

## *The Importance of Drying Conditions*

Ensuring the finish is sufficiently dried before recoating or allowing traffic across the floor is very important to a beautiful and lasting wood floor finish. It is true that water-based coatings are noted for their fast drying times compared to oil-modified urethane finishes but it must be kept in mind that although it is fast there are limitations. Dry times and recoat times are stated in manuals and these are meant to be a guide only because the actual dry time can vary significantly. There are a number of factors that influence dry times in finishes. These are listed below:

- a) Amount of air movement and circulation over the drying surface
- b) Film thickness
- c) Relative Humidity
- d) Temperature

### *Amount of Air Circulation*

This is considered the major contributing factor to dry time. Without air circulation, the solvent and water evaporating from the surface can quickly saturate a small layer of air just above the coating. If this saturated layer is not moved away from the surface, the rate of evaporation slows significantly.

If the coating is in an enclosed room or space with limited air circulation, the dry rates will be significantly slower and there is a higher risk of marring the finish by walking on it or placing objects on it too soon. This is because solvents still in the coating will make it “soft”.

A window that is open a crack will in a lot of circumstances **not** provide the type of circulation required. This is why having a fan to circulate the air is strongly recommended. **Note:** It is not necessary to have a hurricane, but “dead air” kills the finish hardness.

### *Film Thickness*

This is a factor in drying of a coating because at the coating/ air interface, the solvent and water molecules nearest to the surface leave first due to their proximity to the surface. In other words, it dries from the top down. This forms a film that solvents in the coating below must pass through. The curing process happens at a relatively slow rate so as this film builds and gets thicker, it becomes more and more difficult for the solvents to escape through each additional coat. The curing process becomes slower as the film becomes more solid. Thus the thicker films take longer to dry AND stay softer longer. Since the second coat is done over top of previous coat, it is significant that any solvents not dry on the first coat will have to **travel twice as far through twice as much solid finish in order to escape**. This means a number of things. Firstly, the “trapped” solvent takes a longer time to make its escape and secondly, the finish stays softer, longer because of this solvent presence and can easily be marred. Each time a new coat is applied over a coat that is not fully dried, the solvents passing up through will keep all the coats soft and easy to mar. Dry each coat well with air movement.

### ***Relative Humidity***

This affects dry time by changing the solvent carrying capacity of the air. The higher the humidity, the more water it contains. The more water it contains, the less room that will be available at a given temperature and barometric pressure, to pick up and carry away solvents from the finish. More airflow over the finish will help to compensate for this problem along with higher temperature.

### ***Temperature***

Temperature affects drying rate in two ways. First of all, it increases the air's capacity to carry vapor. This can increase the drying rate but only if the air is moving and circulating. Second, temperature can increase the rate of curing solvents, meaning that it can result in a faster drying time. But curing rates are a couple of orders of magnitude slower than the air transport and still can result in relatively slow dry times. This is also why opening a window a crack, particularly in the winter **will not** give satisfactory results. The temperature declines thus slowing the curing rate but the airflow is still not good. The result can be a floor that dries slowly and remains in a softer state for a long period of time.

It can be clearly seen from the above discussion that air movement and circulation is the most important factor in drying any floor finish. Other factors do have influence by they are only significant when used along with air circulation.

A properly dried finish means that enough solvents have been removed from the finish to allow good coalescence. This coalescence in turn allows the polymer chains to entangle each other helping with chemical resistance and the physical properties of the finish, close entanglements in the finishes such as StreetShoe allows cross-linking to occur thus further enhancing the adhesion, durability and overall beauty of the floor finish.

Yet, if the dry times are too fast, there may be some combing lines in the finish and the finish may not be as smooth as you would like. In knowing what influenced dry times, it is possible to create conditions so that a perfect finish is achieved every time. This is why our instructions read “allow 30-45 minutes for flow and leveling, then open up and ventilate to dry”.

The conclusion to this is that in low air circulation conditions, more time must be taken before allowing regular traffic and moving furniture back onto the floor. These actions can seriously mar a still “soft” finish. This also applies to large pets whose paws and toenails will tend to dig into a slow drying and curing finished caused by limited circulation.

So in this way, if there appears to be some softness or marring problems in a freshly finished floor, the first thing to consider is dry time and **WAS THE AIR MOVING?**