

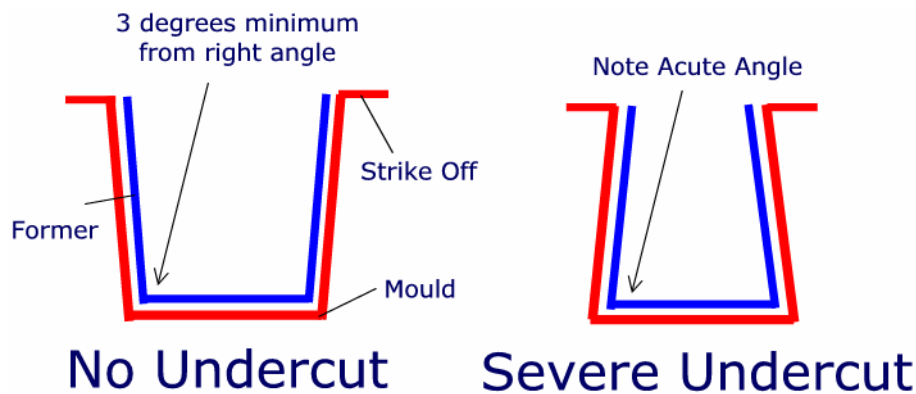
TOMPS Mould Making & Casting Guide 2006

Single Piece GRP Fibre Glass Moulds

Rigid moulds have several advantages over their soft counterparts like silicone and latex. They self support and do not require cases and can produce a very glossy finish. They are also extremely durable.

However they also have their disadvantages due to their inflexibility. First off they will not release a cast with an undercut without damage to the mould or cast itself. They are also difficult to demould casts from due to their rigidity often requiring more effort or force to demould than their soft counterparts.

When a former with an undercuts presents itself a sectional mould will be needed, refer to the next section for selecting split points. However with a simple object like that pictured below a single piece mould will suffice.



Firstly prepare your former and fix it down to a base board. Seal the entire area including the board and apply a release agent (s). We recommend waxing and buffing to a high gloss then using gloss PVA over the top. This will give a reliable release of the mould from the former. By using gloss PVA you will end up with a Gloss finish to the mould. Matte PVA is also available should you not require a glossy mould surface. Allow the release agents to dry fully.

Begin to prepare your reinforcements at this stage. Cut glass mat and tissue to fit neatly around the former. Gather some chopped strands (or make some by pulling mat to pieces) as these will be used to reinforce the Gelcoat layer.

Next prepare some gelcoat, preferably coloured as this shows where you have coated by easy visual inspection. Approximately speaking 1kg of Gelcoat is enough for 1 square metre coverage. Apply via brush or spray and look to achieve a few millimetres of gelcoat in an even layer. Continue over the former and onto the base board which will provide you with strike off points.



You must now allow the Gel to reach the green stage. This is determined by gently touching the gel with your finger. If it feels tacky but comes away clean you are ready to continue. If it leave residue on the finger wait a little longer. At this stage if you proceed too quickly you will ripple the gel and ruin the mould.

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Next prepare some resin, most choose 0.5-1kg at a time. Catalyse as per the instructions (usually 2-3%) and paint a good coat onto the gel. BE GENTLE!!!! Lay on your tissue and allow it to wet out then ensure it lays flat to the gelcoat using a stipple action with a paintbrush. Where there are shallow areas add a few chopped strands to level it all out before laying on the pre cut matting. Again allow the resin to come through from behind, but you can add resin onto the top.

Be careful to remove all air using stippling and paddle rollers. Work outwards from a central point. Note that on verticals or overhangs the resin may want to run out of the mat. If this is the case thicken it slightly with some silica or calcium carbonate.

After the first layer of mat is applied and all air driven from it allow it to cure. Wait for the exotherm to reach its peak before beginning to prepare more mat and resin. Then repeat the process again allowing the peak exotherm to pass before starting the next layer.

Excessive heat build up can cause problems with the Gelcoat like rippling or cracking and can even cause premature de-lamination of the matting from the gel or the layers of mat themselves to separate.

Typically 3-6 layers of 450 gram mat should be used to ensure no deformation during use. Alternatively use stronger tooling resins like Vinyl Esters instead of Polyesters. The more layers you add the more rigid the mould becomes but the less likely it is to deform. Generally you should consider at least double the thickness of your tool to that of your cast.

For very large areas consider encapsulating metal tube or section into the laminate, particularly when there are large flat areas. This will assist in reducing deformation with regular or heavy mould use.

Allow the whole thing to cure fully, minimum 24 hours and gently separate from the former and base board. You may need to use plastic flexible wedges at intervals along the edges to help it demould. Constant pressure at many points usually produces the best result rather than tugging hard at one corner where damage may occur.

At all costs ensure that there is resin and glass in full contact with the gelcoat, if there are any air spaces you will end up with a weak surface to your mould or small holes appearing after first use. This can be filled with gelcoat after the moulding operation.

To do this clean out the hole with a pricking tool clearing all loose gel. Ensure there are no pieces or loose areas around and wash out with Acetone. DO NOT TOUCH THE AREA to be repaired, oils from the skin will decrease adhesion of the gelcoat. Lay in some gel just proud of the surface and block back. Then compound back to a gloss and re-wax.

You can also use car body fillers such as P38 or P40 or Durabuild Mould Repair Systems to cure these problems.

The next section covers the basics of a two piece mould, the lamination process is the same, the section concentrates on separation points and flange construction (the point where the mould halves meet and join).