

Focus On

New & Green Molds

Why are new and green molds sometimes a problem?

It is a known, and accepted fact that the resins used to build fiberglass molds don't fully cross-link. This less than 100% cure, means there is always some un-reacted styrene in the gel coat of the mold and in the reinforcing layers of laminate. It is the un-reacted styrene that can cause molding headaches. Heat that is generated when the first parts are molded can drive this un-reacted styrene up and out of the mold. These styrene vapors can degrade or destroy the release coating. The severity of styrene migration out of a new and green mold depends on the amount of un-reacted styrene built into the mold, and the amount of heat the part generates during cure.

It is always important to follow the break-in procedures for new and green molds as prescribed by your mold supplier. If you have built your own molds and you are using a polymeric liquid release or a paste wax (MoldWiz or PasteWiz) we recommend using PVA for the initial break-in period. PVA acts as a barrier. It prevents the styrene from migrating further, reacting with the spray-up gel-coat, and bonding a part with the mold. As heat is generated in the molding of each part with PVA, the mold gradually cures more completely.

When properly applied and cured, semi-permanent mold releases can provide a good barrier between the mold and the part. For this reason, manufacturers who use semi-permanent releases frequently choose to forego PVA. Usually they compensate for the new molds by adding an extra coat of sealer and 2 or more extra coats of release. If you intend to use an XTEND semi-permanent mold release on a new or green mold, we recommend a minimum of 3 coats of S-19A sealer with a minimum of 30 minutes cure between coats. This should be followed with 6 coats of release, allowing 20-30 minutes between each coat. After the final coat of release has been applied, the mold should be left a minimum of 3 hours, or preferably overnight, to cure before molding.

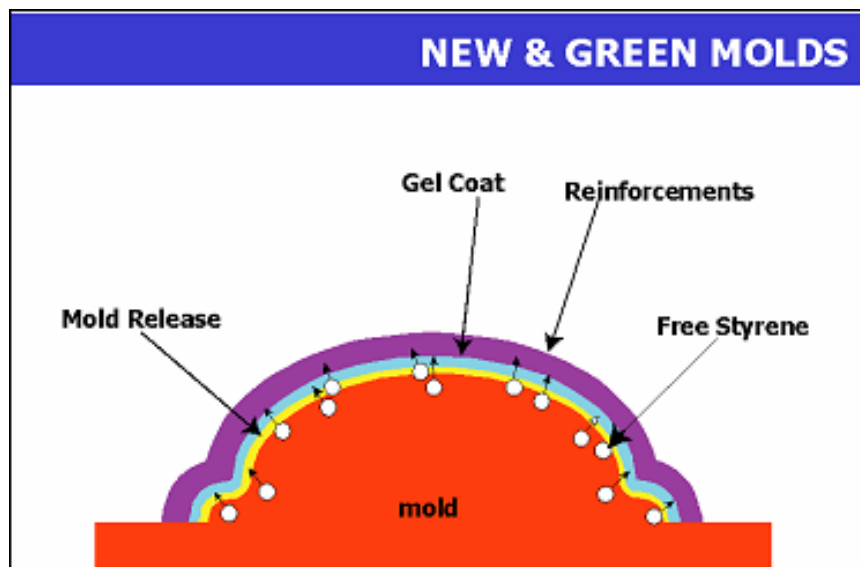
Few molders like using PVA. However, PVA is an inexpensive insurance against the risk of damaging or ruining a brand new mold. PVA is not soluble in styrene (which is why it protects the mold so well), but easily soluble in water. Prepare your molds with the release system that you ultimately intend to use, following the recommended application for that product. When de-molding the first parts, some of the PVA will stick to the mold. Wipe off PVA with a damp cloth and dry thoroughly. Apply another coat of release, follow with PVA, and then mold again. Continue this procedure of release plus PVA until all the PVA comes off with the molded part. Then, apply two good coats of liquid release and proceed without applying PVA. If you have decided to use PVA as an extra barrier of protection over a semi-permanent sealer and release you may find that it is difficult to get the PVA to wet the release, since semi-permanent releases are generally more slippery than wax or polymeric releases. Your supplier of PVA can offer some guidelines for this operation. Rexco, a major manufacturer of PVA, offers formulations with different flow characteristics. They suggest that when PVA is applied to a slippery surface it should be sprayed on with an initial fog coat and then gradually and repeatedly sprayed until the desired thickness is achieved (for additional information, contact www.rexco.com.)

Every mold will vary on the number of cycles for which you must apply PVA. Usually 2-4 applications are sufficient before the PVA comes off completely with the molded part. However, on a properly constructed mold, where a sealer and mold release are applied correctly, the PVA may release with the first de-molding. If there is a spot in which the PVA does not release from the mold, then you most likely have a soft spot. Spots in the mold that have not reached a proper hardness interfere with easy and smooth mold release. These spots may be due to incomplete catalyzation, and therefore contain un-reacted styrene. Styrene bleed-out often appears on molds

as dull, discolored or white spots with a rough texture. Styrene build-up can accumulate fast so when buildup occurs in an area, that area should be maintained more frequently. Failure to address build-up promptly and routinely can compromise release and the production of good and uniform molded parts.

There is no way to measure the amount of un-reacted material in a new and green mold. You may develop a successful break-in procedure without using PVA for several consecutive new and green molds without mishap. Then, without forewarning, a mold with a lot of un-reacted styrene bleeds and you stick the part on the new and green mold. When this happens, the release agent is invariably blamed for the failure. In reality, the release agent was not the cause. Rather, it was the migration of un-reacted styrene, which acted as a solvent to degrade, dissolve or permeate the release agent on the mold surface.

To reduce the incidence of molding problems, remember that the some factors apply to both seasoned and new and green molds. Careful attention should always be made to 1) Proper gel time of the production gel-coat, 2) Maintaining an optimum & consistent gel-coat thickness, 3) controlled scheduling of backup reinforcements, 4) Assuring catalyst gel-coat compatibility, 5) Properly maintaining & operating spray equipment, 6) Not applying gel coat, resin, release or any other materials on cold molds.



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