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### **Mixing**

Wear a NIOSH approved dust particulate mask when mixing and using Ultra-CAT™. Add 6 to 7 ounces of water to 2.66 cups (or 1 lbs) of the adhesive powder and mix thoroughly. Then add another 2 to 3 ounces of water and mix again. Continue mixing until material is lump free (3-5 minutes). This will create enough adhesive to cover approximately 50 square feet of substrate material.

Ultra-CAT Powder	Water Initial Mix	Water Additional Mix	Coverage (Square Feet)
.5 cup (.19 lbs)	1.25 oz.	.5 oz.	8
1 cup (.38 lbs)	2.2-2.6 oz.	.75 - 1.1 oz.	17
2 cups (.75 lbs)	4.5 - 5.2 oz.	1.5 - 2.2 oz.	34
2.66 cups (1 lb)	6 - 7 oz.	2 - 3 oz.	45
13.3 cups (5 lbs)	30-35 oz.	10-15 oz.	225

\*When measuring by volume, it is important to assess the measurement before the powder settles. A delay in adjusting the measurement will cause an error in the mixture ratio.

### **Mixing Process**

Water is all that is necessary to start the reactive curing process of the Ultra-CAT powder.

- With the amount of required water determined, first add 2/3 of that amount to the mixing vessel.
- Slowly add the powder, while stirring the mix with a paint stick or a mixing blade in a hand-held drill.
- Continue mixing for 3-5 minutes. Use a spatula to scrape powder from the sides of the mixing container back into the liquid. Mix should be creamy and virtually lump-free at this point.
- Add the remaining water and mix for an additional minute. Mix should be smooth, creamy, and lump-free.
- If the glue seems too thick, you can add up to 4% more water. Be sure to give the adhesive an extra minute to fully absorb the water and re-stir.

If the Ultra-CAT powder will not easily and readily dissolve into the water, or if the mix appears sandy and/or grainy, the product should not be used. These characteristics signal that the powder has passed its shelf life.

### **Spread**

A thin spread is critical when working with raw veneer in order to reduce the effect of bleed through. Be aware of the thickness of your veneer and relative porosity of the species you're working with, and adjust the spread accordingly. In many instances, a thin spread coupled with mandatory open assembly time (perhaps up to 10 minutes) will be necessary to prevent excessive bleed-through. Take care not to let the glue dry-out if allowing open assembly time. It must still be wet enough to transfer to the mating surface.

- Press pressure also has great bearing on the spread rate. Lower pressures should have less glue in the glue line, as thick glue lines will take longer to cure and be a weak point in the glue line.
- We recommend using a glue roller available at [VeneerSupplies.com](http://VeneerSupplies.com) for applying the Ultra-CAT glue.
- The key to applying glue is to put it on evenly. The rule of thumb is that the surface of the substrate should look evenly painted with veneer glue. It should not be dripping wet. A good test is to place a pencil mark on the substrate and apply the glue. If you can barely see the pencil mark on the substrate (through the adhesive), you have the right amount of glue.
- Always apply glue to the substrate material, not to the veneer.

### **Pot Life**

Once mixed with water, the resin begins curing/hardening. The amount of time between when it is first mixed until it reaches the unusable point is termed pot life. As with most directions for gluing, this is a dynamic value. It will change, primarily due to temperature. Hotter temperatures yield a shorter pot life. At 70°F pot life is less than 4 hours.

- The adhesive will continue to cure until it is rock hard—generally within 24 hours.
- Only experience and a careful eye will tell you the point when the mix is unusable, so err on the side of performance rather than yield. When it has thickened to the point that it is not spreading well, consider the mix unusable.
- Before it gets too heavy, a small amount of water (up to 3%) may be added to keep the glue thin enough to be used. Additionally, a new glue mix can be added to a small amount of thicker product, and after being stirred, will yield a new full pot life.

### **Assembly Time**

The time you have after spreading the glue, before full press pressure is applied, is referred to as assembly time. Urea resins offer very generous assembly times, making them ideal for intricate work requiring longer lay-up time.

- Open assembly is after the glue is applied to the work piece, but before it is put together with the mating surface.
- Closed assembly is after the surfaces have been placed together, but before full press/clamp pressure is applied.
- Open and closed assembly times are related. The maximum closed assembly time is only reached when virtually no open time is given, and is reduced about 2 minutes for every minute of open assembly time.
- Once again, these are dynamic, dependent on spread rate, substrate porosity, moisture content, and temperature—both ambient and stock temp.
- Keep in mind that a heavy spread rate is necessary to obtain maximum assembly time.
- As temperature increases, allowable assembly times decrease.
- More important than just measuring the time is being sure that the spread glue is wet enough to transfer to the mating surface, and once again, this is indicated by a slight bead of squeeze-out.

### **Tip from Joe**

The open time is critical! The open time allows the moisture to be absorbed by the adhesive so that the chemical curing process can begin. Don't rush to get the adhesive on to the substrate. Otherwise, the veneer and/or substrate may pull water from the adhesive preventing the chemical cure from occurring.

### **Pressing/ Curing**

As with pot life, cure time varies and is dependant on the conditions at hand.

- Cold pressing panels @ 70°F will require from 4 hours press time on low density species to 6 hours on high density species. At 90°F this range will be from 2 hours to 4 hours.
- Ultra-CAT requires a minimum of 68°F to cure. If this temperature can not be achieved in the shop, some users opt to place a heating blanket over the vacuum bag. This speeds up the press time and improves the bond strength.
- For optimal edge maintenance, veneered panels should be dead stacked with the top weighted for 4 to 6 hours prior to machining.
- Urea glues such as Ultra-CAT cure by chemical action in which the presence of water is necessary. If the water leaves the glue line prior to the complete chemical reaction, the resulting bond will be weak. This is why the "open time" is critical.

### **Clean-Up**

Ureas are water-based products and therefore can be cleaned up with water. Warm water is preferred, as either cold or hot water will make clean-up more difficult.

- Eliminate as much of the adhesive from surfaces to be cleaned as possible, prior to adding water. The straight adhesive should be collected in a bucket and allowed to sit until cured completely, which leaves a solid plug of urea. This can be discarded as solid waste in a dumpster.
- Cured adhesive on the work pieces can be removed by either sanding or machining. Ureas are considered easier to sand than most adhesives and will not load sanding belts with gummy residue.

### Storage

Because Ultra-CAT is extremely hygroscopic, it should be stored in a tightly closed container in cool, dry place at all times. You can expect 12 months of shelf life when Ultra-CAT is stored properly.

Keep in mind that the rated shelf life pertains to unopened containers stored in a cool (60°-70°F) and dry place. Higher temperatures will severely reduce the shelf life (only 6 months @ 90°F), and exposure to high humidity may cause severe lumping or actual catalyzation of the powder resin.

### Times and Conditions

Open time: 20 to 30 minutes

Assembly time: 40 minutes

Pressing time: cold vacuum press - 4 to 6 hours @ 70°F

Pressing time: heated vacuum press - 2 to 4 hours @ 90°F

Dry shelf life: 12 months

### Troubleshooting

Some veneer species are highly sensitive to adhesive moisture content. Maple is a notorious troublemaker in the world of veneering especially when used on very porous substrates. The problem is caused when the moisture in the adhesive is pulled into the substrate. This water is the "carrier" that feeds the adhesive polymers into the pores of the veneer and substrate. Without water, the adhesive doesn't penetrate the veneer and an insufficient bond is made. To resolve this issue, use one of the follow methods.

Method 1: Moderately spray the substrate with water prior to applying the glue. Then work quickly to get the veneer in place and in the vacuum press.

Method 2: Mix up a batch Ultra-CAT glue with 50% more water. Apply a light coat to the substrate and let it dry. This will seal the substrate pores and prevent the moisture from being pulled in from the glue. After it dries, make sure the surface is smooth (sand lightly if needed) and then proceed as normal with applying the glue and veneer.

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