BAMBOO TREATMENT PROTOCOL

NISUS®

Better science for a better world.

BAMBOO TREATMENT MODEL SERVICE PROTOCOL

(ALWAYS READ, UNDERSTAND AND FOLLOW LABEL COMPLETELY BEFORE ANY APPLICATIONS.)

TOOLS

Adequate supply of preferred product(s):

Nibor-D®

INSPECTION TOOLS AS NEEDED

Eye protection

Rubber gloves

APPLICATION EQUIPMENT AS APPROPRIATE FOR JOB

Measuring containers

Water

Containers for solution

OTHER

Possess proper credentials to perform work

PPE as required by label for work being done

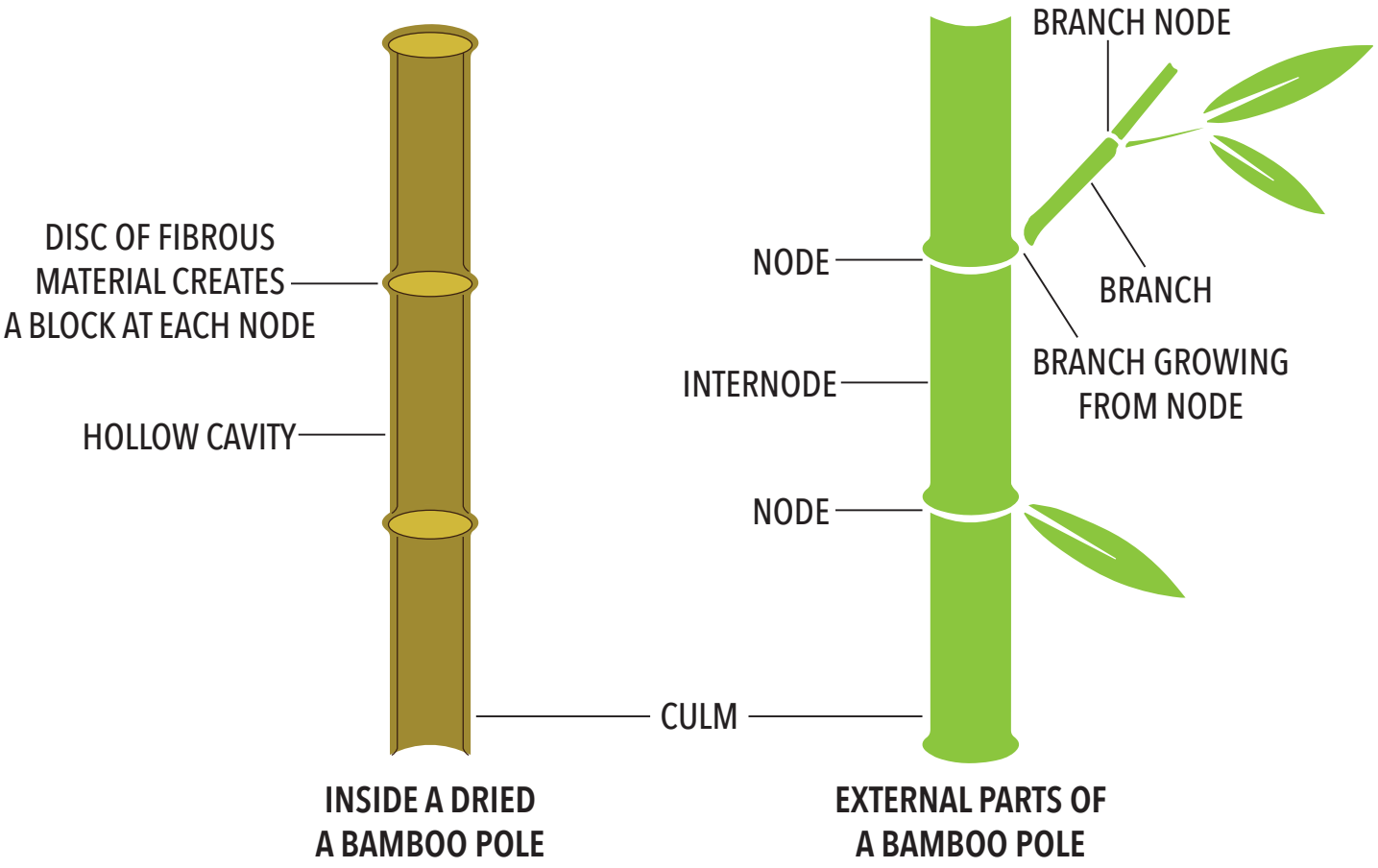
BAMBOO TREATMENT BACKGROUND

TREATED

UNTREATED

Introduction: Bamboo is a great building product, but without preservative treatment, products made from bamboo can only be expected to last few years. Treatment of bamboo culm with Nibor-D can help maintain bamboo strength over time, help prevent termite attacks and help prevent decay. Nibor-D's active ingredient is disodium octaborate tetrahydrate (DOT). Nibor- D has a 20% higher boron concentration than boric acid and is also far more soluble in water than boric acid, allowing for higher active concentrations – up to 15%.

ANATOMY OF A BAMBOO CULM



SIX MAIN TREATMENT METHODS

Bamboo must be treated from the inside out. It is best to treat when the bamboo is freshly cut but can be left standing for a few days if placed on blocks or stones. Use the anatomy diagram to identify the bamboo charateristics mentioned in the treatments. There are six main methods used to treat green bamboo (right).

TREATMENT METHODS

1.	Split the bamboo and dip treat the halves in a cement treating pool or metal dip tank with a 5% solution of Nibor-D. Mix 0.25 kg of Nibor-D for every 4 liters of water (1 lb. Nibor-D/gallon). Place the split halves in the tank and soak for 3-5 days.
2.	To treat whole culms, drill out the internodes with a drill bit wielded to a long piece of rebar, then dip treat in a 5% Nibor-D solution for 5-7 days.
3.	Another method for treating whole culms is to drill out all the internodes except the last one, then fill the bamboo with 10% Nibor-D solution and soak for 5-7 days
4.	If the time required on the above methods is not available, you can treat split bamboo by soaking it for 1-2.5 days in a 10% Nibor-D solution, and whole drilled bamboo for 2.5-3.5 days in the 10% solution Mix 0.50 kg of Nibor-D for every 4 liters of water (1 lb. Nibor-D/gallon).
5.	Here is another method that can only be used with freshly cut bamboo: Fill a 50-gallon drum with a 10% Nibor-D solution. Mix 0.50 kg of Nibor-D for every 4 liters of water (1 lb. Nibor-D/gallon). Place the freshly cut bamboo in the Nibor-D solution and allow transpiration to take place (like flowers in a vase). When the leaves at the top die, the Nibor-D has diffused into the culm.
6.	You can also use a 15% Nibor-D solution in a single dip with no soak time. Mix 0.75 kg of Nibor-D for every 4 liters of water (1.5 lb. Nibor-D/gallon). However, the borate will not be diffused through culm for several weeks.

With all these methods, the solution mix can be reused. The DOT will settle over time but if you can mix it back into solution, you can continue to use it. Additionally, you can always check bamboo to see if it is treated by using our curcumin test: simply spray the bamboo and if it turns red or orange, it has been treated with boron at sufficient levels. If it turns yellow, the boron levels are too low. If you are setting up an ongoing treatment facility you will need to check the solution concentration regularly to make sure it remains at 5%, 10% or 15% using titration analysis equipment such as Metrohm's Eco Titrator (https://www.metrohm.com/en-us/products-overview/titration/eco-titrator/).

NOTES

NISUS®

Better science for a better world.

Nisus Corporation | 100 Nisus Drive | Rockford, Tennessee | 800.264.0870 | www.nisuscorp.com