

Insulating Piping & Equipment



NAIMA

NORTH AMERICAN INSULATION
MANUFACTURERS ASSOCIATION

Presenter: Ricardo Gamboa



Insulating Piping & Equipment

Today's Presentation

1. Benefits & Functions
2. Selection Criteria
3. Installation Practices
4. Insulation Thickness
5. Resources



Insulating Piping & Equipment

Benefits

- Energy Conservation/Emissions Reduction
- Personnel Protection
- Process Control
- Condensation Control
- Acoustic Control



Insulating Piping & Equipment

Selection Criteria: Application Dependent

Vibration

*Proximity to turbines/motors
High pressure steam pipes*

Abuse

*Foot traffic
High maintenance*

Process Requirements

*Operating temps – Min/Max
Constant/Cyclic
Below grade
Stainless steel/Pipes/Tanks*



Design Life

*Life cycle
Operations/Maintenance
Reusable after service*

Safety

*Burn potential
Fire safety*

Freeze Protection

Corrosion Prevention

Insulating Piping & Equipment

Selection Criteria: Material Dependent

Life Cycle Cost

Reusable/Value

Material-Initial Cost

Ease of installation

Strength Properties

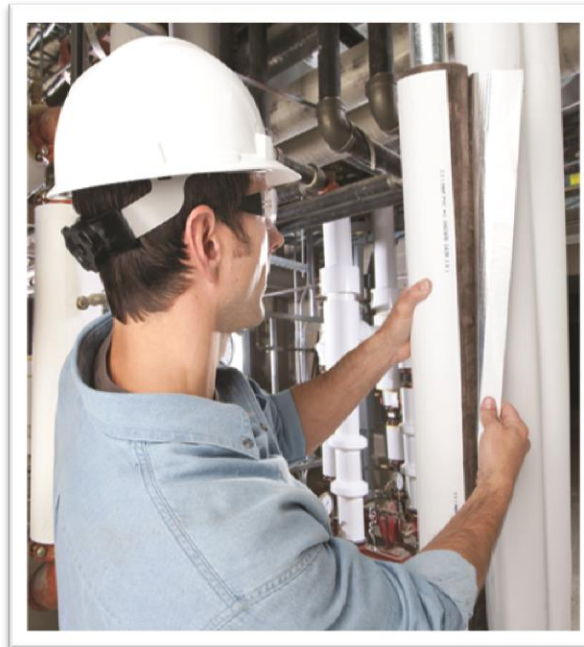
Foot traffic/Vibration

Thermal Performance

Initial/Life

Temperature Performance

Max/Min Service temp



Fire Properties

Non-combustible/Fire safety

Corrosion Properties

Environment/Process

Stainless or carbon steel

Specs & Testing

ASTM/Government

Health Safety

MSDS

Insulating Piping & Equipment

Types of Insulation

- Fiber Glass
- Rock Wool/Mineral Fiber
- Calcium Silicate
- Expanded Perlite
- Cellular Foams
- Refractory Fiber
- Insulating Cements



MICA National Insulation Standards – 7th Edition

Insulating Piping & Equipment

Insulation Materials – Temperature Ranges

Low Temp (-450°F to 60°F)

Cryogenic (-450°F to -50°F)

Refrigeration (-49°F to 32°F)

Cold & Chilled Water (33°F to 60°F)

Intermediate Temp (61°F to 232°F)

High Temp (451°F – 1500°F)



MICA National Insulation Standards – 7th Edition

Insulating Piping & Equipment

Installation is Critical!

Industry Standards

- *Guidelines*
- *Best practices*
- *Plates for all applications*
- *Inclusive for all insulation types*



MICA National Insulation Standards – 7th Edition

Insulating Piping & Equipment

Installation is Critical!

PIPING

Field- and Factory-Applied Non-Metal Jacketing

Non-metal jacketing can be of the plastic, laminated foil-scrim-kraft treated paper, flexible membranes, or fabric types. Factory-applied jacketing provides a longitudinal overlap (often self-adhering) for sealing purposes. Field-applied jacketing must be measured and cut to provide proper overlapping at longitudinal and circumferential joints.

Detail A — **Factory-applied** jacketing (hot and cold applications)

Detail B — **Field-applied** jacketing.

Materials: Jacketing material, adhesives, tape, wire or bands.

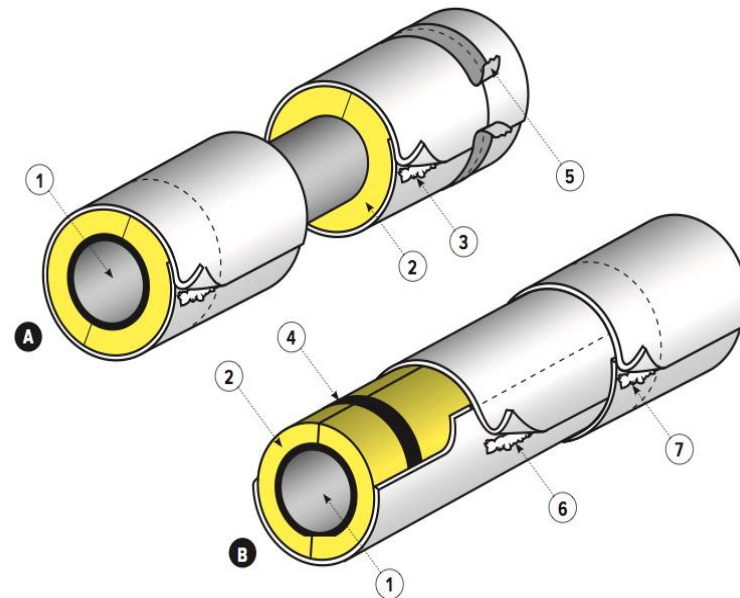
1. Pipe.
2. Insulation.
3. Longitudinal lap on factory-applied jacket (self-adhering or secured with adhesive.)
4. Wire, tape or bands securing insulation in place before the jacket is applied.
5. Circumferential butt strip, self-adhering or applied adhesive.
6. Longitudinal overlap on field-applied jacketing is secured with appropriate adhesive or may be self-adhering.
7. Butt joint overlap sealed (Tape at overlap joints is optional on cold applications.)

* Vapor stop required for below ambient conditions (see *Plate 1-660*).

PIPING

Field- and Factory-Applied Non-Metal Jacketing

 Plate 1-500



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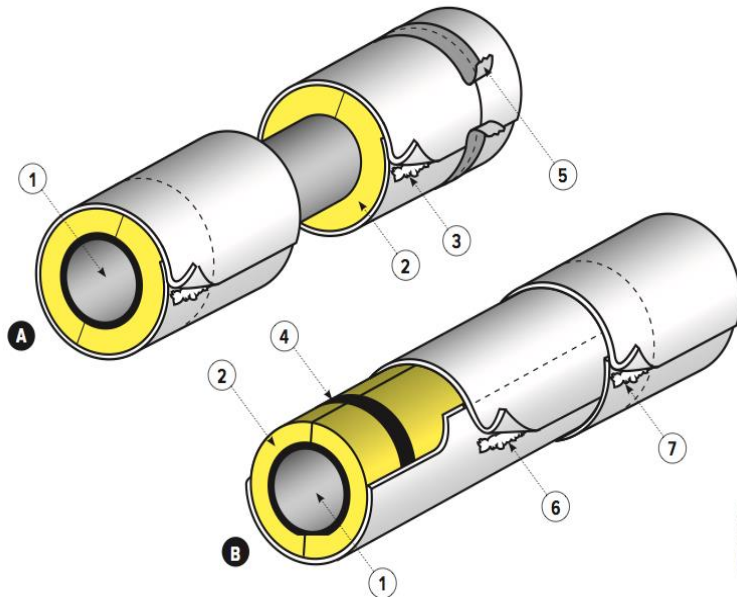
Insulating Piping & Equipment

Installation is Critical!

PIPING

Field- and Factory-Applied Non-Metal Jacketing

 Plate 1-500



SUBMITTAL DATA

- ① _____
- ② _____
- ③ _____
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- ⑦ _____

NOTES

- _____
- _____
- _____

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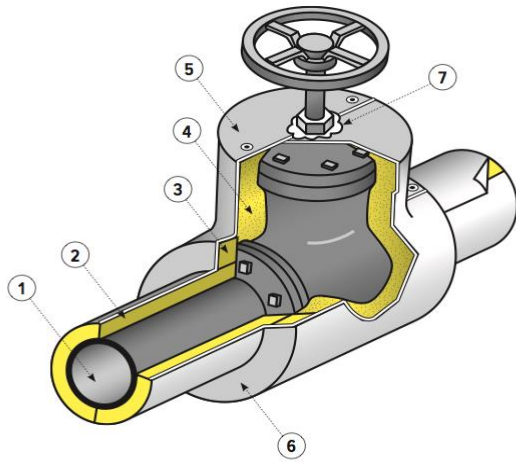
Insulating Piping & Equipment

Installation is Critical!

FITTINGS, ETC.

PVC/Mineral Fiber Valve Insulation

 Plate 2-530



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SUBMITTAL DATA

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- ⑤ _____
- ⑥ _____
- ⑦ _____

NOTES

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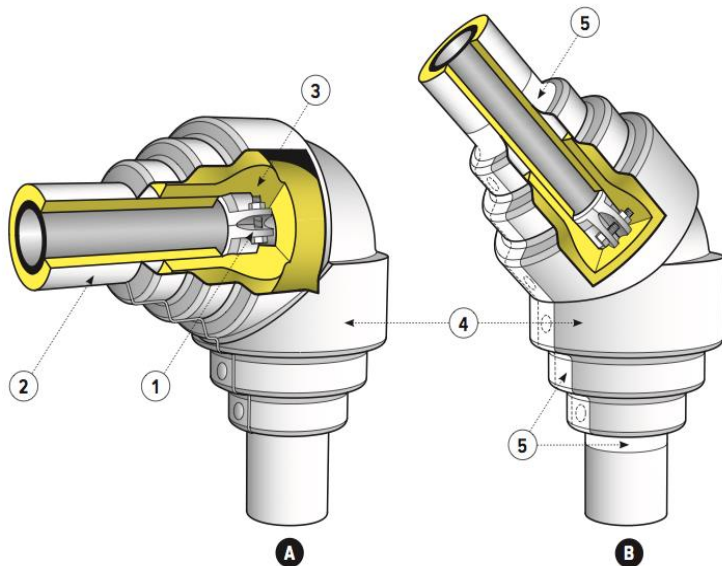
Insulating Piping & Equipment

Installation is Critical!

FITTINGS, ETC.

Mechanical Fitting Cover
Mineral Fiber 90's and 45's

 Plate 2-115



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SUBMITTAL DATA

- 1 System: _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

NOTES

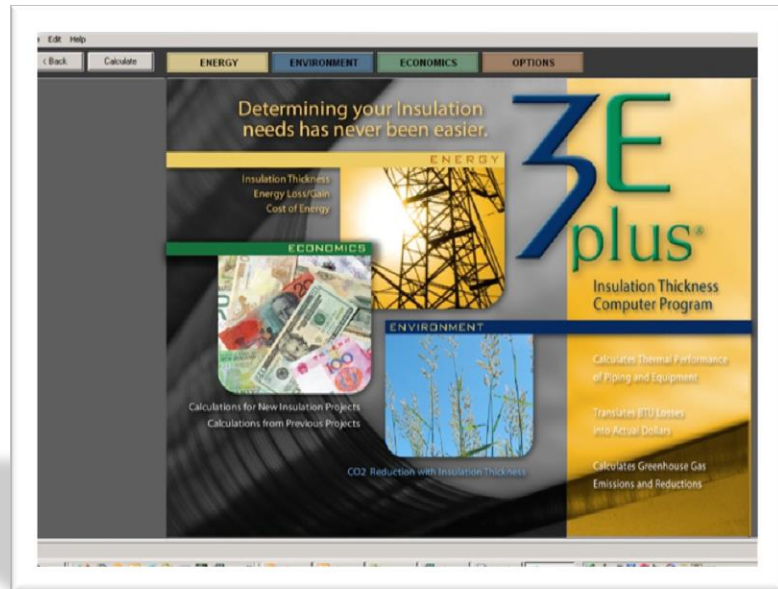
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Insulating Piping & Equipment

3E Plus

Pipe & Equipment Insulation Thickness Software

- Provides economic justification!
- Quantifies CO₂ reduction
- Quantifies energy savings
- Determines the insulation thickness for various performance issues
- Calculate greenhouse gas emission reductions
- Free download



www.pipeinsulation.org

Insulating Piping & Equipment

RESOURCES

- **NAIMA**
 - www.naima.org
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