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## 3D Jewelry Design and Manufacturing

Giuseppe Massoni can trace his family history in the jewelry business in Italy back at least five generations to Pietro Massoni, a silversmith artisan and watchmaker who worked in Rome in 1790. Pietro mainly worked in the Vatican as most of his fellow contemporary silversmith-masters. Giuseppe, his son, follows in his footsteps, subscribing in the role of silversmiths, and starts making jewellery with his own trademark. In 1865 Giuseppe is dubbed the honor of "Master of the Art of Goldsmith of the Noble Guild of Jewellers" by the Consul Camerlengo. In 1880 the management passes on to Torquato Massoni that opens a store in Via dei Serpenti. It is the first step from artisan to storekeeper. A few years later the store moves to Corso Umberto, the historical center of that time, meeting point of the Roman nobility and upper middle class.



The Massoni store in the mythical Via Condotti, on the corner with Largo Goldoni, Roma, Italy

Today brothers Carlo and Giuseppe run [Massoni Jewelry International](#). Their father, Giorgio, apprenticed abroad and studied as a diamond and precious gem cutter in London. Giorgio saw that his sons received the same rigorous international training. Carlo runs the financial side of the business, purchasing and public relations, while Giuseppe runs the creative and production side

Giuseppe feels very lucky to be able to work in a field he feels passionate about. He began using computers as design tools about fifteen years ago, mostly out of curiosity. After some experimenting, he thought he could apply computer engineering to jewelry design and manufacturing. Giuseppe laughingly remembers initially trying to duplicate his pencil-and-paper sketches with the computer which, rather than simplifying his workload, actually doubled it! He insists it was great training however.

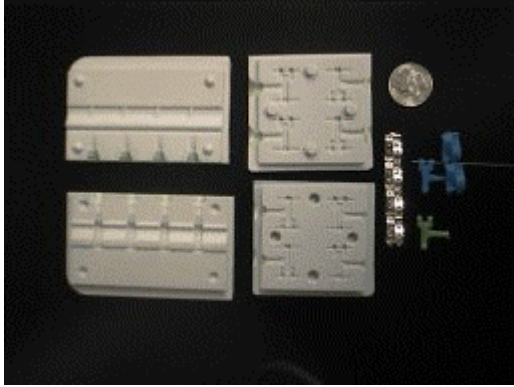


Giuseppe Massoni is the Design and Production manager of Massoni Jewelers of Rome, Italy.

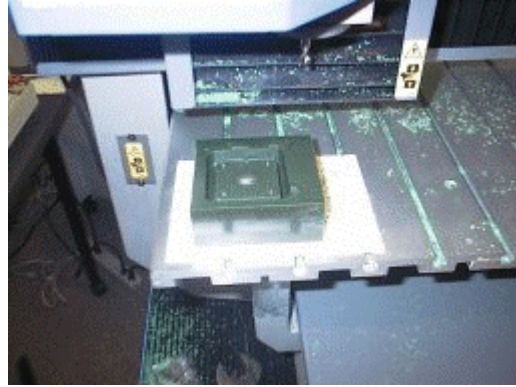
Improved productivity didn't come until about five years ago when 3D modeling and manufacturing began to become a standard procedure in their jewelry-making production. He still likes showing his watercolor designs to customers who ask for custom-made pieces because that's what they expect. Once a design goes into production, there is an entirely different technology involved. "I think of the process as modern without neglecting tradition", says Giuseppe. "All my sketching is still done with pencil and paper and, in my rare spare time, I create watercolors for illustrations".

Massoni's jewelry collection includes rings, pendants, necklaces, bracelets and various other specialized and custom designed pieces. Giuseppe designs all of these items using Rhino a 3D design program from [McNeel & Associates](#). The ease of use of Rhino and the powerful organic modeling capabilities of this tool makes it his favorite design tool. All of the esthetical and technical details are taken care of at this stage, including the expected weight of the final piece. The design might go through multiple iterations of careful refinement and editing. The time and effort spent at this stage pays off during the production stage.

Once the pieces are modeled are approved for manufacture, molds for manufacturing these items are created in Rhino. These molds are then used in the production process to create wax pieces. These wax pieces will then be used in a loss wax casting process to create the finished metal pieces. Giuseppe and his manufacturing team use VisualMill from [MecSoft Corporation](#) (Irvine, California) to program the toolpaths that will be used for machining these molds. The high level of integration between the design and the manufacturing software allows Giuseppe and his team to be extremely productive with the combination of the two software products. Additionally VisualMill's speed of calculation and accuracy of the computed toolpaths allows for zero defect manufacturing on the first try. Computed toolpaths are sent to the machine tool with utmost confidence because of use the toolpath simulation software built into VisualMill, which allows for error free programming. Giuseppe uses three [Roland](#) PNC 300 machines for the production process. VisualMill comes standard with a post-processor for generating the needed output for these machines.



The complete mold set used in the production of a bracelet piece.



The machining of a mold prototype for a ring.

In all projects utilizing CAD/CAM/CNC, the workflow must run smoothly from concept through the milling process to save time and materials. The combination of Rhino, VisualMill and Roland machines are an integral part of Guisepe's workflow and he considers them one of the most reliable tools available today for jewelry design and manufacturing.