

## Treatment process

*Borasmart* insect-and mold-resistant-treated lumber is produced using Boralife's high temperature dip-diffusion impregnation process of a concentrated aqueous solution of sodium borate, a recognized and effective wood preservative having a very low toxicity.

Sodium borate diffuses naturally through wood using water found in wood cells at various moisture contents. Our process takes full advantage of this behavior, minimizing the absorption of more external water that would then need to be evaporated by kiln drying the final product.

Graded kiln dried lumber is used as input for our process.

## Borate Retention

Treated wood meets requirements of American Wood Protection Association (AWPA) Standard U1-19; approved for Use Categories *UC1 Above ground, interior construction, dry* and *UC2 Above ground, interior construction, damp*.

These Use Categories define the associated degree of bio degradation hazard and product service life expectations for specific products and exposure conditions. Provided that exposure conditions are maintained, service life expectation is not limited.

For the NLGA S-P-F species combination, Southern Yellow Pine and Pochote (*Bombacopsis Quinata*) borate retention exceeds 4,5 kg/m<sup>3</sup> (0,28 pfc) (B<sub>2</sub>O<sub>3</sub>), as specified by the AWPA Standard U1-19 for exposure in areas subject to Formosan subterranean termite activity.

## Moisture Content

Moisture content of the final product is less than 19% (w/w).

## Mechanical Properties

*Borasmart* lumber is mostly composed of Balsam Fir and Eastern Spruce lumber all graded under *NLGA Standard Grade Rules for Canadian Lumber* meeting the provisions of PS20 and/or CSA O141, commonly referred to as ALS and/or CLS lumber. Balsam fir and Eastern spruce are produced and distributed under the NLGA Spruce-Pine-Fir species combination (S-P-F).

Design values for the S-P-F species combination and appropriate grade are available for use in Canada in the current edition *CSA O86 Engineering Design in Wood*. Design values are available for use in the USA in the current edition of the *National Design Specification for Wood Construction*. Design values are available for use in the EU in the current edition of *EN 1912 Structural Timber Strength Classes- Assignment of visual grades and species*.

As required by the various design standards, *Borasmart* lumber was evaluated under the following to confirm the treated wood factors.

*ASTM D5664-17 – Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperature on Strength Properties of Fire-Retardant Treated Lumber*

*ASTM D6841-16- Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber*

**Table 1 – *Borasmart* Design Value Adjustment Factors for temperature up to 150°F (66°C) Spruce-Pine-Fir**

	<b>Zone 1a</b>	<b>Zone 1b</b>	<b>Zone 2</b>
<b>Bending <math>F_b</math></b>	0,94	0,94	0,94
<b>Bending MOE</b>	0,98	0,98	0,98
<b>Tension Parallel to grain <math>F_t</math></b>	0,78	0,89	0,98
<b>Compression Parallel to grain <math>F_{c  }</math></b>	0,78	0,89	0,98
<b>Shear parallel to grain <math>F_v</math></b>	0,78	0,89	0,92
<b>Compression Perpendicular to grain <math>F_{c\perp}</math></b>	0,95	0,95	0,95
<b>Fastener/Connector</b>	0,78	0,89	0,90

Zone 1: Where minimum roof live load or maximum ground snow load  $\leq 20$  psf (960 Pa).

Zone 1a: Southwest Arizona and Southeast Nevada (Area bound by Las Vegas, Yuma, Phoenix, and Tucson).

Zone 1b: All other qualifying areas.

Zone 2: Where maximum ground snow load  $>20$  psf (960 Pa).

### Hygroscopic properties

Test procedure: ASTM D3201

Hygroscopic properties are in accordance with AWPA U1-19 Criteria (Interior Type A High Temperature (HT) products). Moisture Content equilibrium  $\leq 28\%$

### Corrosivity

Non-corrosive. Can be assembled with standard hardware.

### Packaging

Bundles wrapped in waterproof canvas.

### Conditions of use

1. All strength calculations shall be subject to the design value adjustment factors shown in Table 1 above.
2. The design value adjustment factors and span ratings given in this datasheet shall only be used for unincised dimensional lumber of the species noted above.
3. *Borasmart* treated wood is limited to interior applications.
4. *Borasmart* treated wood shall not be used in contact with the ground.
5. *Borasmart* treated lumber shall not be ripped or milled as this will alter the surface retention density.
6. Exposure to precipitation during storage or installation shall be avoided. If material does become wet, it shall be replaced.
7. The design value adjustment factors for lumber span in Table 1 above are applicable under elevated temperatures resulting from cyclic climatic conditions. They are not applicable under continuous elevated temperatures resulting from manufacturing or other processes which shall require special consideration in design, which is not in the scope of this technical specification sheet.



## TECHNICAL SPECIFICATIONS SHEET

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