

# STRUCTURAL BUILDING COMPONENTS MAGAZINE

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Western Wood Products Association (WWPA) has provided procedures for the quality control of specific gravity of MSR lumber grades at mills since 1996. Based on our experience and the review of other studies, WWPA has modified the MSR lumber grading rules with the assignment of higher specific gravity values for the MSR grades of Douglas Fir-Larch, Hem-Fir and Spruce-Pine-Fir (SPF) (South) lumber.

This higher specific gravity will allow more efficient use of these MSR lumber products. In addition, this allows the recognition of interchangeable use of U.S. SPF (South) MSR lumber with Canadian SPF of the same grade and size.

Table 1 shows the revised specific gravity values for Western species MSR lumber.

Specific Gravity (oven dry weight and volume)		
Douglas Fir-Larch	2.4E	0.55
	2.3E	0.54
	2.2E	0.53
	2.1E	0.52
	2.0E	0.51
	1.0E to 1.9E	0.50
Douglas Fir-South	1.0E to 2.4E	0.46
Hem-Fir	2.4E	0.52
	2.3E	0.51
	2.2E	0.50
	2.1E	0.49
	2.0E	0.48
	1.9E	0.47
	1.8E	0.46
	1.7E	0.45
	1.6E	0.44
1.0E to 1.5E	0.43	
Engelmann Spruce-Lodgepole Pine**	1.5E and higher	0.46
Spruce-Pine-Fir (South)	2.0E and higher	0.50
	1.8E to 1.9E	0.46
	1.2E to 1.7E	0.42
Western Cedars	1.0E to 2.4E	0.36
Western Woods	1.0E to 2.4E	0.36

\*\*Based on tests conducted by WWPA.

TABLE 1: SPECIFIC GRAVITY VALUES OF WESTERN SPECIES MSR LUMBER (EFFECTIVE OCTOBER 1, 2001)

## KD-HT Grade Stamp

Lumber users will soon be seeing a new mark on gradestamped lumber. Western lumber mills and others are now producing lumber showing a KD-HT mark, indicating that the wood has been kiln dried and heat-treated.

The KD-HT mark was added to meet new European Union regulations for wood pallet and crating materials. The mark indicates that the lumber has been heated to a core temperature of 56°C for a minimum of 30 minutes and is dried to a maximum moisture content of 19 percent.

Many mills are adding the new designation to grademarks. For structural framing applications, including wood trusses, the KD-HT mark can be considered the same as DRY and KD.

## Specific Gravity Values for Western Species MSR Lumber by Kevin Chung

Mills that conduct daily testing for specific gravity as part of their MSR quality control program can show the specific gravity value as part of the grade stamp. The values can be the same as those listed in Table 1, or they can be different.

The tabulated Specific Gravity values may be used to calculate higher Horizontal Shear ( $F_v$ ) and Compression Perpendicular to Grain ( $F_{c\perp}$ ) design values than those used for visually graded lumber. The equations for  $F_v$  and  $F_{c\perp}$  design values are:

$$F_v \text{ (in psi)} = 40 + (266 \times \text{Specific Gravity})$$

and

$$F_{c\perp} \text{ (in psi)} = (2252.4 \times \text{Specific Gravity}) - 480$$

The MSR grading rules changes should expand the choices of lumber products for users such as truss manufacturers. Those using Canadian SPF MSR lumber can now select U.S. SPF (South) products of the same grade and sizes for use in trusses without additional documentation.

WWPA is one of North America's leading agencies in MSR lumber quality control. In addition to its work in MSR lumber, WWPA provides lumber grading and technical support services for a wide variety of structural Western lumber products. Approved by the Board of Review of the American Lumber Standard Committee (ALSC), which operates under the jurisdiction of the U.S. Department of Commerce, WWPA is certified as a lumber inspection and rules-writing agency.

## Specific Gravity Values for Southern Pine MSR & MEL Lumber by Cathy Kaake, P.E.

Five years ago, the Southern Pine Inspection Bureau (SPIB) assigned a specific gravity of 0.57 to Southern Pine Machine Stress Rated (MSR) and Machine Evaluated Lumber (MEL) grades with a Modulus of Elasticity (E) level of 1.9 million pounds per square inch (psi) or higher. Corresponding to a specific gravity of 0.57 is an allowable compression perpendicular-to-grain design value,  $F_{c\perp}$ , of 805 psi, and an allowable horizontal shear design value,  $F_v$ , of 190 psi.

SPIB has now extended the 0.57 specific gravity value to Southern Pine MSR and MEL grades with an E level of 1.8 million psi or higher, as approved by the American Lumber Standard Committee. Specific gravity qualification for those 1.8E grades will be required to support the 0.57 value. When qualified, the 1.8E MSR and MEL grades will also have the corresponding design values of 805 psi for  $F_{c\perp}$  and 190 psi for  $F_v$ .

Southern Pine 1.8E MSR and MEL grades that do not qualify for the 0.57 specific gravity value must show a specific gravity of 0.55 on the grademark. Southern Pine MSR and MEL grades with an E level of 1.7 million psi or lower, and all Southern Pine visual grades have a specific gravity of 0.55 unless the specific gravity is shown on the grademark. Corresponding to a specific gravity of 0.55 is  $F_{c\perp}$  of 565 psi and  $F_v$  of 175 psi.

SPIB published the higher 0.57 specific gravity for 1.8E and higher grades of MSR and MEL in Supplement #19 to the 1994 SPIB Standard Grading Rules for Southern Pine Lumber, effective November 15, 2001. Supplement #19 supersedes Section 600 of the 1994 SPIB Standard Grading Rules for Southern Pine Lumber and previous Supplements.

## Specific Gravity Values for Canadian SPF by Eric Jones

Different values of specific gravity (G), shear  $(F_v)$  and compression perpendicular to grain  $(F_{c\perp})$ , have been assigned to Canadian Spruce-Pine-Fir machine graded lumber, including MSR and MEL lumber, depending on the E grade. The following values are published in the National Lumber Grades Authority's Standard Grading Rules for Canadian Lumber, as approved by the **American Lumber Standards Board of Review** (species = Spruce-Pine-Fir):

Grades (psi)	G	$(F_v)$ (psi)	$(F_{c\perp})$ (psi)
E= 1,800,000 & 1,900,000	.46	160	525
E= 2,000,000 & higher	.50	170	615

The G value for grades that are lower than E = 1,800,000 psi is 0.42. The design values for shear parallel to grain,  $F_v$ , and compression perpendicular to grain,  $F_{c\perp}$ , are identical to those assigned to visually graded lumber of the appropriate species, except where specific grades of MSR or MEL lumber have been assigned specific gravity values, G, different from overall species values, or where the G values are determined on a mill-specific basis and included on the grade stamp.

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**Western Species MSR Lumber:** If you would like more information regarding this article or WWPA please visit the following web sites, [www.wwpa.org](http://www.wwpa.org) or [www.woodtruss.com](http://www.woodtruss.com).

**Southern Pice MSR & MEL Lumber:** To request a free copy of Supplement #19, contact the Southern Pine Inspection Bureau, 4709 Scenic Highway, Pensacola, FL 32504-9094, 850/434-2611, FAX 850/433-5594, [www.spib.org](http://www.spib.org).

**Canadian SPF:**For more information, email Eric Jones at [ejones@cwcc.ca](mailto:ejones@cwcc.ca) or visit Canadian Wood Council web site at [www.cwcc.ca](http://www.cwcc.ca).

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