

**COMPOSITE ENVISIONS KNOWLEDGE HUB
PRACTICAL AND INSIGHTFUL COMPOSITES INFORMATION**



MULTIPLE PIECE MOLDS - FILLING THE GAP



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INTRODUCTION

The time spent effectively preparing a plug or tooling surface will result in creating parts that will require little to no finish work on the part itself. Minimizing the gap between the flanges of the split mold surfaces is the best way to achieve the best finish on parts that will ultimately require less work for finishing. However, gaps are part of the split mold process. Dependent on the size of the gap, the surface finish of the part may be altered. Small gaps may simply be in the form of a thin resin wall up that can easily be chipped and lightly sanded away. However, a big enough gap could lead to distorting a weave pattern or having a faulty surface finish. Repairs on some of these parts could take hours or days to achieve the desired surface finish on the part.

While some molds have gaps upon initial fabrication, some molds inherit gaps through wear, repeated use, and even thermal cycling. This may cause a mold to change dimensionally and increase sizing of a gap. This is not necessarily a reason to scrap the mold out. Often a “filler” can be placed into these gaps and smoothed accordingly to provide a high-quality surface finish. The fillers used can vary depending on desired surface finish needs.

FILLING GAPS

Most fillers are used by pressing a modeling clay, filleting wax, or other material onto the gap area to provide a seamless transition between the split mold surfaces for the part layup. Modeling clays and filleting waxes have a broad range in applicable uses in composites and mold making. One of their top uses is gap filling for providing smooth transition surfaces in split mold applications. It is important to know that smoother finished molds create smoother final parts. This goes the same way for the parting lines in a split mold that the part will see. Selection and application of the gap filler makes all the difference in how much work will have to be done for achieving the desired surface finish in the final part.

Chavant Le Beau Touché Plasteline Non-Hardening Clay 2-lb Block has proven to be effective in filling most tooling gaps as it is reformable and easily removable after a part has been cured. It is specifically designed for use in composites with resins and gelcoats. These clays feature high flexibility for conforming to complex shapes and gaps. Once worked into the tooling gap, the clay may not seem like it is smooth enough for achieving a high surface finish for the mold. For this, using a small amount of light solvent on top of the clay will help smooth the clay out to achieve a desired smooth tooling surface. Just remember to prep the entire tool effectively with a PVA mold release before layup as some solvents may remove any applied mold release from the tool surface. Referencing Technical Data Sheets for each product used is highly encouraged in this situation, especially for compatibility with mold release. These types of clays should not be used for elevated cure temperatures in ovens or autoclaves.



MULTIPLE PIECE MOLDS

Gaps can also be filled effectively using filleting wax. Filleting waxes are used commonly in part for making split molds. They are also referred to as “filling” wax because they provide a smooth workable solution for filling gaps in split molds. It is applied by hand and worked into the gap as clay would be. However, because this filling material is a “wax” so common resins such as polyester, vinyl ester or epoxy do not stick to its surface. (It can be applied after the mold release) The wax is reformable and reusable. However, this wax should not be used in elevated temperatures with oven cures as the wax will melt.

Airtech release (Flashbreaker) tapes may also be used to fill small gaps in split molds. It is easy to apply to any mold surface and will hold up to general layup practices in smaller gaps. However, there will be a parting line or tape line in the part’s final finish. This is just generally a resin line that can be hand sanded out of the final part. Use of this simplified method is highly dependent on final dimensional tolerances of the part as there will be a mil gap dependent on the thickness tape used for the gap. In other words, it is an option, a quick and easy one, but probably not the highest quality option.

There are also a wide variety of silicone mold putties that can be used to fill gaps for elevated temperature situations. Running a bead of silicone on the edge of the flange before bolting the mold together will help to provide a seamless transition along the parting line of the mold. After its is bolted up, put a pair of chemical resistant gloves on and smooth out the excess using a finger or smooth surface such as a plastic scraper or equivalent. Mostly any type of silicone will work for this application dependent on the temperature exposure of the part during cure.

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