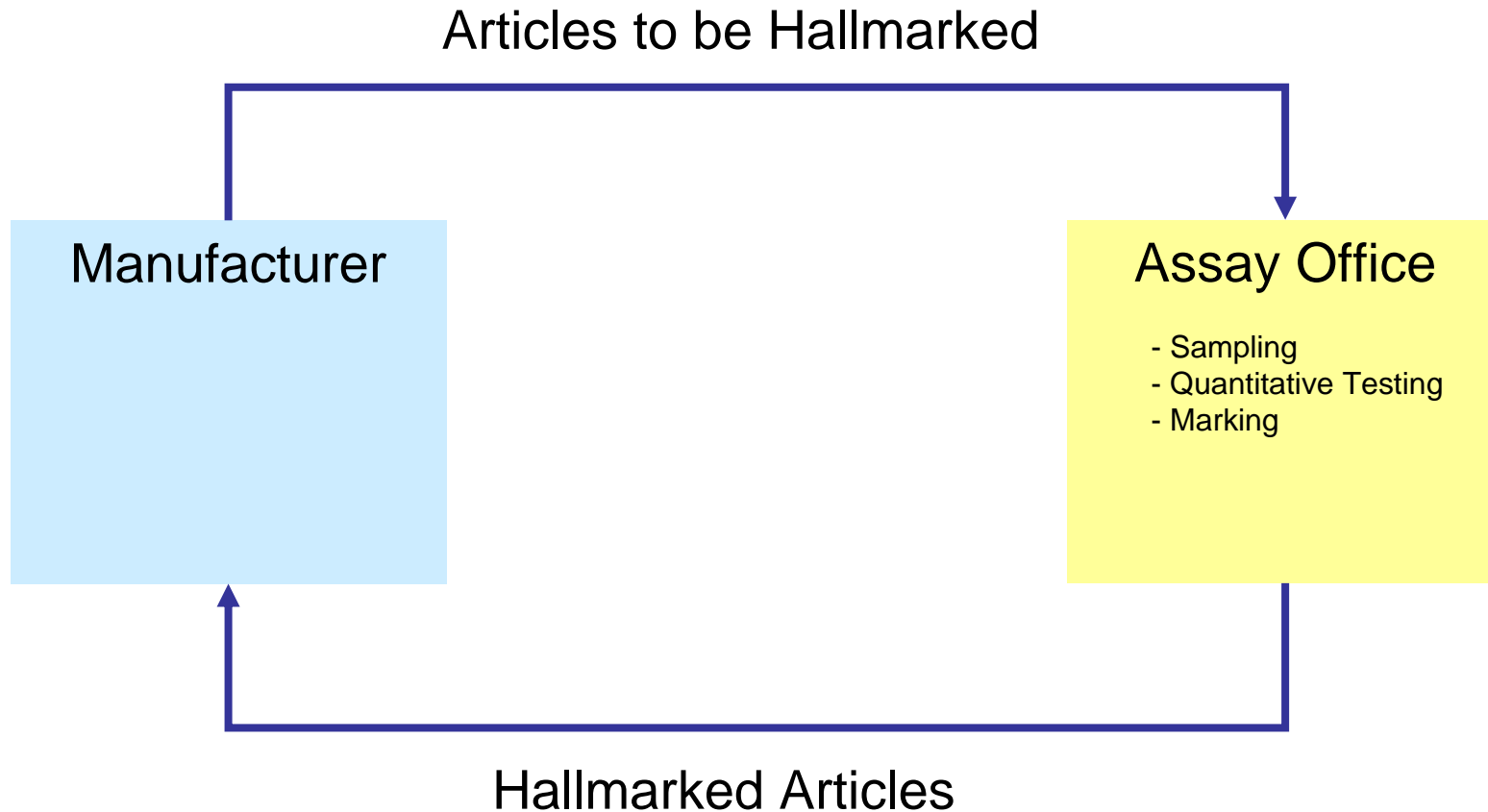


Trends and Developments

- **“Off-Site” Marking Procedures**
(Hallmarking activities outside the AO’s premises but within the borders of the member state)
- **“Off-Shore” Marking Procedures**
(Hallmarking activities outside the AO’s premises and outside the borders of the member state, e.g. China)
- **“Process-Oriented” Marking Procedures**
(quasi delegation of the marking activities to manufacturers fulfilling severe quality exigencies under supervision of an authorised Assay Office)



Traditional Hallmarking Procedures





“Off-Site” Marking Procedures

