

Frequently Asked Questions about Bluestain on Canadian Wood Products

You may have noticed a larger proportion of western spruce-pine-fir lumber or plywood that contains blue streaks. This discoloration is called bluestain and is associated with the activities of the mountain pine bark beetle. In BC a lot of trees that have recently been attacked by this beetle are being processed into lumber and plywood. This document has been produced to answer some of the questions that have been raised in the market about bluestained wood. The answers are based on reviews of the scientific literature by Forintek Canada Corp. scientists.

What is bluestain?

A common blue-toned wood discoloration in softwoods, especially pines, that is caused by a type of harmless fungus. Bluestain occurs only in the sapwood—the outer part of the tree, closest to the bark—this is why a piece of lumber may be stained only in a very distinct section of the wood. Bluestain fungi are usually carried by forest insects, mainly bark beetles, that are common in the forest and in areas where logs are stored. When the insects land on logs that have bark partially removed, or when they attack standing trees or logs with bark still on, the fungi can germinate and grow into the sapwood. While the fungi penetrate deep into the sapwood, the bark beetles do not. Beetles are no longer present in finished products as the bark is removed during processing.

Some people mistakenly confuse bluestain with mold, which can grow on the wood surface after it is processed. Under the microscope you would see that the bluestain is caused by embedded dark coloured threads of fungus growing in part of the wood tissue. The threads are found mainly in the horizontal “ray” cells that the tree uses for storage of nutrients upon which the fungus feeds. The fungus is so intensely coloured that it makes the whole of the wood which it has colonised appear blue/grey, even though only a few fungal threads may be present.



Bluestained logs



Wood products from bluestained logs



*Threads of bluestain fungi in wood as viewed under the microscope
(Source: Paprican)*

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Will bluestain spread to other pieces of wood?

The fungus can only spread to other pieces of wood and cause more staining if it is actively growing, which is unlikely. In order to spread it must be alive in wet wood and in prolonged contact with another piece of wet sapwood. By the time a stained log reaches the sawmill the bulk of the fungus is usually dead. When the fungal threads have used up the food resource (sugars, starch and other tree nutrients) in the specific cells they have colonised, the fungus dies back. Any live fungi remaining are killed during the kiln drying process. Canadian dimension lumber that has been kiln-dried for overseas shipping bears a stamp with the initials HT (heat-treated) or has paperwork to say it has been heat-treated. The HT stamp indicates that the wood has been heated internally to the international standard of 56°C for at least 30 minutes. This temperature kills organisms, such as fungi and insects, that can sometimes be found in wood. For any existing blue streaks, the pigmentation is permanent and fixed in place – it will not spread further.

Is bluestain a type of rot or mold?

No. Bluestain fungi are harmless. Decay fungi cause rot because they have the ability to digest the wood fibres and thus weaken the wood. Bluestain fungi do not attack wood itself but live on nutrients stored in a small proportion of wood cells. Mold is a multicolored wooly surface growth with spores that readily become airborne. It can easily be removed and also doesn't harm the wood.

Will bluestained wood affect my health?

No. Bluestain fungi have not been associated with any human health problems in medical literature. The fungi do not readily become airborne and therefore cannot affect indoor air quality.

Is bluestained wood weak?

No. Tests done at Forintek Canada Corp. and other research laboratories have demonstrated that there is no practical difference in strength between stained and non-stained pine. Bluestained wood is commonly used for construction in North America.

Can I use bluestained and non-stained wood interchangeably?

Yes. For construction and other purposes where strength is required you can use either or both. Where appearance is important, bluestained wood may or may not be desirable. Tests show that bluestained wood glues and finishes just as well as non-stained wood. The right combination of dark finishes can be used to hide any bluestain.

For more information read:

Properties of lumber with beetle-transmitted bluestain. Forintek Canada Corp., 2003. Available in English, French and Japanese.

Discolorations on wood products: causes and implications. Forintek Canada Corp. and the University of British Columbia School of Occupational and Environmental Hygiene, 2002. Available in English and French.

These, as well as this bulletin, are available on www.durable-wood.com and www.forintek.ca

Background research and preparation of this document was funded by the CFS Mountain Pine Beetle Initiative.



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This document is available in Japanese Translation.

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