



POLEPRINCIPLES

Guidance for specifying and using preservative-treated wood poles

Preservatives for wood utility poles

Preservative-treated wood utility poles are the backbone of the North American electrical distribution infrastructure. Wood poles are critical in carrying electricity and communications throughout the continent and they must stand up to demanding conditions for decades in place.

Utility poles are subjected to the harshest conditions that nature can dish out, from rain, ice and wind to insects and decay fungi. Preservatives integrated into the poles through pressure, combined with wood's natural resilience, allow wood poles and crossarms to remain in service for 70 years or more.

Most poles are preservative treated with the entire pole placed in a pressure cylinder during processing. But some Western Red Cedar poles may only have the butt, or lower portion of the pole, treated with preservatives.

Enhancing pole durability

Pressure treating with preservatives adds decades to the service life of wood poles. The standards for preservative treating of wood utility poles are set by the American Wood Protection Association (AWPA) and Canadian Standards Association (CSA) in each respective country. These standards define the penetration and retention of preservatives in the wood required for poles.

All preservatives used for utility poles are approved and regularly reviewed by the U.S. Environmental Protection Agency (EPA) and the Canadian Pest Management Regulatory Authority (PMRA). Two types of preservatives are used for wood poles: oil-type and waterborne.

Preservative treating creates a chemical barrier that protects wood poles from decay fungi and insects, allowing them to remain in service for decades. The preservatives are moved by pressure into the wood fiber to provide long-lasting protection.

The following preservatives are most commonly used for treating utility poles:

Penta - Pentachlorophenol

Type: Oil-type **Manufacturer:** KMG Chemicals
Species: Douglas Fir, Hem-Fir, Southern Yellow Pine, Western Red Cedar, Red Pine

Pentachlorophenol, often referred to as penta, is an industrial strength preservative used in wood pole treating since the 1930s. Used extensively in treating Douglas fir poles, penta has achieved a long record of service performance and safe use. The light honey brown color of wood treated with penta adds to its aesthetic appeal.

Penta is effective in resisting fungal decay and wood poles treated with penta have been known to last 70 years or more. Penta has historically been dissolved in diesel oil for pressure treating. More recently biodiesel has been used as a carrier for penta. Biodiesel is also a more sustainable alternative to petroleum-derived diesel fuel since it is produced from renewable sources such as corn and soybeans.

CCA - Chromated Copper Arsenate

Type: Waterborne **Manufacturers:** Koppers Performance Chemicals, Lonza Wood Protection, Viance, LLC
Species: Southern Yellow Pine, Western Red Cedar, Red Pine

CCA has been used in treating Southern Pine and Western Red Cedar poles for many decades. CCA has an extensive record of durable performance for utility poles and is also used to treat products used in agriculture such as posts.

CCA provides effective protection for poles because it chemically "fixes" or bonds to the wood, reducing the chances of potential migration of the preservative into the soil or groundwater. To improve climbability for utility linemen, oil-based emulsion treatments can be added to CCA, allowing for better climbing gaff penetration.

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CuN - Copper Naphthenate

Type: Oil-type **Manufacturer:** Nisus
Species: Douglas Fir, Hem-Fir, Southern Yellow Pine, Western Red Cedar, Red Pine

Copper Naphthenate, also referred to as CuN, is an industrial strength, oil-type wood preservative with proven performance. It has clean handling characteristics and offers good gaff penetration for climbing.

Classified by the EPA as a general use preservative, Copper Naphthenate also is widely applied as a field treatment on end cuts or holes bored into pressure-treated wood during construction. Treatment practices for CuN-treated poles have been refined over the past two decades by manufacturers to ensure the utility poles provide a long service life in demanding conditions.

DCOI - 4,5-Dichloro-2-N-Octyl-4-Isothiazolin-3-One

Type: Oil-type **Manufacturer:** Viance, LLC
Species: Southern Yellow Pine, Douglas Fir, Red Pine

DCOI is the newest oil-type preservative available for utility poles and crossarms. DCOI has been standardized as a wood preservative by the AWPA since 1989 and ground contact uses were added in 2017.

DCOI is a thoroughly tested preservation system, offering a high performance, durable pole. Key components in the preservative are also used in Ecolife treated decking and fencing. In addition to wood preservation, DCOI is used in water treatment, paints and coatings, adhesives, vinyl roof membranes, vinyl flooring, marine upholstery and outdoor furniture.

Creosote

Type: Oil-type **Manufacturers:** Coopers Creek Chemical Corp., Koppers, Inc., Lone Star Specialty Products, Rain Carbon, Inc.
Species: Douglas Fir, Hem-Fir, Southern Yellow Pine, Western Red Cedar, Red Pine

Creosote has been successfully used as a preservative for well over a century. Creosote-treated utility poles have established a documented record of long-term performance and a reputation for safety and reliability.

Through the years, creosote-treated wood has been a high performing choice for preserved wood products, offering a low total environmental impact. Creosote is supported by various multinational corporations who provide product stewardship through technical and research initiatives.

ACZA - Ammoniacal Copper Zinc Arsenate

Type: Waterborne **Manufacturer:** Lonza Wood Protection
Species: Southern Yellow Pine, Douglas Fir, Western Red Cedar, Red Pine

ACZA is commonly known by its brand name Chemonite. Developed by the University of California in the 1920s, ACZA treatment is particularly effective for hard-to-treat species like Douglas Fir.

In addition to utility poles, ACZA preserved wood is often used in aquatic environments, docks, piers and applications where it will be exposed to water. ACZA-treated poles protect against the major causes of wood degradation: decay and termites (including Formosan), marine organisms, carpenter ants and woodpeckers.

Additional preservative information

For additional information, consult the manufacturer website for each respective preservative:

<u>Preservative</u>	<u>Manufacturer</u>	<u>Website</u>
Penta	KMG Chemicals	www.kmgchemicals.com/our-businesses/wood-treating-chemicals
CCA	Koppers Performance Chemicals Lonza Wood Protection Viance, LLC	www.kopperspc.com/products/industrial-products.html www.wolmanizedwood.com/home/products/industrial-preservative-products www.treatedwood.com/products/supatimber
CuN	Nisus Corp.	www.nisuscop.com/wood-preservation
DCOI	Viance, LLC	www.treatedwood.com/products/ultrapolenxt
Creosote	Creosote Council	www.creosotecouncil.org
ACZA	Lonza Wood Protection	www.wolmanizedwood.com/home/products/industrial-preservative-products