APPLICATION NOTES

Section Name	Product Application Notes – JAXXON 1500 Series.
Last Updated	06/09
Aim	Document the application procedures for the 1500 series.
Scope	Covers all aspects of application.
References	

JAXXON 1500 Series - 1505/15/25/35/45

The JAXXON 1500 series of harsh environment protective coatings are based on pure liquid epoxy polymers and amine curing agents. Pigmentation is selected for hardness and durability in order to obtain the best possible properties in the cured film, and JAXXON 1525/35/45 reinforced with Kevlar fibres to enhance the strength, wear, chip and flexural properties of the coatings.

They are formulated with no solvents, have exceptional moisture and surface tolerance, and have excellent chemical resistance. These properties make them ideal as chemical-resistant linings, protective coatings for concrete and steel (above or below water), or as industrial non-slip flooring when combined with appropriate aggregate.

The cured films are extremely hard, glossy and very tough. Application is easily made by brush, roller or spray.

1 Coverage

The 1500 series product line (JAXXON 1505/15/25/35/45) has two size options – 4 or 8L kits. Each kit consists of a pre-measured container of epoxy base and a pre-measured container of curing agent. The two components are added in the supplied ratio and mixed thoroughly.

Coverage rates can be affected by the condition of the surface being coated, eg porosity. The recommended film thicknesses of the products, together with the theoretical coverage rates they correspond to are presented below:

1505 – 150 microns @ 6.67sq.m/L
1515 – 250 microns @ 4sq.m/L.
1525 – 250 microns @ 4sq.m/L
1535 – 250 microns @ 4sq.m/L.
1545 – 300 microns @ 3.33sq.m/L.

Practical coverage rates will be marginally less depending on the losses that occur during application, eg localised excessive film thickness, losses in rollers, brushes, trays, buckets, hoses etc.

2 Temperature

Temperature will exert a considerable influence on the rate of curing of thermoset coatings such as the NMP epoxy coatings. In broad terms, curing times will double for a 10°C decrease in temperature and half for a 10°C increase. The table below contains the curing schedules for the JAXXON 1500 series products at 25°C. Temperature will also affect viscosity (heated epoxies will have reduced viscosity) and hence the maximum vertical application thickness achievable with the 1500 series products (without sag).

Product	Pot Life	Set - Touch	Set - Hard	Full Cure
1505	45 mins	6 hrs	15 hrs	7 days
1515	45 mins	6 hrs	15 hrs	7 days
1525	45 mins	6 hrs	15 hrs	7 days
1535	45 mins	6 hrs	15 hrs	7 days
1545	40 mins	6 hrs	15 hrs	7 days

3 Application

3.1 Planning

Before application begins, the surface must be prepared thoroughly. Read Surface Preparation Notes for recommended procedures.

It is very important to read the data sheet and MSDS before use, taking particular note of film thicknesses, cure times, product features etc. Wear the appropriate protective clothing and have all tools and mix area ready before mixing.

Spending some time planning how the application is to proceed will provide the best opportunity to achieve a high standard finish.

If rolling a larger area requiring several kits or more, plan out how to best progress across the area. Accessibility, equipment availability, shutdown restraints etc. may all impact upon the decision making at this point. You will need to consider how and where you finish a kit. Using expansion joints as boundaries (never coat directly over expansion joints) and keeping edges fresh so the next kit can be seamlessly rolled into it are important considerations.

Once the sequencing has been determined, mark off each successive rectangles of designated area with masking tape as application progresses. A high-quality cloth tape is preferred as it will prevent seepage under the tape and achieve straighter/cleaner lines. This marking is very important to ensure an even application and proper budgeting of materials – under no conditions have the material simply spread over an estimation of the area with no control of consumption. Over time experience will allow you get by without marking each rectangle (except for areas where sharp lines are required, eg door entries), however it is a good idea initially as it gives you a good feel for coverage, area etc

The designated mix area shouldn't be too far from the application area and it should be cordoned off if possible. Make sure it's big enough to allow plenty of room in which to move and work cleanly. Use drop sheets to protect from splashes/spills/drips, and have plenty of lint-free cotton rags and solvent (Metho, Acetone etc.) ready for clean-up. To simplify things even further, store only the product you need for the immediate coat being applied. A well-organised, functional, clean mix area is very important. It helps to think of the mix and application areas as "clean zones". Inside wear booties/plastic bags over socks and normal footwear on the outside.

If using budget rollers, it is a good idea to "de-lint" first by wrapping the roller in masking tape and removing. Repeat this process, "fluffing" the roller in between, until there are no fibres visible on the back of the tape. The lint can also be

removed by simply giving the rollers a wash in a washing machine. These measures will ensure there are no errant fibres in the film. Alternatively, higher quality Mohair roller covers can be used for greater fibre retention.

If spraying, thought also needs to be given to the execution of stripe coats prior to application. What awkward/difficult areas will need to be brushed before hand? Are there welds, joints, pipes that need stripe coating first? Stripe coats will have to be over-coated within re-coat times, so familiarity with product cure times etc. should be gained via data sheets before commencement.

The applicator also needs to plan how to deal with contingencies such as:

- Availability of power, lighting, access etc.
- Restricting access through signage or cordoning off to protect floor from accidental damage.
- Sensitivity of surrounding areas to noise, odour, dust etc.
- Poor substrate - sealing requirements, patching, re-building.
- Unexpected conditions during application e.g. extreme heat or cold, condensation etc.
- Drainage or levelling problems e.g. pooling.
- Coating defects such as holidays, pinholes, crawling, colour separation, soft spots etc.
- Dust migration and/or insect contamination on wet films.

3.2 Spraying

For larger spraying application projects, the 1500 series product line can be supplied in Project PAX, which consists of 10L fills of the components rather than pre-measured kits.

The product can be sprayed using either of two alternatives. These options are an airless plural spray or a single component airless conventional spray. When spraying, it is possible to add some thinner to make the spraying easier. Typically 2-3% can be added to the epoxy. If using airless, plural spray unit (recommended), the following configuration is suggested:

Ratio -	Base/Cure (see product data sheets for ratios).
Fluid Temperature -	55°C.
Fluid Pressure -	2,250psi.
Tip -	30thou" – fan size to suit application.
Cleaning Solvent -	MEK or standard epoxy thinner (used to flush system every 20 minutes)
Hose Length -	Not to exceed 15m.
Hose Size -	3/8 inch.

Airless spray application is preferred for high build coatings on large plain areas where power/compressed air and labour of suitable standard is available. The advantages of this method include cost benefit pertaining to speed of work, over-spray reduction (material loss estimated at 20-30%), and ability to produce a much higher wet film thickness for certain coatings.

As the name suggests, airless spray doesn't utilise atomising air to disperse the coating, rather it employs the use of a specially configured system that pumps a very high speed stream (using hydraulic pressure) through the nozzle orifice which releases the pressure and causes atomisation.

The special configuration consists of air activated pumps that operate at 25 to 50 times traditional air-operated pumps, which pump the coating through pressure resistant hose lines to the application gun/nozzle. This equipment can achieve a 25-30% increase in production per hour (on brushing and rolling).

As no atomising air is used, there is considerably more control and consequently considerably less over-spray and more even application. Also, the high-pressure system can process higher viscosity material, which results in savings on thinners.

Before spraying begins, perform the stripe coating with a brush as determined in the planning phase. Pay particular attention to welds and other hard to reach areas, ensure that all folds, crevices and peaks are fully coated. Spraying must proceed within the re-coat “window” of the stripe coat.

The spray gun is typically held at a distance of about 20-30cm from the surface and applied in a parallel line fashion as opposed to circular/fan pattern. The material will be thicker in the centre of the spray; therefore it is essential to correct this by overlapping successive sprays by about 50%. A criss-cross pattern is suggested for higher film thickness. Using this method material loss will approach 30-40%, and higher for surfaces in open areas.

Properly controlled, the airless spray is the most economical method of spray application, however equipment is expensive.

Conventional spraying is also a popular and widely proven method applies paint quickly, however isn’t as effective in high-build coating applications as the airless alternative. Equipment is easier to maintain, however probably more complicated to correctly operate. The lower pressure in the system also necessitates thinning to allow pumping which can create problems with dry film thicknesses.

The process starts with the material being contained in a material pot being forced through a hose to the spray gun with air pressure. At the gun, another hose containing pressurised air interacts with the material at the nozzle to atomise the coating. Other air outlets are used at this point to shape the distribution.

Essentially, control of this method depends on a few key variables:

- Viscosity – must be low enough to permit proper atomisation, yet high enough for build on the surface to occur without sag (if desired).
- Material pressure – this directly controls the rate of coating flowing through the nozzle. A needle that opens and closes on the trigger regulates this.
- Atomising pressure – excessive atomising pressure will result in over-spray. Correct pressure will produce a uniform wet film.

Adjustment of pressure in the system can be performed in two ways:

1. Adjust material pressure so that a stream of coating will fall about one metre horizontally from the end of the gun. This will correspond to approximately 400-650mL/min of material.
2. Adjust atomising pressure until it is high enough to provide a uniform wet film.

3.3 Rolling

The 1500 series product line is supplied in 4L or 8L kits, with coverage depending on film thickness (see coverage guide).

Mask off the first area as determined in the planning phase. Until confidence has been gained with coverage, it is a good idea to mark off rectangles as application progresses. As discussed, the masking will need to be done before each successive kit. If a boundary is formed by a joint or a previous kit’s edge, masking will not be required.

3.3.1 Material Preparation

Thoroughly pre-mix base with coloured pigment pot, and then add the entire curing agent, preferably using an electric drill stirrer and a ‘Jiffy’ type mixer, ensuring that the edges are also well mixed. Mixing will take only a couple of minutes, but must be done completely. Try to limit the amount of air trapped in the coating by holding the mixer below the surface as much as possible when mixing – don’t allow mixer to “beat” the surface.

3.3.2 Application

If working on a horizontal surface, pour the mixed epoxy directly onto the floor, as evenly as possible over the marked area using a snaking or “S” pattern. Pouring directly onto the surface is encouraged as this will extend the pot life of the product by eliminating heat build-up when product is left in the can. Start approximately 50cm from a wall and work your way towards the exit point (e.g. door) pouring lines with 1 metre gap to allow you somewhere to stand when rolling.

Leave some product to use for “cutting-in” around tight areas using a 50mm brush. Try not to cut in too far, just enough to achieve the aim of protecting the wall against the roller. If the area to be “cut-in” is large, it may be best to mix a smaller portion first (in a 2L, flat-bottomed plastic jug for example) to perform the cut-in so there is no danger of the poured product thickening too much before it has a chance to be rolled. A plastic measuring jug is ideal for splitting kits as it allows easy volume measurement and after the product has cured it can be peeled from the bottom and the jug re-used.

Don’t scrape the buckets to remove all product unless you have scraped the sides whilst mixing (otherwise you could be applying poorly mixed areas onto the floor that can result in soft spots).

Perform an initial "rough" spreading using lint-free or budget rollers (or trowels, squeegees) to achieve a relatively even surface, allow product to level by itself for 2-3 minutes, then backroll smooth. When backrolling, the aim is to roll in long, even strokes/sections (approximately 1 metre long as per “S” pattern) trying to get the product feeling and sounding the same with each roll to ensure even film thickness.

Timing is critical and uniform spreading is important. The hardening process will begin as soon as it is mixed, so endeavours to spread all the epoxy within about 15 minutes after mixing should be made to ensure easier manageability.

As noted, the coatings should never be installed directly over expansion or control joints. These should be treated as natural boundaries when considering how to divide the application. The coating should be rolled right to the edge (and over the side if possible) and a specialist, flexible sealant applied over the top of the complete system. If the coating is applied directly over a joint, the movement experienced will inevitably crack the epoxy, impacting on its aesthetics and compromising its function.

Once a coat has been put down, it will need to be backrolled correctly for an unblemished finish. Haphazard, multi-directional strokes will show up if they are not “smoothed” by backrolling. It is best to start at the far edge of the floor and use long, uniform, parallel strokes back towards the applicator, once again trying to get the product sounding the same with each stroke. This will give the floor the best chance to settle evenly and avoid visible ridges and patterns in the finish.

If working on a vertical surface/wall, it is not possible to pour product out in the manner described above. Instead, the mixed epoxy will have to be transferred to a roller tray and gradually applied like a standard house paint. The 1500 series are all thixotropic materials, meaning they can be applied up to 300 microns on vertical surfaces without sag.

The masking strips delineating the area should be removed immediately after application. If these are left on too long, the product can harden and stick to the tape, which could result in “tearing” of the film. The removal of the tape should expose clean, sharp edges around the coated area

If applying subsequent coats of product, wait until product has reached its specified “re-coat” window or is hard enough to walk on (if applying horizontally). At this point, the surface should be hard enough not to be marked and can be walked socks covered in plastic bags.

NOTES –

Film thickness: It may be tempting sometimes to “stretch” the coating further by applying at thinner than specified film thicknesses to save on material costs. It is recommended that this practice is avoided otherwise it can severely compromise the quality of the coating film. The Kevlar-reinforced products, in particular, will suffer from rolling out too thin as they need a certain film thickness to establish the network of fibres responsible for the high strength and impact

resistance. Applying too thin, especially with the aid of too much solvent (see below), will make the fibres tend to clump rather than be evenly distributed, resulting in lower performance and poor aesthetics.

Use of solvent thinners: JAXXON 1500 series products are solvent free and used without solvents. However, the addition of a small amount of solvent can be beneficial in some conditions. The solvent should be added to the base product or the combined base/curing agent mixture. The solvent will add several minutes to the epoxy pot life, making spreading and rolling easier, and increasing coverage. Most contractors add only about 50-120mL of solvent per 4L kit (which results in a product approximately 97% free of solvents).

Alternatively, gradually warming the base prior to mixing will also effect a reduction in viscosity if required. Use a larger bucket containing warm water and allow the base to sit in the bath until the viscosity drops sufficiently. Occasionally stirring the base while it's in the bath will help the warming process. Care should be taken not to get the product too hot (e.g. over 35°C) as this will affect film thickness and markedly reduce the pot life.

4 Records/Quality Control

Recording the details of a job can be extremely useful throughout the preparation and application period. Kept records can also be used as references for future jobs, which will make tasks such as material calculation, planning and even troubleshooting a lot easier. Indeed, records are of tremendous legal benefit in cases where coating performance is disputed.

The following pieces of information should be recorded:

Important – Photos – take photos of everything deemed significant: before commencement, after all stages (preparation, basecoat, topcoat, completion etc.), any problem areas, after fit out (if applicable), during service (to understand wear patterns for maintenance). Photos are much more effective at conveying information than written descriptions.

- Date of application – date of start and date of completion.
- Client details – name, address, contact details.
- Approximate area – drawing a basic plan on grid paper will help you visualise and plan sequence of tasks.
- Condition of surface – any repairs needed, age and condition of existing coating etc.
- Service conditions – temperature, chemical exposure, physical demands (wear, abrasion, impact) should be listed and product choice explained (inc. any other criteria, e.g. environmental, odour, slip requirements).
- Site conditions – is the site dusty, crowded, hard to access, weather conditions, any interruptions? etc.
- Division of labour/personnel employed – who did what? Recording these details helps trace problems back to their source and establishes accountability.
- Type of preparation – equipment used (make and model), quality checks made etc.
- Coating system employed – product codes, batch numbers, number of coats, thickness of coats/overall consumption (planned versus actual).
- Method of mixing and application – equipment used (drill type, rollers, trowels etc.), procedures (mix speed, time, any special application techniques etc.).
- Completion details – start and finish time of each task/stage, total number hours to complete, details of agreements and/or acceptances with client.

- Any identified defects or other notes – product behaviour/observations, insects/contamination, future references etc.

5 Maintenance

To honour the terms of NMP's product warranty and as a service to the client, two inspections over the 12-month period need to be conducted by the applicator – one after 3 months to determine maintenance requirements and a final inspection at the end of 12 months to monitor the condition of the floor.

During these inspections, the applicator will need to liaise with the client to identify any changes to the condition of the floor – whether or not they are covered by warranty. This process will enable the quick repair of damaged areas and adjustments to the maintenance plan if required and therefore will be invaluable in prolonging the life of the floor. Taking photos is an important part of the inspection process as it will provide the best means for comparing any changes that emerge.

Examples of things to look out for and consider include:

- Physical damage, e.g. gouges, holes etc.
- Areas wearing excessively.
- Changes in colour or appearance, e.g. stains, yellowing etc.
- Areas of complete failure, e.g. peeling, blistering, cracking.