



Poly Stone[®]
Spray Guidelines

ACS
INTERNATIONAL

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Chapter One: Introduction to Poly Stone™

Poly Stone surfacing can dramatically enhance almost any surface with spectacular granite colors and textures. Designed for use in solid surface kitchen counter tops, bath room vanities, shower surrounds, wall panels, fiberglass products, furnishings, and many other applications, Poly Stone has almost unlimited application potential.

Using the finest raw materials under a patented process (Patent No. 5,588,599) exclusively owned by ACS International, Inc., Poly Stone granules are a polyester compound, incorporating pure alumina tri-hydrate into the particle. Poly Stone is UV resistant and fire resistant. Poly Stone granules are virtually dust free, typically having less than 2% fines and have a specific gravity of 1.7 g/cc. Poly Stone particles may be used to cast solid surface, cast cultured granite, spray solid surface, spray cultured granite or in a variety of fiberglass applications. Poly Stone may also be used in specialty operations like Bulk Molding Compounds (BMC) or Sheet Mold Compounds (SMC). ACS makes hundreds of custom colors for a small minimum order.

Our commitment to offering high quality, innovative products that use the latest technology in the industry, results in products of unsurpassed beauty and durability. Whatever your applications, Poly Stone is certain to enhance its cosmetic appeal.

Solid Surface Casting

Use Poly Stone particles to make solid surface sheets, shaped goods, or sinks. Simply combine by weight 20% Poly Stone to 80% Alumina Tri-hydrate powder to make your dry side component.

Cultured Granite Casting

Cultured granites can easily be made by adding Poly Stone at a ten to twenty percent by weight ratio to your calcium carbonate (marble filler) to make your dry side component. Then add polyester resin at a 70 percent filler and 30 percent resin ratio.

Solid Surface Spray Products

Solid surface sprayable granite products can easily be manufactured by mixing Poly Stone granules with solid surface sprayable resin or gel coat.

Spray Cultured Granite Products

Poly Stone may be wet or dry sprayed with or without a clear gel coat layer in the mold. Most manufacturers will add 25 to 30 percent Poly Stone (on a weight basis) to their clear gel coat and then wet spray into the mold. Fiberglass reinforced products such as trash cans, restaurant seating and table tops are excellent uses for Poly Stone.

Poly Stone Standard Color Selection

<u>Name</u>	<u>Color Code</u>
Atlantis	PSLC 512
Aurora	PSC 402
Beach	PSC 403
Blossom	PSLC 511
Burnt Amber	PS 030
Canyon	PSLC 471
Coal	PS 200
Cappuccino	PSLS 219
Dune	PS 060
Eclipse	PSC 406
Ecru	PSS 314
Edelweiss	PS 602
Emerald	PS 120
Europa	PSLC 515
Everest	PSLC 462
Fashion Gray	PSS 310
Forest	PS 080
Garnet	PS 230
Ironwood	PSLC 500
Kilimanjaro	PSC 463
Kodiak	PSLC 505
Kona	PSLC 509
Lace	PSS 301
Lapis	PSLC 503
Magma	PS 601
Malachite	PSC 409
Matterhorn	PSLC 464
Mesquite	PSLC 502
Mont Blanc	PSLC 465
Ocean	PS 170
Obsidian	PSLC 508
Outback	PSLC 510
Pebble	PS 070
Pecan	PSLC 514
Persia	PSLC 504
Pepper Ivory	PSLC 466
Ramses	PSLC 506
Sahara	PSLC 486
Sand	PSS 302
Shimmer	PSLC 501
Silkstone	PSLC 513
Snow	PS 130
Steel Gray	PS 150
Tan	PSS 312
Terracotta	PSS 307
Tigris	PSLC 507
Vanilla	PSS 326
Ventana	PSLC 516

Poly Stone Custom Colors

Custom colors are available by special order. Please contact ACS directly at 520-889-1933 or toll free 800-669-9214.

Poly Stone™ Coverage Ratings

Poly Stone Mix (25%)			Spray Resin (75%)		
Mils of thickness	Coverage per gallon sq. ft.	Pounds of total spray mix sq.ft.	Poly Stone needed lbs./sq. ft.	Spray resin needed lbs./sq. ft.	Sq. Ft covered per lb. of mix
10	96	0.09	0.02	0.07	11.1
20	48	0.18	0.05	0.14	5.6
30	32	0.27	0.07	0.20	3.7
40	24	0.36	0.09	0.27	2.8
50	19	0.45	0.11	0.34	2.2
60	16	0.54	0.14	0.41	1.9
70	14	0.63	0.16	0.47	1.6
80	12	0.72	0.18	0.54	1.4
90	11	0.81	0.20	0.61	1.2
100	10	0.90	0.23	0.68	1.1
120	8	1.08	0.27	0.81	0.9

Example: To spray one 60" by 60" panel and two panels that are 30" by 60", all at 50 mils. How much Poly Stone would be needed and how much gel coat is needed?

Answer: 60 inches = 5 ft; 5 ft. x 5 ft. = 25 square feet
 30 inches = 2.5 ft; 2.5 ft. x 5 ft. = 12.5 ft. square ft. x 2 panels = 25 ft2
 Now go to the chart at 50 mils. 0.45 lbs per sq. ft. are needed.
 0.45 lbs. x 50 ft2 (25 + 25) = 22.5 lbs. of mix, 5.63 pounds of Poly Stone, and
 16.87 pounds of gel coat

Chapter Two: Poly Stone™ Spraying and Equipment

Spray equipment is available from many manufacturers. Some spray systems are designed as either a *dry* or a *wet* application type. Dry means that the Poly Stone is sprayed into a wet gel coat and then covered with more wet gel coat. The dry spray system is comparable to a stream of powder similar to a low pressure sand blaster.

Most spray operations use the wet system, which means the Poly Stone (25% by weight) and the gel coat (75% by weight) is mixed prior to spraying and applied conjunctively. ACS International does not endorse any specific equipment. Nevertheless, the spray equipment options mentioned below are based on commonly used brands and models. ACS International invites any supplier, manufacturer or fabricator that successfully uses/offers any other spray equipment, to please contact ACS to be added to this list of options.

Cup Gun

The cup gun is the basic type of spray equipment available (figure 2a shows the G100-6) and is the least expensive option. Operating on the Venturi system, the cup gun functions like a *hot-pot* set-up, requiring the Poly Stone/gel coat mix to be catalyzed (initiated) in the cup, and then sprayed. Most cup guns use a 32 ounce cup, spraying an average of approximately 800 grams of Poly Stone/gel coat mix. This covers approximately 6.5 square feet at 25-35 mils—not counting over-spray or other losses.

A disadvantage of the cup gun is the small area that one cup will cover. Sprayers are required to have several cups in line with catalyst (initiator) aside and ready to be combined, stirred, and sprayed. The cup gun is designed ideally for start-ups, small jobs, custom shops and hobbyists. Cup guns are

com) and Poly Craft (Binks®). The cost for a cup gun is approximately USD\$150.

Additional information to note when using a cup gun:

- A #8 or 9 tip should be used
- An air intake hole should be drilled out on the metal cap—1/16" to 1/8"

Dry Spray System

The basic dry spray system is a step up from the cup gun method (see figure 2b). It is recommended that a film (10-20 mils) of gel coat be sprayed onto the mold prior to spraying the dry Poly Stone mix onto the wet film of gel coat. This initial layer of gel coat achieves a finished part with a surface containing no dry spots or porosity. Once the mold is appropriately covered with Poly Stone, another film of gel coat should be sprayed on top of the dry Poly Stone to *wet-out* the product.

The dry spray system covers a greater square footage than the cup gun. Two application methods that are used are:

1. Allow the dry spray to settle into the initial gel coat film, then blow off the excess
2. Strap dry spray nozzle onto gel coat nozzle, creating a second application which includes both dry Poly Stone and gel coat sprayed simultaneously.

Two disputable disadvantages of this system are that it tends to entrap more air and the fact that Poly Stone tends to perform better when allowed to soak in gel coat for two hours or more prior to applying. Generally, the dry system is an appropriate system for small shops that require a higher production capacity than a cup gun and that uses many colors. Dry spray systems are manufactured by ES Manufacturing (www.esmfg.com) or Magnum Industries (727-573-2955). The cost for a dry spray system is approximately USD \$550.



Figure 2a: G100-6 Cup Gun.



Figure 2b: DSA-150-V25C dry spray system.



Figure 2c: Binks 7N spray gun.

Spraying without Gel Coat

Using Poly Stone in applications without a clear gel coat is preferred by many fabricators. In such cases, proper care must be taken to ensure that a quality gel coat or resin that is designed for use as a spray solid surface be used.

For more information on spray-able resins and gel coats, see chapter five.

Supplemental Equipment

A mil gauge is an inexpensive (often times obtained from manufacturers free of charge) tool that allows for quick, easy measuring of gel coat and Poly Stone thickness (see figure 2d).

For a variety of spray systems and accessories, Troesch Company offers sales and service (contact information below). Systems offered by Troesch include a Binks 7N[®] with unique modifications, allowing for the ability to spray granite. The Binks 7N system is based on a liquid pressure pot tank containing the Poly Stone and gel coat mixture on one intake line going to the gun. A catalyst (initiator) tank is attached on another intake line going to the gun. The functional aspect of the Binks pot system is that components can be added or subtracted, resulting in either a simple hot pot system, to a complex air-assist system. Using a 10 gallon system that allows placing a mixed matrix 5 gallon bucket inside the pressure pot is recommended. For more information contact Craig Troesch at 513-271-5700 or craigt@fuse.net.

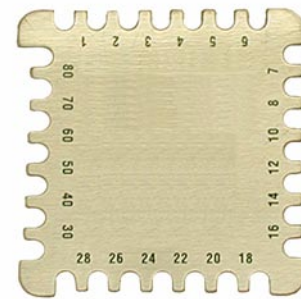


Figure 2d: Mil gauge.

Wet Spray Systems

Large capacity wet spray pump systems deliver high volumes of Poly Stone mixed with gel coat and catalyst (see figure 2d). These systems are designed with either an internal static catalyst mixing system or external fans (catalyst and gel coat) mixing system.

Such systems allow for high part volume as on a production line or large custom shop. A higher skill level and understanding are necessary to operate these systems to ensure speed and quality.

In order to function properly, wet spray systems require routine cleaning and maintenance. Manufacturers for these spray systems include Venus Magnum at www.venusmagnum.com/products-b.htm, RimCraft Technologies at www.rimcraft.com (offers large chip spray systems). This level of spray equipment cost ranges from USD\$4,500 to \$6,500.

STEP 1



Mold Assembly

- Measure and number mold bars to ensure proper placement.
- See the proceeding chapter for other examples of molds that can be used with Poly Stone.
- Image to the left is an example of mold bar assembly.

STEP 2



Secure Mold

- Once mold sections are in order, use double sided tape and tempered glass to set-up mold bars.
- Apply mold release and make sure the glass is level and on a stable platform.
- Image shown, illustrates mold on tempered glass surface.

STEP 3



External Mold Bar Taping

- To secure mold form, tape corners of mold bars to avoid bar separation caused by weight of matrix.
- Images to the left illustrate tape location on mold bars.



STEP 4

Measurement

- Resin: Measure by weight, pouring resin first, filler second.
- Typical ratio is 25% Poly Stone, 75% Gel Coat
- PLEASE NOTE: Gel coat properties (viscosity and shop temperature) or chip size may affect mix ratio.



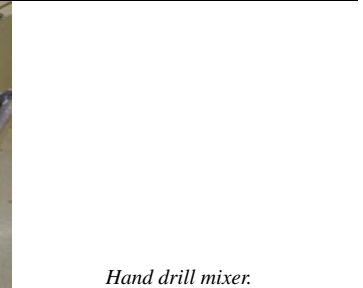
STEP 5

Mixing Equipment

- First image shows a very basic system of mixing equipment.
- Second image shows another system for mixing resin and filler.



Motor driven mixer.



Hand drill mixer.

STEP 6

Poly Stone Spray Methods

- First image to the left shows the beginning spray application using a cup gun.
- Second image illustrates spraying Poly Stone using a different spray system (not shown in these steps).



STEP 7



Cup Gun Preparation

- Hold cup gun at a 45 degree angle
- Trigger air to the gun prior to angling the gun towards the mold—this avoids drips.

STEP 8



Poly Stone Spray Application

- Apply several spray passes, instead of one overlapping pass as done with gel coat.
- Use a gel coat thickness gauge to measure depth of material (figure 2f).
- For use behind gel coat 30-40 mils are recommended.
- For solid surface applying, 80 mils are recommended.

STEP 9



Poly Stone Technique Tip

- Use a paint brush and some of the Poly Stone mixture to completely cover the over hangs—which could have been missed during spray application.

STEP 10

Poly Stone Technique Tip

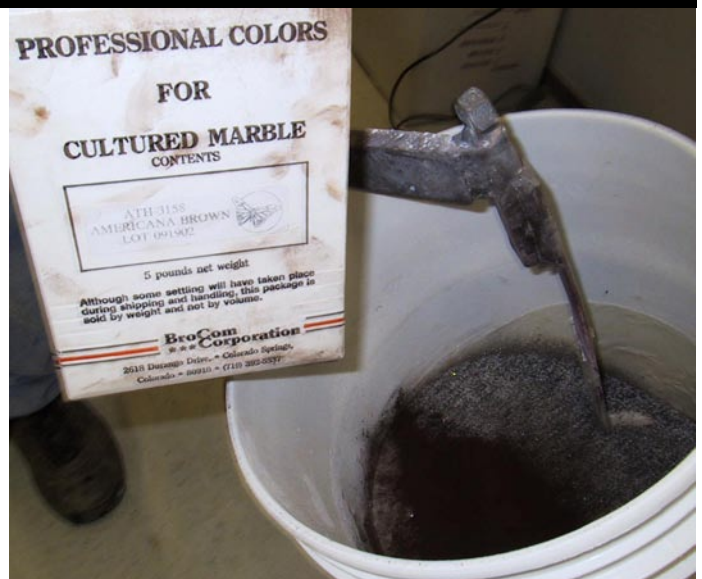
- For best results, allow Poly Stone and gel coat mix to become *tacky* to touch before proceeding to next step (back fill pour).



STEP 11

Back Coat Mixture

- When mixing the back coat, use a pigment that matches the Poly Stone spray color.
- See chapter on back coats and back fills for more information on color selection.
- Cultured marble or **Featherlite**® may be used if the finished part does not require fabrication (see chapter six for more information on Featherlite).
- If fabrication is required, Alumina tri-hydrate must be used for backfills.



STEP 12

Matrix Mix

- Image to the left show the pigment mixing into matrix.



STEP 13



Poly Stone Technique Tip

- For improved catalyst dispersal, pre-mix catalyst into a small portion of resin.
- Mix thoroughly and then add to matrix mix.

STEP 14



Catalyst to Matrix

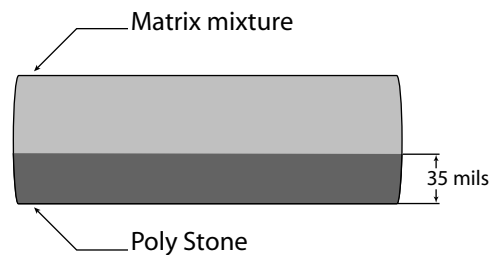
- Add pre-mixed catalyst to pigmented matrix.
- Introduce catalyst as matrix is mixing

STEP 15



Back Coat Mixture

- Pour back fill mixture into mold immediately after catalyst is mixed thoroughly into matrix.



STEP 16

Poly Stone Technique Tip

- Cure temperature should not exceed 180° Fahrenheit.



STEP 17

Completion

- After cure is complete, remove part from mold.
- Image to the right illustrates a finished Poly Stone product.



Tips for Spraying Liquid Granite Material

1. Liquid granite lines must always be *wet out* by pressurizing un-catalyzed gel coat through the line and the gun. This prevents clogging of the lines and the gun.
2. Liquid granite must have a viscosity of less than 10,000 centipoise (cps). To ensure less than 10,000 cps, do not add Poly Stone in greater concentrations than one part by weight Poly Stone to three parts by weight solid surface spray-able resin.
3. It is not necessary to flush granite lines with acetone when changing granite colors. Instead, flush with clear gel coat, then proceed to next color. Poly Stone colors do not use pigment, making color changes simple.
4. To reuse a bucket of mixed liquid material that has been sitting around for more than 24 hours, simply remix the materials together.
5. When spray system is not in use for an extended time period, pressurize non catalyzed clear gel coat through system.

Chapter Three: Poly Stone™ Matrix

There are four types of matrix materials that may be used to back Poly Stone material.

- **Featherlite®**
- Calcium carbonate
- Chopped fiberglass
- Alumina Tri-Hydrate

Each of these options offer unique benefits. ACS offers Featherlite and a variety of alumina tri-hydrates to choose from.

About Featherlite

Featherlite is an ultra-light filler, blended with calcium carbonate, specifically designed as a means to reduce product weight. When used as a direct replacement to cultured marble, weight reduction is approximately 50%. In addition, it is an easy-use filler, as it comes ready to use with the addition of resin. Featherlite is a very white filler, requiring little to no titanium dioxide.

Products made with Featherlite have shown to have a better thermal shock performance than those without. Featherlite incorporates plastic micro spheres, which have an elastic property that allows the sphere to stretch and compress while subjected to stress. This elasticity will absorb stress and significantly reduce the likelihood of stress fractures and cracking. The end result is better thermal cycle with little to no stress cracks caused from hot cures in the mold.

Resin Requirement

A standard marble resin is all that is needed to use with Featherlite. Resin use percentage is 50% resin by weight.

About Alumina Tri-hydrate (ATH)

ACS provides several varieties of alumina tri-hydrates (ATH) to choose from including a bayer grade ATH, Onyx Pro, and OC 1500.

Bayer Grade

ACS supplies a bayer grade alumina tri-hydrate, with an average particle size of 22 microns and excellent air release characteristics. The standard color of this grade of bayer grade ATH is off-white.

Key Advantages Using Bayer Grade ATH

- Less expensive than white grades of ATH
- Fast lead times

Applications

Bayer grade ATH is designed for customers who develop their own solid surface granite colors and need a proven ATH base filler material.

Resin Requirement

It is recommended to use a low viscosity solid surface resin. Resin ratio is 35 to 40% resin—depending on filler loading and chip material used.

OC 1500

A white grade of ATH, OC 1500 provides excellent air release characteristics at a competitive price.

Key Advantages Using OC 1500

- No yellow or brown cast
- Excellent air release properties
- Market proven product

Applications

OC 1500 is ideal for solid surface applications.

Resin Requirement

A low viscosity solid surface resin is recommended. Resin ratio is 35 to 40%, depending on filler loading and chip material.

Onyx Pro

Onyx Pro is a very clear white grade of alumina tri-hydrate with excellent gel time and low resin consumption.

Key Advantages Using Onyx Pro

- High translucency and ultra-white color
- No yellow or brown cast
- Fast gel times with a LOW resin demand

Applications

For use as a filler to produce cultured onyx where high translucency is desired.

Resin Requirement

It is recommended to use clear onyx resin with Onyx Pro. Resin use percentage is 28–35% to filler by weight.



Figure: 4a



Figure: 4b

In-Mold

In-mold granite refers to the process of spraying the liquid granite into a mold. Then, marble or solid surface matrix is cast behind the sprayed granite product. Figure 4a is an example of spraying liquid Poly Stone into bar molds (also seen in chapter three). Figure 4b is an example of a sprayed granite mold.

Post Mold

Post mold granite refers to the process of spraying the liquid granite onto a core product, that may be wood, Medium Density Fiberboard (MDF) or foam board. In post mold granite spraying, it is necessary to Poly Vinyl Acetate (PVA) spray the entire product to seal the product after completion of spraying the granite material. Sealing the product stops the inhibition of the cure caused by polyester being in contact with the air. This is most important when sanding the product. Sanding a product that is not PVA will cause sandpaper to block up and become useless.

Methods of Seaming Poly Stone Parts

The following procedure will replicate the process of seaming solid surface sheet goods as in Poly Stone products. The most important part of the seam is making sure that a perfect dry fit seam is achieved. If the seam is visible when the pieces are dry fit together, it will also be seen when the pieces are wet seamed together. Therefore, it is very important that the seam is routed cleanly after the cut.

Procedure

1. Cut the finished product to be seamed with a sharp triple chip blade. A diamond tip granite blade is recommended.
2. Clean edges of the cuts made with the circular saw. There will be some minor chips/cracks or chatter marks that will need to be removed in order to make a dry fit seam that is inconspicuous. This

is done by mirror cutting/trimming both pieces, using a high speed three horsepower router with a straight cut carbide tip router bit and using a straight edge for the exactness. The bit cut width is 1/2", so gap the pieces to be cut uniformly about 3/8" apart. Between 1/32" to 1/16" from each cut piece will be removed. Make sure that the alignment is correct on the pieces, so that the straight lip of the front edge of the counter does not have a slight angle.

3. After trimming the cut, align the pieces and visually check the cut. If gaps or uneven spots are visible, re-trim pieces. When sanding, be careful not to round out the face edges of the cut, which could create unsatisfactory results.
4. Once the seam dry fits well, for post mold applications, screw and hot melt in an 18" wooden seam block to the larger, less mobile piece to be joined. Split the dimensions so that 9 inches is on one side of the cut and 9 inches are on the other side of the cut.
5. Use **Acrybond**[®] color matched adhesive. A color reference chart is provided. See appendix.
6. Wipe the seam and the deck area (at least 4 inches from the seam on both pieces) with denatured alcohol, removing dust and oils that may prevent a smooth seam. Take 2" by 2" sample blocks of solid surface samples, or other appropriate material, and hot melt them down in three to four locations along the seam. Blocks should be equally spaced, and no closer than 1/2" to the seam. Many fabricators find that taking the blocks and drilling out 1/4" holes approximately 6 to 10 per block in advance helps adhesion of the hot melt to the block and the seaming surface. Do this before hot melting the block to the deck. For another method see figure 4a.
7. Take three or four more blocks and repeat the process by placing these blocks on the other piece, exactly opposite of the pieces which were

hot melted down in step 10.

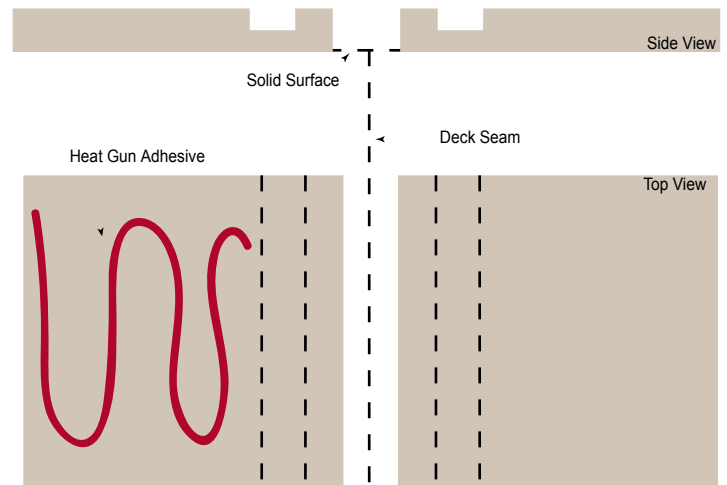
8. Prepare clamps (either Jorgeson® or bar clamps) by having them set to the proper lengths ready to seam.
9. Place both pieces together, and gap them approximately 1/8 of an inch. For the front piece of the counter top, be prepared to place some masking tape to prevent the adhesive from running out.
10. Apply the **Acrybond®** adhesive using two parallel beads along the length of the seam.
11. Gently tighten clamps. Tightening the closest clamp while ensuring that the top edges of the counter top are exactly level. The more level these surfaces are, the less sanding that will be required, and the higher likelihood that you'll have two matching sides of the seamed area. A popsicle stick may be used to move back and forth across the seam to ensure the top edges are level. If readjustment is necessary, simply loosen the clamp and readjust to level the seam.

Repeat this process for each clamped area. Tighten all four clamps uniformly finger tight. **Caution: Overtightened clamps will cause a seam failure.** Remove extra adhesive by using a one sided razor blade, sharp wood chisel, or putty knife. Then, tighten the clamps 1/16 of a turn, which will cause a little bit of adhesive to come out.

12. For post-mold applications, screw in the underneath side that has not yet been screwed in.
13. After the adhesive has gelled, remove clamps. Gel time is between 15 to 25 minutes.
14. Using denatured alcohol, gently remove the blocks from the surface of the counter top. If excessive force is used part of the surface of the counter top will be pulled off. If necessary, use a sharp putty knife will help in removing the blocks.
15. Once the adhesive is hard (dry) and ready to sand/work, use a 60 micron pad on a dual action orbital sander to create a matte finish. Less sanding will result in a better match. Finish job with a **Scotchbrite®** 7447 pad (purple) for a matte finish. For a satin finish, use 60 micron, then 30 micron, then use a 7448 pad (white or grey).

Deck Seam Clamp Blocks

(Made with Solid Surface Scrap)



Side View of Seam Block
(Made with Solid Surface Scrap)

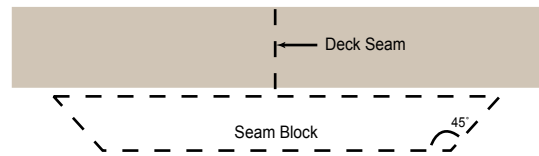


Figure 4c.

Chapter Five: Poly Stone™ Gel Coat & Resin

The following are product recommendations from various suppliers. ACS is not responsible for the information given within these specifications, but is offering these as an example of gel coat and resin specifications available. For questions regarding these specifications, please contact the manufacturers directly.

Manufacturing

Cook Composites and Polymers
Revchem Plastics, Inc.
Silmar Technologies
Polygard
Ashland
Reichold

Recommended Resin(s)

Stypol® 040-4913, 4917, 4919, 4981
Stonetec® Product HK A-1984
93AE1958A: Silmar® 75AE-1045
Polygard® 2000 Exterior Clear Gel Coat
CG-SG-0010
Polylight 32166-50

Chapter Six: Poly Stone™ Back Coats & Back Fills

The following is to assist in selecting the correct pigment for matrix behind Poly Stone. **If you do not see a Poly Stone color referenced, this means that a natural, unpigmented backfill may be used.** Custom colors will require your experimentation to determine for yourself which matrix color works best with your custom Poly Stone spray granite color. Light color pigment loading should be at 0.5%, medium color pigment loading at 1.0% and dark, bold color loadings at 1.5% to 2.0%. The following table will serve as a guideline to selection of the proper matrix color. The following color recommendations are based on BROCOM® colors. Other brands may be used.

BroCom A-2245, **Rhapsody Blue** goes with ACS:

- PS210
- PSS323, Starry Night
- PSLC512, Atlantis (dark back coat)
- PSLC503, Lapis

BroCom A-408, **Almond** goes with ACS:

- PSLC 608, Zion
- PS060, Dune
- PS070, Pebble
- PSC402, Aurora
- PSLC486, Sahara
- PSLC513, Silkstone
- PSLC510, Outback
- PSS314, Ecru

BroCom A-112, **Mexican Sand** goes with ACS:

- PLSLC514, Pecan
- PS020
- PS030, Burnt Amber
- PS040, Walnut
- PS050, Latte
- PSS302, Sand
- PSS307, Terracotta
- PSS312, Tan
- PSLC219, Cappuccino
- PSLC464, Matterhorn
- PSLC509, Kona
- PSLC504, Persia

BroCom A-2094, **Designer White** goes with ACS:

- PSLC 606, Jubilee
- PSLC 605, White Smoke
- PS100
- PS130, Snow
- PS220
- PSLC462, Everest
- PSLC466, Pepper Ivory
- PSLC501, Shimmer
- PS602, Edelweiss
- PSLC505, Kodiak
- PSS326, Vanilla

BroCom A-315, **Platinum** goes with ACS:

- PS110
- PS140
- PS190
- PSC401, Aqua
- PSC405, Dusk
- PSS310, Fashion Gray
- PSLC 516, Ventana

BroCom A-4530, **Loganberry** goes with ACS:

- PS230, Garnet
- PS 604, Plum Crazy

BroCom A-311, **Country Grey** goes with ACS:

- PS150, Steel Gray
- PSLC483, Platinum
- PSLC465, Mont Blanc

BroCom A-220, **Heron Blue** goes with ACS:

- PS160, Baccarat
- PS180
- PSS321, Baby Blue

BroCom A-517, **Innocent Blush** goes with ACS:

- Blossom, PSLC511
- PS 240
- PS 250
- PS 260
- PS 270
- PSLC 485
- PSS 311
- PSS 315
- PSS 301, Lace

BroCom A-117, **American Brown** goes with ACS:

- PSLC 607, Cocoa
- PSLC506, Ramses
- PSLC502, Mesquite
- PSLC 471, Canyon

BroCom A-306, **Designer Black** goes with ACS:

- PSLC508, Obsidian
- PSLC515, Europa
- PSLC500, Ironwood
- PS 200
- PSC 442

BroCom A-217, **Cerulean Blue** goes with ACS:

- PSLC512, Atlantis (light back coat)
- PS 170
- PSS 322
- PSC 461

BroCom A-2662, **Aspen Green** goes with ACS:

- PSLC 507, Tigris (for light back coat)
- PSC 417
- PSC 407
- PS 080
- PSN 122

BroCom A-645, **Teal** goes with ACS:

- PSLC 507, Tigris (for dark back coat)
- PS 090
- PS 120, Emerald
- PSC 409 Malachite

BroCom **Red** pigment goes with ACS:

- PS601, Magma

BroCom A-1166, **Light Mink**

- PSC403, Beach
- PSC406, Eclipse
- PSC 416
- PSLC 485

BroCom A-116, **Fawn Beige**

- PSC463, Kilimanjaro

For the new Poly Stone colors released in 2006 that are not listed above, no pigment color was used in the back fill when creating the colors. Examples include Coriander and Tapioca. Contact our laboratory for more information on our recommended backfill colors.

Ultimately, there are two reasons to pigment a backfill.

1. Hide thin areas from spraying.
2. Make the granite coating less obvious (in regards to its thickness).

Chapter Seven: Poly Stone™ Care & Maintenance

One of the benefits of using **Poly Stone** as surfaces is the ease of care that both products provide. Each product is available in matte, satin and gloss finishes, requiring basic routine care. Simply clean each surface type regularly with soapy water. It's that simple. Have a more difficult stain to remove? Follow the guidelines below for each surface finish and your cultured stone surface will look like new.

Matte Finishes

For difficult stains, use a mild abrasive cleaner (results shown above), or by using a mix of one part bleach to one part water. If there are minor cuts and scratches in the matte finish, use a Scotchbrite® pad (white or gray pad preferred) with a spritz of a little water upon the pad. Then, go over surface until scratches are removed. If the surface has received deeper cuts, the services of a professional are required for repair.

Satin Finishes

Just as with matte finishes that couldn't be cleaned with soap and water, satin finishes require a stronger solution. Use a cleaner such as Soft Scrub® or try a solution of one part bleach to one part water. A white Scotchbright pad may be used on satin finishes for more stubborn stains.

If you're looking to enhance the shine of the surfaces' satin finish on your Poly Stone surface, use a nonabrasive polish such as Hope® Counter-top Polish or Protectall's Quick Shine®.

Gloss Finishes

The benefit to a gloss finish is that it is generally more difficult to stain, however that same quality makes gloss finish more difficult to remove stains from. First try using the solution of bleach and water as mentioned above and let it sit for a few minutes before scrubbing. Then, with a soft sponge, use circular motions to clean—for up to fifteen minutes. After fifteen minutes, remove the bleach and water solution with clean water. *Never* use abrasive cleaners or Scotchbright pads on gloss finishes.

As with most surfaces there are a few precautions that should be observed.

- Do not use your counter top as a cutting board
- Use a pot holder or other heat/cold absorbing device for setting hot pots or frozen foods directly on your work surface
- Use trivets with rubber feet
- Run cold water in sinks made with Poly Stone before using a colander
- Avoid contact with strong chemicals, such as paint thinners, oven cleaners, drain cleaners, etc. (Such items may damage the surface color/finish).

Scotchbright is a registered trademark of 3M.

Quick Shine is a registered trademark of Protectall.



Chapter Eight: Poly Stone™ Trouble Shooting*

Problem: Air bubble

<u>Cause</u>	<u>Solution</u>
Air pockets in gel coat.....	Lower air pressure in gun. Adjust resin ratio higher lengthen gel time.

Problem: Alligatoring—wrinkling of gel coat



Before Laminating Process

<u>Cause</u>	<u>Solution</u>
Water.....	Look for water contamination.
Solvent.....	Do not use solvents to reduce.
Cured over-spray.....	Keep line wet.
Raw catalyst.....	

After/During Laminating*

<u>Cause</u>	
Under cured gel coat.....	

Thin gel coat.....

*Could also occur on second application of gel coat.

Problem: Bleeding—a color that shows in another color

Problem that arises when one color shows on another color.

Color Striping

<u>Cause</u>	<u>Solution</u>
Gel coat sagging over gel coat.....	Assess sag resistance, striping gel coat immediately spray strip coat. Over wet base coat, spray thin film of strip.

Laminate Bleed

<u>Cause</u>	<u>Solution</u>
Monomer in laminating resin.....	Excessive monomer in resin used in laminating.

Backside of gel coat cure..... Change the gel coat.

Problem: Blisters—bubble-like defect in appearance

Problem appears like bubbles on the surface.

After Part is Pulled, Heat Exposure

<u>Cause</u>	<u>Solution</u>
Under-cure of un-reacted catalyst.....	Catalyst over-spray, % of catalyst, mixing issue, leaks.
Oil, solvent, water.....	Dirty air lines, material or rollers.
Air pockets.....	Review rollout.

After Part in Field

<u>Cause</u>	<u>Solution</u>
Un-reacted catalyst.....	Review catalyst levels, distribution, and film thickness (18 mils).

*Source: Cook Composites & Polymers Co., 2000 Application Manual. For more detailed application information contact CCP at 800-821-3590. Please note that the information has been altered as required as it applies to the application of Poly Stone.

Problem: Chalking—gel coat oxidation

Problem appears chalk-like or deposit on surface of gel coat (premature). Gel coats can oxidize over a long period of time. Related to environmental conditions.

<u>Cause</u>	<u>Solution</u>
Cure.....	Incomplete cure from under/over catalyzing. Check air lines, material, rollers. Also catalyst level, film thickness and water/solvent contamination.
Contamination.....	Particles from atmosphere.
Insufficient buffing.....	Wipe buffed area with solvent rag. If gloss remains, are is alright. If gloss dulls, more buffing is required.
Poor mold condition.....	Reduce sanding/buffing requirement on parts by keeping mold in good condition.

Problem: Checking—mud cracking

Problem appears as crescent shaped cracks either separately or in groups.

<u>Cause</u>	<u>Solution</u>
Poor integrity of the gel coat film.....	Could be trapped vapor or incompatible liquid that blows through the gel coat film upon aging. Check catalyst level, asses if there is water, solvent or some other liquid in area. Chemical damage or extremes in temperature.

Problem: Craters

Problem appears while spraying.

<u>Cause</u>	<u>Solution</u>
Chunks in gel coat.....	Check for dirt in gun or filler. Material could be old and gelling—use new material. Filter the gel coat.
Equipment.....	Clean gun, could be clogged. Air setting could be too low.

Problem: Cracks

Web-like cracks radiating from a center-point. Also cracks in circles.

Frontal impact occurs.

Stress cracks appearing in parallel lines.

<u>Cause</u>	<u>Solution</u>
Impact from laminate side.....	Handling and de-molding procedures. Parts should be handled with care.
Mark on mold.....	Defect in mold.
Impact mark.....	Handle with care.
Stress from flexing.....	Too high gel coat thickness. Laminate too thin or under cured. De-molding or handling procedure causing problem to occur.
Mold mark.....	Mold defect.

Problem: Delamination

Problem occurring in small areas (spots)

Problem occurring in large areas.

<u>Cause</u>	<u>Solution</u>
Contamination.....	Source could be from dust, solvent, moisture or catalyst getting onto the gel coat surface.
Gel coat too fully cured.....	Too high catalyst level.
Contamination.....	Solvent wiping, then waxing (around taped areas).
Unbalanced laminate.....	Dry fiberglass, or dry backfill.

Problem: Dimples

Problem of dimples in gel coat surface.

<u>Cause</u>	<u>Solution</u>
Granite materials.....	This is normal for spray granites. Sand finished part to remove.

Problem: Dull gloss

*Problem appearing on gel coat.
When part is just pulled.*

<u>Cause</u>	<u>Solution</u>
Rough mold.....	Polish rough spots out on mold.
Mold buildup.....	Wash, buff with cleaner. Often wax buildup is really polystyrene buildup—follow solution given below.
Polystyrene buildup.....	Sand or scrub with brush and strong solvent (read precautions). DO NOT USE STYRENE!
Dirt or dust on mold.....	Clean mold in spray booth before gel coating. Time between cleaning and spray should be short. Use tack rag.
Solvent or water.....	Check for solvent or water. Drain water traps often.
Raw catalyst.....	Only catalyzed gel coat should be sprayed into mold.

After (when) part is pulled.

<u>Cause</u>	<u>Solution</u>
Rough or wet PVA.....	Review spray technique and allow for longer dry time.
Insufficiently cured gel coat or laminate.....	Correct catalyst level in gel coat and laminate. Allow more time before pulling. To low of temperature (min. of 60 F.). Water, oil, or solvent contamination.

Problem: Dull spots

Problem of dull or soft spots appearing in random.

<u>Cause</u>	<u>Solution</u>
Uneven gel coat.....	Poor breakup—use three passes.
Catalyst improperly mixed into gel coat and/or laminate.....	Mix catalyst thoroughly or adjust equipment for good catalyst mix. Equip. surging, improper catalyst settings. Gun to close to mold.
Trapped solvent in gel coat and/or laminate.....	Review cleaning procedures. Check catalyst level with equipment using solvent reduced catalyst.
Trapped water in gel coat and/or laminate.....	Drain lines and correct the problem.
Insufficient catalyst.....	Confirm correct catalyst concentration.

Problem: Fading

Reference water spotting later in chapter.

<u>Cause</u>	<u>Solution</u>
Poorly cured gel coat.....	Check catalyst levels and film thickness—18 mils (± 2 mils).
Improper cleaners or chemicals.....	Do not use strong alkaline or acidic cleaners.

Problem: Fish eyes

<u>Cause</u>	<u>Solution</u>
Contamination from water, oil or silicone.....	Drain air lines. Check mold release wax. Excess and/or fresh coat of wax is worse. Check lubricating materials within the equipment.
Dust or dirt on mold.....	Use tack rag.
Gel coat film too thin.....	Use 18(± 2) mils wet, in three passes.
Low viscosity material.....	Old material; use new stock.

Problem: Material gelled

<i>Problem occurring in container.</i>	<u>Cause</u>	<u>Solution</u>
	Age.....	Use partial container first (keep covered).
	Storage condition.....	Be aware of storage limitations.

Problem: Jagged tape lines

<u>Cause</u>	<u>Solution</u>
Gel coat starting to gel.....	Use less catalyst, but not below recommended min. level. Use double sided tape process. Use good tape recommended for fine lines.

Problem: Pin holes

<u>Cause</u>	<u>Solution</u>
Insufficient atomization.....	Too high gel coat delivery rate or not enough atomizing pressure.

Problem: Porosity

<i>Visible pores.</i>	<u>Cause</u>	<u>Solution</u>
	Entrapped air.....	Wrong air pressures. Too high—fine porosity; too low—larger surface porosity.
	Wrong catalyst.....	Get recommendation from gel coat vendor.
	No catalyst.....	Check catalyst supply and alignment.
	Gel coat film thickness.....	Applied too thick (18(±2) mils wet). Use two or three passes.
	Formulation.....	Incorrect viscosity and/or resin solids.
	Water or solvent.....	Contact vendor.
	Pump cavitation.....	Contamination
	Excessive mixing.....	Check pump for air leaks. Mix once per day for only 10 minutes

Problem: Pre-release

<i>Problem occurring in the gel coat during cure, with visible surface distortion and low gloss.</i>	<u>Cause</u>	<u>Solution</u>
	Incorrect catalyst.....	Contact vendor for correct catalyst.
	High catalyst level.....	Check equipment and decrease catalyst.
	Low catalyst level.....	Check equipment and increase catalyst.
	Uneven and/or too thick film.....	Check thickness, not to exceed 24 mils, wet. Film thickness should be consistent
	Gel coat cured too long.....	Do not leave gel coat in mold for more than 3 hours without laminating the skin coat. Laminate same day if there are variations in temperature.
	Gel coat resin solids too low.....	Contact manufacturer. Do not add styrene without their approval.
	Uneven cure.....	Catalyst not dispersed correctly.
	Trapped solvent.....	Possible water, oil or solvent contamination.
	Mold release.....	Type and amount on the mold.
	Clay.....	Some may cause and oily residue and pre-release. Change clay, dust with fine powder or over-spray with PVA.
	Extended cure time.....	Laminate sooner
	Laminate curing too fast.....	Check for correct catalyst level. Build laminate in stages.
	Incorrect type of resin.....	Too high in exotherm.
	Laminate curing uneven.....	Low resin solids. Uneven laminate thickness. Check resin to glass ratio.

Problem: Resin tearing

Also known as resin separation.

<u>Cause</u>	<u>Solution</u>
Pigment separate from resin.....	Possible water contamination
Application.....	Avoid over-spray. Incorrect spray techniques create excessive over spray droplets and flooding. Can be aggravated by long gel time and sagging. Keep a wet line and do not let over spray dry.

Problem: Sags and runs

<u>Cause</u>	<u>Solution</u>
Too much gel coat.....	18 (±2) mils, wet should be applied.
Spray technique.....	Atomizing air is pushing and blowing the gel coat.
Low viscosity.....	More styrene should be volatilized. Check viscosity and thixotropic properties or over agitation. Material reduced, but shouldn't have been.
Mold wax.....	Silicone content too high.
Other causes.....	Shifting the mold before it could gel.

Problem: Softness

Problem resulting in the gel coat being easily marked or damaged.

<u>Cause</u>	<u>Solution</u>
Soft gel coat.....	Cure of gel coat in not complete. Also, check catalyst levels, film thickness and possible contaminants.

Problem: Splotches

After sanding and buffing, splotches appear on parts. Problem also referred to as leathery, pebbly and chicken skin.

<u>Cause</u>	<u>Solution</u>
Over-spray.....	Over-spray should not accumulate.
Line not maintained wet.....	Spray 'laps' within five minutes.
Cure.....	Film must cure as a total homogenous film instead of individually cured thin films.

Problem: Water spotting

See fading for more information.

<u>Cause</u>	<u>Solution</u>
Exposure to a combination of excessive heat and moisture.....	Use product recommended for the application. Improper shrink wrap. Only use product applicable to gel coats. Possible under- or over-catalyzation.
Improperly cured gel coat.....	
Chemical treatments such as chlorine or cleaners.....	Incorrect use of these chemicals.
Parts exposed to moisture too quickly after fabrication.....	Allow for one week ambient cure before service.

Appendix

Catalyst Chart

Catalyst Concentration Chart					
Pounds of Resin	% of Catalyst (cc)				
1.0 lbs	4.5	5.7	6.8	7.9	9.1
2.0 lbs	9.1	11.4	13.6	15.9	18.2
3.0 lbs	13.6	17.0	20.4	23.8	27.2
4.0 lbs	18.2	22.7	27.2	31.8	36.3
5.0 lbs	22.7	28.4	34.0	39.7	45.4
6.0 lbs	27.2	34.0	40.9	47.7	54.5
7.0 lbs	31.8	39.7	47.7	55.6	63.6
8.0 lbs	36.3	45.4	54.5	63.6	72.6
9.0 lbs	40.9	51.1	61.3	71.5	81.7
10 lbs	45.4	56.8	68.1	79.4	90.8

MATERIAL SAFETY DATA SHEET*

Safety and Handling Information

The following is general ingredient information for Poly Stone.

SECTION I—PRODUCT INFORMATION

Chemical Name/Synonyms: Poly Stone, Textures

RTECS NO: None

Trade Names: This MSDS pertains to all Dura Stone, Poly Stone and Textures colors.

Chemical Formula: Mixture - See Section II

SECTION II—HAZARDOUS INGREDIENTS

INGREDIENT	CAS#	WEIGHT %	EXPOSURE LIMITS
Aluminum Tri-hydrate (As Aluminum hydroxide)	21645-51-2	50-97 5 mg/M3 (Resp)	15 mg/M3 (Total)
Titanium Dioxide (Pigments)	13463-67-7	< 1.0% 5 mg/M3 (Resp)	10 mg/M3 (Total)
Filler (Filler is a proprietary, trade secret ingredient and is considered non-hazardous under OSHA 29 CFR 1910.1200)	N/A	3-20	15 mg/M3 (Total)

NOTE: None of the ingredients are shown to be carcinogenic

SECTION III—HEALTH INFORMATION

Permissible Exposure Limits: See Section II

Eye Contact: May be mildly irritating to eyes

Skin Contact: Not a skin irritant

Inhalation: May be mildly irritating to the upper respiratory tract. This material is considered a nuisance particulate.

Ingestion: No significant health problems are expected

SECTION IV—EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush eyes immediately with large amounts of water for at least 10 minutes. Seek medical attention if irritation persists.

Skin Contact: Wash off with water.

Inhalation: Remove from area of exposure to fresh air area.

Ingestion: Low toxicity; should not cause any significant health problems.

SECTION V—PHYSICAL DATA

Appearance and Odor: Granular solid material, various colors. No odor.

Molecular Weight: Not applicable Boiling Point: Not Applicable

Melting Point: Not Applicable Specific Gravity: Not Applicable

Solubility: Soluble in strong acids and alkalies

SECTION VI—FIRE AND EXPLOSION HAZARDS

Flash Point: 680°F for filler material. Base material presents no fire or explosion hazard.

Unusual Fire and Explosion Hazard: Filler material will burn with a dark smoke once ignited but will not present an explosive hazard.

Special Fire Fighting Procedures: Use a self contained breathing apparatus approved by NIOSH for all fires. Use dry chemical, carbon dioxide, foam or water spray extinguishing media.

SECTION VII—PHYSICAL HAZARDS AND REACTIVITY DATA

Stability: Stable. Hazardous Polymerization: Will not occur

Incompatibility (Materials to avoid): Strong oxidizing agents

Hazardous Decomposition Products: In a sustained fire, product components may degrade to form carbon monoxide, hydrogen cyanide, and other hazardous by products.

SECTION VIII—EMPLOYEE PROTECTION

Respiratory Protection: If PEL/TLV of any constituent in the mixture is exceeded, use a NIOSH approved half mask, air purifying respirator with particulate filters in atmospheres to 10X the PEL.

Ventilation: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposures

below the PEL/TLV(s)

Other protective Equipment: Eye protection as goggles, and gloves and protective clothing (particulate impermeable) as needed to prevent irritation.

SECTION IX—ENVIRONMENTAL PROTECTION

Spill and Leak Procedures: Use dry cleanup procedures; avoid dusting. Collect in containers or bags.

Waste Disposal: If reuse or recycling is not possible, material may be disposed of in a sanitary landfill if codes permit.

RCRA Hazardous Waste No.: Not federally regulated

SECTION X—SPECIAL PRECAUTIONS

Prolonged storage and exposure to moisture will lead to eventual caking of the product. This is a detriment only to handling the material. No hazard entailed.

Some or all of the reportable chemical substances in this product are regulated by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. None of the substances in this product are classified as toxic chemicals subject to reporting requirements of Section 313 of SARA Title III.

DOT Classification: Not hazardous by DOT regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE AND IS BELIEVED TO BE CORRECT. HOWEVER, ACS MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. ACS ASSUMES NO RESPONSIBILITY FOR INJURY OR ILLNESS FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

**The above data sheet is also available separate from the spray guidelines upon request.*

Poly Stone Product Description

COLOR NAMES : PS000 - PS999

WE CERTIFY THAT POLY STONE IS COMPOSED OF THE FOLLOWING INGREDIENTS:

CHEMICAL COMPOSITION:

CHEMICAL NAME	CAS NUMBER	%
POLYESTER	26062-94-2	47-53
ALUMINA TRI-HYDRATE	21645-51-2	47-53

Poly Stone to Acrybond Color Cross Reference Chart

Poly Stone Color	Code	Acrybond	Poly Stone Color	Code	Acrybond
Amber	PS030	Pewter 2260	Mont Blanc	PSLC465	Pearl 2200
Aqua	PSC401	Pearl 2200	Moss	PSS303	Pearl 2200
Atlantis	PSLC512	Pewter 2260	Obsidian	PSLC508	Black 2140
Aurora	PSC402	Alabaster 2280	Ocean	PS170	Pewter 2260
Baby Blue	PSS321	Pearl 2200	Outback	PSLC510	Cream 2050
Baccarat	PS160	Pewter 2260	Peacock	PSN122	Pewter 2260
Beach	PSC403	Natural 2190	Pecan	PSLC514	Icicle A2340
Black Pearl	PSC442	Black 2140	Pebble	PS070	Tan 2080
Blossom	PSLC 511	Natural 2190	Pepper Ivory	PSLC466	Bisque 2220
Blue Ridge	PSC461	Pearl 2200	Persia	PSLC504	Icicle A2340
Blush	PSS315	Natural 2190	Pine	PS090	Pearl 2200
Canyon	PSLC471	Pewter 2260	Platinum	PSLC483	Beige 2210
Cappuccino	PSLS219	Cream 2050	Pyrenees	PSC407	Pearl 2200
Cloud	PSS210	Natural 2190	Quartz	PS110	Beige 2210
Coal	PS200	Thunder 2270	Ramsese	PSLC 506	Thunder 2270
Dune	PS060	Alabaster 2280	Raspberry	PS260	Alabaster 2280
Dusk	PSC405	Bisque 2220	Rosetta	PSLC485	Natural 2190
Eclipse	PSC406	Pearl 2200	Sahara	PSLC486	Alabaster 2280
Ecru	PSS314	Alabaster 2280	Sand	PSS302	Tan 2080
Edelweiss	PS602	Bisque 2220	Shimmer	PSLC501	Icicle A2340
Emerald	PS120	Verde 2130	Silkstone	PSLC513	Icicle A2340
Europa	PSLC515	Thunder 2270	Snow	PS130	Bisque 2220
Everest	PLSC462	Bisque 2220	Starry Night	PSS323	Thunder 2270
Fashion Grey	PSS310	Natural 2190	Steel Grey	PS150	Pearl 2200
Forrest	PS080	Pearl 2200	Sunset	PSC416	Pearl 2200
Garnet	PS230	Thunder 2270	Tan	PSS312	Tan 2080
Gossamer	PSS311	Alabaster 2280	Tarragon	PSC417	Natural 2190
Ironwood	PSLC500	Black 2140	Terracotta	PSS307	Tan 2080
Isabella	PSS322	Pearl 2200	Tigris	PSLC507	Pearl 2200
Kilimanjaro	PSC463	Natural 2190	Un-named	PS250	Beige 2210
Kodiak	PSLC505	Bisque 2220	Un-named	PS220	Bisque 2220
Kona	PSLC509	Tan 2080	Un-named	PS210	Thunder 2270
Lace	PSS301	Alabaster 2280	Un-named	PS180	Pearl 2200
Lapis	PSLC503	Pewter 2260	Vanilla	PSS326	Bisque 2220
Latte	PS050	Beige 2210	Walnut	PS040	Tan 2080
Leaf	PSS304	Pewter 2260			
Magma	PS601	Plum 2550			
Malachite	PSC409	Pewter 2260			
Matterhorn	PSLC464	Tan 2080			
Mesa	PS240	Natural 2190			
Mesquite	PSLC 502	Tan 2080			
Mint	PS600	Icicle A2340			