Gold filled jewelry is made from karat gold which has been bonded to the surface of a supporting base metal through a process of fusing and rolling. It is always marked with the karat designation and an indication that it meets the legal standard. Look for marks such as 1/20 12K G.F. or 12 Kt. Gold Filled. Rolled gold plate is also made by fusing and rolling gold onto base metal, but the plating is significantly thinner. Rolled gold plate may be marked 12 Kt. R.G.P. or 1/40 12K R.G.P. Another mark you will sometimes encounter is G.E., or gold electroplate. This is the thinnest of all gold plating techniques. The gold or gold alloy is not fused and rolled onto the base metal beneath, but rather plated in solution using an electrical charge to make the bond. By law, gold electroplate must be at least 7/1,000,000-inch thick, but this is extremely thin when compared with gold filled.

The manufacturing of gold filled jewelry is a remarkable feat of technology! Two trade publication articles about this process dating from 1953 and 1958 supply a wealth of information, as well as some wonderful photographs. Here are the steps in the process:

1. Pure gold (24 karat) and alloy metals such as silver, copper, zinc, or nickel are meticulously weighed out in the correct proportions to create the desired karat gold.

Figure 4 - Weighing gold and alloy. From Jeweler's Circular-Keystone, September 1958.

2. The gold and alloy are melted in a crucible and then poured into a mold to form an ingot.

Figure 5 - Pouring the melt into a rectangular mold. From Jeweler's Circular-Keystone, September 1958.

3. The karat gold ingots are rolled into rectangular sheets. These sheets are used like slices of bread to sandwich a “filling” of base metal such as bronze, brass, nickel, etc. A “dressing” of solder (usually silver and copper) is used to help the layers of the sandwich stick together firmly.

Figure 6 - Making the "sandwich." From Jeweler's Circular-Keystone, September 1958

4. The “sandwich” is clamped between steel plates and guided into a gas-fired bonding furnace. Here it is heated to the melting point of the solder and that temperature is held absolutely constant until the gold is

completely bonded to the inner reinforcing layer of base metal. This results in a gold filled ingot, which is then cooled slowly and evenly to maintain a perfect bond.

Figure 7 - The bonding furnace. From Jeweler's Circular-Keystone, September 1958

5. The gold filled ingot is put through a series of giant rollers which compress it into sheets of the desired thickness. Throughout this pressing and rolling, the precise proportion of karat gold to base metal is maintained and the thickness of the gold plating remains absolutely uniform.

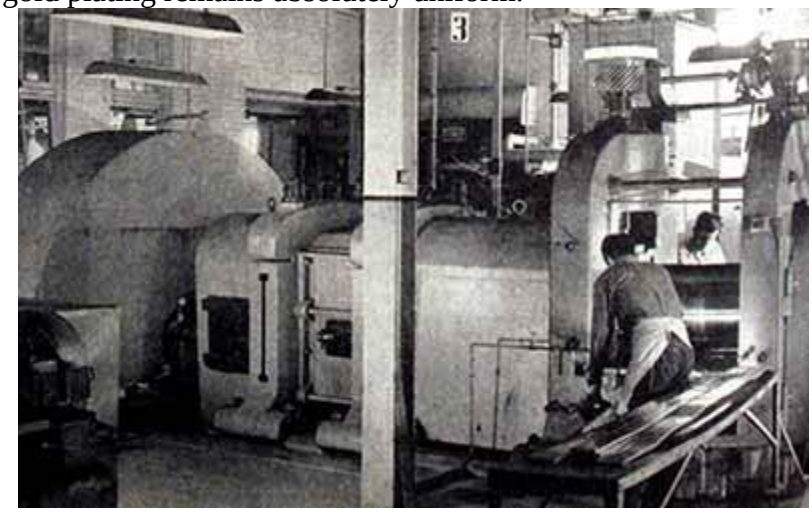

Figure 8 - Break-down rolling mill. From Jewelry, September 1953.

6. Finishing rolls with a mirror-like surface create the final ultra-smooth finish of the gold filled flatstock sheets.

Figure 9 - Mirror finished roll for the final rolling of the gold filled flatstock. The worker is holding a buckle which is reflected in the shiny finish of the roll, demonstrating its brilliance. From Jewelry, September 1953.

7. Gold filled tubes and wires are created through a similar process, with a machine known as a cupping and drawing press.

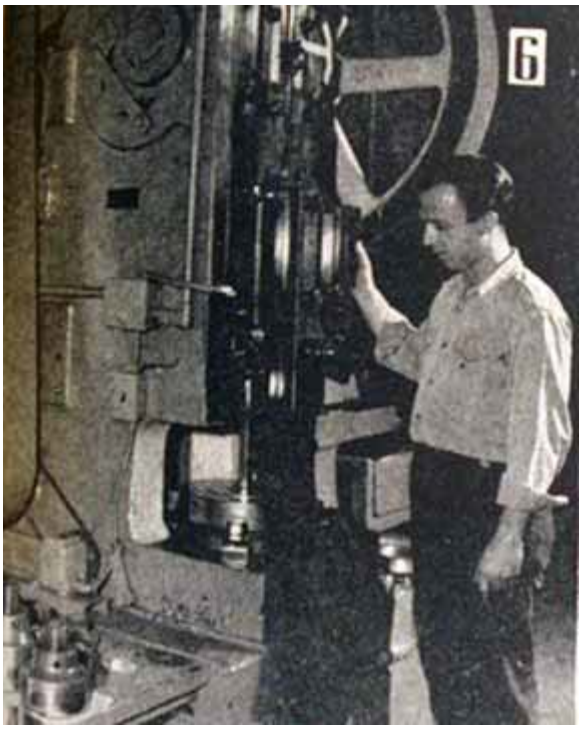

Figure 10 - Cupping and drawing press for making gold filled tubes or wire. From Jewelry, September 1953.

8. These mirror-finish gold filled flatstock sheets, tubes, and wires are then sent to the jewelry manufacturer to be cut and shaped into finished products. Tubes of various sizes can be used to make pen, pencil, or pill cases, as well as jewelry components. The gold filled wire is used to make chains, as well as jewelry elements.

Figure 11 - Gold filled sheets, tubes, and wires ready to be sent to the jewelry manufacturer. Jewelry, September 1953.

Because of the unique properties created by this manufacturing process, gold filled jewelry has many advantages. It is stronger than karat gold jewelry because the inner core of base metal adds structural strength. It is extremely durable because the gold plating is so thick. Unlike rolled gold or gold electroplate, it is rare to see gold filled jewelry which has lost its gold plating. The luster of gold filled jewelry is generally excellent because the perfectly even thick karat gold plating produces the rich appearance of fine jewelry. More finely worked designs are possible with gold filled jewelry than with thinner plating or base metal because the thicker plating creates a malleable surface. Best of all, however, is the price difference between gold filled jewelry and fine karat gold. The development of this process brought the look of fine gold into the range of affordability for the masses at a time when the middle class was rapidly growing.

Restrictions were placed on the use of base metals during World War II, creating a dilemma for manufacturers of gold filled jewelry and their customers. It is not uncommon to see jewelry from this era marked 1/20 12K G.F. ON SILVER or STERLING + 1/20 12K GF.