

POWERLINE 2021 – Overhead Conference

Advanced DCOI Wood Preservative

AUGUST 11, 2021





Options after penta

- **Creosote**
 - Oldest – set by physical characteristics – all species – all industrial uses
- **ACZA – Ammoniacal Copper Zinc Arsenate**
 - Waterborne
 - Used primarily with Douglas fir in aquatic situations
- **CCA – Chromated Copper Arsenate**
 - Waterborne
 - Used in Southern Yellow Pine (SYP) poles primarily in the southeast
 - Used in aquatic situation
- **CuNap - Copper Naphthenate**
 - Oil borne can be used for Douglas fir and SYP
- **DCOI - 4,5-Dichloro-2-n-Octyl-4-Isouthiazolin-3-One**
 - Oil borne can be used for Douglas fir and SYP

What is the industry's Best Option?

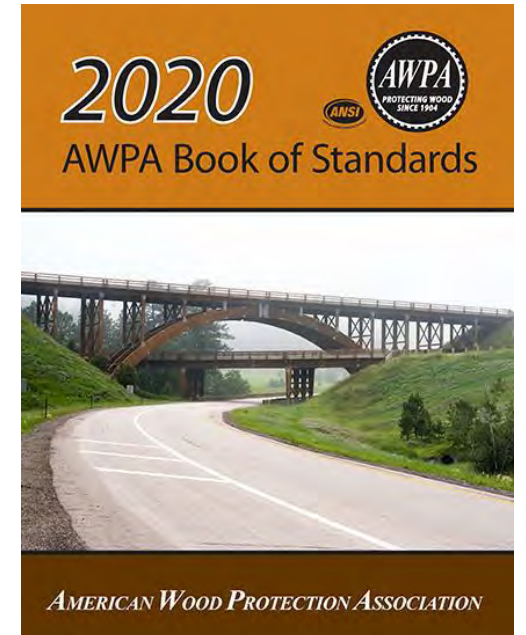


The UltraPole NXT wood preservative (DCOI) system offers the treater, utility, and consumer, a warranted, environmentally advanced and tested system for protecting the wood support structures that bring power to homes and businesses



What is DCOI?

- It is an organic wood preservative
- It is a broad spectrum antimicrobial compound
- It is an AWPA standardized wood preservative listed as P-39 in the AWPA Book of Standards
- DCOI is the first new oil borne industrial wood preservative in decades.

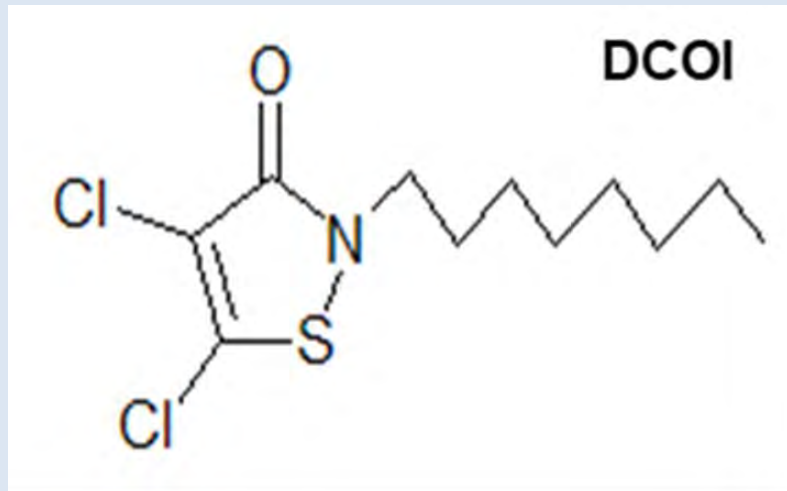


ULTRApole™ NXT

ULRAARM™ NXI

DCOI-what is it?

- 4,5-Dichloro-2-n-Octyl-4-Isothiazolin-3-One



How does DCOI compare to penta?

- A DCOI UltraPole[®] NXT pole looks just like a penta treated pole
- Both preservatives use similar oil solvents as a carrier
- DCOI UltraPole NXT poles climb just like other oil-borne treated poles
- Electrical resistance is comparable to penta poles
- Hardware corrosion rate for UltraPole NXT poles is similar to penta poles
- It is an effective wood preservative like penta – at 1/3 or less retention
- All treated wood poles have a superior life cycle environmental profile than competing materials – DCOI is one step better
- DCOI can be disposed of like other poles-landfills



Effective and Unique

- DCOI is a moldicide used in paints and coatings



industrial microbicide in
brewery pasteurizing and
can warmer systems

- DCOI is an algaecide used in cooling towers

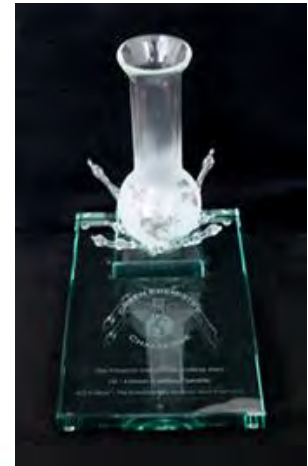


Effective and Unique

- In fish nets, treated wood decks and hulls of ocean going vessels



- DCOI is in drywall, shower curtains and pool liners



Effective

- DCOI is the active ingredient in marine antifouling formulations that won the 1996 US EPA Presidential Green Chemistry Challenge Award
- Decades of stake test data commissioned by Electric Power Research Institute (EPRI) and monitored by Mississippi State University (MSU) indicate it performs well in the challenging environments in sub-tropical plots in Dorman Lake MS and Saucier MS, proving its efficacy as a fungicide & insecticide



UltraPole[®] NXT performance

- Laboratory and long term field testing has demonstrated that UltraPole NXT treated wood is highly effective against decay fungi and termites



- Minimum retention recommendations of 0.04 pcf for above ground and 0.08 pcf for ground contact were **established by AWPA in 1989**
- 28 years** of field stake test data from the study commissioned by EPRI
- This test data used by AWPA to adopt the retentions for poles and cross arms are inherently conservative and provide a significant performance safety factor
- AWPA is the largest collection of wood preservation experts in the world

Evolution of popular Oil Borne Preservatives

- Creosote – 1838 Bethell
 - Contains hundreds if not thousands of chemicals – WHO
 - Only preservative that AWPA specifies by physical character rather than chemical constituents
- Pentachlorophenol - developed in Germany in 1930's
 - Technical grade penta is:
 - 86% technical grade penta
 - 10% other chlorinated phenols
 - 4% other
- Copper Naphthenate – standardized in the AWPA in 1988
 - Copper
 - Mix of different natural and synthetic acids
- DCOI - standardized in the AWPA in 2017
 - Virtually 100% DCOI

Environmental Impact

- DCOI is a metal free preservative (no zinc, copper, arsenic, chrome)
- Lower retention (1/3 of penta)
- The active ingredient, DCOI, used in UltraPole NXT poles is also used for residential treated wood – Ecolife[®]
- End of life use as a co-gen fuel offers an alternative to increasingly regulated and expensive land fill costs
- Pilot scale burn tests showed no hazardous compounds produced in co-gen conditions
- A description of material characterization of DCOI has been submitted to EPA for the approval of DCOI treated wood as a co-gen fuel
- Not a restricted use pesticide





Environmental Impact- Soil

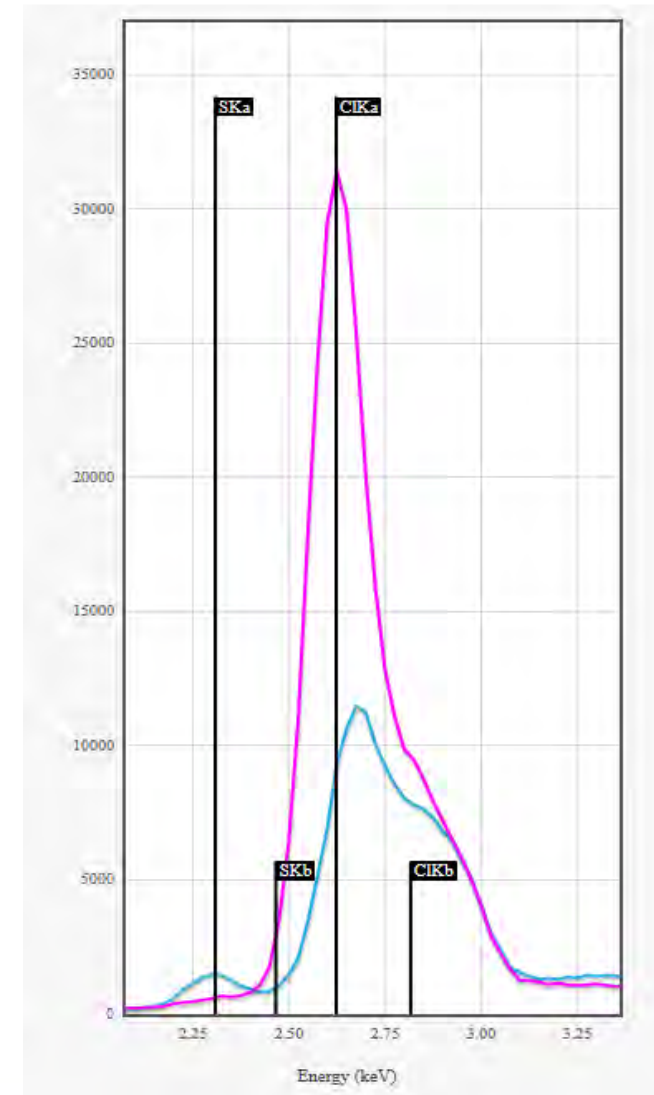
- **DCOI is non-persistent in the soil, breaking down to simple compounds**
 - Due to its biocidal nature, DCOI is not suitable for biodegradation testing under standard protocols
 - OECD 303A simulation studies have shown however that dissipation half life in soil is very short - 4.7 days
 - Cleavage of the isothiazolone ring results in reducing the DCOI into 4 metabolites that are significantly less toxic than DCOI (2-5 x less)
 - As a result the risk assessment for DCOI includes risk assessment of its metabolites.

Environmental Impact-Water

- DCOI has low water solubility of ≤ 5 ppm
- DCOI removed from waste water by wastewater-treatment facilities.
- Dissipation half life is reported to be:
 - 4.7 days in soil
 - 16.5 hours in surface water
 - 0.17 days in sediment
- DCOI has a mean Koc of 6610 L/Kg - Soil Absorption Coefficient
 - A very high value means it is strongly adsorbed onto soil and organic matter and does not move throughout the soil.

DCOI in Oil - End of Life Disposal

- New technology allows for a quick determination of treated wood preservative so that DCOI treated poles may be separated from other oil borne treated wood
- Hitachi handheld



Utility Benefits

Usability

1. No design changes
2. No strength differences
3. No corrosion differences
4. No climbability differences
5. No conductivity increase
6. Non-Hygroscopic
7. No specie differences
8. **Low odor – oil dependent**
9. **Similar:**
 - Appearance
 - Handling
 - Weight
10. **Line workers will be handling material treated with a non-restricted use pesticide.**



Treater - UltraPole NXT Value Proposition

- UltraPole NXT provides the treater the opportunity to be the only supplier to offer its customers the preferred support structure- the wood pole, protected with the tested, **environmentally-advanced preservative system** that lowers their own regulatory burdens.
- UltraPole NXT utilizes a standardized, award-winning preservative active ingredient and combines it into a system that **integrates easily into today's oil-borne treating plants** and production processes.



ULTRApole[™] **NXT**

Consumer

UltraPole NXT Value Proposition

- UltraPole NXT provides the consumer with confidence that their electricity supplier is using the **most environmentally-advanced and reliable** materials to supply their everyday power needs.
- UltraPole NXT offers tested protection for the grid that supplies them everyday while reducing the impact on the environment by lowering toxicity and the burdens on landfills at the **end of the life** of the product, at a very minimal cost over the life of the pole.
- UltraPole NXT provides the consumer the comfort of knowing that the same **safe active ingredient** that is used on their backyard deck, is in the utility pole in their front yard.

SYP Treatments

Poles treated with:	Creosote	Penta	CCA	Cu Naph	DCOI
Easy to climb	Yes	Yes	Not w/out additive	Yes	yes
Treated with a Restricted Use Pesticide	Yes	Yes	Yes	No	No
Contain heavy metals (Copper or Arsenic)	No	No	Yes	Yes	No
Is Low to no odor	No	No	Yes	No	Yes
Active ingredient also used in residential applications	No	No	No	No	Yes
Contain dioxins or Furans	No	Yes	No	No	No
Protected with a Warranty	No	No	Yes	No	Yes
Contain PAH's (Polycyclic Aromatic Hydrocarbon)	Yes	No	No	No	No
American Wood Protection Association (AWPA) Standard Retentions (SYP UC4C) Book of Standards pcf – pounds per cubic foot	9.0 pcf	0.45 pcf	0.60 pcf	0.13 pcf cu (cu is 11.75% of cunap molecule) Preservative 1.1 pcf	0.15 pcf

Specifying DCOI

SYP	UC4A	UC4B	UC4C
PENTA	0.30 pcf	0.38 pcf	0.45 pcf
DCOI	0.10 pcf	0.13 pcf	0.15 pcf

Brand or Tag

Suppliers Brand	Penta	DCOI
Plant Designation	A	A
Year & month of treatment	09-20	09-20
Species & Preservative	SPPA	SPDA
Retention	45	15
Class & Length	5-30	5-30



Poles in place in Ohio



RUS Standards

- **Norris W. Nicholson**
- **Chair, Technical Standards Committee A**
- **Office of Customer Service & Technical Assistance, Rural Development**
- **United States Department of Agriculture**
- **1400 Independence Avenue, SW**
- **Washington, DC 20250**
- **Phone: 202.720.1979**
- **www.rd.usda.gov**
- **norris.nicholson@usda.gov**

UltraPole – DCOI Treaters

- **Brooks Manufacturing Co. – November this year**
- **Hughes Brothers, Inc. – later this year or early next year – when penta allotment is gone**
- **WC Meredith – has DCOI capability now – all DCOI by year’s end**
- **Stella-Jones**
 - **Pineville LA – has converted a cylinder to DCOI**
 - **Arlington WA – has treated DCOI and has capability to switch back and forth**
- **Huxford Pole – converts to DCOI next month**
- **Baldwin Pole – plans to begin converting next month**
- **Other companies have indicated they will begin to treat with DCOI when their penta is supply is exhausted**

For more information on DCOI

- Type “UltraPole NXT” or
- Go to <https://www.treatedwood.com/>
- Or contact Bob Baeppler
 - Email bbaeppler@viance.net
 - Phone 704-497-0592
- Or to be put on a mail list for monthly updates contact Edie Kello
 - Email ekello@viance.net
 - Phone 704-905-4726

Thank you

Go to <https://treatedwood.com/utilities>

