

HALLMARKING AND ITS IMPLICATION FOR THE GOLD JEWELLERY INDUSTRY IN GHANA

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Abstract

The value of precious metal jewellery is partly based on the precious metal content. In order for the customer to obtain value for money when purchasing gold jewellery, it is imperative that the precious metal content of such item is known. Many countries has laws and regulations that seek to protect consumers by ensuring that precious metal jewellery items bear quality marks as well as unique, traceable maker's or manufacturer's mark. Ghana currently has no such laws despite the Government's announced intention, in its 2005 budget statement, to set up a "centre of hallmarking of precious metals". This article reviews Ghana's gold jewellery sub-sector as well as the history of hallmarking, and discusses hallmarking models operated in some parts of the world and recommends a hallmarking option for Ghana based on the country's peculiar gold jewellery environment.

Keywords: Carat, Gold, Hallmarking, Jewellery, Stamping.

1. Introduction

Man began using gold for body adornment several thousand years before the Bronze and Iron Ages. Gold's function as a medium of adornment, in jewellery, spans more than 6,000 years. The earliest gold jewellery, from the Sumerian civilization of the fertile basin between the Tigris and Euphrates rivers, dates to around 4,000 BC (Schomp, 2005).

The ability of metalworkers to control the quality of gold and silver through refining, alloying and standardization gave impetus to the use of gold and silver coinage, beginning around the 7th Century BC (Cooper, 2001; Corti, 2001). After the collapse of the Empire of Charlemagne in the 9th century, this standardization and centralization of minting ended and hundreds of local authorities, kings, nobles, and

cities minted their own money and issued coins without regard to uniformity or standardization. This situation encouraged the minting of debased coins. The technique of surface enrichment of inferior alloys through depletion gilding, well known in antiquity, was an additional incentive. Forgery and counterfeiting was thus rampant and became a big concern in the ancient world (Oddy, 1992, Corti, 2001).

In a bid to curtail the production and circulation of debased precious metal coins and artifacts, counterfeit and forgery detection techniques began to be adopted and rulers of antiquity enacted laws to stem the menace. For instance, the Romans are credited with the introduction of coins with serrated edges (common even on many modern coins) in a bid to discourage the dishonest practice of “shaving off thin slices” off the edges of precious metal coins: any filing or scraping on the edges of such serrated coins was easily noticeable (National Geographic, January, 1974).

Even though details of ancient counterfeit detection procedures remain obscure, evidence points to three rudimentary methods (Corti, 2001):

- Cutting of coins to detect surface plating (surface enrichment)
- Dropping of coins on hard surfaces to cause ringing
- Melting and subsequent solidification to detect any colour change

Cutting through surface-enriched or plated coins exposed the substrate material and revealed whether or not the surface had an enriched coating. Debased coins did not present the same ringing sound as genuine coins when dropped on a hard surface. Melting and subsequent solidification of suspected coin resulted in a colour change, at variance with the original colour of the coin, if the coin was indeed debased.

In addition to the above rudimentary methods, ancient Egyptians and Greeks pioneered and utilized quantitative assaying methods for checking the quality of gold and silver coins and objects. Three of the methods: Touchstone, Fire Assay, and Density, are still very important and relevant today, and are currently utilized variously by practitioners in the jewellery and precious metals sector throughout the world for verifying the quality of precious metal items.

In Ghana, most jewelers and goldsmiths still rely on the touchstone method for testing gold while the “ringing” method is also used to test the soundness of gold and silver ingots as well as finished jewellery items. Some licensed small-scale gold buyers in Ghana use the specific gravity (density method) for checking the quality of gold. The method utilizes hydrostatic weighing scales and converts specific gravity values thus obtained into carat.

2. History and Origin of Precious Metal Testing and Stamping

Throughout the world, gold and gold jewellery is priced and sold according to the fine gold contained therein (carat and total weight). To forestall cheating and protect consumers, many countries have laws that regulate the precious metal jewellery sector. These laws require that precious metal jewellery is tested and stamped with a mark or symbol indicating the maker and the precious metal content among others. When this testing and marking are carried out by an independent accredited assaying laboratory, the process is termed ‘Hallmarking’ (Rushforth, 1999). The term ‘Assaying’, on the other hand, applies to the quantitative chemical analysis of a substance or material to determine the presence and level of one specific metal or element. It is often used in conjunction with the evaluation of ores and the analysis of metals. When applied to gold jewellery, assaying refers to the determination of the fine (pure) gold content of an item (Corti, 2001).

Modern practice of testing and stamping precious metal items is said to have originated in 13th century France where goldsmiths and jewelers applied unique marks (traceable to the towns in which the items were worked) on their jewellery (Untracht, 1985). It was from France that the practice was adopted and entrenched in England. Successive generations have always sought to ensure the integrity of their precious

metal items. King Henry II is reported to have employed expert coiners from the eastern part of Germany of “improve and standardize” British coinage which had become debased. The coiners were originally known as Easterlings and the silver coins made by these pioneer metallurgists were known as “Easterling” silver. This name eventually became contracted, as it were, to become “Sterling” silver, a current term denoting a standard quality for both coin and plate silver with a fine silver content of 92.5% (Smith, 1978).

The use of the term ‘hallmarking’ began in England around 1300 A. D. where King Edward II enacted a statute requiring gold and silver items to be sent to London’s Goldsmiths Hall for a mandatory testing and marking (Ayensu, 1998; Untracht, 1985). The items were to be assayed by the guardians of the craft. King Edward III is reported to have granted the Worshipful Company of Goldsmiths its charter in 1327, formalizing its existence. The evolution of assaying regulations in Britain culminated in the establishment of the Assay Office in London’s Goldsmiths Hall in 1478 (Hare, 2005)). Over the years, ‘hallmarking’ came to be accepted as referring to the act of testing (assaying) and affixing (marking) quality mark on a precious metal item, by an independent assaying/testing laboratory. In the UK, hallmarking is controlled by the Hallmark Act of 1973, as modified by the Hallmarking Regulations 1998. These revised regulations and standards became effective January 1, 1999 (Hare, 2005).

Throughout the world, hallmarking regulations have included among others, stipulation of levels of purity of gold jewellery that can legally be sold in a particular country, the tolerance (if any) allowable on the fine gold content, the types and quality of solders used, and the mandatory marking (stamping) of items with quality and a maker’s marks. For instance, the current allowable caratage in the UK are: 375, 585, 750, and 916 per thousand for gold alloys, and 990, and 999 per thousand for gold itself (Hare, 2005).

Many countries exempt precious metal items below certain weight threshold from hallmarking. In the UK, precious metal articles do not have to be hallmarked if they weigh less than 1 gram for gold, 0.5 grams for platinum and 7.78 grams for silver. Some countries allow negative tolerance in their precious metal items while others do not. The US, for example, allows a very small negative tolerance of not more than 0.0003 parts on items without solder and not more than 0.0007 parts when the article is soldered (Untracht, 1985). Other countries such as the UK do not accept anything short of the quality mark stamped or engraved on the precious metal item. If an item assayed even slightly lower than the legally recognized standard, the UK assay offices have the option to assign it the next lower recognized carat mark. For instance, if an item assayed 914 instead of 916, the recognized UK standard, the UK assay offices have the option to stamp it with the next lower recognized standard – 750 or reject the consignment outright. In the UK, the fineness mark and the assay office mark are put on the jewellery items by independent Assay Offices after testing. Maker’s or sponsor’s mark is however embossed on the items prior to submission to the Assay Office for testing.

3. Overview of Different Stamps

The interpretation of hallmarks and stamps are much dependent on the knowledge of the one who judges them and mistakes can easily be made by the neophyte. At all times the marks that are found need to be in agreement with other indicators, such as style and manufacturing technique. There are four main types of hallmarks (Figure 1) that can give vital information on the origins of jewellery items: (i) Purity marks, (ii) Maker’s marks, (iii) Date letters and (iv) Town marks. Some of these marks can be bundled in one mark depending on origin, or they can be absent due to various reasons. When a mark is found that carries a crown, it usually indicates that it was marked in a country which has or had a monarch as the head of state.



Figure 1: A Typical Gold Ring Showing the Various Hallmark Stamping

3.1 Purity marks

The purity mark is one of the first stamps to look for when inspecting jewellery. When such a mark is found, it reveals the percentage of precious metal used to create the item. Gold in its purest form is very soft and is not very suitable to create jewellery from it. In days gone by the people who could afford golden body ornaments were not concerned with household chores, that privilege was given to domestic servants. Consequently their jewellery was not very susceptible to wear and tear. Later, there came a need to give extra strength to the precious metal and other metals were added to make the jewels more durable, these diluted metals are referred to as "alloys". Alloys are a mixture of different metals and the amount of precious metal used to create such an alloy is named the "purity" of the alloy. Up until the mid-20th century this purity was primarily expressed in karats (or carats in the English Commonwealth). In the USA the karat weight is abbreviated as "k", while in Great Britain it is abbreviated as "ct", which provides for a good clue to the possible origin.

Karat weight is expressed in divisions of 24, with 24 being the purest gold. When one finds a purity mark of 18k, it indicates that the alloy to create the jewellery from is made out of 18 parts of gold and 6 parts of other metal. To translate that to percentages we divide 18 by 24 and multiply it by 100. In the case of 18 karat gold the simple equation will be $(18/24) \times 100 = 75\%$.

As more and more countries are transferring to the metric system, you will find the purity being expressed as parts of thousands. 1000/1000 is pure gold in the metric system and an 18 karat gold item will therefore be stamped as 750 (leaving out the trailing "/1000"). Table 1 provides various gold karat stamping by way of hallmarking.

Table1: Gold Karat Stamping

Karat	% Pure Gold	Stamp
24	99.99	999
23	95.80	958
22	91.60	916
21	87.50	875
18	75.00	750
14	58.50	585
9	37.50	375

While in the USA, and some other countries, the purity is clearly indicated by stamps such as 14k and 18k, there are many other countries that indicate precious metal purity marks with pictorial marks and one needs a good library to discriminate the many stamps that were (and are) used worldwide. Silver and platinum purity stamps are much like those for gold but the pictorials c.q. numerals are different. The phrase "sterling" is stamped on many post-1870 USA pieces. One will not find that mark on, for instance, English pieces, unless they were fabricated for export. Prior to 1870 the silver standard in the USA was "coin silver" (900/1000) which is slightly lower than sterling (925/1000) silver.

3.2 Maker's marks

Traditionally the maker's mark is the main responsibility mark for the gold (or platinum/silver) content of an artifact. When problems arise, the maker (or company) can be identified and held responsible. The maker's mark does not necessarily mean that the item was made by the one whose mark is struck, it merely indicates the person who was responsible for the purity. In modern times it also serves as a trademark, much like why Coca Cola labels its bottles. Important names commission an added value.

In many countries with a long standing tradition of mandatory hallmarking, these maker's marks had to be unique and copies of these marks were well kept in the archives of the guilds. Usually these stamps carried the initials of the maker accompanied by a pictorial mark in a specific contour. Sometimes regulations required the contour to be a specific shape, like the lozenge shape that is mandatory for French maker's marks from 1797 onwards. In the USA these marks were made mandatory only in 1961 and they can be in the form of a registered trademark, or the name of the maker/firm in full. On English, and later on USA, pieces one will find a lot of maker's marks containing an ampersand as in the mark "J & S", which could indicate the (fictional) firm "Johnson and Stewart". The use of an ampersand is typical for British (and their former colonies) maker's marks. In most cases this stamp is struck by the manufacturer and is therefore not a hallmark in the strictest sense, although the mark needs to be registered at the assay office.

3.3 Dateletters

Dateletters were first introduced in 1478 in London. New English regulations at the time required all gold and silver artifacts to be assayed by a governmentally controlled body, at Goldsmith's Hall in London. Here lies the origin of the word "hallmark"; it had to be marked at the "Hall". The head assayer was usually chosen from one of the most prominent guild members and the position changed hands every year. To prevent fraud by the assayer a new assay responsibility mark was introduced and this took the form of a letter from the alphabet. In practice that meant that every 25 years (some letters were skipped) the same letter should be used. To prevent confusion a different letter font and/or contour around the letters was used every cycle.

While the original purpose of the letters was to indicate the responsible assay master, today it serves as a "dateletter" to indicate when the item was assayed. In daily practice, jewellery historians are hardly ever interested in the name of the assay officer behind that responsibility letter. The dateletter indicates the year the object was offered for hallmarking, not the time of fabrication as is popularly believed. In recent years the use of a dateletter has been made voluntary in the UK. One will hardly ever find a dateletter on delicate jewelry pieces because there was often no room for a full set of marks on such items.

3.4 Town marks

Due to the expansion of financial prosperity in the late middle ages and the renaissance hitherto, many nations with a mandatory hallmarking system opened new assay offices dispersed across the country in order to accommodate local precious metalsmiths. To discern between the marks used in those towns a new

mark was introduced, the town mark. This mark usually took the form of the city's heraldic shield or another distinguishable pictorial mark. The assay mark of Birmingham, England is an anchor which is not very logical as Birmingham does not have a port, nor is it located near a sea or other open water. The anchor refers to the Crown & Anchor Tavern where the decision on the mark was made. Today the Birmingham assay office is the largest assay office in the world and one can find many items that have been struck with this town mark. In some systems, such as the Dutch hallmarking system, the combination of the town mark with another mark indicated the purity of the precious metal from which a jewel or larger item was made. In France it was customary to have a purity mark for Paris and another one for items made in the provinces (departments), the latter were sometimes individually distinguished by a numerical.

3.5 Other marks

There are many other stamps that one can find on jewellery items that are not hallmarks but are important to properly judge jewellery. Some of them are outlined below:

Designer marks are marks that are stamped on jewellery to indicate the designer. A lot of items made under the responsibility of the famous Russian manufacturer Fabergé carry a designer mark. In addition, some pieces that were made in the Art Nouveau period carry designer stamps.

Tally marks are sometimes found on USA and British items to indicate the journeyman who actually created the piece.

Retailer marks indicate that a piece was sold through a specific outlet, mostly through large firms like Tiffany's and other large branded stores.

Duty marks may be struck on items to indicate that taxes have been paid on domestic jewels.

Import and export marks may be struck on items to indicate that taxes have been paid or that items were exempt from taxes.

4. The Role of Hallmarking

The use of expensive precious metal such as gold in combination with inexpensive base metal like copper (for gold alloys) in gold jewellery production offers unscrupulous practitioners the opportunity to cheat and defraud customers. The high intrinsic value of gold makes such criminal activity very lucrative, since even an infinitesimal reduction in quality through adulteration can give appreciable additional profits to goldsmiths, jewellers and manufacturers. In addition, the average customers' difficulty in differentiating between apparent and real fineness of a jewellery item, by simple visual inspection, colour or feel makes defrauding and cheating a very easy option in the precious jewellery sector (Hill and Putland, 2014).

The ramification of hallmarking requirements, processes and procedure in countries with stringent regulations is that by testing and affixing quality marks and thus vouching for the quality of the items so marked, the Assay Offices and/or their agents in effect assume perpetual responsibility for any discrepancy in quality that may be detected in respect of any such marked item. Thus the burden of quality assurance is taken off the manufacturer or maker once the items have passed the test at the Assay Office. Any settlement arising out of any future dispute is borne by the Assay Office.

Assaying and hallmarking regulations are however not enforced to the same extent in all countries. In some countries such as the United States of America the responsibility for marking the finished item with a maker's identification and quality marks rests with the goldsmith, jeweller or manufacturer even though under-carating is a punishable offence and defaulting producers are liable to prosecution when caught.

5. The Current Situation in Ghana

The gold jewellery sector of Ghana is estimated to comprise more than one thousand goldsmiths and jewellers working in small-scale jewellery workshops throughout the country. Output of this category is estimated at around 7 million dollars US.

Domestic production of fine gold jewellery is said to account for one 20 per cent of national sales. In fact, when it comes to gold jewellery consumption, Ghana is a net importer despite the fact that the country has been producing more than two and half million ounces of raw gold per annum in recent years (Ghana Chamber of Mines, 2012).

Ghana has no specific mandatory hallmarking regulations apart from the general mandate given to the Ghana Standards Board to oversee standards in the country. The precious metal jewellery sector in effect is regulated by the outmoded "Gold Mining Products Protection: Act, Cap. 65, of 1923. That law merely deals with the licensing of goldsmiths and sets forth the conditions under which goldsmiths may buy and account for the gold purchased. The act does not cover hallmarking or standards. The Mining and Mineral Act, 2006 (Act 703) also does not address the issue of hallmarking or the production and sale of jewellery. Section 98 (1) of the Act merely provides that: "nothing precludes a person from disposing of personal jewellery to an authorized dealer or *another person*", while section 98 (2), in a rather contradictory sense asserts that "a person shall dispose of a gold artefact or gold coin only to an *authorized dealer*. Even though Section 107 (h) stipulates a penalty for using "a false or fraudulent assay scales knowing them to be false or fraudulent," the absence of a provision on hallmarking or testing and marking does not complement government's own intention of setting up a hallmarking centre as proposed in the 2005 Budget (MoFEP, 2005). The absence of hallmarking regulation creates doubt in the mind of consumers and retailers as to the genuineness and purity of made-in-Ghana precious metal jewellery and at the same time undermines the credibility of the gold jewellery sector as a whole. The situation promotes the production of under-carated jewellery since there are no specific laws under which defaulters can be sanctioned. The problems of the sector are further compounded by the fact that Ghanaian goldsmiths and jewellers do not have access to refined gold or certified gold alloys and have to prepare their alloys using gold of doubtful quality. As a result, many goldsmiths and jewellers may consciously or unconsciously be 'under-carating' their gold jewellery. The honest ones may intentionally go above the designated carat as a compensatory or quality ensuring measure at the expense of their profit margin, while the unscrupulous may knowingly be taking advantage of the unregulated environment.

The authors have encountered many instances of under-carating in relation to gold rings brought in by clients for the engraving of name initials. The 90 odd pieces of made-in-Ghana gold wedding and engagement rings (brought in from different sources in Accra and Kumasi) and claimed by their owners to be 18ct (750) in quality, were tested in the course of 18 months (2004 to 2005) using the touchstone method, explained earlier in this article. Out of the 90 pieces, 28 rings (31.1%) tested below the claimed 18ct (750) standard. Sixteen (17.7%) of the rings actually tested around 14ct (585). These gold rings, like many made-in-Ghana gold jewellery, did not bear any maker's mark or quality mark, which are not currently mandatory in Ghana.

6. The Need for Hallmarking in Ghana

The need for hallmarking is very important now in Ghana as it has ever been: (i) The cost of the metal as a percentage cost of a finished article is invariably higher than for other fabricated products. There is therefore a temptation for unscrupulous dealers to cheat their customers by attempting to pass off base metals or metals with low precious metal content as precious metals. (ii) The current high prices of precious metals, particularly of gold, reinforce the need for consumer protection. (iii) Hallmarking provides a widely

recognized way of protecting the consumer against potentially fraudulent behaviour through the misrepresentation of new materials. (iv) Imported articles represent an increasing proportion of precious metal articles sold in Ghana. The hallmark ensures that the precious metal content of such articles complies with the standards for domestically produced articles, ensuring a level playing field for both Ghanaian manufacturers and importers alike.

With the rise of online retailing and internet auction sites, the route to market for the retail of jewellery and silverware has been transformed. The routes available to defraud the consumer have also evolved with this increased complexity. However, the presence of the hallmark remains a simple and effective check to ensure that the customer has indeed bought a precious metal article

Hallmark is a “tardis of information”. It tells “who” submitted the article, “what” the fineness is, “where” it was tested and often “when” it was tested. This information provides huge opportunities for marketing and branding, and the hallmark has thus gone far beyond its original objective as a means to ensure consumer protection. Some specific examples include: (i) Hallmarks, termed “display hallmarks” which are incorporated into the design of objects for decorative purposes. (ii) The sponsor’s mark has become akin to the signature on paintings. It provides provenance and permits makers to become brands. (iii) The date letter, assay office mark and commemorative marks indicate time, place and occasion.

7. Conclusion and Recommendation

A hallmarking system will evidently bring some order to the jewellery and goldsmithing subsector of Ghana. The introduction or the phasing in of a hallmarking scheme will however have to be done gradually after consultation with all stakeholders and after an intensive education of all practitioners. Not only should practitioners be properly apprised with the scheme itself, but they must also be trained in the many aspects of jewellery-making that can impact positively on design and quality. Areas like basic gold metallurgy, gemstone setting, design, finishing and production gold loss mitigation will have to be included in any training scheme which much also cover training in the business aspects of the profession. Education is very crucial in view of the rather low educational level and background of majority of goldsmiths and jewellers. The introduction of regulatory hallmarking measures without prior education, sensitization and a general improvement of the gold jewellery sector could have an adverse effect on the industry.

Steps must be taken by the relevant governmental agencies to make refined gold and certified gold alloys available to the sector. The actual modalities of the intended assaying and hallmarking regulations including acceptable pathways should then be agreed upon by all stakeholders. In the meantime, the Ghana Standards Board or the relevant implementing agency must, among other things, ensure that stakeholders agree on pertinent details before considering the implementation of assaying and hallmarking regulations. For instance, what selected qualities of gold jewellery should be tradable in the country: 9ct, 10ct, 12ct, 14ct, 18ct, 21ct, 22ct or every imaginable caratage and why? Should Ghana allow minor negative tolerance in the caratage of precious metal jewellery as is the case in some countries, notably the US, or none at all, as obtains in some countries such as the UK? What should be the minimum unit weight below which an article may be exempted from hallmarking? What about the sitting of implementing agency? Should jewellery makers, scattered across the country, send their jewellery items all the way to a centralized location, such as the premises of the Ghana Standards Board or a designated entity in Accra for hallmarking? These and other details must be discussed by stakeholders including consumers where necessary before implementation is executed.

India’s voluntary hallmarking scheme, launched in April 2000 by the Bureau of Indian Standards, may be a model worth studying (Prasad, 2010). That Standards Bureau has already developed quality standards and guidelines for various gold alloys and gold solders among others. Even though the ultimate intention of the

bureau is to make hallmarking mandatory in India by 2008, the scheme was started on a voluntary basis. Much as the ultimate objective should be a hallmarking scheme that is in harmony with existing schemes globally, the implementers must be mindful of the current state of the Ghanaian gold jewellery sector in order not to overburden it with cumbersome regulatory schemes. The sudden introduction of a compulsory third party hallmarking regime such as obtained in the UK, can cripple the indigenous Ghanaian goldsmithing industry and hinder the transformation of the sector into a vibrant modern entity capable of evolving the country's gold jewellery making traditions into efficient production facilities that can compete globally.

Ghana must therefore introduce a voluntary hallmarking regulation that will enjoin all makers to mark their gold jewellery products with the correct quality mark and a registered unique identification mark or logo before offering such jewellery for sale. Those who would want the added advantage of third party assaying, may under the scheme submit their finished/semi-finished jewellery items to the Ghana Standards Board or accredited agents for hallmarking. Such items will then bear the mark of the Board. In situations where jewellery makers opt for third party hallmarking by the Board or its agents, the Board must agree to assume liability for any under-carating that may be detected in items bearing its mark.

The local industry here must be assisted to take full advantage of Ghana's rich endowment in gold by modernizing Ghana's indigenous goldsmithing skills to transform the greater portion of our raw gold output into globally competitive gold jewellery for export. Training institutions and entities concerned with the provision of jewellery production skills must be capacitated in terms of infrastructure, manpower development, modern tools and equipment to impart the requisite skills and knowledge to the teeming youth to enable them add value to the country's gold output through improved quality gold jewellery production methods.

Government agencies, mining companies and stakeholders must work together to make refined gold available, at reasonable price, to the Ghanaian gold jewellery sector either by setting up a medium size gold refinery locally, or embarking on a barter importation of refined gold and certified alloys in collaboration with the mining companies who can use a small percentage of the royalty due to the state to defray the cost of such imported refined gold. In addition, Parliament ought to pass a comprehensive hallmarking bill within which the Ghanaian gold jewellery sector can grow and compete globally. It must also pass a bill to establish a National Jewellery Council to oversee all aspect of precious metal jewellery production including education, manpower training, and standards. The Mining Protection Act-Cap 65 or 1923 and the Mining and Mineral Law, Act 703 of 2006 are inadequate and appear obsolete against current realities.

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