SHOP Talk by Steve Inlow

Making a Mold with VLT Rubber

Castaldo® VLT Mold Rubber

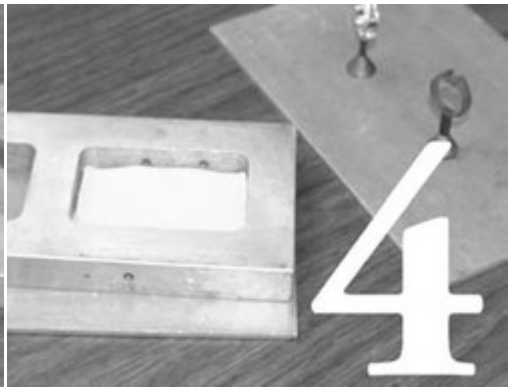
I have been using Castaldo mold rubber for many years. A couple years ago I tried the product VLT mold rubber when a tool company gave me a free sample. (I have been buying the product ever since!) VLT stands for Very Low Temperature. VLT is a silicone mold material which is much like RTV (Room Temperature Vulcanization) but is cured using conventional vulcanizing methods.

Silicone RTV is a nice product but takes a lot of time to mix two parts, vacuum the material after mixing, it requires special mold frames, and again vacuuming the material, frame and model to remove bubbles (not to mention all the cleanup after you have made the mold!) Also, in most cases, you must wait 24 hours for the mold to cure. On the positive side, you have a mold with very little or no shrinkage and a glossy finish on your injected waxes, which means less cleanup of the casting.

VLT on the other hand has these same positive characteristics, but is user friendly. I will explain as we go through the steps of making a few molds. VLT is not compatible with

natural rubber compounds. You must either devote a set of mold frames, plates, sprues, and sprue formers to this product, or you may use mold frames that have been used with natural rubber if you thoroughly clean them with a solvent . Use a rag or paper towel wet with acetone and clean all surfaces of the frame, plates, sprue formers and sprues

(Photo1). VLT strips are thicker than the natural rubber strips. VLT is about 7mm thick while the natural rubber is 3 – 4mm thick, which means you are only handling three sheets to fill a 19mm mold frame not six or seven. Pull off the protective wax paper covering from both sides of the material (Photo 2). Lay the sheet over the mold frame and with your fingers push the material against the frame to mark the sheet for cutting (Photo 3).



VLT cuts easily with a scissor. Pack the VLT into the frame as in photo 4. You will notice the VLT handles like putty, not gooey as RTV would be, and not leathery like natural rubber. Packing inside the ring is a breeze due to the puttylike consistency seen in photo 5.

I did no special preparation to the metal model before making the mold. I had no problems with the VLT sticking to the surface of the ring. With VLT you are able to make molds of plastic resin models created by CAD-CAM rapid prototyping systems as well as traditional wax carvings. This saves time and an extra step by not having to cast a model before producing a mold. In this experiment I used a ring model carved from a Matt hard green wax tube.

First spray the wax model with a vegetable oil spray which is recommended (silicone spray is not recommended with VLT). Photo 6 shows the wax model with hollow shoulders packed withVLT. I packed both models into a double mold frame. A standard 3/4 mold will cure in 90

minutes at 160 degrees F. At 190 degrees F., the same size mold will cure in 30 minutes. The lowest setting I could reach with my old vulcanizer was 174 degrees as seen in

photo 7, and the mold was finished in one hour. I did not over tighten the vulcanizer because I was afraid of breaking the wax model. After cutting the molds, I inspected the model. It was not broken, but had turned color from dark green, to light green, to yellow in spots, but the model itself is still castable. I compared the wax model against an injected wax from the mold. Although Castaldo states there is only 1.4% shrinkage in VLT, I could find no difference in measurements. The finger

size of the model and injected wax were both a size 6. The side shank depths were both correct at 2mm, and the width of both were exact.

I have found VLT to cut easier than natural rubber. I have cut plugs and vents that work extremely well. There is no need to use lubricating spray because VLT is self lubricating. Another positive is the price. VLT is priced very close to Castaldo White and Gold Label mold rubber.

Although VLT is a great product for making molds of traditional wax and plastic resin rapid prototype models, I would suggest making a sample mold using the same type model material to ensure your model will hold up to the low heat and pressure.

As many of you know, I do service bureau work for jewelers that have CAD programs. I use a SolidScape rapid prototype machine. These models are nontoxic, burnout like injection wax, but are fragile and have a melting point around 165 degrees. This type of model is not a good candidate for this process. Photo 8 is a sample of two charms I created on my CAD program. These two models were milled by Mark Esslinger at Esslinger & Co. with one of the Roland milling machines they sell. The material is a carving wax designed for the milling process. This is a good material for VLT molds. Photo 9 shows the injected wax models from a VLT mold, notice the clean sharp corners and the glossy finish of the injected waxes.

Until next month, keep your nose to the bench pin!

Steve

Steven Inlow is a JA Certified Master Bench Jeweler. He has been designing, manufacturing and repairing jewelry for over 30 years. He owns and operates Steven Inlow Designs, a fine jewelry manufacturing and special order shop.