

Q):What exactly is Condensation and how do I deal with it?

(A):**GLASS, WINDOW AND FRAME CONDENSATION**

## **AND WHAT TO DO ABOUT IT:**

Each winter sees more and more homeowners vitally interested in the subject of condensation. It's not a happy interest. It stems from bad experiences with condensation forming on the windows, glass, doors and framework. It may strike you as odd, but the growing condensation problems of the nation are caused by progress. Yes, if you have trouble with condensation it's probably because you live in a tight modern home, or you've added an addition that offers more insulation than was there before.

What causes "Trouble" condensation? A little fog on the lower corners of your windows or solariums (insulated units) now and then probably doesn't bother you. It shouldn't. By the time you've thought about it a second time it is usually gone away.

What we're talking about is excessive condensation, troublesome condensation. We're talking about condensation that blocks whole windows with fog, or frost, water that runs off windows to stain woodwork, or in serious cases even damage the wallpaper or plaster. If you have this kind of condensation on your windows, you have a good reason to worry, and a good reason to react.

Don't worry so much about the window where you can see the effect of excess humidity. You should worry more about what excess moisture may be doing elsewhere in the home. It may be freezing in the insulation of your attic where it will melt and damage your plaster exactly like a roof leak when warm weather comes. Or it may be forcing its way out through the siding to form blisters under your exterior paint. That means the most expensive kind of paint job is now in order. It's natural and easy in such cases to blame the paint, or the insulation, or the windows or the solarium, but it's wrong to blame them.

The real villain is invisible water vapor... too much water vapor. The best and usually the only way to prevent this trouble is to get rid of excess water-vapor; to reduce the humidity.

## **WHAT IS HUMIDITY?**

Humidity, water vapor, moisture, steam, they're all the same. They are all one form of water. Humidity is an invisible gas. It is present in varying quantities in nearly all air. **THIS MOISTURE IN AIR TRIES TO FLOW TOWARD DRIER AIR AND MIX WITH IT.** Scientist's describe this force as "vapor-pressure". It is often a very power force indeed. It can act independently of the flow of the air within the home, which holds the moisture. Vapor pressure can force moisture easily through wood, plaster, brick, and cement, and even right through most of the materials we use to build our homes. That is exactly what happens when moisture seeks to escape from the humid air usually found inside your home to the drier winter air outside.

# MORE Moisture Trapped in LESS Space:

Certain building materials stop water vapor. Glass is one of these. Also on this list are some varnishes, paints, tiles, metals, and plastic wall coverings.

## 7 PRACTICAL STEPS TO CONTROL CONDENSATION

Here, arranged from easy to more difficult, are the steps you should take to reduce condensation on your windows or solarium:

1. Use high performance MC Wonderglass™.
2. Shut off furnace humidifiers and any other humidifying devices in your home.
3. Be sure that louvers in attic or basement crawl spaces are open and that they are large enough.
4. Run kitchen or other ventilating fans longer and more often than has been your custom.
5. Open fireplace damper to allow easier escape for moisture.
6. Air out your house a few minutes each day, such as your kitchen, laundry, and bathrooms during use, or just following use.
7. If troublesome condensation persists, see your heating contractor about an outside air intake for your furnace; about venting of gas burning heaters and appliances; or about installation of venting fans.

If the common remedies we suggest (1 through 5) don't work, you really have a condensation problem. But the changes your heating contractor may recommend to further reduce humidity in your home should not be very expensive. Certainly they will be less expensive than a big paint job caused by excess water-vapor. You see the basic principle of reducing window condensation is extremely simple. Where there's too much window condensation on your windows, it means that humidity is too high in your home. You should take steps to reduce humidity until condensation disappears.

But in practice, window condensation and reducing humidity may become very complicated, because many entirely different conditions may affect the way condensation problems work out in different homes. Let us just mention a few:

- The number and type of windows throughout your home.
- The type of glazing in your windows, doors or sunroom.
- The heating system – hot air or water – perimeter or interior wall heating.
- The type of insulation and vapor barrier.
- The type of soil and quality of drainage.

Because of so many variables, a condensation problem can sometimes be very tough to solve. That's why we recommend that you put an expert to work on your problem if the simpler steps to reduce humidity don't solve your condensation problem. See your heating contractor first. If they can't help, we suggest that you ask your general contractor, or lumber dealer to put you in touch with a qualified expert. They are available both at engineering schools and from the staffs of heating, insulation, wallboard, or window manufactures.

Before we leave the subject of reducing humidity, we would like to add the following: There are two causes of condensation that are **TEMPORARY**. They will disappear after a few weeks, or at the most season of heating.

First, there is the moisture that comes from new construction or remodeling. There can be quite a lot of moisture in the wood, the plaster, or other building materials of a new home. When the heating season starts, this moisture will gradually flow out into the air in the home and eventually it will disappear and not cause any more trouble.

Much the same sort of thing happens in milder forms at the beginning of each heating season. During the summer, your house has absorbed some moisture. After the first few weeks of heating your house will be dried out – and have less trouble with condensation.

In discussing the control of condensation, we've mentioned just about everything EXCEPT windows and solariums. There's a good reason. There is just nothing much that can be done with windows or solariums to cut down on condensation.

Vapor-seal insulation is designed specifically to stop the escape of water-vapor and to protect the insulation and your walls from the ravages of water.

Increased use of these "moisture trapping" materials in the last few years has created the modern tight homes. Moisture that is created by bathrooms, kitchens, laundries and occupants no longer flows easily to the outside. The modern insulation and construction that keeps cold air outside also keeps moisture in. So it is very easy to build up excessive and even harmful moisture levels in such homes. American Builder Magazine calls the problem a combination of many causes that build excessive moisture in the modern home.

First, more washing, more bathing, more showers, more appliances, and more gas furnaces – all pour water vapor into homes than in former years. HEATING and VENTILATING Magazine provides builders with reference data on sources of water-vapor. For instance cooling for a family of four will add 4.5 lbs. of moisture a day to a house. Each shower contributes a half-pound, weekly laundry, 30 lbs., human occupancy, 6 to 8 lbs., etc. All of this moisture must eventually escape from your home. So you can see that the modern living of a family of four can easily release 150 pounds, or more than 18 gallons of water per week into the air in your home. And houses with no basements have further moisture problems.

## How to Reduce Humidity:

1. Controlling Sources of Humidity: For instance, venting all gas burners, clothes dryers, etc. to the outside. Using a kitchen or bathroom exhaust fan is also a must.
2. Winter ventilation: Because outside air usually contains less water vapor, it will "dilute" the humidity of inside air. This takes place automatically in older houses through constant infiltration of outside air.
3. HEAT: The process of heating your home will reduce the relative humidity – providing its DRY HEAT. It will counter balance most or all the moisture produced by modern living. Now before we summarize specific steps for reducing humidity in your home, let's include some basic data about recommended moisture. You can refer to it if you are inclined to test the moisture levels in your home.

The table below is the result of long and careful experiments at the University of Minnesota Engineering Laboratories. It shows the maximum safe humidity for your home...not just for the windows or solariums, as well for your paint, insulation and structural members.

In most cases, reducing moisture to these humidity levels will cure troublesome condensation on windows or solarium. If not, you can reduce humidity without discomfort to you or your family.

If you test humidity in your home, be sure to use an accurate instrument, preferably a good sling psychrometer. Remember, too, these relative humidity levels are for 70° F. For higher temperatures, lower humidity levels are required.

<b>OUTSIDE AIR TEMPERTUARES</b>	<b>INSIDE RELATIVE HUMIDITIY FOR 70° F INSIDE AIRTEMPERATURE</b>
-20° F or below.....	not over 15%
-20° F to -10° .....	not over 20%
-10° F to 0.....	not over 30%
10° F to 20° F.....	not over 35%
20° to 40° F.....	not over 40%

These humidity levels are comfortable. They are about the average levels you would expect in the spring month in Phoenix, Arizona.