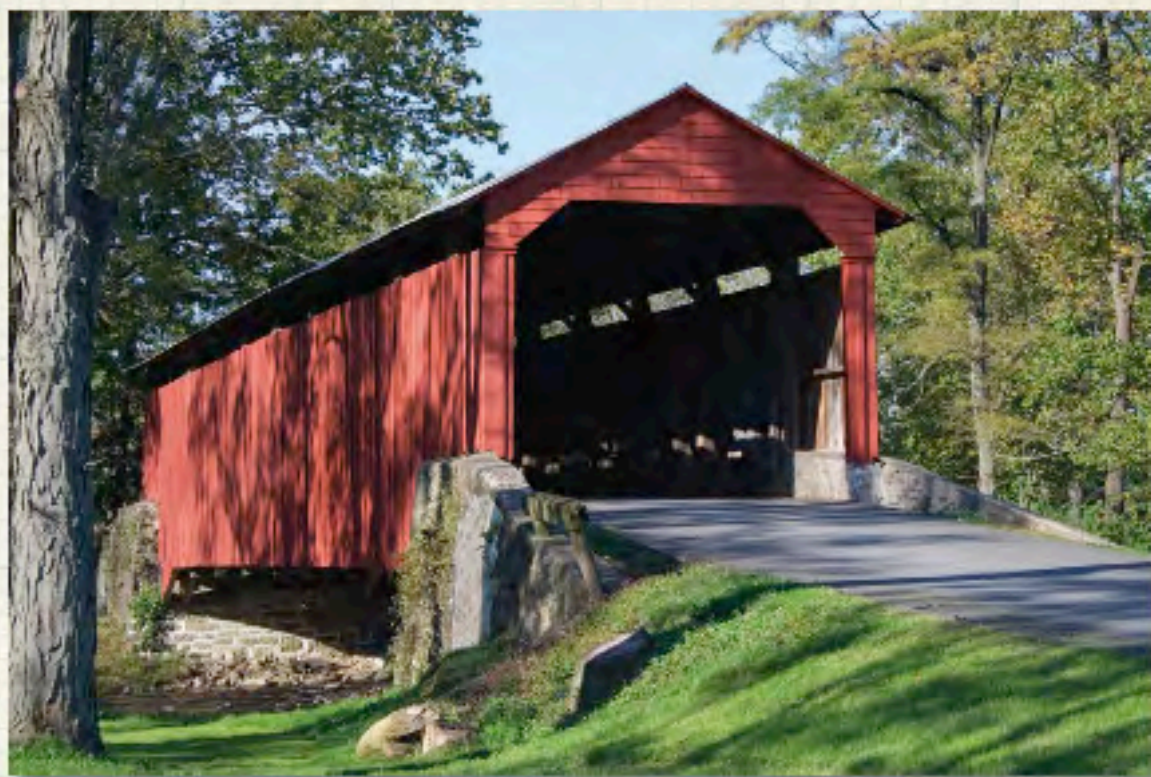


COVERED BRIDGE TECHNICAL BULLETIN

BORA-CARE®

For Wood Preservation and the Prevention & Control of
Wood Destroying Organisms in Covered Bridges



Nisus
CORPORATION

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BORA-CARE® TECHNICAL BULLETIN: COVERED BRIDGES

Preservation of wood frame buildings and prevention of wood destroying organisms (including powderpost beetle attack) in covered bridges.

(ALWAYS READ AND UNDERSTAND LABEL DIRECTIONS COMPLETELY BEFORE ANY APPLICATION.)

Introduction: Bora-Care will help prevent powderpost beetles as well as other listed wood boring beetles, subterranean termites, carpenter ants and wood decay fungi from infesting wood. Bora-Care is an exceptional wood preservative and helps prevent wood rot. Bora-Care may be used on all cellulosic materials including wood, plywood, particle board, paper, oriented strand board (OSB), cardboard and wood composite structural components. It also can be applied to concrete block, metals, PVC plumbing pipes, and other non-cellulosic materials.

Bora-Care Characteristics: Bora-Care is packaged as a water-soluble, liquid concentrate that contains 40% Disodium Octaborate Tetrahydrate (DOT) active ingredient and proprietary penetrants that enhance penetration and absorption into wood. Once applied to the wood, Bora-Care will not degrade or volatilize.

General Statement: Bora-Care may be applied as a primary treatment during the construction process of new bridges or to existing bridges. Treat all wood members with a Bora-Care 1:1 solution for prevention of wood destroying organisms, including termites and powderpost beetles. Treat all sides of wood, interior and exterior joists, trusses, rafters, all flooring any cement footers, all studs, floor decking and appropriate siding. If three or more sides of the wood are not available, then apply two applications to available sides. Refer to the architect's blueprint to determine total board feet of the structure and apply the Bora-Care 1:1 solution at the rate of 1 gallon

per 400 board feet of wood or 400 square feet of surface area.

COVERED BRIDGE TREATMENTS

Amount needed: The quantity of Bora-Care needed remains the same whether applying one application to all sides of the wood or applying two applications to two sides. Use

square feet or board feet to determine how much product is needed for proper application. Measure the square footage of all sides of the timber to be treated (not the square footage of the bridge itself), then divide the total square footage of all surfaces by 400. This will tell you how many finished gallons of solution are needed to treat the bridge. If you are using the total board feet, divide that by 400 also.



Mixing Bora-Care: Bora-Care concentrate must be mixed with water as a 1:1 volume solution. To mix any solution, add 3/4 of the amount of the water into pail/tank and begin mechanical agitation while gradually adding the required amount of Bora-Care. Use remaining water to triple-rinse the Bora-Care container(s), and add final rinse solution into a pail/tank. Mix until a smooth one-phase solution is created. Only mix enough Bora-Care 1:1 solution needed for each day's application. Do not store the 1:1 solution in the spray tank or other container for more than 12 hours. Use the TrueTech® 2000 PowerCart sprayer or a mechanical pump spraying unit with good agitation. We recommend using an 8002 spray tip.

Covered Bridge Treatment: Bridge Ties and Piers, Cement Footers, Concrete-Masonry

Foundations, and Roof Sheathing: Treat **ALL** construction components. This includes floor joists and all wood and cement in contact with foundation inserts, including both internal and external trust, joist, and any supporting protrusions and joints.

TREATING WOOD WITH ORGANIC BUILD-UP

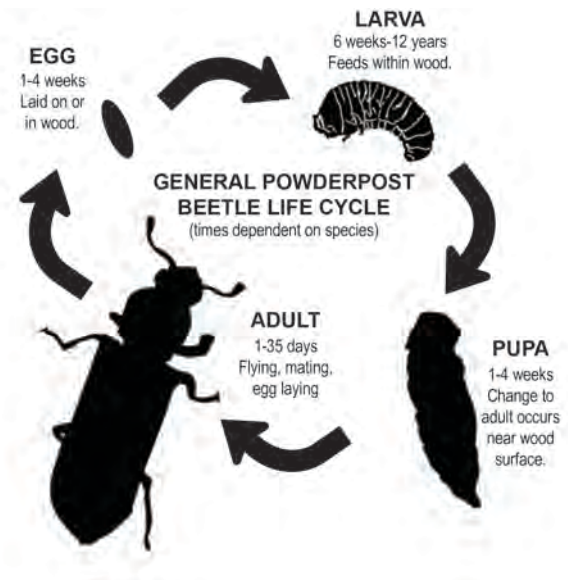
Existing bridges tend to have accumulated organic build-up on the wood. Bora-Care may be applied to the surface build-up. Bora-Care will not kill surface mold, but will penetrate enough for powderpost beetle prevention and remediation. If desired, surface organic material including fungi stains can be removed with Nisus Corporation's Mold-Clean® product.

POWDERPOST BEETLE OVERVIEW

Wood boring beetles are a major cause of structural damage. Some attack softwoods, others hardwoods and some both. Due to their ability to turn wood into powder, many different kinds of wood beetles are referred to as "powderpost" beetles. Lycidae ("true" powderpost beetles), Ptinidae (formerly Anobiidae), Bostrichidae ("false" powderpost beetles) and old house borers are responsible for much of the beetle damage to structural wood. If an active infestation is found in a building, all wood should be carefully inspected for further signs of infestation. Exit holes indicate that adult beetles have emerged and will continue to reinfest unless treated. Wood boring beetles have varying life cycles that include egg, larva, pupa and adult stages. Eggs are laid on bare, unfinished wood, either on the surface, in cracks or in constructed tunnels.



Lycidae: "True" powderpost beetles usually infest only hardwoods. Their short life span, large initial populations and high survival rate mean overlapping generations that reinfest, resulting in rapid and expensive damage. The larvae are responsible for all damage and feed entirely within the wood; however, most infestations are not discovered until adult beetles emerge through the wood surface.

Ptinidae: Ptinidae beetles attack both hardwoods and softwoods but are generally found in softwoods. They prefer wood of slightly higher moisture content. The cycle of reinfestation can occur within one to two years. This group of beetles is a more likely candidate for attacking older bridges.



Bostrichidae: Originally a tropical pest, false powderpost beetles are now found throughout North America, especially in the mid-Atlantic region and Florida. They mainly attack seasoned hardwood, but will also infest softwood with high levels of moisture and starch. Both adults and larvae feed on the infested wood.

Old House Borers: These beetles are generally found east of the Mississippi River. Typically infesting newer structures, they prefer recently seasoned softwood. borers feed only in pine, spruce, and other coniferous woods. Depending on conditions, damage may not be detected until adults emerge four to twelve years after the initial infestation. Older larvae can often be heard feeding, frequently the first alert of their presence. The majority of borers will be present in the thicker timbers of a bridge and are usually localized. They are rarely found in wood members less than one inch thick.

BEETLE TYPE	TUNNEL/ EXIT HOLE SIZE & SHAPE	DESTRUCTIVE STAGE	TYPICAL LIFE CYCLE	FRASS / PREFERRED WOOD TYPE
Lyctidae (True Powderpost Beetles)	• • • Round 1/32"-1/16"	Larva	3-12 months	Loosely packed with very fine, talc-like powder. Hardwoods.
Ptinidae (Deathwatch Beetles)	• • • Round 1/16"-1/8"	Larva	1-3 years	Loosely packed with fine to coarse powder with oval, gritty pellets. Mostly softwoods.
Bostrichidae (False Powderpost Beetles)	 Round 1/8"-3/8"	Larva and adult	~1 year	Fine to coarse and tightly packed. Tends to stick together. Mostly hardwoods.
Old House Borers	 Oval 1/4"-3/8"	Larva	1-32 years (normally 3-10 years)	Tightly packed with coarse powder often formed into small pellets. Softwoods.

NOTE: Illustrations of holes are actual size.



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Remember, always read, understand and comply with the label.