



Fishermen's Information

Bulletin 77-14E

ROT IN WOODEN VESSELS

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A damp, "mushroomy" smell, a change in the color of the wood – either lighter or darker – or a loss of strength or softness in the wood are all signs that your boat may be beginning to rot. A "mushroomy" smell does not necessarily mean your boat is rotting, but IT DOES MEAN THAT THE CONDITIONS IN WHICH ROT CAN START ARE PRESENT.

Wood exposed to damp conditions will sooner or later become decayed. This is due to a number of different factors – wear and tear, fire or heat, chemical reactions, fungal decay, and insects or marine borers. In this Bulletin we are dealing only with fungal and chemical decay.

Fungus

Wood rot, also called dry rot, is the result of fungus growth. For this type of decay, the fungus spore (seed) must land on a wooden surface, and have enough moisture, oxygen and heat. Dry wood won't rot because there isn't enough moisture; waterlogged wood won't rot because there isn't enough oxygen.

Wood in the hull will absorb water, while wood in the engine room or other heated compartments will dry out. Most types of wood used for planking on the inside that are exposed to normal air circulation are in little danger of rotting.

Recognition

Rot is easily recognized when it's more advanced, but harder in the early stages. Aside from those already mentioned – a "mushroomy" smell, a change in color, and a softness or weakness – signs to watch for are a loss in weight, ease in burning or an

increase in permeability. Rotten wood was once used as tinder because it burns so easily. Rotten wood also absorbs water much more quickly than healthy wood.

Causes

The use of green timber in construction is a prime cause of rot. The moisture in green timber makes it easy for the fungus to grow there. For the same reason, poor ventilation anywhere in your boat can lead to rot. Any place where fresh water can enter is liable to rot; sea water is not so bad because the salt in it slows the decay.

Where Rot Strikes

Most decay in salt-water vessels is above the waterline at places where rainwater can enter but can't evaporate easily. Keels, garboards and deadwood that are under water and waterlogged will only rot if the boat is out of the water for long periods.

Rainwater that gets in through the deck seams will cause the deck beam and frame ends, shelves and knees to become infected. Hull planking, where it joins the stem and transom, is a bad spot because of the leakage there. Butts and butt blocks, stem head and mooring bitts are also problem areas. Rainwater in the deckhouse and hatch coaming joints can lead to the decay of the deck, deck beams and coamings themselves.

In fact, any place where rainwater can get at a joint or an exposed end grain is a problem area.

Fresh water storage within the boat should be watched carefully, and any leaks repaired immediately. Areas around fresh water tanks have rotted because of spills when filling tanks.

Cupboards and storage lockers in closed areas like the forepeak and steering gear compartments need to be well ventilated and have good drainage to the bilge. But if rainwater drains into the bilge and stays there, it can cause decay.

The spots where galley and engine room exhaust pipes pass through bulkheads are dangerous because of the combination of water and heat.

Prevention

There are solutions available to prevent rot, but they should be used after the wood has been cut, shaped and any necessary holes bored. The wood should be dry and seasoned, and the preservative given a chance to soak in. The common preservatives are copper naphthanate and pentachlorophenol. The copper solution is either green (cuprinol) or colorless. Cuprinol will stain the wood green, and will bleed through paint. The clear kind can be used under paint or varnish without affecting the color. Pentachlorophenol is also clear, and will not affect any finish put on over it. Both types of preservative work well, but they must be well applied, particularly to end grains, and allowed to sink in.

Pressure treatment requires more equipment. Under heat and pressure, the preservative is forced into the wood. The most common preservatives used in this process are creosote in oil, pentachlorophenol and copper/chrome/arsenate oxide mixture in water (Boliden Salts K33). Because the fumes from the other two types can be objectionable, Boliden Salts are best for shipboard use.

Chemical Decay

Chemical decay is the result of an electric reaction between wood, metal and sea water. It can happen wherever these three elements are present. For example, wood around a nail will become dark and discolored, and a depression will appear. Eventually a split, an inch or so long, will appear around the nail. This is called "nail sickness".

Nail sickness can cause fastenings to become loose and leakage may develop. When the wood is rubbed or scraped, it separates into fibres or broken parts of fibres.

Because chemical decay is an electric reaction, any leakage of current from electric machinery (sonar, radio, sounder, etc.) will speed up the decay.

Prevention

Nail sickness can be avoided as far as possible by grounding electric equipment and countersinking and sealing all nails and fastenings. Different types of metals attached to the same piece of wood set up an electric field between them, and this should be avoided where possible.

Construction

While green timber can't be avoided for keels and other heavy members, wood used for decks, hull planking and interior work should be well dried. The wood should have less than twenty per cent moisture content if it is used for boats.

Air seasoning is the simplest method of drying lumber, but depends on the weather. The drying period is relatively long, but gives good results for boat building purposes. The green lumber can be stacked outdoors or in sheds.

Laminated lumber is often used in construction when seasoned, solid lumber of the right dimensions is hard to come by. Laminated wood is thoroughly dried, and is a better material than green wood. It is stronger and more easily fitted to the curvatures required.

A boat in storage ashore will not rot provided it is properly drained, cradled and covered.

Table No. 1
DECAY RESISTANCE
OF
NATIVE CANADIAN WOODS

| GROUP | SOFT WOODS | HARDWOODS |
|---|--|--|
| Group 1. Species with heartwood of high resistance to decay | Yellow Cypress Cedars Junipers Western Yew | Red Mulberry Black Walnut |
| Group 2. Species with heartwood of moderate to low resistance to decay | Douglas Fir * Western Larch * Ponderosa Pine Eastern White Pine * Spruces Tamarack * (Hackmatack) | Ashes Beech Birches Elms Hickory Red Oak White Oak * |

* Species marked with an asterisk are rated moderate.

The information for this bulletin was taken from "The Problem of Rot in Wooden Vessels", written by G.M. Sylvester for Engineering Development and Assistance Programs Division, Fishermen's Services Branch, Fisheries and Marine Service, Environment Canada.

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