BARNES
Moulding + Casting supplies

SILICONE SELECTION GUIDE - ADDITION/PLATINUM CURE

NAME	RATIO	POT LIFE	DE-MOULD @ 23*C	SHORE	TEAR STRENGTH	VISCOSITY	CERTIFICATION	COLOUR	THIXOTROPIC
PINKYSIL	100:100 PBV/PBW	6 MINS	20+ MINS	20A	4.5 N/mm	2,500 mPa s		PINK	SIL-THIX
ODDBOD	100:100 PBV/PBW	5-6 MINS	20+ MINS	25A	4 N/mm	BRUSHABLE	SKIN SAFE	PINK	N/A
PINKYSIL PUTTY	100:100 PBV/PBW	2 MINS	8-12+ MINS	25A	20 ppi	PUTTY	SKIN SAFE	PINK	N/A
TRANSIL 5A	100:100 PBV/PBW	8-10 MINS	90+ MINS	5A	135 pli	2,500 cps		TRANSLUCENT	SIL-THIX
TRANSIL	100:100 PBV/PBW	8-10 MINS	60-90 MINS	25A	115 pli	5,430 cps		TRANSLUCENT	SIL-THIX
VARIO 15	100:10 PBW	90+ MINS	6+ HOURS	15A	15 N/m	3,000 mPa s	FOOD CONTACT SAFE	TRANSLUCENT	SIL-THIX
VARIO 40	100:10 PBW	90+ MINS	6+ HOURS	40A	15 N/m	10,000 mPa s	FOOD CONTACT SAFE	TRANSLUCENT	SIL-THIX
RTV 3428	100:10 PBW	60 MINS	16 HOURS	28A	20 KN/m	20,000 mPa s		TRANSLUCENT	SIL-THIX
M4601	90:10 PBW	90 MINS	12 HOURS	28A	>30 N/mm	20,000 mPa s	FOOD CONTACT SAFE	SALMON RED	SIL-THIX
M4642	100:10 PBW	90 MINS	12 HOURS	37A	>30 N/mm	15,000 mPa s	FOOD CONTACT SAFE	DARK RED	SIL-THIX
M4644	100:10 PBW	90 MINS	15 HOURS	40A	>25 N/mm	50,000 mPa s	FOOD CONTACT SAFE	TRANSLUCENT	SIL-THIX
M4670	100:10 PBW	60 MINS	24 HOURS	55A	>12 N/mm	80, 000 mPa s	FOOD CONTACT SAFE	BEIGE	SIL-THIX
PLATSIL GEL 0020	100:100 PBW	40 MINS	120 MINS	00-20	24.8 pli	3,900 cps	SKIN SAFE	MILKY TRANSLUCENT	SIL-THIX
PLATSIL GEL 0030	100:100 PBW	45 MINS	240 MINS	00-30	36.6 pli	6,200 cps	SKIN SAFE	MILKY TRANSLUCENT	SIL-THIX
PLATSIL GEL00	100:100 PBW	6 MINS	30 MINS	00-30	56 pli	15,000 cps	SKIN SAFE	MILKY TRANSLUCENT	SIL-THIX
PLATSIL GEL10	100:100 PBW	6 MINS	30 MINS	10A	80 pli	15,000 cps	SKIN & FOOD CONTACT SAFE	MILKY TRANSLUCENT	SIL-THIX
PLATSIL GEL25	100:100 PBW	5 MINS	60 MINS	25A	146 pli	6,000 cps	SKIN & FOOD CONTACT SAFE	MILKY TRANSLUCENT	SIL-THIX

PLEASE READ PRODUCT TDS FOR MORE INFORMATION

SILICONE SELECTION GUIDE - CONDENSATION/TIN CURE

NAME	RATIO	POT LIFE	DE-MOULD @ 23*C	SHORE	TEAR STRENGTH	VISCOSITY	CERTIFICATION	COLOUR	THIXOTROPIC
M4503	100:5 PBW	90 MINS	15-20 HOURS	25A	>20 N/MM	40,000 cps	N/A	WHITE	THIXO C
M4470	100:3 & 100:4 PBW	90 MINS @ 3% 80 MINS @ 4%	20-24 HOURS @ 3% 5-6 HOURS @ 4%	60A	>4 N/mm	10,000 mPa s	N/A	RED OXIDE	N/A
TUFSIL	100:2.5 PBW	20 MINS	24 HOURS	28A	2.8 KN/m	30,000 cps	N/A	WHITE	SIL-THIX

PLEASE NOTE THERE MAY BE FURTHER INFORMATION AVAILABLE ON EACH SILICONE PRODUCT PAGE OF OUR WEBSITE, AND OUR SDS & TDS DOCUMENTS. THERE ARE OTHER ANCILLARY PRODUCTS THAT MAY BE USED WITH OUR SILICONE SYSTEMS SUCH AS PIGMENTS, SILICONE DILUENT, FAST CATALYSTS, PRIMERS AND ADHESIVES. PLEASE EMAIL TECH@BARNES.COM.AU FOR CLARITY REGARDING COMPATABILITY.

WHAT SILICONE SHOULD I USE?

Have you asked yourself the following questions?

- Do the dimensions need to be very accurate i.e. shrinkage?
- What material will be cast into the mould and how aggressive is it?
- How quickly does the mould need to be ready?
- Will the silicone be poured or brushed on?
- Is good flowability important?
- How hard or soft does the finished mould need to be?
- Will the mould be subject to strong forces i.e. are there any undercuts?
- The design of the mould such as single part block mould, two-part block mould, brush on silicone skin, or matrix mould
- Are there any special requirements e.g. colour, suitable for food contact, heat resistance?

WHICH TYPE OF SILICONE IS MOST SUITABLE?

Addition/Platinum Cure Silicones

- Maximum reproduction accuracy & dimensional stability
- Multiple reproductions may be produced
- Fast set times available
- No volatile reaction produced upon cure
- Ready for immediate use
- Compatible with a wide variety of casting materials
- Curing may be disrupted by substances that block the catalyst, also referred to as inhibition
- Available in food contact and skin contact safe formulas

Condensation/Tin Cure Silicones

- A more cost-effective option for making reproductions
- Low to no risk of inhibition
- Shrinkage of the cured rubber is on average between 0.4 to 0.8%
- Requires approx. 50% relative humidity to cure in conjunction with the catalyst
- Mould may require cleaning, post-curing, and/or sacrificial cast
- Additional & special catalysts available for altering cure times

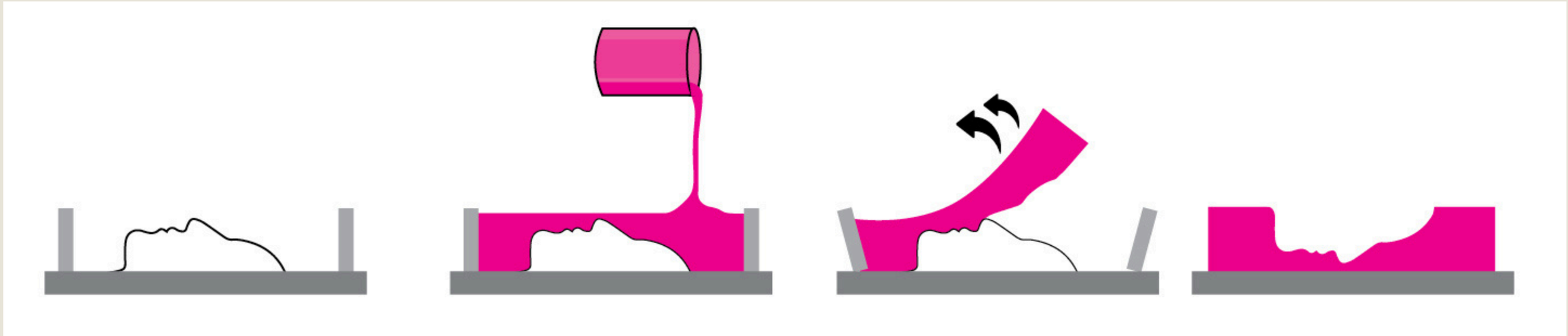
THE LIFESPAN OF A SILICONE MOULD

“How many casts will I get?” is something we often get asked. Silicone rubber moulds are capable of producing many reproductions; however, there are variables that will effect the final number. The mechanical properties of the silicone, the mould design, and the casting material are some key factors in the number of casts that may be produced.

- We recommend storing your mould in a cool, dry space, and if possible, cover it from dust and contamination but allow ventilation. You may also need to store your mould upside down and/or add additional support to avoid warping in storage.
- Try to avoid casting different materials into the same mould and let it rest in between casts.
- If your mould needs to be cleaned, avoid aggressive solvents and use warm soapy water, rinse thoroughly and sufficiently air dry.
- Try to design your mould and select a silicone that will avoid stretching the cured silicone as much as possible during de-moulding.
- In some instances, release agents may help protect the mould and delay burnout.
- The casting material you select may fall somewhere on the scale between aggressive to non-aggressive. Epoxides and Polyurethanes would be considered aggressive, through to Waxes and Plasters being considered non-aggressive.

COMMON MOULDMAKING TECHNIQUES

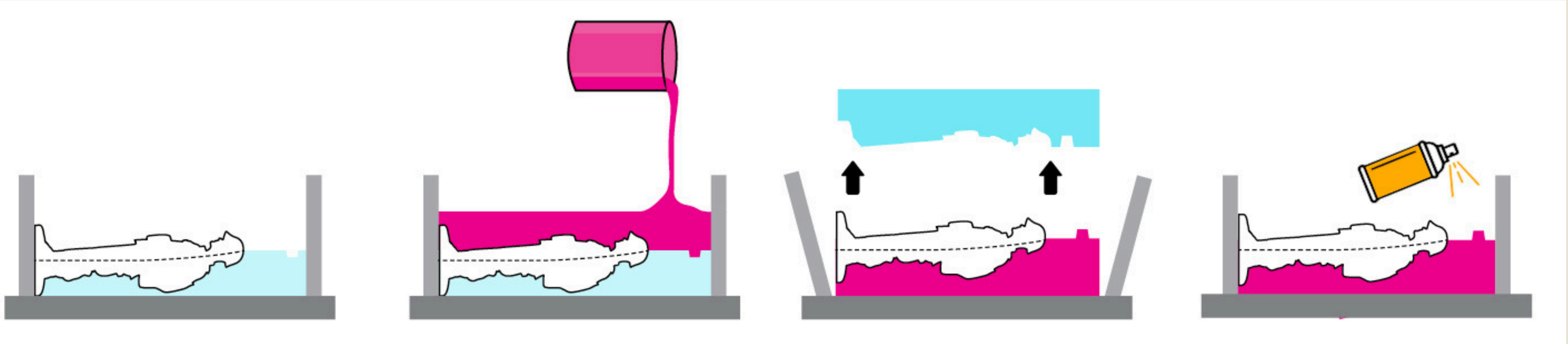
1. BLOCK MOULD



Step 1: Prepare Your Object and Mould Box	Step 2: Mix and Pour the Mould Material	Step 3: Demoulding	Step 4: Prepare for Casting
Place your object into a non-porous mould box that is appropriately sized for your project. Ensure the object is clean and free from oils, fingerprints, or debris. Secure it to the base of the mould box to prevent floating during pouring. If you're unsure of the object's material compatibility with the mould material, conduct a small test before proceeding.	Measure and mix your mould material according to the manufacturer's instructions. If required, vacuum degas to remove trapped air. When pouring, hold the container at least 20-30cm above the mould box and pour slowly in a thin, steady stream. This technique helps reduce air bubbles. Pour into the lowest section of the mould box, allowing the material to flow naturally. Minimize movement while pouring and take your time if the material's pot life allows.	Once the mould material has fully cured, carefully remove the mould box walls. Gently peel the mould away from the object. If the object does not release easily, make an "S" shaped cut using a scalpel or similar tool—this prevents the mould from tearing over time. Some materials may require post-curing before use, while others are ready immediately.	Place your mould on a clean, flat surface, ready for casting. For added support, you can reassemble the mould box around it. If you made a slit in the mould for de-moulding, secure it with rubber bands, painter's tape, or the original mould box to maintain shape during casting.

COMMON MOULDMAKING TECHNIQUES

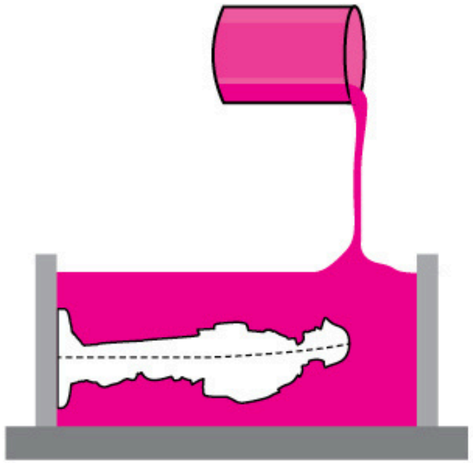
2. TWO-PART MOULD - POURED

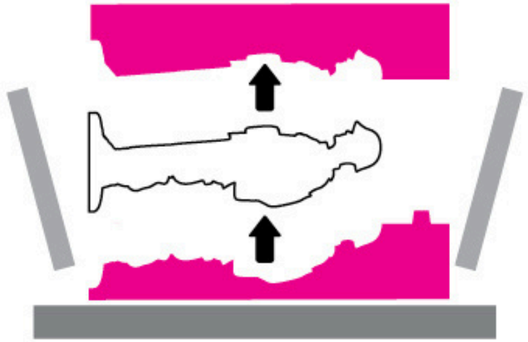


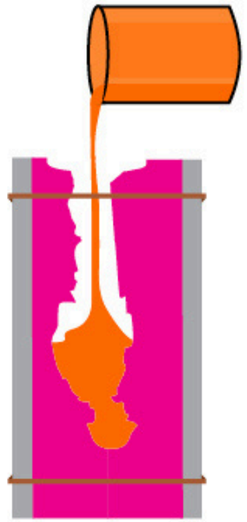
Step 1: Prepare & Create the First Half of the Mould	Step 2: Mix and Pour the Mould Material	Step 3: Removing the Clay	Step 4: Prepare for the Second Pour
Place your object into a non-porous mould box that is appropriately sized for your project, and work out where the pour point will be located. If this is not obvious, you may need to create a sprue. Ensure your object is clean and free from oils, fingerprints, or debris. Use a product such as oil-based clay to embed the object up to the halfway point, pressing it firmly to create a clean parting line. Add registration keys in the clay to help the mould halves align. If you're unsure of the object's compatibility with the mould material, conduct a small test before proceeding.	Measure and mix your mould material according to the manufacturer's instructions. If required, vacuum degas to remove trapped air. When pouring, hold the container at least 20-30cm above the mould box and pour slowly in a thin, steady stream. This technique helps reduce air bubbles. Pour into the lowest section of the mould box, allowing the material to flow naturally. Minimize movement while pouring and take your time if the material's pot life allows.	Once the silicone has cured, remove the mould box walls and carefully flip the half silicone/half clay slab over. Gently remove the clay, taking care not to disturb the original object. If the object dislodges from the first half of the silicone mould, it may cause inaccuracies and unwanted air pockets. Ensure the surface of both the object and surrounding area is as clean as possible before proceeding.	Reassemble and secure the mould box around the cured silicone slab. Apply an appropriate release agent to prevent the two halves from bonding together. For the best coverage, spray or apply the release agent at different angles. Once fully coated, you're ready to pour the second half of the mould.

COMMON MOULDMAKING TECHNIQUES

2. TWO-PART MOULD - POURED



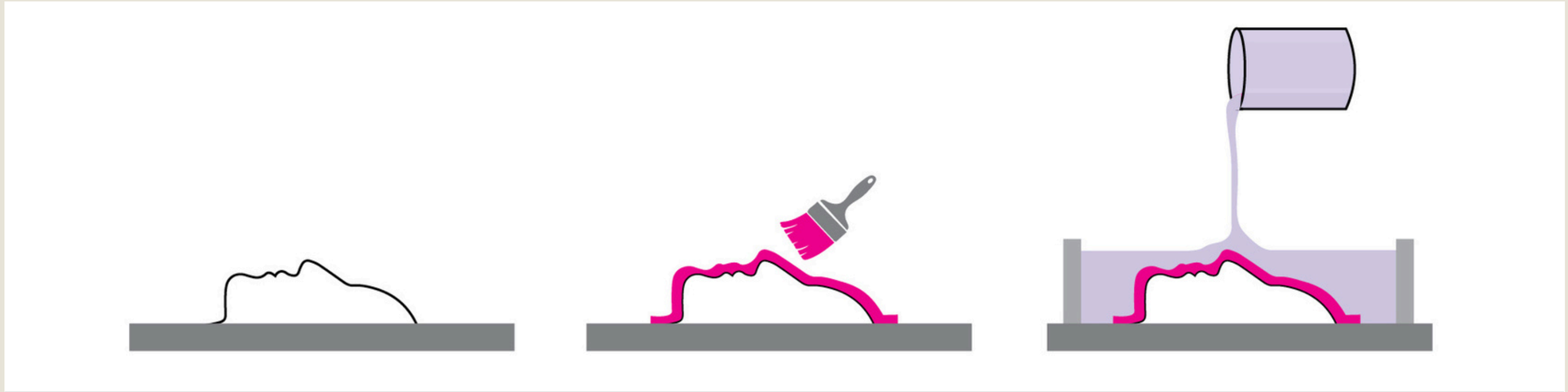




Step 5: Pour the Second Half of the Mould	Step 6: Disassemble and De-mould	Step 7: Prepare the Mould for Casting	Step 8: Cast Into Your Mould
Follow the same process as step 2.	Remove the mould box walls and carefully peel back the most recently poured layer. Extract the original object and inspect the mould for any imperfections. Some moulds may require post-curing before use, while others benefit from a gentle wash with warm soapy water and thorough drying.	Even with registration keys, the two mould halves must be securely strapped together. Use rubber bands or gentle tape, but be mindful that these can create pressure points or distort the mould. To prevent this, consider placing the mould between two baseboards for added support, ensuring even pressure distribution. Apply any relevant release prior to strapping the mould.	Now your mould is ready for use. Place it on a level surface and cast your material into the mould. Once you have finished using your mould, it may require a gentle clean prior to storing it away. Consider covering it in a sheet of plastic, or placing it into zip lock bag or storage tub. These do not need to be air tight to allow for some ventilation, but they should be kept in a cool, dark place for longevity.

COMMON MOULDMAKING TECHNIQUES

3. BRUSH ON MOULD



Step 1: Prepare Your Object and Mould Box	Step 2: Brush On Mould Material	Step 3: Create Rigid Support
Place your object on to a clean, non-porous base board and ensure the object is free from oils, fingerprints, or debris. Secure it to the board by either strong adhesive or screws to prevent movement. If you're unsure of the original object's compatibility with the mould material, conduct a small test before proceeding.	Measure and mix your brushable mould material, starting with a thinner print coat. As you apply the material with your brush, work at different angles to ensure it gets into every detail and potential undercut of the object. Allow this first layer to nearly cure before applying subsequent layers to build the appropriate thickness. For added stability, create a flange around the object by brushing an additional 3cm or more onto the board. This extra room will allow for a more finished edge and an easier de-mould.	Assemble some walls around your object that has now been covered sufficiently. If necessary,, apply a release agent to the surface of the mould and the mould box itself. Mix and pour your rigid support material such as plaster, and wait for it to set.

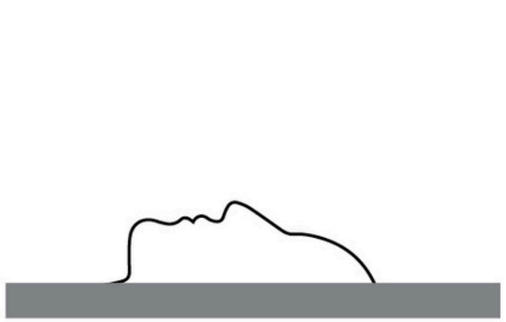
COMMON MOULDMAKING TECHNIQUES

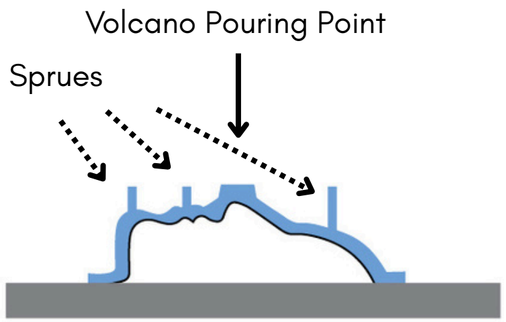
3. BRUSH ON MOULD

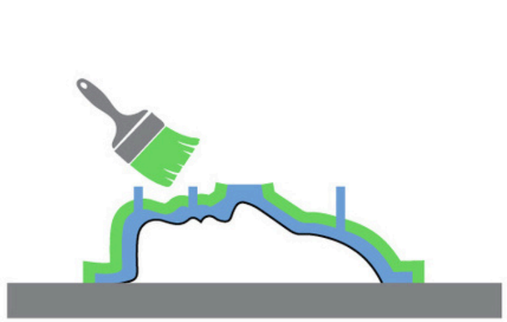
Step 4: De-mould	Step 5: Prepare Your Mould	Step 6: Cast into Your Mould
Remove the mould box walls and gently pry away the rigid support. You may also remove the mould material from the master which may need a gentle wash at this point with some warm soapy water and thorough dry.	Place the rigid support on to a level, clean surface. At this point you may want to lightly talc the outside of your mould prior to placing it in the rigid support. The talc can relieve surface tension and make it much easier to remove and slot into place. Once your mould skin is positioned, you are ready to cast.	Apply a release if necessary, then cast into your mould. Once cured, see how easy it is to pull at the flange and lift out the mould. At this point you should be able to easily remove the skin from your cast. Once you have finished using your mould, place the skin back into the rigid support and covered for storage in a cool, dark place.

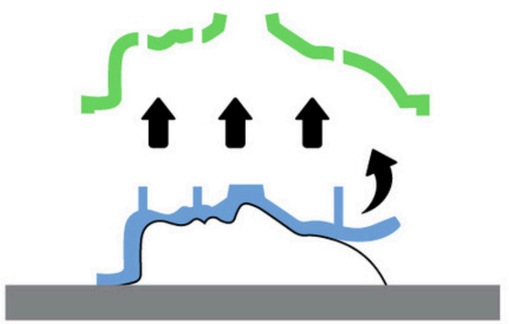
COMMON MOULDMAKING TECHNIQUES

4. MATRIX MOULD





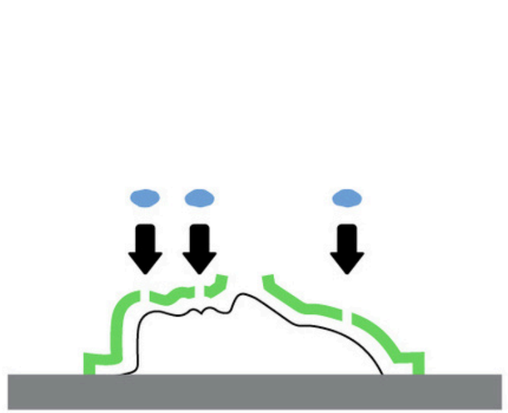


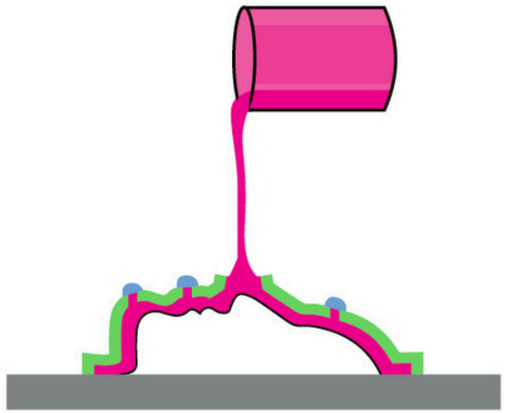


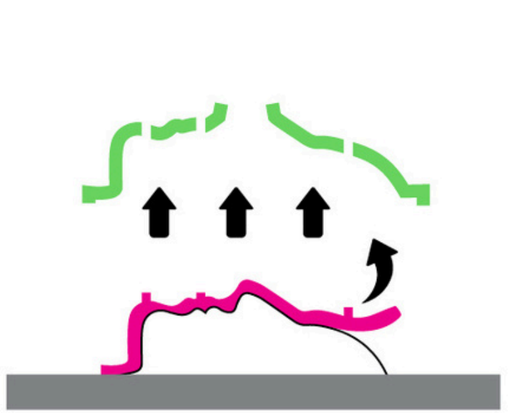
Step 1: Prepare Your Object	Step 2: Cover With Clay	Step 3: Brush On Shell	Step 4: Remove the Shell & Clay
Place your object on to a clean, non-porous base board and ensure the object is free from oils, fingerprints, or debris. Secure it to the board by either strong adhesive or screws to prevent movement. If you're unsure of the original object's compatibility with the mould material, conduct a small test before proceeding.	Use a clay to cover the object averaging 8 to 20mm in thickness. Keep in mind this is to imitate the thickness of the mould material that will take its place. Include sprues to assist with air release and a pouring point which helps the skin mould fit securely into the rigid shell without shifting. The location of the sprues will be determined by the high points of your master. We would suggest a sulfur-free, oil-based clay; however, your clay selection may be dictated by your shell mould material. Make sure to create a flange with the clay.	There are a number of terms used for this process such as shell, mother mould, case mould, and jacket. There are also a number of different materials that may be used such as plasters, laminating resins, brush on resins, and 3D prints. Depending on the material selected, you will need to ensure the appropriate release agent and possible barrier product is used. The shell material is then applied over the clay, around the volcano & sprues allowing them to stay visible. Make sure the flange is well covered, as the shell needs this part to be secured in an upcoming step.	Once your shell has cured, you can use a marker to draw around the base, or pre-drill holes before removing to screw the flange back down. This ensures accuracy of shell placement. Next you may remove the shell from the clay, and then the clay from your master object. At this point you may need to gently clean the surface of your master and the interior of your shell, as the mould material will pick up a high level of detail and the clay has likely disturbed the surface finish. Ensure all surfaces are dried thoroughly.

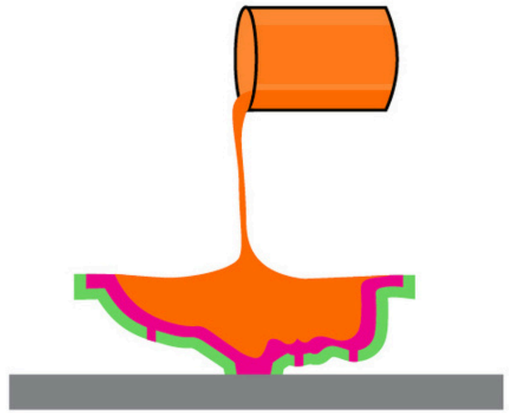
COMMON MOULDMAKING TECHNIQUES

4. MATRIX MOULD









Step 5: Re-assemble & Secure the Shell	Step 6: Pour Your Mould Material	Step 7: Remove the Shell & Skin Mould	Step 8: Cast Into Your Mould
The shell is now placed over the master into position, and may be secured by screws or clamps. The shell will need to be secured in order to ensure the mould material does not leak, or shift the shell. Using the same clay, you can plug the smaller sprue cavities. Again, depending on the shell and skin materials selected, you may need to apply a release agent before this assembly.	Measure, mix, vacuum and pour your mould material into the volcano pouring point. If the pot-life allows, pour slow and steady to minimize any air bubbles. A fast pour may also create pressure inside the sprues and create unnecessary leaks and air pockets. If a blocked sprue starts to leak during a slow pour, it is more likely that you are at the end of you pour.	Once the mould material has cured, you may first remove your shell and then remove the flexible skin. The volcano and sprues will act as keys to ensure the skin slots nicely into position and doesn't move. If you use a silicone, you may want to carefully dust talc on the outside of the skin, to create less surface tension when slotting into place inside the shell. Another consideration is to embed a frame or legs when making the shell, so it may stabilize on a flat surface.	Now that the shell and skin are ready to use, assemble on a clean and stable surface. You may now cast into your mould. Although this may be a more time consuming method, it is often more economical and you will find the skin mould will peel off your cast creating an easier de-mould.