

Drying parameters

Application guidelines

Teknos waterbased joinery coatings are engineered to provide fast turn round, over coating and handling times required 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. However, 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.

The following information gives some typical drying guidelines for Teknos primers and topcoats, and some guidance on optimising drying conditions.



Drying area parameters

With waterbased coatings, drying time is determined by a combination of air temperature, air flow, 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.

The ideal air temperature is 15°C but the minimum air temperature is 10°C throughout the drying and storage period. 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 - 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. This will prevent surface skinning of the coating which will inhibit through drying.

Ideally the drying area should be humidity controlled. However, 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 one to two air changes per hour are typical, although 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 cubic meters/min across the surface of the joinery
- Humidity: 60% - 85% Rh
- Temperature: 20 - 25°C
- Air changes: 1- 2 per hour

* Airflow 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 show how the drying curve is modified as humidity increases, and as the air flow and air changes reduce.

Some important points to note:

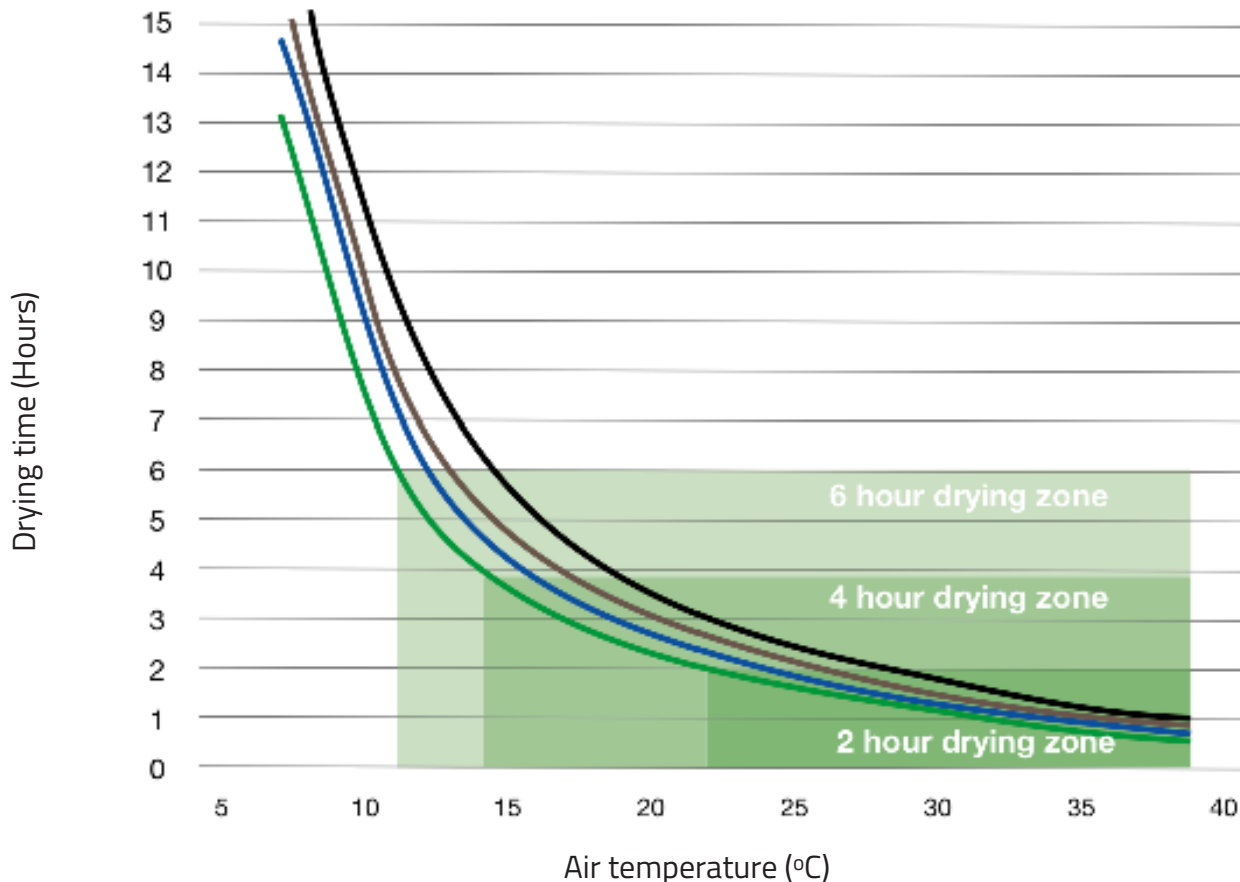
1. In winter and lower temperatures, particularly in unheated storage and drying areas, combined with higher humidity will significantly extend through drying times.
2. Ducting filtered warm air from the workshop can often help to raise temperatures in drying and storage areas. Workshop air is usually '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 μ 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.

Water based paint: drying parameters

175 μ wft



Teknos products

The table below gives guideline drying times for three typical Teknos products. The drying times quoted assume the drying zone is set up with the recommended air circulation and extraction, and the products are applied at the recommended film thickness. Drying systems and throughput do vary, and we would be delighted to provide specific advice on any particular customer configuration.

Notes:

1. Drying at temperatures over 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.

Typical drying times

Wet film thickness	Flash off (20°C)	Drying temperature °C	Drying time	Cooling time (20°C)
AQUAPRIMER series				
150 - 175 µ	-	20	3 hours	-
150 - 175 µ	15 minutes	40	45 minutes	5-10 minutes
150 - 175 µ	15 minutes	60*	30 minutes	10 - 15 minutes
AQUATOP series				
150 - 175 µ	-	20	3-4 hours	-
150 - 175 µ	15 minutes	40	1 hour	15 - 20 minutes
TEKNOCLEAR 1332/HYDROLINE and TEKNOCOAT 2575/KRISTALL TOPP series				
100 - 125 µ	-	20	60 minutes	-
100 - 125 µ	5 minutes	40	20 minutes	5 - 10 minutes
100 - 125 µ	5 minutes	60*	10 minutes	10 - 15 minutes