

Why Worry About Condensation?

By Chris Davis and Caesar Wright

"Your roof is leaking! My stuff is soaked!" Unfortunately, this is not an uncommon complaint in self-storage facilities. Many times, the roof is not leaking, but condensation is dripping down on the contents below. Metal has become the industry standard in self-storage due to its durability, attractiveness, low maintenance and ease of use. However, without taking the proper precautions, metal roofs can have problems with condensation.

What is Condensation?

Condensation is a natural phenomenon in which water vapor in the air is returned to its liquid state. All air contains water vapor in differing amounts. When air is cooled, the amount of water vapor it can hold is reduced. The point when it becomes too cold for the air to hold its moisture level is called the dew point. If the air is saturated, it will release this moisture in the form of droplets until such point as it is back below the dew point or the temperature goes back up. (See "Condensing the Facts.")

For our purposes, condensation depends on three factors:

- Temperature inside the building
 - Temperature outside the building
 - Relative humidity (amount of moisture in the air)
- Metal-roofing panels are not good thermal insulators, so as the cold outside air hits the roof panel, it cools. When the relatively warm moist air inside the building meets the cold metal-roof panel, the dew point is reached and water condenses on the underside of the roof panel, causing water to drip on the contents below.

Condensing the Facts

- Condensation occurs when the humidity conditions inside the building and temperature of the metal-roof panel reach the dew point.
- Condensation will continue to drip until either the temperature goes back above the dew point, or enough moisture is released in the form of water droplets to alter the dew point.
- The traditional method for dealing with condensation is to insulate the roof so the temperature on the panel never reaches the dew point.
- In self-storage it only takes once for the vapor barrier to be ripped and contents damaged.



Combating Condensation

The traditional way to deal with condensation is to keep the temperature on the underside of the roof panel from reaching the dew point. This is accomplished through the use of insulation. A vapor barrier is added to keep the moisture in the air from reaching the roof panel. In the building process, a vapor barrier is spread over the purlins, and insulation is rolled on top of that. Then, the roofing is attached on top.

There is another system that has been used for years in Europe and has been winning favor in the United States, particularly for the non-climate-controlled self-storage industry. This system uses a fleece coating that is adhered directly to the roof panel. The roof panel with coating provides a medium for trapping this moisture in specially designed pockets. The fleece holds the moisture until conditions go back below the dew point and releases the moisture back into the air in the form of normal humidity. Thus, the fleece acts much like a sponge that soaks up the moisture when it appears and releases it as it returns to its humid air state.

This material is self-adhesive and is applied to the panel in the roll-forming process. As a result, it arrives at the building

site already in place and set to be installed with the roofing panels immediately.

The membrane is designed to be resistant to aging, and has an adhesive that keeps moisture from coming into contact with the metal panel, actually providing an additional layer of protection for your metal roof. It's a simple idea that cuts cost, time and condensation. Perhaps it will work for your facility, too.

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Chris Davis is a designer and creator of roofing components. For the past three years, he has been working with roll-formers, contractors, coil-coaters and self-storage end users across the United States to manufacture and distribute Dripstop, an age-resistant condensation blocker that can be applied via self-adhesives to metal-panel roofing. Caesar Wright is president of Mako Steel Inc., which designs, supplies and installs steel buildings for the self-storage industry including single-story, multi-story, boat/RV storage, climate controlled and custom buildings. Mr. Wright has been a member of Mako Steel since its inception in 1993. For more information, call 760.634.5495; visit www.makosteel.com.

Why Worry?

You have a well-written rental agreement that excludes water damage, so why worry about condensation at all? Maintenance issues cost time and money. They also can lead to unhappy customers, which ends up costing more money. Worse, rumors of dissatisfaction can spread fast.

In a perfect world, there would be no complaints and no maintenance worries. All we would have to do is worry about getting to the bank in time to cash all the checks from our full facility. But it only takes once for conditions to be just right for condensation to wreak havoc.

The good news? If you take this into consideration in your building plans, you can minimize headaches with a little preventive medicine.

