

Solar Hot Water Heater The solar panels pictured below, mounted on a Moscow, Idaho home, are part of a domestic hot water heating system capable of providing up to 100 percent of home or small business hot water needs. Produced by Lennox Industries Inc., Marshalltown, Iowa, the panels are commercial versions of a collector co-developed by NASA.

In an effort to conserve energy, NASA has installed solar collectors at a number of its own facilities and is conducting research to develop the most efficient systems. Lewis Research Center teamed with Honeywell Inc., Minneapolis, Minnesota to develop the flat plate collector shown. Key to the collector's efficiency is a

black chrome coating on the plate; developed for use on spacecraft solar cells, the coating prevents sun heat from "reradiating," or escaping outward. The design proved the most effective heat absorber among 23 different types of collectors evaluated in a Lewis test program.

The Lennox solar domestic hot water heating system has three main components: the array of collectors, a "solar module" (blue unit pictured) and a conventional water heater. A fluid—ethylene glycol and water—is circulated through the collectors to absorb solar heat. The fluid is then piped to a double-walled jacket around a water tank within the solar module.

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The jacket is a heat exchanger; the fluid circulates around the water tank and its heat is transferred to the water within. The working fluid, cooled in the process, is piped back to the collectors to repeat the cycle. As hot water is drawn from the conventional heater, sun-heated water from the solar module replaces it. When the sun is obscured by cloud cover, the conventional heater heats the water. In the Idaho installation shown, water heating bills were cut by two-thirds.