Drying Conditions and Extractives

Drying Conditions:

The high quality ranges of PPG Wood Finishes are manufactured from the latest water based resin technology to give exceptional performance in use, however to ensure that these products perform to the best of their ability it is important to follow the drying schedule guidelines that we recommend as shown below:

Drying conditions, based on a two or three layer system

PPG Opaque System 2 x Spraying Total dry film thickness 150 - 160 µm		1st Coat (Primer) PE 025QO						2nd Coat (Finish) TE 112QO Satin			
		Spraying	Flash off	Drying	Spraying	Flash off	Forced Drying	Spraying	Flash off	Forced Drying	Through Drying
Dry film thickness	[µm]	90-100						60-70			
Wet film thickness	[µm]	225-250						160-180			
Temperature	[°C]	≥ 15	≥ 15	≥ 18				≥ 15	≥ 15	≥ 18	≥ 15 °C
Humidity	[%]	60-80	60-80	≤ 65				60-80	60-80	≤ 65	≤ 65
Airspeed/ventilation	[m/s]	not relevant	0	≥ 0.2				not relevant	0	≥ 0.2	0
Time	[hours]	not relevant	≥ 15 min.	≥ 16				not relevant	≥ 15 min.	≥ 4	≥ 72 hours

PPG Opaque System 3 x Spraying Total dry film thickness 150 - 180 µm		1st Coat (Primer) PE 025QO			2nd Coat (Midcoat) PE 025QO			3rd Coat (Finish) TE 112QO Satin			
		Spraying	Flash off	Drying	Spraying	Flash off	Forced Drying	Spraying	Flash off	Forced Drying	Through Drying
Dry film thickness	[µm]	50-60			50-60			50-60			
Wet film thickness	[µm]	150-160			150-160			150-160			
Temperature	[°C]	≥ 15	≥ 15	≥ 18	≥ 15	≥ 15	≥ 18	≥ 15	≥ 15	≥ 18	≥ 15 °C
Humidity	[%]	60-80	60-80	≤ 65	60-80	60-80	≤ 65	60-80	60-80	≤ 65	≤ 65
Airspeed/ventilation	[m/s]	not relevant	0	≥ 0.2	not relevant	0	≥ 0.2	not relevant	0	≥ 0.2	0
Time	[hours]	not relevant	≥ 15 min.	≥ 4	not relevant	≥ 15 min.	≥ 4	not relevant	≥ 15 min.	≥ 4	≥ 72 hours

PPG Translucent System 3 x Spraying Total dry film thickness 150 - 170 µm		1st Coat (Stain basecoat) FE 128QT			2nd Coat (Midcoat) TE 323QT Satin			3rd Coat (Finish) TE 323QT Satin			
		Spraying	Flash off	Drying	Spraying	Flash off	Forced Drying	Spraying	Flash off	Forced Drying	Through Drying
Dry film thickness	[µm]	10			70-80			70-80			
Wet film thickness	[µm]	50-60			200-220			200-220			
Temperature	[°C]	≥ 15	≥ 15	≥18	≥ 15	≥ 15	≥ 18	≥ 15	≥ 15	≥18	≥ 15 °C
Humidity	[%]	60-80	60-80	≤ 65	60-80	60-80	≤ 65	60-80	60-80	≤ 65	≤ 65
Airspeed/ventilation	[m/s]	not relevant	0	≥ 0.2	not relevant	0	≥ 0.2	not relevant	0	≥ 0.2	0
Time	[hours]	not relevant	≥ 15 min.	≥ 3	not relevant	≥ 15 min.	≥ 4,5	not relevant	≥ 15 min.	≥ 4,5	≥ 72 hours

General notes, related to all drying options;

Preferable is at least one overnight drying between primer and topcoat for a better through drying of the total system.
Windows and Doors can only be exposed outside, after passing the through drying period completely and only if protected and stored properly.
End grain should be sealed 2 times by brushing with PPG End grain sealer before finishing, the minimum drying time at > 18 °c is one hour for every layer.
V-joints exposed outside, should be extra sealed with PPG V-joint sealer following the instructions on the Technical Data Sheet.

If the conditions used during application of the coatings result in lower temperatures, less air movement or higher levels of relative humidity then the drying times will be increased.

If the drying schedule is not adhered to or the coatings are not given enough time to dry prior to installation then there is a risk that coalescing solvents may become entrapped within the layers of the coating.

On exposure to water these products which are hydroscopic may cause a “blooming” or “milky” appearance on the surface of the coating, this is of course more noticeable

on darker coloured surfaces and appears unsightly when experienced, however the coating will return to normal after the water has evaporated.

Upon complete through drying with full evaporation of the coalescing solvent from the coating the phenomenon will disappear, although the period of time for this to occur is dependant on the amount of solvent that has become entrapped during the factory drying process.

It is important that the coating is not damaged or attempts are made to remove the coating during periods where this phenomenon occurs and the coating is left to dry naturally as this will then have no detrimental effect on the integrity of the coating film.

Extractives:

One common problem which may be seen in relation to joinery coatings is that of resin exudation.

This is caused by movement of resins and gums present within certain species of timber and most often this is associated with timbers classified as softwoods such as Douglas fir.

Resin which is present within the resin ducts of the timber can become mobile when subjected to temperatures in excess of 35°C these temperatures are easily achieved by thermal gain on coated joinery items. On certain darker colours, for example Black coated joinery items, temperatures in excess of 75°C are regularly recorded.

There is no recognised cure for this problem as even treatment with “knotting agents” such as shellac only temporally alleviate the problem and in long term can cause total system failure as the coatings delaminate from the resin under the knotting.

It is therefore ideal to use softwoods with as few knots and resin pockets as possible, ensure as long a time is left between preservative treatment and coating as possible and then minimise the effects by using a high quality microporous isolating primer and topcoat coating system.

If resin exudation does occur on the surface of the coated joinery then after allowing the resin to crystallise remove from the surface of the coating with knife or similar edged tool, and then wipe with a cotton rag containing methylated spirit.

It is recommended that this process could be done when a first maintenance check on the coating is undertaken by when hopefully the resin may have finished moving and become fully crystallised, after removal a coat of topcoat applied on site will remove any surface staining that may have occurred and increase the subsequent maintenance interval.

Other timbers may exhibit a phenomenon of “tannin staining” where water soluble extractives, which may be present in the timber, migrate through the coatings to the surface causing discolouration. This can be minimised by the use of isolating primers which attempt to “lock” the tannin extractives within the first coat of primer applied. It is important to allow this first coat to dry fully before applying subsequent coats or further migration of the tannins may occur if the primer is not fully cured.

Another factor affecting the migration of the tannins is that of water permeability, as the more water allowed to permeate the film the greater the chance of migration. To minimise any risk of this it is important to ensure that window design does not promote areas of puddled water which could lead to excessive water permeability through any coatings that have been applied.