

## Drying parameters

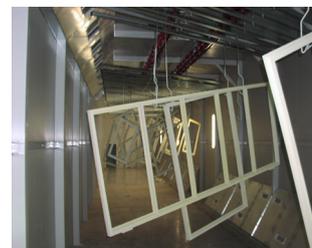
Factory finished joinery

Teknos water based joinery coatings are engineered to provide the fast turn round, over coating and handling times in a modern production environment.

To achieve optimum system performance, it is important that good drying conditions are achieved, particularly in cold and wet winter weather. If a water based coating system is not fully cured before installation, it may exhibit micro blistering in the first few weeks of service. Generally this problem will disappear as the weather improves and the through drying process is completed, and no further action is required, but additional care is required when using stain blocking primers as further tannin leaching can occur before these products are fully cured through.

Paint storage temperature prior to application is also important in achieving adequate curing. Before use, paint should be kept in a warm, dry and draught free area with a minimum ambient temperature of 10° C. Never store paint on a cold factory floor.

This note gives some typical drying guidelines for Teknos primer and topcoats, and some guidance on optimising drying conditions.



### Drying area parameters

With water-based coatings, drying time is determined by a combination of air temperature, airflow, humidity and air changes. Temperature and air flow over the painted surface are most significant and usually the easiest to control in a typical joinery workshop.

Minimum air temperatures should be above 10°C throughout the drying and storage period and the design of the drying zone and any tracking, stillages or racking should allow free air circulation around each individual component. It is also important that sufficient air movement is generated: typically overhead fans are an inexpensive and effective way of achieving this.

With good circulation, elevated temperatures will shorten drying times, but it is important to allow a “flash off” period, before the joinery enters the elevated heating zone, to prevent surface skinning of the coating which will inhibit through drying.

Ideally the drying area should be humidity controlled, though within a fairly broad band of 55 –85% relative humidity the coatings will dry satisfactorily. If the relative humidity is above 85% the airflow has less capacity to absorb moisture, and drying will be retarded. Conversely, if the air is too dry the surface can dry too quickly and may skin over, inhibiting through drying.

Finally, as drying proceeds and the circulating air absorbs more moisture, it is important to remove this wetter air and replace it with dryer air from an external source. Around 1–2 air changes per hour are typical; though in higher capacity systems or where

the ambient relative humidity is high, up to 10 air changes per hour can be required.

Typical parameters are shown below:

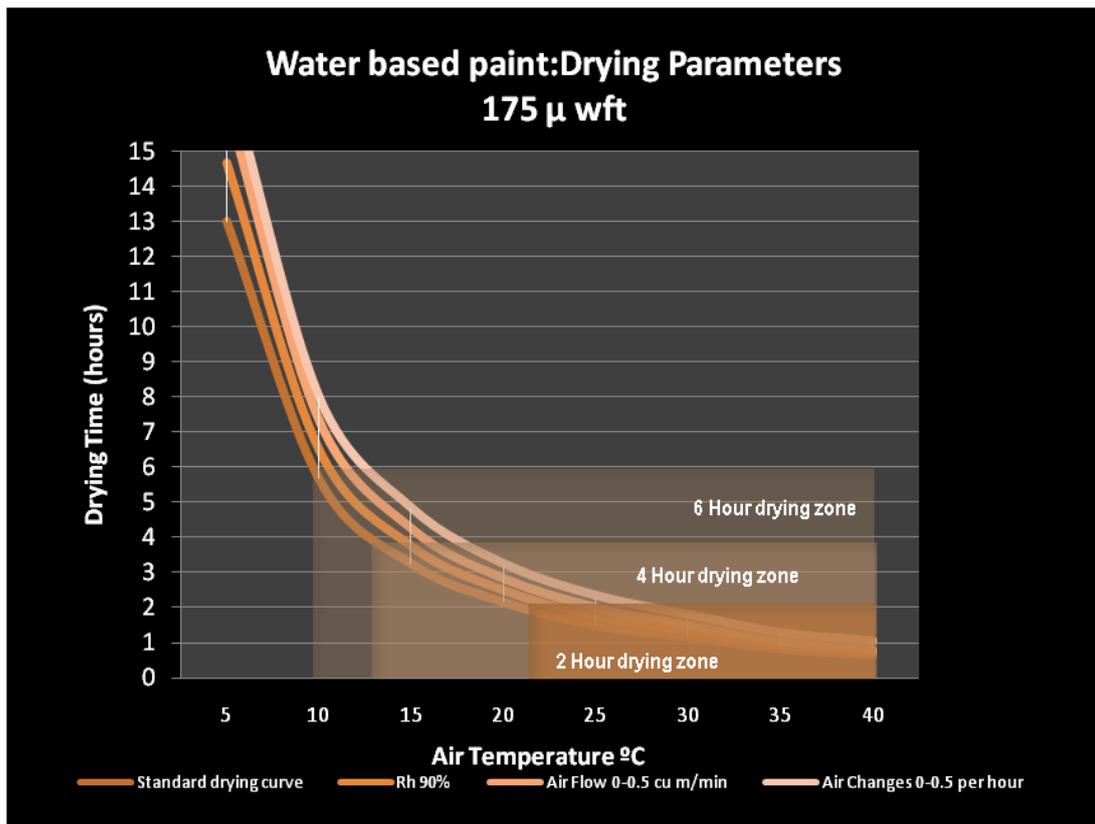
Air Flow*	1 - 1.5 m³/min
Humidity	60 - 85% Rh
Air temperature	15 - 20°C
Air changes	1 - 2 per hour

\* air flow across the joinery surface

Please note that the airflow refers to the movement within the drying area and air changes to the flow of air into and out of the drying zone.

## Practical drying times

The graph below shows how drying times vary with temperature under typical conditions and their sensitivity to higher humidity and lower levels of air flow. The lower line shows the drying curve under “standard” conditions, the upper lines how the drying curve is modified as humidity increases, and as air flow and air changes reduce.



Some important points to note:

1. In winter, lower temperatures, particularly in unheated storage and drying areas, combined with higher humidity will significantly extend through drying times.
2. Ducting filtered, warm, air from the workshop can often help to raise temperatures in drying and storage areas. Workshop air is usually “dry”, and provides an economic, low humidity, drying medium.
3. Ceiling fans, such as those used in domestic conservatories, will improve airflow and speed drying even at low temperatures.
4. The curve is based on application of a high build coating at around 175 $\mu$  wet film thickness. At higher thicknesses the curves move up (increasing drying time) and conversely at lower thicknesses. Most importantly, the shape of the curves remains the same, regardless of film thickness.

## Teknos Products

The table below gives guideline drying times for three typical Teknos product types.

The drying times quoted assume that the drying zone is set up with the recommended air circulation and extraction, and that the products are applied at the recommended film thickness.

Drying systems and throughput do vary, and Teknos would be happy to provide specific advice on any particular Customer configuration

## Typical Drying Times

	Wet film thickness	Flash off 20°C	Drying temp °C	Drying time	Cooling time 20°C
Anti Stain Aqua Aqua Primer series	150 - 175µ	-	20	3 hours	-
		15 minutes	40	45 minutes	5 - 10 minutes
		15 minutes	60*	30 minutes	10 - 15 minutes
Aquatop series	150 - 175µ	-	20	3 - 4 hours	-
		15 minutes	40	1 hour	15 - 20 minutes
Aquacoat series	100 - 125µ	-	20	60 minutes	-
		5 minutes	40	20 minutes	5 - 10 minutes
		5 minutes	60*	10 minutes	10 - 15 minutes

### Notes:

1. *Drying at temperatures > 40°C can be used for timber where a water-based preservative is applied by flow coating. It is not recommended on timber that has been double vacuum treated with solvent based preservative, as residual solvent trapped in the timber can cause blistering and de-lamination.*
2. *Care needs to be taken when drying some timber species at elevated temperatures as this can mobilise resins within the timber.*
3. *Flash Off zones should have low air movement with Relative Humidity controlled at around 70%. Drying ovens should be zoned to ensure equal drying of the coating system.*
4. *Before application, ensure the paint is fully stirred and the liquid temperature is above 10°C.*

## Teknos UK and Ireland

Teknos is one of Europe's leading suppliers of industrial wood coatings. We provide technical support and delivery services throughout the UK and Ireland from 3 service centres, located at Swerford, near Banbury, Livingston and Belfast.

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