



[Energy Code Overview](#)[Fact Sheets](#)[Code Links](#)[Resources](#)

[Glossary](#)[References](#)[Software](#)[NRC](#)[ENERGY STAR](#)[Code Info](#)[Links](#)[Publications](#)

[Fact Sheets](#)[Books](#)[Newsletters](#)[Other](#)[Toolkits](#)

[For Manufacturers](#)[For Designers](#)[For Builders](#)[FAQ](#)

[Contact Us](#)

[Search](#)

[WINDOW SELECTION TOOL](#)

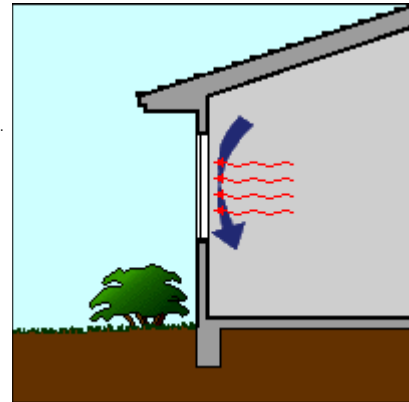
[WINDOW TECHNOLOGIES](#)

[Glazing Types](#)[Frame Types](#)[Operating Types](#)[Low-E Coatings](#)[Gas Fills](#)[Spacers](#)[BENEFITS](#)

[Energy & Cost Savings](#)[Improved Comfort](#)[Less Condensation](#)[Increased Light & View](#)[Reduced Fading](#)[Lower HVAC Costs](#)

High performance windows with new glazing technologies not only reduce energy costs but make homes more comfortable as well.

High-performance windows create warmer interior glass surfaces, reducing frost and condensation. High-performance windows with [warm edge technology](#) and insulating frames have such a warm interior surface that condensation on any interior surfaces is significantly reduced under all conditions.

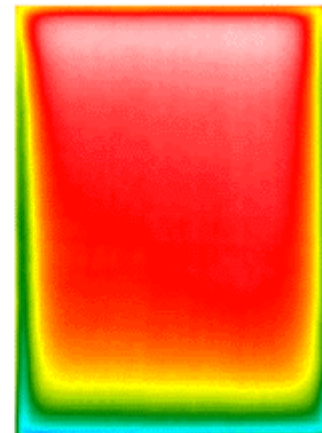
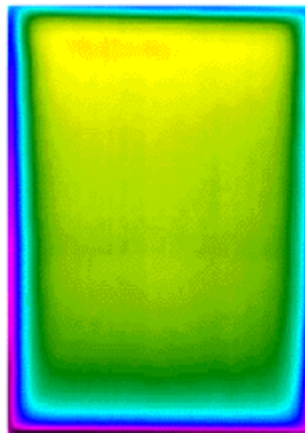


Impact of Low-E Glass and Insulating Spacers on Condensation

The adjacent images show interior surface temperature patterns of a clear double glazed unit (left) and an energy-efficient Low-E insulated glazing unit with an improved spacer (right).

Under typical winter conditions, (i.e. 20°F outside), condensation on the glass under typical humidity levels is shown by purple and blue. With a conventional clear double glazing (left), condensation occurs in a band a couple inches wide along the edge of the sightline, with more condensation along the bottom than at the top. With the energy-efficient Low-E insulated glass unit (right), condensation will be greatly reduced (a small strip less than 1" high along the bottom).

Under extreme winter conditions (i.e. 0°F outside), condensation is shown by purple, blue and green. With clear double glazing, there is condensation over the entire unit. With energy-efficient Low-E glazing, there is only condensation on a band along the bottom and up along the edges.

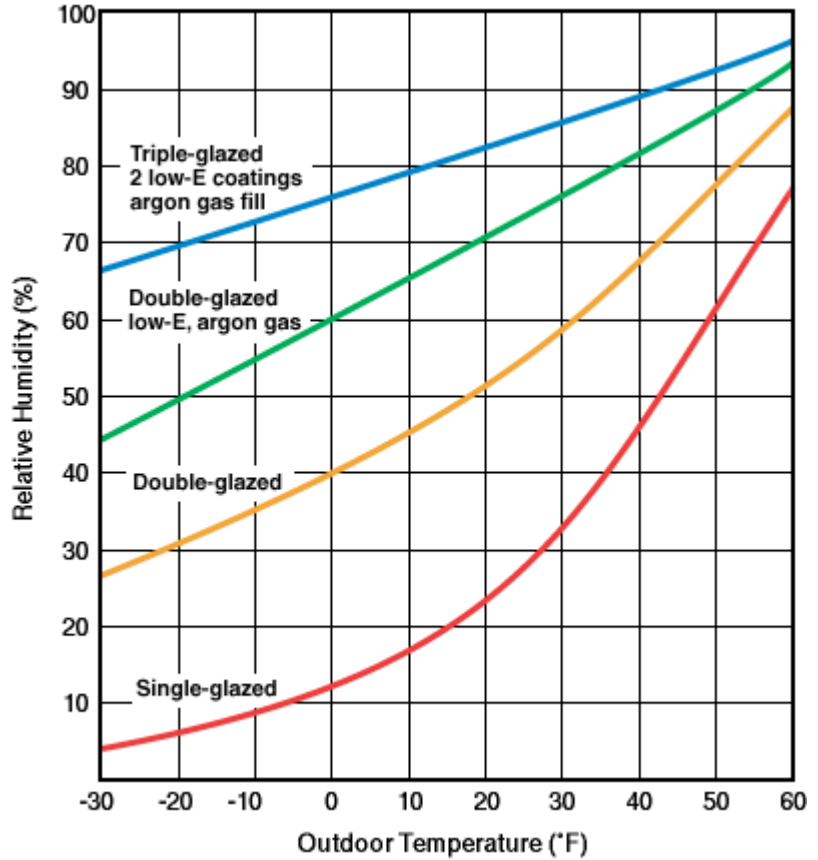


Source: Lawrence Berkeley National Laboratory.

Impact of Temperature, Humidity and Glass Choice on Center-of-Glass Condensation

The graph below shows condensation potential on the center of glass area (the area at least 2.5" from the frame/glass edge) at various outdoor temperature and indoor relative humidity conditions. Condensation can occur at any points that fall on or above the curves. As the U-factor of windows improve, there is a much smaller range of conditions where condensation will occur.

Source: Lawrence Berkeley National Laboratory. These values are based on center-of-glass temperatures. Condensation may occur at lower humidity levels on the glass edge.



[Energy and Cost Savings](#) | [Improved Comfort](#) | [Less Condensation](#)
[Increased Light and View](#) | [Reduced Fading](#) | [Lower HVAC Costs](#)