

Tarnishing in Silver Jewelry

Problems with normal sterling

One of the frustrating problems jewelry manufacturers faces is that the bright, shining and sparkling surfaces of metal becomes corroded, turning the brightness and the color of the jewelry to be dull and darken from tarnishing. In some cases, this phenomenon appears after certain period of time but in some worse cases this happen even before the products reach out to the customers.

This kind of corrosion on the surface of the jewelry items are a result of its contact with the environment where the chemical reaction between the item surfaces and the oxide-causing agents occurs. In silver jewelry in particular, this problem is more serious. A lot of studies have found that the reaction between silver, sulfur and its compound, oxygen or chlorine and relative high humidity value or higher temperature are responsible for the growth of the silver-sulfur compounds which diminish the surface quality of this silver jewelry.

In real life it is rather difficult to determine how a piece of jewelry will react to tarnishing agents. Many scholars have now developed the so-called accelerated tarnish test which will show the reaction of the jewelry pieces more quickly, and a relative result can be determined how good the pieces are anti-tarnished. More commonly sulfur compounds are use for such accelerated test which give a result in short time period. In addition, other methods have also been used for the purpose. Sweat test such as artificial tear is used. Resistance to environment such as salt spray test, or even actual usage in the daily life observation, in sport or swimming are also used.

To cope with this weakness of traditional sterling to tarnishing, metallurgist have developed silver alloys with certain elements added to the formula. If the environment has a presence of sulfur or other elements as described earlier which create tarnishing in the finished jewelry , the protection will occur as a new coating of tarnish-resistance oxides. The type and amount of of these additives used in the alloys have a varying degree of deterring the sulfur induced tarnishing.

In addition to using this type of alloys, electro plating is commonly used to add a protective layer on the jewelry pieces to extend their shelf life as well. This coating include e-coating, silver plating, rhodium or palladium plating etc.

As far as jewelry manufacturing is concerned, it is a balance of the cost of remaking the defect pieces, the cost of using the alloy and the delivery time of the orders. We found that an additional cost of the anti tarnishing alloys provides greater benefit over the above costs. It also helps with longer shelf life and saving the frustration of customers from handling and cleaning the pieces in the showcase, waiting for the customers to pick. This is the reason why only very few silver jewelry manufacturers still use traditional copper to alloy sterling. The rests have now changed their usage.