



INNOVATIVE ENERGY, INC.

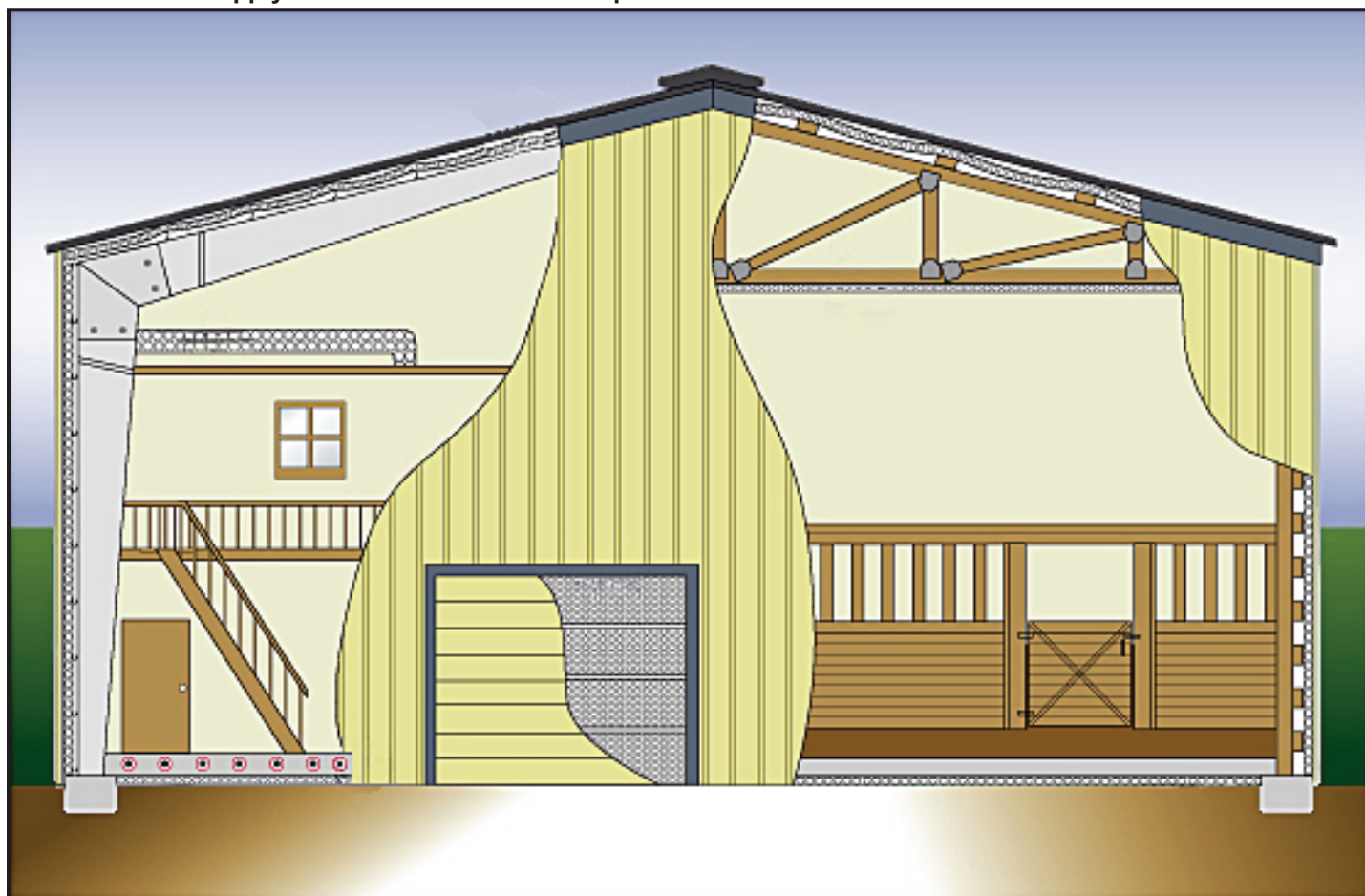
Your Single Source for Reflective Insulation Products

ASTRO SHIELD™
REFLECTIVE INSULATION

ASTRO™
ARMOUR
REFLECTIVE INSULATION

Installation Guidelines

* Guidelines also apply to installation of **astroECO** products



For Pre-Engineered Metal and Post-Frame Buildings

More Efficient, Safer To Use and Easier To Install Than Regular Bulk Mineral Fiber Or Foamboard Insulation

AstroShield & AstroArmour is a revolutionary type of industrial, commercial and general purpose insulation incorporating state-of-the-art technology in design and manufacture. It includes a building code approved vapor barrier, air infiltration barrier and powerful insulation all in one.

Its unique composite design consists of layers of polyethylene air bubble pockets, surrounded by a thin layer of reflective metalized film that is inorganic, water-resistant, puncture-resistant, termite and fungus resistant, non-allergenic and inhospitable to nesting rodents.

AstroShield & AstroArmour is easy to install—its thin, pliable, lightweight design is especially suited for pre-engineered and post-frame buildings.

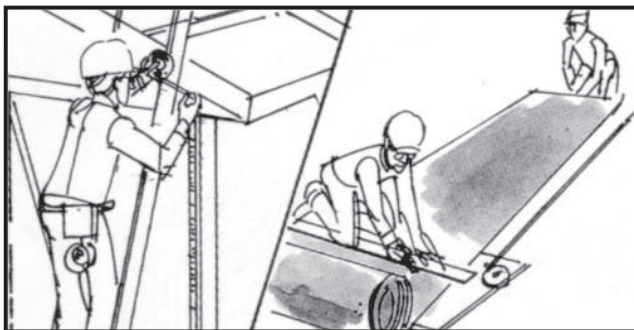
AstroShield & AstroArmour offers increased energy efficiency over traditional insulation products. And it's **safe...** there are no protective masks, gloves or safety glasses required. Standard 4' and 6' wide rolls can be easily trimmed with a utility knife or pair of scissors to fit any application.

AstroShield & AstroArmour lightweight design makes it easy on your building's design load.

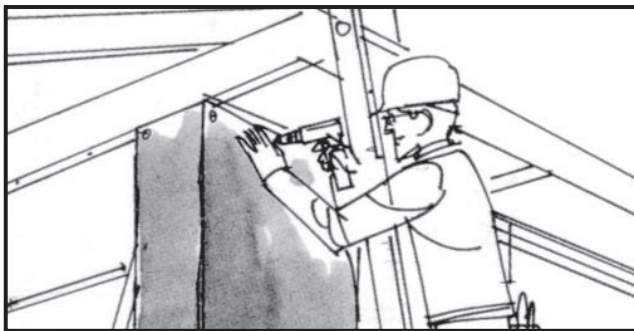
Pre-Engineered Metal Buildings: Vertical Installation of AstroShield/AstroArmour in Walls

NEW CONSTRUCTION

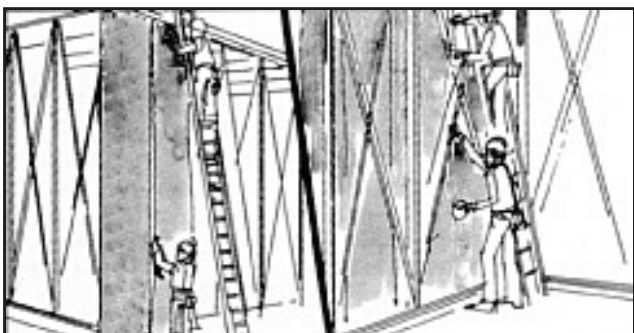
AstroShield & AstroArmour can be installed in sidewalls, either running from the top wall plate down to the foundation or running horizontal along the structure's frame, prior to the installation of the metal sheeting. Page 2 of this manual describes vertical installation; page 3, horizontal.



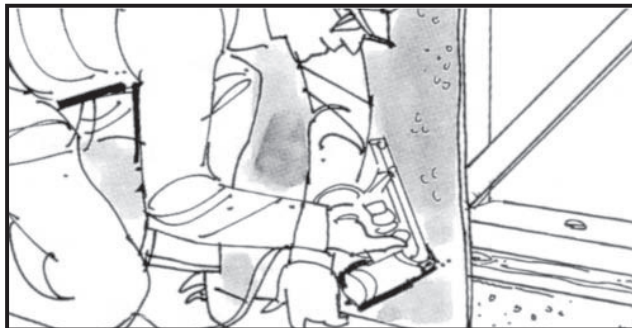
1. Measure the length to be applied, then cut a similar length of **AstroShield & AstroArmour**. Add an inch or two to assure complete coverage at top and bottom.



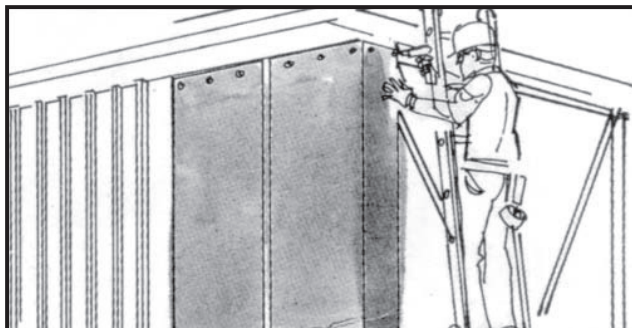
2. At corners, wrap **AstroShield & AstroArmour** around the corner and continue vertical installation as described in the previous steps. Attach metal sheeting directly over insulation in the conventional manner.



3. Cut a second length and position next to the first length. Butt sides evenly together or slightly overlap. Tape all seams following the instructions on page 6.



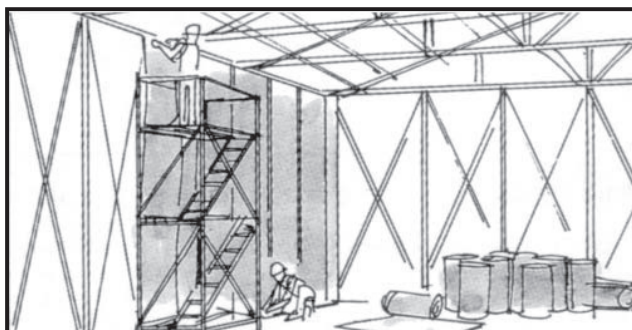
4. When securing bottom, staple or tape insulation to the sill plate or a furring strip secured to the floor.



5. Position first length at corner, wrapping around the corner and fasten with self-tapping screws or with reflective tape, sufficient to hold in place.

NOTE: If the AstroShield product you are installing on walls is one of the AstroShield 'White' products, and the reflective surface is facing toward the outside, installation must include a method of insuring a 1" airspace between Astroshield and the metal siding.

RETROFIT APPLICATION



Measure and cut lengths as in Step 1. Attach to the inside of the top of the wall plate as in Step 2. Begin hanging and securing subsequent strips as in Step 3. Leave approximately 1" airspace between wall and insulation. Continue installation per Step 4 and 5, following taping instructions on page 6.

Horizontal Installation of AstroShield/AstroShield in Walls

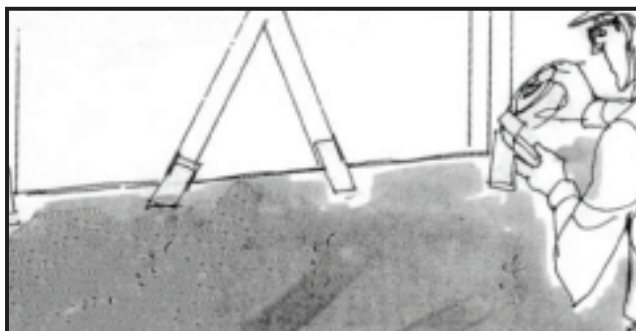
NEW CONSTRUCTION



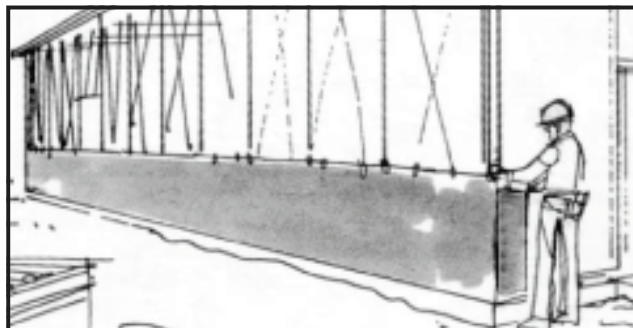
1. Install **AstroShield & AstroArmour** from the bottom up. Snap a line across the entire wall length to establish a straight edge. Position line to leave approximately 3" of insulation below the top of the foundation



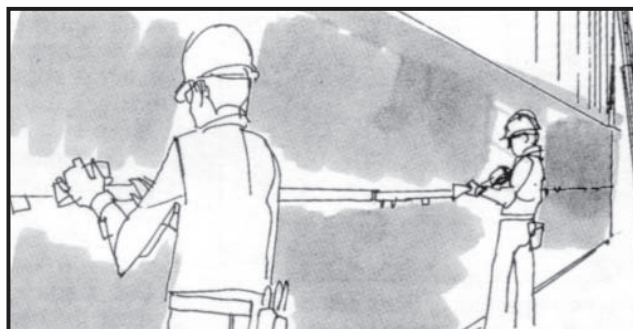
2. Measure the length to be applied from corner to corner, allowing an additional amount of overlapping. Starting at the bottom of the wall, overlap the foundation approximately 3", keeping the top edge parallel to the snap line. Wrap around the corner and staple or tape in place.



3. Continue with the next length, installing it parallel to the first length. Staple, screw or tape to purlins across the entire length of the wall, overlapping the first layer 2" if edges don't meet at the purlins. Secure **AstroShield & AstroArmour** only to the extent that the material will stay in place until the metal skin is applied.



4. Attach **AstroShield & AstroArmour** to opposite corner as in Step 2.



5. Follow the taping instructions found on page 6. Continue along each wall until application is complete. Attach metal sheeting directly over **AstroShield & AstroArmour** in the conventional manner.

NOTE: If the AstroShield product you are installing on walls is one of the AstroShield 'White' products, and the reflective surface is facing toward the outside, installation must include a method of insuring a 1" airspace between Astroshield and the metal siding.

RETROFIT APPLICATION



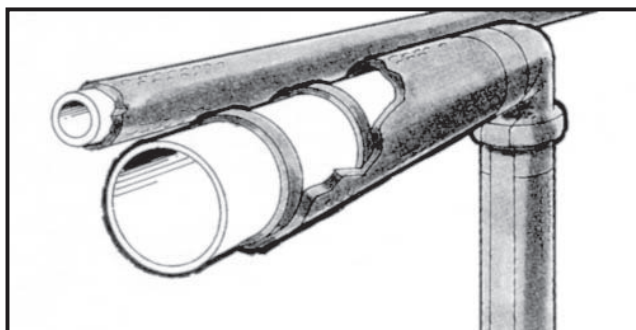
Snap a line as in Step 1. Measure and cut lengths. Attach to corner on the inside lower corner of the wall as in step 2. Roll out and begin securing to purlins as in Step 3. Leave approximately 1" airspace between wall and insulation. Continue per Steps 4 and 5, following recommended taping instructions on page 6.

Installing AstroShield/AstroArmour in Post-Frame Buildings

Follow the same instructions as for pre-engineering metal buildings using staples to secure the **AstroShield & AstroArmour** to the wood girts or purlins prior to installation of metal sheeting.

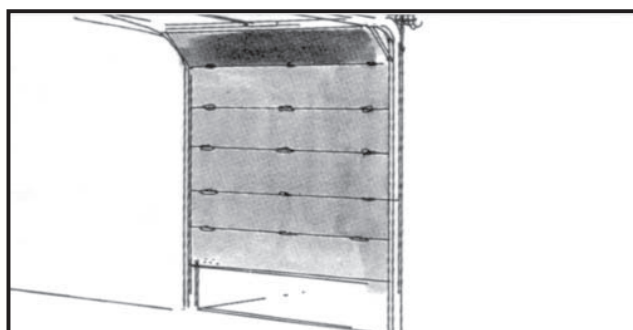
For the best finished look, space purlins or girts on 2' or 4' centers. This will place the seams on the purlins or girt edge which will be covered and sealed by the outside of the building. In many applications, this would replace the need for taping.

AstroShield GOES WHEREVER REGULAR MASS FIBER AND BOARD INSULATION CAN...AND EVEN PLACES THEY CAN'T!



PIPEWRAP

Use 1" wide strips of **AstroShield** secured around pipe every 2 feet on center to create necessary air space.



LOADING DOCK OR OVERHEAD DOORS

Special coated **AstroShield** is available for these applications.



DUCT WRAP

Use AstroShield 3" wide strips wrapped around to create 3/4" wide airspace prior to installing AstroShield HVAC duct material. 3/4" foam spacers are also an option. Space about 2 feet on center.

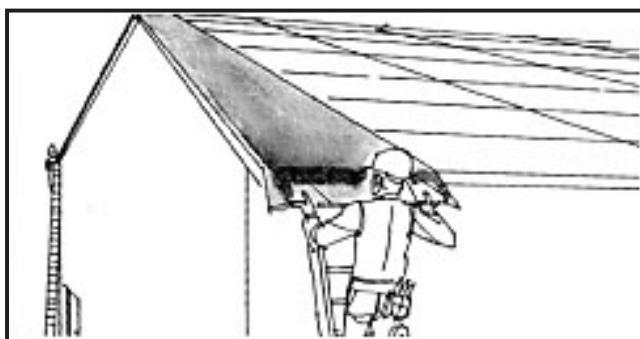


ENTRY DOOR INSULATION

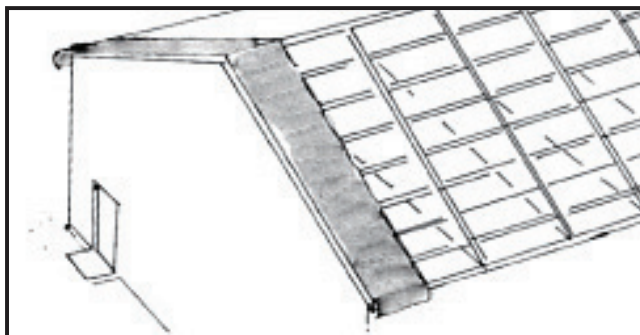
Special Note: Be sure to check technical data for temperature ranges in any high temperature application.

Installing AstroShield/AstroArmour in Roofs

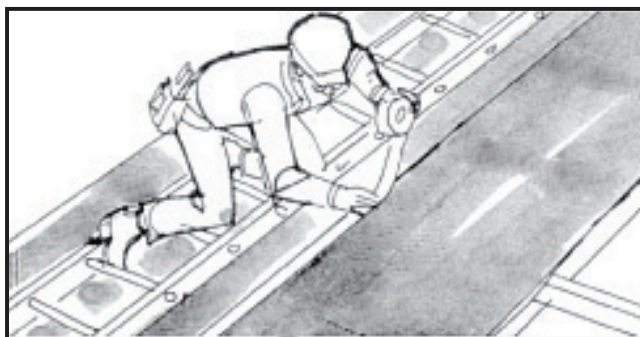
NEW CONSTRUCTION



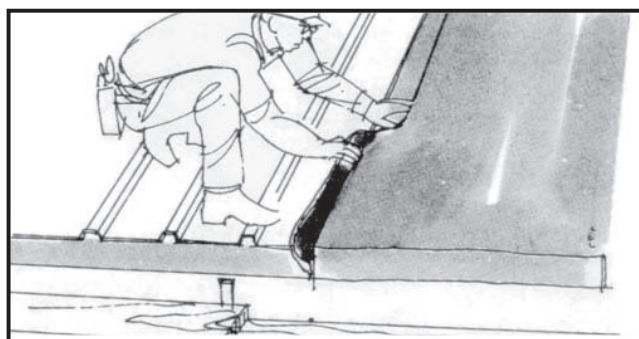
1. Starting at the end of the roofing framework, measure the length across the trusses, adding enough to allow hang at both ends. Cut the first piece and lay in place. Do not pull tight.



2. Attach to trusses and purlins using self-tapping screws and washers or with pressure sensitive reflective tape. **DO NOT USE DUCT TAPE.** Follow taping instructions found on page 6. It is important for AstroShield & AstroArmour to sag slightly. Do NOT pull tight over the purlins. This will not be noticeable from the inside of the building following installation.



3. Cut the second length, laying parallel to first. Make sure to butt or slightly overlap edges. Tape ALL seams.



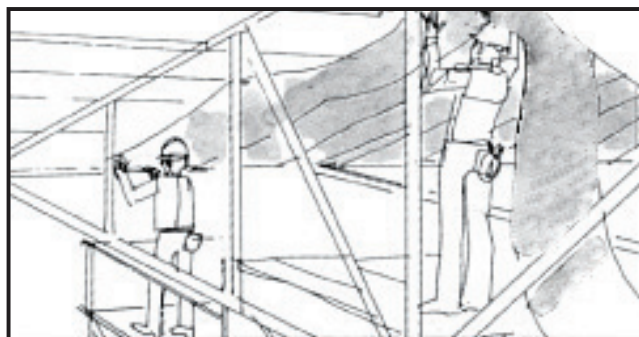
4. Roof sheeting can be applied in the conventional manner as soon as there is sufficient insulation in place to accommodate sheeting width.

IMPORTANT

When installing **AstroShield or AstroArmour** products over the purlins, it is important to allow the material to drape between each purlin so that there will be an air space of about 1" after the roof deck is applied. The reflective side must face an air space in order to reflect the heat that comes from the roof. Failing to provide the air space could lead to degradation of the material and void the warranty.

**An alternative to taping each seam is to use our Peel & Seal version of AstroShield & AstroArmour. This version features a self-adhesive release tape, which allows for an easy peel-and-stick process; eliminating the need to nail, screw or tape down.*

RETROFIT APPLICATION



Measure the first length per Step 1. Secure the wall plate per Step 3 to left or Step 2, page 2. Remember!! Do not pull tight and secure to roof truss and purlins. Continue adding additional insulation starting from the wall plate, laying parallel to prior piece. Tape all seems following recommended taping procedure.



Extra Touches That Mean Extra Efficiency



Friction fit **AstroShield & AstroArmour** around lighting fixtures, exhaust fans, motors, vents, or other equipment extending onto the roof. Strictly follow manufacturer's recommendations on covering or coming into contact with their fixtures.



Small punctures, large rips or tears can be repaired or patched with pressure sensitive reflective tape.



Eliminate cold spots by filling cracks around doors or window framing. Where possible, bow **AstroShield & AstroArmour** into openings. Use a closed cell foam product to fill small cracks. Follow manufacturer's recommendations for proper use.

TAPING INSTRUCTIONS

1. Butt ALL seams. Use only reflective tape recommended by the manufacturer for insulation applications. NEVER USE DUCT TAPE!
2. Make sure tape and insulation are clean, dry and applied according to tape manufacturer's recommendations. Apply tape evenly over seams using a tape width that is appropriate to the job. Usually, the wider the tape, the easier it is to install.
3. Use a squeegee or flat edge to press against the tape to ensure the best adhesion. Keep insulation as smooth as possible. When taping, it helps to work from the middle out to the ends. Squeegee the tape with a flat edge to ensure a tight seal.
4. Always follow the tape manufacturer's recommendations on storage and use.
5. Manufacturer recommends using an acrylic based adhesive tape, wherever moisture or condensation is a concern.

General guide to application, appearance and performance

A. WARNING! Metalized film is an excellent conductor of electricity. In both new construction and retrofit applications it is important to make sure there are no "live", bare wires in the work area that could come in contact with **AstroShield & AstroArmour** or installers during or after installation. Use caution around junction boxes and electrical fixtures. Have a qualified electrician examine area for safety BEFORE INSTALLATION.

B. AstroShield works best with an air space on each side of the insulation.

C. Taping seams is not always necessary for good performance. In buildings where moisture or condensation is not a concern, overlapping edges or installing them behind girts or purlins is often all that is required. Animal confinement buildings, food or seed, or vegetable storage structures generally give off moisture to the air that can cause condensation in some climates. Careful taping of all seams and covering of all building truss members in direct contact with the building metal skin will improve maximum building envelope performance. **AstroShield & AstroArmour** properly installed and taped in a building with adequate ventilation, is your best protection against condensation problems.

D. Do not paint **AstroShield & AstroArmour's** surface or allow it to be coated with a liquid. Metalized film will not reflect heat if painted.

E. Attach to wood with staples at least 1/4" in length; attach to metal with self-tapping screws at least 1/4" in length.

F. Store rolls in a dry area, out of direct sunlight and in plastic bags until ready for use.

G. Do not install **AstroShield & AstroArmour** on top of existing mineral fiber insulation, cellulose or rock-wool in attics or roofs. However, these same products can be installed on top of **AstroShield & AstroArmour**.

For technical information on specific applications, contact your nearest **AstroShield & AstroArmour** dealer or call 1-800-776-3645.



INNOVATIVE ENERGY, INC.

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