

Gold on Base Metal – the Omega Constellation Way

A topic that often arises in discussions about vintage Omega Constellations is that of the meaning of 'Gold Cap' versus other gold treatments applied to watches. What made gold capped Constellations of the 1950s and 60s special compared with what was offered in the 1970s and even more so today?

New Processes

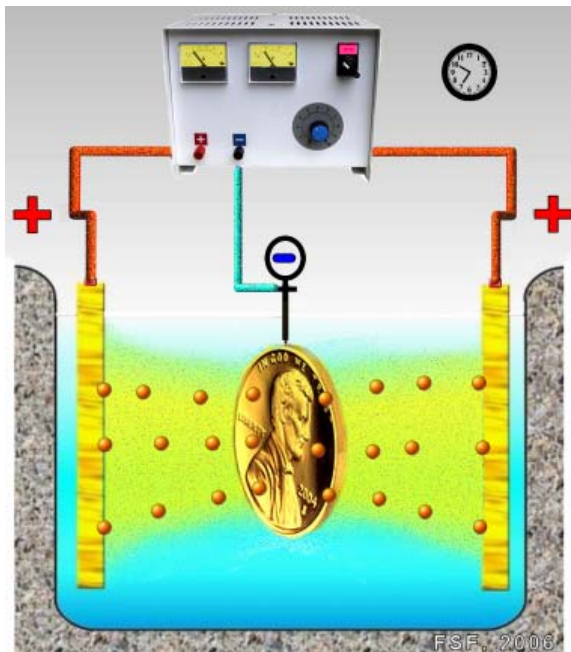
The technology to create the illusion of a solid gold watch case has, allegedly, come a long way since the 50s and 60s. Techniques such as PVD and CVD are becoming more popular over the more traditional methods.

PVD (Physical Vapour Deposition) is a process in which molecules of gold material are vaporised in a vacuum and condense on a watch case. The deposits are very thin, often in the range of a few angstroms. When used on watch cases, the case may glitter for a couple of years, but then becomes landfill material when the coating wears through to the base metal. PVD is also used to create the metallic layer on snack bags. While PVD is seen as a new coating process for metals, this method was used in other types of manufactures requiring coatings as early as the late nineteenth century.

CVD (Chemical Vapour Deposition) is a chemical procedure usually used to produce high-purity, high-performance solid materials. It is often used in the semiconductor industry to produce thin films. In a typical CVD process, the base metal watch case is exposed to one or more volatile precursors, which react with the case to produce the desired deposit of gold. The CVD process is also used to produce synthetic diamonds.

The above methods can create the thinnest films of gold. Durability is dependent mostly on the depth of those thin layers and can be improved marginally by using procedures that increase the hardness of the plate. PVD processes are regularly used for plating 'fashion' watches and have been known to produce up to 17 – 19 microns thickness.

Traditional Processes



Example of a gold plating cell. Courtesy R & S Electroplating

Electroplating, is a branch of electrochemistry invented by Italian chemist Luigi V. Brugnatelli in 1805. Brugnatelli experimented with the voltaic pile, an invention by colleague, Alessandro Volta, to facilitate the first 'electrodeposition'. Electroplating is still one of the most popular plating methods today, particularly on brands that lay claim to durability. Seiko, for example, regarded by many as being amongst those at the leading edge of metals technology in horology, still use electroplating.

Electroplating describes the means of passing an electric current through a gold plating solution to deposit a layer of gold on the case. There are a broad range of formulas for gold plating solutions and each is designed to produce a specific alloy, colour, hardness or thickness or a combination of those attributes. There is almost no limit to the thickness of gold that can be plated with the right solution and equipment. Five to twenty microns is the usual standard within the Swiss watch industry, although 40 microns is not unheard of.

Gold filling was a tradition popular up until the later 1960s, particularly in American cases, and involves using heat and pressure to bond a layer of gold alloy to base metal and then rolling it into sheet. A gold-filled case can be seen as a sandwich made from a slice of base metal contained between two thinner slices of gold. The sandwich was then formed into the case shape.

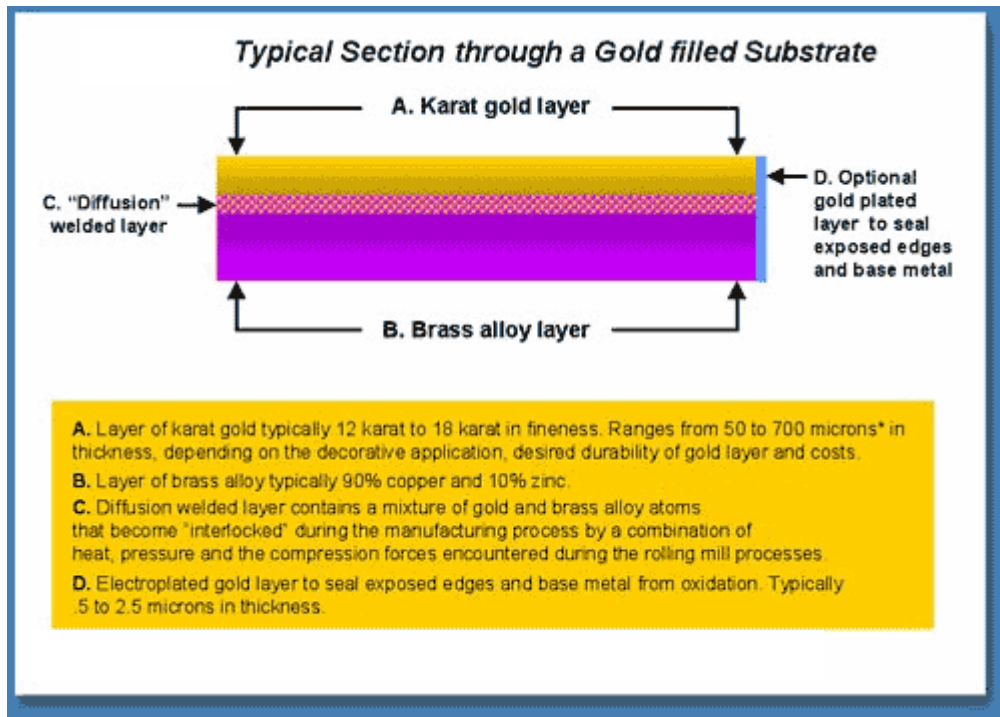


Diagram courtesy of Artisan Plating



Stamp on a double clad gold filled pocket watch

There are certain US standards of thickness that apply with gold filling, and the minimum layer of gold must equal 1/20th of the total weight of the finished item. Gold filled watches normally are in the range of 50 to 140 microns but can be up to 700 microns. 125 microns is approximately the diameter of a healthy hair follicle.

Gold filling processes are still being used to produce watch cases, writing instruments, and assorted jewellery items. Gold fill could be either single or double 'clad'. Single clad gold fill has a gold sheet bonded to the external side of the base metal while double clad has layer of gold bonded to both sides. The double clad sandwich was the standard for 'quality' watches up until the mid-twentieth century.

Rolled Gold Plate is made by a process that bonds a layer of gold over base metal. It is basically the same as "gold filled" except that the quantity of gold can legally be less than 1/20th of the total weight of the finished metal item such as gold filled cases. The term has been shortened to 'rolled gold', and while double clad rolled gold was produced for watch cases, particularly in America, it is more than often seen in its single clad manifestation.

Standards dictate that it must be identified with a fraction mark indicating the quantity of gold. As a rule, rolled gold plate is thicker than gold plating but thinner than gold-filled.

Gold Plaque, as it is often described in European literature of the time, is exactly the same as rolled gold plate. The gold was rolled out flat before enshrouding the exposed upper parts of a watch case and being bonded to the base metal of the case.

The Omega Standard

Gold Capped is interesting nomenclature that appears in descriptions of a number of Omega lines including Seamasters and Constellations of the 1940s to late 1960s. In Omega brochures and advertisements of the early 1960s, the mention of *Gold Capped* is often made in respect to a combination of solid gold bezel and a "rich layer of gold" covering the lugs.

Omega's commercial use of *Gold Capped*, an English translation of the original French term, I believe, also includes the 'crowning' of the case with a solid gold bezel. Rolex used another translation of the same term in early advertisements for its 'Golden Egg' automatics describing a stainless case with a 240 micron yellow *Gold Top*.

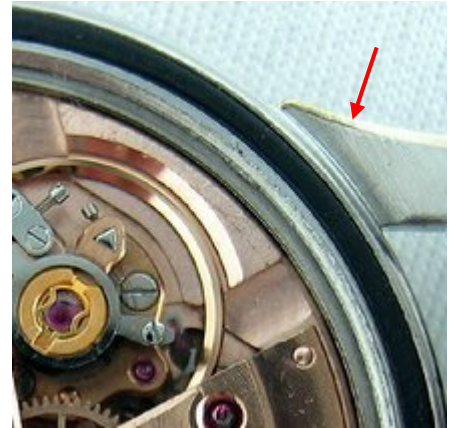
In an early Constellation advertisement in French (see overleaf), the gold capping process was described as "Coiffe d'or 14 carats sur acier inoxydable". Some people would translate Coiffe d'or literally as gold coif (a cap) but conversational French allows us a little more latitude and I incline towards the more fluid translation of "Cover of 14 karat gold over stainless steel".

In examining an up-ended Constellation bezel, I would estimate the thickness of the entire bezel to not be any more than 200 - 250 microns. That is why I believe it is plausible to assert that Coiffe d'or may well describe both the thick layer of gold over the lugs and an equally thick, but solid gold cover that frames the crystal.

However, on its website, Confederation Suisse details the official definition of "*Coiffe or*" as it applies to the watch industry as "a superior quality of plate for watch cases and bracelets". It goes on to say that standards dictate that *Coiffe or* has "a thickness of the gold layer of at least 200 microns." (See screen capture on page 5). So, it can be confirmed that the term is an official description that denotes a minimum standard for the thickness of the gold plaque and also confirms that the lugs of Omega Constellations contain a layer of gold of at least 200 microns.

As mentioned, Omega was not the only manufacture to produce "gold capped" or "gold top" cases, The process was clearly associated with upper-shelf and 'quality' watches and most certainly added to the Constellation's reputation as a 'high value' watch.

The most important difference between the various plating processes is layer thickness and layer thickness is tied up with longevity. There are 1000 microns to the millimetre. It is very difficult to determine in a forty to fifty year old watch the exact thickness of the gold



Omega Case from the early 1960s showing rolled gold or gold plaque over stainless steel lugs. Note the thickness (arrowed)



Omega Constellation case 2852 with solid gold bezel (arrowed)



1970s F300 gold electroplated watch head and bracelet. Note the wear in bracelet. The 80 micron watch head is in good shape

plaque on the lugs, but Constellations of the 1960s are at least 200 microns thick, which is more than the thickness of two sheets of quality photocopying paper.

Normal charts indicate that an 80 micron gold plaque layer should withstand the bumps and grinds of daily life for around for around twenty years. No wonder, that with more than twice the amount of gold covering the lugs of Omega Constellations, many Constellations having been around for more than fifty years are still not showing wear through to the base metal.

In correspondence with John Diethelm of Omega Museum, John confirmed that models with reference numbers KO or CD definitely have a solid gold 14 karat gold bezel and the stainless steel case lugs are covered with a layer of 14k gold having a minimum of 200 microns.

With more than ten times the thickness of an average middle-range gold plated watch today, crowned with a solid gold bezel, Omega Constellations of the 1950s and 60s are still wearing well. The same cannot be said for some of the gold plated Constellations produced in the later 1970s during the Swiss crisis and this is yet another reason for the collectibility and popularity of the 300 and 500 series Constellations.



OMEGA *Constellation*

CALIBRE 28 SC - 501 - 19 RUBIS

Chaque chronomètre Automatic Rotor a obtenu le bulletin officiel de marche «Résultats particulièrement bons». Il est livré dans un très bel étui pleine peau.

Étanche avec glace armée
fond à pression, joint «0»

CK 2852	acier inoxydable	Fr. 390.-
KO 2852	coiffe d'or 14 carats sur acier inoxydable	Fr. 470.-
OJ 2852	or 14 carats	Fr. 820.-
OT 2852	or 18 carats	Fr. 930.-

35 mm, lunette 27 mm, cuir 18 mm, cadran de luxe 6150, heures or rivées lapidées
singles or laudées: trotteuse or



Zollfrei:
Exempt de droit
Dutyfree:

Coiffe or

[Coiffe or](#)

[Coiffe or C](#)

Boîtes de montres et bracelets de montres de la catégorie des ouvrages plaqués, mais dont l'épaisseur de la couche d'or atteint au moins 200 micromètres (microns).

Coiffe or C

Qualité de plaqué supérieure pour les boîtes de montres et les bracelets de montre. En plus de cette désignation figure aussi l'indication de l'épaisseur en micromètres, par ex. 200, 250, etc.

Screen capture of Confederation Suisse website showing official definition of 'Gold Cap/Top'. (English website not currently established)