

MAKE THE CASTING CALL: WORKING WITH A TRADE CASTING HOUSE

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Lost wax casting is an ancient, versatile process that allows you to make just about anything you can imagine. But it also requires very high heat, torches, high-silica plaster, and a learning curve. For jewelry makers who can't or don't want to do their own casting, here's how to work with a professional casting house.

by

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Casting is one of three primary processes used to make jewelry. (The others are die striking and hand fabrication.) The process has been used for millennia because it allows metalsmiths to make just about anything they can imagine. And it's versatile. You can produce one unique piece, or, by making a mold of the original metal piece after it's cast, you can make thousands of wax, then metal, copies. You can take the wax copies, slice them apart, reassemble them into new designs and then cast, mold, and copy those. For these reasons, casting is the method of choice for many jewelers who create production lines. (The wax design and carving process is rapidly being replaced by CAD CAM, however.) Due to the requirements of the process, though, cast pieces are generally heavier than similar pieces made by hand fabrication or die striking methods. So if feather-lightness or springiness are your goal, you may have to look into other production methods.

Many amateur and professional jewelry makers cast their own wax models into metals. But there are good reasons to send a casting project out to a professional casting house.

Experience: While casting is straightforward, practice does make perfect—or at least consistent. Occasional casters may face more frustration than success if the investment isn't mixed right, the piece is not invested correctly, the metal is too hot or not hot enough, the burnout is incomplete, or the spruing is faulty. Having work professionally cast can eliminate virtually all these problems.

Fire: Casting involves extremely high heat. First, there is the burnout oven. Then there is the molten metal which, during the centrifugal casting method, is thrown from an open crucible into the blisteringly hot flask. Casting also involves torches and tanks of gas—neither of which are popular with landlords, may not be a hit with your home insurer, either, and may not be allowed by your city's ordinances. (And some jewelry makers just never become comfortable with the process of casting.)

Expense: A new casting set-up runs between \$1500 and \$3000; used equipment costs about half. If you only cast a few times a year, you may not want to buy the equipment or devote studio space to it. Another big consideration is today's metal prices. When you go to a caster, you only pay for the metal in the piece itself. If you cast yourself, you need enough extra metal for the sprue and button. This can be as much or more than the weight of metal that will be in the final piece of jewelry.

Space: The kiln, caster, and vacuum machine needed for casting takes up space you may not have, if you live in an apartment or a home with family. Wax carving takes only a small work table. If you design with a CAD program, any number of casters can accept your design, via e-mail, print it with a 3D printer, and cast. You won't even have to worry about getting wax in the carpet.

Safety: Casting is messy. Investment is a fine, high-silica-content powder. Mixing it can put dangerous particles into the air, as can quenching the flask after you've finished casting. The kiln puts out fumes as the wax burns. A careful and thoughtful working

environment, good venting, and simple safety precautions eliminate most risks associated with these. But if there are others at home, especially children or anyone with health issues, moving the casting off premises provides great peace of mind. (If you live in an apartment or rented house, the heat, dirt and risk of the process will not sit well with your landlord.)

Spruing: This process of creating pathways by which the molten metal enters the hollow mold is the most critical part of creating a perfect casting. The most beautiful wax can be ruined by poor or inaccurate spruing. Spruing, especially spruing a complex piece, is an art. And most trade casters employ sprue artists to reduce the risk of a ruined casting. (Be sure, however, that they understand any specific design needs—carving, engraving, places where another piece will be joined later--that can affect spruing.)

Special metals: While most jewelry makers get the hang of casting silver, gold and bronze fairly quickly, metals like palladium or platinum, which are cast in special gas environments and at very high temperatures, require a professional. The professional touch can be required for out of the ordinary metals, too. Don Briscoe, owner of Artistry of Gold, a trade caster in Los Angeles, had a client who wanted small solid pieces cast in fine silver, which can be a tricky metal, he says, due to “horrible shrinkage.” But working together, they were able to work out the process and give her the pieces she envisioned.

Finishing: Casting houses may offer a variety of finishing services. You may be able to have the piece returned to you as a rough casting, rough tumbled, or even fully finished and set. If you love the tactility of carving a physical model in wax or prefer working with a CAD program, but you hate the work of finishing, sending your models to a trade caster is the perfect solution.

Other services: In addition to finishing, trade casters may offer mold-making, mold storage, wax injection, stone setting services. Some offer 3D printing services, as well.

If any of this sounds good to you, there are some things to know about working with a trade caster.

Understand the industry: In the last decade, a lot of jewelry manufacturing has been sent out of the US. This means the casting houses that are left are competing not only with domestic casters, but with casters overseas. They're running a tight ship with small margins to stay in the game, says Briscoe. They have to be efficient and this means they don't have a lot of time to educate you on the process of casting. Realize that you are not in an artist's studio when you go to a caster, "but in a factory," says Briscoe.

Understand the process: Nothing frustrates a caster more than someone calling to say "I have this size wax. How much will it cost to cast?" says Jonathan Russell at JR Casting in San Francisco. "It's doesn't work like that. There are too many variables involved. At the very least, I have to know how thick it is, how much the wax weighs, do you want a mold made and what kind? What metal do you want? Do you want multiples or singles?" he says.

That's why casters emphasize that jewelry artists have at least a "rudimentary understanding of casting," says Russell, "so you can talk to the caster in some kind of coherent fashion." At the very least, read about the casting process, becoming familiar with the process and its pitfalls. Better yet, work through the casting process yourself at least once, in a class or with a friend who casts. You'll have a better idea of what can and can't be done, and a greater appreciation of the caster's skill.

Fees: Casting charges and fee structures vary from caster to caster. There may be a per-piece charge, or a flask charge. There may be both. There may be bulk discounts, if you're doing a line of multiples.

Any special services—using your metal, complex spruing, finishing, setting, findings, stones, or expediting an order—will likely incur additional charges. (If you supply

the metal—if you want a specific color or alloy, for example—you'll have to supply enough for the sprues and button. Anything that doesn't end up in the final piece will be returned to you.)

Be sure you understand how the metal is being charged. Most casters cut the sprues off at a reasonable length, weigh the casting, and that's what you're charged for. If the caster is finishing for you, expect to pay for reasonable metal loss. The caster will cut the sprues, weigh the casting, then finish. You're charged for the pre-finish metal weight, which will be somewhat different from the weight of the finished piece.

Be sure you are both using the same weight terminology. Some casters weigh in grams, others in pennyweights (abbreviated dwt.) which is 1/20th of a troy ounce, the standard unit of weight for precious metals. One gram equals .64 dwt. If you assume that you are being quoted at one weight unit, but are being quoted in the other, the caster's price can look either too high or too low compared to other casters.

Time: It may take a day or a week for a caster to turn the work around, depending on how often they cast and the work they have on hand. Be sure their schedule suits yours. Don't forget to factor in mail time, if you send your work to a caster the old-fashioned way. You may be able to ask for expedited service—and pay extra for it—but it's usually done as a favor. Don't make a habit of it, especially around the holidays.

Number: Many trade casters have a minimum number of pieces they'll cast. They may charge a premium for small orders. Others may not take small jobs at all. This will factor into the fee you're charged. (One option might be to find a fellow jewelry artist who is set up to cast, does it well, and is willing to cast for you. You may have to cast on her or his time schedule, however.)

Metal: Not all metals are the same. They are refined differently, and, especially with precious metals, alloyed differently for color and often for the purpose. Some large

casters use metals alloyed with deoxidizers—great for mass marketers but brittle to work for custom designers. If the casting has to match other pre-made elements, you'll want to be sure of a color match before ordering the casting. And a cheap caster may be just that: they may use metal from unreliable sources that results in unusable castings.

Some casters will use the metal you provide them for casting, others will not. A great deal of casting quality can depend on the quality and alloy(s) in the metal—especially if it is scrap from several refiners or other jobs. If you bring the metal to the caster, you will take responsibility for the quality of the casting. If you want to use scrap, talk to the caster about taking the metal in trade—he may pay you scrap value and give you that as a credit against new metal.

Expectations: Unrealistic expectations of novice wax workers can create hard feelings on both sides. The process is called “lost wax” for a reason, says Russell. Once invested and burned out, the original wax is gone. While good trade casters are masters of their craft, even the most proficient caster can have something go wrong. And your wax will go with it. “The casting process is too fluid and organic to be perfect,” says Russell.

Accept that there is an element of risk. Briscoe worked with an artist whose unique process meant that only 8 of 10 pieces cast correctly. She understood and accepted that. Both were pleased with the working relationship.

That said, if a casting fails, most casters will recast at no charge. The exception to this is if you have insisted on spruing the piece yourself. Unless you're proficient at spruing your own pieces, or you've got a piece that must be sprued in a particular way, it's best to let the casting house sprue the piece. “The way metal flows, the temperature of the flask—there are so many thing you need to take into account,” says Russell. Even something as simple as changing the metal—from silver to copper—may affect the efficiency of the spruing. If you just don't trust anyone else to sprue the piece, work with

the casting house—they can give you valuable advice on spruing the piece to suit their process.

A good caster will tell you if there are potential problems with a wax you've designed and may suggest ways to correct it. Listen to his advice. If there is no way to reduce risk, give yourself some insurance by molding the wax with a cold-molding product. If disaster strikes, you'll be able to reproduce the wax. You'll learn from the process.

If you want to work with things like pine cones or plastic toys, you'll have to find a caster willing to work with you. These are particularly tricky because they may not burn out cleanly. They may take time to work out a process that is successful—and there may never be 100% success. Be prepared to accept the risk and the cost of the trial period.

Even when a casting fails, says Briscoe, it's rare that it fails so completely or badly that it can't be molded. Molding allows you to make a wax (or many) from the failure and use that as the starting point to remake an original.

Surface quality: One of the beauties of casting is that the process perfectly reproduces the most minute details put into a wax. On the flip side, one of the nightmares of casting can be that the process perfectly reproduces the most minute details put into a wax. Casting will not eliminate your errors or extraneous marks from a wax. Be sure the wax is very cleanly finished or you—or the caster, if you're paying for finishing--may spend hours removing those scratches that would have taken a few seconds to remove in the wax. Some makers, says Russell, do not completely finish their waxes, preferring to cut the details into the metal for a sharper, crisper look.

Communicate. Ask lots of questions up front. Be sure the caster knows what metal alloy or color you want, if a piece requires special spruing, how finished you want the piece and so on. Listen to what he says or advises. The most important thing in the

process is building a relationship with the caster. “Chocolate chip cookies,” laughs Russell. “You can’t believe how that greases the wheel.” Mostly, respect the caster’s time, his work and his knowledge.

Get a recommendation. Jewelry making friends and workshop instructors are good sources for casting house recommendations.

Barring a personal recommendation, some jewelry artists recommend testing a variety of casters—send a representative piece of your work to several casters to find out whether or not you can work with them, whether they understand your work, and to see the quality of casting they produce. Briscoe emphasizes that because things can—and do—sometimes go wrong, statistically you might get a dud casting from a very good caster. If you do get a bad casting, talk to the caster about what might have gone wrong. You may end up developing a beautiful partnership.

Sidebar:

HOW MUCH WILL IT WEIGH?

To estimate how much metal will be in your casting, weigh the wax (which has a specific gravity very close to 1) with or without sprues, then multiply the wax weight by the specific gravity of the metal. (The chart below provides a guide. Ask your caster for the formula they use.) Remember that a rough casting may weigh a bit more than you expect when you get it back because it will come to you with sprue stubs. You’ll lose some metal in the finishing process—filing, sanding, buffing—so the final, finished casting may weigh less than your estimate. If you work with a lot of precious metal—silver or gold—keep all your bench filings and buffs and send them to a refiner periodically to reclaim this metal.

When converting wax weight into metal weight:

Wax weight x 8.5 = Copper weight

Wax weight x 10.0 = Brass/Bronze weight

Wax weight x 10.5 = Sterling Silver weight

Wax weight x 13.5 = 14 Karat Gold weight

Wax weight x 15.5 = 18 Karat Gold weight