

CrownTech™ - Technical Bulletin No. 10

MIXING GUIDELINES

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INTRODUCTION

Crown Polymers multi-component products all have specific mix ratios that must be strictly adhered to, to assure proper performance of the polymer materials. The vast majority, if not all, of the mix ratio are listed by volume and by weight on the label.

CONSIDERATIONS BEFORE STARTING

Before starting mixing there are a number of things to consider, such as:

1. Is the manufacturer's mixing instruction available and does everyone understand them?
2. Will only complete factory units be mixed?
3. Will the factory units be split? If so, will they be split by weight or by volume?
4. Can the amount of material be installed with the material's pot life and working time?
5. Is there enough material to complete the installation, including wastage?
6. Are the proper tools and equipment on hand?
7. Is the mixing station ready to go?
8. Are the Safety Data Sheets on hand?
9. Does everyone have the proper safety equipment?

PROPER MIXING

Correctly mixing construction polymers is one of the most important items leading to successful coating and surfacing placement. If the product is mixed incorrectly (ex: an incorrect mix ratio or a failure to thoroughly mix each component together), part of or all of the coating or surfacing will fail. This Technical Bulletin will point out a

number of the mixing recommendations. Never shake, over agitate or entrain air when mixing.

MIXING

Mixing Small Batches: When mixing small batches is critical to use the right tools. A mixing paddle and variable speed drill are often too large. It is best to use a metal spatula designed for small batch mixing. Never shake or agitate mixes because this will entrain air.



Liquids: For liquids, always mix with a jiffy type impeller mixer that can scrape the bottom and sides of the mixing vessel without chipping the side of the bucket. Never use a squirrel type mixer which will entrain air into the mix.



Aggregates: For an aggregate loaded polymer system use a single or preferably a dual paddle mixer with heavy duty variate speed drill.

Note: Aggregate Mix – When mixing an aggregate rich system immediately disperse after mixing. Keep in mind that gravity will cause the liquids to migrate to the bottom of the mix and leave the top starved. Immediately invert the mixing vessel and spread the material to minimize the gravitational effects.



MATERIAL CONDITIONING

For best results, place the material off the concrete on a wooden or plastic pallet and precondition at 65°F to 80°F (18°C to 27°C) at a relative humidity between 20% to 60% for at least 48 hours prior to mixing.

CHEMICAL MIX RATIO

Each product, based on its chemical stoichiometry or reactive elements, has a precise mix ratio, such as 1.7:1 mix ratios. However, 1.7 to 1 mix ratios are not user friendly, therefore Crown Polymers' products contain reactive and non-reactive ingredients to make the products more user friendly. For simplicity, some non-migratory, reactive and non-reactive ingredients may be added to provide the convenience mix ratio by volume, such as, 2:1, instead of 1.7:1.

MATERIAL MEASUREMENTS

Splitting Units: Measuring and mixing of a multi-component polymer product accurately requires essential skill and paying close attention to details. The polymer products may be recommended to be mixed by volume, common with epoxies or by weight, common with methyl methacrylates. Crown Polymers multi-component products all have specific mix ratios that must be adhered



to, to assure proper performance of the polymers. Therefore, the labels list the mix ratio by volume and by weight on the label.

MIX RATIO BY VOLUME

When splitting units, mixing by volume requires that the measuring vessels have a fine scale so that the materials can measure exactly. After pouring in the polymer material, wait a short time until the surface levels out, especially with more viscous materials.

MIX RATIO BY WEIGHT

Power up scale. Scales measure in either grams or weight ounces or pounds.

1. Choosing the best size mixing vessel with graduated measurement.
2. Place your mixing vessel on the scale and reset the scale to zero by pressing the Tare or Zero Scale button.
3. Pour hardener in first and note the amount poured. (Example: 10 weight ounces) The reason for placing the hardener first is because it is usually the lowest in viscosity.
4. Calculate the amount of resin needed based on that amount of hardener

FACTORY PIGMENTED MATERIAL

Factory pigmented material can be sent to the installer from different lots. Different lots may have slightly different color or shading. The variation can be due to a number of manufacturing factors, including but not limited to, difference in temperature, pigment load, intermediate variation, aging, etc. Stated a different way, no two pigment lots are identical; sometimes the variation is undetectable by the human eye, while other times, it is noticeable.

There are two ways to avoid lot to lot color variation One way is to insist that only one lot of material be sent. That is a great idea, but if the installer runs short of material, the extra material may be from a different lot. If the contractor runs short the best option, provided that there is enough time, is to ask the manufacturer to “match the lot” from the retention of the material placed.

The other way is to “box the lots” which means mixing the different lots together to ensure that they are the same color. Contact a Crown Polymers representative if there are questions regarding boxing.

PIGMENT PACKS

CrownPigments™ known as PigmentPacks™ are a valuable and economically way to stock multiple colors, requiring the stocking of a single clear product, such as, CrownShield® No. 320 and several CrownPigments No. 6300 PigmentPacks in various colors. Keep in mind that pigment packs increase the yield per kit, since they increase the volume yield. As an example, a three gallon kit of CrownShield No. 320 Clear, yield at 10 mils or 160 per gals covers 480 Sqft The addition of a quart pigment

pack will increase the coverage at 10 mils to 520 Sqft

To avoid pigment pack to pigment pack color variation, check and make sure that they are all from the same lot. Box them if the lots are different. Turn the pigment pack can upside down and open with a can-opener, which will allow all of the pigment to be removed quickly with a margin trowel and avoid the challenges of can's lip.

To remove all of the pigment residue, it is recommended to pour a small amount of the A component into the pigment can and agitate with a metal spatula.

Note: Mix the A and B components before adding the pigment packs.

PREMIXING

Due to the different specific gravity (density) of each raw material they will settle out relatively quickly. The Specific gravity of the different raw materials means that they will separate over time by their weight. The heaviest raw material will settle to the bottom while the lightest material will rise to the top.

In clear products it might not be noticeable that settlement has occurred, while it is usually obvious in pigmented products.

For the best results when splitting a kit, before splitting the kit always premix each component to ensure that all of the raw materials are uniformly dispersed. Settlement happens:

- Raw materials settle by weight over time
- Raw materials settle by weight during shipping, especially when shipped over sea
- Raw materials settle by weight faster if the temperature is higher
- Raw materials settle by weight more if they are under pressure

RAW MATERIAL INGREDIENTS	PURPOSE of INGREDIENT
1. Pigments	Color
2. Diluents	Reactive and Non-Reactive Lower Viscosity and Modulus Increase Elongation Adjust Working Time Reduce Cost Balance Stoichiometry
3. Plasticizers	Increase Elongation Improve Impact Resistance Reduce Cost
4. Solvents	Lower Viscosity Increase Working Time Reduce Cost
5. Stabilizers	Improve Chemical Resistance Improve U.V. Resistance Improve Heat/Cold Resistance Improve Resistance to Oxidation Anti-Crystallization Anti-Blush
6. Fillers (Inert and Reactive)	Increase Viscosity Increase Compressive Modulus Increase Hiding Power Decrease Elongation Reduce Volumetric Shrinkage Reduce Cost
7. Additives	Flow Agents Defoamer Enhanced Surface Performance

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