

A-1 ALUMINUM INC.

Reducing Condensation in Your Home

What Causes Condensation

Under the right conditions, condensation can occur both inside and outside your home. The source of condensation, or "sweating" on windows and mirrors inside a home is caused by humidity, or invisible water vapor, present in virtually all air. When this water vapor comes in contact with a surface, which is at a temperature below what is called the "dew point," the vapor turns to visible droplets of liquid, or condenses on the cooler surface. This often happens to bathroom mirrors and walls after someone has taken a hot shower. Condensation can also occur on windows during the winter if the inside humidity level is high enough.

When it comes to condensation outside your home, it is simply a fact of nature. Exposed to certain conditions, like a clear night sky, still air or high relative humidity, the exterior surface of the glass can radiate heat away from your home and into the night air - allowing the glass temperature to fall below the dew point of the ambient air and create condensation. Only when the glass temperature rises above the dew point will the condensation evaporate back into the air. Common examples of this is when dew forms on grass, car hoods and roofs.

We tend to notice condensation only on windows, mirrors, etc., because the glass does not absorb the excess moisture and is simply more visible there. A little condensation, or "fogging" now and then is to be expected and causes no problems. Of more concern, however, is the less visible condensation that can penetrate and collect in walls and ceilings. Excessive condensation can cause damage.

When you see consistent condensation on glass surfaces, take it as a warning that you may have an excessive humidity level in your home.

Balancing Humidity for Comfort and Condensation Prevention

Controlling the amount of moisture in the air, or humidity, is the most effective way to reduce condensation. The amount of moisture in the air is indicated by the "relative humidity" of the air. Relative humidity is the percentage of moisture in the air compared to the maximum amount it can hold. For instance, when it is raining or very foggy outside, the outdoor relative humidity would be 100%. Temperature also effects how much moisture air can hold. At 100% relative humidity, air at 60 degrees will hold three times as much water vapor as air at 30 degrees Fahrenheit. As temperatures drop during the winter, the air can not hold as much moisture as before and condensation will occur unless the relative humidity level is lowered.

The following chart illustrates the maximum recommended levels of moisture in interior air for different outside temperatures. You can check the relative humidity levels in your home using a hygrometer, an electronic humidity gage or a sling psychrometer. Follow instructions carefully, because a reading in the middle of a room will yield a different result than a reading taken near windows. Once you've determined the humidity level in your home you can take appropriate actions.

Maximum Recommended Humidity Levels

Based on engineering studies conducted at The University of Minnesota Laboratories.

Outside Air Temperature	Inside Relative Humidity
-20° F or Below	Not Over 15%
-20° F to -10° F	Not Over 20%

Courtesy of A-1 Aluminum Inc.

4405 Kiln Court * Louisville, KY 40218 * (502) 452-2239 * (502) 452-9937 fax
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-10° F to 0° F	Not Over 25%
0° F to 10° F	Not Over 30%
10° F to 20° F	Not Over 35%
20° F to 40° F	Not Over 40%

- *Based on engineering studies at 70° F conducted at the University of Minnesota Laboratories*
- *Relative humidity levels above these are not recommended at the low outside temperatures indicated, unless special provisions are taken in building construction.*
- *If higher relative humidity levels are required because of special interior environmental conditions, the window manufacturer should be consulted.*

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