## Section 716. — MATERIAL FOR TIMBER STRUCTURES

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Check with landowner agency, Structures and Materials for acceptable preservatives. See “Note” regarding preservative types.

Note regarding preservative types:

This subsection needs to be modified on a project-by-project basis to allow only those preservative treatments which are acceptable to the owner and appropriate for the intended application. Following are some considerations in choosing the appropriate preservative treatment.

Certain species (referred to as "refractory” species) will not take oil borne preservative treatment. These include Douglas fir from east of the Cascades, mountain larch, eastern hemlock, Sitka spruce, and lodgepole pine.

Water-borne preservatives tend to result in more severe checking and splintering of the finished wood. This is largely due to rapid drying before and after treatment. Oil-borne preservatives tend to have less of this problem, in part because the oil residue stabilizes the wood fibers. If water-borne preservatives are to be used, and checking and splintering are a problem, this should be noted in an “advisory” spec to the treater to take special precautions to minimize rapid drying of the wood. Kiln drying will generally exacerbate this problem.

If the treated wood is to be painted, use either water-borne preservatives or oxine copper with Type C solvent (see below). Oil-borne preservatives leave a residue on the surface which prevents paint curing and adhesion.

Pentachlorophenol (Penta): Long history of effectiveness as a wood preservative. AWPA C14 lists its use for all applications except salt water. Depending on requirements of the owner, penta is an acceptable preservative for use where there is not likely to be direct human contact with the treated wood. APWA standards allow for treatment using either “Type A” or “Type C” solvents. There is always some potential for bleeding of treatment after the timber is in service.

Ammoniacal copper arsenate (ACA) & Ammoniacal copper zinc arsenate (ACZA): Both ACA and ACZA are also water-borne preservatives. These are formulations which were developed specifically to give better penetration in Douglas fir. The ammonia increases the solubility of copper and zinc and improves the fixation of these metals in the wood fibers. AWPA C14 lists their use for all applications except glulam treated after lamination.

To avoid corrosion problems with galvanized hardware, it is important that the treated wood be given adequate time for the ammonia and moisture to evaporate and the preservative to fixate in the wood before use. Use of BMP treatment should assure that this occurs.

Chromated copper arsenate (CCA): This is a water-borne preservative. CCA cannot be applied with as much heat as other preservatives. Because of this, and its mechanical and chemical properties, it can be difficult to obtain adequate penetration with CCA in Douglas fir. CCA may be used with Douglas fir for relatively small sized members (2x4, 2x6, 2x8). For larger members, use some other preservative. AWPA C14 lists its use for all applications except glulam treated after lamination.

Ammoniacal Copper Quat - Type B (ACQ-B): AWPA C14 lists its use for most applications except salt water use, timber piles, and glulam treated after lamination.

Copper Naphthenate or Copper-8-Quinolinolate (Oxine Copper): These are both oil-borne preservatives. Neither is listed in AASHTO M133, but they are listed in AWPA C14 for various applications. Copper naphthenate is listed in AWPA C14 for use in all sawn lumber and timber (excludes glulam) except salt water use. Copper Nap is very durable and effective in preventing decay. It can be considered an acceptable substitute to Pentachlorophenol (except in glulam members). Copper naphthenate typically uses "Type A" carrier (light diesel oil) which leaves a slight residue on the wood surface and thus makes this wood unsuitable for painting. Oxine copper is acceptable for use on hand rails, benches, and similar locations where toxicity is a major concern, and the timber is not required to provide long-term structural performance. Oxine copper was developed during WWII to treat refrigeration storage liners. It is very safe for human contact. It uses "Type C" carrier (mineral spirits) which evaporate soon after treating and thus leave a dry surface suitable for painting.