

# Sealers & Release Agents

# Selection Guide

The careful selection of sealers and/or release agents is essential to successful mold making and casting. As you will see, there are many ways these materials can be used separately or in conjunction with one another. Therefore, this guideline makes no guarantees regarding the success of any particular release or sealer. There is no substitute for adequate testing! Feel free to contact Polytek® technical support staff for assistance at 800-858-5990 or via sales@polytek.com.

The following table provides summary information on sealers and release agents available from Polytek®. For more detailed information, please read the entire document:

Polytek® Product	Sealer	Release Agent	Use On Model or In Cured Mold	Description
Poly PVA Solution	✓	✓	Both	Water-soluble, alcohol-based sealer for porous models. Also acts as barrier coat when casting in cured molds. Available in clear or green. <i>Can be applied to models for use with liquid polyurethane and liquid silicone rubber. Should only be applied to cured polyurethane molds.</i>
Pol-Ease® 2350 Sealer & Release Agent	✓	✓	On Model Only	White petrolatum dissolved in mineral spirits. This semi-permanent option can serve as a sealer and/or release agent. <i>Can be applied to models for use with liquid polyurethane and liquid silicone rubber.</i>
PolyCoat Sealer & Release Agent	✓	✓	Both	Semi-permanent, silicone-based sealer and release agent. <i>Can be applied to models for use with polyurethane and platinum-cured silicone rubbers (not recommended for tin-cured silicone rubbers). Can be applied to cured polyurethane, platinum-cured silicone, and tin-cured silicone rubber molds.</i>
Pol-Ease® 2300 Release Agent		✓	Both	Silicone-based, aerosol spray release agent for use on non-porous or sealed models. <i>Should only be used with polyurethane rubber.</i>
Pol-Ease® 2450 Release Agent		✓	Both	Solvent and silicone-based release agent for use on models before pouring <i>liquid polyurethane rubber</i> . Fast drying, but flammable. Can be applied to <i>cured polyurethane molds</i> , but avoid puddling on the surface.
Pol-Ease® 2500 Release Agent		✓	Both	Aerosol spray release agent that can be washed off of models and castings. Preferred choice when castings need to be painted. <i>Can be applied to models for use with liquid silicone rubbers, but is not recommended for use with liquid polyurethane rubber. Can be applied to cured polyurethane and silicone rubber molds, but may affect mold life of cured polyurethane rubber.</i>
Pol-Ease® 2601 Release Agent		✓	In Cured Mold Only	Water-based release agent designed for use when casting concrete or plaster. <i>Should only be applied to cured polyurethane rubber molds.</i>
Pol-Ease® 2650 Release Agent		✓	In Cured Mold Only	Silicone-free, oil-based release agent designed for use when casting concrete or plaster. <i>Should only be applied to cured polyurethane rubber molds.</i>
Pol-Ease® 2750 Latex Release Agent		✓	In Cured Mold Only	A release agent designed specifically for use when casting concrete into latex rubber molds and will result in easier demolding of concrete parts and improved mold life. <i>Should only be applied to latex molds.</i>

## General Notes on Sealers

Release agents and sealers serve different purposes. In the simplest sense, a sealer is doing just that: sealing small pores/holes so that liquid mold material cannot penetrate the surface. Sealing these pores reduces the chance that rubber can stick or mechanically lock onto the model/master. Sealers and releases do not necessarily need to be used together. In some applications, a sealer is all that is needed. In others, there is no need for a sealer, but a release may be critical.

Sealers, if needed, are always used before applying a release agent. Sealers can be permanent, semi-permanent or removable. If they are semi-permanent or removable, they must be applied periodically with a frequency dictated by the model material and the liquid rubber being used. Permanent sealers (not supplied by Polytek) include materials such

as shellac or paints. Semi-permanent sealers include paste wax, Pol-Ease® 2350 Release Agent and PolyCoat. Poly PVA Solution is an example of a removable sealer since it can be dissolved with water.

It is imperative not to over-apply a sealer. This may lead to loss of detail in the mold. Ideally, you don't want too little, or too much, but just the right amount. This amount is ultimately determined by testing and experience. It is important to understand that your model may be affected in some way during the mold making process and, in the worst-case scenario, may get "damaged." This doesn't mean you cannot make molds of valuable items; but, it is important to understand and share this information with the model's owner to manage expectations. Again, small scale testing is not over-rated!

## Sealers Available from Polytek

**Poly PVA Solution** is a water-soluble, removable sealer and release agent. It can be brushed lightly over any porous surface that you wish to seal. It dries to the touch within an hour (depending upon coating thickness and workshop humidity). The advantage of Poly PVA Solution is that it can be removed with water once the mold making process is complete. It is suitable for use with both silicone and polyurethane mold rubbers.

Poly PVA Solution is available in both colorless and green varieties. The green option is typically used if it is difficult to see where the liquid has already been applied on the model. If green Poly PVA Solution is used, test to make sure that no staining occurs on the model.

Words of caution: Even though Poly PVA Solution can be removed, do not expect the model to look exactly the same after the mold making process as before. Removable PVA is helpful when a customer needs a model returned to as close to original as possible; however, residual PVA, release agent (if used over the PVA) or the application of water to a model may change its physical appearance (e.g., color, texture) to some extent. If the PVA is left on the model (not washed off with water), it should continue to act as a sealer the next time a mold is made. Do not use a water-based release agent on a PVA-sealed model as this will dissolve the PVA, negating its ability to seal the surface of the model. If the model is to be washed with water, it obviously must be made of a material compatible with this process.

Poly PVA Solution can also be applied to cured polyurethane rubber molds as a "barrier coat" and is most often used when casting polyester resin (some resins, such as polyurethane, do not require a barrier coat). PVA Solution should be allowed to completely dry before pouring any casting material into the mold. Generally, Poly PVA Solution needs to be reapplied before each use, as it often comes out of the mold when removing the casting.

**Pol-Ease® 2350 Sealer & Release Agent** is white petrolatum dissolved in mineral spirits. It can be brushed or sprayed to seal a porous model. The solvent evaporates, leaving a thin coating of sealer behind to fill in pores. Evaporation typically occurs within an hour; however, this may vary depending on thickness of the layer, the porosity of the model, and temperature. It is customary to apply a couple of layers within a few minutes of one another, then allow the evaporation to take place. More porous models may require additional coats to achieve the desired level of sealing.

Pol-Ease® 2350 is considered semi-permanent since small amounts of the sealer may come off when the mold is cured and removed. As such, reapplication is suggested at a frequency dictated by the model surface. Pol-Ease® 2350 can be applied to most porous models and can be used with either silicone or polyurethane mold rubbers.

Note: If the solvent is not evaporated sufficiently from the model, this residue can interfere with the cure of the liquid rubber. If in doubt, place the model in a warmer area to accelerate the evaporation process. In cooler months, evaporation will take a little longer. A small test cure of the chosen rubber on the sealed surface will help you determine if the surface has been properly sealed.

**PolyCoat Sealer & Release Agent** is a low-viscosity, semi-permanent sealer and release agent. PolyCoat can be either brushed or sprayed onto a model. Once applied, the solvent carrier evaporates and leaves

behind a thin coating of silicone. Cure time varies between 30 minutes and 16 hours depending on temperature, humidity and porosity of the model; ensure that PolyCoat has completely cured before applying liquid rubber or plastic. Since PolyCoat leaves a dry, cured silicone coating on a surface, it may be used without additional release agent. This can be quite advantageous when making a polyurethane rubber mold as no residual release will transfer to the cured mold surface from the mold making process.

For example: If PolyCoat is applied to an EasyFlo 60 (non-porous, polyurethane plastic) model, a polyurethane mold rubber, such as Poly 74-30, can be poured against it without any further release agent being applied. Because PolyCoat is semi-permanent, many more Poly 74-30 rubber molds could be poured against this PolyCoat-covered EasyFlo 60 model without the need for reapplication. Tests have shown that over 25 molds could be poured over an EasyFlo 60 model coated with PolyCoat without change in performance. If subsequent molds appear increasingly difficult to demold, reapplication of PolyCoat would be recommended.

Very porous surfaces may require multiple coats of PolyCoat, applied ~15-20 minutes apart. Care should be taken to adequately seal the surface, but not over-apply; as with other sealers, surface details on the model can be lost when a sealer is over-applied. When brushing, be careful not to leave brush marks on the surface as the PolyCoat begins to gel.

To spray PolyCoat, use a Sure Shot Atomizer. Since PolyCoat cures quickly, we recommend using two spray tips. One can be removed as soon as spraying is done and placed into a closed can of acetone, while a second tip (which has not been cleaned, therefore allowing PolyCoat to cure in it) can be left in its place to prevent moisture from entering the sprayer between use. To use the sprayer again, just use the tip from the acetone container. If the sprayer is not being used for a couple of days, we recommend cleaning the sprayer and tip with acetone so PolyCoat does not cure.

One common technique used when either brushing or spraying is to apply the PolyCoat then flip the master over to allow excess to run off. This leaves a thin coating behind and helps to eliminate brush marks or surface defects.

NOTE: Do not use PolyCoat to seal plaster. Gypsum models tend to aggressively wick the solvent into pores and the curing process can be slow or incomplete, leaving some residual solvent behind, which may interfere with the cure of certain rubbers.

PolyCoat can also be applied to aging PlatSil® and TinSil® silicone molds to improve performance (easier demolding) and extend their useful life. In addition, PolyCoat can be applied to firm polyurethane rubber molds to give them a thin silicone skin on the mold face. This can allow materials such as polyurethane plastics or foams, that would ordinarily require releases, to be cast into dry polyurethane molds at a reduced cost. Since there is no release agent to remove from cast parts, they can be painted quite easily without being washed first. When casting polyurethane foams, PolyCoat even permits barrier coats/paints to be sprayed into the mold to increase mold life and produce a pre-primed part right out of the mold.

## General Notes on Release Agents

Release agents are coatings applied to prevent liquid rubbers and resins from sticking to surfaces. They can be classified into two general

categories: those used for mold making and those used for casting. In certain cases, the same release agent can be used for both purposes.

When selecting a release agent, you should first determine if you need one at all. In many cases, they are not necessary. Gypsum plasters, many waxes and some concrete mixes can be cast into polyurethane and silicone molds without release agent. In general, silicone molds can be cast into without a release agent.

As one might expect, there is no perfect release agent. Each has its pros and cons and one user's preferred release may be unsuitable for another (even when used for the same application). As with all Polytek products, we recommend testing release agents as thoroughly as practical before deciding on a release agent for a particular project. The importance of the correct selection of a release agent is often unappreciated. The incorrect selection can be frustrating and expensive.

### Releases Available from Polytek

**Pol-Ease® 2300 Release Agent**, a silicone-based release agent, comes in an aerosol can. It should be shaken, sprayed (using the supplied spray straw to make a more uniform mist) then brushed out onto a sealed or non-porous model before applying liquid polyurethane mold rubber. Pol-Ease® 2300 Release Agent is NOT recommended for use when making silicone molds as inhibition or sticking may occur. Once a polyurethane mold is made, Pol-Ease® 2300 Release Agent can also be applied to its surface to release casting materials such as polyurethane liquid plastics, rubbers or epoxies. Pol-Ease® 2300 Release Agent can also be used as a release for stickier foundry waxes, concrete and more.

Pol-Ease® 2300 Release Agent needs to be washed off of cast parts thoroughly before they can be painted, stained, or finished. Pol-Ease® 2300 Release Agent can be cleaned with repeated washings of water and detergent or some citrus degreasers. All paints and stains bond differently to surfaces, especially those previously coated with a release agent. Perform testing to determine if the release agent used will adversely affect this process. If Pol-Ease® 2300 Release Agent makes finishing your cast part difficult, PolyCoat (discussed above) or Pol-Ease® 2500 Release Agent (below) may be good options. Then again, a silicone mold (although a bit more expensive), which requires no release agent, is an option as well.

**Pol-Ease® 2450 Release Agent**, a liquid release agent, is a blend of silicone in a solvent. It is flammable! The carrier solvent dries quickly, leaving a thin silicone release on the model surface. As with Pol-Ease® 2300 Release Agent, this release is NOT recommended for use when working with liquid silicone rubbers. Pol-Ease® 2450 Release Agent can also be applied to cured polyurethane rubber molds, but avoid puddling on the surface.

**Pol-Ease® 2500 Release Agent**, a washable release agent, is available in aerosol cans and can be used on sealed or non-porous models before applying liquid silicone rubber. In some cases, no release is needed before applying liquid silicone, but for added insurance, Pol-Ease® 2500 Release Agent can be used. This release is useful for preventing liquid silicone rubber from sticking to cured silicone, for example, when pouring a two-piece silicone block mold. Pol-Ease® 2500 Release Agent can be used for casting as well as mold making.

To extend mold life, spray and brush Pol-Ease® 2500 Release Agent into a silicone mold when casting materials such as polyurethane plastics, rubbers or epoxies. It may also be sprayed into polyurethane molds

before casting polyurethane liquid plastics, but the molds will not last as long as they would if Pol-Ease® 2300 Release Agent was used in the polyurethane mold. The main reason for using Pol-Ease® 2500 Release Agent in a polyurethane mold would be to cast a part that can be cleaned more easily than a part covered with Pol-Ease® 2300 Release Agent. Pol-Ease® 2500 does contain a small quantity of silicone, but it washes off much easier than Pol-Ease® 2300 Release Agent, a desirable trait when parts need finishing/painting.

**Pol-Ease® 2601 Release Agent**, a water-based silicone emulsion, can be brushed or sprayed into a polyurethane mold before casting concrete or plaster. It works best when allowed to dry; therefore, a thin application is preferred to accelerate this process. As with other releases containing silicone, castings may need washing before applying finishes. Since Pol-Ease® 2601 Release Agent is water-based, it does not affect the dimensions of cured rubber molds as much as releases that contain solvents.

**Pol-Ease® 2650 Release Agent**, a silicone-free release agent, is designed for use when casting concrete or plaster into polyurethane rubber molds. As light of a coating as possible can be sprayed or brushed into the mold with casting done immediately following since no drying is needed.

**Pol-Ease® 2750 Latex Release Agent** is designed for use when casting concrete into latex rubber molds. A uniform coat can be sprayed or brushed into the mold with casting done immediately following since no drying is needed.

### Release Agents and High-Volume Casting

Almost every release agent supplied in bulk form (from Polytek® and all others) has the potential to shrink or swell a mold rubber. This is usually the result of oils being extracted or release agent components being absorbed by the mold rubber, somewhat like a sponge. The same release, such as Pol-Ease® 2650 Release Agent, can swell some rubbers while shrinking others. The only way to determine the effect on a particular mold rubber is to test a release with the rubber in question. Polytek has data on a number of rubber/release combinations, which can be useful in selecting the best materials. As one would expect, these dimensional changes occur over time and are more important to understand when operating in a high-volume environment. If dimensionality is critical, consider calling Polytek for advice along with performing tests with your specific casting system. In the case of concrete, mix designs vary greatly and may contain components that in themselves can affect long-term mold dimensionality, so testing is necessary.

# Sealer & Release Agent Matrix - Polytek Development Corp.

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## Onto or Into This Material

	Wood, Stone, Concrete	Plaster	Glass, Metal	Sulfur-Free Oil-Based Clay	TinSil® Silicones	PlatSil® Silicones	Polyurethane Rubbers	Latex Rubbers	Polyurethane Plastics
<b>TinSil® Silicones</b>	PVA, 2350, or Vaseline®	PVA, 2350, or Vaseline®	2350, 2500, or Vaseline®	2500 or Vaseline®	2350, 2500, or Vaseline®	2350, 2500, or Vaseline®	None Required, 2350, 2500, or Vaseline®	None Required	None Required, 2350, 2500, or Vaseline®
<b>PlatSil® Silicones</b>	PVA, PolyCoat, 2350, or Vaseline® Test for inhibition!	2350, Potter's Soap, or Vaseline® Test for inhibition!	2350, 2500, or Vaseline® Test for inhibition!	2500 or Vaseline® Test for inhibition!	Don't do this: <b>Cure Inhibition.</b>	2350, 2500, or Vaseline®	Don't do this: <b>Cure Inhibition.</b> (Call for use with PlatSil® Gels)	Don't do this: <b>Cure Inhibition.</b>	None Required, 2350, 2500, or Vaseline® Test for inhibition!
<b>Polyurethane Rubbers &amp; Polyurethane Plastics</b>	Sealer w/ 2300 or PolyCoat	Sealer w/ 2300	2300, 2450, or PolyCoat	2300 or Vaseline®	<i>Polyurethane Rubbers:</i> <b>Cure Inhibition possible</b> in new TinSil® molds. <i>Polyurethane Plastics:</i> None Required.	None Required	2300, 2500 if painting castings. 2500 will result in <b>fewer castings.</b>	2300	2300, 2450, or PolyCoat
<b>Latex Rubbers</b>	None Required	None Required	Seal Copper-Containing Metals with Shellac	Seal w/ Shellac	None Required	None Required	None Required	2300	None Required
<b>Epoxy Resins</b>	Sealer w/ 2300	Sealer w/ 2300	2300	2300	None Required	None Required	2300	2300	2300 or PolyCoat
<b>Poly-Optic® 14-Series</b>	Not Recommended	Not Recommended	2300 or PolyCoat	2300	Don't do this: <b>Cure Inhibition.</b>	None Required	2300	2300	2300 or PolyCoat
<b>PolyFoams</b>	Paste Wax, PolyCoat, or PVA	Paste Wax or PolyCoat	Paste Wax, PolyCoat, or PVA	Paste Wax, PolyCoat, or PVA	None Required. Use Barrier Coat or Paint to extend mold life.	None Required. Use Barrier Coat or Paint to extend mold life.	Paste Wax, PolyCoat, or PVA	PVA (Paste Wax harms Latex)	Paste Wax, PolyCoat, or PVA
<b>Fiberglass &amp; Polyester Resin</b>	Sealer w/ 2300 or PolyCoat	Sealer w/ 2300 or PolyCoat	2300 or PolyCoat	2300	None Required	None Required	PVA w/ 2300 or PolyCoat. <b>Limited castings.</b>	PVA	2300 or PolyCoat
<b>Concrete &amp; Plaster</b>	Sealer w/ 2650 or w/ 2300	Potter's Soap or Vaseline®	2650, 2300, or Other Form Oils	None Required.	None Required. Silicone may cause efflorescence in concrete.	None Required. Silicone may cause efflorescence in concrete.	None Required, 2650, 2601, or 2300. No petroleum-based products.	None Required, but may use 2750, Castor Oil or Alcohol for concrete.	2650, 2601, or 2300. No petroleum-based products.

## Key

<b>2300 =</b> Pol-Ease® 2300 Release Agent
<b>2350 =</b> Pol-Ease® 2350 Sealer & Release Agent
<b>2450 =</b> Pol-Ease® 2450 Release Agent
<b>2500 =</b> Pol-Ease® 2500 Release Agent
<b>2601 =</b> Pol-Ease® 2601 Release Agent
<b>2650 =</b> Pol-Ease® 2650 Release Agent
<b>2750 =</b> Pol-Ease® 2750 Latex Release Agent
<b>PVA =</b> Polyvinyl Alcohol [May come off on castings; can be washed-off with water]
<b>PolyCoat =</b> Semi-Permanent Sealer & Release Agent
<b>TinSil® Rubbers =</b> 70 & 80 Series
<b>PlatSil® Rubbers =</b> 71, 73, FS & HTS-Series, PlatSil® Gels
<b>Polyurethane Rubbers =</b> 74, 75, 77, 81, PolyGel®, Poly-Fast 72-40 & Poly PT Flex Series
<b>Polyurethane Plastics =</b> EasyFlo, Poly 15, Poly Lite Cast & Poly Plasti-Flex Series
<b>Latex Rubbers =</b> Poly Latex 60, Latex False Face Compound, NaturForm
<b>Epoxy Resins =</b> PolyPoxy® Resins & PolyCures

Pouring, Brushing or Spraying This Material

1) NaturForm 30/False Face only in dry plaster molds. 2) Alginate- no release required. 3) PlatSil® Gel 10, use baby oil or Vaseline to prevent sticking to hair. Chart is provided as a general reference. Please call for additional information or special circumstances.