



ENVIRO STAIN®

# IMPEL BORON RODS

**DESCRIPTION** The Impel®Rod is a highly concentrated solid formed, water-diffusible borate rod created from compounds of boron, a naturally occurring preservative element. The rod combines with water to become boric acid, which has long been recognized as a natural inhibitor of decay-causing fungi and insect infestation. Once the Impel rod is inserted into damaged log ends, it remains inactive until moisture in the wood increases at which time it slowly dissolves and the moisture stream carries this fungicide along the wood fiber paths to saturate the rotting areas. When the wood dries and moisture levels drop below approximately 25%, the preservative becomes dormant and provides a reserve that is ready to reactivate should decay-conducive conditions reoccur.

### APPLICATIONS

Impel®Rods offer the only effective decay control system that protects logs internally. They are ideal for both preventative treatments of high-risk areas and remedial treatments in areas with existing decay fungi and wood-destroying insects. They are not recommended for food-contact wood. Impel®Rods combined with periodic wood preservative treatment will halt the rate of wood decay in log homes but they cannot repair any damage that has already been done. The plugs should be removed and their status checked every 3 to 5 years to see if replacement is necessary. Impel rod effectiveness can be greatly enhanced if wood surfaces are sealed with a water sealant or water repellent stain

### PRODUCT BENEFITS

- the most cost-effective measure that can be taken to protect log and timber structures against decay
- “user friendly” and environmentally acceptable
- highly toxic to fungal decay and many insects at concentrations that are not poisonous to humans or other mammals.

### CHARACTERISTICS

The Impel®Rod remains dormant until the moisture levels in the wood reach about 25%, the level where conditions are ripe for wood rot. Contact with water activates the rods and they begin to diffuse and slowly deposit boric acid crystals throughout the surrounding wood. Wood is composed of millions of porous cells comprising an intricate vascular system that is both the cause and solution to log decay; it is this vascular system that allows for efficient transportation of boric acid. As moisture enters the

log ends, the boron rod combines with the water and naturally gravitates to those areas with the highest moisture content - the areas most affected by wood decay fungi. The Impel rods contain 100% Anhydrous Disodium Octaborate equal to 1.5g of Boric Acid per gram of rod.

Rod Dimensions (mm)	Net Weight of 1 Rod (grams)(± 6%)	Corresponding Weight of Boric Acid per Rod
8 x 65	6.9	10.0
12 x 100	24	36
18 x 75	40	58

### Active Ingredient:

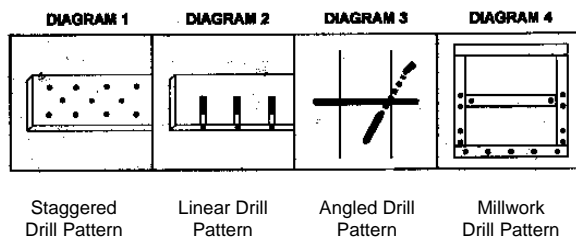
Anhydrous Disodium Octaborate (NA <sub>2</sub> B <sub>8</sub> O <sub>13</sub> ).....	100%
Inert Ingredients: .....	0%
Total: .....	100%

### PREPARATION

There are 3 steps to install Impel®Rods:

1. Drill appropriate sized holes to accommodate the rods. Drill holes should be about 1/16” greater in diameter than the rods for a snug fit. This ensures diffusion in all directions.
2. Insert Impel rods into the holes. They may be positioned in a variety of ways depending on access and owner preference. A drilling pattern that is least conspicuous may be selected for aesthetics. (see diagrams 1 through 4)
3. Seal the holes with wooden dowels, wood filler, or caulk. A minimum of 1/8” (2-3mm) head space should be left between Impel rods and the hole plug or cap to allow for rod expansion. The covering may be stained or sealed.

## HOW TO POSITION IMPEL RODS IN WOOD



### APPLICATION METHODS

Placement into the very heart of wood offers superior protection over brush-on or spray type wood preservative treatments. All areas where wood is exposed to water are at high risk, such as in soil, concrete, and other places that retain moisture. Impel®Rods can be inserted through any wood surface, depending on access, in either a staggered or linear pattern, see diagrams 1-4 above. First, calculate the total cubic feet of wood to be treated with Impel®Rod. For best results, linear spacing *along* the grain should be between 8" and 18" intervals. And since diffusion *across* the grain is more limited and there is a higher risk of attack, spacing should be at 2" to 6" intervals. It is important to understand that spacing depends upon the size of the Impel rod, the dimensions of the wood, and the volume of wood to be treated. If log ends have badly deteriorated, it would be best to trim an inch or more off the timber. After the rods are inserted, this exposed log end should be well treated with a water-repellent wood finish. Precautions should be taken when used in structural timber as holes drilled in critical positions may seriously weaken the structure. Advice should be obtained from a qualified engineer where remedial treatment of load-bearing timber is required.

### COVERAGE

The rate of application for Impel®Rods is equivalent to 6.0kg of Boric Acid per cubic meter of wood (6oz per cubic foot).

### STORAGE

Store in original containers, tightly closed and in a safe place. Do not allow freezing

### SAFETY

See Material Safety Data Sheet (MSDS)

### WARNING TO USERS

Keep out of reach of children. Keep away from animal feed-stuffs. Before determining the most appropriate product it is necessary to specifically identify the source of the problem, so that the best method of treatment can be applied. Technical advice of this nature is available from your supplier or your local Technical Agent. The information contained in this document is given in good faith based on our current knowledge. The use of the product is beyond the control of The Sansin Corporation, and no guarantees, expressed or implied, are made as to the result to be obtained if not used in accordance with the published Directions for Use. The Sansin Corporation does not assume any legal responsibility for use or reliance on same. This information must on no account be used as a substitute for necessary field tests, which alone can ensure that the product is suitable for the expected use. Before using any product, read its label.

September 2009

# Frequent Inspection Means Greater Protection

The best protection is periodic inspection for signs of decay. Look for wood deterioration, discoloration, and fungal growth when examining a structure's interior, exterior, attic and crawl space/foundation. Utility buildings, decks, fencing, and other wood structures should also be inspected.

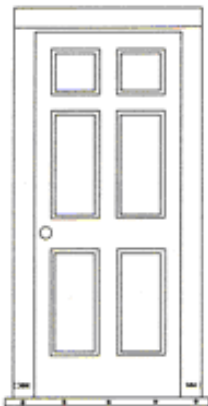
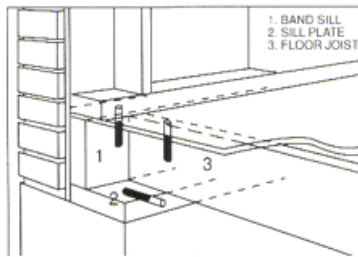
Since moisture is a leading cause of decay closely examine structural areas where there may be:

1. Soil contact
2. Frequent rain
3. Rain seepage
4. Water flow from roof
5. Splashing rain
6. Water collecting against wood
7. Plumbing leaks
8. Condensation

All areas where wood is exposed to water are high risk, such as in soil, concrete and other places that retain moisture. These high exposure areas include:

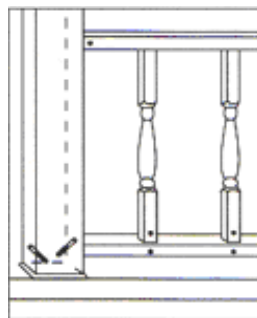
## Flooring and Foundation Systems

The greatest risks for decay are at exposed wood ends and at wood joints where moisture is more readily absorbed than on side surfaces. These areas are especially at risk in wood construction under kitchens and bathrooms where leaky plumbing, deteriorated caulking and inadequate moisture barriers may be common. Other areas of concern are where joists rest on block piers, at band sills around dirt filled porches; at untreated deck headers and at foundation sites near chimneys. To protect these areas, install IMPEL Rods as shown within 6 inches of wood ends and at recommended spacings thereafter.



## Window and Door Framing

Anywhere weathering of paint and exposure has occurred, especially at the bottom of windows and doors, is at risk of decay. Other areas include the base of garage doors and crawl space access doors and their frames. For Protection install IMPEL Rods as shown.

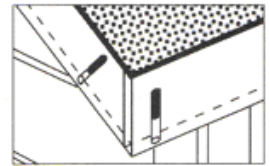


## Exterior Steps Porches and Decking

Install IMPEL Rods as shown in posts, rails, wood ends, joints and trim. Hollow columns can be protected by installing rods through the thickest edges of side pieces

## Roof Trim and Facia

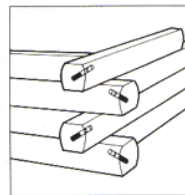
Facia boards supporting gutter systems and soffits are especially vulnerable to decay attack. Install IMPEL rods within 6 inches of corners (as shown) And at recommended spacings thereafter. Also protect areas where trim is in contact with skylights, vents, chimneys and where excessive moisture is common.



## Roof and Attic

Install IMPEL Rods where leaks have caused water damage to support members and rafters.

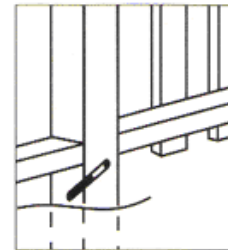
## Log Construction



IMPEL Rods should be installed (as shown) in corner areas, lower courses of logs, joints or wherever logs are not protected from the elements.

## Poles and Posts

Where moisture may cause decay; especially in building and foundation poles and farm and residential fence posts.



If the wood's structural integrity has been damaged to the extent that repair or replacements should be made and the source of moisture should be reduced or eliminated. Inspection should also reveal areas where potential damage can occur. In either case, the application of IMPEL Rods in the appropriate step to preserve wood integrity.

IMPEL Rods are easy, low-cost and EPA approved as a decay protection and prevention system for wood. They have an appearance similar to glass rods and are available in a variety of sizes for a wide range of applications.

# IMPEL<sup>®</sup>

## RODS

## Log And Timber Structures

### Use And Applications Guide

*IMPEL<sup>®</sup> Rods offer a unique and effective preservative system for the prevention and control of internal decay in log and timber structures. They are a EPA approved, low-cost, environmentally responsible alternative to potentially hazardous brush or spray-on preservatives. IMPEL Rods can easily be applied at the time of log production, building construction or in existing log structures.*

IMPEL Rods are manufactured as a highly concentrated, solid form, water-diffusible borate rod. Their placement into the very heart of wood offers superior protection over brush-on or spray type wood preservative treatments. Where paints or water repellents prevent the penetration of subsequent liquid preservatives, IMPEL Rods offer the only effective decay control system that protects logs internally. They depend upon moisture to be activated and diffuse very slowly to provide a controlled and long-lasting release of borate preservative in strategic areas.

IMPEL Rods are ideal for both preventive treatments of high risk areas and remedial treatments in areas with existing decay. Because IMPEL Rods stop decay when properly used, there's no need to replace decay damaged, yet structurally sound, logs. On average, this can cost more than \$150 a lineal foot. That's why IMPEL Rods are the most cost-effective measure that can be taken to protect log homes against decay.

Decay prone and rot hot spot areas at greatest risk include: base logs, corner construction, exposed rafters or overhangs, and below windows, doors or dormers. Diagram 1 highlights those areas in a typical log home that are at highest risk for decay and most appropriate for treatment with IMPEL Rods.

### Installation Details

There are three easy steps in installing IMPEL Rods: (1) drill appropriate sized holes to accommodate the rods; (2) insert IMPEL Rods into the holes; and (3) plug

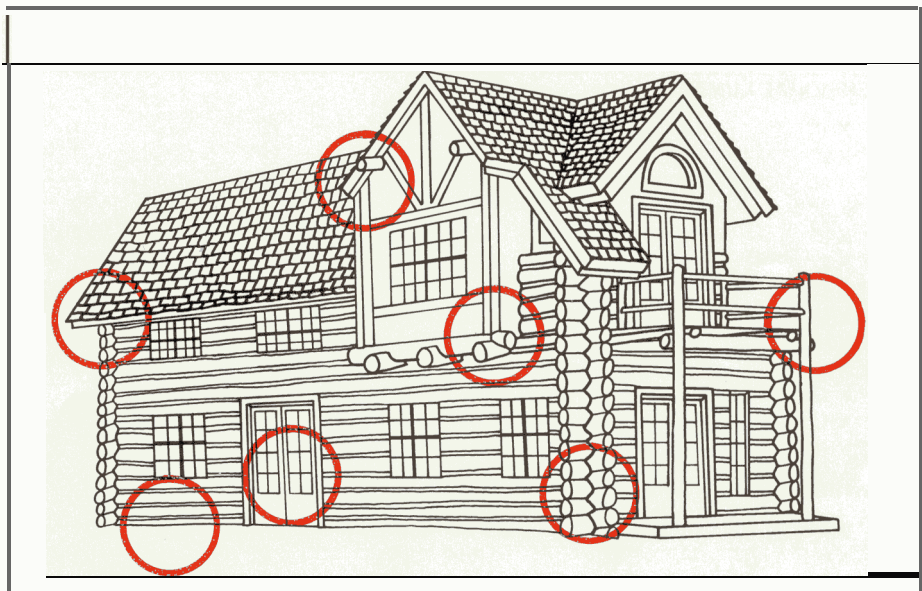


Diagram 1 Typical Log Home Rot "Hot Spot" Areas

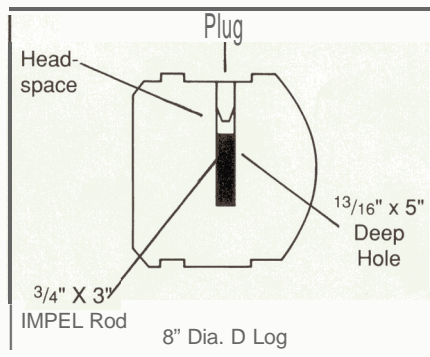
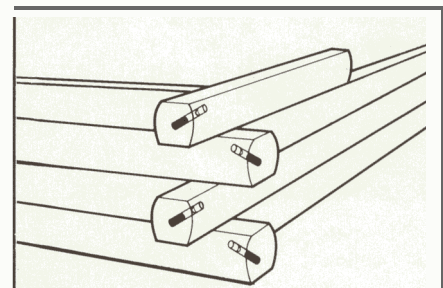


Diagram 2 Typical Installation Detail

the holes with wooden dowels or caulk. Drill holes should be about  $1/16$ " greater in diameter than the rods for a snug fit. This ensures diffusion in all directions. Also, a minimum of  $1/8$ " head space should be left between IMPEL Rods and the hole plug to allow for rod expansion. See Diagram 2 for an illustration of these details. The recommended application rates for various sizes of logs and timbers are found in Table 1.

IMPEL Rods may be positioned in a variety of ways depending on access and



IMPEL Rods positioned into holes drilled 6" from log end, 45° angle to top of logs.

Diagram 3 Typical Butt and Pass Corner

owner preference. A drilling pattern that is least conspicuous may be selected for aesthetics. Diagram 3 shows how IMPEL Rods may be positioned in a typical butt and pass corner section. Although corner construction details vary widely, IMPEL Rods should be placed about 6 inches from the end of each log and perpendicular to the wood grain, as shown.

In base logs, install IMPEL Rods 6 inches from each end and at the recommended spacings along the log. In

rafters and overhangs, install IMPEL Rods 6 inches from each exposed end and at the recommended spacings.

## Preservative Diffusion: How It Works

IMPEL Rods depend on moisture to work. When moisture contents reach levels suitable for decay attack (i.e., around 25 percent), IMPEL Rods slowly dissolve and begin to diffuse throughout the wood.

The rate and extent of diffusion is

mainly dependent upon the wood moisture content. The preservative will migrate into the areas of highest moisture, which are also the areas at highest risk from fungal decay. Generally, higher moisture contents result in more rapid diffusion. Diffusion is also more rapid along the wood grain and in wood where decay is present than across the grain. Remedial treatments can effectively stop decay up to 12" from the site of application in relatively short periods of time. At moisture contents of 60 percent, borate preservative can migrate 10 inches in

only 8 weeks. At 30 percent, this distance may take 4-6 months. Nonetheless, preservative diffusion from IMPEL Rods will adequately control fungal decay, which attacks wood at a much slower rate.

When moisture levels drop below about 25 percent, the preservative becomes dormant and provides a reserve ready to reactivate should decay-conducive conditions reoccur. See Diagram 4 for an illustration of this diffusion process over time.

Table 1

RECOMMENDED APPLICATION RATES				
Nominal Dimension	Rod Size (Dia. x Length)	Hole Size (Dia x Depth)	Linear Space Between holes	No. of Rods Per Hole
<b>DIMENSIONAL LUMBER</b>				
1" x 1"	1/4" X 1/2"	5/16" x 3/4"	12"	1
1" x 2"	1/4" X 1/2"	5/16" x 1"	12"	1
1" X 4"	1/4" X 1/2"	5/16" x 2 1/4"	6"	2
1" X 6"	1/4" X 1/2"	5/16" x 3 1/4"	4"	2
2" x 2"	1/4" X 1/2"	5/16" x 1 1/2"	7"	2
2" x 2"	1/3" X 1"	3/8" x 1 1/2"	12"	1
2" x 4"	1/3" X 1"	3/8" X 2 3/4"	8"	1
2" X 6"	1/3" X 1"	3/8" x 3 3/4"	10"	2
2" X 8"	1/3" X 1"	3/8" x 4 1/2"	7"	2
2" X 10"	1/3" X 1"	3/8" X 6"	8"	2
2" x 10"	1/2" X 2"	9/16" x 5 1/2"	12"	1
2" x 12"	1/3" X 1"	3/8" X 7"	7"	3
2" x 12"	1/2" X 2"	9/16" X 6 1/2"	10"	1
<b>SAWN TIMBERS</b>				
4" x 4"	1/2" X 2"	9/16" X 2 3/4"	14"	1
4" X 6"	1/2" X 2"	9/16" x 3 3/4"	9"	1
4" X 8"	1/2" X 2"	9/16" x 4 3/4"	6"	1
6" X 6"	1/2" X 2"	9/16" x 4 3/4"	11"	2
6" X 6"	3/4" X 3"	9/16" x 4 3/4"	15"	1
6" X 8"	1/2" X 2"	9/16" x 5 3/4"	8"	2
6" X 8"	3/4" X 3"	13/16" x 5 1/4"	14"	1
6" X 12"	3/4" X 3"	13/16" x 7 1/4"	9"	1
8" X 8"	3/4" X 3"	13/16" x 5 1/4"	10"	1
10" x 10"	3/4" X 3"	13/16" X 6 1/4"	13"	2
12" x 12"	3/4" X 3"	13/16" x 7 1/4"	9"	2
<b>ROUND LOGS, POSTS AND POLES</b>				
4" Diameter	1/2" x 2"	9/16" x 2 3/4	14"	1
6" Diameter	1/2" x 2"	9/16" x 4"	12"	2
6" Diameter	3/4" x 3"	13/16" x 4 1/2"	15"	1
8" Diameter	3/4" x 3"	13/16" x 5"	12"	1
10" Diameter	3/4" x 3"	13/16" X 6"	7"	1
12" Diameter	3/4" x 3"	13/16" x 9"	10"	2
14" Diameter	3/4" x 3"	13/16" x 10"	7"	2
16" Diameter	3/4" x 3"	13/16" x 12"	9"	3

Diagram 4

