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BULLETIN

TIMBER TREATMENT

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Timber is a natural organic material, and many species can be subject to insect attack and fungal decay (rot), especially under damp conditions.

Protecting the timber with chemical preservatives makes it resistant to rot-causing fungi or wood-boring insects (borer).

This bulletin outlines the requirements for timber durability and the preservative options available. It replaces Bulletin 538 of the same name and incorporates information resulting from Amendment 5 to NZS 3640:2003.

1.0 INTRODUCTION

1.0.1 Timber is a natural organic material. Many species can be subject to insect attack and fungal decay under damp conditions.

1.0.2 Protecting the timber with chemical wood preservatives increases resistance to fungal decay and wood-boring insects.

1.0.3 This bulletin outlines the requirements for timber durability and the preservative options available. It replaces Bulletin 538 of the same name and incorporates information resulting from Amendment 5 to NZS 3640:2003 *Chemical preservation of round and sawn timber.*

2.0 CODES AND STANDARDS

2.1 NEW ZEALAND BUILDING CODE

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

2.1.2 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 building life, but not less than 50 years, for structural components like piles, bearers, joists and studs.

2.2 STANDARDS

2.2.1 NZS 3602:2003 *Timber and wood-based products for use in building*, Part 1 is called up as an Acceptable Solution to B2. Tables 1, 2 and 3 of the standard set out the requirements for radiata pine and other species for 50, 15 and 5-year durability periods.

2.2.2 Amendment 7 to clause B2 *Durability* amends the requirements of NZS 3602:2003. It changes the wood treatment requirements for radiata pine and Douglas fir framing for light timber-framed buildings.

2.2.3 NZS 3602:2003 also references the preservation standard NZS 3640:2003, which was last amended in December 2012 (Amendment 5).

2.2.4 Amendment 5 of NZS 3640:2003 removes iodocarb as a treatment option for H1.2 framing and adds two additional copper-based waterborne treatments for hazard classes H3.1, H3.2, H4 and H5:

- Micronised copper quaternary, which has a preservative code number of 89. In this treatment, the micro-sized copper compound particles are suspended in water (with the aid of a dispersant) rather than dissolved in water. The preservative also incorporates a didecyldimethylammonium (DDA) quaternary compound.
- Micronised copper azole, which has a preservative code number of 88.

2.2.5 Other Amendment 5 changes include:

- azoles (propiconazole plus tebuconazole 1:1) were approved as a micro-emulsion that could be diluted in a waterborne carrier (previously only an LOSP treatment option was approved) – both the waterborne and the LOSP azole options are approved for H3.1 treatment
- waterborne azoles were included in H1.2
- the use of H1.2 treatment options and requirements for timber framing were clarified
- adding DDA carbonate/bicarbonate was approved as an alternative co-biocide option for didecyldimethyl-ammonium compound in copper quaternary preservatives
- a dearomatised hydrocarbon solvent was approved for LOSP
- a glueline additive treatment (triadimefon, cyproconazole, bifenthrin) was approved for LVL in H1.2
- recognition of methylene chloride as a solvent although its use is restricted to an approved facility.

2.2.6 Creosote was removed as a treatment option in an earlier amendment to NZS 3602 although it is still referred to in NZS 3604:2011 *Timber-framed buildings.*

3.0 TIMBER DURABILITY AND PRESERVATION

3.0.1 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.

3.0.2 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).

3.1 TIMBER PRESERVATION

3.1.1 NZS 3640:2003 contains detailed treatment specifications covering:

- the types of chemicals or combinations that may be used
- the hazard classes, which reflect exposure, service conditions and the expected biological risks
- the different preservative treatments by hazard class
- the requirements for minimum preservative retention and penetration
- treated timber identification and quality control.

3.1.2 The penetration and retention requirements can vary with the preservative type and hazard class – NZS 3640:2003 should be consulted for specific requirements.

3.1.3 Timber treated to meet NZS 3640:2003 must be verifiable – various organisations provide independent quality assurance schemes for timber treatment plants.

3.2 HAZARD CLASSES

3.2.1 When specifying a timber treatment, the most important requirement is that an appropriate level is specified for the particular situation. This can be done by reference to the appropriate hazard class as defined by NZS 3640:2003 and called up in NZS 3602:2003 Tables 1, 2 or 3 (as modified by B2/AS1 Amendment 7).

TABLE 1. TIMBER TREATMENT LEVELS, TREATMENT OPTIONS AND SUITABLE APPLICATIONS

Timber treatment	Exposure	Comments	Timber and treatment	Typical uses
Untreated	Where there is no risk of dampness	Manufacture, storage, delivery, construction and in-use conditions that will prevent exposure to external or internal moisture or conditions that would allow the moisture content to exceed 18% at any time	High-temperature kiln-dried (KD) untreated radiata pine and other appearance grade timbers	Internal finishing timbers, furniture
		Manufacture, storage, delivery, construction and in-use conditions that will prevent exposure to external or internal moisture or conditions that would allow the moisture content to exceed 18% at any time	Untreated Douglas fir	Framing in a low-risk building as defined by Amendment 7 to B2/AS1
	Where there is a risk of dampness	Timber with proven natural durability when exposed to the weather. Not suitable for use in ground contact conditions	Western red cedar, redwood, cypress species heartwood (macrocarpa)	Weatherboards, door and window joinery, exterior trim timbers
Treated to hazard class H1.1 – currently no H1.1 treated timber is produced	Where there is no risk of dampness but borer protection is required	Manufacture, storage, delivery, construction and in-use conditions where no risk of fungal attack exists but resistance against borer attack is desirable Internal use only, not exposed to ground atmosphere, always dry H1.1 no longer exists as an acceptable treatment in B2/AS1	Boron treated radiata pine Copper chrome arsenate (CCA) Synthetic pyrethroids	Interior joinery such as door frames, stairs, architraves, skirtings and cornices, built-in or freestanding joinery items (excluding timber window reveals and frames)
Treated to hazard class H1.2	Where there is moderate risk of dampness or water	Not suitable if exposure to weather during production, storage, delivery and construction is likely to be for long periods – typically a maximum weather exposure of 3 months recommended Internal use only where in-use moisture content will be maintained at less than 20%	Boron treated radiata pine or Douglas fir Azoles as a water-based emulsion treatment of radiata pine or Douglas fir Triadimefon + cyproconazole treated radiata pine LVL Note: • LOSP treatments (TBTO, TBTN, IPBC) are not permitted for framing • CuN LOSP has been removed from H1.2 and is not permitted for framing	Structural wall and roof framing timber including subfloor framing (excluding piles)
Treated to hazard class H3.1	External use with a three-coat paint finish to protect from direct wetting of timber	External use with a three-coat paint protection system or use within a 20 mm nominal E2/AS1 drained and vented cavity Not suitable for direct exposure of timber to the weather or for stained finishes	LOSP (azole, TBTO, TBTN or CuN) CCA Copper azole Boron LOSP H3.1 azole can be used for LVL Amendment 7 to B2/AS1 does not allow the use of H3.1 LOSP TBTO, TBTN or IPBC treated timber for framing	Fascias, weatherboards, facings and other painted trim requiring a not less than 15-year durability Exterior joinery and timber reveals for aluminium windows Timber cavity battens

TABLE 1. TIMBER TREATMENT LEVELS, TREATMENT OPTIONS AND SUITABLE APPLICATIONS (CONTINUED)				
Timber treatment	Exposure	Comments	Timber and treatment	Typical uses
Treated to hazard class H3.2	External use	Suitable for exposure to weather but not in ground contact Not less than 15-year durability except enclosed deck framing, which requires a not less than 50-year durability	CCA Copper quaternary (including micronised copper quaternary) Copper azole (including micronised copper azole) LOSP (CuN) Amendment 7 to B2/AS1 does not allow the use of LOSP CuN for framing	Cantilevered enclosed deck joists and associated framing (joist trimmers, nogs, dwangs and blocking), decking and outdoor structures, rafters exposed to the weather, uncoated or stained radiata pine weatherboards and trim, fence rails and palings
Treated to hazard class H4	In contact with ground or concrete	Not suitable for critical major structural components in ground contact	CCA Copper quaternary (including micronised copper quaternary) Copper azole (including micronised copper azole)	Fence posts, horizontal timbers for retaining walls
Treated to hazard class H5	In contact with ground or concrete	Suitable for critical major structural components in ground contact	CCA Copper quaternary (including micronised copper quaternary) Copper azole (including micronised copper azole)	House piles and poles, crib walling, retaining wall poles
Treated to hazard class H6	In contact with seawater or estuarine ground	Suitable for critical major structural components immersed in seawater or embedded in estuarine soils	CCA	Wharf piles, sea walls

Note: Refer to NZS 3640:2003 for full details of treatment chemical retention requirements
Abbreviations:

CCA	copper chrome arsenate
CuAz	copper azole including micronised copper azole
CuN	copper naphthenate
LOSP	light organic solvent preservative
TBTO	tri-n-butyltin oxide
TBTN	tri-n-butyltin naphthenate
IPBC	iodopropynyl butylcarbamate
DDAC	didecyldimethyl-ammonium chloride
DDAX	didecyldimethyl-ammonium carbonate or bicarbonate

3.2.2 Table 1 of this bulletin summarises the timber or treatment options and gives the permitted end uses, primarily for radiata pine.

3.3 SUITABILITY OF TIMBERS FOR TREATMENT

3.3.1 Not all timber species can be treated – for some species, sapwood only is treatable, and for some, the level or hazard class they can be treated to is limited by the end-use exposure conditions or biological hazard. In New Zealand, only *Pinus* species can achieve an H6 classification using the CCA (copper chrome arsenate) treatment, provided the material has a suitable minimum sapwood depth.

3.3.2 Some species may be difficult to treat by vacuum or pressure treatment schedules but may be receptive to boron diffusion and other treatment methods. For most species, sapwood is easier to treat than heartwood.

3.3.3 For most timber species, penetration of preservative during vacuum and/or pressure treatment is generally better when the timber is dry when treated. Kiln-dried timber may treat better than air-dried timber.

3.4 UNTREATED TIMBER USE

3.4.1 For some applications, NZS 3602:2003 lists a few species with a natural durability to meet Building Code requirements without treatment.

3.4.2 Although not referenced by NZS 3602:2003, AS 1604:2012 *Specification for preservative treatment* Appendix F gives four classes of natural durability of species in terms of probable in-ground life expectancy.

3.4.3 Examples of timber species that may be used untreated are:

- externally (above ground with a not less than 15-year durability) – tōtara, heart macrocarpa, redwood, western red cedar, selected eucalypts, kwila, vitex
- internally – Douglas fir (for framing only in low-risk buildings as defined by Amendment 7 to B2/AS1), European larch, radiata pine (finishing timbers only), rimu, matai.

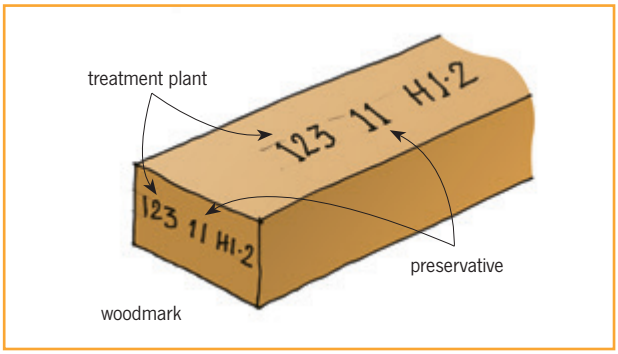

Figure 1. Branding requirements of treated timber.

3.5 BRANDING AND IDENTIFICATION

3.5.1 Preservative treated timber must be clearly branded with the treatment plant number, the code number for the preservative used and the hazard class number (Figure 1). Branding must be applied after any cutting or machining and carried out after treatment.

3.5.2 Branding can be a permanent ink mark, an imprint, a burnt mark or a plastic tag.

3.5.3 Brands must be located as follows:

- Piles or poles for use in buildings – at one-third of the length of the piece, from and facing the top.
- Posts (rounds or part rounds) – on one end of each piece.
- Sawn or machined timber less than 1.5 m long and less than 5000 mm^2 in cross section – on one end of each piece or branded on a broad face 150 mm from the end or repetitively along the length at 1500 mm centres or packet branded.
- Other sawn or machined timber – on one end of each piece or branded on a broad face 150 mm from the end or repetitively along the length at 1500 mm centres.
- Bundles of fence palings, pickets and cavity or roof battens – packet branded.

3.5.4 Branding is not required for:

- mouldings
- sawn or machined timber less than 1250 mm^2 cross section
- fence battens and droppers.

3.5.5 The preservative used is identified by a number and is given in Table 2.

3.5.6 Treated timber may also be branded with a mark or symbol from the quality assurance provider.

3.6 PRESERVATIVE PENETRATION

3.6.1 NZS 3640:2003 section 6 sets out the requirements for each hazard class. This includes the approved chemical treatments and the penetration requirement of the treatment chemicals for each hazard class, whether applicable to sapwood or heartwood or both, and the retention of preservative in the timber. In some cases, there are specific requirements or exclusions for the treatment types.

3.6.2 Complete sapwood penetration is required for timber treated to all hazard classes. In most instances, the penetration can be checked using a colorimetric reagent at the treatment plant.

3.6.3 The heartwood penetration required varies with the hazard class and treatment options. Consult NZS 3640:2003 for full details.

3.7 MACHINING

3.7.1 NZS 3640:2003 clause B5 recommends that any required machining (moulding) of timber is carried out before the timber is treated.

3.7.2 Machining or cutting timber (such as notching cantilevered floor joists) after treatment is not recommended for material at hazard class H3.1 or above, as it may expose the untreated heartwood or less well treated inner timber to an increased risk of decay or insect damage.

3.7.3 When machining of timber after treatment is unavoidable, any cut ends or surfaces should be protected from the weather, and it is advisable to apply an in situ supplementary chemical treatment to the cut surface.

3.8 EFFECTS OF COPPER TREATMENTS ON METAL FASTENERS

3.8.1 The use of copper as a preservative increases the corrosive potential of timber, particularly while still wet or damp following the treatment process and when wet in service. The copper quaternary and copper azole treatment options contain higher levels of copper and have the potential to be significantly more corrosive.

3.8.2 The potential corrosion risk is lessened once the copper compounds have been chemically fixed in the wood and drying is completed. This may take from several weeks to several months depending on the timber section and the weather conditions – slower in cool conditions.

3.8.3 Where copper-based treated timber remains damp in service, the moisture and the presence of copper ions may initiate corrosion, even at fixation of the preservative.

3.8.4 If the timber moisture content can be maintained at no more than 18%, corrosion of metal fasteners is unlikely to be a problem.

3.8.5 To minimise corrosion problems:

- use fasteners with a higher level of corrosion-resistance (copper, silicon bronze or stainless steel) where copper-based treated timber is likely to be continually damp in service – electroplating (electrogalvanising) is not suitable as the coating is too thin
- CCA-treated timber should only be used when the preservative compounds are fixed and the moisture content has reduced to 18%

- for structural uses such as pole houses or for coastal installations, use stainless steel or other equally durable material types.

3.8.6 NZS 3604:2003 clause 4.4.4 covering the durability of fixings in copper quaternary and copper azole-treated timber requires the use of stainless steel in an 'exposed' or 'sheltered' position but permits hot-dip galvanised in 'closed' areas such as roof spaces.

4.0 PRESERVATIVE TREATMENTS

4.0.1 Table 2 of this bulletin summarises the preservative type, hazard class, identification number and colour.

4.1 BORON SALTS

4.1.1 Boron salts can be applied by spray, dip, diffusion or vacuum/pressure processes.

4.1.2 Conventional diffusion has 'green-off-saw' timber briefly immersed in the preservative solution and then left stacked under cover for 4–6 weeks to allow the boron salts to diffuse through the sapwood.

4.1.3 The diffusion process is relatively economic and may be used on timbers difficult to treat by other methods. However, the timber still requires drying and possibly machining following treatment.

4.1.4 Boron salts can also be applied using a pressure and vacuum method to partially dried or dry radiata pine timber. Modern pressure treating processes are low uptake, resulting in drier timber after processing so machining after treatment can be avoided.

4.1.5 Spray or dip processes have also been used to apply boron preservative to dry timber, followed by an activation process (usually with heat) to achieve penetration. These are specialised applications that may have constraints around timber dimensions and the types of formulation, additives and timber products to be treated.

4.1.6 H1.2 boron-treated framing timber is required to achieve a 0.40% m/m boric acid equivalent retention in sapwood cross section and be identified by a pink colour. Amendment 7 to B2/AS1 permits H3.1 boric-treated timber boards at a 0.80% m/m boric acid equivalent retention for fascias, cladding, joinery and other timber components, provided an oil alkyd, modified acrylic or modified latex grey-pigmented coating is applied to all surfaces after treatment and before dispatch from the plant.

4.2 LOSP

4.2.1 LOSP (light organic solvent preservative) is a mixture of fungicides and insecticides in an organic hydrocarbon solvent, typically referred to as white spirits, using low-uptake variants of the pressure process – typically, pressure and vacuum cycles. Treating solutions may also contain colourants, water-repellent waxes, resins and tracers. NZS 3640:2003 Amendment 5 allows the use of dearomatised hydrocarbon solvent as an alternative to white spirits.

4.2.2 Because LOSP treatment does not cause swelling of the timber, it is used for treating manufactured components such as finger-jointed timber, glue-laminated beams, plywood, mouldings and door/window joinery. LOSP treatment of timber after it has been machined to final shape and form also helps eliminate treated wood waste problems.

4.2.3 LOSP-treated enclosed framing timber cannot be used under Amendment 7 to B2/AS1.

4.2.4 LOSP is used to treat radiata pine, and all LOSP treatments are approved for H3.1. CuN LOSP is the only approved LOSP treatment for H3.2 (see Table 2).

4.2.5 It is important to ensure that all solvent has dissipated (there is no noticeable solvent odour) before painting, clear finishing or applying adhesive to LOSP-treated timber.

4.2.6 LOSP-treated substrates are not usually permitted by roofing membrane manufacturers because the treatment may affect long-term adhesion of the membrane to the substrate.

4.2.7 H3.1 LOSP treatment cannot be used for unpainted exterior timber.

4.3 CCA

4.3.1 CCA (copper chrome arsenate) treatment is a waterborne solution of copper, chromium and arsenic salts (or oxides) applied under pressure and vacuum treatment methods. The treated timber has a light greenish colour and over time may weather to a silver-grey colouring. The retention of preservative in the timber varies to meet different hazard classes – increasing as the hazard class number increases.

4.3.2 With CCA treatment, a chemical fixation occurs in the timber and the chemicals become leach resistant when exposed to wetting. Fixation occurs naturally and is achieved by allowing the timber to stand for a period of time – from 3 weeks to over 2 months depending on climatic conditions. Fixation is accelerated with warmer temperatures, such as in summer months, and can be slowed in winter.

4.3.3 Accelerated fixation processes can be used to allow quicker dispatch of timber from the plant and minimise waiting time for the CCA treatment to become fixed.

4.4 COPPER QUATERNARY

4.4.1 Copper quaternary preservatives are waterborne treatments of copper salt compounds in combination with didecyldimethyl-ammonium chloride (DDAC) or a

TABLE 2. PRESERVATIVE TYPE AND HAZARD CLASS IDENTIFICATION				
Generic type	Chemicals/fungicide	ID no.	Colour coding and branding for framing	Applicable hazard classes
Copper-based	CCA oxide (copper 23–25%, chromium 38–45%, arsenic 30–37%)	01		All
	CCA salt (copper 23–25%, chromium 38–45%, arsenic 30–37%)	02		All
	copper quaternary (copper 56–67%, DDAX 33–44%)	90		H3.1[1], H3.2, H4, H5
	micronised copper quaternary[4] (copper 56–67%, DDAX 33–44%)	89		H3.1[1], H3.2, H4, H5
	copper azole (copper 95.8–96.4%, azole 4.2–3.6%)	58		H3.1[1], H3.2, H4, H5
	micronised copper azole[4] (copper 95.8–96.4%, azole 4.2–3.6%)	88		H3.1[1], H3.2, H4, H5
Boric or boron	boron salts (0.4% retention) as boric acid equivalent (BAE)	11	H1.2 pink[1] end or face mark that is a permanent ink mark, an incised mark, a burnt mark or a plastic tag stapled to the timber – every stick of timber must be marked	H1.2
	boron salts (0.8% retention)[2] BAE	11	H3.1 (end or face branded)	H3.1
LOSP	CuN (copper naphthenate)[3]	57	H3.1 no added colour	H3.1, H3.2
	TBTO (tri-n-butyltin oxide)[3]	56	H3.1 no added colour or green	H3.1
	TBTN (tri-n-butyltin naphthenate)[3]	62	H3.1 no added colour or green	H3.1
	propiconazole + tebuconazole	64	H3.1 no added colour or green	H3.1
	permethrin (insecticide only)	70		H1.1
Aqueous azoles	propiconazole + tebuconazole + permethrin	64	H1.2 green end or face branded	H1.2
	propiconazole + tebuconazole + permethrin	64	H3.1 green end or face branded[3]	H3.1

Notes

(1) B2/AS1 Amendment 7 has a minimum requirement of using H1.2 timber that is boric treated for enclosed framing. Treatment of framing to cantilevered deck joists and associated framing is required to be at least H3.2 and cavity battens at least H3.1. H3.1 LOSP or water-based azole treatments are not permitted for timber framing, but water-based azole at higher retention (0.04% propiconazole + 0.04% tebuconazole) is approved for framing.

(2) H3.1 boric-treated cavity battens and external finishing timbers (see paragraph 4.1.6) are required by Amendment 7 to B2/AS1 to be primed before dispatch and to have a specified type of paint coating.

(3) B2/AS1 Amendment 7 does not allow the use of LOSP-treated timber for framing applications.

(4) Micronised copper is 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.

didecyldimethyl-ammonium carbonate or bicarbonate (DDAX) applied to timber using vacuum and pressure methods. This preservative type does not contain arsenic or chromium.

4.4.2 Copper quaternary treatment can be used to achieve hazard classes H3.1, H3.2, H4 and H5.

4.5 COPPER AZOLE

4.5.1 Copper azole preservatives are waterborne treatments of compounds of copper and tebuconazole, a triazole fungicide, applied using pressure and vacuum treatment methods as for CCA and copper quaternary preservative types.

4.5.2 Copper azole can be used for hazard classes H3.1, H3.2, H4 and H5.

5.0 TREATED TIMBER IN USE

5.1 MOISTURE CONTENT

5.1.1 Freshly treated timber may have a moisture content similar to that of green, sawn timber, depending on the treatment process and chemical type. If it has been pressure treated, drying may be more difficult and take longer.

5.1.2 Building Code Acceptable Solution E2/AS1 section 10 restricts the maximum moisture content to:

- 20% for framing for insulated buildings before installing lining
- 24% for framing for non-insulated buildings before lining
- 20% for timber weatherboards and exterior joinery at the time of painting.

5.1.3 Manufacturers of lining materials may recommend lower moisture contents for timber framing, such as 18%. NZS 3602:2003 Table 4 specifies a maximum of 18% for framing timber before lining. Note that the presence of timber preservatives may affect the accuracy of electrical moisture meters.

5.1.4 Solvents used in LOSP treatment must be allowed to fully evaporate (there is no identifiable solvent smell) before coatings are applied.

5.1.5 LOSP-treated materials should not be used in situations where contact with roof and waterproofing

membranes, vinyl flooring, flexible wall underlay or flexible flashing tapes will occur.

5.2 STORAGE

5.2.1 H1.1, H1.2 and H3.1 timber must be stored in dry conditions and protected from wetting. Pre-primed timbers should also be protected from moisture before they are installed.

5.2.2 H3.2, H4 and H5 timber should be stored clear of the ground and protected from the weather after treatment to ensure fixation of the preservative. When timber is supplied wet, BRANZ recommends capturing run-off from newly treated timber on purpose-designed collection pads or a tarpaulin with turned-up edges on the ground.

5.3 DEALING WITH CUT ENDS

5.3.1 Because preservatives may not penetrate the full depth of large timber cross sections, when heartwood is present, specific installation recommendations apply to timber that has been cut, bored or machined after treatment:

- For all H3.2–H6 hazard class timber, site-treat the exposed cut surface with a paint-on water or solvent-based in situ preservative. To ensure good penetration, do not apply the preservative until the wood surface is dry. (This treatment is not as effective as the original factory treatment – avoid cutting treated timber if possible.)
- Boron-based formulations are suitable for timber protected from the weather. Copper and zinc naphthenate preparations in hydrocarbon solvent are preferred for outdoor applications exposed to weather.

5.3.2 Do not embed the site-cut ends of treated posts, poles or piles into the ground.

5.4 HANDLING TREATED TIMBER SAFELY

5.4.1 Once dry, preservative-treated timber is unlikely to cause health problems in normal use, but because treatment chemicals have varying levels of toxicity, take sensible precautions when handling, using and disposing of freshly treated timber.

5.4.2 In general:

- avoid breathing in wood dust from cutting and machining (even with untreated timber)
- use treated timber that is clean, dry and free of surface residues or deposits
- do not burn treated timber waste and off-cuts – burning CCA-treated timber may release toxic arsenic in smoke and ash
- do not use any treated timber for food and feedstock receptacles, toys, barbecues, smoking of meat or fish or for domestic fires
- do not use sawdust or shavings from treated timber under children's play equipment, as garden compost or mulch or for animal litter.

5.4.3 Specific permission may be required from a council to allow treated timber, and CCA-treated timber in particular, to be disposed of at its landfill.

5.4.4 Guidance on treatment chemicals, processes and risk levels may be obtained from the New Zealand Timber Preservation Council website www.nztpc.co.nz.

5.4.5 Recommended precautions when handling all treated timber are:

- wear suitable protective clothing, including gloves, when handling freshly treated timber
- wear protective glasses and a filter dust mask when sawing, sanding or machining treated timber where fine airborne dust is generated
- brush treated wood dust off clothes and skin
- wash hands at rest breaks, after work and before eating
- wash work clothes separately from household laundry.

5.4.6 It is recommended that users of boron-treated timber:

- wear protective clothing, including gloves, when handling freshly treated timber
- wear protective glasses and a filter mask when sawing, sanding or machining treated timber.

5.4.7 Specific requirements when handling unpainted LOSP-treated timber (solvent should have fully evaporated from painted LOSP-treated timber delivered to site) are to:

- remove protective wrapping and store under cover in a well ventilated area
- open packs at least 1–2 days before use to allow solvent to evaporate
- wear gloves and long sleeves – applying a chemical barrier cream to exposed areas, particularly wrists and forearms, is recommended
- avoid working with solvent-damp timber
- wash clothes that have sawdust on them separately from household laundry.

6.0 IN SITU TREATING OF EXISTING FRAMING TIMBERS

6.0.1 Research commissioned by MBIE has shown that boron in a glycol carrier as an in situ remedial treatment is effective in limiting the spread of the early stages of brown rot fungi provided at least two coats are applied by brush to at least three faces of existing untreated or H1.1-treated timber framing and the recommended concentration, application method and coverage rate are followed. The effectiveness decreases if fewer faces of the timber are site treated.

6.0.2 To be effective, ready-to-use remedial preservative treatments need a concentration of active ingredients above a certain minimum. For boron glycol type preservative, a minimum solution concentration of 20% boric acid equivalent (BAE) is recommended. Two generous undiluted coats of preservative treatment should be applied as recommended by

the manufacturer on all exposed surfaces. Using a treatment solution with coloured dye helps to apply it evenly.

6.0.3 For studs where three faces cannot be accessed, a combination of two coats applied by brush and injection of boron glycol into holes drilled into the interface between studs is recommended. The holes should be 6 mm in diameter and 80 mm deep, sloping downwards (at approximately 30° to the horizontal) at 300 mm intervals. 10 mL of treatment solution should be injected into the holes followed by a second 10 mL injection 30 minutes later.

6.0.4 A similar technique can be used on double lintels. Two coats of boron glycol should be applied by brush followed by injection of boron glycol into 6 mm x 45 mm deep holes drilled into the outer lintel 10 mm below the top edge. A drill hole spacing of 100 mm is recommended starting 75 mm from the end of the lintel. 15 mL of treatment solution should be injected into the holes followed by a second 15 mL injection 30 minutes later.

6.0.5 Adhesive tape should be applied to the bottom of the joint before injecting the treatment to minimise treatment running out the bottom of the lintel. One of the main influences on boron coverage is the size of the gap between the two pieces of timber. If the gap is too large, the treatment rapidly runs out with little coverage and penetration. Temporary clamping of the lintel can help minimise this.

7.0 FURTHER READING

STANDARDS

NZS 3602:2003 *Timber and wood-based products for use in building*
NZS 3604:2011 *Timber-framed buildings*
NZS 3640:2003 *Chemical preservation of round and sawn timber* (incorporating Amendment 5)

AS/NZS 1604:2012 *Specification for preservative treatment* Parts 2–5
AS 1604.1–2012 *Specification for preservative treatment – Sawn and round timber*

MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT

Acceptable Solutions
B2/AS1 *Durability* (incorporating Amendment 8)
B1/AS1 *Structure*
E2/AS1 *External moisture*

Building Controls Update No 44 and No 71

Dealing with Timber in Leaky Buildings
A Quick Guide to Timber Treatment for Enclosed Framing

NEW ZEALAND TIMBER PRESERVATION COUNCIL (NZTPC)

Best Practice Guideline for the Safe Use of Timber Preservatives & Anti-sapstain Chemicals

NZTPC factsheets:
- *CCA: Treated Wood*
- *LOSP: Treated Timber*
- *LOSP: Safe Handling and Storage*
- *Boron: Treated Timber*

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