

RETROFITTING OVER EXISTING METAL ROOFS CREATES SEVERAL ENERGY SAVING OPPORTUNITIES.

Energy savings, reducing our power consumption and lowering our carbon contribution is increasingly in the consciousness of the consumer these days. When an existing metal roof has reached the end of its' useful life, retrofitting, that roof with a new metal roof is the perfect solution. It also provides the building owner the opportunity to add significant energy efficiency to their building in a number of different ways.

Retrofitting will create a cavity between the existing roof and the new roof. The depth of this cavity is adjustable and that flexibility allows any number of possible depths and types of insulation to be added. Let's look at our available options:



- **Raw unfaced-fiberglass (FG):** Fiberglass is the most commonly used insulating material in retrofitting. FG is rated at R-3.3 to 3.5/inch. This material conforms easily to the existing roof's panel profile and fully fills the cavity between the existing roof and underside of the new metal roof. It also minimizes the possibility of panel rumble when run over the top of the new structural sub-purlin framing.

- **Extruded Polystyrene Insulation. (EPS):** EPS is rated at R-3.8 to 4.0/inch. This insulating material is created in large planks and can be precut to fill the space between the ribs of most all existing metal roof panels. Using precut planks makes filling the flutes between the ribs very easy but remember EPS is typically installed in 2 layers. The first is the flute fill layer between the major panel ribs and the second is a cross-lapped larger sheet over the flute fillers with taped joints. For proper roof load transfer, the insulation will need to be flush with the top of the sub-framing so the new metal roof panels can attach directly to a structural member.



- **Polyisocyanurate Insulation (ISO):** ISO is rated at R-5.8/inch. This is a heavier and denser foam insulation typically with a paper or foil facing on it. It is installed in multiple layers in a similar fashion to EPS except because of its density it can be installed over the top of the sub-framing allowing a new standing seam to be attached with clips and bearing plates on top of the insulation with fasteners going down to the sub-framing, creating a full thermal break. It is my preference to keep this layer to 1" to minimize the distance between

the clip and the sub-framing.

A few things to remember when using EPS or ISO are:

1. If you are in snow country or a high wind zone area additional framing will likely be required in the corner and possibly edges. The insulation will need to be hand cut around this framing.

2. When using ISO the R-rating drops as the temperature does cold weather performance is generally between R-4.5 to R-5.0.
3. EPS/ISO may affect the fire rating of the building, it is a combustible material.
4. Bearing plates for standing seam roofs cannot be used on EPS, the material is too compressible. A denser rigid insulation like ISO is needed.
5. When the insulation is not over the sub-framing foam tape may be needed over sub-framing to minimize any possibility of panel rumble. Consult the panel manufacturer for their recommendation.

Competing single-ply roofers frequently use EPS and ISO over metal roofs as well. A few things to point out to the owner and/or contractor when they are considering a single-ply application over EPS on an existing metal roof:

1. Existing metal roofing cannot be treated as structural steel decking. The roofing material must be attached to the sub-framing purlins not the existing roof panels.
2. In snow country the codes have changed and drift loads must be considered. Was the existing building checked for compliance with the drift loads? If the building is not compliant, foam insulation and a membrane roofing will do nothing to strengthen the existing roof and bring it into code compliance.
3. In high wind zone areas does the new single-ply meet the necessary uplift requirements on the existing purlin spacing (typically 5'-0").



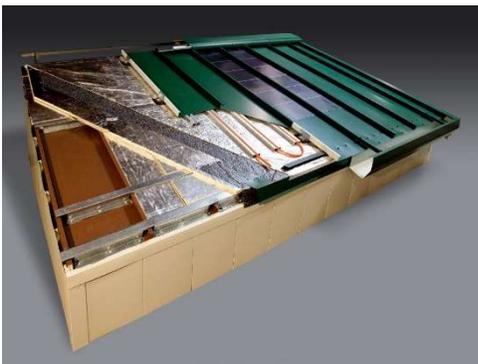
4. Is there an existing parapet gutter or valley gutter they are planning to fill with foam? If so remember it is NEVER acceptable to allow water to pond or stack on the roof, even for a short period of time. Several building collapses have been caused by this in recent years.

5. Does the weight of their system exceed the maximum 3#/S.F. allowed by code?

6. Finally, the Fire Rating for the building will be affected, both insulation and roofing material are combustible. This could change the insurance classification

of the building and its' insurance rate.

The ability to increase the roof's thermal resistance is only one of the opportunities available for a metal-over-metal retrofit. A few more are as follows:



1. Photovoltaic panels are easily added to the new standing seam metal roof in a non-penetrating way. The great news here is that the new metal roof is the only roofing material that will outlast the life of the photovoltaic panels, eliminating the need to remove and reinstall them before they need replacement.

2. Heat recovery systems. The cavity between the old and new roofs is typically 40-60 degrees above ambient air temperature. That means on a 50-degree day, the cavity air will be between 90-110 degrees. Glycol coils

can be added to collect that energy and transfer it into the building for pre-heating water systems or other fluids used in manufacturing.

3. Air recovery systems: Since the cavity air is always warmer than outside ambient air temperature, the cavity air can be drawn into the building for heating.
4. Rain Water recovery systems are ideal for metal roof systems.

Re-roofing that old metal roof with a new metal roof will not only will provide the building owner with the longest life roof available, but also opens a whole world of possibilities for increased efficiency and reduced environmental impact. Finally, there are also a host of tax incentives for re-roofing and improved building efficiency but that's another article.

Dale Nelson
President
Roof Hugger, LLC