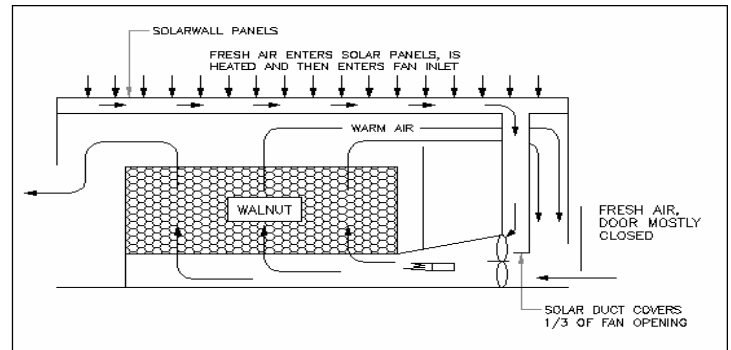


Walnut Drying Carriere & Sons



Above: In the drying chamber a portion of the warm air rising from the walnuts is recirculated back to the blower and mixed with the solar heated air.
Left: Walnuts being dried with solar heat.

Background

Carriere & Sons owns and operates hundreds of acres of walnut trees, in addition to their walnut drying facility. They are also in partnership with Borges of California, which is owned by Borges of Spain. Borges is the world's leading walnut operator and has forty-eight companies in its group devoted to the production and marketing of oils, dried fruits and nuts.



Walnuts are dried at a relatively low temperature with a maximum temperature of 110°F (43°C) leaving the dryer. This low temperature requirement is ideally suited for the use of the SolarWall® technology. A normal drying season consists of two months of drying from September 1st to October 31st. The walnuts are dried from 35% moisture content to 10% moisture content.

Typical multi bin walnut dryer. A duct from the roof distributes the solar heated air to the two air inlets for the blower.

Solution

The SolarWall® system was installed on the roof of a new drying building at Carriere. The 3,200 ft² (300 m²) solar system spans the entire roof area and will displace around 308 million BTU of natural gas for the two month drying season. The system heats approximately 25,000 cfm of air, which is then ducted into the 70,000 cfm blower.

The energy savings for two months of operation from September 1st to October 31st, was documented to be over 3,800 therms. (111,300 kWh) The actual dollar savings are based on the cost of gas, which, in 2002, was fluctuating between \$0.45 and \$0.93 a therm. The multi-fold fluctuations in the price of natural gas since that time has meant that Carriere has been able to keep their operating costs stable, as well as realizing tremendous energy savings.



Roof mounted SolarWall system producing high quality "Solar Dried" walnuts

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