DUO-THERM
SERVICE BULLETIN
DIVISION • MOTOR WHEEL CORPORATION
LAGRANGE, INDIANA

CONDENSATION IN MOBILE HOMES

Too much moisture in the air can result in formation of water on windows and walls. We have seen severe cases where water drained out of ceiling fixtures and ceiling joints in amounts that would appear the roof was leaking.

Back in the days of "trailers" when the usual size was 35 x 8' or smaller, condensation was a very real problem. Residents learned to use the kitchen and bath vents and to keep the heater blower running. They also learned to avoid doing things which added water vapor to the air such as drying clothes in the house. These coaches were made with vents in the wall near the ceiling which could be opened to bring in outside air.

Why the fresh air? One of the most striking examples of the need for fresh air is in an automobile when first started on a cold morning.

The moisture you exhale condenses on the windows. To avoid this you have learned to open a vent and bring in outside air. As the heater warms the interior the vent can be partially closed. Soon a point is reached where you are comfortable yet the windows are free of fog.

Some of the available data about condensation helps to explain what happened in the automobile and applies to a mobile home.

For instance, the actual amount of moisture in air is measured in grains. There are 7000 grains in a pound of water which would be about a pint.

One pound of air at 30 degrees will hold 24 grains. That same pound of air will hold 118 grains at 72 degrees or nearly five times as much. These amounts at those temperatures saturate the air at what is known as 100 per cent relative humidity.

The term relative humidity is used when describing the moisture content of air. When air is described as having a relative humidity of 40 per cent it means; that air contains 40 per cent of the moisture it could hold at 100 per cent relative humidity.

Relative humidity can be measured with a sling psychrometer. This is nothing more than two thermometers mounted on a handle so they can be rapidly rotated. One thermometer is equipped with a sleeve that is moistened when a check is made. When swung rapidly moisture evaporates from the sleeve and the temperature of that thermometer falls from the cooling effect of the evaporation. The drop in temperature will be determined by the relative humidity of the air being checked.

As it is swung through the air a reading will be found where no more moisture will evaporate. At that point the wet bulb thermometer has reached the saturation point. The difference between the wet bulb and dry bulb is noted and checked on charts supplied from which the relative humidity can be read. The greater the difference in the readings, the lower the relative humidity will be.

Except at 100 per cent relative humidity the temperature at which condensation takes place, which is referred to as the dew point, is always lower than the wet bulb reading.

CHARACTERISTICS OF AIR AT
72 DEGREES DRY BULB

Relative Humidity	Temperature		Grains per Pound* Of Air
	Wet Bulb	Dew Point	
20	51	29	24
30	55	38	35
40	57	46	47
50	60	52	59
60	63	58	71
70	65	62	83
80	68	66	94
90	70	69	106
100	72	72	118

*One Pound - About 13.5 Cubic Feet

What effect does this have on condensation in a mobile home?

1. Storm sash will have a higher surface temperature than single glass. They not only save fuel but the higher surface temperature may prevent condensation. See dew point temperature in chart above. We recommend storm sash.
2. Be sure to use vent fans where they are provided. They remove extra moisture which would otherwise increase the relative humidity and the dew point. Remember an open gas flame produces water as one of the products of combustion.
3. Don't hang washings and wet clothes inside which will raise the humidity.
4. Any moisture producing appliance such as a clothes dryer must be vented to the outside.
5. Keep the heat registers open. Closed registers prevent proper circulation of warm air. In some cases walls can cool because of insufficient air movement and cool to the dew point.

In the modern mobile home, these problems are not as common as they used to be. The size of homes now helps in that the volume of air per person is nearly three times as great as in the 35 foot models. Better vapor barriers are available and construction techniques have been improved. Remember that every Duo-Therm furnace is made so it automatically brings in the dry outside air and mixes it with heated air to reduce the possibility of moisture problems.

When condensation does take place, there has to be a reason for it. Check the list above to be sure you are not doing something that is contributing to the problem.

DUO-THERM DIVISION
Motor Wheel Corporation
LaGrange, Indiana

Form No. DS-431 Printed in U.S.A.