COPPER-BORON GROUNDLINE TREATMENT FOR POLES:
An Update on the Efficacy and Performance of A Copper Naphthenate-Borax Preservative Paste

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ABSTRACT

A wood preservative paste consisting of borax and copper naphthenate has been tested to determine its efficacy and performance in protecting wood in ground contact from decay fungi and insects for a period of over 15 years. The paste was applied to polyethylene-backed wraps that were fastened to the below-ground portions of both seasoned and unseasoned southern pine pole stubs. After 4 years of exposure in Mississippi, in a high decay and high termite hazard zone, the untreated control stubs were completely deteriorated. After nearly 6 years of exposure, the groundline and below-ground portions of the treated stubs remained completely sound due to movement of copper and diffusion of the borate throughout the cross section. Borate and copper also moved vertically in the stubs and was present in sufficient amounts to protect sections of the stubs as high as 3 feet above grade.

After 9 years of exposure, the below-grade portions of the treated stubs had very limited areas of decay and no termite damage; the majority of the cross section remained sound. After 15.5 years, the pole stubs were removed from service and examined visually and measured for cross-sectional soundness. The visual inspection and push test on all treated stubs at 15.5 years indicated that all the stubs treated with the copper naphthenate-borax containing preservative paste were still serviceable. The cross-sectional areas near groundline, where attack had begun to extend from the uppermost untreated sections, had large percentages of solid, sound wood. This paper also reviews and summarizes previously published and unpublished work on copper naphthenate-boron treated wooden posts and results from other testing of remedially treated wood pole stubs.

KEYWORDS: groundline treatment, pentachlorophenol, borax, copper naphthenate, pole, remedial, efficacy, performance

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TABLE 1. Evaluation of untreated pine pole stubs fitted with ground line bandages containing either borate-copper naphthenate or pentachlorophenol after 15.5 years of field exposure in Mississippi.

Disc I.D.		% Sapwood Sound	% Sound cross-section [4]	Cu Penetration[5] (inches)	Comments
Seasoned pine [1]	Cud 6" up (1)	20	20	0	Termite damage
	Cud 6" down	60	60	1-4	Termite damage
	Cud 6" up (2)	70	50	0	Termite damage
	Cud 6" down	90	95	4.25	Termite damage
Non-seasoned pine [2]	Cuf 6" up (1)	60	75	0	No sap decay on one side
	Cuf 6" down	40	50	3-3.5	Outer 1" sound
	Cuf 6" up (2)	100	100	3-4	Outer 3" sound
	Cuf 6" down	100	100	3-4	----
Non-seasoned pine [3]	Penta 6" up (1)	70	40		Termite damage
	Penta 6" down	95	80		Outer 1" sound
	Penta 6" up (2)	90	80		Termite damage
	Penta 6" down	100	60		Outer 1 ½" sound

[1] Poles that received a Cu-Rap bandage after seasoning.
[2] Poles that received a Cu-Rap bandage before seasoning.
[3] Poles that received a Pol-Nu™ bandage.
[4] Percent of sound cross-section at groundline.
[5] Cu-penetration determined by spray indicator (PAN Indicator - AWPA Standard A-3-14-97).