

CONTRACT CASTING

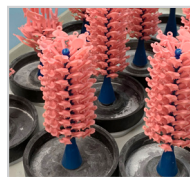
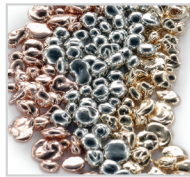
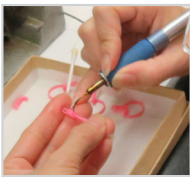
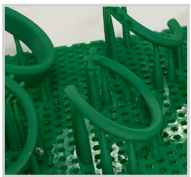
CAD SERVICES | CAM/WAX PRINTING | FINISHING AND STONE SETTING

Our quality castings are manufactured with 100% recycled Harmony casting grains. Enjoy competitive pricing, quick and reasonable turn-around times and the highest quality products.



WE ALSO OFFER:

Volume Discounts for Annual Purchase Commitments
Fairmined Metals | Free Consultations | Technical Advice



**HOOVER®
& STRONG**
THE GOLD STANDARD

www.hooverandstrong.com • info@hooverandstrong.com • 800-759-9997

Ready To Meet Your Casting Needs

We offer start to finish contract casting services! With our full-service factory behind us, you can rely on us for anything from custom designs to production level casting. We are particularly good at helping jewelers scale their business through mass production, which we have been doing with our own line of findings for over 30 years. Contact us today to get started!

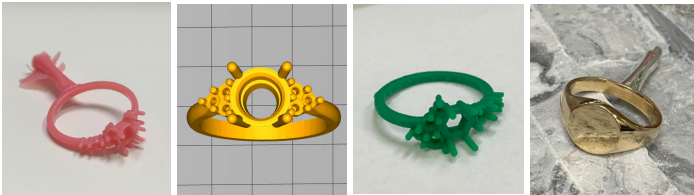
In this brochure, we will share spruing guidelines, mold recommendations, design requirements and more! You will also learn about our CAD/CAM service, finishing levels and materials.

Please contact one of our casting specialists for more information about our high quality casting services. Email casting@hooverandstrong.com or call 800-759-9997.

Types of Models

Hoover & Strong will accept the following types of models:

- Wax - hand carved or from a mold
- Resin - 3D prints
- STL Files - used for 3D prints in house
- VLT and RTV Molds
- Metal masters - We must know the type of metal, karat and color for pricing and sprue.



PLEASE ENSURE YOUR DESIGN CAN BE SUCCESSFULLY CAST

- sprue at thickest areas so that metal freezes from thick to thin or you will get shrinkage porosity
- 1mm thickness recommended throughout (if smaller than 1mm, it is subject to evaluation and possible rejection)
- engravings (in wax or CAD) must include a 7° draft angle
- depth maximum = 0.5mm
- width minimum = 0.75mm

If your part does not clearly meet these requirements, we are happy to evaluate it and provide design suggestions if needed. We can cast it regardless, but labor is non-refundable if the casting fails and we recommended against it.



WE CAN FULFILL ALL YOUR CASTING NEEDS!

- Our CAD services, CAM/WAX printing, and expert finishing guarantee exceptional results
- Competitive pricing, quick turnaround times (starting at 3 days for clip & ship) and volume discount benefits
- Embrace our commitment to the environment with 100% recycled Harmony casting grains. Fairmined options are available, too!

FREQUENTLY ASKED QUESTIONS

What do you cast in? We can cast in most of the grains we keep in stock. The most commonly used is 14W, 14Y, 14P, 18R and STR.

What is the price per gram for casting? We don't have a set price per gram. The cost is based on the labor rate, final weight of the piece and the finishing level. The more work done to the piece the more it will cost.

How long will this take? The average lead time for clip & ship is 5 production days, mass finish 5 days, hand polished 10 days, with stone setting 15 days. Lead times are subject to change based on the time of year and current business volume.

What finishing levels do you offer? Many of our customers choose to finish themselves. We offer clip & ship (no finishing), mass finish (grind, desprue and magnetic tumble) and hand polishing. Please note that for silver castings, we offer clip & ship, burnish and mass finishing. We do not offer additional finishing services for silver.

Do you set stones? Yes, we offer stone setting for gold and platinum alloys only. We can set diamonds and all major gemstones. Opals are extremely soft, therefore are subject to rejection. The customer will need to send in the **Stone Submission Form** with the stones.

Design and Spruing

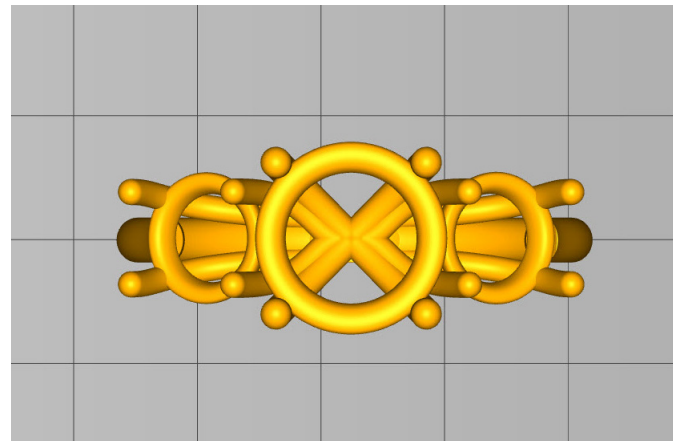
Design and spruing are two of the most fundamental aspects of lost wax casting. They can be the source of a quality casting, or dreaded porosity. The challenge is that not all custom designs can be treated the same. Moreover, a good design or sprue placement for wax injection does not necessarily translate to a good casting. The general guideline is to allow the molten metal to flow from **thicker areas to thinner areas; the sprue should be placed at the thickest area to facilitate this flow** and metal freeze, as allowed by the detail of the piece. Otherwise, shrinkage occurs and porosity appears.

This principle holds true for design as well. For instance, a piece that holds several geometry variations (i.e., thick areas to thin and back to thick, etc.) will require more creative spruing in order to prevent porosity from forming. Occasionally, creative spruing is not enough, and a design must be reworked.

Other key design recommendations involve minimum thickness of 1mm throughout and metal flow pertaining to negative space and wax-engraving. If a piece has sections that are too thin, the molten metal may be unable to reach that area, causing a non-fill area. Smaller widths can sometimes cast successfully, but are dependent on how pervasive the small area is. The further the molten metal has to travel through these narrow gaps, the less likely it is to fill completely.

This same principle applies to metal flow and negative space in design (engravings, thin ridges, small settings, pinholes). We recommend a minimum draft angle of 7°, a maximum depth of 0.5mm, and a minimum width of 0.75mm for all CAD/wax engraving.

Hoover & Strong is happy to evaluate your design for spruing and castability. For new customer designs, or custom contract casting, some pieces will be evaluated at a higher success rate. This is not common, but may be due to design complexity, size, thickness (whether very thin or very thick), elaborate engravings, etc. Some examples would be large cuff bracelets, belt buckles, or highly custom rings.



GENERAL SPRUING GUIDELINES

	Correct	Incorrect
1. Sprue to the thickest section of the model. The sprue should be 25% larger than the heaviest section.		
2. Arrange sprues to provide sufficient mesh to each heavy section.		
3. If casting high karats, color or rings with textures, sprue to edge or inside to ring		
4. Avoid spruing at right angles. Do not sprue at dead level.		
5. Molten metal flows down and out into the flask. Sprue to accommodate flow.		

What You Need To Know

About Molds

We select the mold material that best suits your piece unless otherwise requested. Generally, there is 1% to 6% total shrinkage from master to finished piece. Shrinkage occurs during molding, injection, casting, and finishing. Shrinkage has been calculated from in-house tests and manufacturer specifications and may be different depending on model geometry. (Example: Marquise dimensions change differently than squares and outside dimensions change differently than inside dimensions.)

It is your responsibility to plan for the dimensional change in your parts based on your needs. Consider your model's sprue location, mold material, finishing process and final part requirements. Please call or e-mail with any dimensional change (shrinkage) questions, concerns or for further assistance.

Sometimes, the pieces we receive, while esthetically beautiful, do not account for the natural laws of precious metal flow dynamics. These technical design issues often cause porosity, non-fills, and other casting defects. Based on our experience and testing capability we can compensate for these issues by changing sprues, adding risers, adjusting flask and metal temperatures or recommending a change in the model.

Mold Recommendations

If you want us to work from your mold or metal model, we may recommend modifications to ensure quality. Most commonly we need to replace, modify, move, or completely alter the feed sprue system of your metal model to get the best casting results. Alterations to molds or sprue changes on models are done for a fee. Sprue changes on models will also require making a new mold for a minimal fee. We will contact you in advance regarding any recommended changes.

IF YOU CHOOSE NOT TO HAVE MODIFICATIONS TO YOUR MOLDS OR MODELS, we reserve the right to reject a model mold, or waxes if we feel that the labor required to produce the order exceeds our costs, or that the results will produce poor quality pieces due to pre-existing uncorrected defects.

If you have spent a lot of time or money making a hand carved wax or rapid prototype, it is always in your best interest to make an RTV mold of your valuable design. The small \$30+ investment in a mold is far cheaper than re-carving or rebuilding your design again in the event of a less than satisfactory casting. Back up molds from waxes, are always made in RTV. The casting and mold department will make individual decisions on what type of mold is needed based on the model sent.

Copyrights and Trademarks: Hoover & Strong will not copy or infringe on a customer's copyright and is not liable for copyright infringements by others. It is the customer's responsibility to maintain ownership of the submitted design. Hoover & Strong will not cast designs that have trademarks other than those owned by the customer.



PLEASE NOTE:

Bracelets and/or complex-cut molds will require a quote.



©Ross Coppelman

Types of Molds

Mold Type: VLT

Turquoise Silicon Medium Strength Mold



Molding and Injection Shrinkage: 3%

Pieces: Production (5+ per run)

Mold Use: Small to large production runs. This is our most popular silicon mold. This is a low temperature vulcanizing mold for metal models.

Silver Model Sprue - If needed, we will add a silver sprue to your metal master. This includes clean up of master and silver sprue. Price starts at \$20.

VLT Services - Price starts at \$30.

Large Size VLT - Price starts at \$60.

Mold Type: RTV

Clear Silicon Very Low Strength Mold



Molding and Injection Shrinkage: 1%

Pieces: 1-5

Mold Use: Cold mold process for molding waxes and items that can't be heated. This is not a mold for production runs.

Wax Model Sprue - If needed, we will add a wax sprue to your wax or resin master. Price starts at \$4.20.

RTV Services - Price starts at \$30.

SEND YOUR MODELS AND WAXES TO:

Hoover & Strong
10700 Trade Road
N. Chesterfield, VA 23236-3000
Attn: Casting

Before you send your waxes and masters, please inspect them for:

Surface bubbles, heavy file marks, flashing, incomplete prongs, bearings or bezels, dirt or metal filings on or in the wax, small gaps, cracks or parting lines in your wax. Also, check for the proper karat markings if needed in your models and masters.

Shipping Your Waxes, Masters and Molds:

For tracking purposes, FedEx or UPS are best. The U.S. Postal Service should only be used if you are insuring your items. Wax models should be very carefully packed into a smaller box to avoid any kind of shock. Use soft fibrous material that will not leave behind lint or allow much movement. Please ensure waxes are dry, with no solvent residue to avoid dust buildup. That smaller box should be taped to the inside of a larger box for protection.

REQUIRED FORMS

Prior to sending your casting order, you must complete and sign our CONTRACT CASTING FORM.

The Contract Casting Terms and Agreement Form also needs to be completed and signed the first time you cast with us, but you only have to submit this form once.

Scan this QR code to access all the casting related forms.

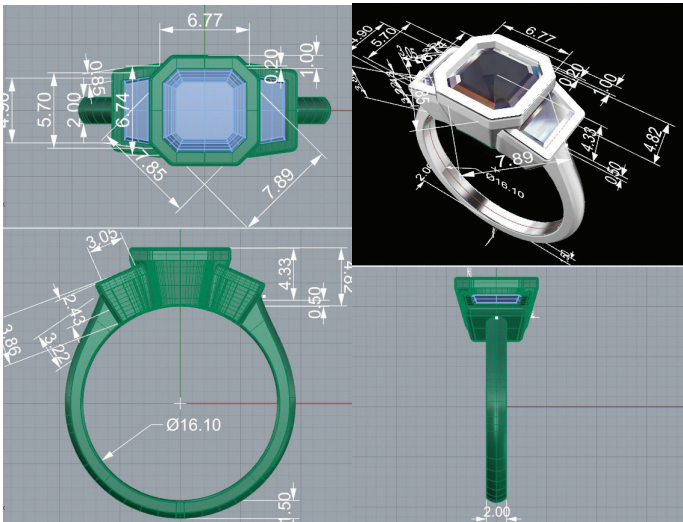


USE OUR ONLINE CUSTOM CASTING CALCULATOR!

Visit our website to get an estimated cost for your piece using our online calculator.



CAD Services



Work with our CAD team for your custom jewelry needs or use our services to design your jewelry line.

We provide full CAD services to all our customers. Send us your sketch or idea and watch your jewelry come to life! We will walk it through design to production using our full services CAD department, prototyping and casting facility.

CAD Estimates: 1-3 days

CAD Development: 5 days

CAD Service	Charge
CAD	\$75/hour, average time 2 hours

When submitting drawings, make sure you fill out our online Contract Casting Form and supply this info:

- metal color and karat to be cast
- finger size
- ring width at top and bottom
- height at top and bottom
- all stone sizes and number of stones
- metal weight
- level of finishing desired (raw casting or a polished piece)

NO MINIMUM ON CAD SERVICES

There is a 1 piece minimum for gold, platinum and palladium.

CAM Services

Just send us your CAD model, and we'll take care of everything else. Our services include printing and casting your model from a wide selection of Harmony Recycled Metals or Fairmined Metals. Whether you prefer a raw casting or hand polishing, we have the flexibility to cater to your needs.

We will accept STL and 3DM file types to print your 3D model, but STL is preferred.

For sufficiently large quantities or large pieces, a mold may be required. This improves turnaround time for the order and reduces labor costs for the order.

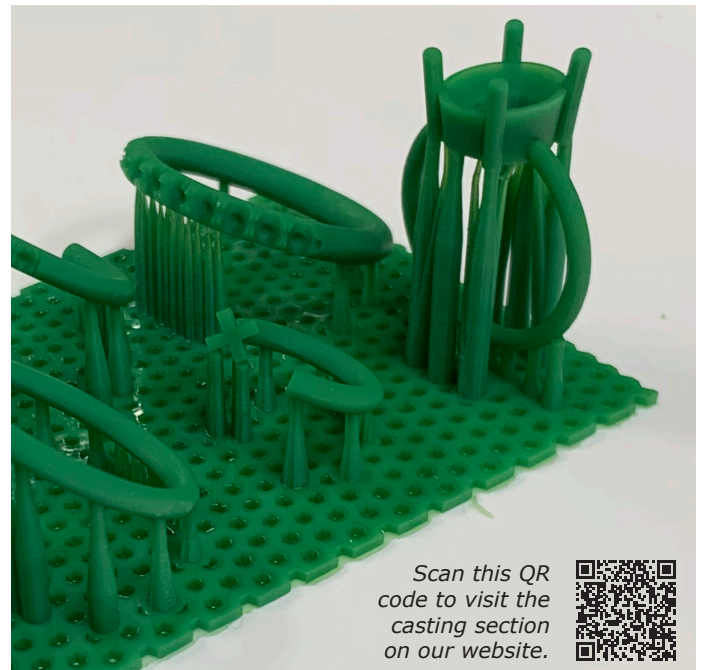
Email your CAD models to: casting@hooverandstrong.com

CAM Service	Charge
3D Print	starting at \$31.50

All platinum or palladium CAD/3-D printed pieces will require a mold.

LEAD TIMES MAY VARY BASED ON THE COMPLEXITY OF YOUR CUSTOM PIECE.

We can RUSH your order for a \$50 fee. Call for details.



Scan this QR code to visit the casting section on our website.



Finishing and Stone Setting Services

Once your product is cast, we offer a range of services that can decrease your workload. Our casting department offers multiple finishing levels. **Ask for clip & ship or mass finish if you want to finish the product yourself.**



Finishing Services	Definition	Charges
Clip & Ship	no finishing (Multiple clipping charges may apply.)	no charge
Burnish Finish*	the product is clipped off the tree and run through a magnetic tumble. No despruing, grinding, sanding or bench work is done.	starts at \$5.00
Mass Finish*	includes grind, de-sprue and magnetic tumble	starts at \$10.29
Sand Blast or Bead Blast**		starts at \$4.99
Rhodium Plating**	white gold only, includes hand polish	\$40.00
Satin Finish**	hand applied	starts at \$12.45
Hand Polish		\$30.00
Karat Stamping		\$2.50
Melee Stone Setting		starts at \$3.89
Center Stone Setting		starts at \$9.49

*Pricing for gold and silver. Prices slightly higher for palladium and platinum.

**Masking is an additional \$10.

SILVER CASTINGS

- Sterling pieces are limited to Clip & Ship, Burnish or Mass Finish. We DO NOT offer additional finishing services for silver.
- There is a 10 piece minimum for silver.

NEED A POST ADDED TO YOUR EARRING?



OR



A CHAIN ADDED TO YOUR PENDANT?

We offer earring and necklace/chain assembly.
Call for details.

CASTING TIME FRAMES

3-4 DAYS

Gold clip & ship

5-7 DAYS

Platinum clip & ship

7-10 DAYS

- large volume clip & ship (50+ pcs) where customer provides mold
- medium volume with mass finishing (25-50 pcs)
- small volume hand polishing (1-10 pcs)

10-14 DAYS

- new model from existing CAD (Wax has to be cast, cleaned up with correct sprue, molded, cut and injected. Then waxes must be cleaned, treed and cast.)
- mold services
- large volume with mass finishing
- medium volume with hand polishing
- small volume setting from existing mold

15-20 DAYS

- large volume hand polishing
- small volume setting from new CAD or mold
- medium to large volume setting

These are general time frames and are subject to change due to volume of orders in-house and the holiday seasons.

Harmony Fairmined Metals



You can MAKE A DIFFERENCE when you choose casting services that utilize Fairmined metals.

Hoover & Strong is pleased to offer casting services in 14KW, 14KY and 18K Royal Yellow Fairmined metals that come from artisanal mines in Peru and Colombia. When you choose the Fairmined option, you help hundreds of artisanal miners, families and communities that are in need.

Ask your customer service rep about Fairmined options when placing your next casting order!

About Fairmined

Fairmined is an assurance label that certifies gold from responsible Artisanal and Small-Scale Mining (ASM). It ensures that small entrepreneurial mining communities meet world leading Standards for responsible practices. Fairmined transforms mining into an active force for good, delivering social development and environmental protection, providing everyone with a source of gold they can be proud of. The supply chain is traceable through Alliance for Responsible Mining (ARM) and SCS Global Services.

How Your Fairmined Purchases Help: Our Fairmined sources receive fair prices and a premiums from Hoover & Strong for their precious metal. These premiums go directly to the mining organizations for transparent investment in the social, economic and environmentally sustainable development of miners, their families, workers and the community.

How Licensees can use Fairmined gold or silver: Jewelers can use Fairmined gold or silver to make an entire piece or part of a piece. As a licensee, you can mark pieces containing Fairmined gold with the Fairmined mark.

While we encourage all Fairmined users to be Fairmined licensed, you do not have to be a licensee to purchase and use Fairmined gold in your jewelry. However, if you are not a licensee, you cannot mark or reference the name Fairmined. You can, however, create your own brand name or just state it is made from gold from certified ASM sources.

Jewelers interested in using the FAIRMINED label should contact the Alliance for Responsible Mining (ARM) to become a FAIRMINED Licensee. Learn more about Fairmined gold and silver at www.fairmined.org.

Scan this QR code to learn more about Harmony Artisanal Metals.

