

2001 EQUALIZER VALVES vent water vapor out of the roof. Low pressure vaporizes water in a roof assembly when:

1. Hot air migrates through the roof deck into the roof assembly from inside the building.
2. The roof assembly is heated by solar radiation.
3. The roof assembly is drawn down in negative vacuum pressure from wind uplift, low pressure being transferred into the roof assembly.
4. Water vapor is sucked out of the roof assembly through 2001 Equalizer Valves.

## Venting Moisture

### How to Dry Out a Wet Roof

by Tom Kelly, 2001 Company

**C**ontrary to common roofing opinion, wet roof assemblies, both new and existing, can be dried in place. Two reports regarding roof drying were submitted by the Department of Energy (DOE), Oak Ridge National Laboratories (ORNL) in the 1995

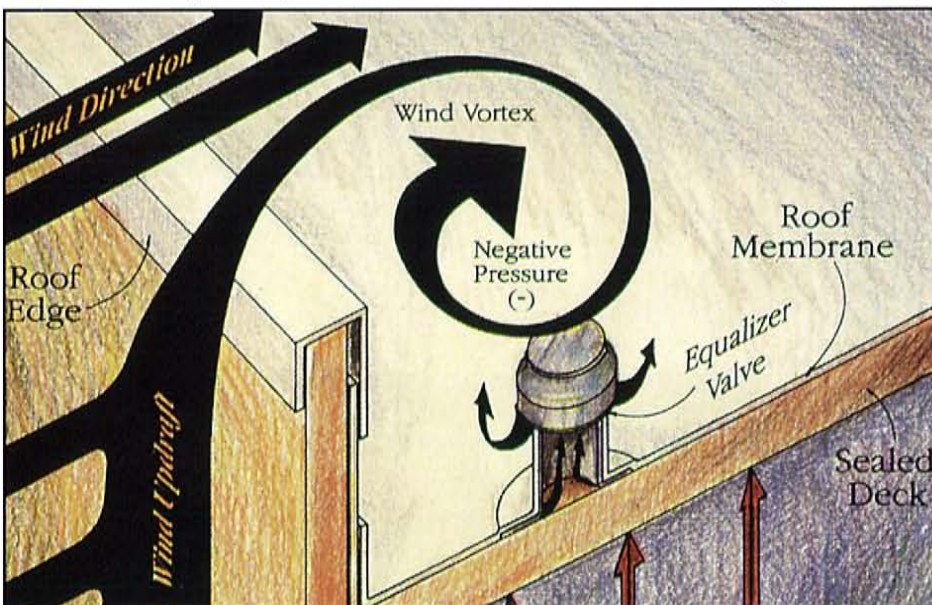
International Roofing Symposium in Washington, D.C. sponsored by the U.S. National Bureau of Standards and National Roofing Contractors Association (NRCA).

The first report by ORNL titled, "A Whole Building Demonstration of Recover Over An Existing Wet Roof,"

resulted from tests on actual roofs and laboratory analysis of various wet insulations. Authors of the report were A. Desjarlais, P. Childs, T. Petrie, J. Christian, and H. McLain.

The report showed that existing wet roofs can dry out when they are reroofed. The existing roof on an ORNL building was verified to be water saturated by nuclear moisture capacitance, infrared survey and verifying core cut tests. The wet roof assembly having an estimated 840 gallons of water was reroofed and scientifically monitored for drying by the scientists at ORNL. Within 18 months, the existing wet roof assembly had dried out substantially to return the R-value to the insulation.

**Conclusion:** Existing wet roofs do not have to be torn off. The insulation "R" value will return as the existing wet roof substrate dries out as it is exposed to low pressure. The principle to accomplish this drying: expose moisture to low pressure and air exchange.

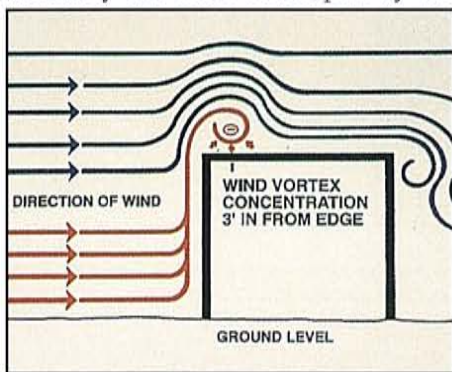




## Low Pressure and Air Exchange

The second report by ORNL titled, "Laboratory Measurements of the Drying Rates of Low-Slope Roofing Systems," described how various roof insulations were saturated with water in the ORNL testing chamber. This chamber was put through a series of tests simulating climate conditions to record the water vapor permeability of the various low slope roof insulations and their specific drying rates. This data provides the calculations to estimate the time an existing wet roof will dry out when an additional roof is placed on top of it.

A computer program to predict the drying duration of an existing roof assembly has been developed by the



ORNL. To predict the drying duration of an existing wet roof assembly, the following parameters of a specific building must be entered into the computer program:

- Internal building temperature
- Internal building humidity
- Existing roof assembly
- Estimated moisture in the old roof
- New roof assembly
- Area weather determined by zip code

With this information, the actual drying time of an existing wet roof can be predicted. Consequently, existing wet roofs do not have to be torn off.

## The Science of Roof Assembly Drying

A roof assembly dries when entrapped water is exposed to low pressure causing water to turn into water vapor. The water vapor is then absorbed by dry air molecules and vented out of the roof assembly.

Hot air is low pressure. The hottest air in a building floats

upward into the ceiling and can pass through nail and screw holes, deck joints and penetration gaps into the roof assembly. This hot air—low pressure will cause water to vaporize into water vapor. Heated air expands and becomes lighter. This is why a hot air balloon rises.

## Venting Moisture Out

2001 Company patented Equalizer Valve Technology employs low pressure generated by wind over the building to vent a roof assembly of

water vapor. Upward migration of water vapor is vacuumed out of the roof assembly through one way valves placed in wind vortex intensity areas of a building perimeter.

The drying capability of the 2001 wind generated vacuum venting has been verified throughout all climate zones and in extreme wind areas across the United States. Over 7,000 commercial roofs have been installed with this technology, including airports, Naval Facilities, and commercial/industrial applications.

# 2001 COMPANY

## HOW TO DRY OUT A WET ROOF

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