Hawkeye Industries

3D Print Plug, Pattern, or Mold Making with Duratec Products

APPLICATION GUIDE

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Duratec products can be used on the surface of additive manufactured plugs or patterns ABS, PLA, PLA+ for pattern and mold-making. Use of Duratec products can increase substrate durability and deliver ultimate glossy finishes.

PRODUCTS

Duratec Sealer - 823 Crystal Clear Polyester or 1800 Vinyl Ester
Duratec Base Primer - 707-051
Duratec Polyester Surface Primer - Black - 702-003, Gray - 707-002, White - 714-002
Duratec Vinyl Ester Primer - Grey - 1799-006, Black - 1702-006, Untinted - 1704-006
Duratec Polyester Hi-Gloss Coating - Clear - 904-040, Black - 602-021, White - 614-021
Duratec Vinyl Ester Hi-Gloss Topcoat - Black - 1902-045, Clear - 1904-045
Aqua Buff 2000 Compound &Polish - AB2000

Application Conditions

The surface should be clean, dry and free from oil, grease, wax or other contaminants.

Thoroughly stir products before use. A paint shaker or drill-mounted mixer is necessary - a stir stick is not enough.

Catalyze at 2% with full strength MEKP catalyst. We recommend Norox 925 for Polyester and 925H for Vinyl Esters.

Ambient temperatures should be in excess of 64°F, 18°C to ensure a rapid & complete cure. Time calculations are based on temps of 77°F

Note: The exception to this is the ambient temperature for Duratec Vinyl Ester Topcoat, which should be 68°F, 20°C.

Choosing & Applying a Sealer # 823 or # 1800

In some applications, Duratec Sealers increase structural stability of 3D printed parts while improving adhesion between substrate surface and Duratec primers and topcoat.

A sealer is not necessary in all applications We advocate testing to determine best solution for your filament choice and application.

If sealing, Duratec 823 Crystal Clear Sealer is recommended for sealing plugs and patterns in applications where exothermic or post-curing temperatures are below 180°F. Duratec 1800 Vinyl Ester Sealer is recommended in applications where exothermic or post-curing temperatures are between 200° - 300°F. (Keep temperature limitations in mind when making filament selection.)

Prior to using the sealer, wipe the surface with a clean rag. Catalyze as outlined above.

Your Duratec sealer of choice can be wiped onto the surface, or applied by spray. Apply enough to wet-out the surface, but do not build a film on the surface.

Apply the primer or topcoat (if eliminating primer) while the sealer still has some tack. If the sealer has cured tack-free, sand prior to applying the primer or topcoat.

continued on next page...

Limited/ warranty statement: Our products are intended for sale to industrial and commercial customers. We request that customers inspect and test our products before use and satisfy themselves as to contents and suitability. Nothing herein shall constitute a warranty, expressed or implied, including any warranty of merchantability or fitness, nor is protection from any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is replacement of our materials and in no event shall we be liable for special, incidental or consequential damages.

Priming The Pattern # 702-003, # 707-002, # 714-002 or # 1799-006, # 1702-006, # 1704-006

Which Duratec Primer is right for you?

Duratec Surface Primer provides a strong polyester primer than can be polished or topcoated.

Duratec Vinyl Ester Primer is unmatched in strength. Strong, tough primer that can be polished to a good gloss but is more difficult to sand. 285° HDT for great high-temperature capability.

Stir and catalyze your primer of choice as outlined above.

Due to the rapid gel time of these products, only catalyze what can be used in 15-20 minutes. Remember that higher ambient temperatures yield a shorter pot life and gel time, while lower temperatures yield a longer pot life and gel time.

Spray the pattern with multiple build coats. Allow at least 2 minutes between applications but less than 30 minutes to assure each coat fuses with the previous coat. Build 4-5 mils per wet pass. Build up 15-20 mils in total, to allow for sanding.

Allow to cure. NOTE: Several of our customers report additional adhesion success by applying primer in cool temperatures, the longer cure time allowing the primer to soften and etch into the 3D laminate.

Sand with a fine grit if possible (220 is a good starting place). If polishing the pattern sand up to 1000 grit sandpaper and then compound and polish. If topcoating, sand to 180-220 and then topcoat.

Applying Duratec Hi-Gloss Topcoat*

904-040, # 602-021, #902-046 # 614-021 OR # 1902-045, # 1904-045

Which topcoat is right for you?

Duratec Polyester Hi-Gloss Coating offers a HDT of 180°F, and faster sanding and polishing.

Duratec Vinyl Ester Hi-Gloss Topcoat provides a hard, heat resistant surface, free of porosity with great off-the-gun characteristics and 285°F HDT. It is ideal for pattern surfacing, mold resurfacing, or mold construction. It is also a great choice for avoiding fish-eyes or surface defects.

Sand the primed or sealed surface to a 180-220 grit finish. Prior to catalyzing, thoroughly stir and catalyze as outlined on page one. Due to the rapid gel time of the coating, mix only the amount that can be applied within 15-18 minutes. If thinning is needed, thin with Duratec Reducer.

Use air aspirated or pressure pot spray equipment. The recommended line air pressure is 35-50 psi and pot pressure is 10-15 psi. Airless, air-assisted airless and air-aspirated gelcoat plural-component spray systems can also be used.

Spray 3 to 4 wet passes of 5-7 mils of Duratec Topcoat, building to a total of about 20 mils.

Once topcoat is cured enough to sand, sand starting with the highest grit necessary for your surface profile.

Buff and polish the surface to reach the ultimate shine. We recommend Aqua-Buff 2000 Compound & Polish.

*For reliable adhesion, do not apply a Duratec Topcoat directly to the 3D printed surface without the use of a sealer or primer first.

Considerations & Testing

Hawkeye Industries has conducted internal testing on the adhesion of Duratec 707-002 Surface Primer and Vinyl Ester Primer 1799-006 with ABS, PLA, and PLA+ substrates with good results. Like with all applications, ultimate pattern or mold strength relies on the substrate. Successful use of Duratec with 3D printed plugs or patterns requires customer testing and clear performance expectations of plug/pattern/mold.

Talk with your composites supplier or reach out to our Technical Sales Team for advice or trial samples.