

# woodcare

new generation protective coating



**CLELANDS**  
TIMBER LTD

Thanks to the development of exciting, new-generation protective coatings, timber's future as a leading building material now looks better than ever. BM Pacific's new water-based primers not only include state-of-the-art protective technology, they are also designed to prevent tannin and resin bleed, provide better adhesion and be more flexible.



# Looking after wood

Wood finishes (paint, varnish and stain) are necessary to protect the wood surface, help maintain a certain appearance and provide decorative protection. Without these finishes any surfaces exposed to the elements will change colour, roughen due to photo-degradation, surface check, and slowly erode.

The first step in finishing wood is the application of a primer. A paint primer has two basic functions. The most fundamental and important function is to attain and maintain adhesion to the substrate. The second function is to seal or uniform the substrate.

## ***What are water-soluble extractives?***

The amount of extractives in wood varies from 5% - 20% by weight and includes a wide variety of organic chemicals such as the terpenes and resin acids and phenolic materials in the heartwood.

When extractives discolour paint, moisture is usually the cause. The extractives are dissolved and leached from the wood by water. The water then moves to the paint surface, evaporates and leaves the extractives behind as a reddish brown stain.

BM Pacific's new water borne primers will block these extractives without compromising adhesion and flexibility. In the past only solvent based coatings had this capability.

Up until now oil or alkyd based primers have been the only choice. However resistance is growing towards these solvent borne coatings driven by environmental concerns, high solvent prices and the time consuming, expensive and outmoded processes required to apply them.

## **New generation water borne systems**

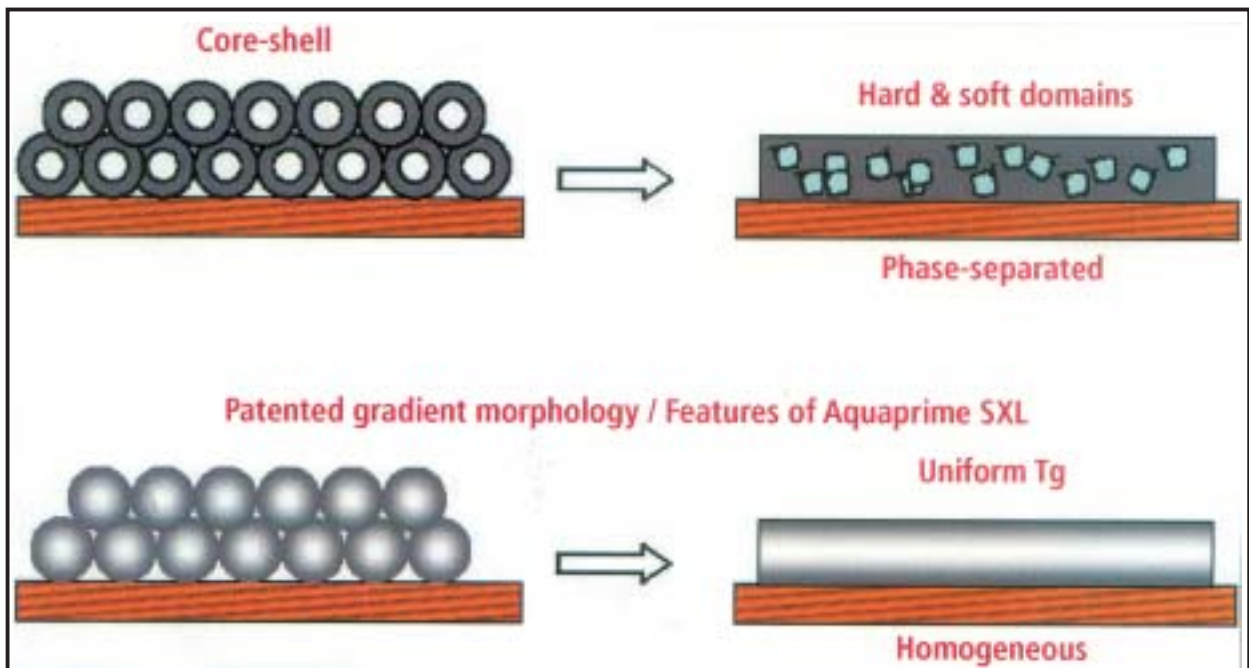
In the past water borne systems were not considered suitable for wood primers mainly because the water-soluble chromophoric compounds that are present in wood, such as tannins, bleed through the coating to stain and discolour the finish. Solvent borne primers were considered to be better in preventing this bleeding.

Thanks to extensive research by BM Pacific Ltd this problem has been overcome through the use of nano-technology. Their chemists have developed unique new concepts for both water borne tannin blocking wood primers and fast sandable sealers. These non-bleed formulations for primers and sealers have extremely low VOC and are zinc free making them significantly more desirable from an environmental point of view than traditional solvent borne primers.

---

**Above: This villa was built in 2004 using pinus radiata**

# effect of particle-morphology on film formation



## Groundbreaking advances

BM Pacific's Aquaprime SXL primer has proven to be tremendously versatile, blocking extrudates whether they are rosin based from pine, or tannins. In all tests the adhesion to both hard and soft woods was maintained as well as excellent penetration, flexibility, surface hardness, sandability, scrub and water resistance.

To produce water borne coatings with this combination of desirable properties is a major achievement for BM Pacific and a groundbreaking advance for the timber industry. Until now it has not been possible to obtain this level of performance with water borne coatings with such low levels of volatile organic compounds in the coating.

Such impressive advances are due to the introduction of a number of special features in the formulation of these waterborne coatings. These include a built-in proprietary cross-linking mechanism and a polymer with a very low glass-transition temperature that ensures good adhesion AND flexibility. The final coating is not tacky at all and the primer has good sandability, due to the cross-linking reaction taking place after film formation.

## What is gradient morphology?

A way of ensuring the polymer and hence the dry coating has consistent desired hardness/softness throughout the entire film.

Without the use of gradient morphology the dry film can have hard and soft zones which disadvantage the durability potential of the coating.

Another critical decision by BM Pacific's chemists was to choose a polymer with a very small particle size that meant that the adhesion and penetration into the wood by the coating replicated that of oil/alkyd paints (one of the traditional features of the older oil paints was the excellent penetration into the substrate). In fact Aquaprime SXL is the only acrylic primer in the world that has the ability to penetrate the substrate. Most conventional acrylic decorative primers sit up on the surface. Another technical milestone resolved by BM Pacific Ltd.

## Cost saving benefits

With wood finished to the high standard provided by these new-generation coatings painting contractors need to spend much less time on preparation before they apply topcoats.

This will create real saving in the cost of painting timber buildings.

When finger-jointed pinus radiata is primed and undercoated with this new technology, contractors only need to apply two coats of exterior 100% acrylic paints, provided installation instructions have been properly followed (STC04).

## Years of research

BM Pacific's coating system combination of Aquaprime SXL and P1900 acrylic is the most cost effective and technologically advanced method of priming and undercoating wood available anywhere in the world. Its new generation water borne primer Aquaprime SXL exceeds the durability, adhesion and flexibility of traditional oil based systems but also has previously unattainable advantages of being fast drying, zinc free and extremely low VOC.

These economic, environmental and performance benefits mark an exciting new direction for the timber companies of New Zealand.

### *How does the cross linking mechanism work?*

By incorporating SXL (self cross linking mechanisms) it allowed us to deposit the film on the substrate in a condition that supports and improves adhesion and penetration.

But the final properties are required to have different performance characteristics. Cross-linking of the film after the water has gone ensures blocking resistance, flexibility and toughness – desirable properties that are essential for long-term durability. Until now only 2 pack solvent type systems have been able to deliver such outcomes.

### *What do nano particles do?*

These are microscopically small clay particles that capture water soluble tannins as they pass. These particles also impart toughness - one of the features that helps reduce resin bleed and resin migration.



Two pass vacuum coating line with I/R driers

## IMPORTANT TECHNICAL ISSUES

### **Aquaprime SXL**

Best applied by vacuum/IR cured

Can be sprayed / air dried

Targeted wet film – 80 microns

Average dry film - 35-40 microns

Volume solids 47%

Total resin suppression achieved at 70-80 microns dry film

Excellent tannin suppression achieved at 35-40 microns dry film

Total tannin suppression achieved at 70-80 microns dry film

Coating can be infra-red cured in 15 seconds with full maintenance of all properties

Cross-linking generally takes between 1-4 days dependent on temperature

When IR cured coating reaches full cross-linking potential within 24 hours

Fully compatible with both LOSP solvent type treatment systems or water based boron options

### **P1900 Undercoat**

Best applied by vacuum/IR cured

Can be sprayed / air dried

Target wet film 70 microns

Average dry film 30-35 microns

Volume solids 45%

Developed as a co-partner with Aquaprime SXL for the purpose of a complete coating system.

Has significant international history – used for both domestic and international markets.

Exhibits outstanding weathering and water resistance  
Zero blocking once the film is dry.

Has excellent sandability in preparation for topcoats

Designed for new generation water based enamels, 100% acrylic paints, acrylic emulsion and latex paints generally.

Has outstanding adhesion to most surfaces but in particular has a significant affinity to Aquaprime SXL

The combination of Aquaprime SXL and P1900 developed specifically for exterior applications on pinus radiata.

# frequently asked questions

## **1 Why is this new paint system so much better?**

This coating system is a result of years of research by world-renowned chemists targeted directly at pinus radiata and softwoods. In the last 10 years all research has concentrated on the development of water based acrylic. The result of this research is a coating specifically developed for Pinus radiata.

## **2 What impact does it have on the environment?**

The timber processor, its staff, agents and sales people, customers, building and painting contractors have been removed from contact with solvents. This is a significant development for their future health and safety. Also, we don't yet know how damaging to the environment are the millions of tons of hydrocarbon solvents emitted annually.

## **3 Does acrylic last longer than oil paint?**

Yes – acrylic stays as designed by the paint chemists. Oil paints go hard and brittle over time.

## **4 Why do you need a primer?**

A primer prepares the foundations and has different characteristics to undercoats. With this new paint system it is applied in a controlled environment using state-of-the-art technology.

## **5 Why do you need an undercoat?**

An undercoat is made to fill grain and imperfections. It can be sanded where required but importantly, is designed to accept a variety of acrylic topcoat options. Again it has been applied in a controlled environment.

## **6 Does this primer stick better than conventional acrylics?**

Aquaprime SXL is the only acrylic primer world-wide that has the ability to penetrate the substrate. Most conventional acrylic decorative primers sit up on the surface.

## **7 How much preparation is required?**

Priming cut ends and filling nail holes is all that is required.

## **8 How long can I leave it before painting?**

Because we have already primed and undercoated the board with acrylic, painting the topcoat can be left for a much long period. Old oil primer requires coating within 3 months. Providing you have carefully followed the installation instructions, you could delay painting, although it is preferred to apply topcoats as soon as practicable.

## **9 What steps do I follow to paint the board?**

Please refer to installation instructions.

## **10 What topcoats do I use?**

Use premium quality 100% acrylic paints for exterior. Use premium water based enamels for interior.

## **11 Can I use dark colours?**

Dark colours generate heat. For example a very dark grey can generate temperatures in the region of 85degC.

## **12 How do you classify a dark colour?**

Black has a light reflectance value (LRV) of approximately 5. White has an LRV of approximately 95. Colours brighter than LRV 50 are a wise choice. Your paint manufacturer should be able to advise you of the LRV for a selected colour.

## **13 How do you classify a light colour?**

Colours with light reflectance values 50 – 95 are those which generate less heat, ie the higher the number the brighter the colour, therefore less heat generated.

## **14 What is the best option for trim?**

For trim we recommend water based enamel paints. New technologies replacing old oil paints has advanced significantly over the last 5 years. Water based enamels are the best option.

## **15 What maintenance is required?**

Maintenance of all building types is recommended. Please refer to Building Maintenance STC07.

## **16 Will it save me money?**

Typically in the market, to carry out a full first painting of oil pre-primed pinus radiata to a good standard, a painting contractor would quote somewhere between \$20 - \$25/sqm. To apply only two coats of acrylic paint with significantly reduced surface preparation, one could expect savings in the vicinity of \$7 - \$8/sqm from a painting contractor.

It is not that we are taking income away from a painting contractor, it is simply that all the work of sanding, priming, undercoating etc. has already been done by the timber processor.

# Contact details

## **Clelands Timber Limited**

**Physical Address:** 61 Katere Road, New Plymouth, New Zealand  
**Postal Address:** PO Box 3240, New Plymouth, New Zealand  
**Phone:** 64 6 758 0869  
**Fax:** 64 6 757 9752  
**Email:** [headoffice@clelands.co.nz](mailto:headoffice@clelands.co.nz)  
**Web:** [www.clelands.co.nz](http://www.clelands.co.nz)

## **BM Pacific Ltd**

**Physical Address:** 699 Rosebank Road, Avondale, Auckland, New Zealand  
**Postal Address:** PO Box 19-289, Avondale, Auckland, New Zealand  
**Phone:** 64 9 828 3405  
**Fax:** 64 9 828 0123  
**Email:** [sales@benjaminmoore.co.nz](mailto:sales@benjaminmoore.co.nz)  
**Web:** [www.benjaminmoore.co.nz](http://www.benjaminmoore.co.nz)

Manufacturers of Benjamin Moore decorative brand, Aalto, Seahorse marine products, industrial and technical coatings.

# BM Pacific Limited

*Decorative, Technical & Industrial Paints*

P.O. Box 19-290, AVONDALE, AUCKLAND, 699 ROSEBANK ROAD, AUCKLAND,  
NEW ZEALAND TELEPHONE: 0-9-838 3405, DIRECTORS' FAX: 0-9-828 0531, FAX: 0-9-828 0123, FREEPHONE: 0800 335 335  
E.MAIL: sales@benjaminmoore.co.nz, WEBSITE: www.benjaminmoore.co.nz

## ACRYLIC PRIMER & UNDERCOAT PAINTED H3 FINGER JOINTED RADIATA PINE INSTALLATION INSTRUCTIONS (STC04)

### DESCRIPTION

The product you have chosen has been prepared and painted using new generation acrylic primer and undercoat technology. To properly finish your project you need to follow these simple guidelines.

### HANDLING

Store the product where it is dry and kept off the ground using blocks. If stored outside use a waterproof cover but allow for good air circulation. When handling, take care to ensure as little damage as possible to all surfaces. This makes it easier for painting contractors to do their job but also ensures an improved finish.

### INSTALLATION

Avoid scratching or marking the board during installation and cutting. Prime cut ends and mitre cuts with a 100% acrylic paint nominated as exterior 100% acrylic direct to timber types. Follow instructions on the can of your chosen product. Apply two coats. Allow to dry between coats.

### FINISHING

Remove all loose material, dirt etc. Spot prime exposed bare timber with selected 100% acrylic topcoat, putty all nail holes, use a filler and sealants nominated as exterior type suitable for overcoating with 100% acrylic paint. Apply two coats of 100% acrylic paint at a coverage rate of 12-14 square metres per litre per coat. Follow instructions on the can.

### MOISTURE

Tannin extracts (dark stains in the film) are a result of the board being allowed to get wet. This is neither a board nor paint issue as it is a result of excessive moisture which infiltrates the board. After installation of the board it is recommended that the painter be allowed to complete the finishing work as soon as is possible.

### HEAT GENERATING COLOURS

Dark colours absorb heat from the sun. Light colours reflect significantly more heat. Testing has shown that dark colours can generate temperatures in excess of 85°C in direct sunlight whereas light colours under the same conditions can be as much as 35°C cooler. It is recommended that the chosen colour therefore has a LRV greater than 50 (LRV>50). LRV of White IS 95/100, IRV of Black = 5/0.

Follow these instructions to ensure that your investment in natural timber products will stand the test of time.



CLELANDS  
TIMBER LTD

### ACRYLIC PRIMED & UNDERCOATED H3 FINGER JOINTED RADIATA PINE

This product features new generation acrylic primer and undercoat technology. Please follow these important instructions carefully.

Store: this product should be kept dry at all times, off the ground and fully covered prior to installation. Seal all mitre cuts and exposed ends with your selected 100% acrylic topcoat. Note: apply 2 coats to cut ends, mitres etc. Erect the weatherboard or fascia and fasten as per the Building Code. Putty all nail holes, remove loose material, dirt etc, spot prime exposed bare timber with selected 100% acrylic topcoat. Apply two full coats of selected 100% acrylic topcoat at a coverage rate no greater than 12 – 14sqm/litre per coat. Recommended – use light colours to reduce heat absorption LRV >50. For further technical information, contact your merchant or (insert contact details as appropriate).

**NOTE: Resin bleed may occur from timber in hot conditions or where painted in dark colours. Adherence to above specification will help minimise the problem.**

Clelands Timber Limited, 61 Katere Road, PO Box 3240, New Plymouth  
Ph: 64 6 758 0869, Fax: 64 6 757 9752  
Email: headoffice@clelands.co.nz

# **BM Pacific Limited**

*Decorative, Technical & Industrial Paints*

P.O. Box 19-290, AVONDALE, AUCKLAND, 699 ROSEBANK ROAD, AUCKLAND,  
NEW ZEALAND TELEPHONE: 0-9-838 3405, DIRECTORS' FAX: 0-9-828 0531, FAX: 0-9-828 0123, FREEPHONE: 0800 335 335  
E.MAIL: sales@benjaminmoore.co.nz, WEBSITE: www.benjaminmoore.co.nz

## **BUILDING MAINTENANCE (STC07)**

### **DESCRIPTION**

Building movement and settlement are inevitable in new construction. Paint coatings are affected by this occurrence whether it be a concrete or timber substrate. It is important to deal immediately with new issues that are as a result of what is mostly movement of the substrate – in the case of concrete, cracking, and in the case of timber, movement of the board.

Make good these areas by priming and then touching up with the original topcoat paint.

### **REGULAR WASHING**

Exterior building surfaces benefit from being cleaned regularly. This is particularly important under eaves or overhangs. Mould, fungi and marine salts can have a detrimental effect on the paint coating and the substrate if left. Arrange to lightly wash all surfaces at least every 2 years. Pay attention to under eaves and overhangs. In a marine environment a regular wash will be of significant benefit to all surfaces.

### **MAINTENANCE PAINTING**

When required use of the same primer, undercoat and topcoat originally selected. In some circumstances where maintenance is delayed for many months it may be required to make good the repair area and then fully coat the whole section because of the change in the appearance of the coatings. Loss of gloss, colour change etc is normal for paint.

Mostly walls on the north face (Southern Hemisphere) will be subject to this requirement, particularly if maintenance is delayed. It is however beneficial for both the paint film and the substrate to get another coat, this maintenance should be viewed as a positive outcome for both the paint, the substrate and your investment in the home/building.

Building movement normally reduces over time, experience has shown that areas that have been subject to maintenance mostly do not require any further repairs providing the substrate is not subjected to continual movement.

As part of your maintenance, always check flashings, sealants, and fastenings to ensure they do not permit the passage of water into the substrate. Water causes damage.

Follow these instructions to ensure that your investment in natural timber products will stand the test of time.

ISSUE DATE: AUGUST 2006