

# **PRODUCTION PROCEDURE OF JEWELLERY**

While manufacturing any product some costs get involved in its process in the form of fixed and variable manufacturing costs. As the cost of various products is based on the quality specifications of that product it happens also in case of Jewellery. Jewellery as a product can be classified in various categories such as pure Gold Jewellery, Diamond Jewellery, Kundan Jewellery etc. Moreover, their design specifications also contribute in its manufacturing.

Jewellery Manufacturing is a matter of creativity. First of all the design comes in the mind than a blue print of that design is drawn on paper. Moreover, it is a kind of assembling and jointing various gold parts like flowers, small balls and gold leaves, wire etc. In this way the process of manufacturing Jewellery passes through various interlinked sub-processes starting from melting the gold and ends with polishing the Jewellery. Now a days in Jewellery industry two main processes of manufacturing are popular i.e. traditional method and modern method of manufacturing. Jewellery making is hundred percent a human process whereas modern method of manufacturing process is some where based on machines too. In modern method designs are made with the help of machines. One other pattern of manufacturing Jewellery is very popular now a days i.e. Kundan Jewellery which is also a hand made pattern and required a significant degree of human effort.

As far as the matter of prefer ability of any production process is concerned; it is being adopted according to the requirement of the ordered Jewellery. Before analyzing the production procedure it would be appropriate to get familiar with the various methods of Jewellery making. These methods may be defined as various Jewellery manufacturing terms. Ever wonder what the difference between gold electroplate and gold-filled are? Every industry has its own terminology, and it is very confusing to the layman. In Meerut district manufacturing of Jewellery is categorized into these main manufacturing terms:

- A. Handmade
- B. Cast
- C. Die Struck
- D. Gold Filled and Rolled Gold Plate
- E. Gold Electroplate

A brief description of the above mentioned terms are being given below:

#### **A. HANDMADE**

In this process the Jewellery is made by hand, without the aid of mechanical devices other than ordinary hand tools. The major components, including joints, settings, etc., are handmade from plate, bar or wire. Actually the karigars show their perfect skills in this process of Jewellery manufacturing.

## **B. CAST**

The method in which metals are poured or forced into molds which have cavities in the shape or form of the articles to be produced. Of the various casting processes, Lost-wax casting is the one most commonly used. Lost-wax casting means the item is first sculpted from wax. The original wax sculpture, or a copy of it, is then used to make a mold and the wax is lost in the actual casting process.

## **C. DIE STRUCK**

The method in which metals are mechanically hammered into hardened steel dies to produce definite impressions. This process is used on a lot of signet rings.

## **D. GOLD FILLED & ROLLED-GOLD PLATE**

Continuous plates of metal are covered mechanically by means such as soldering, brazing, or welding. The carat gold used is at least 10 carat fine, and this gold covering can be applied to one or more surfaces of the base metal. Many quality costume Jewellery manufacturers use this process to imitate the carat gold look of fine Jewellery. Gold filled or rolled gold Jewellery is not as durable as carat fine Jewellery, however, because the actual layer of gold on the item is extremely thin.

## **E. GOLD ELECTROPLATE**

Electroplate is the process of affixing a plate or layer of fine gold on a base of metal by an electrolytic process using electricity and chemicals. This process can be used to improve appearance and to prevent disintegration. Like gold plate, this process imitates the carat gold look of fine Jewellery but is not as durable due to the thin layer of gold.

## **JEWELLERY MANUFACTURING PROCESS**

Jewellery manufacturing process includes most advance technologies and dedicated research. Jewellery making is a very composite process undergoing a long and slow procedure making it tough from the initial point to the finishing point. Each product undergoes a series of procedures before we get the finished product as a beautiful Jewellery product.

The natural components of Jewellery (stones, metals, and accessories) passes through multiple processes. These jewellery is unique and involve a lot of time and skill. Except for personalized Jewellery which is handcrafted, most of the jewellery is executed by casting machines.

Jewellery manufacturing process may be exhibited with the help the following chart:

## **CHART SHOWING THE JEWELLERY MANUFACTURING PROCESS**

**DESIGN MAKING**



**MOLDING**



**CASTING**



**POLISHING**

Following is a brief description of all the processes involve in the manufacturing chain.

### **A. DESIGN MAKING**

In order to produce a unique piece, the very initial step is to create a design. This is the point from where the magic begins. An idea of the end product is communicated to a very talented designer who then makes a sketch of the design. This process of Blueprint Designing is carried out by proficient craftsmen using techniques and methods handed down over decades.

Each piece of Jewellery starts off with a concept. A concept is basically a rough design in the mind of the designer. The final design is the result of close cooperation between designer and craftsman giving the art object a real hand crafted origin. The

designer's concept and drawings are used by the model maker to create the original piece of Jewellery.

## **B. MOLDING**

Once the master piece of Jewellery is complete, it is used to make a high technology mold, which in turn is used to make wax reproductions of the Jewellery.

After the sketch is complete with all the fine details, it is passed on to the molding section. In the molding department the very experienced professional molders then turn the sketch into a master mold which sets the base for the total process there from. The master mold is a very complex level of crafting as the final outcome rests on the master mold.

## **C. CASTING**

Casting again is a very complex process and requires utmost skilled and experienced casters for the desired final product. The wax replicas are placed in steel containers which are then occupied with a chemical powder and the containers are heated in a chamber to 550°c which solidifies the powder and melts the wax leaving behind a perfect effect. Liquefied metal is then poured into the flasks, allowed to cool, then demolished to reveal the Jewellery in casting form.

## **D. POLISHING**

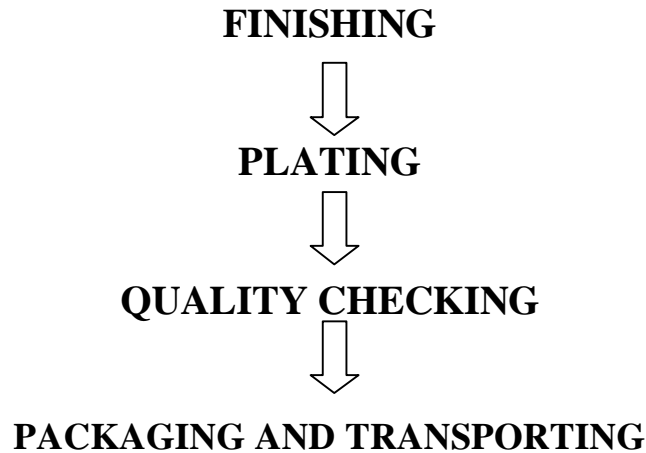
Every part must be polished while the mount is being made. The entire mount is carefully made clean and polished to the highest degree of smoothness so that each and every part is attractively polished. After stage setting, the polisher is credit worthy for giving the Jewellery a concluding polish. All tinctures of the polishing compounds and 'rouge' must be meticulously got rid of either by careful washing by hand or by use of supersonic cleaning baths.

## **EMBELLISHMENTS/ DECORATIVE PROCESSES**

After the product has passed from the polishing and finishing departments, it has to undergo for embellishment process. When the products gets cased and foiled, the required decorative stones of the correct sizes and weight are cut and made with extreme preciseness and assorted for the final setting which is done once the products leave the foiling and finishing department.

It requires immense patience and skill to make the master-model and to produce an exquisitely casting free from defects and which needs the minimum of chasing to make it perfect. Applied wire can also be used as inherent decoration.

## **CHART SHOWING THE EMBELLISHMENTS / DECORASTIVE PROCESS**



The process of embellishments/decorative can be explained as below:

### **A. FINISHING**

Once the casting process is over and the caster delivered the products to the following department, these are then foiled extreme attention for a smooth and soft finish. These castings are then hand finished in order to meet high standards - adding adjustments and settings before being delivered to all corners across the world.

### **B. PLATING**

Considerable technical improvements have been made in plating, especially as used in the Jewellery trade. Most plating is done by electro-deposition, rhodium, copper, chromium or other metals



being practiced by passing an electric current through a solution and then channelizing the plating metal from the piece of pure metal to the object set aside in the solution. Sincere attention must be paid to fabricating and polishing procedures because it is vitally significant.

### **C. QUALITY CHECKING**

After the plating process is over, the product is brought to the checking department where each and every piece is checked with excessive attention and thoroughly checked for any defects. This process of quality checking is done by very experienced workers and all the defected pieces send back to the respective departments.

### **D. PACKAGING AND TRANSPORTING**

Last but not the least, once all the products pass through all the inspections and checking, it is then forwarded for final packaging and labeling. Each product is extensively packed into respective boxes in order to avoid any sort of damages.

Thus, each piece of Jewellery, regardless of its size and weight, passes through a long and complex manufacturing process forming each piece as valuable, precious and unique.

## **PRODUCTION PROCEDURE OF DIAMOND JEWELLERY**

When Diamond Jewellery is manufactured a standard production procedure is followed from making rubber mould and

ends with polishing the final piece. It can be exhibited with the help of the following chart:

### **CHART SHOWING THE PRODUCTION PROCEDURE OF DIAMOND JEWELLERY**

**BLUE PRINT DESIGNING**



**RUBBER MOULD**



**WAX INJECTION**



**CASTING**



**WAX SETTING**



**DIAMOND ASSORTMENT**



**MECHANICAL FINISH**



**ASSEMBLY**



**MANUAL SETTING**



**POLISHING**

The production procedure of diamond jewellery can be explained as below:

### **A. BLUE PRINT DESIGNING**

This is the point from where the process begins. This process of Blueprint Designing is carried out by efficient and experienced craftsmen using techniques and methods handed down over decades. The start concept is basically a rough design in the mind of the designer. The final design is the result of close cooperation between designer and craftsman. The designer's concept and drawings are used by the Model maker to create the original piece of Jewellery.

### **B. RUBBER MOULD**

Once the master piece of Diamond Jewellery is complete, it is used to make a high technology rubber mold. After the sketch is completed with all the fine details, it is passed on to the molding section. In the molding department the very experienced expert professional molders turn the sketch into a master mold which sets the base for the total process. The master mold is a very complex level of crafting as the final outcome rests on the master mold.

### **C. WAX INJECTION**

This is again a very complex process and requires utmost skilled and experienced casters for the desired final product. The wax replicas are placed in steel containers which are then occupied

with chemical powder and the containers are heated in a chamber at a temperature of 550° centigrade which solidifies the powder and melts the wax leaving behind a perfect effect.

#### **D. WAX SETTING**

After the application of the wax it is set in the mould according to the design. The appropriateness of this act ensures the quality of the final product.

#### **E. DIAMOND ASSORTMENT**

After wax setting diamond assortment is made because the diamond piece/pieces are required to be fitted in this Jewellery according to the size and shape of the diamond.

#### **F. MECHANICAL FINISH**

A mechanical finish is required to be made as the mould can not be exact according to the size and cut of diamond. This mechanical finish ensures the appropriate space and gap for fixing a diamond in the Jewellery.

#### **G. ASSEMBLY**

Now the work of assembly is done with the help of these parts in the form of gold part and diamond piece. A required change may be needed at this level. This work of assembly is done with the help of machines.

## **H. MANUAL SETTING**

In some cases where the piece of the diamond is a bit big it is set with manual help. The reason of such requirement is that machines deal with a standard size of diamond and in case of specific size and cut a manual setting is required.

## **I. POLISSHING**

After finishing the assembly work every part must be polished while the mount is being made. The entire mount is carefully made clean and polished to the highest degree of smoothness so that each and every part is attractively polished off. All chemicals of the polishing compounds must be thoroughly get rid of either by careful washing by hand or by use of cleaning baths.

## **J. TOOLS & TECHNOLOGY FOR GEMS & JEWELLERY**

This particular section deals with the introduction of new tools and technology for superior and more production.

India reigned supreme in the world of gems and Jewellery in earlier times when it was a monopoly sector. Then the hand-driven wheel and a few home-made tools sufficed to translate the country's manual expertise into jewel marvels. However, with the passage of time, many competitors have come in the market. Therefore, it has become imperative to switch over to new tools and technology for superior and more production. Modern technology and its revolutionary tools that have taken rapid strides in other enterprises

of commercial production over the globe have also advanced rapidly in the gems and Jewellery sector to speed up production - both quantitatively as well as qualitatively. From land mining or recovery of gems from deep sea-beds to the ultimate production of exquisite Jewellery with fascinating gems, technology now holds sway. Gone are the olden days of floor-squatting, laborious hand-crafted gems and Jewellery not only in India but also in the centers which came up elsewhere subsequently. More sophistication with the advent of computers and laser technology has virtually revolutionized the gems and Jewellery industry.

Of late India too has turned over a new leaf and has been endeavoring to keep abreast of advancing times. Consequently manufacturers here are switching over to latest tools and technology for better, more and faster production. With the sweeping changes, many modern machines, electronic and laser gadgets and advanced tools are appearing in Indian factories because in a keenly competitive world where more and more rivals are emerging, India cannot afford to lag behind. So India has even started manufacturing a number of modern tools and machinery, computers and innovative software.

Lately many Indian and foreign training institutes some of them run by India's Gem & Jewellery Export Promotion Council and others of the private sector, have been established to train newcomers in latest technology. A Coimbatore - based trade body the

Gems & Jewellery Machinery & Accessories Association has been organizing tools and technology exhibitions at various manufacturing centers of the country to introduce and popularize new scientific aids for the precious sector. Many tools, instruments and gemological aids have been developed all over the world for the gems and Jewellery industry.

Thus it can be said that the production of Jewellery is a very tough and lengthy process and demands of hard and expertise skill in the field of Jewellery designing and manufacturing. As in gold and diamond Jewellery manufacturing a high cost is involved, so no experimental risk can be taken at any level.

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