

DOCKET

12-BSTD-1

DATE MAY 30 2012

RECD. MAY 30 2012

May 30, 2012

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 12-BSTD-1

2008 2013 Building Energy Efficiency Standards (2011 Update in Progress) Page 288
SECTION (150)150.0 – MANDATORY FEATURES AND DEVICES

3. **Insulation Protection.** Insulation outside conditioned space shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Protection including ~~ing~~ but is not limited to the following:

A. Insulation exposed to weather shall either be rated for outdoor use or installed with a cover ~~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 located outside the conditioned space shall have a ~~include a~~ Class I or Class II vapor retarding facing and located outside the insulation, or the insulation shall be installed at the thickness that meets qualifies as a Class I or Class II vapor retarder. ~~(unless the insulation is inherently vapor retardant), and all penetrations and joints of which shall be sealed.~~

Suggested change: Highlighted

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Justification- 3A

There is no accepted rating system for outdoor insulation or accepted criteria

“Accelerated UV aging studies are difficult to correlate to actual outdoor exposure because of the wide range of potential exposures for various applications and in different parts of the country. In addition, there are no industry accepted performance criteria by which to determine if a product is meeting expectation or not of potential exposures for various applications and in different parts of the country. In addition, there are no industry accepted performance criteria by which to determine if a product is meeting expectation or not”

Nomaco Insulation TECHNICAL BULLETIN TA16-1209

A recent code change proposal to the IPC #P24 stated "Pipe insulation exposed to weather shall be listed and labeled for exterior use" This code change was disapproved as the representative of the National Insulation Association (NIA) testified that there is no rating system for outdoor insulation.

Insulation Manufactures state that they have limited UV for outdoor applications

Weathering of any insulation material that will be subject to outdoor exposure is of concern. Insulations that are to be used outdoors require protection from elements such as ultraviolet radiation, ozone and oxidation. Materials that are not protected will, over a period of years, begin to show signs of degradation in the form of surface hardening, cracking and flaking of the surface. Polyethylene or polyolefin insulation foams, like elastomeric insulation foams, require this type of protection. All flexible foams will suffer degradation after several years of outdoor weathering and require this type of protection from the elements.

ARMACELL TECHNICAL INFORMATION

bul let in #011
october 1993
revised October 2003

Protection Outdoors

Regardless of additives, all polyethylene/polyolefin materials must be protected from ultraviolet light or they will degrade rapidly.

TECHNICAL INFORMATION

bullet in #022
March 12, 2008

How important is UV resistance

in an insulation product? Far more insulation is installed indoors rather than outdoors. From a formulation point of view, the thermal properties, water vapor permeability, flame and smoke properties are therefore typically far more important than UV resistance.

"and offer a limited resistance to UV"

ArmaFlex

TECHNICAL INFORMATION

bulletin #032
April 2004

Accelerated laboratory tests may not accurately predict how a product will weather under actual field conditions. Products that appear to perform under ideal laboratory conditions may have different results under actual end use conditions.

ASTM G90 - 10 Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight-" This practice should not be used to establish a "pass/fail" approval of materials after a specific period of exposure unless performance comparisons are made relative to a control material exposed simultaneously, or the variability in the test is defined so that statistically significant pass/fail judgments can be made"

Justification- 3B

The large amount of thermal expansion/contraction that polyethylene pipe insulation experiences. This dimensional change may be as great as 30% of the original dimension. This dimensional change causes stress on all adhesive bonds, which may result in split seams, water vapor intrusion and sweating pipes.

For every 1% of water vapor, thermal k increases 7.5%

It has been proven that a 1% by volume increase in moisture within an insulation can cause up to a 7.5% increase in thermal conductivity.

Adhesive tapes shall not be permitted as adhesives break down due to heat, constant exposure to moisture and bacteria. Adhesive tape when wrapped over the entire length of the insulation-

1. Restricts the insulations ability to expel condensation **especially significant for a suction line outside the conditioned space.** .
2. Trapped water leads to reduce thermal efficiency and is counterproductive to the code requirement.
3. Corrosion of the piping and degradation of the insulation.
4. Removal of Adhesive tapes from insulation during maintenance usually destroys the insulation

Whether water vapor intrudes and how quickly depends on the insulation's water vapor retarder. Some insulations use a vapor retarder applied to the outer surface. To meet long-term performance requirements, such insulations:

Must have vapor retarder properly installed

- Must be protected from damage
- May require weather protection
- May be rendered ineffective by even a small tear or puncture

ARMAFLEX TECHNICAL INFORMATION

bul let in #019
apr il 1996
July 2008