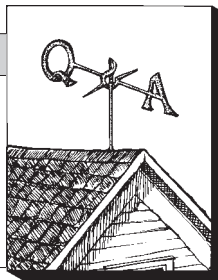


Purifying Catchment Water

by Hank Spies



Q. In our area of Hawaii (and in other rural areas), water catchment systems are the primary source of drinking water. Unfortunately, the cisterns are easily polluted by acid rain, lead from the solder in metal roofing and gutters, and lead-shielded roofing nails. Is there any way to neutralize the acid or remove the lead from the water?

A. There are two problems with using catchment water for drinking. The first is the need to sterilize the water in the cistern with chlorine after each rain to avoid bacterial growth in the cistern itself. It is better to have a diverter valve so the runoff from the first five minutes of rainfall will wash most of the dirt, guano, etc., off, without entering the cistern. By measuring the water level in the cistern, the appropriate amount of granular chlorine (used to treat swimming pools) can be added. There should be a residual chlorine level of about one part per million.

The second problem is lead, zinc, aluminum, or other heavy metal content, if metal roofing material is used. There is relatively little lead unless the roof is terne. A reverse-osmosis unit will remove the chlorine and any metallic salts from the water, and provide excellent potable water. It will not remove all bacterial contamination, so chlorine must still be added. Reverse-osmosis units are available from distributors of water treatment systems. The common sizes produce only 3 to 5 gallons per day, which is adequate for cooking and drinking. A still could also be used, but this is usually more expensive to operate and maintain. A commercial ion-exchange demineralizer would also remove the metallic salts.

If the water is truly acid (pH below 6.2 produces a blue corrosion on copper piping) a chemical feed pump, which adds precise amounts of soda ash to the water, will neutralize it for the entire water system. Or a special cartridge and filter can be used to neutralize only the potable water. If a concrete cistern is used, the alkaline content of the concrete will tend to neutralize the water as well. Acid rain should be minimal in Hawaii.

Sealing Oak

Q. I was recently advised to back-prime some oak lumber to be used for interior trim. Will oak (or any type of "open-grain" wood) expand and contract due to moisture absorption more than other types of wood?

A. The "open-grain" woods do not expand and contract more or less than other woods. While there is some difference among species, what part of the log the piece came from will have more to do with moisture-caused movement. "Juvenile wood" from the center of the tree will expand and contract more than mature wood from the outer portions of the log.

Similarly, a quarter-sawn piece will move less than a flat-sawn board. Back-priming and sealing the cut ends is the best way to minimize movement due to moisture.

Felt Under Siding

Q. Can 15# roofing felt be used as a backing for exterior siding? Will it cause moisture problems due to low permeability?

A. The permeability of 15# asphalt felt is about 1, and tar felt about 4. This is considerably higher than that of plywood sheathing, and much higher than that of 6-mil polyethylene, which is .06. The rule of thumb is that the permeability of the cold side of a wall should be at least five times that of the warm side, which is easily met by the asphalt felt. Many builders have reported fewer problems with wood siding over foil-faced sheathing if a layer of 15# felt is used between the siding and sheathing. It apparently acts as temporarily moisture storage to buffer the daily moisture cycle of the siding.

Roofing Over Foam

Q. Is there any good way to attach asphalt roofing shingles over 3 inches of foam insulation, which has been applied over 2-inch T&G roof decking?

A. The only satisfactory way to apply asphalt shingles under these circumstances is to install a second roof deck of plywood or OSB over the foam and nail the shingles to that deck. It would be best if that deck was spaced an inch above the foam and the space between ventilated, to reduce temperature extremes in the shingles. Shingles installed on a deck that is in direct contact with foam insulation get hotter in the summer and colder in the winter, and such an installation may void the manufacturer's warranty.

Sealing Icy Shingles

Q. If I apply shingles in cold weather, will they seal down well once warm weather comes?

A. If they haven't blown off before then, yes, assuming that the adhesive or the surface to which they must bond has not built up a coating of dirt. A dab of roofing cement under each tab is good insurance during cold-weather application. ■

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