

Global Technical Services Bulletin #116

Awlwood System Technical Note

Surface Preparation Methods, Overcoating Existing Varnishes, Best Application Practices and Polishing/Buffering Guidelines

With thanks to Keith Ryman

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1. Introduction

This information sheet has been produced support the application of the Awlwood system. Discussed are best application practices for Awlwood primers and topcoats, ways and means of handling the normal release of air from timber during the varnishing process, use of Awlwood over sealants and its use with sign writing paints and vinyl logos.

Further technical guidance has been provided on the question of over coating existing varnishes and polishing Awlwood MA Gloss.

2. Sanding Bare Timber Before Priming

2.1. Exterior Exposure

To enable Awlwood to give the highest level of durability especially for exterior timber it is important that the grain structure of the timber is opened up as much as possible to enable deep penetration of the primer.

Coarse sanding can easily increase primer uptake by 50% which will give a significantly improved performance of the finished system.

P 120 paper is recommended in the data sheets and if possible coarser papers can be used. Using finer papers tends to burnish the timber closing the timber grain, reducing primer penetration which can compromise primer uptake and reduce durability.

Ideally use the coarsest paper possible, and always sand parallel to the direction of the wood grain.

It is important to ensure that all sanding dust and other debris is thoroughly removed from the surface and from the bottom of the pits in the timber grain before applying any primer or finish coats.

2.2. Interior Exposure Only

For interior use where solar damage would be minimal the sanding requirements listed as for exterior exposure are not such a necessity.

For interior use, a DA sander can be used with care for the final sand without resulting in orbital marks. Typically P-150 for example works well on mahogany. In fact coarser paper has been used with excellent results but it is left to the individual to explore that route.

Note: DA sanders may vary in their orbit diameter (throw) and therefore may not produce similar results when comparing different DA sander models. Please test your sander on a timber cut off or sample panel prior to applying Awlwood primers and finish coats to see the end results.

3. Primer Application:

3.1. Temperature Conditions during Application of Product

To reduce bubbling of Awlwood during the grain filling stage it is recommended to apply the primer and first 2 -3 topcoats when the timber is cooling down as during this period of application air pockets and voids are still being filled. Air release is essential to avoid bubbles and pin holing.

The best conditions for application of the Awlwood MA primer and the first 2 – 3 finishing coats is in the shade when the timber is cooling down. Avoid applying during any period where the timber substrate will be warming up.

Since the primer is slower curing than the finishing coats it is advisable not to apply the primer in the early evening if conditions are such that condensation could form on the product.

As for any product it is best not to apply any products in full hot sunlight conditions or when the surface is warming up as application will be far more difficult.

Although the maximum recommended temperature for use is 30°C (86°F) (but has been used at higher temperatures) temperatures above around 28°C (82.4°F) require far more care during application. This is especially so in relation to substrate temperatures which can easily reach or pass 60°C (140°F) in the full sun. At higher temperatures the product becomes more reactive and the risk of the product gassing/bubbling internally due to the speed of the reaction increases, similar to some two pack polyurethanes.

Once the grain is sealed the final coats of product can be applied under less restrictive conditions, taking note of the points mentioned above.

3.2. Method of Primer Application

Apply as per the data sheet and do not attempt to build a film or flood the product on especially on deep grained timbers. The primer if applied correctly will be absorbed into the timber fibres and will coat and seal the surface of the those fibres but will not necessarily fill deep voids and/or air pockets so air may still rise out of the grain when the first or second coat of the finishing system is applied. Often such bubbling will be seen to follow the timber grain.

Applying the primer using a rag can sometimes be beneficial in reducing bubbling. This expels the air from within the structure and helps the system to achieve such a high level of durability.

4. Topcoat Application

4.1. Method of Topcoat Application

If primer has been applied to a deep grained hardwood timber, apply the first two coats of finish at one day intervals by brush for best results. Rolling and tipping off with a brush or just rolling may also be satisfactory.

Sand each coat with P-220 – P-280 grit paper without sanding through to the primer. This will fill the grain more effectively, reduces solvent entrapment in the pits of the grain and minimises air bubbles forming in the topcoat before the grain is fully sealed. If any bubbles do occur from wet product displacing air in the timber grain, gently tipping these with a dry brush before the product cures is easier than sanding later and will in many cases seal the pinhole.

If these initial coats of product are sprayed they may not flow in and fill the grain since there are no shear forces to force product into the grain and the product tends to sit up on the surface.

Spray application of these first two coats can also result in air bubbles breaking and forming near invisible pin holes which may show up as cissing on the next application of finish coat.

5. Applying Awlwood Over Sealers and Deck Caulking

Most chemical cured sealants (usually moisture cured variants) once cured can be over coated with Awlwood finish.

Do not apply the Awlwood MA Primers over any sealant as the primer is less elastic than the finish and in severe sealant movement may crack. The Awlwood finish is sufficiently flexible to withstand most likely levels of movement. It is unlikely the sealant will flex more than the Awlwood finish so cracking of the Awlwood finish would not normally be expected to occur. Adhesion should be satisfactory provided the sealant contains no Silicone based materials.

A test should however be carried out to ensure there is no inhibition of cure of the Awlwood and/or that no negative effect on the sealant is noted. Due to the number and variety of sealants on the market and the likelihood that any of them can undergo formulation changes at any time makes it difficult to list definitely those sealants that are known to be suitable for over coating with Awlwood.

6. Application of Names, Graphics, Logos and Decals

Awlwood is unlikely to affect self-adhesive vinyl type logos and names should the product be applied over them but tests on such materials should be carried out to ensure there is no adverse reaction and that any colours do not bleed or change colour.

Names and logos can also be painted / applied over Awlwood using two pack polyurethanes (preferably high quality acrylic types), good quality well curing single pack enamel paints or self-adhesive vinyl types. All can in turn be over coated with Awlwood to seal and protect them from scratching. Single pack paint products must of necessity be well cured otherwise the Awlwood may act like a paint stripper.

Users should carry out suitable tests with any combination of materials to be used in their particular situation.

7. Application of Awlwood over Existing Varnishes

7.1. Overview

One of the most often asked questions on the technical desk is whether Awlwood can be applied to existing varnishes. The answer is, *Yes, it can be done*, however the performance if doing so cannot be expected to match that of the complete Awlwood system from bare timber. If an applicator wishes to overcoat an existing varnish scheme, it is very important to explain the potential drawbacks and future problems that may arise. The existing varnish will be the weak link of the system.

However, overcoating an existing varnish with Awlwood MA is more likely to provide superior performance than overcoating with the previous product.

The Awlwood becomes more like sunglasses over the old coating minimising further degradation.

7.2. Condition of Existing Varnish

It is very important that the previous product should be in good condition with no signs of 'mud-cracking', crazing or delamination from the timber. Previous coatings also need to be well cured otherwise applying the Awlwood may soften the existing varnish.

7.3. Preparation of Existing Varnish

They need to be white sanded to ensure an effective key, but if sanded right through, a patchy appearance will result. Any sand through areas could indicate the DFT of the underlying varnish is low, and in this case, the longer term benefit will be attained by fully removing the existing varnish and applying the full Awlwood primer and topcoat system.

7.4. Age of Existing Varnish (All Layers)

The age of the first coat has significant bearing on performance. Whilst existing varnish schemes may get renewed on an annual basis, leading the applicator into assuming the entire system is in good order, it is important to consider the age of the first coat that was applied to bare timber. This first coat is essentially acting as the anchor to the entire system and will generally define the success of the entire system.

Depending on the geographical region, UV attack will slowly deteriorate the interface between the first coat and the timber. It is recommended that the first coat is no older than 2 years, although in more temperate geographical zones with lower UV values, slightly older coatings may be overcoated if found to retain good adhesion to the substrate.

7.5. Application of Awlwood MA

It is also important to ensure at least 100um DFT is applied over existing coatings in order to provide the necessary UV protection. This should be built up in at least 3 – 5 coats. Insufficient film thickness of the Awlwood MA may lead to UV penetration to underlying varnish layers or even the timber surface, potentially causing UV degradation and ultimately detachment or delamination.

8. Polishing / Buffing Awlwood MA Gloss

8.1. Overview

Awlwood MA Gloss is an excellent product for polishing or buffing when desired. This may be desired to eliminate or reduce the effect of dust inclusions or to help remove runs, sags or texture due to heavy / over application.

Under normal curing conditions, it is recommended to wait 7 days of full cure and hardness to develop if a heavy cut and polish is required. The time to cut and polish can be cut to just 24 hours for parts that are produced and dried in a heated (>40°C) and ventilated spray booth. If multiple heavy coats have been applied the previous day the coating may remain rubbery for longer.

Do not sand or polish through the final coat to the coat beneath. If this does occur, a full recoat may be required as a visual effect occurs that polishing will not remove.

8.2. Polishing / Correction Process

There are various polishing systems and corrections processes available, each with its own merits and success. The following system has been tried and tested on Awlwood MA with success, although other systems may work equally well.

If using coarser grades of sand paper for paint correction, it is extremely important when changing up sanding grades, not to jump more than 2 grades between steps. This will minimise the chance of DA swirls being left in the finished surface.

Stage 1. Cutting / Sanding: If Paint Correction is Necessary

Step 1: P800 DA Pad Wet: (Optional) This should only be used if runs or sags of heavy texture need localised repair.

Step 2: P1200 DA Pad Wet: Start at this grade to flatten fine texture if a truly flat surface is required. This is too coarse if only dust inclusion removal is necessary.

Stage 2. Cutting / Sanding: For Dust Removal and Flattening

Step 1: P1500 Hookit Sanding Pad (Dry): Run the sander at slow speed. At no stage in the process should the coating be allowed to heat - it won't sand or buff if it becomes rubbery through heating up.

Step 2: P2000 Hookit Sanding Pad (Wet): (Recommended)

Step 3: P3000 Hookit Sanding Pad (Wet): Mist the Awlwood with water from a spray bottle. Attempt to achieve 6 to 8 passes. A trail of small bubbles should follow the sander - if this doesn't happen, the sander is aquaplaning and not cutting. The entire surface should be cut with the 3000 grit at this stage. Attempting to 'spot repair' will result in uneven gloss.

In all three steps above, it is important to avoid running the DA too fast as this may heat the surface up, result in a rubbery texture and a potential milky finish. This is more important when the final coating has been applied just 24 – 48hours previously.

Stage 3. Polishing (3M 'Perfect-it' Compounds)

Step 1: 3M Fast Cut XL Compound (Green top): Use an electrical buffer starting at 900/1000 r.p.m. and with some pressure initially. After some time increase the speed to 2000/2500 and reduce the pressure. Use the recommended manufactures stipulated pad for every compound step. If DA swirls are still visible, this may mean having to go back to Stage 2 / Step 3 (P3000).

Step 2: 3M Perfect-it™ III extra Fine Compound (Yellow top): Use an electrical buffer with 900/1000 r.p.m. and with some pressure at the start of buffing. After some time increase the speed to 2000/2500 and reduce the pressure.

9. Trouble Shooting

9.1. How to Rectify Pin Holing

If for whatever reason you find that after application of the first two coats of finish the subsequent coats result in cissing or pinholes, there are ways to remedy the situation.

Careful application of product using a foam roller has in some cases been found to squeeze / push / force product into the pin holes filling a good percentage on the first application. A squeegee has also been used.

In all cases what you are trying to do is to force product into the hole by allowing air to escape at the same time.

Also note that after sanding air bubbles open or a surface with pin holes it is imperative to remove the sanding dust that fills either of them by using for example clean compressed air and a suitable blower. This is best achieved by blowing out with compressed air or vacuuming out. Cloth wiping alone will not be suitable.

When working on vertical surfaces or fiddly wood work take note of any runs or sags where the higher local film build may have resulted in internal gassing forming bubbles as these will need to be sanded to break them open and the sanding residue removed.

Trying to flood coat a pin holed surface using heavy spray (or brush) application of product will usually result in the pin holes reforming as the product cures. If they are not filled it can lead to dimples printing through to the final finish as the air in the voids expands and contracts with temperature changes.

9.2. Timbers More Prone to Out Gassing

Generally speaking deep grained Hardwood timbers are more prone to out gassing than softwoods due to the type of pore structure within the timber. Most Softwood is usually sealed after priming and one coat of top coat.

Hardwoods include: Ash, Birch, Cherry, Holly, Mahogany, Maple, Oak, Teak and Iroko.
Softwoods include: Cedar, Basswood, Pine, Spruce and Oregon.