

Reflective Insulation Technology

Introduction

Presented on Behalf of the

**Reflective Insulation Manufacturers
Association International**

About RIMA International

The Reflective Insulation Manufacturers Association International represents manufacturers and distributors of reflective insulation, radiant barriers and interior radiation control coating materials.

RIMA activities are guided by an active board of industry members who participate on national and local levels of building code organizations and governmental agencies.

Visit us at www.rimainternational.org

Overview

- **Installation Examples**
- **Radiant Heat Fundamentals**
- **R-Values, U-Factors and Thermal Performance of Reflective Insulation**
- **Q&A**

Basics of Heat Transfer by Radiation

3 ways heat moves

- Conduction
- Convection
- Radiation

Heat always goes to cold

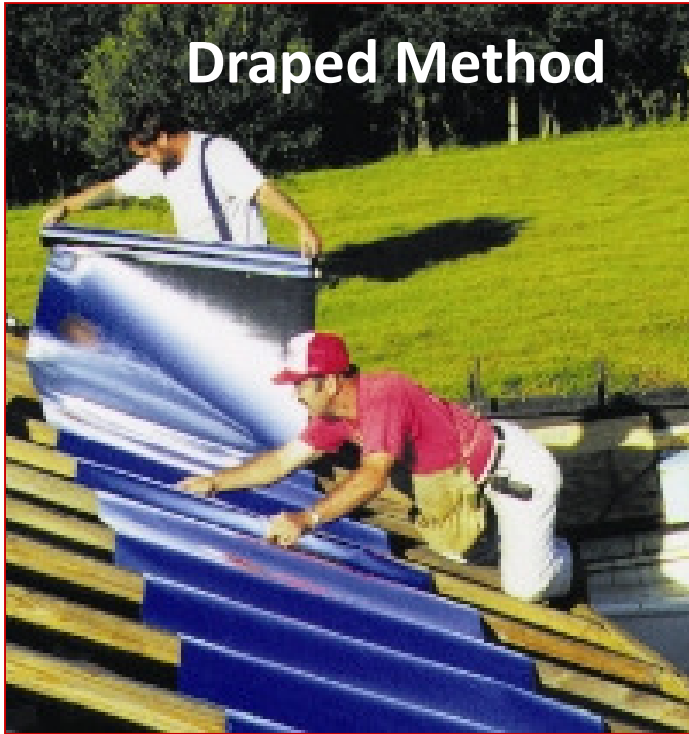
Our concern today is with the radiant mode
of heat transfer

Installation

**Reflective Insulation
and Radiant Barriers
must always be
installed in the
presence of an air
space**

Examples of Radiant Barrier Applications

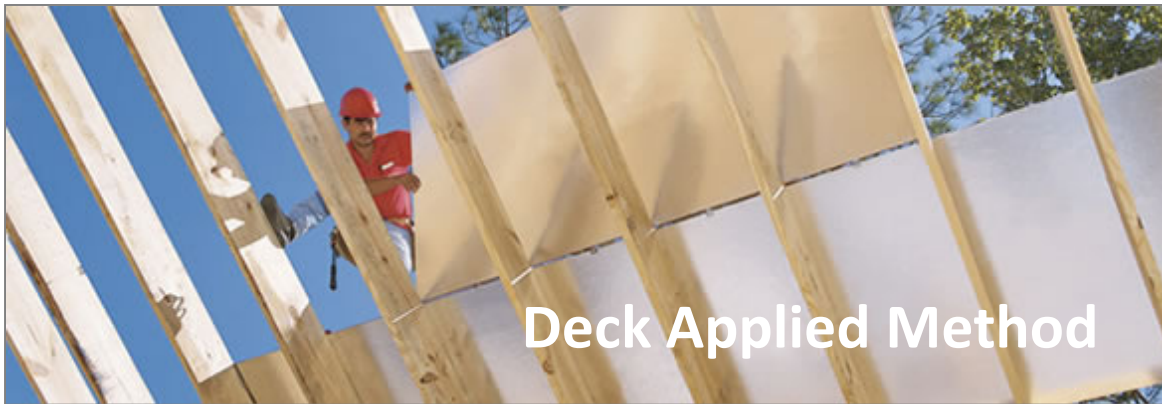
Draped Method



Bottom of Roof
Rafter - Method



Deck Applied Method



Installation of Reflective Insulation Systems Metal Buildings



Metal Buildings – New



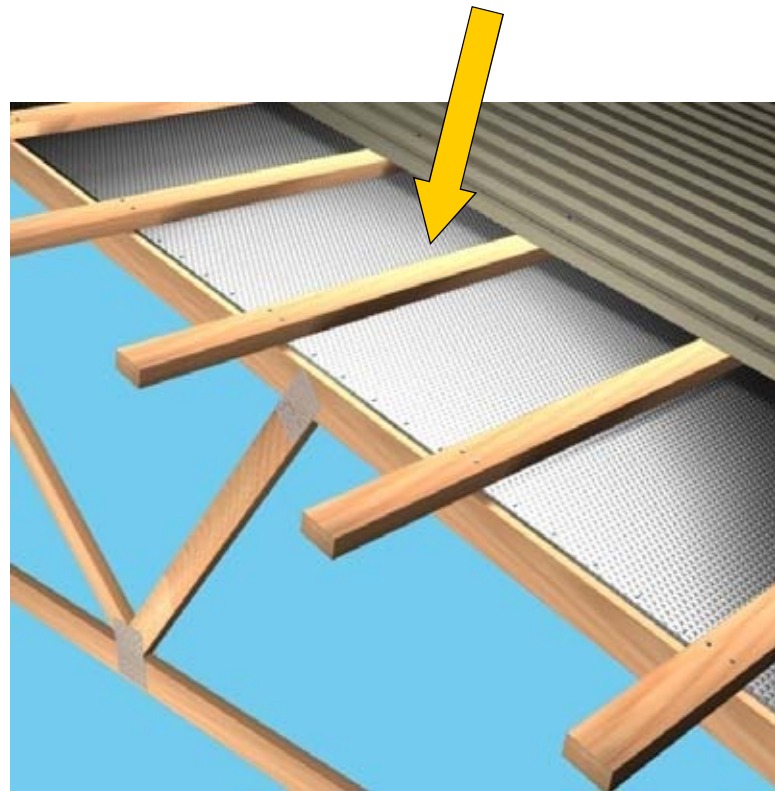
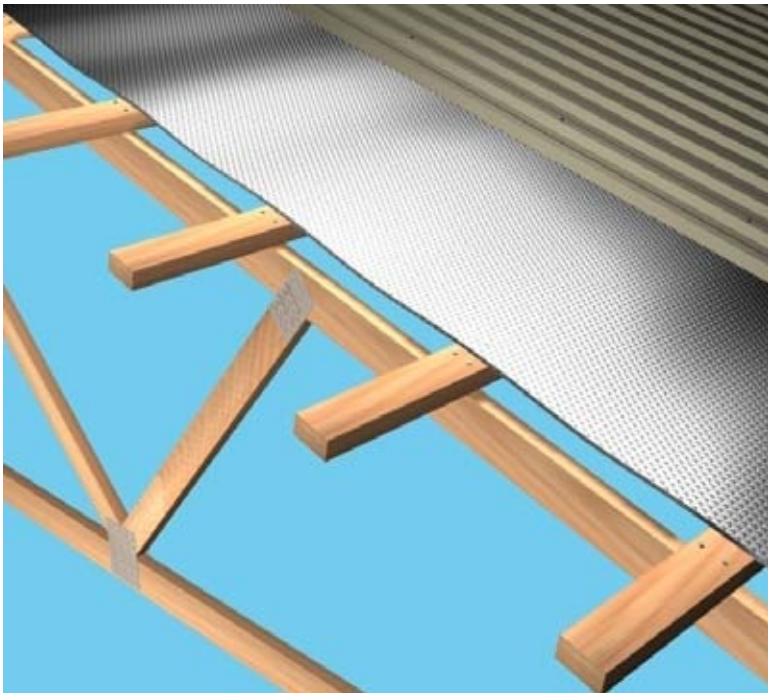
Various Widths
With or without Mass Insulation

Lightweight
Low E films on One or Both Sides

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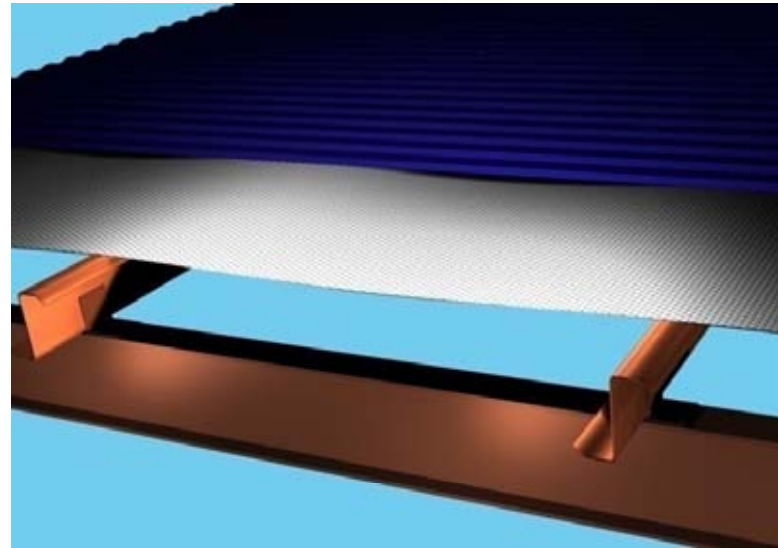
New Construction Roof

Thermal breaks are important in providing maximum thermal performance of a reflective material.



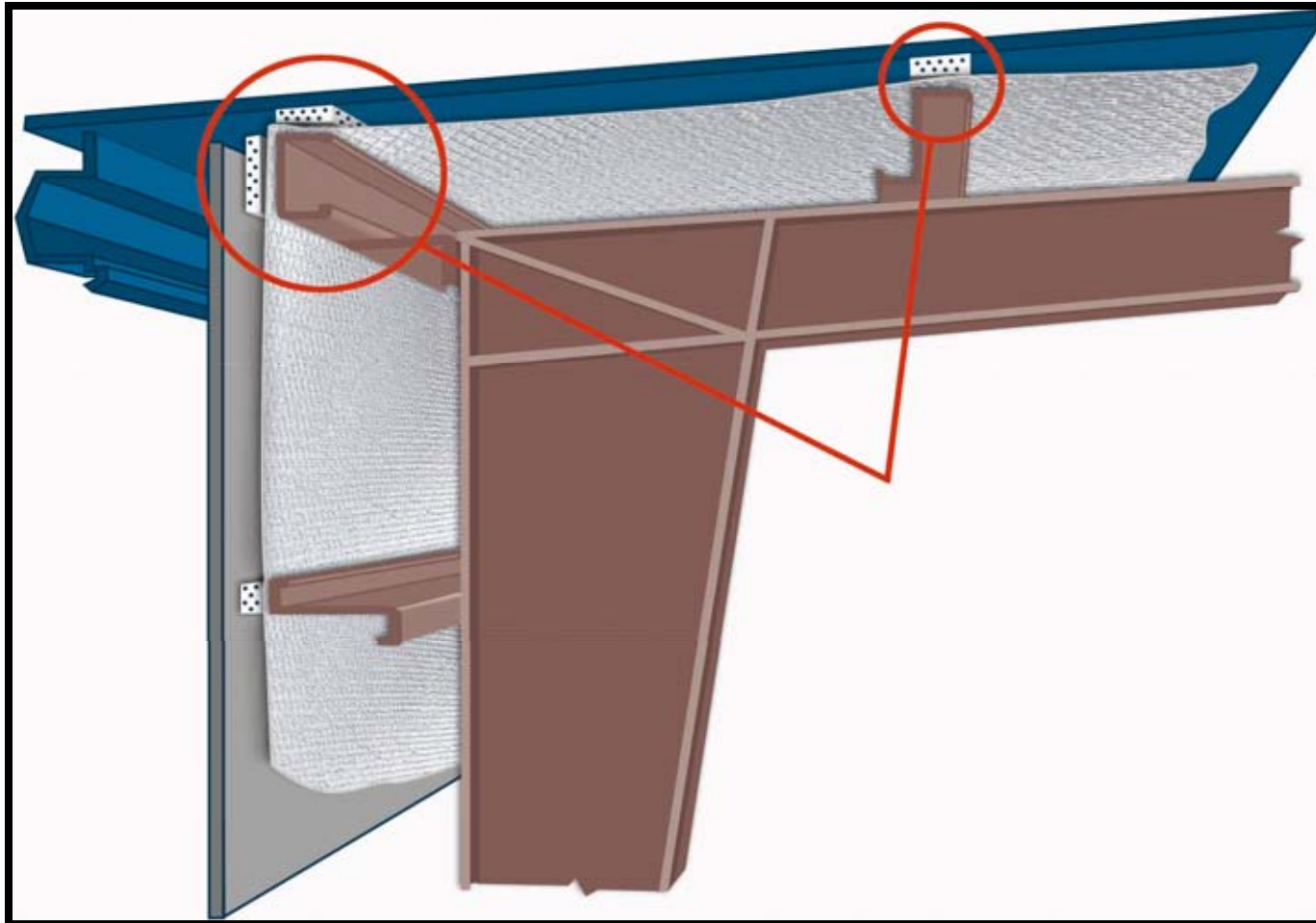
New Construction Roof

- Reflective insulation is draped over the purlins.
- Can be installed with thermal blocks

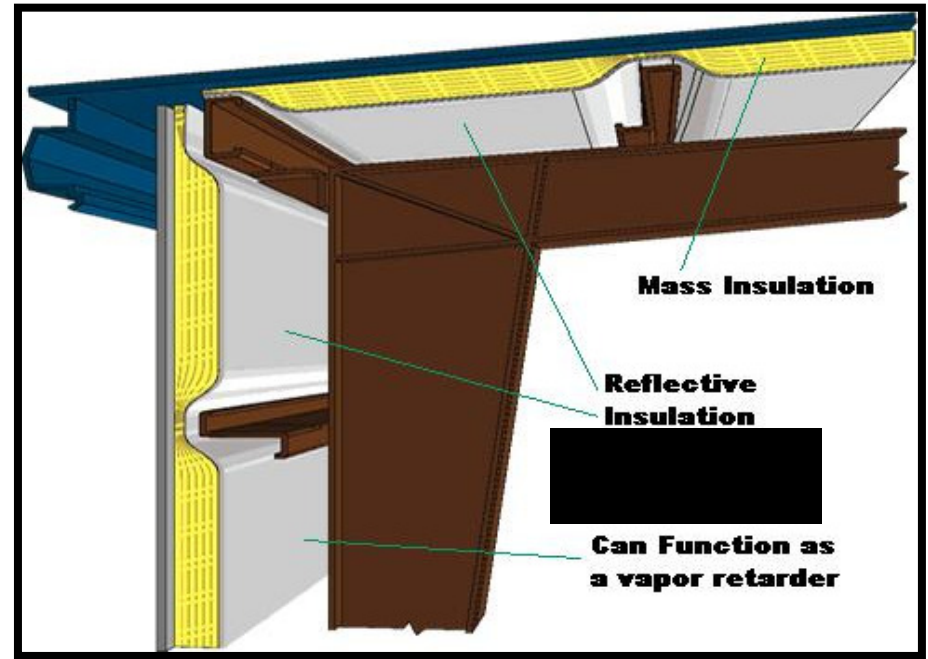
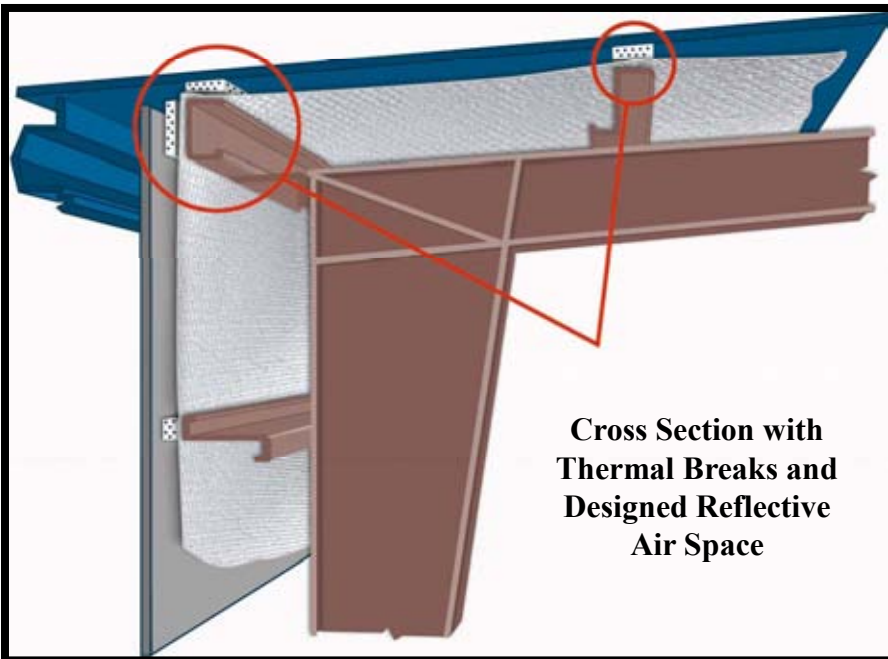
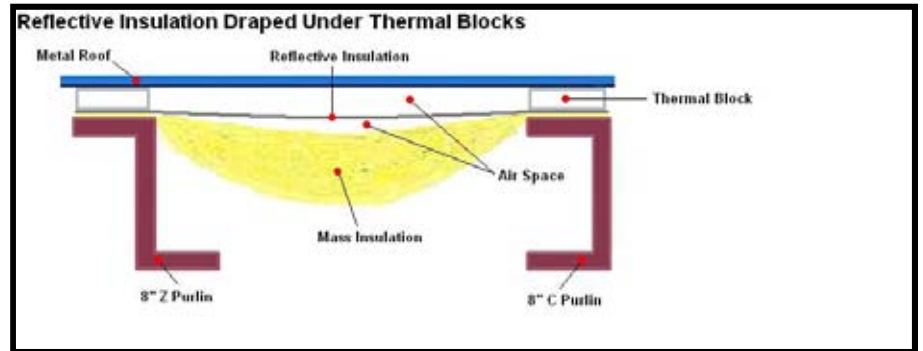
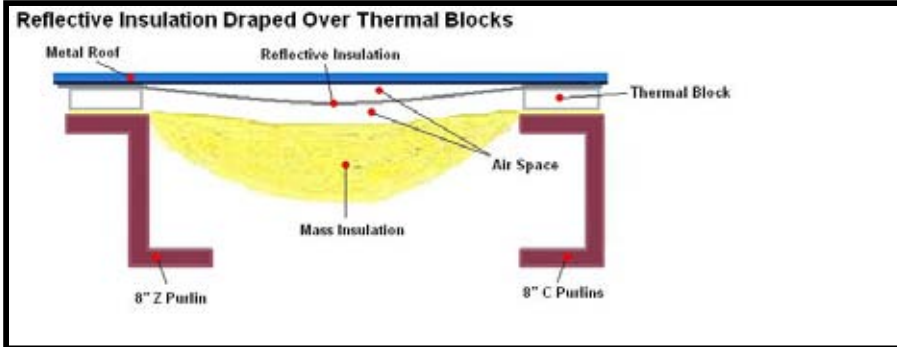


Cross Sectional View for New Construction:

Reflective insulation installed over purlins and girts with thermal spacer blocks



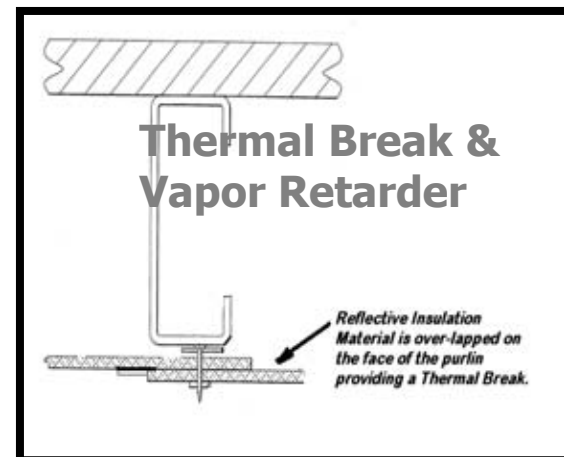
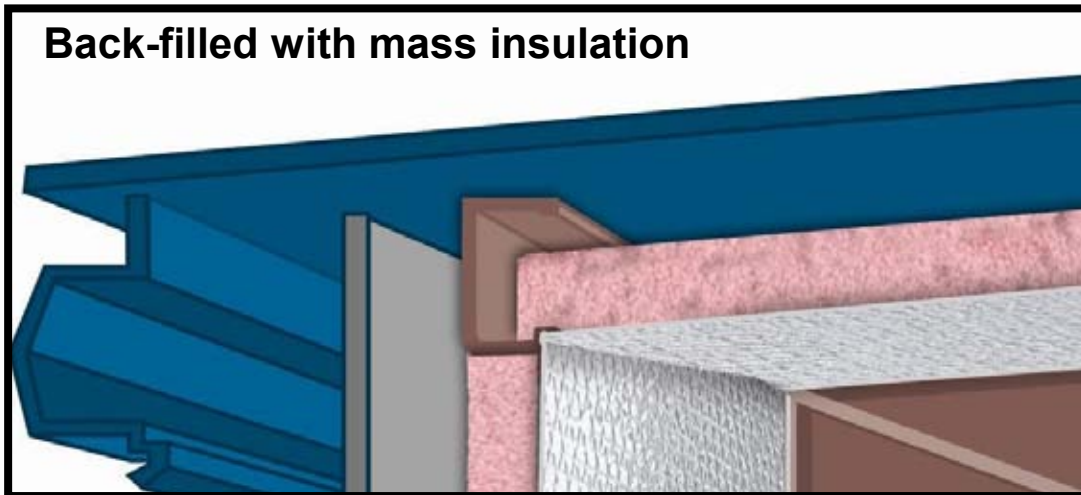
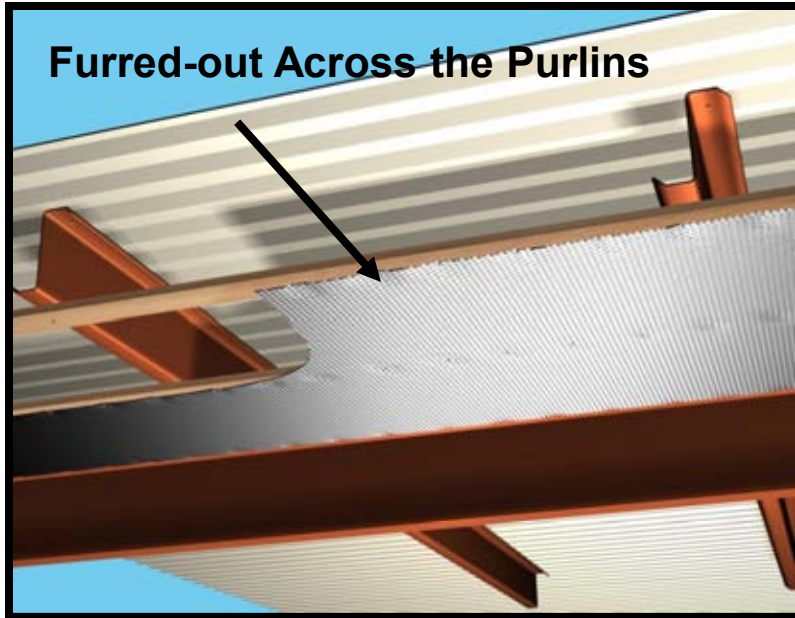
New Construction Roof With and Without Thermal Breaks



Metal Buildings – Ceilings

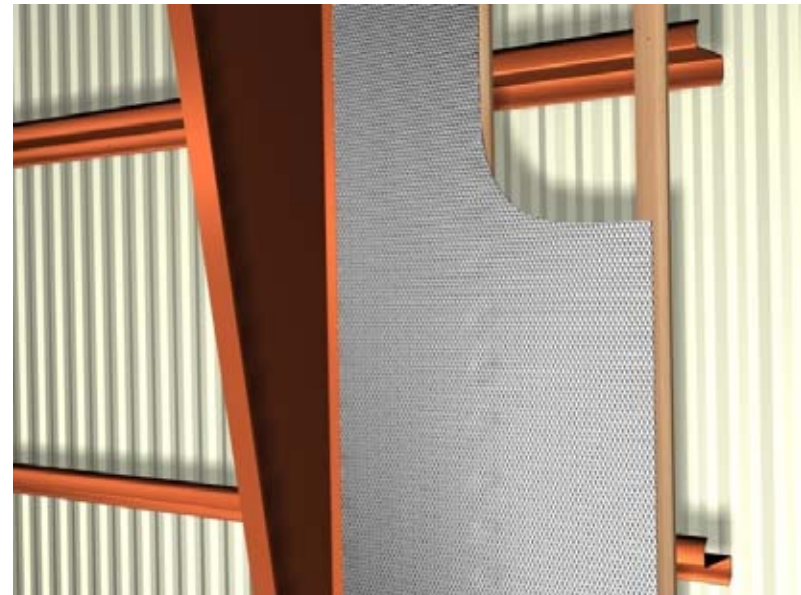
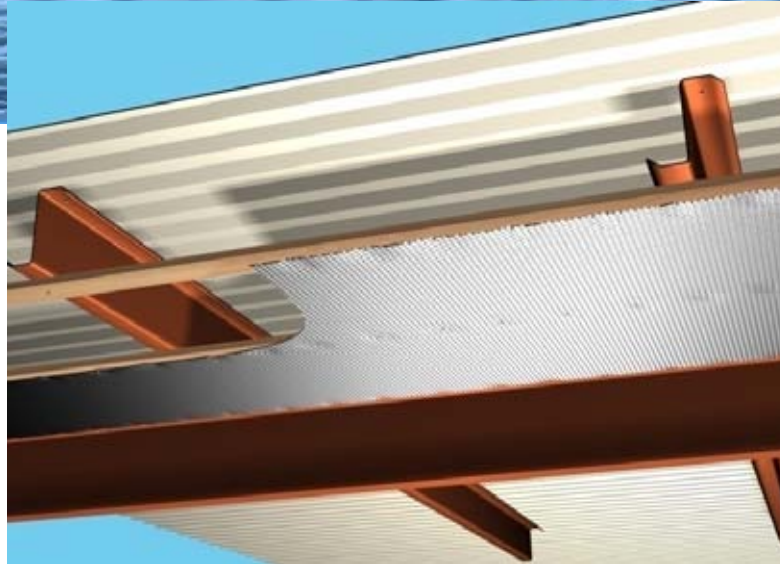
New or Existing

Over-lapped on Bottom



Retrofit

- Easy to retrofit either walls or ceiling.
- Can be applied directly to the purlins or girts or applied with Furring strips.



Vapor Retarder

Sealing the Seams



Options:

- Staple together
- Silicone between tabs
- Double sided tape between tabs
- Foil tape over seam

Metal Buildings – Ceilings New or Existing

**Sealed seams &
easily trimmed**



**Obstructions are
easily over-come**

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Examples of Reflective Insulation Applications

R-Values Apply



← Enclosed Cavity

Wall Applications

- Masonry wall application
- Applied to furring strip on the inside of an exterior block wall



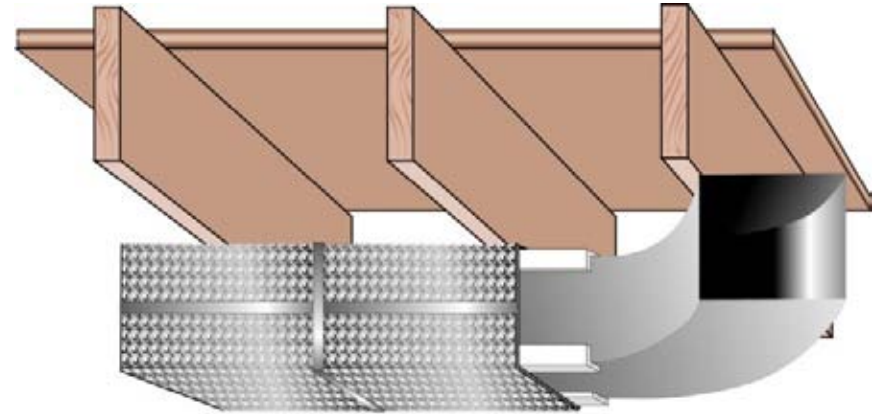
Wall Applications

- May be installed between the studs on exterior or interior walls
- Ideal for saunas, wine cellars and walls with high exposure to sun (in conjunction with mass)



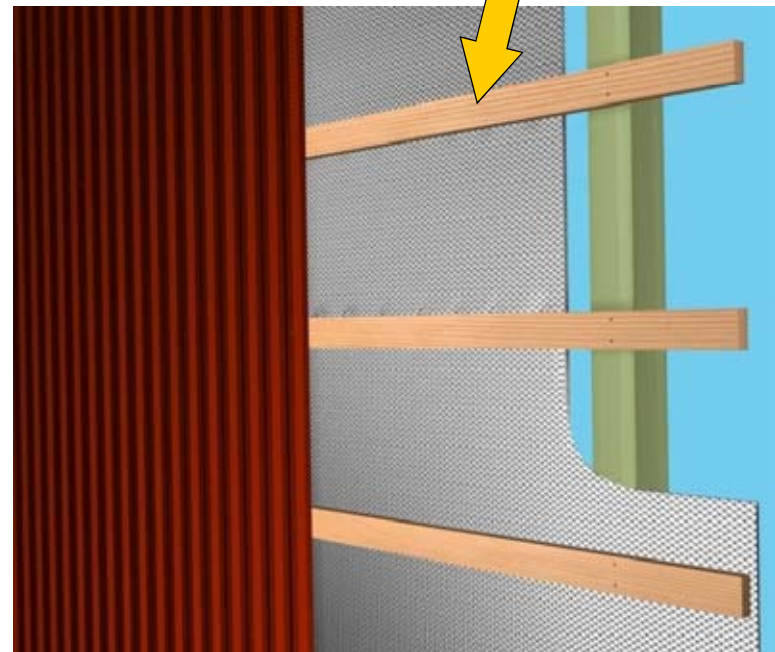
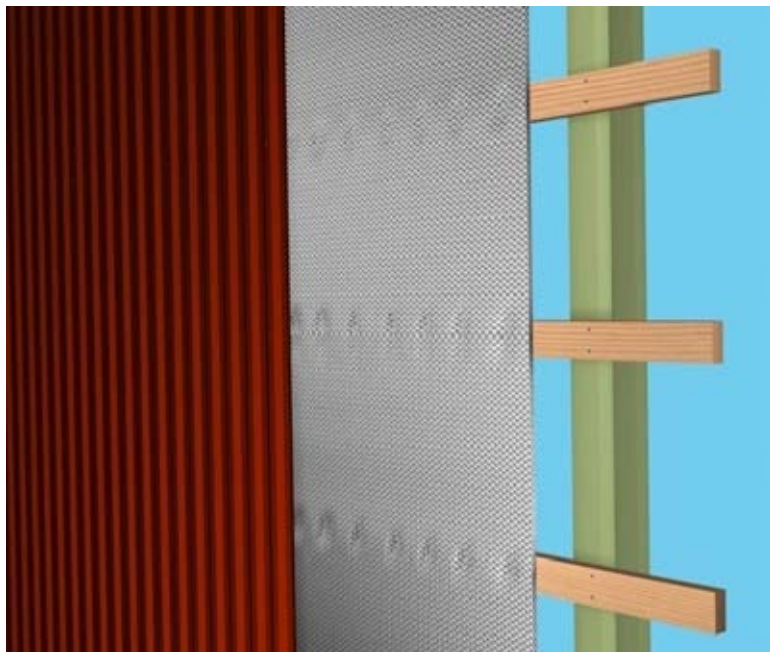
Duct Applications

- Excellent duct insulation
- Can be applied with or without spacers depending on required R-Value

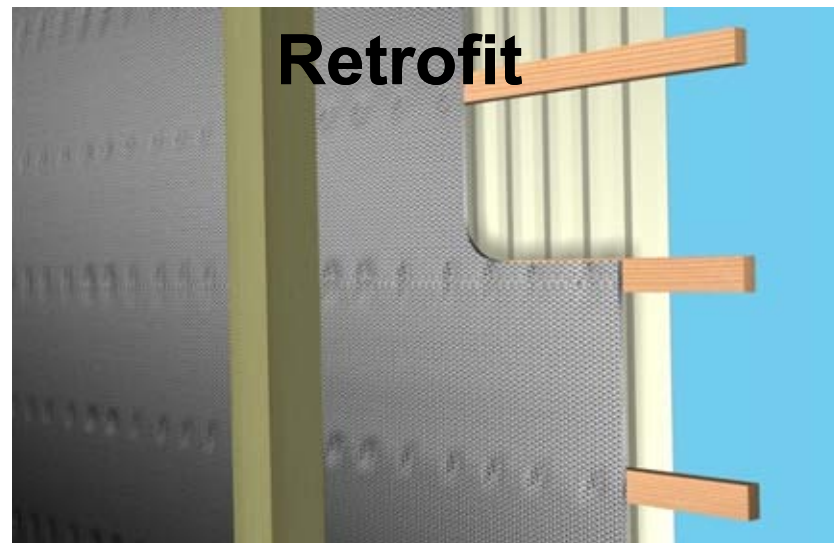
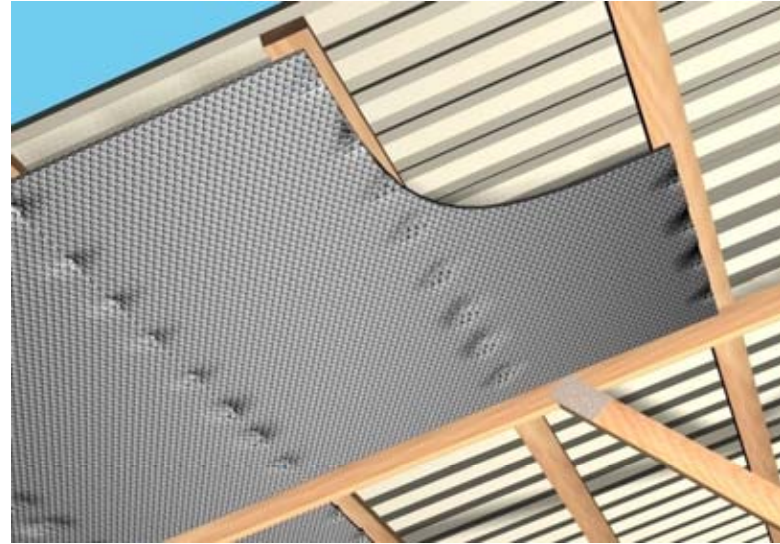
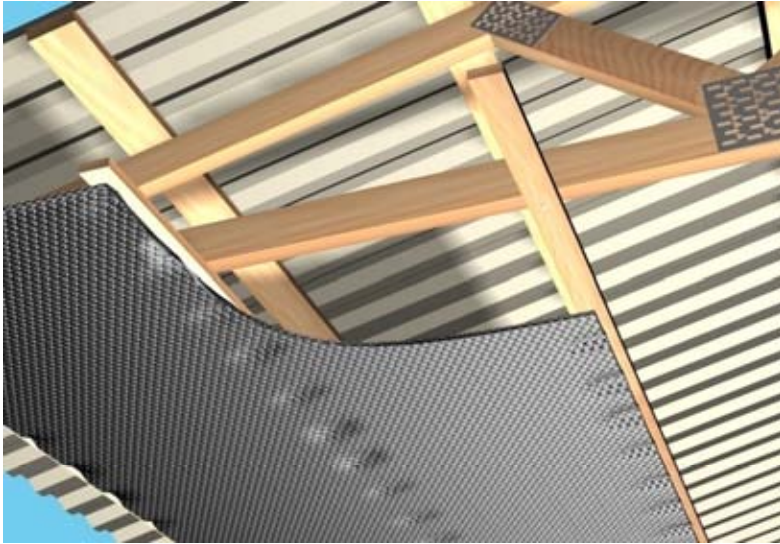


New Construction Walls

Thermal Breaks - Be Sure to Install Correctly



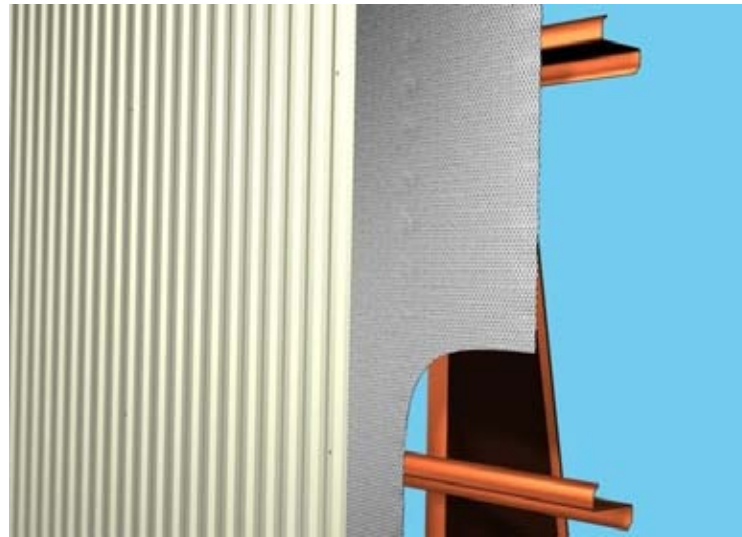
Post Frame - Wall and ceiling



Retrofit

New Construction Walls

- **Reflective Insulation is applied to the outside of the girts and draped to provide an enclosed airspace**



Hybrid Strategies

- Enclose the space below an R-19 batt insulation to form a reflective air space.
- Install reflective insulation above the purlins to produce a reflective air space between the mass insulation and the roof panels.
- Both strategies increase the thermal resistance between the purlins and add a continuous layer of insulation.

New Construction Walls



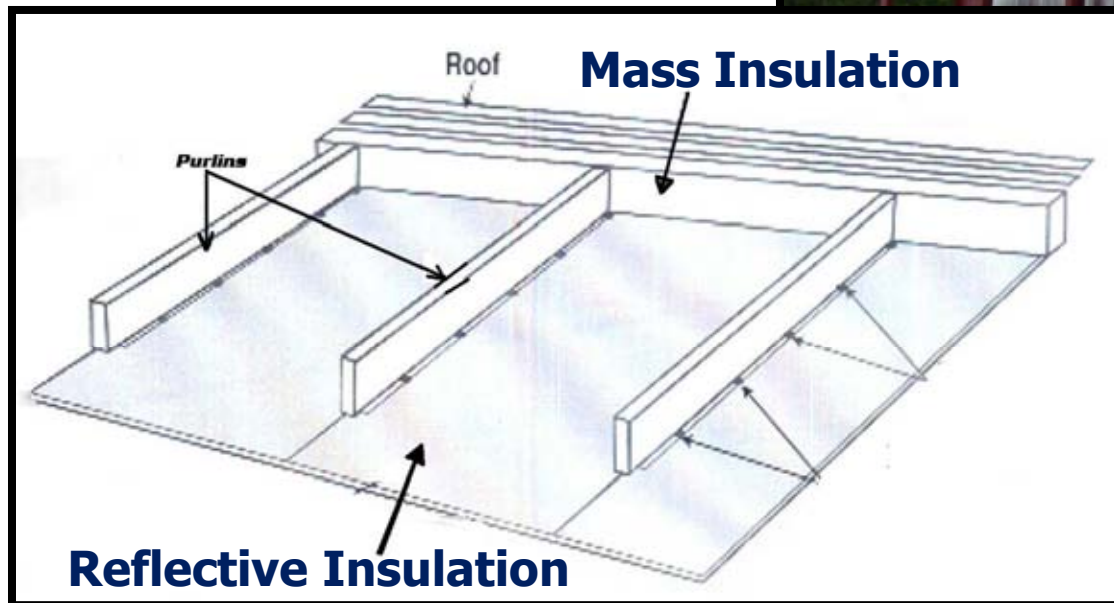
Low Emittance Surface – Back-loaded with Mass

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In Combination with Mass Insulation



Walls

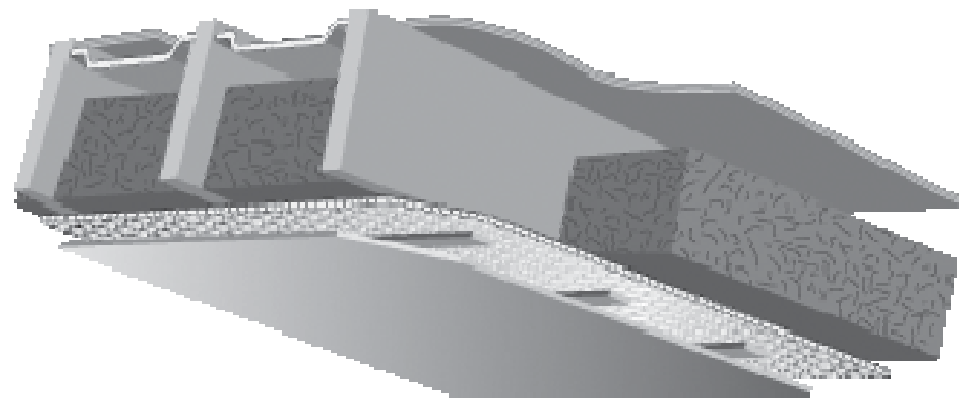
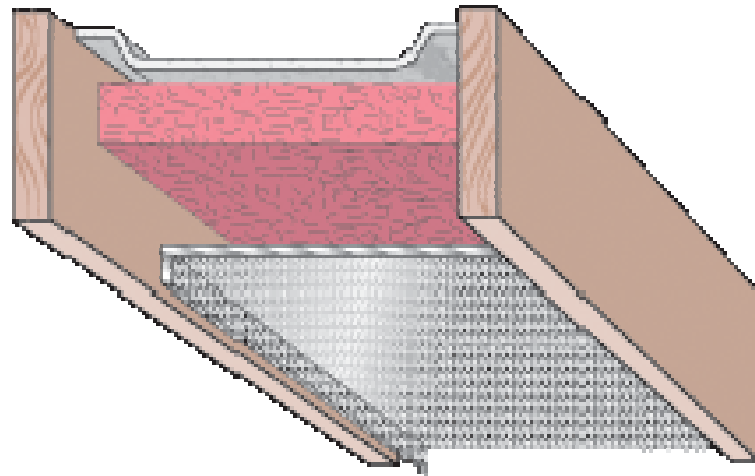


Roof / Ceiling

Roof Applications

Two Application Methods

- Between joists or with furring strips
- Ideal for cathedral ceilings and crawl spaces



SUMMARY

Enclosed reflective air spaces can be used to form hybrid metal building insulation systems.

Continuous added R value can be achieved.

Hybrid systems provide a way to satisfy new thermal resistance requirements for metal buildings.