

NZS 3640:2003

CHEMICAL PRESERVATION OF ROUND AND SAWN TIMBER

AMENDMENT NO. 5

21 December 2012

REVISED TEXT

EXPLANATORY NOTE

The purpose of the limited technical amendment to NZS 3640 is to allow for the inclusion of new timber treatments.

This amendment is limited to those applications submitted to Standards New Zealand by 11 November 2011. In addition, this amendment incorporates the Department of Building and Housing Amendment 7 to New Zealand Building Code Acceptable Solution B2/AS1 for table 6.1 for H1.1, H1.2.

NOTE – Department of Building and Housing became part of the Ministry of Business, Innovation and Employment on 1 July 2012.

APPROVAL

Amendment No. 5 was approved on 29 November 2012 by the Standards Council to be an amendment to NZS 3640:2003.

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(Amendment No.5, Dec 2012)

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Referenced documents (page 3)

Delete Referenced documents and **substitute**:

REFERENCED DOCUMENTS

Reference is made in this document to the following:

NEW ZEALAND STANDARDS

NZS 3602:2003	Timber and wood-based products for use in building
NZS 3603:1993	Timber structures Standard
NZS 3604:2011	Timber-framed buildings
NZS 3605:2001	Timber piles and poles for use in building

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

AS/NZS 1604:----	Specification for preservative treatment
Part 2:2012	Reconstituted wood-based products
Part 3:2012	Plywood
Part 4:2012	Laminated veneer lumber (LVL)
Part 5:2012	Glued laminated timber products
AS/NZS 1605:----	Methods for sampling and analysing timber preservatives and preservative-treated timber
Part 1:2006	General requirements, sampling, and determination of sapwood and heartwood presence
Part 2:2006	Determination of preservative penetration by spot tests
Part 3:2006	Analysis methods for determination of preservative retention
Part 4:2006	Analysis methods for determination of preservative solution concentration
AS/NZS 2843.1:2006	Timber preservation plants – Timber preservation plant site design

AUSTRALIAN STANDARDS

AS 1604.1:2012	Specification for preservative treatment – Sawn and round timber
AS 3530:2009	Solvents – Mineral turpentine and white spirit

BRITISH STANDARD

BS ISO 12040:1997	Graphic technology. Prints and printing inks. Assessment of light fastness using filtered xenon arc light
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OTHER PUBLICATIONS

Agricultural Compounds and Veterinary Medicines (ACVM) Group database, Ministry of Agriculture and Forestry, www.foodsafety.govt.nz

American Wood Protection Association AWPAC Standard P8-01 July 2011 – Standard for Oil-Borne Preservatives

New Zealand Building Code Handbook and Approved Documents, Department of Building and Housing (became part of the Ministry of Business, Innovation and Employment on 1 July 2012)

NEW ZEALAND LEGISLATION

Hazardous Substances and New Organisms (HSNO) Act 1996

(Amendment No.5, Dec 2012)

Foreword (page 5)

Delete Foreword and **substitute:**

FOREWORD

This Standard supersedes NZMP 3640:1992 – Minimum Requirements of the NZ Timber Preservation Council Inc.

Creosote has been removed from the coverage of this Standard without prejudice by previous amendment.

Under Amendment No. 5, this Standard has been revised to include the following recently approved amendments:

- Micronised copper quaternary and micronised copper azole (CuAz);
- Water based azole (propiconazole plus tebuconazole);
- Dearomatised ‘white spirit’ solvent;
- Methylene chloride solvent;
- Glueline treatment for laminated veneer lumber (triadimefon, cyproconazole, bifenthrin).

In addition, iodo propynyl butyl carbamate (IPBC), bis-(tri-n-butyltin) naphthenate (TBTN) and bis-(tri-n-butyltin) oxide (TBTO) have been removed from the H1.2 hazard class without prejudice.

This Standard refers to the WOODmark® scheme, which is an initiative of the New Zealand Timber Preservation Council and to the AgriQuality Timber Treatment Programme. Quality assurance schemes arranged by other organisations in the future could also comply with the requirements of this Standard.

(Amendment No.5, Dec 2012)

1.1.1 (page 7)

Delete clause and substitute:

This Standard sets out requirements for the preservative treatment and identification of timber to provide protection from decay and insect attack. This includes marine borers in all likely exposure conditions throughout New Zealand. The requirements are based on hazard classes that are described in this Standard.

The assessment of treatments in this Standard is on an evidential basis for resisting fungal, insect or marine wood borer attack within the prescribed hazard class.

In addition, in this Amendment No. 5 some consideration has also been given to the intended end-use of the treated timber.

(Amendment No.5, Dec 2012)

1.1.2 (page 7)

Add new second paragraph:

Some special requirements are also included for softwood Laminated Veneer Lumber (LVL). Refer to AS/NZS 1604 Parts 2 to 5 with the exception of H1.2 treatment for LVL for which this Standard will apply.

(Amendment No.5, Dec 2012)

C1.1.3 (page 7)

Delete commentary clause and substitute:

C1.1.3

NZS 3640 is to be used in conjunction with NZS 3602, NZS 3603 and NZS 3604 which are referenced in the New Zealand Building Code (NZBC) Compliance Documents.

NZBC Compliance Document acceptable solution B2/AS1 may reference all or part of a Standard. As this Standard may not be referenced as a complete Standard users need to refer to B2/AS1 for compliance requirements.

The New Zealand Timber Preservation Council (NZTPC) and AgriQuality as examples operate quality control and branding schemes. Further details are given in Appendix A. This Standard does not preclude the adoption of any other appropriate quality assurance schemes which may be introduced in the future.

The effectiveness of preservative treatment can be adversely affected by subsequent handling, storage and utilisation. These issues are outside the scope of this Standard, but some advisory information is given in Appendix B.

(Amendment No.5, Dec 2012)

1.2.4 (page 8)

Delete clause and **substitute**:

The terms 'Normative' and 'Informative' have been used in this Standard to define the application of the Appendix to which they apply. A 'Normative' Appendix is an integral part of a Standard while an 'Informative' Appendix is only for information and guidance.

(Amendment No.5, Dec 2012)

1.3 (page 8)

Add new second **sentence**:

The determination of triadimefon and cyproconazole in LVL shall be by the method in Appendix E of this Standard.

(Amendment No.5, Dec 2012)

2 Definitions (page 9)

Delete and **substitute** the following definitions:

ANALYTICAL REQUIREMENT. The minimum preservative retention required by the Standard determined by chemical analysis using methods described in AS/NZS 1605 with the exception of the determination of triadimefon and cyproconazole in LVL that shall be by the method in Appendix E of this Standard.

COMPLETE PENETRATION. Evidence of preservative throughout the specified penetration zone.

FIXING. The process by which CCA preservatives become fixed into the wood fibre.

Add new definitions:

DDAx. Didecyldimethyl ammonium chloride or didecyldimethyl carbonate/bicarbonate.

LAMINATED VENEER LUMBER (LVL). A product which is an assembly of veneers laminated with adhesive, in which the grain direction of the outer veneers and most of the other veneers is in the longitudinal direction.

MICRONISED COPPER. A copper compound ground into particles that are 0.005 to 10 microns in size and suspended in water with the aid of a dispersant.

PENETRATION TRACER. A chemical compound used as an additive in a treating solution and can be used as a penetration indicator chemical for the active ingredient.

(Amendment No.5, Dec 2012)

3.1 Hazard classifications (page 12)

Add new second sentence:

Hazard classes H1 and H3 have two sub classes.

Add new commentary clause:

C3.1

NZBC clause B2.3.1 refers to minimum durability requirements for building elements. 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 the building has a specified intended life. This is applicable to hazard classes H1.2, H3.2, H4, H5, and H6. Structural timber refers to timber that has been graded to characteristic strength and stiffness properties.

The minimum requirement for a H1.2 treatment for timber framing is to provide protection in-service but the preservative treatment is not designed for extended exposure to elevated moisture content.

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.

(Amendment No.5, Dec 2012)

Table 3.1 – Hazard classifications (page 12)

Delete table 3.1 and substitute:

Table 3.1 – Hazard classification

Hazard class	Exposure	Service conditions	Biological hazard	Typical uses
H1.1	Protected from the weather, above ground	Protected from the weather, always dry	Borers	Interior finishing timber – see NZS 3602
H1.2	Protected from the weather, above ground, but with a possibility of exposure to moisture	Protected from the weather, but with a risk of moisture content conducive to decay	Borers, decay	Wall framing – see NZS 3602
H2	Protected from the weather, above ground	Protected from the weather, dry, exposed to ground atmosphere where well-ventilated but not in contact with the ground	Borers, termites	Framing timber in Australia
H3.1	Exposed to the weather, above ground	Periodic wetting, not in contact with the ground	Decay fungi and borers	Cladding, fascia, joinery – see NZS 3602 for requirements on paint protection
H3.2	Exposed to the weather, above ground, or protected from the weather but with a risk of moisture entrapment	Periodic wetting, not in contact with the ground, more critical end uses	Decay fungi and borers	All H3.1 uses, plus structural and decking – see NZS 3602
H4	Exposed to the weather, in ground or in fresh water	Ground contact, or conditions of severe or continuous wetting	Decay fungi and borers	Fence posts, landscaping timbers
H5	Exposed to the weather, in ground or in fresh water	Ground contact, or conditions of severe or continuous wetting, where uses are critical and where a higher level of protection than H4 is required	Decay fungi and borers	House piles and poles, crib walling
H6	Sea water or estuarine ground	Immersion in seawater or estuarine ground	Marine wood borers and decay	Marine timber and piles

(Amendment No.5, Dec 2012)

3.2 Selection of timber treatment (page 13)

Delete clause and **substitute**:

NZS 3602 sets out the requirements for the level of treatment needed for particular uses of timber. Treatment for service at a higher hazard class number usually satisfies requirements for service at a lower hazard class number, except in the case of H2 and the H3.1 treatments identified in table 6.2 as being excluded for timber framing use. Additionally, H2 may not meet the requirements of H1.2.

(Amendment No.5, Dec 2012)

3.3.1 *Penetration* (page 13)

Delete second paragraph and **substitute**:

Some active ingredients such as synthetic pyrethroids, tebuconazole and propiconazole cannot be checked with a chemical reagent. Other actives e.g. boron, may be present at a concentration below the sensitivity limit of the chemical reagent. In such cases, penetration shall be confirmed either by chemical analysis or by use of a penetration tracer whichever is the most applicable to the active in question. Penetration for the azoles used for timber framing shall be confirmed by chemical analysis.

(Amendment No.5, Dec 2012)

3.3.2 *Retention* (page 13)

Delete first sentence and **substitute**:

The retention of preservative shall be determined by chemical analysis in accordance with AS/NZS 1605 where available, and shall be expressed as per cent mass of preservative per mass of oven dry wood.

Add new second paragraph:

The triadimefon and cyproconazole retention analysis for LVL is to be determined according to the method of analysis described in Appendix E of this Standard.

(Amendment No.5, Dec 2012)

3.4.3 (page 14)

Delete clause and **substitute**:

Samples per charge shall consist of:

- (a) Sawn timber shall be two sets of ten cross-sections at least 30 mm thick for penetration and cross-section analyses. An additional set of samples shall be required when penetration is being determined by analysis of the central ninth core;
- (b) For CCA –
 - (i) Roundwood – Three sets of 10 borings
 - (ii) Sawn timber – Either two sets of 10 cross-sections at least 30 mm thick, or three sets of 10 borings;
- (c) For copper quaternary and CuAz – Roundwood and sawn timber shall be two sets of 10 cross-sections at least 30 mm thick –
 - (i) Roundwood – Two sets of 10 cross-sections at least 30 mm thick
 - (ii) Sawn timber – Two sets of 10 cross-sections at least 30 mm thick;
- (d) For LOSP – Sawn timber shall be three sets of 10 cross-section samples at least 30 mm thick;
- (e) For laminated veneer lumber (LVL) shall be two sets of 10 cross-section samples at least 30 mm thick.

NOTE – For all of the above, one set is to be retained by the sampler.

(Amendment No.5, Dec 2012)

3.4.4 (page 14)

Delete clause.

(Amendment No.5, Dec 2012)

4.1 Approved preservatives (page 15)

Delete clause and **substitute**:

Preservative formulations shall be approved under the Hazardous Substances and New Organisms (HSNO) Act 1996 and listed as approved substances on the New Zealand Environmental Protection Authority (EPA) register.

(Amendment No.5, Dec 2012)

4.2.2 Alkaline, or ammoniacal, copper quaternary (page 15)

Delete clause and substitute:

4.2.2 Copper quaternary

4.2.2.1 Situation

Copper quaternary preservatives are approved for use in hazard classes H3.1, H3.2, H4 and H5. Preservative penetrations and retentions shall be as required by section 6.

C4.2.2.1

Copper quaternary preservatives have a broad range of fungicidal and insecticidal effectiveness.

4.2.2.2 Specification

Copper quaternary preservatives shall comprise mixtures of inorganic copper compounds and didecylmethyl ammonium quaternary compound (either DDA chloride or DDA carbonate/bicarbonate). Alkaline or ammoniacal formulations are dissolved in water. Alternatively, the copper may be micronised to form a dispersion in water. The treating solution containing the active ingredients shall be within the proportions given by table 4.2.

(Amendment No.5, Dec 2012)

Table 4.2 – Relative proportions of alkaline copper quaternary components (page16)

Delete table 4.2 and substitute:

Table 4.2 – Relative proportions of alkaline copper quaternary components

Copper (%)	DDAx (%)
56 to 67	33 to 44

(Amendment No.5, Dec 2012)

4.2.3.1 Situation (page 15)

Delete clause and substitute:

Copper azole preservatives are suitable for use in hazard classes H3.1, H3.2, H4 and H5. Preservative penetrations and retentions shall be as required by section 6.

(Amendment No.5, Dec 2012)

4.2.3.2 Specification (page 16)

Delete clause and substitute:

Copper azole preservatives shall comprise mixtures of an inorganic copper salt and triazole fungicide (tebuconazole) formulated as an emulsion, or as a suspension of micronised copper and triazole fungicide (tebuconazole), that can be readily diluted with water to give a treating solution containing the active ingredients within the proportions given in table 4.3.

(Amendment No.5, Dec 2012)

4.2.4 Propiconazole/tebuconazole/permethrin (PTP) (page 16)

Add new clause:

4.2.4 Propiconazole/tebuconazole/permethrin (PTP)

4.2.4.1 Situation

The combination of propiconazole, tebuconazole and permethrin is suitable for use in hazard classes H1.2 and H3.1.

Preservative penetrations and retention shall be as required by section 6.

C4.2.4.1

The combination of propiconazole, tebuconazole and permethrin has a broad range of fungicidal and insecticidal effectiveness.

4.2.4.2 Specification

Propiconazole, tebuconazole and permethrin shall be formulated as a microemulsion for dilution in water to give a treating solution containing the azole active ingredients in a 1:1 ratio.

The total azole to permethrin ratio shall be 10:1 to meet the permethrin retention in timber for H1.2 but does not preclude the use of a higher concentration of permethrin, such as a total azole to permethrin ratio of 3:1, where the treating solution may also be used for treating timber for export, e.g. to Australia.

C4.2.4.2

Evidence must be available which demonstrates that the penetration of the tracer chemical correlates with the penetration of the active ingredients.

(Amendment No.5, Dec 2012)

4.4.1 Situation (page 17)

Delete second paragraph and **substitute**:

In addition, CuN at 0.05 % m/m elemental copper and the tributyl tin compounds (TBTO, TBTN) are suitable for use in hazard class H3.1 for fascia, cladding, joinery and other timber components less than 30 mm thick but are not suitable for H1.2 framing applications. A continuous face brand shall be applied along the full length of the timber prior to dispatch from the treatment plant.

(Amendment No.5, Dec 2012)

C4.4.1 (page 17)

Delete second paragraph of commentary and **substitute**:

Refer to NZS 3602 for conditions of use for H3.1 applications and painting requirements.

(Amendment No.5, Dec 2012)

Table 4.4 – LOSP fungicides (page 17)

Delete table 4.4 and substitute:

Table 4.4 – LOSP fungicides

Fungicides	Hazard classes ⁽¹⁾
Bis-(tri-n-butyltin) oxide (TBTO) ⁽²⁾	H3.1
Bis-(tri-n-butyltin) naphthenate (TBTN) ⁽²⁾	H3.1
Copper naphthenate (CuN) ⁽²⁾	H3.1 and H3.2
Propiconazole + tebuconazole (1:1) ^{(3) (4)}	H3.1
NOTE – (1) For further information on hazard classes, and especially H3.1, refer to table 3.1. (2) H3.1 TBTO, TBTN, and CuN are specifically excluded from H1.2 framing. (3) Propiconazole + tebuconazole shall be used only in combination with permethrin and with a hydrocarbon resin with minimum concentration of 2 % and with a combined concentration of resins and waxes of 3 % or more in the treating solution. (4) IPBC may be added as a mouldicide.	

(Amendment No.5, Dec 2012)

4.4.2 LOSP fungicides (page 17)

Delete clause title and substitute:

4.4.2 Specification

(Amendment No.5, Dec 2012)

4.4.2.2 Light organic solvent specification (page 17)

Delete clause and substitute:

The light organic solvent (LOS) shall either comply with table 1 of AS 3530 or be a dearomatised hydrocarbon solvent with an aniline point between 65 °C – 75 °C, maximum aromatic content of 0.5 % by weight and distillation boiling point range between 150 °C and 220 °C. The light organic solvent is commonly referred to as white spirits.

(Amendment No.5, Dec 2012)

C4.4.2.2 (page 17)

Add new commentary clause:

C4.4.2.2

Any change in solvent specification may affect the solubility and stability of the active ingredients or additives in the treatment solution so any change in solvent will require appropriate testing by the preservative supplier to confirm fitness for purpose.

(Amendment No.5, Dec 2012)

4.4.2.3 Additive specification (page 17)

Delete clause and **substitute**:

4.4.2.3 Methylene chloride

Methylene chloride may be used as an alternative solvent carrier to LOS for propiconazole plus tebuconazole (1:1). The use of any formulation with methylene chloride as the solvent carrier and for use at specific treatment facilities requires separate EPA approvals and specific controls under the HSNO Act to cover the importation, storage, transport, site handling, treating, solvent recovery and disposal requirements. The solvent recovery process shall be capable of achieving a maximum Tolerable Exposure Limit (TEL) for methylene chloride of 3 mg/m³.

Add new clause and commentary:

4.4.2.4 Additive specification

Other additives such as water-repellent waxes, resins and colourants are permitted but shall not impair the preservative efficacy, penetration of actives into the timber or treatment solution stability. Penetration tracer chemicals are required where there is no colourimetric spot test for the active ingredient and they shall not impair the preservative efficacy, penetration of actives into the timber or treatment solution stability.

C4.4.2.4

Evidence must be available which demonstrates that the penetration of the tracer chemical correlates with the penetration of the active ingredients.

(Amendment No.5, Dec 2012)

4.4.3 *LOSP insecticides* (page 17)

Add new second sentence:

The total azole to permethrin ratio shall be 10:1 to meet the permethrin retention in timber for H3.1 but does not preclude the use of a higher concentration of permethrin, such as a total azole to permethrin ratio of 3:1, where the treating solution may also be used for treating timber for export, e.g. to Australia.

(Amendment No.5, Dec 2012)

C4.4.3 (page 17)

Delete commentary clause and substitute:

C4.4.3

These are used in LOSP treatments for hazard classes H1.1 and H3.1. Higher concentrations of insecticides are added to azoles, TBTN or CuN LOSP treatments for hazard class 3 treated timber exported to Australia and other markets.

(Amendment No.5, Dec 2012)

4.5 **Other preservative types** (page 17)

Add new clause:

4.5 **Other preservative types**

4.5.1 *Laminated veneer lumber*

Triadimefon and cyproconazole formulated as a suspension and added to phenol formaldehyde resin shall be permitted as a glueline veneer treatment for H1.2. The triadimefon and cyproconazole shall be within the proportions given in table 4.5. The bifenthrin shall be added to the glueline in proportion to achieve the required retention of 0.0023 % m/m for the analysis zone described in 6.1.2.2(b).

Table 4.5 – Relative proportions of triadimefon and cyproconazole components

Triadimefon (%)	Cyproconazole (%)
90.0 to 91.8	8.2 to 10.0
NOTE – Triadimefon and cyproconazole to be used in combination with bifenthrin.	

(Amendment No.5, Dec 2012)

Table 5.1 – Requirements for branding or identification of treated timber (page 18)

Delete table 5.1 and **substitute**:

Table 5.1 – Requirements for branding or identification of treated timber

Solid timber product type	Brand position
Fence battens Fence droppers	Branding not required
Bundled fence palings, pickets and cavity or roof battens	Packet branded
Sawn or machined timber < 1250 mm ² cross-section	Branding not required
Mouldings	Branding not required
Sawn or machined timber < 1.5 m long; and cross-section < 5000 mm ²	One end of each piece, or branded on a broad face 150 mm from an end, or repetitively along the length at 1.5 m centres, or packet branded
Other sawn or machined timber	One end of each piece, or branded on a broad face 150 mm from an end, or repetitively along the length at 1.5 m centres
Posts – rounds, part rounds	One end of each piece
Piles or poles for use in buildings to NZS 3605	One third of the length of the piece, from and facing the top
Utility service poles	Location specified by purchaser
Engineered wood products	
Laminated veneer lumber – see 4.5.1	Branded repetitively along the length at a minimum of 1.5 m centres and shall be no greater than 1.8 m centres
NOTE – The width of the member is the longest cross-section dimension, and the thickness is the smallest cross-section dimension.	

(Amendment No.5, Dec 2012)

5.1.4 (page 19)

Delete 5.1.4(c) and **substitute**:

(c) The preservative type using the following code numbers:

CCA oxide.....	01
CCA salt.....	02
Boron	11
TBTO	56
Copper naphthenate.....	57
Copper azole (as emulsion)	58
TBTN	62
Propiconazole + tebuconazole + permethrin.....	64
Triadimefon + cyproconazole + bifenthrin	66
Permethrin	70
Micronised copper azole (as dispersion)	88
Micronised copper quaternary (as dispersion)	89
Alkaline copper quaternary.....	90

The sequence of the above information in the brand shall be plant number, preservative code number, and hazard class number as in figure 5.1.

NOTE – IPBC, previously included in this Standard, had code number 63 – see the Foreword of this Standard for further information.

(Amendment No.5, Dec 2012)

5.1.4.1 (page 19)

Delete first paragraph and **substitute**:

Timber that may be exported to Australia may be branded to comply with both the relevant Australian Standard AS 1604.1 and this Standard. This provision shall only apply in respect of timber treated to H3.2, equivalent to H3 in AS 1604.1, using alkaline copper quaternary (90), CCA (01 or 02), CuAz (58), CuN (57), micronized copper quaternary (89), or micronized copper azole (88).

(Amendment No.5, Dec 2012)

5.2 Colouring (page 20)

Delete clause and **substitute**:

In addition to end branding, framing timber for H1.2 shall be colour coded as specified in table 5.2.

(Amendment No.5, Dec 2012)

Table 5.2 – Colour coding for timber to be used as framing (page 20)

Delete table 5.2 and **substitute**:

Table 5.2 – Colour coding for timber to be used as framing

Hazard class	Preservative	Colour ⁽¹⁾
H1.2 ⁽²⁾	Boron	Pink ⁽³⁾
	Propiconazole, tebuconazole, permethrin ⁽⁴⁾	Green ⁽⁵⁾
NOTE – (1) These colours shall not be used for any preservative types/hazard classes other than specified. (2) LVL with H1.2 glue-line treatment outlined in 4.5.1 does not require colour coding. (3) Colour – Red 112 (red) or Red 122 (pink). (4) Formulated as a water-based emulsion. (5) The colour green is to be distinctly different (colour green 368) from the green of copper-based preservatives.		

(Amendment No.5, Dec 2012)

C Table 5.2 (page 20)

Delete commentary clause to table 5.2 and **substitute**:

C Table 5.2

Timber treated to H3.2 is readily distinguishable by spot test from those treatments approved for framing. As an example two reagents (ammonia solution and rubeanic acid) are applied to a freshly-cut surface. A blue/black colouration indicates the presence of copper, an active ingredient of all H3.2 treatments. Other reagents may also be used, e.g. chrome azurol.

(Amendment No.5, Dec 2012)

5.2.2 Light fastness (page 21)

Delete clause and **substitute**:

The pink or green colour for treatments shall have a light-fast rating of 5 in accordance with BS ISO 12040.

(Amendment No.5, Dec 2012)

C6.1 (page 22)

Delete commentary clause and **substitute**:

C6.1

H1.1 and H1.2 timber must be kept dry during storage, when handled prior to use and in service.

(Amendment No.5, Dec 2012)

6.1.1.1 *Penetration* (page 22)

Delete third paragraph and **substitute**:

Some active ingredients such as synthetic pyrethroids, tebuconazole and propiconazole cannot be checked with a chemical reagent. Other actives e.g. boron, may be present at a concentration below the sensitivity limit of the chemical reagent. In such cases, penetration shall be confirmed either by chemical analysis or by use of a penetration tracer whichever is the most applicable to the active in question.

(Amendment No.5, Dec 2012)

6.1.1.2 (b) *Analysis zone* (page 22)

Delete 6.1.1.2(b) and **substitute**:

- (b) For H1.2-classed sawn timber, the analysis zone is the full sapwood cross-section. In addition, when azole treated timber is 30 mm thick or more there is also a requirement for analysis of the central one-ninth of the sapwood cross-section.

(Amendment No.5, Dec 2012)

6.1.2 *Glueline treated laminated veneer lumber (LVL)* (page 22)

Add new clause:

6.1.2 *Glueline treated laminated veneer lumber (LVL)*

The preservative shall be applied as a glueline additive to every glueline followed by a surface treatment to the outer surface veneers.

6.1.2.1 *Penetration*

There is no penetration analysis requirement for the preservative.

6.1.2.2 *Analysis zone*

The analysis zone is:

- (a) The outer 2 mm for LVL surface veneers; and
- (b) The full cross-section (less the outer surface veneers).

6.1.2.3 *Preservative retention requirement*

The retention of preservative in the two retention zones of the treated timber shall be not less than specified in table 6.1.

(Amendment No.5, Dec 2012)

Table 6.1 – Minimum preservative retention in the H1.1, H1.2 analysis zone (sawn timber) (page 23)

Delete table 6.1 and substitute:

Table 6.1 – Minimum preservative retention in the H1.1, H1.2 analysis zone

Preservative type	Component	Retention % m/m oven-dry weight of wood	
		H1.1	H1.2
Waterborne preservatives			
CCA	As	0.04	–
Boron compounds –			
Hardwoods core	H ₃ BO ₃	0.20	Not applicable
Softwoods (wet) core	H ₃ BO ₃	0.10	Not applicable
Softwoods x-sect	H ₃ BO ₃	0.10	0.40 ⁽¹⁾
Propiconazole + tebuconazole (1:1) ⁽²⁾			
Cross-section	Propiconazole + tebuconazole	Not applicable	0.04 + 0.04 ⁽³⁾
Central ninth core	Propiconazole + tebuconazole	Not applicable	0.01 + 0.01 ⁽³⁾
Laminated veneer lumber ^{(4) (5) (6)}			
Triadimefon + cyproconazole	Triadimefon + cyproconazole	Not applicable	0.042 + 0.005 (glueline) 0.174 + 0.024 (surface)
Light organic solvent preservatives (LOSPs)			
Synthetic pyrethroids –			
Permethrin	–	0.0060	Not applicable
Cypermethrin	–	0.0060	Not applicable
Deltamethrin	–	0.0006	Not applicable
NOTE –			
(1) This cross-section retention is required whether the material is sampled wet, where the timber is intended to be air dried, or on the dry timber.			
(2) Formulated as a waterbased emulsion. The minimum permethrin retention is 0.0060 % m/m.			
(3) The requirement for azoles shall be a 50:50 ratio in the retention zone and the minimum proportion of any one azole is to be 45 % of the total.			
(4) This treatment shall be applied only to LVL with a maximum veneer thickness of 4.3 mm and as a glueline additive equal to or greater than 450 g/m ³ triadimefon and 45 g/m ³ cyproconazole. A second separate application is also required to the outer veneer surface.			
(5) Bifenthrin is required in the glueline as outlined in 4.5.1.			
(6) Glueline and surface treatment sampling of LVL shall be in final state and form prior to dispatch from the treatment plant.			

(Amendment No.5, Dec 2012)

Table 6.1 – Minimum preservative retention in the H1.1, H1.2 analysis zone (page 23)

Add new commentary clause to table 6.1:

C Table 6.1

Extended time in block stack after hot pressing can affect analytical recovery of the active ingredients. To ensure the samples are typical of normal production, analytical samples should only be taken after the glueline treated product has completed the full production process. Samples should not be taken directly off the end of the press.

(Amendment No.5, Dec 2012)

6.3 Hazard classes H3.1 and H3.2 (page 23)

Delete second paragraph and **substitute**:

H3.2 applies to timber used in situations above ground, exposed to weather, or protected from the weather but with a risk of moisture entrapment. This classification is for more critical end uses and includes exposed joists and decking.

(Amendment No.5, Dec 2012)

C6.3 (page 23)

Delete commentary clause and **substitute**:

C6.3

See table 3.1 and C3.1 for descriptions of H3.1 and H3.2 hazard classes.

(Amendment No.5, Dec 2012)

6.3.1.1 Penetration (page 24)

Delete clause and **substitute**:

The penetration of the preservative into the timber shall be checked using a chemical reagent (see 3.3.1).

Some active ingredients such as synthetic pyrethroids, tebuconazole, and propiconazole cannot be checked with a chemical reagent. Other actives e.g. boron, may be present at a concentration below the sensitivity limit of the chemical reagent. In such cases, penetration shall be confirmed either by chemical analysis or by use of a penetration tracer whichever is the most applicable to the active in question.

A penetration tracer chemical is required in the treating solution for the propiconazole plus tebuconazole treatment when the timber thickness is 30 mm or more. See 4.2.4.2 and 4.4.2.4.

Where evidence of complete sapwood penetration is to be confirmed by analysis, the samples will comply if the preservative is found in the central one-ninth sapwood core of the sample.

Samples which fail the penetration test shall be deemed to have failed the analytical requirement.

(Amendment No.5, Dec 2012)

6.3.1.1.1

Delete clause.

(Amendment No.5, Dec 2012)

6.3.1.2 Analysis zones – sapwood (page 24)

Delete clause and **substitute**:

- (a) The analysis zone shall be the outer 25 mm from any sapwood face, or the full depth of sapwood where the sapwood depth is less than 25 mm.
- (b) For H3.1 classed sawn timber treated with a propiconazole plus tebuconazole treatment and when the timber is 30 mm thick or more, there is also a requirement for analysis of the central one-ninth of the sapwood cross-section.

(Amendment No.5, Dec 2012)

Table 6.2 – Minimum preservative retention in the H3.1, H3.2 analysis zone (page 25)

Delete table 6.2 and **substitute**:

Table 6.2 – Minimum preservative retention in the H3.1, H3.2 analysis zone

Preservative type	Component	Retention % m/m oven dry weight of wood	
		H3.1	H3.2
Waterborne preservatives			
CCA	Cu + Cr + As	0.37	0.37
Copper quaternary ⁽¹⁾	Cu + DDAX where X = chloride or carbonate/bicarbonate	0.35	0.35
Copper azole ⁽¹⁾	Cu + tebuconazole	0.23	0.23
Boron compounds	H ₃ BO ₃	0.80 ⁽²⁾	Not approved
Propiconazole + tebuconazole (1:1) ⁽³⁾	Propiconazole + tebuconazole	0.03 + 0.03 ^{(4) (5) (6)} and 0.01 + 0.01 ^{(4) (7)}	Not approved
Light organic solvent preservatives (LOSPs)			
CuN	Cu	0.05 ⁽⁹⁾	0.10
Propiconazole + tebuconazole (1:1) ⁽⁸⁾	Propiconazole + tebuconazole	0.03 + 0.03 ^{(4) (5)} and 0.01 + 0.01 ^{(4) (7)}	Not approved
TBTO, TBTN	Sn	0.08 ⁽⁹⁾	Not approved
NOTE –			
(1) Includes micronised copper – see 4.2.			
(2) Boron compounds are approved for H3.1 only for timber boards for fascia, cladding, joinery, cavity bat- tens and other timber components less than 30 mm thick and only when an oil alkyd, modified acrylic or modified latex grey pigmented coating is applied to all timber surfaces, after treatment and before dispatch from the treatment plant.			
(3) Propiconazole + tebuconazole shall be used only in combination with permethrin. The minimum permethrin retention is 0.0060 % m/m. See 4.2.4.2.			
(4) The requirement for azoles shall be a 50:50 ratio in the retention zone and the minimum proportion of any one azole is to be 45 % of the total.			
(5) Retention required in the sapwood cross-section for all timber dimensions.			
(6) The water-based azole treatment at this H3.1 retention shall not be used for timber framing. See table 6.1 for the H1.2 retention requirements.			
(7) Additional retention requirement to analyse sapwood present in the central ninth when the timber is 30 mm thick or more.			
(8) Propiconazole + tebuconazole shall be used only in combination with permethrin and with a hydrocarbon resin with minimum concentration of 2 % and with a combined concentration of resins and waxes of 3 % or more in the treating solution. The minimum permethrin retention is 0.0060 % m/m. See 4.4.3.			
(9) CuN at 0.05 % m/m and TBTO/TBTN are approved for H3.1 timber boards for fascia, cladding, joinery and other timber components less than 30 mm thick and provided a continuous face brand is applied along the full length of the timber at the treatment plant. Refer to NZS 3602 for conditions of use in H3.1 applications and painting requirements.			

(Amendment No.5, Dec 2012)

Table 6.3 – Minimum preservative retention in the H4 analysis zone (page 26)

Delete table 6.3 and **substitute**:

Table 6.3 – Minimum preservative retention in the H4 analysis zone

Preservative type	Component	Retention % m/m oven dry weight of wood
Copper quaternary	Cu + DDAX where x = chloride or carbonate/bicarbonate	1.02
CCA	Cu + Cr + As	0.72
CuAz	Cu + tebuconazole	0.416

(Amendment No.5, Dec 2012)

6.5.1.2 Analysis zones (page 26)

Delete clause and **substitute**:

The analysis zones for CCA, copper quaternary and copper azole shall be the outer 30 mm.

(Amendment No.5, Dec 2012)

Table 6.4 – Minimum preservative retention in the H5 analysis zone (page 26)

Delete table 6.4 and **substitute**:

Table 6.4 – Minimum preservative retention in the H5 analysis zone

Preservative type	Component	Retention % m/m oven dry weight of wood
Copper quaternary	Cu + DDAX where x = chloride or carbonate/bicarbonate	1.35
CCA	Cu + Cr + As	0.95
CuAz	Cu + tebuconazole	0.759

(Amendment No.5, Dec 2012)

6.5.3.1.1 (page 27)

Last sentence to be **moved** above commentary **C6.5.3.1.1** (and under 6.5.3.1.1 (b)), as shown below.

Samples which fail the penetration test shall be deemed to have failed the analytical requirement.

C6.5.3.1.1

A pole requires a higher level of penetration due to its size and greater value.

(Amendment No.5, Dec 2012)

Appendix B – Specification advisory notes (page 31)

Delete first sentence of B2.1 and **substitute**:

Treated timber should be properly cared for before use to avoid exposure to a hazard situation for which it has not been protected (e.g. H1.1, H1.2, H3.1 and H3.2 timbers should be stored out of contact with the ground).

(Amendment No.5, Dec 2012)

Application for approval of timber preservatives (page 35)

Delete courier address and **substitute**:

Courier address:
Level 6
8 Gilmer Terrace
Wellington
New Zealand

(Amendment No.5, Dec 2012)

Appendix D Part B – Information on the timber preservative

1. Approval under HSNO Act 1996 (page 37)

Delete (2) and **substitute**:

- (2) Attach written confirmation from ERMA New Zealand* that the trade name product matches an existing approved substance.

Add footnote:

* From 1 July 2011, ERMA became the Environmental Protection Authority (EPA).

(Amendment No.5, Dec 2012)

Appendix E – Determination of triadimefon and cyproconazole in glueline and surface-treated timber (page 42)

Add new Appendix:

APPENDIX E – DETERMINATION OF TRIADIMEFON AND CYPROCONAZOLE IN GLUELINE AND SURFACE-TREATED TIMBER

(Normative)

E1 Principle

Triadimefon and cyproconazole are extracted from ground timber with methanol using Soxhlet extraction or an equivalent automated extraction system. The extract is analysed for triadimefon and cyproconazole by capillary gas chromatography (GC) with flame ionisation detector (FID) detection.

Quantification is done using an internal standard (see E5.1). Results are expressed as a per cent mass/mass (% m/m) on an oven-dry weight basis by correction for the moisture determined on a parallel sample.

E2 Reagents

All reagents shall be of analytical reagent quality.

The following reagents shall be used:

- (a) Methanol Analytical reagent grade;
- (b) Triadimefon Analytical reference-grade material with certificate of purity;
- (c) Cyproconazole Analytical reference-grade material with certificate of purity;
- (d) Dibutyl phthalate Laboratory reagent grade satisfactory.

E3 Sampling and moisture content

Samples shall be at least air-dry, and preferably at equilibrium moisture content. Samples to be analysed shall not be oven-dried.

Cross-sectional samples shall be dry milled to pass through a 2 mm screen (such as a Wiley mill). More than 50 % of the sample must be retained on a 1 mm screen.

Surface samples shall be removed with a planer or similar and blended in a bench-top blender for 15 – 30 seconds to reduce the size of any long shavings.

To determine moisture content, accurately weigh a sample, dry overnight at 105°C, cool the dried sample in a dessicator, then reweigh.

E4 Procedure

To determine the concentration of triadimefon and cyproconazole, separate samples and analyses are to be carried out on glueline cross-section and surface-treated timber using the following extraction procedure:

- (a) Weigh approximately 5 g of the sample (to the nearest 0.1 mg) into a cellulose extraction thimble (Ws) and place a small amount of glass wool in the top of the thimble;
- (b) Place the extraction thimble into a Soxhlet extractor and add 80 mL of methanol to the collection flask along with some boiling chips;
- (c) Set up the Soxhlet extraction and run for 2.5 hours;

NOTE – Automated Soxhlet extraction may be used in which case sample weights, solvent volumes and extraction time will vary depending on the extraction equipment used.

- (d) Determine the final volume of methanol extract obtained (V) and quantitatively transfer 40 mL of this methanol extract to a 50 mL bottle;
- (e) Add 5.0 mL of dibutyl phthalate internal standard with a volumetric pipette and mix well;
- (f) Filter an aliquot through a 0.2 µm syringe filter into a vial.

E5 Standard solutions

E5.1 Internal standard

The internal standard shall be prepared as follows:

- (a) Weigh 0.15 g of dibutyl phthalate to the nearest 0.1 mg into a 100.0 mL volumetric flask;
- (b) Make up to the mark with methanol.

E5.2 Triadimefon and cyproconazole standards

The triadimefon and cyproconazole standards shall be prepared as follows:

- (a) Weigh approximately 0.01 g of triadimefon standard to the nearest 0.1 mg into a 50 mL bottle;
- (b) Weigh approximately 0.01 g of cyproconazole standard to the nearest 0.1 mg into the same 50 mL bottle;
- (c) Add 5.0 mL of dibutyl phthalate internal standard with a volumetric pipette;
- (d) Make up to approximately 50 mL with methanol;
- (e) Filter an aliquot through a 0.2 µm syringe filter into a vial.

E6 QUANTITATION

The instrument settings and operating conditions for determination of triadimefon and cyproconazole shall be in accordance with table E1 and the following procedure:

- (a) A 1 µL aliquot of each standard and sample solution is injected into the GC with FID detection;
- (b) The order of elution is:
 - (i) Dibutyl phthalate
 - (ii) Triadimefon
 - (iii) Cyproconazole.

Table E1 – Gas chromatograph conditions

Capillary column	Zebron ZB-1, or equivalent 15 m, 0.25 mm ID, 0.25 µ film thickness
Injector	1 µL splitless injection Temperature 28 °C Sampling time 1.50 minutes Carrier gas helium Total flow 27.2 mL/min
Oven	Initial temperature 40 °C, hold for 1 minute Increase temperature at 5 °C/minute to 80 °C, Then 10 °C/minute to 280 °C. Hold at 280 °C for 10 minutes
Detector	FID at 280 °C

E7 CALCULATIONS

E7.1 Moisture content

The percentage moisture content (MC) of the timber sample shall be calculated from the following equation:

$$MC = \frac{W_i - W_f}{W_f} \times 100 \quad \text{.....} \quad (\text{Eq E7.1})$$

where

W_i = initial weight of timber sample, in grams

W_f = final weight of dried timber sample, in grams

E7.2 Corrected sample weight

The sample weight in grams corrected for moisture content (W_c) shall be calculated from the following equation:

$$W_c = \frac{W_s}{\left(1 + \frac{MC}{100}\right)} \quad \text{.....} \quad (\text{Eq E7.2})$$

where

W_s = initial weight of timber sample, in grams

MC = percentage moisture content of the initial timber sample

E7.3 Relative response factor

The relative response factor (RRF) shall be calculated from the following equation:

$$RRF = \left(\frac{A_{IS}}{A_{std}} \right) \times \left(\frac{wt_{std}}{1} \right) \quad \text{.....} \quad (\text{Eq E7.3})$$

where

A_{IS} = peak area of internal standard in standard chromatogram

A_{std} = peak area of standard in standard chromatogram

wt_{std} = weight of active corrected for per cent purity in standard, in grams

E7.4 Per cent mass/mass (% m/m) of active ingredients

The per cent mass/mass (% m/m) of triadimefon or cyproconazole shall be calculated separately from the following equation. Separate results shall be obtained for each active ingredient and for the glue-line cross-section and surface treated timber zones:

$$\text{Active concentration} = \frac{(A_s \times RRF \times V \times 100)}{(A_{IS} \times 40 \times W_c)} \quad \text{.....} \quad (\text{Eq E7.4})$$

where

A_s = peak area of active in sample chromatogram

V = final volume of methanol extract (mL)

A_{IS} = peak area of internal standard in sample chromatogram

RRF and W_c are defined in E7.2 and E7.3

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