

Exterior Use of Weyerhaeuser Engineered Wood Products

Occasionally, designers, builders, and authorities having jurisdiction (AHJ) question whether Weyerhaeuser engineered wood products (EWP), including TJI® joists and structural composite lumber are acceptable for exterior use (i.e., outside the building envelope).

Dry Exterior Use of EWP

Except for Treated Parallam® Plus PSL, Weyerhaeuser EWP are intended for dry-use applications. The installation of Weyerhaeuser EWP for end-use applications where the product will be exposed to repeated wetting or permanent exposure to the weather voids any Weyerhaeuser product warranty (excluding Treated Parallam® Plus PSL). However, covered outdoor locations meeting the requirements of the dry-service condition (as defined below) are acceptable. Locations completely protected from precipitation (such as by properly detailed and maintained roof and fascia or watertight deck membranes) are typically considered to be in the dry-service condition. Locations subject to wind-driven precipitation or other sources of water should not be considered as the dry-service condition.

If wood, including EWP, is protected from weathering and direct contact with precipitation, the dry-service condition will be maintained for most locations in North America, even when wood is exposed to outdoor air. **Table 1** shows the estimated equilibrium moisture content (EMC) for sawn lumber exposed to outdoor air but protected from precipitation, based on average monthly climate conditions for several cities across Canada. EMC for Weyerhaeuser EWP will be somewhat lower than sawn lumber due to the effects of hot-pressing during manufacture.

TABLE 1. EQUILIBRIUM MOISTURE CONTENT (EMC) FOR LUMBER EXPOSED TO OUTDOOR AIR FOR CANADIAN CITIES^[1]

City	EMC (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Calgary, AB	10.8	11.0	10.8	9.5	9.6	10.0	10.4	10.6	10.4	9.9	10.7	11.2
Churchill, MB	11.3	11.1	12.6	14.8	16.1	15.0	14.0	14.8	15.9	16.7	15.6	11.8
Edmonton, AB	13.1	13.3	12.7	10.7	10.2	11.9	13.4	13.7	12.9	12.0	14.2	14.6
Halifax, NS	14.6	15.7	13.6	13.6	14.3	14.1	13.8	14.6	14.9	16.1	17.0	16.6
Montreal, QC	13.8	13.1	12.1	11.5	11.4	12.3	12.6	13.5	14.5	13.8	14.7	15.1
Mould Bay, NT	15.6	19.0	14.7	14.1	18.0	17.5	17.0	19.1	20.5	18.3	12.5	14.4
Quebec, QC	12.7	12.8	12.6	11.7	11.1	12.0	13.2	13.8	14.0	13.4	14.6	13.9
Saint John, NB	13.5	13.2	12.8	12.9	13.2	14.1	14.9	14.9	15.3	15.5	15.7	14.7
St. John's, NL	17.1	15.8	16.6	15.7	15.4	16.2	15.8	16.3	16.8	16.6	16.3	17.3
Toronto, ON	15.7	15.2	14.1	12.4	12.4	12.3	12.3	13.5	14.5	14.6	16.4	17.2
Vancouver, BC	17.6	16.5	16.0	14.7	14.0	14.1	13.8	14.5	15.8	18.0	17.8	19.2
Winnipeg, MB	16.6	14.4	15.1	11.2	10.1	12.0	12.9	12.8	12.4	13.0	15.2	14.9
Yellowknife, NT	11.7	11.3	11.0	11.0	9.9	9.7	10.4	12.1	13.8	16.0	14.3	12.5

[1] Source: *Equilibrium Moisture Content of Wood in Outdoor Locations in the United States and Worldwide*. 1998. William T. Simpson. USDA Forest Products Laboratory Research Note FPL-RN-0268.

Dry-service Condition

Weyerhaeuser EWP are approved and warrantied for use under the dry-service condition defined by CSA O86 *Engineering Design in Wood*. This condition will protect EWP from decay and ensure that the strength and stiffness are consistent with the design values published by Weyerhaeuser. Essentially, the same conditions required for untreated sawn lumber apply to Weyerhaeuser EWP.

CSA O86 defines the dry-service condition as “a climatic condition in which the average equilibrium moisture content of wood is 15% or less on average over a year without exceeding 19%.” These conditions ensure that wood members are protected from decay and that the strength and stiffness design values published for the wood products are appropriate without reduction.

Wet-service Condition

Wet conditions will reduce strength and stiffness, increase creep deflection, and cause decay when wood members are subjected to long term or repeated moisture exposure. Use of wood products in the wet-service condition typically requires preservative treatment to resist decay and the use of reduced design values for strength and stiffness. The installation of Weyerhaeuser EWP for end-use applications where the product will be exposed to repeated wetting or permanent exposure to the weather voids any Weyerhaeuser product warranty (excluding Treated Parallam® Plus PSL).

Construction Moisture Exposure

As with all wood materials, Weyerhaeuser EWP should be protected from weather and water exposure as much as possible during storage and construction, and prolonged exposure to water must be avoided. However, some exposure to moisture during storage and construction is anticipated, and all Weyerhaeuser EWP are moisture durable (constructed with exterior grade, waterproof adhesives). Wood members, including EWP, that have been exposed to short-term high moisture conditions during storage or construction should be allowed to dry prior to installation and application of loads. See also *Moisture Effects on Weyerhaeuser Engineered Wood Products and Oriented Strand Board* ([TB-112](#)).

Comparisons with Plywood, OSB, and Glulam

Weyerhaeuser EWP are manufactured with similar wood components and adhesives as untreated glulam, plywood, and oriented strand board (OSB) and have similar requirements for protection from repeated wetting.

**If you have any questions, please contact
your Weyerhaeuser representative.**