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Krystal Resin Kit is a 100% solids, high-build, clear polymer coating that is commonly seen on bar and table tops. Each kit contains a bottle of resin and a bottle of hardener which are mixed together at a 1 to 1 ratio by volume. This product cures to a clear, glass-like finish that resists scratching and will not distort with age. Items coated with it will become permanently preserved and protected for your enjoyment throughout a lifetime. This product will resist yellowing and is water resistant. However, it does not provide 100% UV protection. This should be carefully considered before applying in an outdoor, high UV exposure setting. The Klear Kote will not exhibit any blushing or sweat-out even under high humidity conditions.

This product is best applied in two stages. The first stage is referred to as the seal coat. The seal coat is brushed on in a thin layer and is used to seal any porosity on the surface which will prevent air bubbles from rising in the subsequent flood coats. Once the seal coat has set for at least 4 hours a flood coat is then applied. The flood coat should be poured onto the surface and allowed to flow out and self-level. You can use a rubber squeegee or a foam brush to help spread the epoxy. Generally one to three flood coats are applied for most table and bar coatings, however you must wait between 4 to 10 hours before applying subsequent flood coats.

What You Need:

- Safety Gloves - Epoxy is very sticky.
- Graduated Mixing Cups - Accurate measurement is extremely important to achieve optimum cured properties.
- Clean Stir Sticks - Dirty sticks can cause contamination of the epoxy.
- Rubber Squeegees - These spreaders will not leave air bubbles behind as brushes can.
- Brushes - Foam or nylon brushes which do not lose bristles
- Solvent - Denatured alcohol or acetone for cleanup and wiping
- Propane Torch, Heat Gun or Hair Drier - Used by sweeping the heat or flame across the surface of the uncured epoxy to release trapped air bubbles
- Drop Cloths - Should be used to avoid spills on flooring surfaces

Beginners Notes:

This product will produce professional results when applied correctly. Take your time to review some of these common problems that first time users can encounter.

1. VERY IMPORTANT: To avoid most of these common problems, you should always do a trial run with the product to insure proper understanding of how to mix and apply.

2. Always make sure that your mixing container is clean and your measuring device is accurate. This product requires that you mix at a 1 to 1 ratio by volume. Any variances from this ratio will cause the epoxy to never completely cure.

3. THOROUGH mixing is the most important part of this procedure. Even if you have experience with other types of resins, it is very easy to underestimate the amount of mixing this product requires. Depending on the quantity being mixed, it can take anywhere from 3 to 7 minutes of continuous mixing without whipping. During mixing the product will turn cloudy white and you must continue to mix until all signs of haziness and white streaks in the mixture have turned back to a completely transparent color.

4. Do not whip this product while mixing. Lifting the stick while mixing can excessively whip the product and will add a tremendous amount of air bubbles which are difficult to remove.

5. Always scrape the sides of the mixing container and stick during the mixing process. If any unmixed material remains on the side of the container and falls onto your surface while pouring it will leave an uncured wet or sticky spot.

6. While pouring the epoxy onto the surface, NEVER scrape or brush the sides or bottom of the container you just mixed in to remove every last drop because no matter how thoroughly you may have mixed, there will always be an unmixed portion stuck which can be dislodged and will leave a wet or sticky spot.

7. Never leave mixed epoxy in your bucket unattended. The longer the epoxy sits in your bucket, it will increase the chances that the epoxy will generate excess heat, begin to smoke and then cure quickly inside the bucket.

8. Cleaning the cured finish should only be done with mild soap and water. Using harsh cleaners or kitchen chemicals can cause the finish to feel tacky.

Getting Started

Project Preparation: For best results the product should be used in conditions between 70° F to 85° F. The room you are working in should be clean, dry, dust and insect-free. Settling dust can often cause imperfections on the surface of the epoxy as it is curing. Make sure your project surface is level. If not level, the epoxy will puddle in the lowest point.

Safety: Gloves should always be worn when working with epoxy. This product is nontoxic and safe for indoor use because it has virtually no odor. Epoxy may be harmful to skin so proper eye and skin protection should be worn at all times.

Surface Preparation: For most applications the wood surface on the bar or table should be sanded first and cleaned and dust-free. It is also important that any prior stains or finishes be completely dry before beginning. Any types of moisture, oils, greases or uncured finishes can potentially cause fish-eye or product curing problems.

Stains: For applications requiring stain to be applied to the wood we recommend using alcohol-based NGR stain. Allow 24 hours for the NGR stain to fully dry before applying epoxy. CAUTION when using "oil-based" stain. Oil-based stain is very slow drying and can cause the epoxy to "fish-eye" or lose adhesion and lift due to the oil not being dry. Oil-based stain must be allowed to dry for at least one-week(or until fully dry), then sealed with a clear, oil-based polyurethane. After the polyurethane has cured for 48 hours, the epoxy coating can be applied on top. Fish-eye will appear as crater-like air bubbles on the surface of the epoxy and can occur if trying to topcoat an oil-based stain too quickly.

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Using The Product

1. Coverage:

In order to determine how much to mix you must know your square footage(length x width). When working on large projects it is not necessary to mix the entire amount all at once due to the difficulty in mixing more than two gallons at one time. Mixing multiple batches for one coat is acceptable when they are poured right after each other. Large projects generally require more than one person in order to facilitate proper mixing and pouring within the allotted amount of working time.

Seal Coat Coverage Guide (48 square feet per gallon)		Flood Coat Coverage Guide (16 square feet per gallon)	
Area to Cover	Total Volume of Epoxy (resin + hardener amounts)	Area to Cover	Total Volume of Epoxy (resin + hardener amounts)
1 Sq Foot	3oz Total (1½oz Resin+ 1½oz Hardener)	1 Sq Foot	8oz Total (4oz Resin+ 4oz Hardener)
4 Sq Feet	11oz Total (5½oz Resin + 5½oz Hardener)	4 Sq Feet	32oz Total (16oz Resin + 16oz Hardener)
10 Sq Feet	26oz Total (13oz Resin + 13oz Hardener)	10 Sq Feet	80oz Total (40oz Resin + 40oz Hardener)
16 Sq Feet	42oz Total (21oz Resin + 21oz Hardener)	16 Sq Feet	128oz Total (64oz Resin + 64oz Hardener)
24 Sq Feet	64oz Total (32oz Resin + 32oz Hardener)	24 Sq Feet	192oz Total (96oz Resin + 96oz Hardener)
For Large Projects: Use formula of 48 Sq Feet per gallon (½gal Resin + ½gal Hardener)		For Large Projects: Use formula of 16 Sq Feet per gallon (¼gal Resin + ¼gal Hardener)	

2. Measuring:

It is extremely important that the product be measured accurately and mixed thoroughly. Clean graduated cups or tubs should be used for measuring. Measure 1 part RESIN to 1 part HARDENER. Do NOT vary this ratio, epoxies are formulated to cure at a certain mixing proportion and any variances can cause the product to never fully cure. We recommend always pouring the HARDENER into your mixing container first, followed by the RESIN. This will help the two components mix more thoroughly.

3. Mixing

- Combine the two components together into a larger container. The mixing container should be about 30% bigger than the amount of product you are mixing so that thorough mixing can be accomplished without spillage over the container lip.

- Mixing of the product should be done by hand with a clean stir stick. The more product you are mixing the longer it will take to achieve a complete mixture. Beginners should generally only mix 2 quarts per batch, this should take about 4 to 5 minutes of mixing. Typically one gallon of mixture takes approx. 5 to 7 minutes of mixing. Two gallons of mixture take approx. 6-8 minutes of mixing. Only experienced users should ever attempt mixing two gallons per batch. Timing this with a watch is a good idea.

- The process of mixing is long and will make your wrist tired, but it is the most important part of the project. As you begin to mix, the resins will almost immediately turn a cloudy white color. This represents the two separate components starting to blend. As you continue to mix the level of whiteness will begin to turn more transparent with the end result being a completely transparent mixture in which you can see to the bottom of the mixing container. Mixing must continue until all signs of cloudiness and hazy lines have completely disappeared. Some air bubbles are normal in the mixture, however do not whip the mixture. Whipping the mix will result in numerous tiny air bubbles which will turn the epoxy completely white with bubbles, this can result in air bubbles remaining in the cured product. Be certain that you scrape the sides of the bucket and the stick while you are mixing. It may be helpful to use a bright light next to the container to insure the mixture is combined thoroughly. After you are confident there are no more thin hazy lines remaining in your mix it is time to pour. [Tip 1: If you don't want to take any chances of under-mixing you can wait until the mixing container starts to become slightly warm to the touch which usually assures a long enough mix. However, this also reduces your working time especially when mixing 1 gallon or more. **Tip 2: Pour quickly after complete mixing. Do not leave large amounts of mixed material in your bucket, this will cause an accelerated chemical reaction due to the heat being generated and your batch can start smoking due to this excess heat.**]

4. Pouring.

WARNING: When pouring the resins onto the surface NEVER scrape or brush out from the container you were just mixing from. Just dump the resins out and leave the remaining material in the container.

a. Pouring the seal coat: The seal coat is designed to penetrate and cover any porous surfaces you will be working with. The seal coat will cut off any potential air pockets in the wood that will release air bubbles. The best way to apply a seal coat is to start on one end and pour the resin all the length of the surface. Set the container down and then use a rubber squeegee or a foam brush to drag the resin across the entire surface and achieve an even coat. Please bear in mind you do not want to achieve any buildup with this coat, it is meant only to cover up the grains of the wood or substrate. Usually only one seal coat is required. However, sometimes extremely porous wood or knots in the wood need multiple coats in order to fully seal the surface. You should wait a minimum of 4 hours before proceeding to apply a flood coat. [**Dense Wood:** Care must be taken with dense wood to avoid too much build-up in the seal coat. If you find yourself in this situation you should reduce the amount of epoxy being applied, either by reducing the amount of epoxy you mix up for the seal coat, or squeegeeing off the excess epoxy after you have poured it on. If your seal coat goes on too thick, you can end up with air bubbles staying trapped in the cured epoxy]

b. Pouring a flood coat: Each flood coat self-levels approximately 1/8" thick. If depths thicker than 1/8" are desired multiple coats are necessary. You must, however, wait at least 4 hours between flood coats. The best way to apply the flood coat is: For Tables: Pour the epoxy in the middle and allow the epoxy to flow out. For Bars: Start on one end and pour the epoxy the entire length. After you are finished pouring, set the container down. Do NOT try to scrape anything else out of the bucket. Because you are pouring about three times the amount of product you did with the seal coat the material will immediately start to flow out. However, you will still want to use a rubber squeegee or foam brush to help guide the material around. The less you use the brush the better. Dragging too hard on the brush will put hundreds of air bubbles into the surface which are impossible to fully remove. Once you have sufficiently covered the entire surface you will then begin the process of popping air bubbles. The best tool for removing bubbles is a small propane torch. By holding the heat source approximately 6 to 10 inches away from the surface and quickly sweeping across you will immediately see the bubbles start to pop. Other tools that can be used to pop the bubbles are a heat gun or a hair drier. However, both of these tools move air around which increases the risk of dust settling in the coating. It is a good idea to stand by the project for at least 30 minutes after pouring in order to pop any air bubbles that suddenly appear.

Other flood coat issues:

-Bar rails and edges: the flood coat can be allowed to run over the sides which will create a coating on the vertical edges. These edges will not create as thick a coating as flat surfaces so you must do your best with a brush to keep the material even.

-Underneath edge: Drips will form underneath the bar-rail or edge, these drips can be sanded off once the epoxy has cured. If you catch the epoxy at just the right moment in the curing process a razor knife can be used to cut the drips off.

5. Re-Coating:

When re-coating within a 4 to 10 hour window no surface preparation is needed. The layers will bond together as one. If you allow the previous layer to fully dry, very light sanding is necessary with some 180 or 220 grit sandpaper. After lightly sanding, you should wipe down the surface with a solvent such as acetone. Do NOT use paint thinner, aka mineral spirits. The wipe down process with the solvent should be done with a clean rag that will not leave any lint on the surface. Continue cleaning until all sanding dust has been completely removed. You are now ready to re-coat. Don't worry about the sanding scratches. The next pour will fill in the scratches and it will look like glass again.

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6. Curing: After applying your final coat, the product will be kept in as clean and dust-free an environment as possible. At 80° F degrees, the product takes approximately 12-14 hours to dry to the touch. However, the product should not be put into any type of use for at least 2-3 days which will allow it to achieve sufficient hardness. At temperatures below 80 F, the product will take longer to cure. The first couple weeks after curing the surface is more prone to scratching, so we recommend the use of coasters and placemats whenever possible. As the product ages its hardness will increase.

7. Cleaning of Cured Surface: When the product becomes dirty from daily use, we recommend cleaning with a solution of mild anti-bacterial soap and water. Using harsh kitchen chemicals not meant for plastics can cause epoxy to soften or become tacky.

Advanced Techniques

After becoming familiar with the proper application procedures, these techniques can be attempted.

1. Imbedding Pictures: Objects such as pictures, articles and maps may be imbedded in this product. Some thin paper such as newsprint and magazines must first be sealed with a white glue or similar product. This prevents the epoxy from penetrating the paper and causing a translucent effect. Alternatively you can laminate thin paper in a plastic to keep the epoxy from coming into direct contact with it. Most photo quality paper does not require these extra steps. Once the papers are properly sealed they can be placed onto your project surface. Make sure your paper will lay flat before placing it. You should generally wait at least one hour after apply your seal coat of epoxy before placing the objects. Subsequent flood coats will then cover and imbed these objects.

2. Imbedding Solid Objects: Wood, rocks, shells, bottle caps, coins, etc. may be imbedded with this product also. All porous objects must be sealed first; either with the epoxy itself or another type of sealer such as shellac, lacquer or polyurethane. If the objects are not properly sealed they will release tiny air bubbles which will form around the object during the flood coats. Placement of these objects may be done before you apply the first seal coat or they can be placed into a previously applied seal coat which has been allowed to set for 30 minutes. Lightweight items such as bottle caps should be glued down to prevent floating.

3. Thick Build-Ups: This product can be used to build up unlimited depths. Each flood coat should not exceed 3/16". Attempting to pour thicker can cause the epoxy to generate excessive heat which in turn will cause more air bubbles, possibly cracking and shrinkage. It is advisable to wait at least 4 hours between pours to allow sufficient curing and cooling. While this product is considered clear by epoxy standards, it does have a very slight amber tone. This color is virtually unnoticeable in depths up to 1/2" thick. The color of the epoxy can become noticeable in greater depths especially over light colored surfaces.

4. Damming The Edges: We generally recommend allowing the epoxy to run over the edges of your surface as it will self level at approximately 1/8" at a time. If your application calls for a temporary dam to be constructed it must be done with great care to insure it can be removed after the epoxy is cured. Ideally a smooth, soft or flexible plastic strip should be used because the epoxy will not stick to it. Alternatively, wooden trim can be used but only if it is first covered with a 2 to 4 mil plastic sheeting. Lining the wood trim with the plastic and tacking it to the edge should prevent the epoxy from running in between the edge and the plastic. Testing on a small mock up should be done to insure no leakage or problems will occur with your damming technique.

Troubleshooting

1. Entire Surface Is Soft, Wet or Sticky after 48 hours:

1. Product was under-mixed. Unfortunately, as much as we stress this as the most important part of the project, it can still occur and is the most common cause of this problem. If you do not mix long enough or do not scrape the sides and bottom of the container while mixing you will find under-cured epoxy. Please re-read Section 3 of our instructions.

2. Product was inaccurately measured. You must follow the strict 1 to 1 ratio by volume. Do not guess or eyeball these measurements. Just dumping the product from their original containers is not a proper measurement. The product MUST be measured with fairly precise accuracy using a graduated tub.

Solutions:

1. If the surface is hard but only slightly tacky, a new flood coat can be applied over the entire surface and the new product will dry hard assuming mixing procedures have been properly followed.

2. If the surface is wet and soft, then as much of the material as possible must be removed with a paint scraper or knife. Use denatured alcohol or acetone when necessary to help remove the wet epoxy. Remix and apply a new flood coat. The new coat will cover up almost all effects of the previous error. Be certain to follow the proper mixing procedures.

2. Sticky or Soft Spots: The most common cause of this is scraping or brushing from the side or bottom of the mixing container while pouring. It is natural to want to use up every last drop you have mixed. However when you pour onto the surface you should just dump it out and set the container down. If you use a stick or a brush to try and remove every drop you will very likely end up with sticky spots.

Solution:1. If the sticky spots are hard but only have a slight tackiness on the surface then you can re-pour over the entire surface and the new product will dry hard assuming correct pour procedures have been followed.

2. If these spots are soft and wet you will need to scrape or cut out as much of the soft material as possible using a paint scraper or knife. Use denatured alcohol or acetone when necessary to help remove the wet epoxy. If you are left with deep depressions as a result, your first re-coat should be used just to fill in the areas in which you scraped. After this pour has set for at least 4 hours a full re-coat can be completed. This will hide the imperfections and leave you with a hard glass-like surface.

3. Air Bubbles: There are many types and causes for excessive air bubbles. We have listed a few below.

1. Air bubbles across the entire surface.

- a. No bubble removal technique was used as shown in Section 4 of our instructions.

- b. Improperly applied or no seal coat was used.

- c. Wood surface below was extremely porous and seal coat was not thick enough to cover. (Very common in aged wood).

- d. Product was whipped or stirred excessively putting so many bubbles in the mix that they could not be removed with the flame/heat technique. Very common for users employing a drill mixer in their mixing technique or stirred the product too aggressively.

- e. Dragging too hard with a brush on the epoxy while spreading. These tiny bubbles sometimes appear in cloudy streaks where the brushing technique was used. Consider using a rubber squeegee instead for spreading.

2. Air bubbles in just one spot.

- a. Knot, cracks or holes in wood were not properly sealed and air bubbles continually rise throughout curing.

- b. Missed a spot during the seal coat.

Solution: Usually the bubbles are not noticeable enough to warrant any further work. If, however, you desire, you may sand or grind the surface to remove as much of the air bubbles as possible and re-coat the entire surface.

4. Surface Cures Uneven with Ripples or Waves:

- a. Wooden surface had too much warping or imperfections and one coat of epoxy was not enough to cover these issues.

- b. Applying too thin a flood coat. This product needs to be applied in full 1/8" flood coats in order to properly self level.

- c. Applying too much heat during your bubble removal techniques will cause a ripple effect. The heat gun or torch should be swept across the surface rapidly without holding it in one place.

Solution: Applying another flood coat in sufficient thickness should hide virtually all signs of the waves or ripples from the previous coat.