

a/Title : Application Process for D200 on PVC

b/ Description : This document explains the process of applying AquaSurTech D200 to PVC using HVLP or other spray equipment.

c/ Required pre-requisite procedure(s):
PREP-01-0712 Rev.01 'PVC Cleaning Procedure'

d/ Products Required :
D200 (regular finish or textured)
D200 Accelerator (unless indicated otherwise)

e/ Expected Coverage:
300 – 350 Square Feet or 800 Lineal Feet of typical frame profile

f/ Optimum Environment:
Enclosed vented paint booth (minimum 12,000cfm, ideal 18,000cfm)
or, dust free area for spraying
Constant air movement while flashing/curing
Proper lighting
Temperature 70 – 90 degree Fahrenheit
Humidity range variant can be compensated through gun adjustment

g/ Tools Needed:
Power mixer or drill with paddle or stirring attachment
Minimum 125 to 40 Micron cone filter strainer or mesh filter
Masking tape
Measuring cup & measuring spoons
Air gun on filtered compressed air system
HVLP gun on filtered compressed air system
Recommended safety equipment (refer to MSDS)

h/ Preparation of substrate:
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 necessary 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.

PVC masking tubes are available in 3 sizes at AquaSurTech to accommodate a wide variety of profile shapes and dimensions. These masking tubes are available in 20 foot lengths that can be cut to suit any lineal painting process.

i/ Preparation of Product:

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).

AquaSurTech D200 Accelerator is only required to help cure the coating faster. It has no effect on the ultimate performance whatsoever. For normal fenestration production environments, faster curing is desirable and it should be used unless D200 container labeling indicates otherwise.

Now measure out 5 % AquaSurTech D200 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. There is no danger of the paint hardening in the gun.

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. D200 should be filtered through a cone filter strainer or mesh filter before pouring the coating into the spray equipment. A minimum mesh size of 125 Microns to 40 Microns is recommended.

j/ Method

An HVLP gun with a nozzle between 1.8 m.m- 2.0 m.m is mandatory.

Proper ventilation and an organic respiratory mask is highly recommended- this cuts down on any over spray being inhaled by the painter, as well the extraction of overspray minimizes “dry fume” which in turn generates a smoother finish.

Proper lighting is important for good coverage (no shadowing).

An air supply free of moisture and oil is required. The immediate appearance of fish eyes after coating is an indication of contaminated air.

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.

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 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).

k/ Drying/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 drying 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 1 day.

The actual cross linking of the coating with the substrate only begins once all the moisture has been extracted, i.e. the curing begins when the drying is completed.

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 recommended to minimize the possibility of marring. Cardboard corners along with shrink wrap, protective film, or at the least using shrink wrap alone are advised.

l/ Clean-Up & storage:

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.

D200 should not be stored at temperatures below 55 F or above 90F. The shelf life of D200 is 1 to 2 years and must be stored in a controlled environment with occasional stirring.

m/ QC :

Colour verification prior to coating is highly recommended to ensure no mistake is made with the colour selection or labeling.

If spraying a job for that will require the use of 2 separate batches it is best to blend the batches together to avoid any subtle colour or shade differences after completion.

Verification of film thickness can be taken with a wet film gauge during application. Once the coating has cured adhesion should be verified by performing a cross hatch test.

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.

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.

n/ Optional Follow-On Processes:

If D200 is applied to lineals rather than completed window boxes, painting the welds after assembly will be required. Touch-up bottles may be purchased from AquaSurTech for this purpose. They should be filled with D200 without the use of accelerator.

If damage occurs to the coated surface or the quality of the finish is not desirable from imperfections such as runs or dirt these can be repaired after the coating has partially cured. Imperfections must be sanded with 400+ grit sandpaper and the preparation & application procedure repeated on the affected area.

o/ Alternative Processes :

D200 can be applied by paint brush or roller if desired or in the case of a field touch-up or repair.