



TABLE of CONTENTS

	PAGE
Choosing a Finish	4
Guide to Recipes	8
Craftsman Mix Recipes	10
GFRC Mix Recipes	12
ECC Mix Recipes	16
Curing	18
Processing	19
Polishing	20
Etching	21
Glazing	22
Sealing	23
Color in Concrete	28
BR Signature Series	29
Pure Pigments	30
Formulated Colors	32
Custom Color	37
Fiber	38
Water Reducer	39
Tools	40
Abrasives	41
Support	42

THE BR STORY

As a young man, Buddy Rhodes was consumed by clay. It was all he could think about, night and day. More important than the material itself, Buddy was compelled by the creative process. Eventually that creative process pushed his desire beyond the capacity of the material he was creating with. His ideas were too big for a kiln.

Rather than let this limit his ability to create, Buddy struck out to find something different to quench his desire as a maker. Buddy was after a material that would behave like clay, but that could develop strength and durability without the need of a kiln. Buddy was after a self-hardening clay.

Buddy found his solution in concrete, but not concrete in the way the world had come to know, as a workhorse in the development of modern civilization— cold and utilitarian. Buddy was investigating the material through his own lens, as a moldable and infinite material, and from that process, a whole new material came to life. Buddy created a material that behaved like both clay and concrete, and from that moment an evolution began.

Buddy sought to create and to share with other makers who wished to do the same. Over the decades of this collaboration, a whole new language has been born. A language in the tradition of the craftsman movement, and a set of materials that would allow the maker community to create their vision.



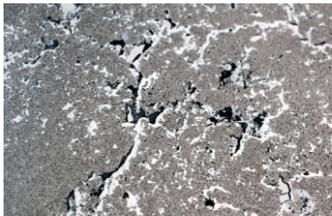
FINISHES - *Who are you?*



It's best to start any journey with the destination in mind. Much of the success of any artisan concrete project boils down to selecting the right materials. But what are the right

PICK THE FINISH THAT IS RIGHT FOR YOUR PROJECT.

materials and recipes for you? The first question you should be asking is "what finish am I after?" The variety of finishes possible with Buddy Rhodes products is virtually limitless. The list below represents some of the most popular choices. Choosing a finish provides a roadmap for the rest of the journey - the materials, tools and skill level required become much clearer.



PRESSED— This is Buddy Rhodes' signature technique. The concrete is pressed into forms and excels when applied to vertical surfaces with minimal effort. The color options are endless. The size of your voids depends on how soft our mix is and how hard you press. This is the easiest finish to get great results from. Best accomplished using our Craftsman Mix (see page 10).



POLISHED— This finish is commonly referred to as a "salt and pepper" finish. This is a result of polishing the concrete after it has been cast. This can be achieved whether cast right side up, or precast upside down. This process exposes a small amount of sand in the mix, which is where the name "salt and pepper" comes from. Best accomplished using our GFRC Mix (see page 12).



TROWELED— This is a finish that reflects the hand of the maker. Full of character and variation, every piece will be different and unique. Any of our mixes can be used for this technique using the trowel or cast recipe.



GROUND— This is similar to Polished, but more of the surface is removed to expose the sand fully, or to expose decorative aggregates. This is the process to use if you want to expose glass or other decorative aggregates. Our GFRC Mix or Craftsman Mix can be used when applying this technique (see pages 10-14).



PRESSED



PRESSED



GROUND

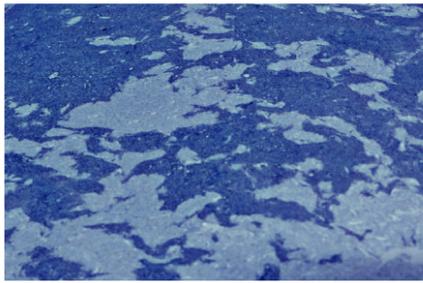


POLISHED



TROWELED

FINISHES - *Continued*



VEINED— This is achieved when different colors of wet mix are blended together and placed in the form. There are numerous methods to achieve this finish. This is best achieved when using our ECC Mix (see page 16).



CREAM— This finish is accomplished when very little processing is done to a neatly cast piece. This finish requires significant attention to detail during the mold building process. It shows loads of character, while being soft and muted in appearance. Best achieved when using our GFRC Mix (see page 12).



HIGH SPRAY— This is a GFRC technique created when the mold is sprayed with variation, and often with different colors. It produces variations in tone and texture, either subtly or dramatically. Best accomplished using our GFRC Mix (see page 12).



GLAZED— Glazes are topical color treatments that can be applied over any of the finishes listed above. They will accent or enhance the finish you've already achieved. Use glazes over a sprayed or lightly ground finish to create a more monolithic look. If using a pressed or veined finish, apply the glaze to create more movement and character in the piece. Learn more about glazes on page 22.

CUSTOM

For every finish we discuss, there is an artisan out there coming up with something new. Concrete is a material of infinite possibilities. These mixes and techniques can be mixed, matched, and manipulated to create infinite variations.



VEINED



CREAM



CREAM



GLAZED

Once you've selected a finish, the next step is to find the correct recipe needed to make it. There are as many concrete recipes and techniques as there are baking recipes and methods. Our recipes were developed by professional artisans. They can be manipulated, modified and twisted to suit your creative needs, but like any good baker, there are certain guidelines that you must understand before you get started. Concrete is a complicated material. This guide to recipes will start you on the right path.



TEMPERATURE IS IMPORTANT

When cement and water are combined, a chemical reaction begins. This reaction produces heat, and is accelerated by heat. The hotter the mix gets, the faster it hardens. For large or complicated projects, you may need to extend the working time of the mix. The important factor is to monitor and understand the temperature of the mix. Once the temperature of your mix reaches 70°F, the cement reaction begins to accelerate. Keep the mix temperature in the high 50's or low 60's if possible.

One way to keep the mix cool is to use cold water and even ice. How cold depends on the other variables you are dealing with. In some circumstances using cool water is enough. In hotter environments, up to 50% of your water weight can be substituted with ice.



WATER REDUCERS | PLASTICIZERS

Water Reducer is used in many of these recipes. Also commonly known as plasticizers, these are chemicals that reduce the amount of water necessary to produce the mix consistency you are after. In general, the more water used, the weaker the mix will be. The goal is to minimize the water content and still maintain the required workability. Water can be added in small doses in situations where the durability of the object is not paramount, but it should be used sparingly in the mixing process.

Water reducers are used differently by virtually every artisan in order to meet their desired objective.

THINGS TO CONSIDER WHEN DOSING YOUR WATER REDUCER

The more you add, the more inclined your mix will be to slump and consolidate. This is a concern if you are going up vertical surfaces. How much is too much? You know you have gone beyond the threshold of water reducer dosages when you notice your mix begin to separate, causing the heavier particles to sink to the bottom of your bucket. Depending on the severity of your segregation, sometimes you can wait a bit for the mix to stiffen up, then remix. Sometimes you need to add more mix to your bucket to balance out the consistency. Always keep your proportions in mind to ensure your color stays consistent.

THERE ARE NUMEROUS WAYS TO MIX

Virtually every type of concrete and mortar mixer available has been used to blend these mixes. The ideal mixers are handheld mortar mixers. If you graduate to larger batches, vertical shaft mixers make a great choice. Another option would be a horizontal style mortar mixer, typically used by masons. Barrel mixers could be used, but are best suited for mixes containing larger aggregates. A good rule of thumb when sizing a batch to a mixer— the capacity is roughly one half the mixer rating capacity. If you don't have access to a mixer, and all you have is a hoe, is that enough? Sure, everyone needs a workout!

REINFORCEMENTS

Many recipes utilize some type of reinforcement. In general, we recommend fibrous reinforcements over steel. We carry a variety of alkali resistant (AR) glass fibers, acrylic fibers and PVA fibers. Adding fiber will make a mix a bit stiffer, but the mix consistency can be adjusted with the addition of plasticizer. Specialty reinforcements such as AR glass scrim can also be added to strengthen cantilevered overhangs or wide spans such as tabletops.

A NOTE ABOUT SAFETY

We love concrete, and strive to make the process as easy and enjoyable as possible. But more than anything we want that process to be safe. We encourage you to use proper safety equipment; gloves and glasses are always appropriate. Dust masks or air extractors are recommended when mixing and should always be used when dry polishing. Be safe, and have fun!



You will be hard-pressed to find a more enjoyable concrete mix to work with. The consistency of this mix can be that of clay or fluid like pancake batter. The choice

CRAFTSMAN MIX

is yours and depends on your project. This mix can be pressed up vertical surfaces, trowels like butter, and can be made fluid

to conform to any shape. It is ideal for the newcomer to concrete, but is also revered by professionals as one of the easiest and more enjoyable mixes there is to work with.

MIXING INSTRUCTIONS FOR CRAFTSMAN MIX

- Combine water and pigment together and mix thoroughly.
- If you know the amount of water reducer required, add that to the water and pigment.
- Slowly add dry ingredients while mixing. Mix until fully blended.

For Backer Mixes:

- Slowly add the AR Glass Fiber* to the thoroughly mixed material. Blend until homogeneous. Temper with water reducer as needed for desired consistency.

*Mixing too long or at too high a speed after fiber has been added can filamentize or damage the fiber, resulting in placement issues and reduced strengths.

Color: Bone White

One bag covers +/- 5 sq. ft. (0.5 sq. m) at 1" (2.5 cm) thick.

Total Cementitious Binder: 20.5 lb (9.29 kg) per bag.

This mix is typically cast at 1.25" - 1.5" (3.17 cm - 3.8 cm) thick. It can be cast thinner, particularly with the use of AR Glass Fibers in the backer mix, but consideration must be given in the handling and support of the piece.



THE PRESS TECHNIQUE

The press technique is Buddy Rhodes' signature technique. It is achieved by using his Craftsman Mix with as little water as possible to create a dry, clay like mix. Buddy's adventure into concrete began with his search for a "self-hardening" clay; so it makes sense that a clay like mix would be central to his signature technique. This mix is then hand packed into the mold. Because the mix is so dry, voids are created naturally during placement. This results in a veined look, unique to every piece. This is what we want— beautiful structural geology.

In many cases, the pressed technique is approached in a similar manner to the composition of GFRC. For this, a thin surface layer is pressed into the form, followed by a backer mix containing AR Glass Fiber. This gives the piece the necessary structural reinforcement.

Because this mix is often pressed up vertical walls, it is important to be cautious with dosing water reducer. If too much water reducer is added, the mix will have a tendency to slump down your vertical surfaces. Water reducer should only be used sparingly in the surface mix to soften the mix for improved workability. You can be slightly more liberal when adding water reducer to the backer mix to compensate for the glass fiber stiffening the mix.

PRESS RECIPE

- 50 lb (22.7 kg) Craftsman Mix
- 6.8 lb (3 kg) Chilled Water
- 0 - 5 ml Water Reducer 420
- Pigment to taste

1.25 - 1.5 lb (0.56 - 0.68 kg)

Alkali Resistant Glass Fiber
(Backer/Structural Mix Only)

Ideal for Pressed Finish

Skill Required ☆☆☆☆☆

TROWEL TECHNIQUE

The trowel technique is different in that you are building your forms right side up, either in the shop, or actually cast in place at the job site. This technique is a great opportunity to show the unique hand and skill of the craftsman. The final finish has an almost buttery, leathery look and feel. This is due to the trowel work bringing up the cream and working it at different stages of curing.

Cast in place objects can also be composed with a structural mix containing fibers, and a finished surface that does not. If additional reinforcement is needed, we recommend layers of AR glass scrim.

Aggregate should be added to improve yield and reduce shrinkage. The mix that is added to the surface (the layer that you trowel) should be made without AR glass fiber, acrylic AC50 fiber can be added to improve trowelability.

You can use water reducer to taste in this application. Make a stiffer mix and it will be ready for troweling sooner. If you make a more fluid mix it will be more difficult to trowel initially, but will consolidate along the edges more efficiently, leaving fewer air voids.

TROWEL RECIPE

- 50 lb (22.7kg) Craftsman Mix
- 15 lb (6.8 kg) 3/8" (1 cm) Aggregate (can be withheld in the troweling layer)
- 6.8 (3 kg) lb Chilled Water
- Water Reducer 420 to taste
- Pigment to taste
- 20 Grams Acrylic Fiber AC 50 (recommended, particularly in the troweled surface)
- 1.25 - 1.5 lb (0.56 - 0.68 kg) Alkali Resistant Glass Fiber (Backer/Structural Mix Only)

Ideal for - Cast in Place, Troweled, Polished, Ground

Skill Required ☆☆☆☆☆



CAST TECHNIQUE

The cast technique (pour and vibrate) is fairly straight forward. Build a watertight mold and pour in the concrete. If mixed properly and vibrated well, a good clean surface can be achieved free of any air pockets or bug holes. For an aesthetic that includes pits and holes, minimize your water reducer and/or vibration.

CASTING RECIPE

- 50 lb (22.7kg) Craftsman Mix
- 6.8 lb (3 kg) Chilled Water
- 5 - 10 fl oz (148 - 296 ml) Water Reducer Adva 555
- Pigment to taste

0.1 - 0.5 lb (45 - 227 g) PVA 15, PVA 100, or Acrylic Fiber AC50

Ideal for Lightly Polished, Ground, Machined, Veined

Skill Required ☆☆☆☆☆

GFRC (Glass Fiber Reinforced Concrete) is a simple composite. It typically consists of a surface layer (face/mist coat) without fiber, and a structural layer (backer mix) containing AR Glass Fibers. Our GFRC Mix can be sprayed, poured, pressed, or troweled. Due

GFRC MIX

to the absence of larger aggregate in the mix, it is an ideal base to add decorative aggregates to, or to build a specific custom recipe from. In some cases the GFRC recipe contains fibers throughout, such as with SCC. The introduction of GFRC to our industry has made possible stronger and lighter weight pieces. The mix can be used to create many different looks; from a clean, almost machined finish to one with beautiful depth and movement.



CREATE YOUR OWN GFRC BLEND

You can source local sands and cements to create your own blend. Here is the recipe for the blend, the only thing you will need to add is the GFRC Admixture.

Your blend will contain the following:

- 24.6 lb (11.16 kg) Portland Cement (We recommend Federal White)
- 21.8 lb (9.88 kg) 30/60 Mesh Silica Sand
- 3.6 lb (1.63 kg) GFRC Admixture



MIXING INSTRUCTIONS FOR GFRC

- Combine water and pigment together and mix thoroughly.
- Add 50% of the water reducer to the water. Slowly add dry ingredients while continuing to blend. Add remainder of water reducer. Blend until homogeneous

For Backer Mixes:

- After initial blending, slowly add the AR Glass Fiber to the mix. Blend until homogeneous*. Temper with water reducer as needed for desired consistency.

If Using Acrylic Fiber:

- Mix fibers with 20% of the mix to create an acrylic fiber slurry.
- After initial blending, add acrylic fiber slurry and any pigments you are using. Blend until homogeneous.

*Mixing too long or at too high a speed after fiber has been added can filamentize or damage the fiber, resulting in placement issues and reduced strengths.

Color: Bone White

One bag covers +/- 5 sq. ft. (0.5 sq. m) at 1" (2.5 cm) thick.

One bag produces +/- 30 sq. ft. (9.14 sq. m) of mist/face coat when sprayed.

Total Cementitious Binder: 26 lb (11.8 kg) per bag.

This mix is typically cast at 0.75" - 1" (1.9-2.5 cm) thick.

It can be cast at 0.5" (1.27 cm) thick, but considerations must be given in the handling and support of the piece.

SPRAY TECHNIQUE

The spray technique is accomplished in two stages: a surface layer (face/mist coat) without fiber, followed by a structural layer (backer mix) containing AR Glass Fibers. The consistency of the sprayable mist coat should be similar to a milkshake. It should be fluid enough to move through a hopper gun, but not so fluid that it slumps down from vertical formwork (see hopper gun on page 40). This is made easier with a little practice. For the backer, you can make a fluid mix that pours over the mist coat, or you can make a thicker mix that is applied by hand. A thicker mix is especially useful for vertical walls. The key to the spray technique is making sure that there is good bonding between layers. Timing is critical. Before applying the backer mix, make sure that the mist coat has not fully dried out, but is firm enough that the backer mix won't push through the surface and show fiber in your finished piece.

This same recipe is ideal for adding decorative aggregates into your mix. You can add up to 10 lbs of decorative aggregates per 50 lb mix, and simply pour the mix into your forms, followed by the backer mix.

SPRAY RECIPE

- 50 lb (22.7 kg) GFRC Blended Mix
- 8.3 lb (3.76 kg) Chilled Water
- 25 ml Water Reducer 420 (Additional may be required)
- Pigment to taste
- 0.1 lb (45 g) PVA 7, PVA 15, or Acrylic Fiber AC 50 (optional)
- 1.5 - 1.75 lb (0.68 - 0.79 kg) Alkali Resistant Glass Fiber (Backer/Structural Mix Only)

Ideal for Cream, Polished, Ground, High Spray

Particularly useful for large complex shapes and 3D objects.

Skill Required ★★★★★



SCC TECHNIQUE

SCC (Self Compacting/Consolidating Concrete) is a mix that consolidates with minimal mechanical force. This mix is cast directly into the forms, often without a face mix. This is a great method for rapid casting of flat panels. The key to success is keeping in mind that the glass fibers are just below the surface. Too much polishing and grinding on this mix will expose fibers and be unsightly. Many people have replaced the glass fiber with 0.6 lb of PVA100 fibers (or a combination of PVA100 and PVA15), allowing the ability to polish a bit further without having the fibers be as noticeable.

SCC/CAST RECIPE

- 50 lb (22.7 kg) GFRC Blended Mix
- 8.3 lb (3.76 kg) Chilled Water
- 5 - 10 fl oz (148 - 295 ml) Water Reducer Adva 555
- Pigment to taste
- 1.5 - 1.75 lb (0.68 - 0.79 kg) Alkali Resistant Glass Fiber

Ideal for Cream

Useful for Objects that will require minimal processing. This will produce more variation than some of the other 'machined' finishes due to the fluid nature of the mix.

Skill Required ★★★★★

TROWEL TECHNIQUE

There are artisans that will take the aforementioned recipes and trowel these mixes. Additional sand and aggregate should be added to this mix to reduce shrinkage and increase yield. The composition will be the same as the sculpt recipe, adding backer mix first, followed by the surface mix last.



TROWEL RECIPE

- 50 lb (22.7 kg) GFRC Blended Mix
- 10 lb (4.53 kg) Coarse Sand (1/8"-1/4") (0.31 - 0.63 cm)
- 20 lb (9.07 kg) 3/8" (0.95 cm) Aggregate
- 8.3 lb (3.76 kg) Chilled Water
- Water Reducer 420 (Add to taste)
- Pigment to taste
- 20 Grams Acrylic Fiber AC 50
- 1.5 lb (0.68 kg) Alkali Resistant Glass Fiber (Backer/Structural Mix Only)

Ideal for Troweled, Polished, Ground, Veined

Skill Required ★★☆☆☆

SCULPTABLE TECHNIQUE

Since there are no large aggregates in this mix, it is ideal for sculpting. The sculptable technique is done in reverse to traditional GFRC. First apply the backer mix to a form, then cover that with a surface mix that contains acrylic fibers. The acrylic fibers won't show on the finished surface.



SCULPT RECIPE

- 50 lb (22.7 kg) GFRC Blended Mix
- 8.3 lb (3.76 kg) Chilled Water
- Water Reducer 420 (Add to taste)
- Pigment to taste
- 20 Grams Acrylic Fiber AC 50
- 1.5 lb (0.68 kg) Alkali Resistant Glass Fiber (Backer/Structural Mix Only)

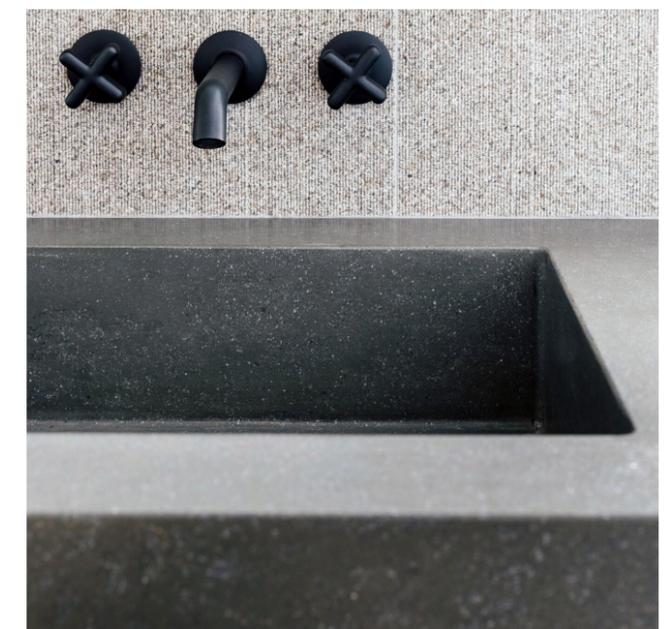
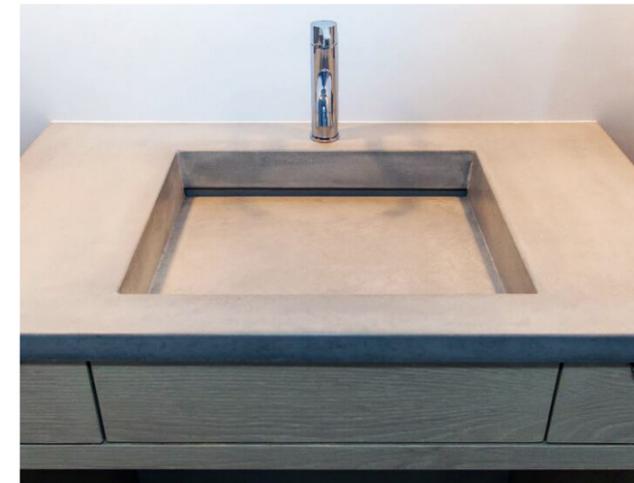
Ideal for Sculpting, Pressed

Skill Required ★★☆☆☆

Skill required really varies depending on the object. It is more complex simply because you are doing the finishing while the mix is workable; making timing critical.

ARTISAN MIX

Just a small job or looking to test the waters? Try our 10 lb. (4.5 kg.) Artisan Mix. Similar to our GFRC Mix, this specially formulated concrete blend is ideal for artistic, sculptural, and craft projects. This mix has only fine sand as aggregate, allowing for casting thin sections. It cures to a bone white and may be pigmented to any color using the BR Color Series, Formulated Colors or Pure Pigments. Artisan mix has all of the necessary high performance ingredients preblended, including curing polymer. The Artisan Mix also comes with a small amount of powdered water reducer. Add this in combination with water to achieve any consistency.



The most advanced mix design available is ECC (Engineered Cementitious Composite). This mix was originally developed for use in seismic zones for its high ductility. It has been modified to improve the mix characteristics while maintaining performance. The strength of our ECC recipes comes from the combination of particle gradation and the addition of a high dosage of fiber. From a creative standpoint, ECC can be mixed to unique workabilities, allowing for many variations in finish. While this mix takes some getting used to, the professionals that use it swear by its vast aesthetic and performance potential. It is very strong, it will bend before it breaks, and it produces unrivaled finishes and durability.

👉 CREATE YOUR OWN ECC BLEND

You can source local sands and cements to create your own blend. Here is the recipe for the blend, the only thing you will need to add is the ECC Admixture.

- 26.15 lb (11.86 kg) Portland Cement
(We recommend Federal White Cement)
- 7.1 lb (3.22 kg) 30/60 Mesh Silica Sand
- 9 lb (4.08 kg) 40/120 Mesh Silica Sand
- 7.75 lb (3.51 kg) ECC Admixture

MIXING INSTRUCTIONS FOR ECC

- Combine water and pigment together and mix thoroughly.
- Add 50% of the water reducer to the water.
- Slowly add dry ingredients while continuing to blend.
- Slowly add PVA Fibers to the mix. Blend until homogeneous
- Temper with water reducer as needed for desired consistency.

If Using Acrylic Fiber:

- Before mixing, add acrylic fibers to the water and let soak thoroughly.

Color: Bone White

One Bag covers +/- 5 sq. ft. (0.5 sq. m) at 1" (2.5 cm) thick.

Total Cementitious Binder: 28.45 lb (12.9 kg) per bag.

This mix is typically done at 0.75" - 1" (1.9 - 2.5 cm) thick. It can be cast at 0.5" (1.27 cm) thick for objects like tiles, but considerations must be given in the handling and support of the piece.



These recipes contain fiber throughout the mix, which will ultimately become part of the finish. In the case of troweled finishes, a composition similar to those mentioned with GFRC can be utilized. Instead of eliminating fibers throughout the face mix, you increase the loading of acrylic fibers which trowel well, and decrease the loading of PVA 100 which are far more visible in finished surfaces.

CLAY TECHNIQUE

This is a stiff recipe, which can be pressed up vertical walls and into molds to create beautiful finishes. While it is quite a bit different to work with than the Craftsman Mix, you can achieve brilliant veined finishes with tremendous durability. Patience is key when mixing this recipe. Adding the fibers too quickly can choke the mix.

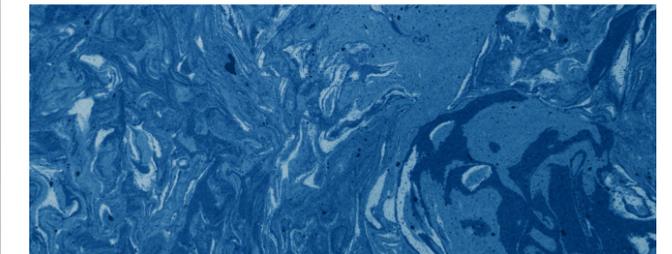


CLAY RECIPE (STIFF)

- 50 lb (22.7 kg) ECC Blended Mix
- 9.4 lb (4.26 kg) Chilled Water
- 0-60 ml Water Reducer 420
- 42 Grams Acrylic Fiber AC 50
- 130 Grams PVA RECS 15
- Pigment to taste

Ideal for Troweled, Polished, Ground, Machined, Veined

Skill Required ★★★★★



CAST TECHNIQUE

This recipe has a soft consistency that is not as fluid as the Flowable mix, but easier to move around than the Clay mix. It is ideal for casting and troweling. Many interesting effects can be created using this recipe in different ways during casting. It is often used in combination with the Clay mix. They can be pressed together without having color bleed between the mixes, opening up a world of possibilities for finish and movement.

CAST RECIPE (SOFT)

- 50 lb (22.7 kg) ECC Blended Mix
- 8.9 lb (4.03 kg) Chilled Water
- 60-140 ml Water Reducer 420
- 110 Grams PVA RECS 15
- 220 Grams PVA RECS 100
- Pigment to taste

Ideal for Troweled, Polished, Ground, Veined

Skill Required ★★★★★

FLOWABLE TECHNIQUE

This recipe produces a fluid ECC mix. It can be placed directly into forms, and will consolidate with minimal effort.



FLOWABLE RECIPE (FLUID)

- 50 lb (22.7 kg) ECC Blended Mix
- 8.9 lb (4.03 kg) Chilled Water
- 140-150 ml Water Reducer 420
- 360 Grams PVA RECS 100
- Pigment to taste

Ideal for Cream, Polished, Ground, Veined

Skill Required ★★★★★

Concrete develops strength through a process called hydration. We want concrete to be as hard and dense as possible, so we create an environment where hydration is as efficient as possible. This is called curing. The recipes and techniques outlined in

CURING OVERVIEW

previous pages can be used to make high quality concrete. But if the concrete is not properly cured, all that effort will be wasted.

CURING

When cement comes in contact with water, a chemical reaction begins to take place. This chemical reaction uses the elements of the cement and the water, and converts these elements into a crystalline formation. This is hydration, and this hydration is most efficient in a humid and warm environment. If humidity and heat are lost too quickly, the process of hydration is stifled and slows to a snail's pace, and we don't want that to happen.

In order to ensure that concrete reaches its maximum potential, we must create a good curing environment. This means we go through the necessary steps to keep the concrete warm and moist for the first hours or days after casting. Ambient temperature should be kept at a minimum of 50°F (10°C).

A layer of moist felt covered with plastic sheeting will keep the moisture from escaping. This is often covered again by blankets or insulation to keep the heat from escaping. This creates an environment ideal for concrete to develop strength.

So how important is this step, and how long should the concrete be in this curing environment? If you create a good curing environment, anything beyond 72 hours in the mold is more than sufficient. 48 hours is ideal. 24 hours is common (and can be improved using heating blankets, but only under guidelines of a pro). One note of caution: if the concrete is cast into a mold made from an absorbent material (ie. melamine), extended periods of moisture and heat can cause bad things to happen to the mold which will be reflected in the finished surface. Troweled finishes should not have plastic placed directly on them during the curing process, as it is likely to leave discolorations.

THE 16 HOUR FALLACY

Many bag-mix concrete products promote a 16 hour cure time, with no instruction for covering with plastic or blankets to promote proper hydration. So, why are Buddy Rhodes Concrete Products so complicated to work with? The truth is all of our mixes will be hard and strong to demold the next day, even if you don't do all of the recommended steps. But you may be sacrificing quality for hastiness. There is chemistry taking place, and to ignore this reality out of negligence or ignorance would negate all the efforts made to create something exceptional. All good things have nuance. We encourage you to embrace and understand the nuance of these materials, just as an artisan winemaker appreciates nuance in the effort of providing you with an experience, not just a bottle of fermented grapes.



Processing describes the different steps needed to transform a freshly demolded casting into a finished piece of artisan concrete worthy of being installed in its final destination.

PROCESSING OVERVIEW

It includes everything from fixing minor imperfections to polishing and etching. Processing prepares a concrete casting for glazing (optional) and ultimately for applying a sealer.

BEFORE YOU DEMOLD

Processing begins just before you demold your piece. While it is still in the mold, take time to polish the bottom of the concrete to a smooth finish. The first thing most people do when encountering a piece of furniture is run their hand along the bottom edge. Polishing this area ensures that experience will always be a pleasurable one.

Now that you have demolded, what's next? To answer this question, you must consider what you had in mind to begin with, and what your piece looks like fresh out of the mold. Certain casting techniques will render something that needs very little processing. Other techniques will require a bit of processing prior to being ready to seal and finish your piece.

FILLING VOIDS - BONE PASTE PLUS

Few castings are perfect straight out of the mold. It is common to have small voids or pinholes to be filled. Bone Paste Plus is a blend of cement, pozzolan, and polymer that is specially formulated for filling these voids. The paste doesn't have any large particles, so it is soft and smooth, allowing it to easily fill holes. Simply add water and pigment to taste before applying. The process is similar to mudding drywall. Bone Paste is applied, allowed to dry (typically overnight), then polished away.

If you've chosen a pressed finish, now is the time to add some character. Fill the voids with one color, or multiple colors. It can be similar to the base color, complementary or contrasting depending on the desired look. Fill the voids a little bit at a time, allowing each layer to dry fully (a few hours depending on the temperature) before adding the next layer. Be sure you leave a thin 'skim coat' of your final color, not so much that you will have to polish forever, but enough that you will fully fill the voids. Bone Paste Plus is packaged in 8 lb (3.63 kg) Pails.



Most often, you will want to do a bit of grinding and polishing. This will allow you to clean up edges and remove any casting residue. In other cases grinding and polishing will fully expose a decorative glass aggregate you have added to the mix.

The most important thing to understand before polishing is the “geology” of the concrete. The finished surface is the “cream layer” consisting of very fine materials only. As you work your way into the slab, the next layer you will find is a fine bit of sand; the “salt and pepper layer.” Going deeper you will begin to fully expose the sand particles in the “sand layer.” Finally, you will enter the “aggregate layer” where your sand and any additional aggregate is fully exposed. Understanding these layers will help you know how deep you must polish or grind to achieve the surface finish you want.

The choice of grinding and polishing tools, pads, and processes will reflect what you are trying to accomplish. To maintain the cream layer, lightly polish the concrete using pads that are 200 grit or higher. The higher grits produce higher sheen. To expose your aggregate, begin grinding with more aggressive grit pads, progressing to higher grits until reaching the desired sheen and exposure.



POLISHING - WET OR DRY?

Dry polishing is likely to produce a higher sheen, even at lower grits, but it will produce a dust that is not good for your health. Wet polishing is messier, but safer for your health and it produces a sheen that is more true to the grits you are using. Careful attention should be given when using electric tools in a wet environment.

As for tools, you can use a wet/dry variable speed polisher, or a random orbital polisher. Variable speed polishers and grinders are best for aggressive grinding, and are faster with polishing. Random orbital sanders are nice since they are less likely to leave swirl marks in the way that polishers can. It is a slower and more methodical process, but it is easier for containing water when wet polishing or dust when dry polishing. For detail work, the Hand Polishing Pads are ideal. Best if used wet, these allow you to easily polish edges and hard to reach spots. For small objects, they can be all you need.

Nonwoven abrasive pads are a great finishing pad. They help remove swirl marks, residue, and slurry that may not have made it off during processing. After polishing, clean off all residue, water and dust. Be sure to dry everything off so that the concrete is ready for the next step (whether etching, glazing or sealing).



A unique and versatile finishing technique used by many professionals is etching the concrete. Etching can be done in conjunction with stencils to produce designs, or as an entire surface treatment.

Etching is a process of washing and profiling the concrete with an acidic solution. In the case of a “full treatment,” the entire surface is flooded with water, then an acidic solution is applied. The concentration of the acidic solution varies based on the desired texture and working time. Several rinses with fresh water will neutralize the acid. Follow this with a wet buffing using Nonwoven Abrasives (see pg 41). (Please follow all recommended safety precautions when utilizing acid solutions.)

WHY ETCH?

Etching opens up the surface so that the sealer is more easily received. It flattens the sheen on a concrete surface. It also creates a ‘tooth’ for materials like Glazes to bond more readily. While it is not required, and in many situations not practical, etching can be a very useful technique under certain conditions.





Glazes are used to produce color enhancements, whether as a full color treatment, or to adjust the concrete's base color in one direction or the other. Glazes are a water-based color treatment

GLAZING OVERVIEW

that will produce a consistent color regardless of the state of the concrete.

Available in a wide color range, glazes can be blended together to produce a wide array of shades. Glazes are UV stable, and do not contain acids, metal salts, or acetone.

Standard Colors: Black, Blue, Leather, Red, Maple, Olive, Umber, Green, Yellow, and White

Packaged in 4oz Spray Bottles, Quarts, and Gallons



Whether applied over stencils to create patterns, used as a tint, or applied to create variation and movement, the possibilities are endless. There are many techniques for application, which include rubbing with a microfiber cloth, dabbing with a cloth, applying with a roller or brush, and so on.

HELPFUL TIPS FOR APPLYING GLAZES:

- The material can be applied over polished concrete, but it will be far more durable on concrete that is matted or etched.
- When the glaze is wet, it is active. When you rub across a still wet area, it will remove the material.
- The longer the glaze has been dried, the harder it will be to remove. Soon after drying, it can be removed with a wet towel. If removed the next day it will require diamond abrasives.
- Apply in thin layers. You will end up with a more durable finish applying multiple thin layers as opposed to one thick layer.
- The first coat is the hardest. When the concrete is thirsty, it is tough to keep from getting streaks. You can dilute the glaze with 50% distilled water. If you want to make an even more dilute solution, you can make a base of 25% CH Prep, 25% FS Seals, and 50% water. With this formula, you can make as dilute a glaze as you want. The further the dilution on your first layer, the more forgiving.
- A dilute version of the Black Glaze is a very effective way to enhance virtually any color. In many cases, this will produce the most durable 'wet look' effect you will find.
- Protect your piece with sealer. Glazes are fully UV stable, and will stand up to a fair bit of abrasion, but a sealer should be used to help protect them for the long haul.



Concrete is an inherently porous material and often needs to be sealed for particular environments and uses. There are a multitude of systems and products on the market used for sealing concrete. There is no magic answer, and every sealer and

SEALING OVERVIEW

system has pros and cons. We offer 3 primary systems for sealing concrete, developed after many years of experience, trial and error, and observation. Like most things we value, concrete requires care and attention. Choice of sealer is often a balance between what best fits the needs of the finished piece and what best matches the skill level of the person applying it.

THE BUDDY RHODES SEALING SYSTEM

Buddy's system is a combination of three products. A Penetrating Sealer, a Satin Sealer, and Beeswax. Do you need to use all three? Not necessarily, but there's a reason for each. The Penetrating Sealer provides a primer that will improve stain resistance and repels liquids. This adds further protection if there is a failure of the Satin Sealer, or there is prolonged exposure to staining agents. The Satin Sealer is the main source of protection, particularly against acids. The Beeswax is an optional step, but it provides a sacrificial layer, and allows for an easy process for rejuvenating your concrete. The only downside to the Beeswax is that it is hard to remove if you want to reseal your countertops.





Buddy Rhodes Reactive Polyurethane Sealer (RPS) is a hybrid sealer combining the benefits of both reactive **BR REACTIVE POLYURETHANE SEALER** sealing technology and a waterborne urethane sealer. Urethane is one of the most abrasion resistant chemistries available, and the reactive component helps toughen the surface even more.

When properly applied and cured, RPS has great scratch resistance and excellent adhesion. The chemistry makes for a surprisingly tough surface. This sealer is easy to use, requiring only a high density roller to apply. Keep in mind that just like concrete, any urethane technology cures faster in warm, humid conditions. Like similar concrete countertop sealers, RPS can remain “gummy” for 24 to 48 hours following application of the final finish coat. Shop conditions should be well controlled.

MATTE v. SATIN | COLOR ENHANCED v. NON-ENHANCED

RPS is available in 2 options: Matte and Satin. Matte versus Satin refers to how flat or shiny the sheen is. Sheen is not related to color enhancement and vice versa. Either sheen option can be applied to provide color enhancement (darkening of the color such as when you wet concrete with water), or not to enhance the color of the concrete (a paler, dry appearance). Color enhancement (or not) is determined by how you mix the ingredients together in the priming steps. Each sealer kit gives you the option of doing either with the same ingredients. There’s nothing extra or separate to buy. Note that some colors of concrete will show more enhancement than others. Typically darker concrete will show more enhancement than lighter concrete.



When properly applied to high performance concrete, there is not a sealer in the market that can compete with ICT. This is a popular choice among professionals, but it requires close **ICT SYSTEM** attention throughout the entire process of creating and finishing concrete. Recently the ICT family has expanded to include two new options. The new products are single component sealers with either a low sheen or normal sheen finish.

ICT is a hybrid reactive sealing system. What exactly does that mean? Reactive sealers penetrate into the concrete, convert weak material into crystalline structures, and block penetration of foreign materials into the pore structure of the concrete. It does all this while maintaining breathability, so you don’t have the concern of the sealer “lifting” if moisture penetrates. The hybrid part of the equation is that ICT also includes advanced technology to improve the stain resistance of the concrete. This sealer is the highest performing reactive sealer on the marketplace, and has been developed over many years specifically for artisan concrete applications.

Here’s the catch— ICT relies on the concrete itself for its performance. It is paramount that a high performance mix design is used and proper curing and processing protocols are followed. This is not a classic topical or penetrating sealer that cures to itself and sits on or in the concrete. This means that the curing and processing of the concrete, and the application of the sealer happens thoughtfully to increase the effectiveness of the system.

ICT | CH PREP + FS SEALS

The original ICT system is a combination of two products; CH Prep and FS Seals. CH Prep is a premium reactive densifier and conditioner which acts as a primer. Application of FS Seals is the second step in the original ICT process. FS Seals is a hybrid reactive sealer with a micro-acrylic emulsion. It provides additional acid and stain protection and will not peel or scratch.

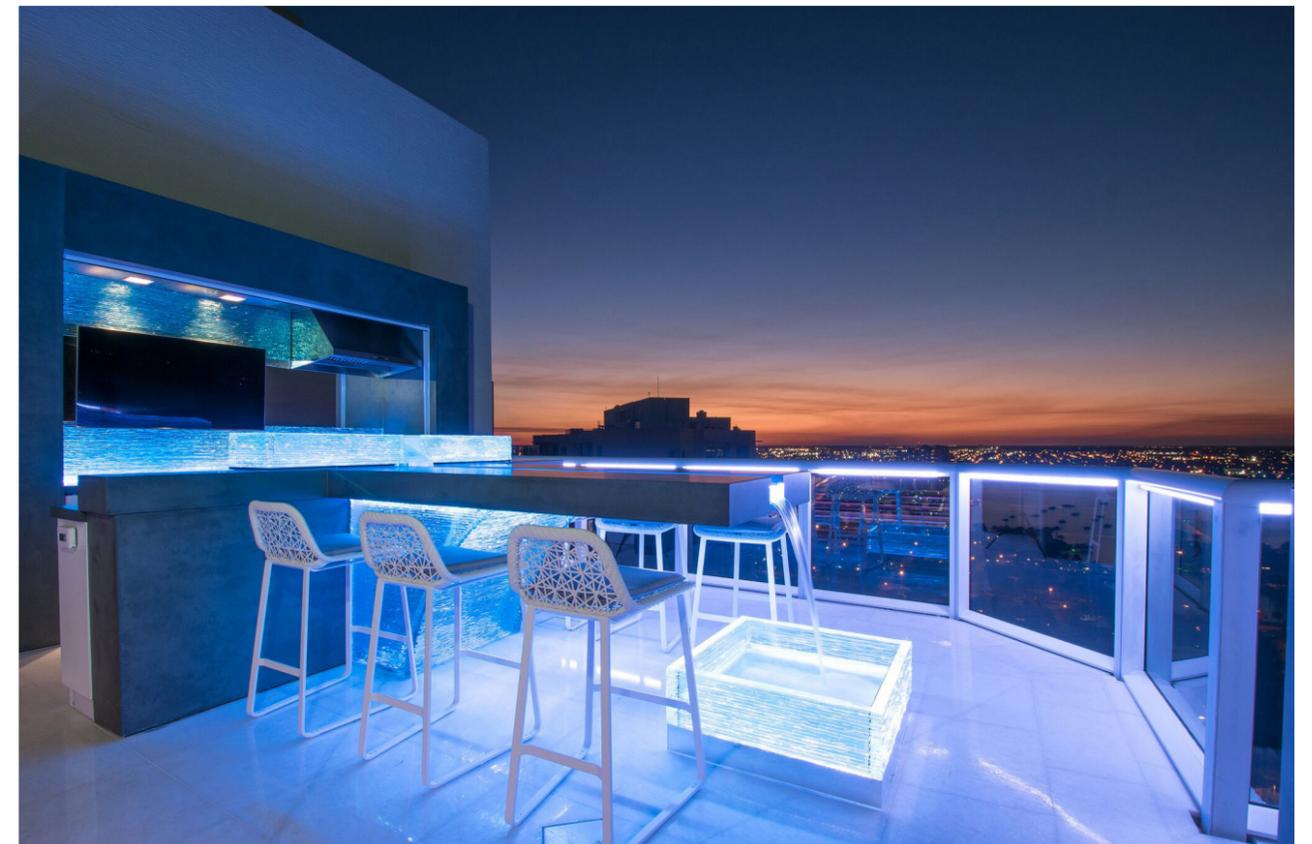
ICT | PS1, PS1-LS

Built on the same foundation as the original ICT System, ICT PS1 combines the benefits of a reactive penetrating sealing technology and a micro-coating technology together in one single product. Use ICT PS1 for both the priming steps and finish application. ICT PS1-LS is the “low sheen” version; for those who prefer a matte appearance.

ICT | CLEAN AND SET

Applying Clean and Set is the last stage in any ICT sealer application. It speeds up the curing process while increasing the early water repellency, hardness and scratch resistance. Simply wipe a small amount of Clean and Set onto a recently sealed surface, allow to dry, then immediately wipe clean with a damp towel.







Buddy Rhodes Concrete Products is unique in our ability to offer limitless color options. Whatever color you are after, and however you would like to accomplish that, one of the options **COLOR TELLS A STORY** in our Buddy Rhodes Color Wheel™ will meet your needs. The pigments we use are designed specifically to withstand the caustic nature of cement, are UV stable, and provide the largest range of color possibilities on the planet.

GETTING THE MOST OUT OF COLOR FOR CONCRETE

The natural color of all Buddy Rhodes Concrete mixes is bone white. We use Federal white cement as a primary ingredient because it is more consistent in quality and color compared to grey cements. For this reason, all of our colors are developed using a white cement base. You can use grey cement for your piece, but know that the color may vary from casting to casting.

HOW TO CALCULATE COLOR IN CONCRETE

All colors are formulated as a percentage of the Total Cementitious Binder (TCB) of the mix. TCB is the sum of all cementitious materials in the mix, including all cement and pozzolans. The TCB is multiplied by the “Loading Percentage Rate” (LR) listed with each of the color swatches, this determines how much pigment needs to be added to your mix.

HERE’S HOW IT WORKS-

- **Determine your color** - There is a percentage number listed on each swatch in the pure pigments and Specialty Collection sections of this catalog. This represents your loading percentage rate (LR). As an example, “2058-30 Deep Ocean” has a LR of 8.55% or .0855
- **Determine your TCB** - Your mix is a blend of cement, pozzolan, sand, aggregate, and so on. We will use GFRC Blended Mix for this example, which has a TCB of 26 lb.
- **Determine your Number of Batches** - How much coverage will you get with your mix? This will determine how many batches of concrete you will need to make, which will tell you how much pigment you need. Let’s say the piece you are making is 10 sq ft and 1” thick. The GFRC Blended Mix covers 5 sq ft at 1” thick, so you will need 2 batches of mix.
- **Round up** - Add 10% for spillage and test samples, then round up one more time. These pigments are sold by the pound.

$$\begin{array}{rcl}
 26 \text{ (TCB)} & \times & .0855 \text{ (LR)} & = & 2.223 \\
 2.223 & \times & 1.1 \text{ (10\%)} & = & 2.445 \\
 2.445 & \times & 2 \text{ (batches)} & = & 4.89
 \end{array}$$

Result = 5 lb of pigment needed.



BEST PRACTICE

The final appearance of the concrete product is determined by a combination of several color factors, including surface texture, color of the cement-pigment paste, aggregate color, admixtures, and water/cement ratio. Test using a small batch of your mix design before any large pour. Use the same steps as above to determine your color needs.

This is a series of colors that are timeless, aesthetically rich, and simple to use. Each **SIGNATURE COLLECTION** Signature Color is formulated so that 1 lb of pigment produces outstanding shades of color when added to one 50 lb bag of our mix. The amount of pigment used per bag can be increased (up to double) to produce richer tones, and can be reduced to create more subtle colors.



ONE BAG OF BLENDED MIX



1LB BAG OF BR SIGNATURE COLOR OF YOUR CHOICE



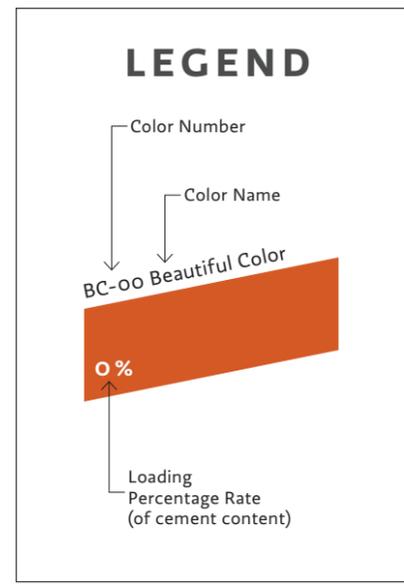
PERFECT COLOR EVERY TIME!

AVAILABLE COLORS



*Colors shown in cured, polished GFRC Mix.

Prefer to blend your own custom colors? You have the power to formulate any color using our range of Pure Pigments. Pure pigments are a selection of organic and **PURE COLLECTION** inorganic pigments suitable for use in concrete. Packaged in small quantities, or in bulk for the professional.



WHITE

SB-01 Titanium White

1%
5%
10%

SB-001 Ultra White

0.5%
2%
4.5%

BLACK

SB-98 Black Oxide

1%
5%
10%

VG-1007 Carbon Black

0.5%
2%
4.5%

SB-99C Cool Gray

1%
2%
4.5%

SB-99W Warm Gray

1%
2%
4.5%

BLUE

SB-35 Teal Blue

1%
5%
10%

SB-40 Cobalt Blue

1%
5%
10%

SB-44 Super Blue

1%
2%
4.5%

SB-48 Ultra Blue

1%
5%
10%

GREEN

SB-30 Green Oxide

1%
5%
10%

Moss Green

1%
5%
10%

VG-20 Super Green

0.5%
2%
4.5%

SB-54 Green Blue

1%
5%
10%

VIOLET

SB-88 Super Violet

0.5%
2%
4.5%

RED

SB-065 Red Oxide

1%
5%
10%

SB-09 Red Oxide

1%
5%
10%

SB-05 Super Red

1%
5%
10%

YELLOW

SB-144 Yellow Oxide

1%
5%
10%

SB-155 Super Yellow

0.5%
2%
4.5%

BUFF

Walnut

1%
5%
10%

Redwood

1%
5%
10%

TAN

Curry

1%
5%
10%

Sesame

1%
5%
10%



Our mixes are designed with very high compressive strengths. You should never have to worry about crushing them. Tension, on the other hand, is an Achilles heel of concrete, and needs to be considered when planning your project. We offer a variety of fiber reinforcements to address this need.

ALKALI RESISTANT GLASS FIBERS are designed specifically for use in concrete. Alkali Resistant (AR) Glass fibers are manufactured from a specially formulated glass composition with an optimum level of Zirconia Oxide (ZrO₂) to be suitable for use in concrete. These AR fibers are designed to resist breaking down during mixing and processing so that it stays basically as a bundle of filaments. These products are particularly suitable for Premix GFRC and other mortar and concrete reinforcement applications. AR glass fiber have high tensile strength and modulus, do not rust like steel, and are easily incorporated into concrete mixes.

Our fibers are 19mm (3/4") in length with 200 filaments per bundle. Each filament has a diameter of 18 microns. These fibers impart strength in a concrete matrix due to their bundled nature. The downside of bundled fibers is that they are more likely to show up in finished surfaces if precautions are not taken. See the recipes section (pg 8) to read more about this.

ALKALI RESISTANT GLASS SCRIM is an oriented fiber fabric. Scrim is often used in conjunction with fiber reinforced mixes to provide additional tensile strengths in locations that will experience point specific strain. When they are placed in the tensile regions of the product they can significantly increase the flexural strength of the composite. This scrim is produced with 10mm X 10mm webbing, and comes in 40" wide rolls. It is available in cut lengths of 15', 50' and 300'.

PVA FIBERS (polyvinyl alcohol) are high-performance reinforcement fibers for concrete and mortar. PVA fibers are well suited for a wide variety of applications because of their superior crack-fighting properties, high modulus of elasticity, excellent tensile and molecular bond strength, and high resistance to alkali, UV, chemicals, fatigue and abrasion. PVA fibers are unique in their ability to create a molecular bond with mortar and concrete that is 300% greater than other fibers.

These are monofilament fibers that are available in 3 different deniers (diameter of the fiber)— 7, 15, and 100. The fiber lengths are 1/4" (PVA7), 3/8" (PVA15), and 1/2" (PVA100). Due to the fine nature of these fibers, and the fact that they disperse into single strands, they are less likely to be visible in a finished surface. How visible they are in relation to each other is in direct proportion to their various diameters (7 is least visible, 100 is most visible). Equally true, the smaller the fiber, the more fibers there are for any given unit of measure, the more likely they are to choke mixes at higher dosage rates. This is why the PVA100 fibers are dosed at higher rates in the more flowable mixes than are the PVA15.

ACRYLIC FIBER - AC50 is a fiber reinforcement for concrete that enhances the performance and durability of concrete, adding years to its useful life. This modified polymer fiber, made of staple fiber, reduces shrinkage cracks and provides reinforcement. They increase impact and abrasion resistance, and improve tensile and flexural properties of concrete mixes. These fibers are the least visible of our fiber offerings, and they are the easiest fiber to trowel, making them especially useful for troweled surfaces.

Most artisan concrete is made at very low water-to-cement ratios in order to achieve the highest strengths possible. Water Reducers (also called plasticizers) are added to adjust the flowability of a mix without changing its fixed water-to-cement ratio. Both dry and liquid Water Reducers are available. Dosage rates will vary, but it is important not to overdose. The ultimate indicator of an overdose of plasticizer is segregation of the mix. A few test batches will help dial in the optimal loading range for your specific conditions.

WATER REDUCER 205 is a powdered polycarboxylate based plasticizer and pozzolan blend. It is a dry, white, multi-component material that can also replace pozzolan or metakaolin material in certain mix designs. It is ideal for use in GFRC mist and backer coats, or as a water reducer in any concrete formulation. This unique blend offers both water reducing capability as well as pozzolanic benefits, improving the workability, strength and durability of concrete.

Dosage Rate: 0.5- 10% of Cement Weight

WR 205 has a wide range of dosage rates, depending on the application and mix. In GFRC mist coats, use the lower end of the dosage range, typically 2-6 grams per lb of cement used. In wet-cast mixes, dosage ranges can approach 10% of the cement weight.

WATER REDUCER 310 is a unique and powerful powdered polycarboxylate plasticizer designed to significantly reduce water requirements. This is an incredibly potent plasticizer, and must be carefully managed to avoid overplasticizing and segregation.

Dosage Rate: 0.05%- 1.5% of Cement Weight

WATER REDUCER 420 is a liquid water reducer designed to be especially effective with mixes that have a high content of finer sands and particles. It can be used to achieve a homogeneous flow in mixes with high fines, a softer flow in mixes like GFRC, and can soften a mix slightly without imparting too much sag or slump.

Dosage Rate: 0.1- 2% of Cement Weight

WATER REDUCER ADVA 555 is a liquid high range polycarboxylate based superplasticizer ideally suited for making Self-Consolidating Concrete (SCC). ADVA 555 has been formulated to impart maximum desired workability without component segregation.

Dosage Rate: 0.5- 1.5% of Cement Weight

Dosage range of ADVA® Cast 555 can vary with the type of application, but will normally range from 8 to 20 fl oz (236 - 591 ml) for every 100 lbs. (45.4 kg) of cement.

