Non-Residential Treated Wood Specifier Guide





MicroPro SPEC





MicroPro SPEC wood products are treated with MicroPro® Micronized Copper Azole (MCA) preservative technology, a revolutionary way to pressure treat wood to provide long-term protection for wood exposed in exterior applications from fungal decay and termite attack. MicroPro SPEC treated wood products can be used in non-residential construction, i.e., agricultural and commercial applications, in above ground, in ground contact and in freshwater contact. Examples include decks, boardwalks, freshwater docks, building posts and poles, round fence and landscaping.

Background

MicroPro Sienna® Treated Wood products have been produced for residential applications in Canada since 2012. The MicroPro Sienna brand of pressure treated wood is the most popular pressure treated wood for residential construction such as decks, fences, gazebos, and other projects around the home. Its environmental certifications, improved compatibility with metal building products, as well as its natural brown colour helped to make MicroPro Sienna the #1 pressure treated wood for residential construction. What has made MicroPro Sienna successful in the residential market has led to an interest by builders for non-residential construction projects. MicroPro SPEC Treated Wood is now available in a limited number of products for non-residential construction such as building posts and poles, landscape timbers, agricultural fence posts, and plywood.

MicroPro SPEC Treated Wood used in non-residential construction is treated to a more rigorous standard and will perform for many decades. Generally, the treatment requirements are greater both in the amount of preservative as well as the depth of penetration. For this reason, many of the wood species commonly used for residential lumber are not approved for treatment for non-residential construction. See Table 1 for details, page 4.

MicroPro SPEC Treated Wood is specifically designed to satisfy the architect, specifier or designer in obtaining the best product for a given application. In most cases, MicroPro SPEC brand pressure treated wood will not be stocked in conventional building material stores. Instead, MicroPro SPEC must be specified for each application.

Understanding the CSA Use Category System – Non-Residential

MicroPro SPEC Treated Wood products for non-residential construction are treated in conformance with the CSA 080 Wood Preservation Standards. The CSA Standard has separate specifications for non-residential products which can be separated into five product groups based on their size, potential for decay, and use (structural or non-structural).

CAN/CSA-080-15 Standard – Wood Preservation contains specifications for treated wood for various uses in Canada using the Use Category System, which is now an accepted international method for specifying treated wood. Essentially the Use Category System or UCS classifies the uses of treated wood according to increasing severity of exposure conditions. All uses of treated wood fall into one of only five use categories as shown below:

- UC1 wood is used in above-ground interior construction and remains dry
- UC2 wood is used in above-ground interior construction but may get wet occasionally
- UC3.2 wood is used in above-ground exterior construction and will get wet and possibly stay wet
- UC4.1 wood is used in contact with the ground or fresh water or within 150 mm of the ground
- UC4.2 wood is used for critical infrastructure including preserved wood foundations*

Uses of treated wood in UC1 are usually very limited in Canada except where termites are prevalent. Wood used in UC2 generally includes such things as millwork and trim, plywood, sill plates and studs. These products are usually treated with an interior wood preservative such as borate for protection against rot, decay, and termites. Most treated wood used in Canada will generally fall into either UC3.2 or UC4.1 which is designed for use outdoors where it is continuously exposed to the weather. MicroPro SPEC Treated Wood is available for use categories UC3.2 and UC4.1.

* MicroPro SPEC is not currently approved for use in UC4.2 applications and cannot be used for critical infrastructure or PWF foundations.



How to Specify MicroPro SPEC Treated Wood for Non-Residential Applications

In order to specify MicroPro SPEC Treated Wood under the Use Category system, three main parameters need to be specified.

- 1. Wood species and sizes
- 2. Use Category UC3.2 or UC4.1
- 3. Type of Preservative MCA

For example, the specification for a non-residential deck for a golf course or commercial patio would include the proper use category, species, and MCA preservative as follows:

- 1. Deck boards (2x6) UC3.2, MCA, LPP (lodgepole pine)
- 2. Joists & beams (2x10) UC3.2, MCA, WWS (western white spruce)
- 3. Deck Posts (6x6) UC4.1, MCA, red pine

How to Identify MicroPro SPEC Treated Wood

All MicroPro SPEC treated wood for use in non-residential applications should be marked with an ink stamp to certify it has been treated to the appropriate CSA treatment specification. The following information should be included on the ink stamp:

- Name of Treating Plant
- CSA Use Category either UC3.2 or UC4.1 and the words Above Ground or Ground Contact
- Preservative Type MCA
- Retention (pcf) either 0.11 for UC3.2 or 0.21 for UC4.1



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Table 1 shows the specific Use Categories and allowable species for MCA for various uses within the CSA 080 Wood Preservation Standard. The species listed for each specific Use Category and product have been shown to demonstrate that they can meet the penetration and retention requirements. Only the species shown in the table should be specified for a particular use for MicroPro SPEC treated wood.

Table 1	Lumber & Timber Building Construction and General Use			Agriculto or Build (Sawn on A	ural, Farm ing Posts II Four Sides)	Round Posts and Poles (Building Posts and Poles incl. Playground Equipment)			
Species	UC3.2	UC4	k.1	UC	4.1	UC4.1			
Thickness		<114mm	>114mm	<114mm	>114mm				
Pines									
Eastern White	•	•	•	•	•				
Jack	•	•		•					
Lodgepole	•	•		•		•			
Ponderosa	•	•	•	•	•	•			
Red	•	•	•	•	•	•			
Southern	•	•	•	•	•	•			
Western White	•	•	•	•	•				
Hemlocks									
Eastern	•	•		•					
Western	•	•		•					
True Firs									
Subalpine	•	•		•					
Balsam	•	•		•					
Pacific Silver	•	•		•					
Spruces									
Engelmann	•			•					
Western White	•			•					
Species Groups									
Hem-fir	•	•		•					
Hem-fir North	•	•		•					
Eastern SPF	•								
Western SPF	•								

Other Important Information for Specifying MicroPro SPEC Treated Wood

Grade Stamps – Almost all 2" dimensional lumber will have a grade stamp or mark from a certified inspection agency. The grade stamp will identify the mill, assigned grade, species or species group, and the condition of the lumber prior to surfacing. The grade stamp indicates the classification according to standard lumber grading rules. Most structural lumber will be No. 2 or better. S-Dry is an indication that the lumber was surfaced in a dry condition and less than 19% moisture content (MC). Most SPF (spruce-pine-fir) dimensional lumber will be S-Dry. An S-Grn designation signifies that the lumber was surfaced above a 19% MC. Some hem-fir structural grades will be marked S-Grn for building construction.

With respect to 4x4, 4x6, 6x6 and greater, these products normally do not contain a grade stamp unless they were heat treated for phytosanitary purposes. Therefore, the moisture content can be anywhere between 19% and 150% depending on when it was processed and how long it has been drying under natural conditions.

Moisture Content – The initial moisture content of the wood is important for successful treatment. This is especially important when specifying treatment of timbers. In order to achieve the best treatment for timbers, the moisture content needs to be 20-25% or just slightly below fibre saturation point (FSP). As well, timbers will inevitably "check" as they dry so it is beneficial to have the checks develop before treatment to ensure they get properly treated. Checking occurs once the moisture content in the wood drops below the fibre saturation point.

Air Drying vs Kiln Drying – Kiln drying of lumber is common for dimensional lumber. However, larger timbers are usually only air dried. Air drying timbers is beneficial because the natural drying improves penetration and allows checking to occur naturally. In addition, for some species such as red pine, penetration is improved due to the beneficial effect of sapstain fungi which inhabit the wood in the drying stage. However, when treating timbers that have not been kiln dried, it is important to inspect the timbers prior to treatment to ensure there is no incipient decay.

Note: Red pine timbers are available in heat treated (KDHT) from the United States. Heat treated timbers are treated to meet phytosanitary regulations to kill infection and insects. They are good for treating because the moisture content is around 25% and the resin is "fixed" in the wood, which means the resin crystallizes in the kiln drying process and has less tendency to bleed in service. Usually a short time of air drying under optimal conditions will allow KDHT timbers to treat almost as well as air-dried timbers at the same moisture content.

Where dimensional stability is also important, treated lumber can be kiln dried after treatment. This is normally specified where precise sizing is required such as for bridge or building construction. Normally kiln drying after treatment is not required. Where it is required, it must be specified.

Note: Canadian softwood plywood can be treated with MCA to either UC3.2 or UC4.1 specification. Typically Hem-fir, D-fir, and SPF Canadian softwood plywood is used. Plywood absorbs a lot of water during the treatment process and swells, so drying after treatment is recommended where dimensional stability is important.

Species considerations – Where maximum performance of the treated wood is required, only treatable species should be used. This is important for timbers especially those to be used in ground contact applications. Generally, all the pine species are more treatable than other species. Red pine is the most treatable Canadian species in eastern Canada, which grows primarily in Ontario and Quebec. Jack pine and lodgepole pine can also be treated to the CSA Standards, though with greater difficulty. For western species, the more treatable species are western white pine, Amabilis fir (pacific silver fir), and western hemlock.

Note: Within the hem-fir species group, the true firs are the most treatable. Within the Western-SPF species group the pines are the most treatable and within the Eastern-SPF species group, only the pines are treatable. If possible, individual species should be specified to ensure the correct species is being provided. For all intents and purposes, species groups should be avoided.

In terms of treatability, the sapwood of most Canadian softwood species is permeable except for spruce, which is resistant. The heartwood of all Canadian species is resistant to preservative treatment. Where maximum treatment is required, a species with a large amount of treatable sapwood is desirable, such as red pine or ponderosa pine. Spruce should be avoided where maximum treatment is desired, especially for ground contact applications. (See *Table 2 – Guide to Specifying Canadian Softwood Lumber for Treatment with MicroPro® MCA for Non-Residential Use*, page 7).

For 2" dimensional lumber, almost all species can be treated with proper incising. However, for timbers, only the pine species can be used as it is difficult to meet the penetration requirements otherwise.

Note: Douglas-fir (D-fir) is a desirable species due to its superior strength properties, availability in large sizes, straight grain, and moderate heartwood durability. However, D-fir can be notoriously difficult to treat because it has a very small sapwood band and the heartwood is resistant to preservative penetration. Where D-fir is specified, it is usually coastal D-fir as it can be treated with preservatives, but it is still difficult. If waterborne preservatives are specified, ACQ and ACZA are the best options to achieve the penetration and retention requirements of CSA. Treating D-fir with MCA is not approved by CSA and therefore not recommended.

Incising – Mechanical incising is required for all species of lumber and timber, except for southern pine, in order to achieve the penetration and retention specified in CSA. Modern mechanical toothed incisors are designed to improve the penetration of the wood by cutting small slits on the surface prior to treatment. The incisions help increase the penetration of preservative mostly in the longitudinal direction. In some cases the penetration can be improved in the radial direction as well. Note: for dimensional lumber incising will reduce the strength properties of the wood. Bending moment and modulus of elasticity will be affected the most with strength reduction in bending of up to 25%. However, for most applications of treated wood, the strength reductions are already built into the span tables. For more information please consult the *Canadian Wood Council Prescriptive Residential Exterior Wood Deck Span Guide*.

Machining – It is important that any machining and drilling be completed before treating, where possible, to ensure untreated wood is not exposed on-site. Pre-machining will increase the longevity of any structure as machining and drilling after treatment will expose untreated wood to decay and insect attack. Where it is unavoidable, all field cuts and bore holes should be treated with a minimum of two coats of copper naphthenate wood preservative. Where it is possible, the following things should be done to avoid premature decay. All cuts should be made on an angle to prevent water accumulation and improve drying. Avoid using fasteners inserted from the top of the board as this creates a source for water to enter the untreated wood.

For more information, visit www.MicroProSPEC.com.

Guide to Specifying Canadian Softwood Lumber for Treatment with MicroPro[®] MCA for Non-Residential Use

Table 2		Ponderosa Pine	Red Pine	White Pine	Amabilis Fir	Western Hemlock	Jack Pine	Lodgepole Pine	Subalpine Fir	Spruce Species
Sapwood ¹ Treatability		Р	Р	Р	Р	Р	Р	Р	Р	R
Heartwood ¹ Treatability		R	R	MR	R	R	R	R	ER	ER
Heartwood² Durability		ND	ND	MD	ND	ND	ND	ND	ND	ND
CSA Minimum Penetration Requirement		63 mm or 85% of sapwood	63 mm or 85% of sapwood	10 mm or 90% of sapwood						
Typical CSA Retention (kg/m³)	Above Ground	1.7 ⁵	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
	Ground Contact	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3 ⁴
Typical ³ Log size, Sapwood Depth and Saw Pattern										
Relative rating for serviceability of treated lumber		Best								Worst
		Heartwood Sapwood								

- 1. P Permeable; MR Moderately Resistant; R Resistant; ER Extremely Resistant.
- 2. ND Non Durable (5-10 years); MD Moderately Durable (10-15 years).
- 3. Larger diameter logs have lower relative sapwood volumes and vice versa.
- 4. Not recommended for ground contact use.
- **5.** Not recommended for decking.

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