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Heating Water with Woodstoves

Woodstoves can provide both space heat and hot water for a home. A few woodstove manufacturers sell dual use systems or retrofit kits. It is also possible, however, to retrofit some woodstoves with a "do-it-yourself" installation.

Dual use woodstoves have a coiled or serpentine heat exchanger made of copper or galvanized pipe located either inside the fire box, on the outside surface of the stove, or around the lower parts of the flue stack. Water is heated as it circulates through the heat exchanger. This circulation is achieved with a pump or by thermosiphoning (fluid movement due to its change in density because of the heating).

Although it may be physically possible to retrofit some woodstoves with a water heat exchanger, it is not advisable for certain types of stoves. U. S. Environmental Protection Agency (EPA)-approved wood-burning appliances are sophisticated in design, and a "do-it-yourself" retrofit may negatively affect their performance. Woodstoves with catalytic converters ("cats") require high temperatures to protect the catalyst from sooting up and loosing their ability to work effectively. Non-catalytic woodstoves rely on a high temperature in the firebox for efficient and clean combustion. A hot water heat exchanger placed inside the stove can lower the temperature so far that it might reduce combustion efficiency and thus increase the amount of smoke produced. In any case, all of the manufacturers of woodstoves will void your warranty if you make such changes or alterations.

Stoves manufactured before 1988, or that are "EPA-exempt," may be more easily retrofitted. These stoves were made before the current EPA emission standards, are not especially air tight, and enough air usually enters the firebox to allow the fuel to burn more or less cleanly. Although such stoves are less expensive, they are much less efficient than the EPA-approved models. Since they are typically much less sophisticated in design than the new, high efficiency models, it may be easier to install a heat exchanger in them.

Bibliography

The following magazine article and reports provide additional information and designs for heating water with woodstoves. All reports are available from the [National Technical Information Service \(NTIS\)](#).

"Gettin' Into Wood-Heated Water," B. Battagin, *Home Power*, (No. 35) pp. 32-35, June/July 1993. Available from Home Power, P.O. Box 520, Ashland, OR 97520; Phone: (800) 707-6585.

Low-Cost Solar-Wood Hot Water Heater, L. Ziegler, 1984. 8 pp. NTIS Order No. DE84003421.

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Woodstove Hot-Water Systems Final Report, S. Leitman, 1982. 65 pp. NTIS Order No. DE84000348.

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