



## Condensate on the outer surfaces of insulating glass

Especially in autumn and spring, a surprising phenomenon is occasionally observed in the morning. On the outside (weather side) of insulating glass condensate has formed, which later slowly disappears by itself again. How is this possible, when glass surfaces in windows and facades are mainly there to provide an unobstructed view to the outside?

On closer inspection, there is a completely natural explanation for this apparently new phenomenon. The exterior of thermal insulating glass, like many other surfaces, is in “radiation exchange” with the sky. The outer pane releases heat thereby and becomes colder on the outside. How much heat the outer pane emits depends above all on the “radiation temperature” of the sky. A clear, “cold” night sky has an extremely low “radiation temperature”. This can be for example -40 to -50°C.

How much the outside of the insulating glass cools down also depends on how fast it is supplied with “replenishment” of heat. Thermal insulating glass prevents this supply – and the more so the better the thermal insulation or the smaller the U-value is. Condensate on the outside can form if two conditions are met:

The outside must be colder than the surrounding outside air and the outside air must be saturated with moisture. Then the air on the colder pane cools down even further and the pane fogs up. This fogging up has a name: Dew.

When the outside air slowly gets warmer in the morning, the dew “evaporates” again, and the fog disappears. Condensate on the outside of insulating glass is therefore a natural thing and a sign of particularly good thermal insulation.