

BORATE TO PREVENT DECAY UNDER THRESHOLD PLATES

Hardwood-based laminated wood flooring is a popular product used in trailers, containers and truck bodies because of its performance and the many advantages it offers. The surface characteristics of hardwood such as high wear resistance and slip resistance are most desirable. The strength and stiffness of the flooring are important for efficient and safe transfer of applied loads to the cross-members of the container/trailer. The shock resistance of wood is useful to withstand any sudden dropping of heavy cargo on the floor.

Unfortunately, the hardwood-based laminated floor also suffers some disadvantages. Under proper and normal conditions, a hardwood laminated floor has a life expectancy of 10, 15, and even 20 years of good services. However, if conditions exist, the development of wood-degrading organisms, like fungus, can also occur and the floor will eventually prematurely fail.

The existence and development of rot caused by fungus in laminated wood flooring depend heavily on the moisture conditions of the wood. Wood decay only occurs when the moisture content of the wood is above the fiber saturation point (average 25% to 30%). It is recognized by the wood industry that wood having moisture content below 20% do not decay. In normal conditions, the moisture content of a laminated wood floor in the United States will vary from 12% to 17%. In that range, decay does not form.

Decay problems on a laminated wood floor mostly occur at the back, near the rear doors. At that particular area, because the doors are often opened, the laminated wood floor is exposed to outside conditions. The outside conditions by themselves are not a problem: it is not because it rains on a wooden floor, that the wood will automatically develop fungus. The problem is more related to the design rather than the wood itself. In trailers, containers or truck bodies, a

threshold plate made of a steel diamond plate is often installed over the first 1' to 4' of the wooden floor. The purpose of the threshold plate is to protect the wood floor from impacts of the fork lift when it enters in the trailers, the containers or the truck bodies.

The problem with the threshold plate is, when it rains (or snows) and the rear doors are open, water travels over the top of the threshold plate and ingresses between the steel plate and the top of the wooden floor. The water is trapped and cannot evaporate because of the threshold plate covering it. Thus, the moisture content of the wood starts to increase until it reaches a level where fungus starts to grow, and decay will eventually form. Figure 1 shows a 10-year old laminated oak floor with severe fungus attack and wood decay.

Figure 1:



Prolam is offering a solution which consists of using a borate wood preservative that will prevent the fungus from occurring and will reduce the risk of decay. The wood preservative is locally applied to the area where the steel threshold plate will be installed. The treatment can be done during the manufacturing process of the laminated hardwood floor or the container, but always before the installation of the threshold steel plate.

Borate preservatives are **highly toxic to all wood products, destroying organisms. Unlike other wood preservatives, they are non-volatile, odorless and are less toxic than table salt. They do not discolor wood, are non-corrosive, environmentally safe and known to be effective in controlling at least 40 different species of wood decaying fungi.**

Preferably, we will use the following borate preservatives: sodium octaborate, sodium tetraborate, sodium pentaborate and boric acid. They will also show a pureness rather greater than 98%.

The borate preservatives are dissolved in water, preferably in a concentration of one part borate for three parts of water. To maximize the protection of wood, the quantity of borate used is between .0022 and .0044 pound per square foot of wood.

The laminated hardwood floors are not exposed directly to outside conditions, even at the back area near the rear doors. The threshold plate protects the treated wood from direct exposure of the outside condition. The moisture content of wood slowly increases, in correlation with the quantity of water which migrates beneath the threshold plate. The borate, which is at the near surface of wood, will now penetrate further into the hardwood, as much as the wood is absorbing moisture. Further when use in combination with WAXIN treatment, Prolam Borate treatment will be fix into wood preventing the borate to leach out provding long term protection.