

Energy Efficient Re-roofing

It is important to understand that when retrofitting over existing sloped metal or solid deck roof systems, the Roof Hugger sub-purlin will create an air-space cavity between the old and new roofs. This air-space presents several options to the contractor and building owner. Simply stated, the space can be used to improve the building inhabitant's comfort and environment as well as provide significant energy benefits through alternative energy resources. Consider the following before finalizing your re-roofing plans.

Insulated Systems

Metal building construction over the years has historically used low R-value insulation between the existing purlins and metal roofing. Because of this, these buildings may be ineffective in reducing heat gain through the roof assembly in the summer as well as heat loss during the winter months. Adding insulation between the old and new roofs is a cost-effective measure to decrease the building's energy consumption while paving the way to pay for itself in a relative short time frame.

The thickness of the insulation may vary dependent on code requirements, such as the ASHRAE 90.1-Model Energy Code. If the code requires a R-Value then the depth of the air-space allows when using a standard sub-purlin, it is very easy to increase the depth of the Roof Hugger to permit

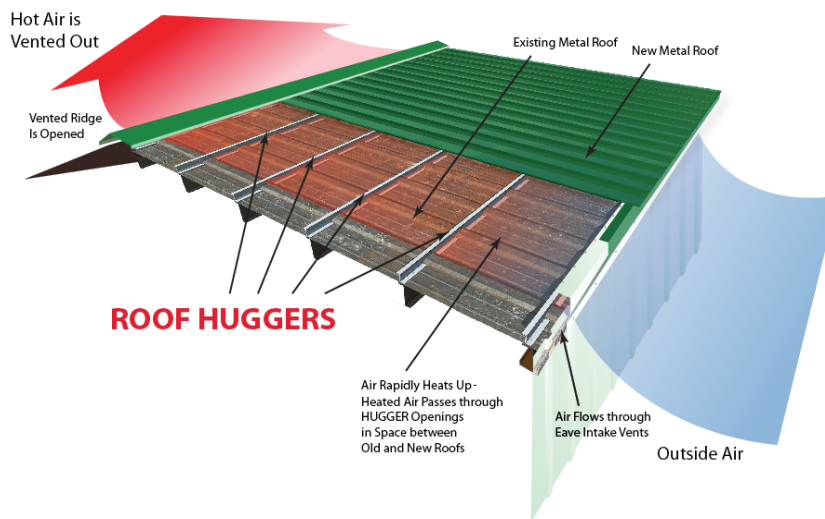
thicker insulation without adding major cost to the project.



Actual project case studies have illustrated up to 25% reduction in energy fuel source consumption for heated and air-conditioned buildings.

Ventilated Systems

If the building that is being retrofitted is not thermally controlled, then adding insulation may not be of benefit. If this is the case, then the air-space should be ventilated. This is easily



accomplished using economical ventilation products at the low eave and high point (ridge, high eave, etc.) of the roof. When ventilated, the air in the cavity becomes a radiant barrier that reduces heat gain/loss. This roofing technology is known throughout the metal

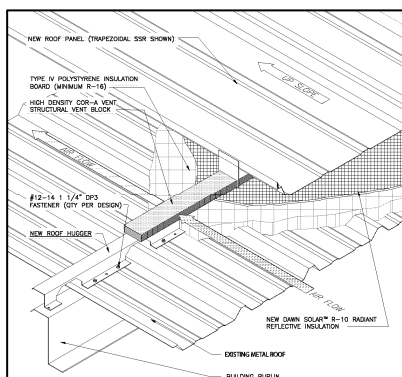
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roofing industry as Above Sheathing Ventilation or "ASV".

Please note that this assembly is very effective as well for buildings that are thermally controlled. Case studies for these systems have illustrated nearly 21% decrease in energy consumption. In warmer climates, this system is very effective in improving the building's interior environment. This is especially true for buildings that have working occupants such as livestock confinement, manufacturing and warehousing.

Ventilated and Insulated Systems

It is possible to incorporate both new insulation and ventilation in the cavity between the old and new roofs. In fact, building envelope industry experts claim this is the best of both worlds. To accomplish this, the thickness of insulation is determined and the Roof Hugger sub-purlins are then manufactured

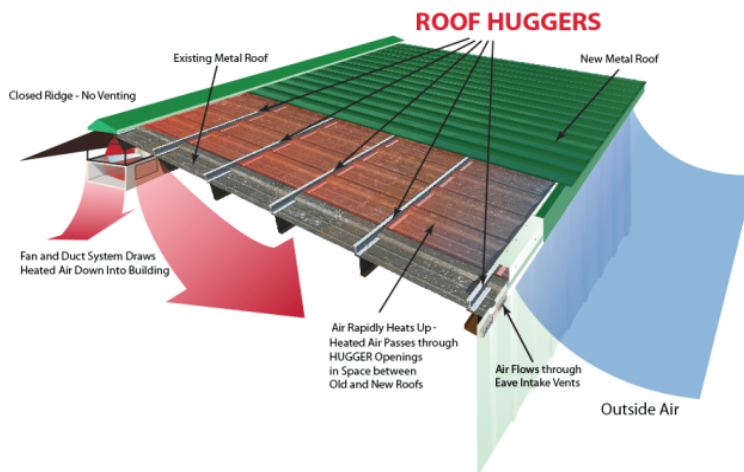


approximately two inches taller to permit air-flow above the insulation. Another technique can be used by installing a Cor-A-Vent strip atop

the Huggers for systems using new standing seam metal roofs with tall clips.

Solar Thermal Heat Recovery Systems

What makes better sense than using your roof as an alternative heating source? By using the sun's radiant heat reflected on the new metal



roof, Solar Heat Recovery "SHR" roof systems have the ability to provide an alternative heating source for the building.

How do these systems work? Fresh air is introduced to the cavity between the old and new roofs through ventilation at the low-eave of the building. When the sun heats the new metal roof, the cavity air is facilitated through solar-powered fans and re-distributed through new ductwork to the existing HVAC system. The system is specifically engineered to suit your building's requirements.

The system has the natural ability to dissipate any moisture caused by condensation as well as aiding in the elimination of mold growth.

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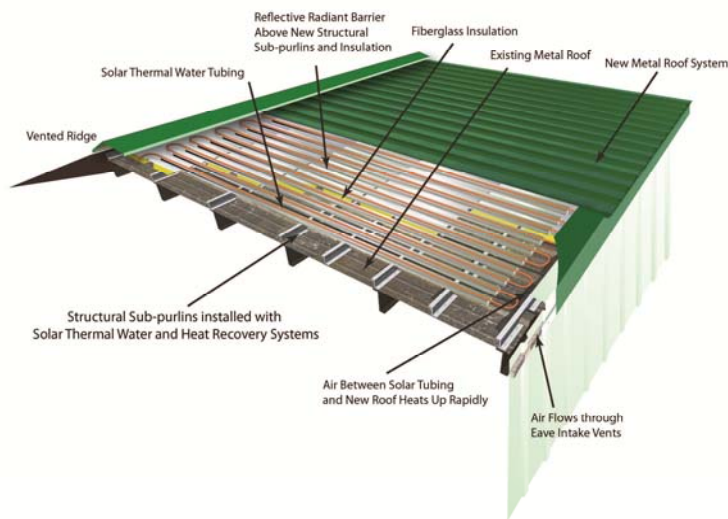
What's even more important is the "SHR" system qualifies for Federal Solar Energy Tax Credits and other benefits. Add the Savings from reduced energy consumption to the Tax Credits and reduced roof maintenance and you get a new roof that pays for itself going forward.

Under the conditions of various Acts passed by Congress (American Recovery and Reinvestment Act, etc), commercial building owners that improve their energy efficiency using solar systems may be eligible for tax credits as allowed by Section 179 of the U.S. Tax Code. These credits have been extended for projects completed prior to January 1, 2017. The tax credit amount is a dollar-for-dollar credit that equates to 30% of the total in-place cost of the system (roof panels, sub-purlins and mechanical/electrical equipment including labor). In addition, the installation is eligible for IRS Bonus Depreciation (thru 2011), which allows 50% the first year and the balance over the following five years. Depending on the State your project is located, a multitude of Loan Guarantees/Funding, Grants, Renewable Energy Bonds and Tax programs are available. Consult your Tax Professional for specific investment tax credit details.

Solar Thermal Water Heating Systems

Based on similar technology as the "SHR" system, it is possible to use the air-space cavity to heat water that is used for the building's space heat, hot water and/or pre-heated water processes. This system known as "SWH" uses

the radiant heat from the sun reflected on the new metal roof to heat tubing filled with a water/glycol liquid. These tubes are installed directly beneath the new roof where the liquid is circulated through conventional pumps and



plumbing to heat various systems throughout the building. The "SWH" is also eligible for the same Solar Energy Tax Credits and Benefits as the "SHR" systems. For agricultural projects, even more benefits may be available including Federal grants up to 25% of the overall cost of the system. Dependent on the location of the project, other tax incentives may be available from State, Local and Public interests.

Consult your tax professional for specific advice regarding these and other available tax incentives. If interested in learning more about these and the other systems in this section, contact Roof Hugger at (800) 771-1711.