

a/Title : Complete Production Oriented Application Process for Painting Doors.
(smooth skin steel (ex. Polytex) , smooth and textured fiberglass)

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

c/ Required pre-requisite procedure(s):
PREP-02-0716 Rev.02 'Preparing doors for application of D200'

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

e/ Expected Coverage:
300-350 sqft / gallon

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
Pressure pot (Recommended)
Recommended safety equipment (refer to MSDS)

h/ Preparation of substrate:
See pre-requisite procedures (Section 'C') for proper cleaning prior to paint application. Mask product if necessary with standard masking tape, or painters

tape. If possible mount doors in a rotating door rack or otherwise on a solid horizontal surface.

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. 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, given that it introduces air into the coating, we recommend using 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. A rotating door rack is the optimal orientation (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 simply 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 and / or air cap may need to be cleaned.

The gun should have a fan no wider than 6-8", 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).

Begin by applying a good hiding fume/fog coat to the entire surface, with specific focus on the edges, corners and embossed areas. Ensuring the mist coat is applied appropriately to these areas will help reduce runs and edge pull challenges as well ensuring opacity at the appropriate film thickness. A fume coat is extremely light, it should be dry almost instantaneously (with 30 seconds) if applied properly. Either a gun adjustment may be required (lower product output) to apply a fume coat, however the most effective technique is to increase the speed of application to apply only the light coat. The substrate should still be visible through the applied fume coat.

The fume or mist coat, once flashed, is followed by a build coat. This is a heavier coat, with a thickness of 1 to 2 mils wet. It must be applied maintaining a wet edge, in order to ensure it is wet everywhere with no resulting dry spray. This can be best evaluated by observing the surface from an angle under a light source. It should look evenly wet with no dry patches and no runs. Allow this build coat to flash off. Flash time will vary given different ambient conditions, however, this is typically 2-5 minutes under normal conditions. Once flashed, repeat the application process of the build coat with a final coat application. Normally 2 passes after the fume are sufficient to achieve opacity.

The goal is to apply around 3-4 mils of coating (it will dry to 1.5-2.0mils) in total. Wet film thickness gauges can be purchased to measure the wet film thickness. The gauge is placed on the surface, and the wetting of a series of escalating “teeth” is observed.

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.

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 recommended to take a small piece of the substrate (minimum once per week) and spraying it along with a batch of doors. This piece can then be tested destructively with a cross hatch adhesion test, and retained on file. Changes in substrate , environment and application methods can be verified with these “retain samples”

In the unlikely event of any future field issues, AquaSurTech may request this sample.