



## BitPost™ Timber Stain & Preserver

### Timber Treatment Durability

UV laboratory product testing to confirm the use of our BitPost™ coating to extend the in-service durability of H-treated rated timber to remain functional for the minimum periods as specified in the New Zealand building code B2/AS1

Revision #1.2

**19 June 2020**

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## 1. Change Control

The following information is being used to control and track modifications made to this document.

Revision	Date	Summary
1.0	31/03/2020	Draft report based on Halt&Hass test report and NZ building Code B2/AS1
1.1	05/04/2020	Document checked and minor changes made by H Janse van Vuuren
1.2	19/06/2020	Minor changes made by Pierre Janse van Vuuren

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## 2. Executive Summary

Biosymph is pleased to present this report to our customers, potential customers and interested stakeholders. This report concerns our BitPost™ Timber Stain and Preserver coating, suitable for use on all treated and untreated timber.

Biosymph Ltd undertook a project to determine and test the effect of our BitPost™ timber stain and preservative coating on H-treated and untreated timber with regards to preservation and durability. We exposed samples to accelerated weathering using weather-Ometer tests. These tests were performed by an independent laboratory.

Our focus was on timber solutions for solid structural framing and enclosed framing under the NZ building code B2/AS1 as H3.1 is no longer an Acceptable Solution for solid structural framing and H1.2 or H3.2 is required for enclosed framing under the building code.

H1.2 and H3.2 treated timber is required for enclosed framing with an in-service life expectancy of 50 years as per the building code under B2/AS1.

The H1.2 treated test samples experienced moderate splitting and colour change after 2,500 hours of weather-Ometer exposure, whereas the H1.2 treated and coated with BitPost™ samples experienced very minor splitting with moderate loss of colour after 2,500 hours of weather-Ometer exposure.

The H3.2 treated samples experienced moderate to major splitting and colour change after 2,500 hours of weather-Ometer exposure, whereas the H3.2 treated and coated with BitPost™ samples experienced very minor splitting and very minor loss of colour after 2,500 hours of weather-Ometer exposure.

We have also observed similar positive outcomes for untreated, H4 and H5 treated timber coated with BitPost™.

*Please see Section 5 of this report for more details.*

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## 3. BitPost™ Durability Testing Project

### 3.1 Project Background and Objective

Biosymph Ltd undertook a project to determine and test the effect of our BitPost™ timber stain and preservative coating on H-treated and untreated timber with regards to preservation and durability.

The objective was to determine and verify that BitPost™ will increase the in-service durability of timber used for structural purposes to comply with the minimum durability requirements for building materials and components as set out in the New Zealand Building Code clause B2 Durability.

### 3.2 What is BitPost™?

BitPost™ is a New Zealand manufactured bituminous emulsion / co-polymer product, created by Biosymph Ltd. It is an alternative product for Creosote or Carbolineum which have been limited and/or forbidden by some countries due to the introduction of stricter environmental regulations.

Because of its rot-resisting and disinfecting effect, BitPost™ is ideally suited for the preservation and staining of wooden structures such as post and rail fences, retaining walls, construction timber framing, etc.

BitPost™ is intended primarily for surface application by brushing/rolling, dipping or by airless spray equipment. It gives an economical yet high quality finish which is ideal for exterior projects and will retard distortion, movement and splitting of timber due to weather exposure. It is non-corrosive to metals and can also be used on other wooden structures. It is non-flammable and the treated wood, after drying, presents no greater fire hazard than ordinary timber. It is also suitable for use on in-ground posts. It will penetrate the timber rapidly. For best results, it is recommended to apply BitPost™ to dry timber.

Timber requires one coat only; one (1) Litre will cover approximately 2 to 3 Square Meters. The colour is black to very dark brown, similar to creosote.

BitPost™ is ideally suited for use on:

- Horse Fencing – horses will not nibble on coated fences; it is non-toxic and safe around animals
- Chicken Coops – BitPost™ will reduce the risk of RED MITE infestation
- Vegetable Gardens – BitPost™ can be used on boxes and stakes

***See Appendix A – BitPost™ Material Safety Data Sheet (MSDS)***

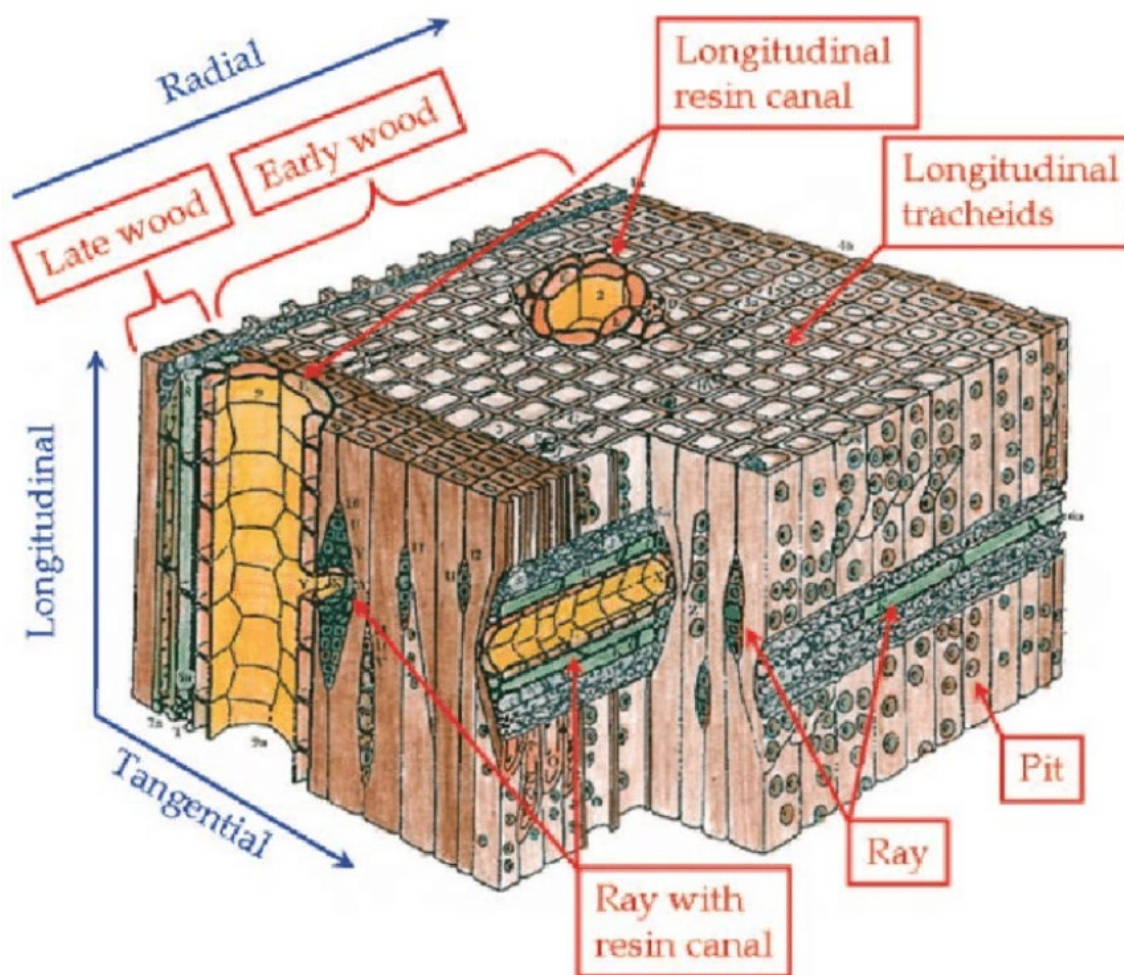
***See Appendix B – BitPost™ Product Data Sheet (PDS)***



### 3.3 How does BitPost™ preserve timber?

BitPost™ formulation is the intellectual property of Biosymph Limited. We will not disclose the entire preservation mechanism but can summarise that BitPost™ contains Bitumen, Gilsonite and a combination of oils and vehicle solvents including Linseed Oil to accomplish this.

The oils and polymers are absorbed into the porous longitudinal tracheids and resin canals in the timber structure by means of capillary action due to the viscosity, vehicle solvents and surface-active agents used in the BitPost™ formulation. Once soaked into the timber structure, it will solidify and seal the timber and make the timber not only waterproof but also strengthen the timber by forming a laminated polymer layered structure. This will prevent any water from being soaked into the timber in the future and hence the preservation and strengthening of the wood structure is accomplished.



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## 4. H-Timber Treatment Level Background

In general, we say that the inside of wood should be protected for about 60 years, and the outside for about 30 years – without any extra treatment, staining, or painting by the user. Again, however, how the wood is treated will have an effect on how long it will last.

### 4.1 The New Zealand Building Code Requirements

The Building Code clause B2 Durability sets out minimum durability requirements for building materials and components. The expected life depends on the location of the material or element in the building and its function.

Generally, timber components must have a minimum durability of not less than:

- 5 years for components that are easy to access and replace, such as interior finishing timber
- 15 years for components that are moderately difficult to replace, such as cladding, exterior trim and exterior joinery
- the life of the building, but not less than 50 years, for structural components such as bearers, joists and studs.

Where timber may be subjected to moisture in use or is used externally, it must be:

- a naturally durable species, or
- treated with a wood preservative to make it resistant to decay, fungi or wood-boring insects (borer) and render it sufficiently durable.

Untreated non-durable timber at less than 18% moisture content and protected from wetting is not particularly susceptible to borer attack or fungal decay but is not permitted for use as framing (the exception being Douglas fir used in low-risk building and meeting the requirements of B2/AS1 paragraph 3.2.2.2).

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## 4.2 Timber use and preservative treatment standards

The requirements for timber use in buildings are defined by NZS 3602:2003 Timber and wood-based products for use in building. This standard also specifies the minimum preservative treatment levels for given end uses. Using timbers or treatments not referred to in NZS 3602:2003 is outside the scope of Acceptable Solution B2/AS1, so evidence of compliance with the Building Code would need to be provided through a different path.

The requirements of specific treatment regimes are contained in NZS 3640:2003 Chemical preservation of round and sawn timber. It contains detailed treatment specifications, the types of chemicals that may be used, the minimum preservative retention and penetration into the timber, identification of treated timber and quality control requirements.

The Ministry of Business, Innovation and Employment has sponsored free access to both of these standards. NZS 3602:2003 and NZS 3640:2003 can be downloaded here:

<https://www.standards.govt.nz/sponsored-standards/building-standards/NZS3602>

<https://www.standards.govt.nz/sponsored-standards/building-standards/NZS3640>

## 4.3 Hazard Classes (H Treatment Rating)

When specifying timber treatment, the most important requirement is that an appropriate treatment level is specified for the particular situation and use. This can be done by reference to the appropriate hazard class as defined by NZS 3640 and called up in NZS 3602 Tables 1, 2 or 3 (as modified by B2/AS1 Amendment 7).

‘...Timber used for structural purposes is required to be durable in-service for the life of the building, being not less than 50 years unless.... This is applicable to H1.2, H3.2, H4, H5, and H6....Timber used for non-structural purposes, such as H1.1 and H3.1 is required to be durable in-service for a minimum of 5 years and 15 years respectively.’

H3.1 is no longer an Acceptable Solution for solid structural framing.

H1.2 or H3.2 is required for enclosed framing under B2/AS1.



Table 1 below summarises the treatment options

<b>Treatment Level</b>	<b>Hazard Class Rating</b>	<b>In-service Life</b>
<b>H1</b>	The treatment level for low hazard situations where timber is not exposed to the weather. Its major use is for framing timber and interior linings. This is split into two categories.	
- H1.1	Timber used in situations protected from the weather, dry in service and where resistance to borer only is required.	5 Years
- H1.2	Timber used in situations protected from the weather but where there is a risk of moisture exposure conducive to decay.	50 Years
<b>H3</b>	For moderate decay situations where timber is exposed to the weather but is not in contact with the ground. This is also split into two categories.	
- H3.1	Timber used outdoors above ground, exposed to the weather – generally in non-structural applications, i.e. fascia boards, weatherboards.	15 Years
- H3.2	Timber used outdoors above ground, exposed to weather or protected from the weather but with a risk of water entrapment, i.e. decking, fencing and pergolas.	50 Years
<b>H4</b>	Used in high decay areas such as ground contact or fresh water. Generally used for fence posts and landscaping timbers.	50 Years
<b>H5</b>	Used for severe decay hazard risks such as ground contact where conditions of severe or continuous wetting may occur. End uses for this hazard class are house piles and poles, retaining walls, crib walling and horticultural supports.	50 Years
<b>H6</b>	This hazard class is for marine use. Wharf piles and fenders, marine and jetty components regularly immersed in seawater or estuarine ground.	50 Years
<b>*H2</b>	This level is similar to H1 but includes an insecticidal treatment to protect against termite attack for use in Australia.	N/A

Table 1 - Hazard Class Treatment Rating

## 5. Independent Laboratory Testing

Biosymph Limited commissioned an independent laboratory to perform UltraViolet (UV) testing on multiple variants of treated and untreated timber, uncoated and coated with our BitPost™ Timber Stain and Preserver wood coating.

### Independent Testing Laboratory

HALT & HASS Consulting NZ Ltd (Established 2005)

1175 Oxford Road

Cust

Canterbury

7471

+64 29 339 3001

New Zealand

### 5.1 Timber Samples for UV Testing

Biosymph Ltd prepared and supplied the samples for testing as follow:

Sample Tray size: 495x300x50

Sample Size: 80x40x20

Number of Samples: 40

#### Products Tested

Sample	Qty	Serials
Untreated	4	1 - 4
H1.2	4	1a - 4a
H3.2	4	1b - 4b
H4	4	1c - 4c
H5	4	1d - 4d
U+Bit	4	1e - 4e
H1.2+Bit	4	1f - 4f
H3.2+Bit	4	1g - 4g
H4+Bit	4	1h - 4h
H5+Bit	4	1i - 4i

Table 2 - Timber Samples Prepared for UV Testing

Four samples of each were prepared and grouped as below and tested for 2,500 hours with 500 hours inspection intervals. Testing was performed in accordance with ASTM-G154 2012 using a QUV/spray Accelerated Weathering Tester with a UVA340 type lamp and a water spray cycle. Test duration and life equivalence is empirically derived, typically through benchmarking tested samples against those used in the field.

- Untreated  
Untreated and coated with BitPost™
- H1.2 Treated  
H1.2 Treated and coated with BitPost™
- H3.2 Treated  
H3.2 Treated and coated with BitPost™
- H4 Treated  
H4 Treated and coated with BitPost™
- H5 Treated  
H5 Treated and coated with BitPost™

## 5.2 Timber Samples Test Results

### Results Summary

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	2	Ends beginning to crack. Colour change.
H1.2	1		2A	Moderate splitting and colour change.
H3.2	1		2B	Moderate to major splitting and colour change.
H4	1		2C	Moderate to major splitting and colour change.
H5	1		1D	Moderate to major splitting and colour change.
U+Bit	1		2E	No splitting - moderate loss of colour
H1.2+Bit	1		1F	Very minor splitting - moderate loss of colour.
H3.2+Bit	1		2G	Very minor splitting - very minor loss of colour.
H4+Bit	1		2H	Very minor splitting - very minor loss of colour.
H5+Bit	1		2I	No splitting, very minor loss of colour.

Table 3 - Timber Samples Test Results Summary

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From the above test results the following can be observed:

Untreated & Untreated and coated with BitPost™ Samples

The untreated samples' ends began to crack and the colour changed after 2,500 hours' exposure.

The untreated and coated with BitPost™ samples did not split and experienced moderate loss of colour after 2,500 hours' exposure.

H1.2 Treated & H1.2 Treated and coated with BitPost™ Samples

H1.2 treated level is required for enclosed framing with an in-service life expectancy of 50 years as per the building code under B2/AS1.

The H1.2 treated samples experienced moderate splitting and colour change after 2,500 hours' exposure.

The H1.2 treated and coated with BitPost™ samples experienced very minor splitting with moderate loss of colour after 2,500 hours' exposure.

H3.2 Treated & H3.2 Treated and coated with BitPost™ Samples

H3.2 treated level is required for enclosed framing with an in-service life expectancy of 50 years as per the building code under B2/AS1.

The H3.2 treated samples experienced moderate to major splitting and colour change after 2,500 hours' exposure.

The H3.2 treated and coated with BitPost™ samples experienced very minor splitting and very minor loss of colour after 2,500 hours' exposure.

H4 Treated & H4 Treated and coated with BitPost™ Samples

The H4 treated samples experienced moderate to major splitting and colour change after 2,500 hours' exposure.

The H4 treated and coated with BitPost™ samples experienced very minor splitting and very minor loss of colour after 2,500 hours' exposure.

H5 Treated & H5 Treated and coated with BitPost™ Samples

The H5 treated samples experienced moderate to major splitting and colour change after 2,500 hours' exposure.

The H5 treated and coated with BitPost™ samples experienced no splitting and very minor loss of colour after 2,500 hours' exposure.

***See Appendix B – HALT & HASS Consulting NZ Ltd - Test Report HSVCR90909***

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## 6. Conclusion

It can be concluded from this testing project that a BitPost™ coating will indeed help to extend and increase the in-service durability of H-treated, rated timber to remain functional for the minimum periods and exceed these periods as specified in the The New Zealand Building Code clause B2 Durability.

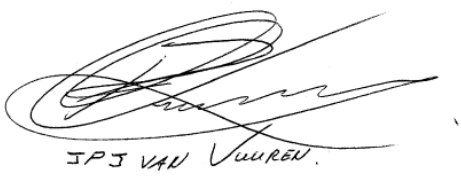
BitPost™ treatment will waterproof and strengthen the timber structure by forming a laminate with the cellulose wood fibres as described in section 3.3 of this document. By combining the BitPost™ coating treatment with the acceptable boron and azole-based treatment solutions as described in NZS 3640:2012, cited in B2/AS1, it is possible to protect the inside of the wood for 60+ years, and the outside for 30+ years.

BitPost™ will not only preserve the timber but will also aesthetically improve the look with minimal colour fading over time. Other windfall benefits observed:

1. Most Horses will not nibble on BitPost™ coated fences;
2. BitPost™ will reduce the risk of RED MITE infestation in chicken coops; and
3. BitPost™ will stop and reduce the growth of most moss and lichen on timber.

### 6.1 Report Validity

This report shall remain valid unless major changes are made to the New Zealand Building Code B2/AS1. This report is subject to review and modification by Biosymph Ltd.



P.J. VAN VUUREN.

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Biosymph Limited  
Pierre van Vuuren  
Managing Director

## 7. Appendix A

### **BitPost™ Timber Stain & Preserver – MATERIAL SAFETY DATA SHEET (MSDS)**



## BIOSYMPH LIMITED

### MATERIAL SAFETY DATA SHEET

#### Section 1. Identification of the material and the supplier

Product: BitPost™  
Product Code: BP - xxx  
Product Use: Wood and Fence Post Stain and Preserver  
New Zealand Supplier: Biosymph Limited  
Address: 2287 Kakaramea Road  
RD10 Whatawhata 3290  
Hamilton  
Telephone: +64 (0)7 829 8606 or +64 (0)22 607 6400 (mob)  
eMail: admin@biosymph.co.nz  
Emergency Telephone: 0800 76 47 66 (National Poisons Centre)  
Date of MSDS Preparation: 23 January 2018 version 6

#### Section 2. Hazards Identification

This substance is not classified as a dangerous good according to NZS5433: 2007

#### Pictograms

NONE REQUIRED

HSNO Classification	Hazard Code	Hazard Statement
6.1E	H333	May be harmful if inhaled
6.3B	H316	Causes mild skin irritation
9.1B	H411	Toxic to aquatic life with long lasting effects

Prevention Code	Prevention Statement
P102	Keep out of reach of children
P103	Read label or visit our website <a href="http://www.biosymph.co.nz">www.biosymph.co.nz</a> before use
P210	Keep away from heat and flames
P233	Keep container tightly closed
P273	Avoid release into the aquatic environment
P280	Wear protective gloves / eye protection

Response Code	Response Statement
P303+361+353	IF ON SKIN: Remove all contaminated clothing immediately. Rinse skin with water
P370+378	In case of fire: Use foam, CO2 or dry powder
P304+312	IF INHALED: Call the POISON CENTRE or a doctor
P332+313	If skin irritation occurs: Get medical advice
P391	Collect spillage

Storage Code	Storage Statement
P403+233	Store in a well-ventilated place. Keep container tightly closed.

Disposal Code	Disposal Statement
P501	Crush or puncture container to prevent further use if not recycled. Dispose of at an approved waste disposal site.

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**Section 3. Composition / Information on Ingredients**

Ingredients	Wt%	CAS NUMBER.
Mixed emulsified petroleum solvents in Water	40-80	Not available
Drying oils	10-20	Not available
Cut-back bitumen	5-15	8052-42-4

**Section 4. First Aid Measures**

Recommended on-site emergency facilities: Eye wash station

Routes of Exposure:

If in Eyes	Remove excess contamination around eyes with olive oil. Wash eyes with a gentle stream of water to dislodge solid particles. Seek medical attention.
If on Skin	Remove contaminated clothing. Physically scrape off excess and use olive oil to dissolve residues. Finally wash skin or hair with soap and water.
If Swallowed	DO NOT INDUCE VOMITING. Seek immediate medical attention.
If Inhaled	Remove patient from contaminated area to fresh air. If patient does not recover normal breathing and is distressed, seek medical advice.

**Section 5. Fire Fighting Measures**

Hazard Type	NON-flammable liquid
Hazards from decomposition products	Carbon dioxide, nitrogen oxides, unburnt hydrocarbons
Suitable Extinguishing media	Not Applicable

**Section 6. Accidental Release Measures**

Land Spill or Leaks	Small leaks or spills may be mixed with dry zeolite absorbent (kitty litter), sand or soil and swept up for domestic rubbish disposal. Large spills: evacuate all unnecessary personnel. Dyke the spill with appropriate spill media (zeolite, sand or soil) and shovel into recovery drums. If the spill enters any waterway, sewer or stormwater, notify the Environmental Response unit at the nearest council offices.
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**Section 7. Handling and Storage**

Approved Handlers: Not required.

Precautions for safe handling: Open containers cautiously as they may be under pressure. DO NOT store in confined spaces.

Conditions for safe storage: Store in a cool, dry, well-ventilated area away from food, animal feedstuffs, strong acids, alkalis and oxidizers. Protect from physical damage.  
Regularly inspect bulk containers for leaks or cracks.

### Section 8 Exposure Controls / Personal Protection

#### WORKPLACE EXPOSURE STANDARDS (provided for guidance only)

Substance	CAS #	TWA ppm	mg/m <sup>3</sup>	ppm	STEL mg/m <sup>3</sup>
Asphalt			5		

Workplace Exposure Standard – Time Weighted Average (WES-TWA). The time-weighted average exposure standard designed to protect the worker from the effects of long-term exposure. Workplace Exposure Standard – Short-Term Exposure Limit (WES-STEL). The 15-minute average exposure standard. Applies to any 15-Minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both the short-term and time-weighted average exposures apply.

**Engineering Controls:** Always provide good ventilation to keep vapours below the lower explosion limit

**Personal Protective Equipment:** Always wear suitable protective gloves (nitrile) and eye protection. In confined spaces, an organic vapour respiratory cartridge mask must be used.

**General:** When large quantities are used, a plastic apron and rubber boots are recommended.

### Section 9 Physical and Chemical Properties

Physical State:	dark brown to black liquid
Odour:	petroleum bitumen odour
pH:	not applicable
Solubility:	soluble in organic solvents; soluble in water
Relative Vapour Density (air=1):	not available
Boiling point:	initial 100°C
Ignition Point:	not available
Flash Point:	not applicable
Specific Gravity:	less than 1.2
Vapour Pressure:	2.13 kPa
% Volatiles:	10%
Evaporation Rate:	not available

### Section 10. Stability and Reactivity

Chemical Stability	Stable under normal conditions. Does not polymerise
Conditions to Avoid	Heat, direct sunlight, open flames
Incompatibility	Strong oxidizers, acids, alkalis
Hazardous Decomposition Products	Fumes of nitrogen, carbon oxides and acrid unburnt hydrocarbons

### Section 11 Toxicological Information

Acute Oral Toxicity	LD <sub>50</sub> Rat (oral) 2000-5000 mg / kg bw
Acute Dermal Toxicity	LD <sub>50</sub> Rat (dermal) 2000-5000 mg / kg bw
Chronic Effects	Inhalation of vapours will irritate respiratory system. Prolonged skin exposure will cause redness followed by dermatitis.

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**Section 12. Ecotoxicological Information**

HSNO Classifications:	Class 9.1B harmful to aquatic organisms
Environmental Precautions:	Prevent from entering waterways or contaminating groundwater
Ecotoxicity Data:	Not available
Environmental Fate:	Persistent and non-biodegradable
Environmental Exposure Limits:	Not set

**Section 13. Disposal Considerations**

Dispose of in approved hazardous landfills or by incineration.

**Section 14 Transport Information**

Classified as a NON-Dangerous Good for transport.

**Section 15 Regulatory Information**

ERMA Approval Code:	HSR002662
HSNO Controls:	
Tracking:	Not required
Approved Handlers:	Not required
Location Test Certificate:	500 L in containers $\geq$ 5L; 1500 L in containers $<$ 5L; 250 L open
Hazchem signage:	1000 L
Emergency Response Plan:	10,000 L

**Section 16 Other Information**

1. This product may not be used as a marine anti-fouling paint, for pruning wounds on trees or shrubs or in the commercial treatment of timber.
2. Hazardous Substances Data Bank (HSDB), a database of the National Library of Medicine's TOXNET system (<http://toxnet.nlm.nih.gov>).
3. HSNO Approved Code of Practice: Preparation of Safety Data Sheets, September 2006.

**Abbreviations:**

CAS No	Chemical Abstracts Number
EPA	Environmental Protection Authority
HSNO	Hazardous Substances and New Organisms
NZIoC	New Zealand Inventory of Chemicals
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
WES	Workplace Exposure Standard

**References:**

Supplier Material Safety Data Sheets

EPA website: [www.epa.govt.nz](http://www.epa.govt.nz)

Hazardous Substances Data Bank (HSDB), a database of the National Library of Medicine's TOXNET system (<http://toxnet.nlm.nih.gov>).

**Disclaimer:**

This document has been compiled by Biosymph Limited and serves as the manufacturer's Material Safety Data Sheet ("MSDS"). It is based on information concerning the product which has been provided from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. The information sourced for the preparation of this document was correct and complete at the time of writing to the best of the writer's knowledge. The document represents the commitment to the company's responsibilities surrounding the supply of this product, undertaken in good faith. While Biosymph Ltd has taken all due care to include accurate and up-to-date information in this MSDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, Biosymph Ltd accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS. The information herein is given in good faith, but no warranty, express or implied is made.

This document should be taken as a safety guide for the product and its recommended uses, but is in no way an absolute authority.

Please consult the relevant legislation and regulations governing the use and storage of this type of product.

For further information, please contact Biosymph Ltd.

**Issue Date:** 26 November 2012  
**Revision Date:** 23 January 2018 – Minor amendments made to template  
**Review Date:** 23 January 2023

END OF MATERIAL SAFETY DATA SHEET

Product Name: BitPost™  
Date of MSDS\_v6: 23 January 2018

Prepared by: Biosymph Ltd  
Tel: 04 7 829 8808 Website: [www.biosymph.co.nz](http://www.biosymph.co.nz) Page 5

## 8. Appendix B

### **BitPost™ Timber Stain & Preserver – PRODUCT DATA SHEET (PDS)**





30/04/2019

## PRODUCT DATA SHEET

### BitPost™ Timber Stain and Preserver

#### Description:

Biosymph's BitPost™ has been designed to meet the needs of the future. Creosote or Carbolineum has been limited and / or forbidden in some countries due to adverse environmental impacts. BitPost™ provides an alternative that is performance-oriented and environmentally compliant.

BitPost™ is a New Zealand manufactured bituminous emulsion / polymer product. It is an oily, water-soluble, non-flammable, black to very dark brown mixture made from bitumen and petroleum components. Because of its rot-resisting and disinfecting effect, it is ideally suited for the preservation and staining of all wooden structures, including post-and-rail fences, retaining walls, construction timber framing, in-ground planted posts, stables, etc.

BitPost™ penetrates timber rapidly due to its viscosity. It gives a high degree of water repellence and will retard distortion, movement and splitting of timber due to weather exposure. BitPost™ is non-corrosive to metals and can have a protective action on iron and steel.

#### Benefits:

- The Bitumen additive prevents horses from nibbling on coated fence rails and stalls
- Reduces the risk of red mite infestations – perfect for chicken coops
- Non-flammable
- Non-corrosive to metals
- Re-coating is typically only necessary 3 to 5 years later, where after it will last another 8 to 10 years before requiring another coat

#### Physical Properties:

Physical State:	black to dark brown liquid
Odour:	petroleum bitumen odour
pH:	not applicable
Solubility:	soluble in organic solvents (Mineral Turpentine)
Relative Vapour Density (air=1):	not available
Boiling point:	initial 100°C
Ignition Point:	not available
Flash Point:	not applicable
Specific Gravity:	less than 1.2
Vapour Pressure:	2.13 kPa
% Volatiles:	10%
Evaporation Rate:	not available
Viscosity:	ASTM D 1200cps 18-22 sec #3 Zahn Cup
Dry Schedule film:	21 °C /40 minutes
Toxicity:	Not determined
Material VOC:	ASTM D-3960 406 g/l

[www.biosymph.co.nz](http://www.biosymph.co.nz)



30/04/2019

QUV:	No gloss loss @ 300 hrs.
Clean-up:	Mineral Turpentine
Shelf Life:	1 year
Theoretical Coverage Rate:	3.0 sq metres per litre at 40 microns DFT
Application:	Spray, brush or roller
Dry Times:	Tack Free 16hrs
Recoat:	Overnight

#### Surface Preparation and Application:

BitPost™ is suitable to use on all wood, although it is specifically formulated as a fence preserver for the New Zealand climate. For best results, this stain should be stirred prior to use and applied to dry and clean timber. It should not be thinned or diluted with water or thinning agents.

BitPost™ - *Brush On* can be applied by brushing, dipping, airless or air-assisted spray equipment.

BitPost™ - *Spray Grade*, with its adjusted viscosity, can be applied by spraying with a knapsack garden sprayer or other spray equipment.

Timber typically requires only one coat. For greater colour depth, a second coat can be applied. One Litre will cover approximately 2 to 3 Square Meters dependent on the application (equivalent to 3 to 4 metres of post-and-3-rail fence). *Spray Grade* may cover less due to likely over-spray.

This product is suitable for use on all wooden structures. However, if there is likely to be frequent brushing against the surface or contact with clothing, we recommend our other products, such as StainDex™ (please see our website). It is not to be used as a marine anti-fouling paint, a pruning paint on trees or shrubs or in the commercial treatment of timber.

#### Clean up:

As a water- and oil-based product, it can be cleaned with soap and water or mineral turpentine.

#### Safety:

This product contains solvents and/or other chemical ingredients. Adequate health and safety precautions should be observed during all storage and use. Please refer to this product's MSDS for complete safety information (available on our website).

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30/04/2019

**Limitations:**

The technical data and suggestions for use in this product data sheet are currently correct to the best of our knowledge, but are subject to change without notice. Because application and conditions vary, and are beyond our control, we are not responsible for results obtained in using this product, even when used as suggested. The user should conduct tests to determine the suitability of the product for the intended use. Our liability (including liability for breach of warranty, strict liability in tort, negligence or otherwise) is limited exclusively to replacement of the product or refund of its price. Under no circumstance are we liable for incidental and consequential damages.

*For more information or if you have any questions regarding special applications and require further advice, please do not hesitate to give us a call.*



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**9. Appendix C**  
**HALT & HASS Consulting NZ Ltd - Test Report**  
**HSVCR90909**

Test Report - HSVCR90909



# Biosymph :: BitPost Timber Stain & Preserver Coating

Test Report :: Fluorescent Tube UV Testing

Prepared For	Pierre van Vuuren, Biosymph Ltd, Hamilton, New Zealand
Emailed To	<a href="mailto:admin@biosymph.co.nz">admin@biosymph.co.nz</a>
Author	Donovan Johnson, HALT & HASS Consulting NZ Ltd
Release Date	18th November, 2018
Revision	B

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## Test Details

### Lab Information

Company Name	HALT & HASS Consulting NZ Ltd
Lab Address	1175 Oxford Road, Cust, Canterbury 7471, New Zealand
Lab Phone	+64 29 339 3001
Established	2005

### Client Information

Company Name	Biosymph Ltd
Address	2257 Kakarames Road, RD10 Whatawhata, Hamilton, New Zealand
Phone	+64 7 829 8606
Contact	Pierre van Vuuren

### Reproduction

The report shall not be reproduced, except in full, without the written approval of HALT & HASS Consulting NZ Ltd.

### Applicability

The test results attained, and presented within this test report relate solely to the Biosymph Wood Coatings (BitPost Timber Stain & Preserver).

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## Executive Summary

### Introduction

UltraViolet (UV) testing has been performed on multiple variants of timber coated with Biosymph BitPost Timber Stain & Preserver wood coating. The results show the timber protected with BitPost treatment outperform those that are untreated.

### Sample overview

The BitPost Timber Stain & Preserver Wood Coatings are used to protect timber used in various applications and also during and within installation in buildings and structures.



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## Reference Standards

Standard Number	Description	Clauses Applied
ASTM-G154:2012a	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.	All

## Life equivalence

Currently it is not mathematically possible to accurately predict the correlation between lab and field UV exposure, specifically due to the variation of UV strength, industrial gases, corrosive atmosphere and temperature across a city, or the world.

Instead we rely on empirical evidence that provides target durations in the lab for various materials. Typically indoor materials are exposed to UVA351 which shows good correlation in the short wavelength to sunlight through glass.

Test duration and life equivalence is empirically derived, typically through benchmarking tested samples against those used in the field. For UVA340 ageing a typical 1000 hour test is often proven to represent 1-3 years of normal use outdoors.

UVA351 may follow a similar empirical model, though the variance will be higher because indoor environments are overwhelmingly affected by the polar orientation of the item with respect to the sun.

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## Results Summary

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	2	Ends beginning to crack. Colour change.
H1.2	1		2A	Moderate splitting and colour change.
H3.2	1		2B	Moderate to major splitting and colour change.
H4	1		2C	Moderate to major splitting and colour change.
H5	1		1D	Moderate to major splitting and colour change.
U+Bit	1		2E	No splitting - moderate loss of colour
H1.2+Bit	1		1F	Very minor splitting - moderate loss of colour.
H3.2+Bit	1		2G	Very minor splitting - very minor loss of colour.
H4+Bit	1		2H	Very minor splitting - very minor loss of colour.
H5+Bit	1		2I	No splitting, very minor loss of colour.

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## Test Summary

### Products Tested

Sample	Qty	Serials
Untreated	4	1 - 4
H1.2	4	1a - 4a
H3.2	4	1b - 4b
H4	4	1c - 4c
H5	4	1d - 4d
U+Bit	4	1e - 4e
H1.2+Bit	4	1f - 4f
H3.2+Bit	4	1g - 4g
H4+Bit	4	1h - 4h
H5+Bit	4	1i - 4i

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## Exposure conditions

Testing was performed in accordance with ASTM-G154 2012, with the following settings:

### General Settings

Lamp Type	Total Duration (Hrs)	Inspection Intervals (Hrs)
UVA340	2500	500

### Cycle Settings

Cycle 7 from ASTM-G154 was selected.

Step	Duration (Hrs:Mins)	Step Type	Temperature (°C)	Irradiance (W2/nm)
1	8:00	UV	60	1.55
2	0:15	Water Spray	NA	NA
3	3:45	Dark	50	NA

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### Inspection process

The products were visually inspected approximately every 500 hours, with results captured in photographs provided later in this report and a sample of each product moved at each interval.

### Failure Characterisation

During the inspection process, any abnormalities are considered possible failure modes until they can be determined otherwise. To establish clear failure identification the list below details acceptable specifications and/or product colouring.

- The colour change of each sample shall be compared to a sample that has not been exposed to UV.
- Samples shall not crack.

### Samples vs Exposure Duration

The following table outlines the number of samples vs duration exposed:

Sample	Qty	Serials	S 1 Hours	S 2 Hours	S 3 Hours	S 4 Hours
Untreated	4	1 - 4	500	1000	1500	2500
H1.2	4	1a - 4a				
H3.2	4	1b - 4b				
H4	4	1c - 4c				
H5	4	1d - 4d				
U+Bit	4	1e - 4e				
H1.2+Bit	4	1f - 4f				
H3.2+Bit	4	1g - 4g				
H4+Bit	4	1h - 4h				
H5+Bit	4	1i - 4i				

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### Test equipment

Description	Manufacturer / Model	Serial Number	Quantity	Calibration
Weathering Chamber	Q-Lab QUV/SPRAY	16-2382-86-SPRAY	1	Every 500 hrs
Calibration Radiometer	Q-Lab CR-10	12-35624-2-CR10	1	16th April, 2019
Fixture - 3D 10mm	HHCNZ	NA	1	NA
Camera	Nikon D90	8059061	1	Na



General view of test equipment

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## Inspection @ 500 hours

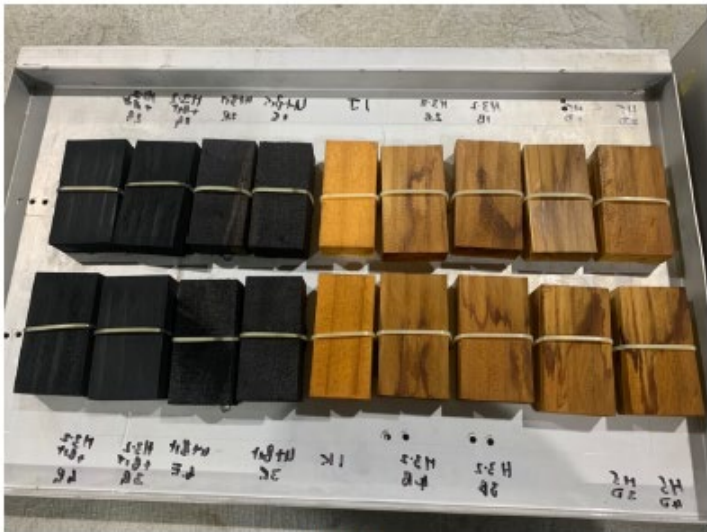
### Results Summary

The results summary includes the samples that were removed from test at this inspection point.

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	4	Moderate colour change
H1.2	1		4A	Moderate colour change
H3.2	1		4B	Moderate colour change
H4	1		2C	Moderate colour change
H5	1		4D	Moderate colour change
U+Bit	1		4E	No change
H1.2+Bit	1		4F	No change
H3.2+Bit	1		4G	No change
H4+Bit	1		4H	No change
H5+Bit	1		4I	No change

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Captured images



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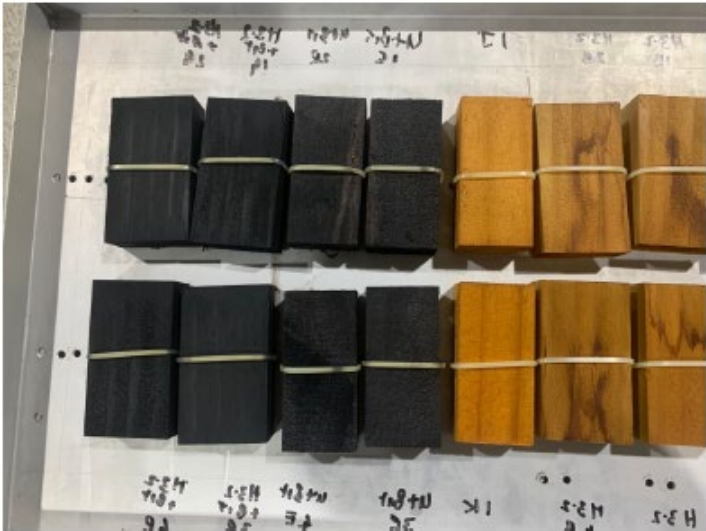


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## Inspection @ 1000 hours

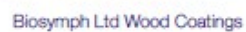
### Results Summary

The results summary includes the samples that were removed from test at this inspection point.

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	3	Moderate colour change
H1.2	1		3A	Moderate colour change
H3.2	1		3B	Moderate colour change
H4	1		3C	Moderate colour change
H5	1		3D	Moderate colour change
U+Bit	1		3E	Minor loss of colour
H1.2+Bit	1		3F	No change
H3.2+Bit	1		3F	Minor loss of colour
H4+Bit	1		3H	No change
H5+Bit	1		3I	No change

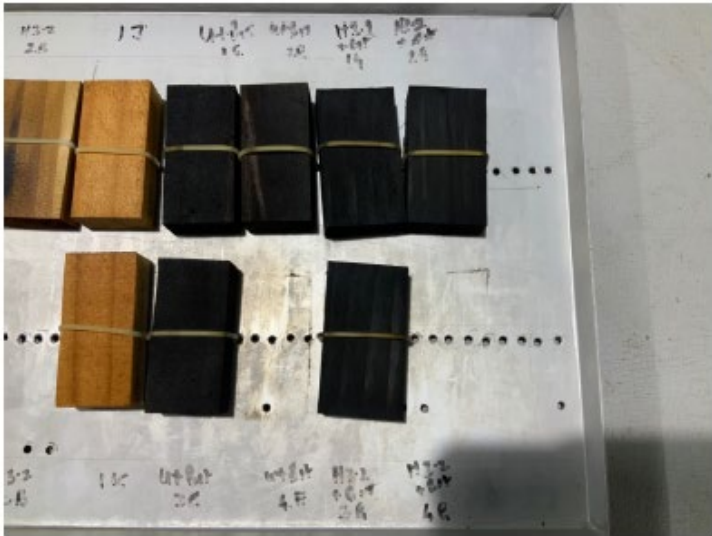


### Captured images

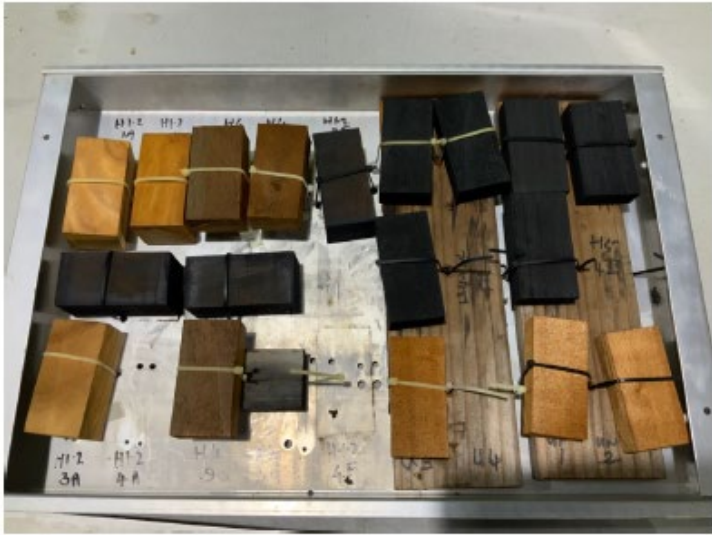


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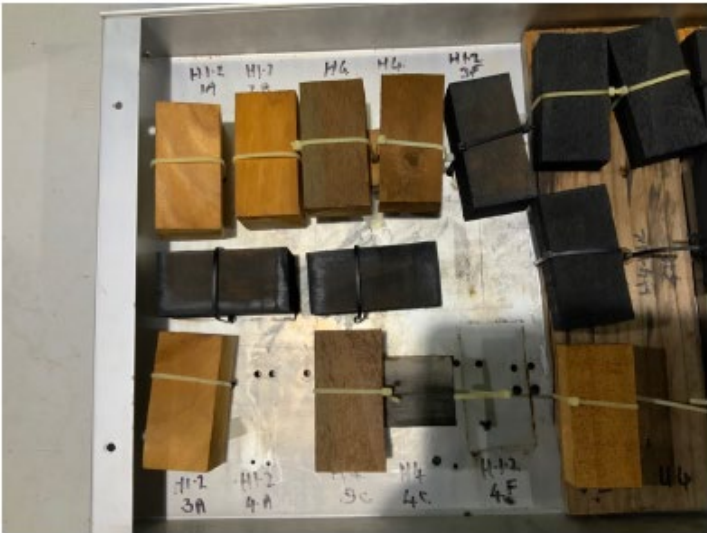


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## Inspection @ 1500 hours

### Results Summary

The results summary includes the samples that were removed from test at this inspection point.

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	1	Moderate colour change
H1.2	1		1A	Moderate colour change
H3.2	1		2A	Moderate colour change
H4	1		1C	Moderate colour change
H5	1		2D	Moderate colour change
U+Bit	1		1E	Moderate loss of colour
H1.2+Bit	1		2F	No change
H3.2+Bit	1		1G	Moderate loss of colour
H4+Bit	1		1H	No change
H5+Bit	1		1I	No change

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### Captured images



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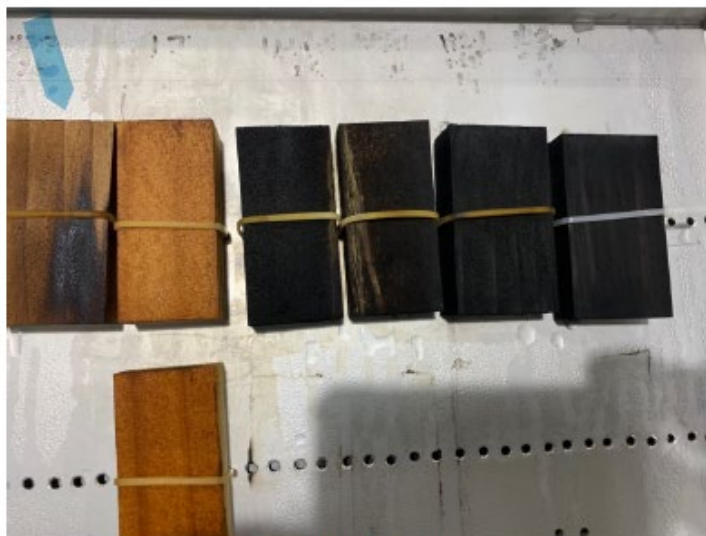


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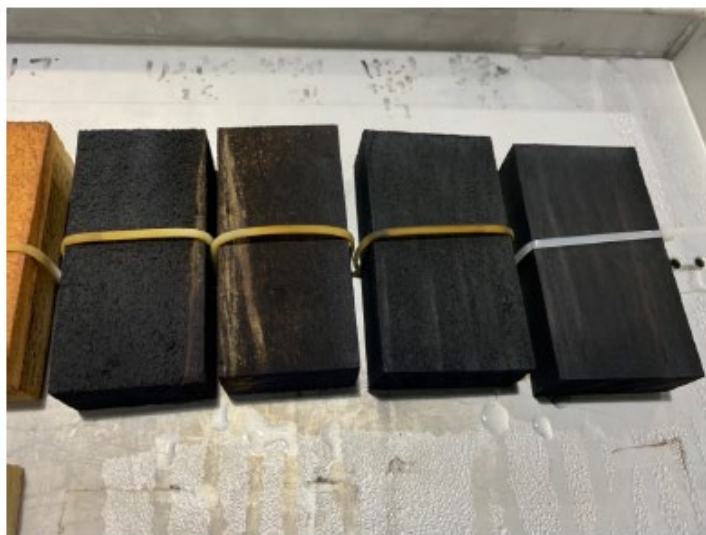
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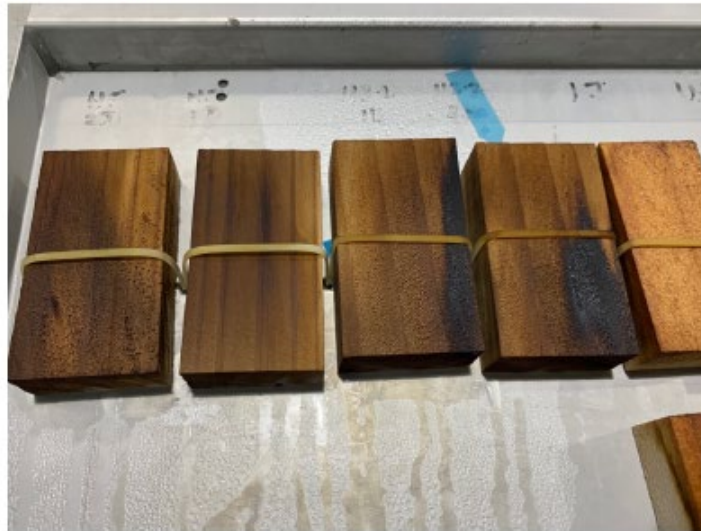


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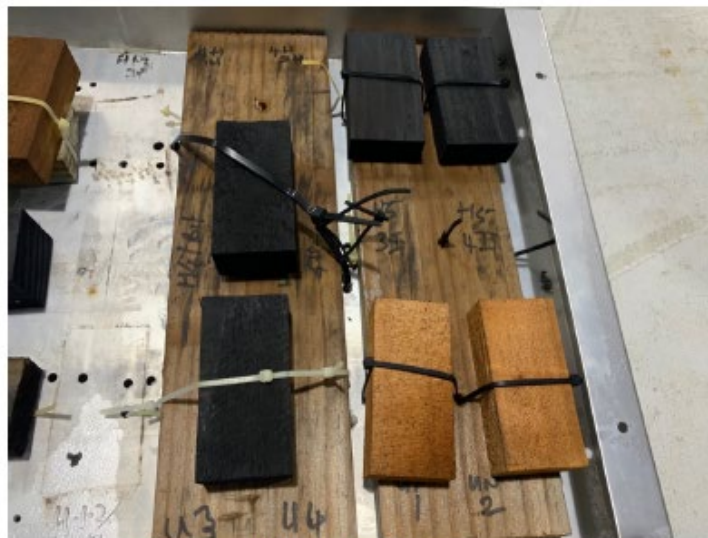
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## Inspection @ 2000 hours

### Results Summary

The results summary includes the samples that were removed from test at this inspection point.

Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	2	Ends beginning to crack. Colour change.
H1.2	1		2A	Moderate splitting and colour change.
H3.2	1		2B	Moderate to major splitting and colour change.
H4	1		2C	Moderate to major splitting and colour change.
H5	1		1D	Moderate to major splitting and colour change.
U+Bit	1		2E	No splitting - moderate loss of colour
H1.2+Bit	1		1F	No splitting, very minor loss of colour.
H3.2+Bit	1		2G	No splitting - moderate loss of colour
H4+Bit	1		2H	No splitting, very minor loss of colour.
H5+Bit	1		2I	No splitting, very minor loss of colour.

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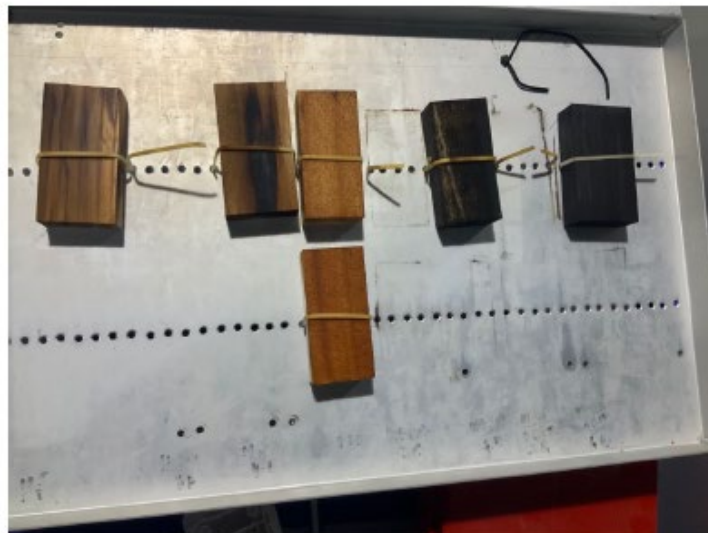
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### Captured images



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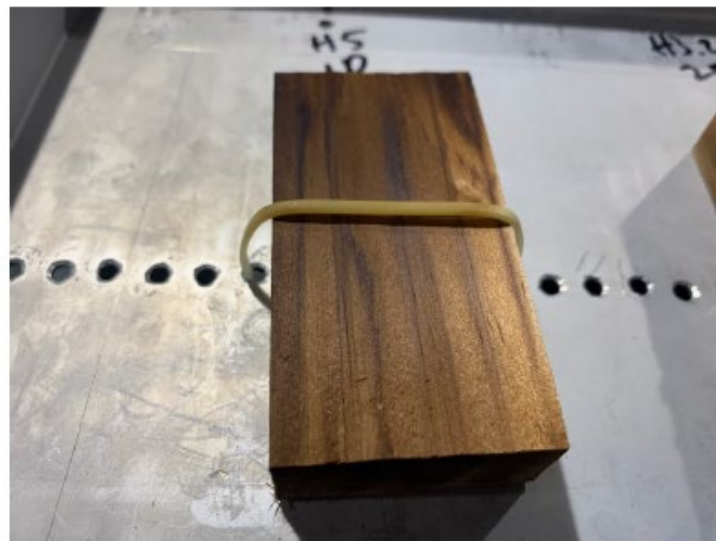
28



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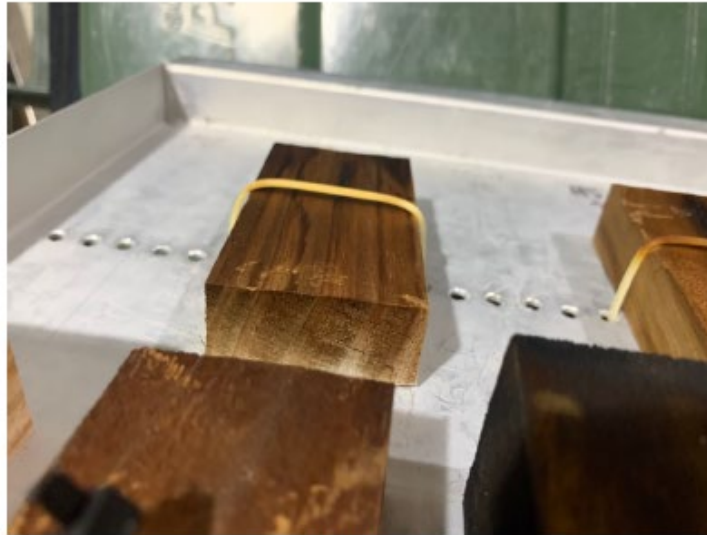


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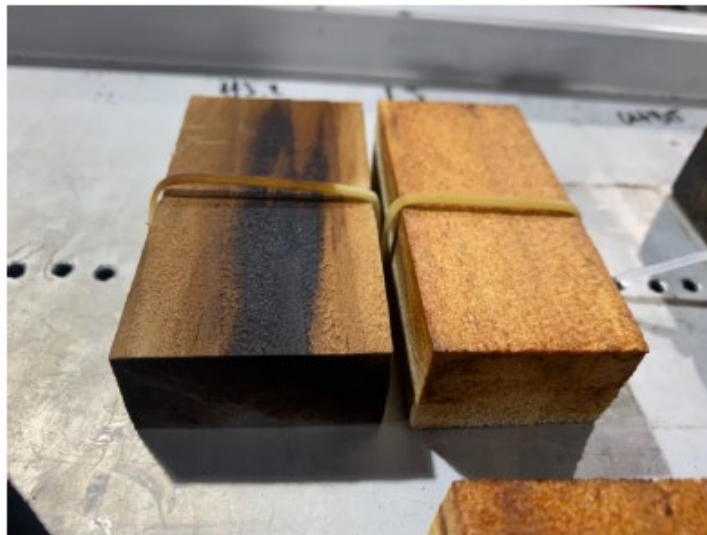
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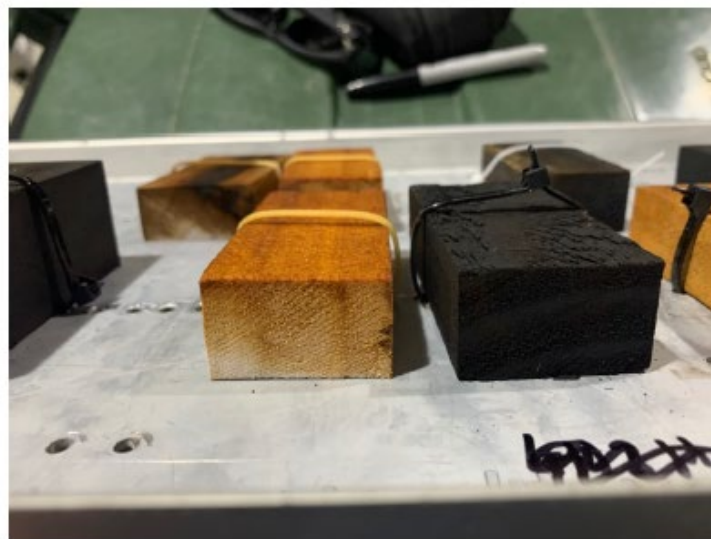
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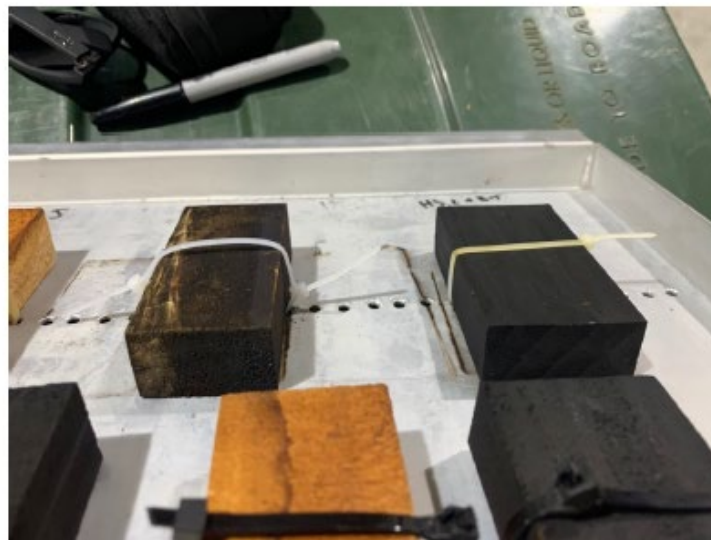
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## Inspection @ 2500 hours

### Results Summary

The results summary includes the samples that were removed from test at this inspection point.

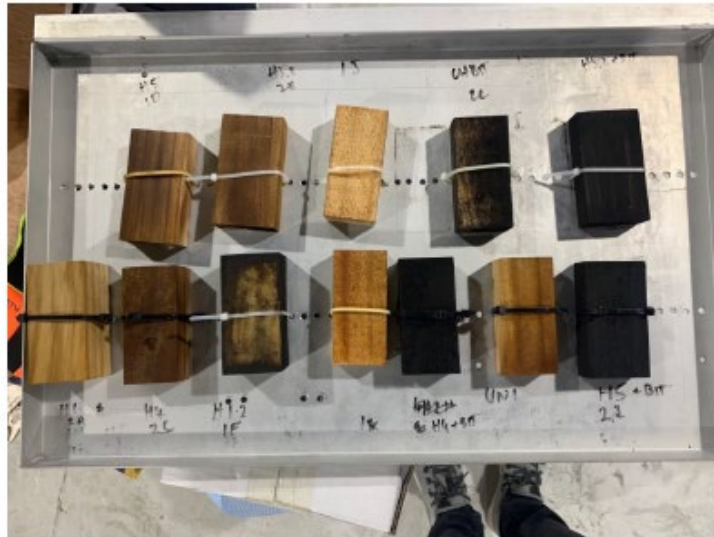
Sample	Qty	Hours Exposed	Serial Number	Notes
Untreated	1	2500	2	Ends beginning to crack. Colour change.
H1.2	1		2A	Moderate splitting and colour change.
H3.2	1		2B	Moderate to major splitting and colour change.
H4	1		2C	Moderate to major splitting and colour change.
H5	1		1D	Moderate to major splitting and colour change.
U+Bit	1		2E	No splitting - moderate loss of colour
H1.2+Bit	1		1F	Very minor splitting - moderate loss of colour.
H3.2+Bit	1		2G	Very minor splitting - very minor loss of colour.
H4+Bit	1		2H	Very minor splitting - very minor loss of colour.
H5+Bit	1		2I	No splitting, very minor loss of colour.

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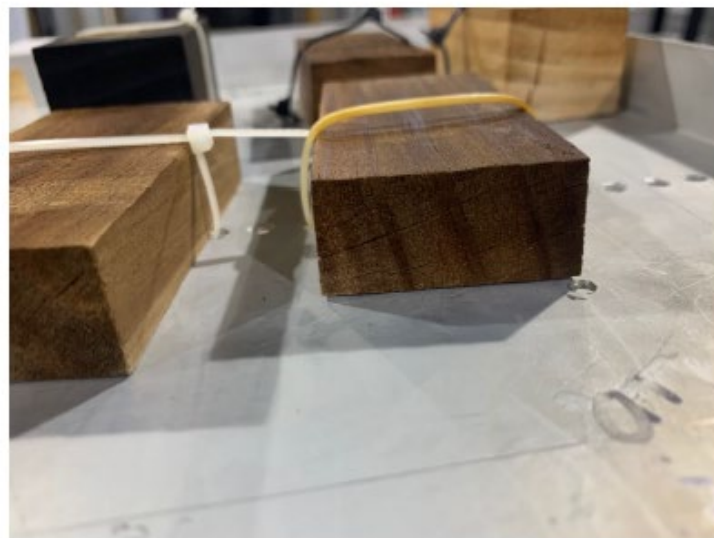
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### Captured images



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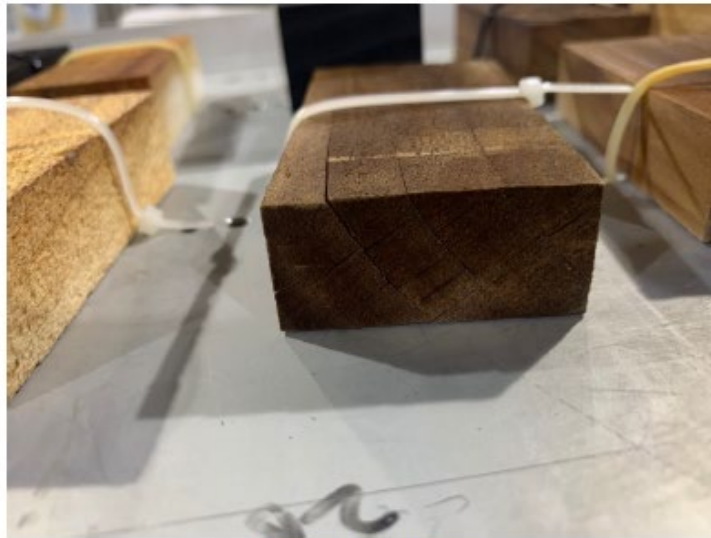


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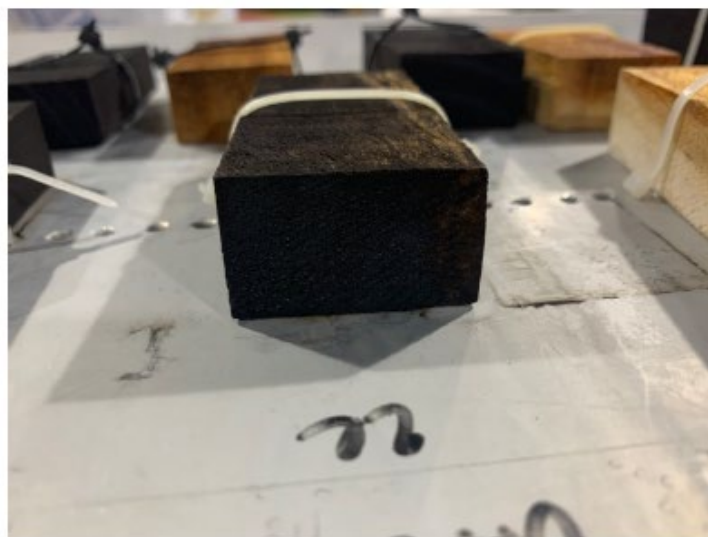


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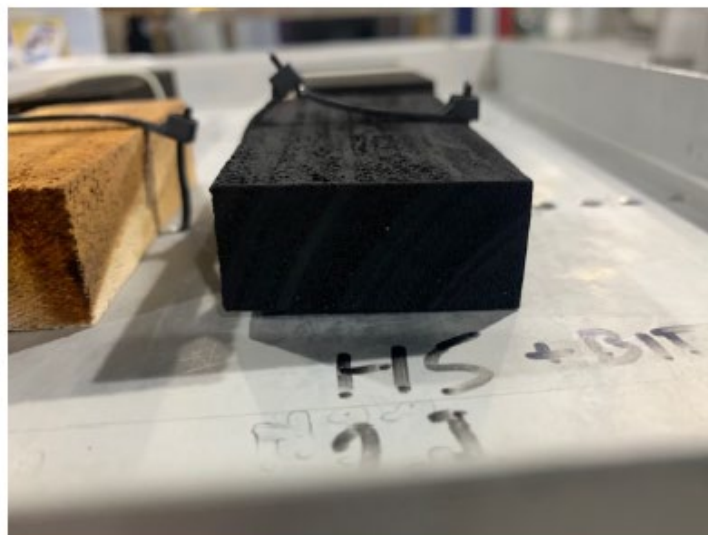
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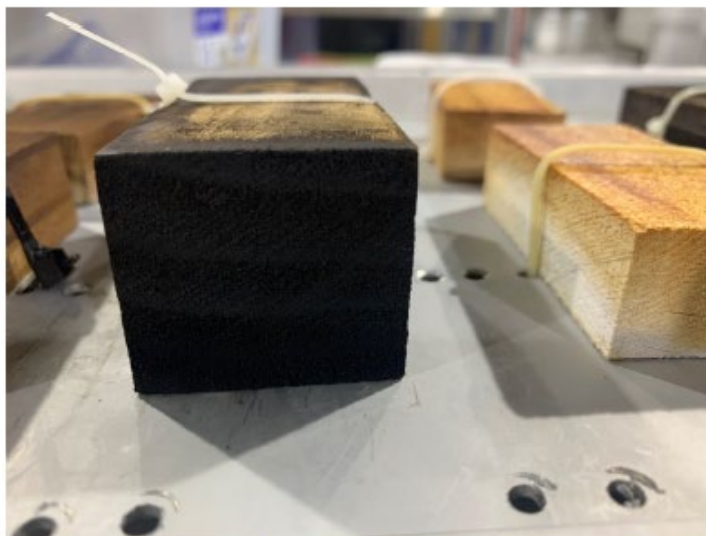


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## Appendix A: Document Control

### Revision History

Revision Date	Author	Revision	Changes Made
25th October, 2019	Donovan Johnson	A	First Release
18th November, 2019	Frank Keating	B	Updates per client request to including adding Ltd and full product name.

### Approvals

Title	Name	Date	Signature
Director	Donovan Johnson	18th November, 2019	

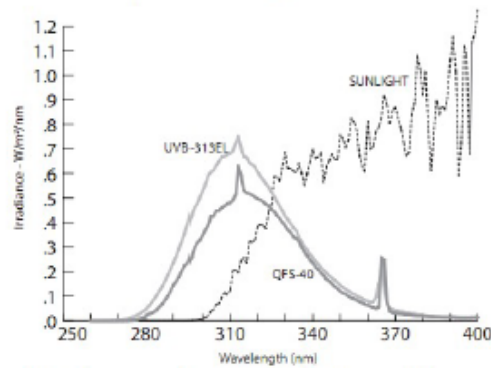
### Template Revision

Revision Date	Author	Revision	Changes Made	Signature
18th May, 2016	Donovan Johnson	A	First Release	

## Appendix B: Lamp Spectra

1. **UVB 313:** The UVB-313 lamps maximise acceleration utilising short-wave UV that is more severe than the UV normally found at the earth's surface. Consequently, these lamps may produce unrealistically severe results for some materials. UVB-313 lamps are most useful for benchmarking and quality control, or for testing very durable materials.

**UVB Lamps vs. Sunlight**

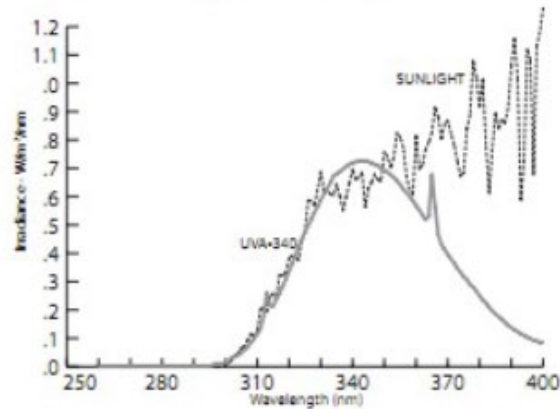


**UVB lamps produce mostly short-wave UV for maximum acceleration.**

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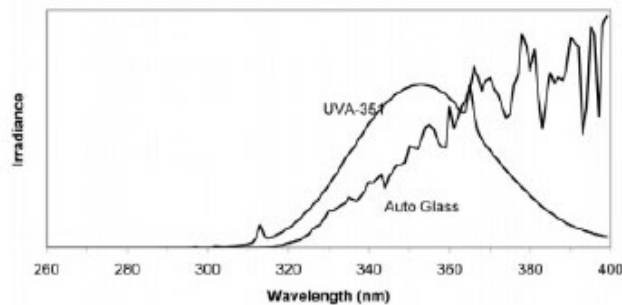
2. **UVA 340:** The UVA-340 lamp produces the most realistic simulation of sunlight in the short wavelength portion of the spectrum. The result is a lamp that provides excellent correlation with outdoor use.

### UVA-340 Lamps vs. Sunlight



**UVA-340 lamps are the best available simulation of sunlight in the critical short-wave UV region.**

2. **UVA 351:** The UVA-351 lamp directly matches sunlight through window glass. It is ideal for testing household items that will spend most of their lives behind glass. Typical uses include testing curtains, carpet, vinyl, bench materials, remote controls and textiles.



**Figure 11 - UVA-351 vs. Sunlight Through Auto Glass**

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