

# New Minnesota Energy Code: Outdoor Refrigerant Pipe Insulation Requirement Protection Must be Removable



## Must Be Removable

"Must be installed independently and in addition to any factory- or field-applied vapor retarder."

-2017 ASHRAE Handbook

## Protection

Must Protect from Weather, UV, Equipment Maintenance, Solar Radiation, Physical Damage, Removable & Reusable

Technical Bulletin

### Energy Code: Pipe Insulation Protection

Residential R403.3.1

Commercial C403.2.8.1 - 2012

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

-2012 IECC

### NEW 2017 ASHRAE Handbook

#### Chapter 10. Insulation Systems for Refrigerant Piping

##### Weather Barrier Jacketing

Weather barrier jacketing on insulated pipes and vessels protects the vapor retarder system and insulation from weather, ultraviolet (UV) light and physical abuse. Various plastic and metallic products are available for this purpose.

**"The protective jacketing must be installed independently and in addition to any factory- or field-applied vapor retarder."**

#### IMPORTANT! CODE INTENT

Outdoor pipe insulation protection, an IECC code requirement, was adopted directly from the ASHRAE 90.1 standard, it was proposed and approved to the 2012 IECC, as EC110-90/10 & EC207-09/10 the code language and intent remain unchanged in the 2015, and 2018 IECC.

The intent of the original code change is very clear; it was the harmonization of ASHRAE 90.1 protection with IECC. In the original proposal the Equipment Maintenance requirement was specifically addressed in the author's reason statement.

"All AC units require periodic maintenance. The frequency varies with how hard the unit operates, exterior temperature, preventative maintenance program, and many others. **In every occasion, every maintenance provides an excuse for the Freon line insulation to be touched and removed.**"

The protection must be removable and allow for replacement if the protective cover is damaged. This will protect the pipe insulation's thermal conductivity insuring system efficiency and will reduce cost due to pipe insulation replacement. **Protection must be installed independently of any pipe insulation or line set and in addition to any factory- or field-applied vapor retarder or coating.**

### 2012 IECC Code and Commentary (Relevant to 2015, 2018 IECC) 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..."

#### IMPORTANT!

### International Mechanical Code 1107.7

Exposure of refrigerant pipe joints.

Refrigerant pipe joints erected on the premises **shall be exposed** for visual inspection prior to being covered or enclosed.

#### IMPORTANT!

### White Gel Coat May Not Comply

UV protection is limited; its purpose is to protect insulation from tearing during installation. Manufacturer's instructions still require **additional protection if installed outdoors. Protection must be removable & independent of insulation.**



### Co-Extruded Cover Systems May Not Comply

Are not removable!

The Co-extruded insulation or coatings applied directly to the insulation's external surface **may not exceed 0.05 perm**, under Residential Code M1411.5, when tested in accordance with ASTM E 96. **Protection must be removable & independent of insulation.**

### "Adhesive Tape Shall Not Be Permitted"

Any Adhesive Taping for Protection is not Allowed, Regardless of Dimensions.

"Adhesives tapes are not removable without damaging the insulation."



### Example of Installation

Not Meeting New Codes

1. Dissimilar metals in contact
  2. Exposed Insulation
- Not Protected



### Protecting Piping Insulation to Comply with the IECC

"As this requirement is not merely concerned with UV resistance, an insulation material that is only listed as "UV retardant" or "UV resistant" **would not comply with these code requirements** and would not be acceptable for use in jurisdictions that have adopted these requirements without additional protection."

K-Flex Technical Bulletin TA88-0616