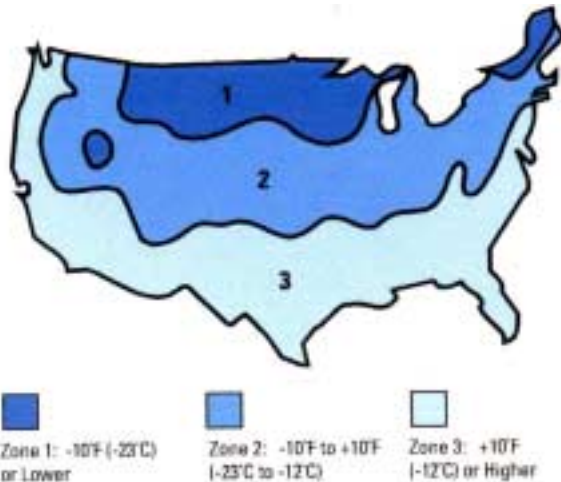


Moisture Control Guideline

Moisture vapor is present in all buildings and is generated from a variety of sources that sometimes cannot be eliminated. As metal buildings are made more airtight for thermal efficiency, this moisture is less likely to be diluted by dry outside air.

While having a positive effect on energy consumption, an increase in the insulation levels in metal buildings will not reduce moisture control problems. As insulation becomes thicker, roof sheets are colder and more likely to be below the dew point. With sufficient moisture in the building, some will penetrate the vapor retarder and condense on the roof sheets and purlins.



Winter Median of Annual Extremes	Maximum Allowed Indoor Relative Humidity (Constant)	Maximum Allowed Indoor Relative Humidity Daytime (Intermittent)
Zone 1: -10°F (-23°C) or Lower	30%	40%
Zone 2: -10°F to +10°F (-23°C to -12°C) or Lower	35%	45%
Zone 3: +10°F (-12°C) or Higher	45%	50%

As a means of reducing this problem, the insulation used in the walls and roofs of metal buildings should have continuous vapor retarders with sufficient perm ratings.

While such vapor retarders can be effective in limiting water vapor transmission, they are not totally impermeable membranes. And all too often, they may be subjected to cuts, punctures, or improper closure systems.

So while good insulation vapor retarders are important means of controlling moisture, they are only one factor in a good moisture control design.

Before a building is erected, construction conditions and end-use processes – both of which are related to moisture generation – should be carefully evaluated. A design professional, such as an HVAC engineer, should be consulted to establish the equipment and construction techniques necessary to reduce the moisture in the building. The accompanying map and chart provide a prudent guideline for interior humidity levels to minimize condensation problems.

Finally, proper ventilation of both interior areas as well as air spaces above insulation is essential. In all metal buildings, natural or mechanically powered ventilation is the single most effective means you can take to control moisture in interior spaces.

The information contained herein is a technical guideline and should not be interpreted as guarantee to avoid moisture related problems. It is important the insulation system be designed or approved by a qualified professional.

Information supplied by Johns Manville Corporation.