

New Michigan Energy Code:

Outdoor Refrigerant Pipe Insulation Protection Required!



Protection

Must Protect from Weather, UV and Physical Damage

Technical Bulletin

Protection

Energy Code: Pipe Insulation Protection

Residential R403.4.1

Protection of Piping Insulation: Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, Equipment Maintenance, wind and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

Damaged Insulation from landscape maintenance



-Michigan Energy Code 2015 IECC

Must Protect From Weather and Physical Damage "No elastomeric foam is truly UV resistant"

Armaceil Technical Bulletin #032

"The 2012 IECC mandates the use of a jacket/protection for all outdoor applications regardless of the severity of UV exposure or if the insulation is listed as "UV Resistant".

K-Flex Technical Bulletin TA22

Insulation Must Have Protection

"Therefore, installing insulation in exterior applications without protection is not in compliance with these standards regardless of the insulation's composition or manufacturer's claims."

-Armaceil Technical Bulletin #38 October 2015

2012 & 2015 IECC Code and Commentary Calls for Weather and Physical Damage Protection

"This section requires protection for piping insulation in all exposed in exterior installations. The piping insulation should be protected from sunlight moisture, wind and solar radiation, but also from personnel who may step on it, run in to it with equipment, etc., and cause it to be damaged. Adhesive tape is not permitted to be used, because it will limit maintenance and damage the insulation's permeability characteristics..."



Insulation must also be protected from physical damage.

Residential Code: Refrigeration Suction Line Insulation Permeance

M1411.6 Insulation of Refrigerant Piping

Refrigerant piping & fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of at least R-4 and **having external surface permeance not exceeding 0.05 perm** [2.87 ng/(s • m² • Pa)] when tested in accordance with ASTM E 96.

Protection and Vapor Retarding

Energy Code: Pipe Insulation Protection & Vapor Retarder

Commercial 6.4.4.1.1

a. Insulation exposed to weather shall be suitable for outdoor service, e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

b. Insulation covering chilled water piping and refrigerant suction piping or cooling ducts located outside the conditioned space shall include a vapor retarder located outside the insulation, (unless the insulation is inherently vapor retardant)...

-Michigan Energy Code ASHRAE 90.1-2007

Trapped water in insulation can **reduce** thermal effectiveness, cause corrosion and degrade the insulation.

For every 1% moisture gain, there is a 7.5% loss in thermal efficiency.

Armaceil-White Paper

The presence of moisture not only degrades the thermal performance of the insulation (resulting in economic loss and potentially process failure), it also creates an environment that contributes to CUI (corrosion under insulation) of the pipe itself.

K-Flex TA63

Section R102 Alternate Materials—Method Of Construction, Design Or Insulating Systems INSULATING SYSTEMS

R102.1 General

This code is not intended to prevent the use of any material, method of construction, design or **insulating system** not specifically prescribed herein, provided that such construction, design or **insulating system** has been *approved* by the code official **as meeting the intent of this code.**

R101. 3 Intent

This code shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building.

-Michigan Energy Code 2015 IECC

Mini Split insulation's UV is limited, the outer coating is for protection from install tearing. Manufacturer's instructions **still require additional protection if installed outdoors.**



4.2.4 Inspections. All building construction, additions, or alterations subject to the provisions of this standard shall be subject to inspection by the building official, and all such work shall remain accessible and exposed for inspection purposes until approved in accordance with the procedures specified by the building official. Items for inspection include at least the following:
f. mechanical systems and equipment and insulation after installation but before concealment.