

Managing Condensation with Quality Vapor Barrier

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Ugh, Condensation, what is it good for...
(well, on the inside of your buildings)
absolutely nothing!

The Energy Team receives several quality inquiries each year citing water on the underside of vapor barriers, or on HVAC ductwork. We even get calls for roof leaks, that have been tracked back to condensation, and the roof being fine. Whatever the symptoms, condensation can be a thorn in your side, and may not rear its ugly head until months after construction is done, and the building well occupied.

We all know the principle of *how* and *why* condensation exists (warm moist air makes contact with something cooler than that air's dewpoint...think lemonade on a hot day), so we'll get right down to how to manage it.

There are only 2 principles in managing condensation:

1. Maintain separation of warm air and cool surfaces.
2. Ventilate the cooler air.

The principles are simple, but applying those principles in actual practice, especially where there are many trades involved, can be challenging.

In our industry, air separation is critical. A quality vapor barrier is key to success. There are many types of materials that can be considered vapor barriers, with each its own PERM rating, and each having specific applications. Those options will be chosen based on many variables, including end use. A higher moisture environment will need a higher quality vapor barrier yielding a lower PERM rating. Just as important though is the installation, seam and lap closure, and sealing any mechanicals or accesses that protrude through the vapor barrier. These are the culprits of most of the condensation issues.

There needs to be a tight sealed barrier, and any protrusions need to be sealed properly. This also includes making repairs to any damage to the vapor barrier in the field of the membrane. The vapor barrier manufacturer will have instructions and recommendations for installing their product and making repairs.

Since metal buildings are not vented like typical home construction, it is especially prudent to ensure that the insulation is in contact with the back or underside of the exterior metal panel. Dead air space between the insulation and the panel will collect any moist air that makes its way through the vapor barrier and condensate when it hits that cool panel. This condensation can build up in the insulation un-





noticed. This often looks like a roof leak that caused the vapor barrier to sag when often it is condensation that has built up over time.

The Metal Building Manufacturers Association (MBMA) has a great 5 page paper titled "[Condensation Fact Sheet](#)" that goes into more detail on the cause and effect of condensation, as well as typical problem areas, and specific product PERF information. It is a great article that is specific to our industry's building type. Check it out.

For more information regarding our Energy Solutions, check out our website here:

<https://www.nucorbuildingsystems.com/capabilities/energy-resources/>

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