

IS IT METAL?

By Brian Whelan



Welding rib in place.

Over the past several years, architects and designers have often used steep sloped roofing as a prominent architectural building feature. Prefabricated metal has been the most widely used roofing application for these roof areas. Although the metal panels themselves are attractive and watertight, as a system there are some issues that still need to be addressed by the metal roofing industry.

Leakage Problems with Metal Roofing

There are a variety of seaming techniques used with varying degrees of success. Although many manufacturers provide flashing details, leaks through metal roofs often originate at details. At ridges and hips, metal or foam closures are typically sealed to roof panels and seams, but eventual sealant failure can result in leaks. Penetrations are flashed with some type of flexible membrane and then sealed in compression to the metal panels, resulting in a gasket approach.

The transverse seams between panels are another source of leaks. Metal panels are overlapped with the flow of water. A single bead of sealant is applied within the panel overlap. The most common sources of leakage are at intersections of different detail conditions, where three-dimensional detailing is required. Examples of these conditions include ridge and hip intersections or valley and ridge intersections at dormers.

Unlike traditional metal roofing made from copper or other solderable materials, pre-painted metal roofs rely on sealant at flashing areas for primary waterproofing protection. Sealant is prone to deterioration from weathering and/or movement.

Snow accumulation and ice dams also lead to leakage problems because they can cause water to pond on low sloped areas. Submerging a metal roof system in water and water back-up are major concerns because a metal roof is not intended to be waterproof and must rely on slope in order to shed water.



Post and rib installation.

Tale of the Tape

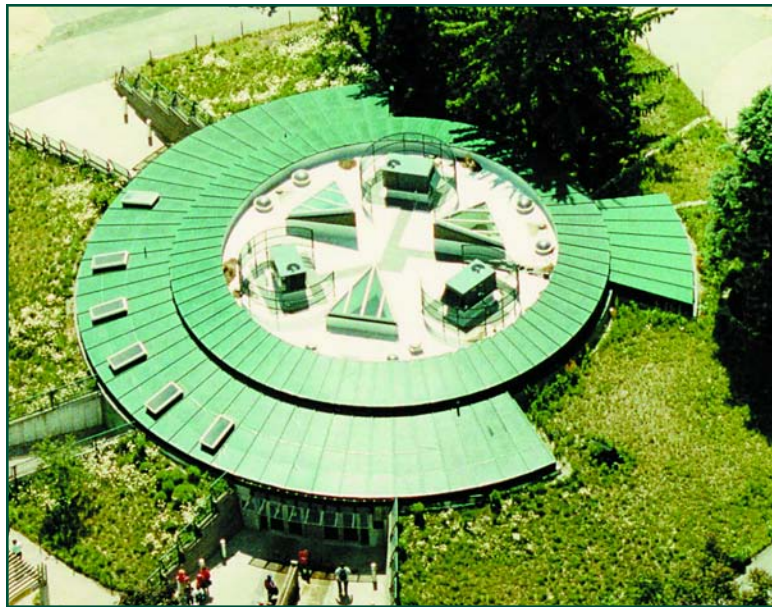
Features/Benefits	PVC Roof w/Décor	Metal Roof w/ Painted Metal
Energy Savings—Insulated Systems	+	+
Energy Star Rated Systems	+	-
Aesthetics	+	+
Waterproof Roof	++	-
Integral Flashings/Details	++	-
Expansion & Contraction	++	-
Noise (Rain/Sleet etc.)	+	-
Color Fast	10 years	20 years
Potential for Condensation	+	-
Warranty Waterproof	+	-
Maintenance Costs	+	-
Flexibility with Profile/Rib Locations	++	-
Little to no slope	++	-
Slope > 3" in 12"	+	+
Barrel Configuration	+	-
Round and sloped configuration	+	-
Potential for Rusting or Deterioration	+	-
- Disadvantage + Advantage ++ Major Advantage		

Table 1

A Single-Ply Alternative to Metal Roofing

The appearance of metal roofing can be created on both new and re-roofing projects by using a thermoplastic PVC single-ply membrane and various decorative rib configuration systems that are permanently installed without affecting the watertight integrity.

Architects, designers, and building owners throughout Europe have been using single-ply membrane and decorative profiles to create the appearance of metal for years. Now, the same cost-effective and innovative technology is available in North America.



Roger Williams Zoo, Providence, RI.

Two Systems Available

There are two systems available. In both, a colored thermoplastic PVC roof membrane is adhered to an acceptable substrate. A felt-backed membrane can be used to hide insulation joints and insulation plates.

In the first system, a proprietary rib made of the same membrane formulation is welded to the thermoplastic roof membrane using an automatic hot air welder with a patent-pending welding kit. The kit permanently welds the rib to the thermoplastic membrane in a straight line.

The second option utilizes a post and rib system. A uniquely designed post with a pre-welded, colored PVC membrane base plate supports a rail and a cover piece of PVC-clad metal. The PVC metal is the same color as the roof membrane.

The post and rib system gives the designer and building owner more flexibility with the size and shape of the profile system. The profile can even be laid out on a portion of the roof for the building owner and roof designer to examine and determine final spacing and location of ribs for desired aesthetics before welding into place.

A complete set of details is available to replicate metal roofing and ensure a watertight condition. There is also the ability, using AutoCAD, to show an architect and owner what the profile roof will look like on a specific building. The isometric of the roof can show color options and can vary spacing of the ribs – a “virtual roof” presentation.

In many applications, there are both sloped roof areas and low sloped (0 – 1/2"/foot) areas. Owners and architects like the idea of getting one warranty for the entire roof area. Others have selected the decorative profiles as a very cost-effective alternative to architectural metal.

ABOUT THE AUTHOR

Brian Whelan is Vice President of Sales and Marketing for Sarnafil Inc., manufacturer of the Décor Profile. Whelan has two patents pending on hot air welding of thermoplastic membranes and profiles. He is a former Project Manager of Simpson, Gumpertz & Heger and has a degree in Architectural Technology. He is a member of SPRI, RICOWI, RCI, and CSI. Brian has participated in many ASTM committees on roofing and waterproofing.



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