AquaSurTech D-200 - Usage Instructions

Note: D-200 should not be stored at temperatures below 55 F or above 90F.

1.0 Coating Preparation

1.1 Mixing Paint

Open paint can and mix entire content thoroughly with power mixer for 5 minutes for 1 gallon, and 10 minutes for 5 gallons .Use a large mixing paddle for 5 gallon container, and be sure to scrape bottom and edges of pail to ensure any settled colorants have been mixed in.
Remove desired amount of paint into a container suitable for mixing (a 4 cup glass container is ideal) Using the cup of a cup gun or remote pressure pot is not recommended at this stage.
Touch up bottles can be purchased at AquaSurTech. Fill them with non accelerated D-200 at this point.
Colors are verified by AquaSurTech before shipping, however double checking custom colors might be prudent at this stage.
Reseal the paint container.

1.2 Addition of Accelerator

The accelerator is only required to help cure the coating faster. It has no effect on the ultimate performance whatsoever. So if what is being coated has at least a week to cure, the accelerator can be eliminated entirely. For normal fenestration production environments, faster curing is desirable and it should be used.

Now measure out 5 **% AquaSurTech's D-200 Accelerator** for the volume of paint extracted above (500 ml = 25 ml accelerator) . Syringes or small measuring spoons are ideal. Begin mixing coating with a power drill and then add the accelerator into the vortex (center) of the paint.
A shaker can be used, however it may introduce air into the coating. We recommend a drill stirrer.
Use coating within 30 days.
Wash all instruments in water after use.

Filter before use.

In the case of a gravity feed or pot style gun, the paint is added to the containers directly. For remote pressure pot designs, it may be more practical to pour the

prepared paint mixture into a small plastic water bottle (with top cut off) and then insert the bottle into the pot. This will save cleaning time of the pot. Plastic bags are also available for this purpose.

2.0 Surface Preparation (for multiple substrates)

2.1 **PVC (Window and Door Profile for application with D-200)**

Preliminary Note:
Any grease , excessive dirt, or silicone contamination on the PVC surface may need to be removed with acetone . A light mechanical scuff with scotch brite pads is advised if the PVC surface is extremely shiny or as an adhesion enhancer on sharp corners in the PVC profile. Painting some sample pieces using your specific PVC and drying conditions is advised before finalizing the surface preparation procedure. The cross hatch adhesion test is the definitive test for the suitability of your prep process. Under normal circumstances the Hurrisafe cleaner should be sufficient as a surface prep.

Using an air gun- blow off all loose PVC particles.

2.1.1 Masking

Mask product if necessary with standard masking tape, or painters tape . The vast majority of masking lines are along breaks in the profile, i.e not in the middle of a flat surface. In these cases, tape can be removed easily, and at any time. If a tape line is along a flat surface, where the paint has been heavily applied to both PVC and the tape, it may be neccesary to score the tape/painted interface surface with an exacto knife prior to removing the tape.

For best results it is recommended that the remainder of surface preparation be done in a dust free environment.
Wearing latex gloves for washing and handling product from this point on is a way of ensuring that cleaned product is not contaminated, in the very least, a cleaned surface should not be handled again.

2.1.2 **Washing PVC**

Saturate a lint free cloth with the Hurrisafe 9100 Cleaner and wipe surface thoroughly, or spray on Hurrisafe, let it soak for 30 seconds and then dry off. Hurrisafe can be used in both concentrated form or diluted 2 or 3 to 1.
Now using a dry lint free cloth, wipe surface dry. Painting a surface which has not been wiped dry may result in poor adhesion and/or cause fisheyes in the surface. The product is now ready to be painted with D-200. Air drying the cleaner will result in adhesion problems since the cleaner itself can leave a residue.

Changing rags regularly is essential to good surface preparation.

Due to the static nature of PVC, any dust and lint can be attracted to the cleaned surface. This can translate into small lumps on the painted surface. To observe this look at the surface at a very shallow angle under a bright light. A tack cloth can be used to remove lint just prior to painting if the lint can't be removed otherwise (change rag manufacturer, or improve environment) .

A non destructive way of verifying the cleanliness of the surface is available in the form of DYNE PENS. These are marker like devices that can verify the correct surface tension, which can be correlated to a coatings ability to stick to a surface. Call AquaSurTech for more information.

Any adhesion issues (as determined by the cross hatch adhesion test) should be discussed with AquaSurTech so that the preparation procedure could be modified if necessary.

2.2 Preparation of Flex Materials

D-200 adheres to most bulb seals, flexible PVC and rubbers. Normally washing with Hurrisafe is enough.
Since hatch testing is difficult on flex materials , adhesion can usual be determined by stretching the substrate, and them attempting to propagate peeling at any edges created (normally found where the flex meets the rigid vinyl). Since rubbers are soft, it may be possible to get a localized delamination, however it is the lack of propagation which is of practical importance.

If adhesion issues are encountered preparation may need to be a bit more aggressive. Scuffing the surface with a green 3M pad in combination with a reasonably forceful solvent wipe, followed by Hurrisafe may be required in some cases. The best approach is to try different combinations and see which works for the particular surface (material chemistry) in question. Consult AquaSurTech for information on potential adhesion enhancers.

Internal corner keys are ideal for screen frames, since most of the external products are made of polypropylene, these tend to be difficult to prep.

2.3 **Preparation of Aluminum**

D-200 will also adhere to prepainted aluminum (**window screen frame, muntin bar**), The prep for this is a scuffing with a green 3M pad, hard enough to remove all shine of the white paint, but not enough to remove the white paint entirely i.e. to expose the bare aluminum. Clean with Hurrisafe cleaner, following the procedure for PVC.
In some cases there can be an incompatibility with the existing coating, a primer may be needed (consult factory) . A primer can also eliminate the requirement to

3.2 Set Up and Gun Settings

Product may be sprayed horizontally or vertically (Recommendation: if a dust free environment is not possible then spray product vertically)
Relative Humidity should be over 20% at time of application- spray down floor if required.
Surface to be sprayed should be at room temperature, spraying below 60 F is not recommended, adhesion problems could result.
The actual gun settings may vary depending on the gun being used. For a remote pot system, pot pressure should be around 10 PSI, and the gun pressure between 45-50 PSI . The best approach to ensuring optimum settings is to spray onto a piece of cardboard and observe the spray pattern. Ideally there are no paint spots larger than the tip of a very sharp pencil, at the edges of the pattern; the paint should simple fade away gradually. Any notable "dots" , indicates a problem, and you should not attempt to spray the target surface. If the spray pattern is not symmetric, the nozzle may need to be cleaned.

The ideal gun fan length setting , would be around 5" at the desired spray distance. Any larger and paint will be wasted since window profile are normally relatively narrow.

3.3 **Spraying Procedure and Technique**

Begin by applying a good hiding fume/fog coat to the entire surface including screen channels, edges, v-grooves, etc. A fume coat is extremely light, it should be dry almost instantaneously (with 30 seconds) if applied properly. A gun adjustment may be required (lower product output) to apply a fume coat, or the speed of application will need to be very fast to ensure only minimal amounts of paint are applied. The substrate should still be visible through the applied fume coat.

The goal at this point is to apply around 3-4 mils of coating (it will dry to 1.5-2.0 mils). This will be achieved if the surface is covered with paint to the point where the surface has been wetted, i.e. observing the surface from an angle under a light source, it should look evenly wet with no dry patches and no runs. Normally 2 or 3 passes after the fume are sufficient to achieve a good build (the passes should be such that no running occurs) . Small metal plate gauges can be purchased to measure the wet film, the gauge is placed on the surface, and the wetting of a series of "teeth" is observed.
The gun should have a fan no wider than 4"-5", when the gun is held 4"-5" inches from the surface being sprayed. The tendency to hold the gun further back is very common, this temptation must be resisted. Distances greater than 7" may create too much overspray and also potentially may generate dry patches since the atomized paint may be partially drying while airborne (this will generate a rough finish) .

3.4 **Other Spraying Tips**

If the humidity is very high 70% + , using a viscosity closer to 40 in combination with applying lighter passes may be required.

Unwanted imperfections (runs or dirt) can be fixed after the coating has partially cured. Imperfections must be sanded with a 400+ grit paper, and the preparation and spraying procedure repeated.

In the even that lineals have been sprayed, touch-ups of welded corners or scratched paint can be achieved using a touch up bottle (apply very lightly in layers so that the resulting thickness is not much greater than the standard sprayed thickness). Alternatively a small touch up spray gun could be used, allowing for superior blending of painted areas.
See trouble shooting guidelines if the surface finish is not optimum.

Rinse gun thoroughly with cold water, it is best to circulate clean water through it for a few minutes. Pressurize the gun and spray water through it until the outgoing stream is clear .On a weekly basis, be sure to take gun apart and do nozzle maintenance.

4.0 Curing

If any kind of forced curing is available (IR, hot air etc..) it is always best to let the freshly coated surface “relax” for a minimum of 5 minutes prior to exposing it- this allows for the natural leveling effects to take place as well as provides some time for air bubbles to release.

The curing of a waterborne coating is determined exclusively by the rate of extraction of moisture from the coating itself. Since the application thickness is relatively thin, this can be achieved anywhere from 2 minutes to 3 days. The actual cross linking of the coating with the substrate only begins once all the moisture has been extracted.

Warning: Adhesion can be impacted if the temperature drops below 50 F anytime during the drying or spraying time.

Examples of Drying Times:

- With a shortwave IR unit- flash off is around 4 minutes- 80% cure in 20 minutes.
- At 75 F- flash off 20 min., 80% cure in 48 hrs.
- at 100 F- flash off 15 minutes, 80 % cure in 12 hours

- At 120 F with air convection – 45 minutes

The above assumes relatively dry conditions less than 50% relative humidity, except in the case of IR where the surrounding environment isn't as important as simple air curing. If product is air dried, dehumidification and air flow over the piece will improve drying times especially during the humid summer months. In extreme humidity, air drying only (no heat, air flow, or IR) it may take days to achieve a hard marr resistant surface.

The best way of evaluating your specific drying conditions is to perform cross hatch testing on a sample piece at specific time intervals , i.e. score a dense cross hatch pattern with a knife(box cutter) into the painted surface, apply a piece of tape (masking tape works well) , and tear away to see if any delamination occurs.

A full cure is not required, to further process painted pieces, depending on the nature of the processing. Cross hatch testing will allow the fabricator to make this determination. A 100% cure will under all conditions be achieved within 1 week, possibly even after the installation of the windows.

If IR or any other forced curing system is used, be sure to not let PVC profiles exceed 140 F. Intensity , stand-off distance, and time must be adjusted accordingly.

Shipping windows with some form of protection is reccommend, to minimize the possibility of marring. Cardboard corners along with shrink wrap , protective film, or in the least shrink wrap alone is advised.

5.0 Quality Control

For in-house **QC purposes**, it is necessary to take a small piece of PVC and spraying it along with every new batch of windows. This piece could be tested destructively with a cross hatch adhesion test, and retained on file. It will serve as a color reference, as well as provide proof that the coating was applied correctly. In the unlikely event of any future field issues, AquaSurTech may request this sample.

Note:
1/ The ultimate success of your application hinges strongly on the degree of detail exercised in equipment selection, paint preparation, surface cleaning, spray application, and equipment maintenance. AquaSurTech is committed to your success, if there are any additional questions please contact the factory.

2/ Painting recycled material, i.e. extrusions where some regrind has been added may generate unreliable adhesion. If this is the case, please send AquaSurTech the substrate for qualification prior to coating.

6. 0 Discussion on Heat Gain Effects:

AquaSurTech incorporates the most advanced heat reflective pigments available, these minimize the heat gain effects experienced by exposure to the sun. The use of our coatings can reduce the temperature of the surface by as much as 25 F when compared to standard pigment technologies.

However, when coating window profiles with D-200 , to minimize heat gain effects, it is always important to consider the venting of the profiles themselves. Both frames and sashes should have venting on the top of the profile.

Other factors which can contribute to heat build up include :

- the use of Low E glass, possibly reflecting onto a sill
- very thin walled profile or snap in components
- single wall upside profile
- improper installation not allowing for the increased expansion related to an increase in surface temperature
- manufacturing tolerances must also account for the possibility of a differential expansion , i.e a thin component snapped into a large component (high thermal mass) at room temp . This is particularly important for large spans, where the absolute expansion is much larger than over asmall distance.

Consult your extruder for any system related questions especially when a product is new. Testing a system under worst case conditions – hottest color, on a hot day, installed at 45 degrees southern exposure, inside a wooden frame structure (not cooled) will simulate the very worst conditions possible.