RCMA ROOF COATINGS MANUFACTURERS ASSOCIATION

COATINGS TECH NOTE 5

METAL ROOFING

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Metal roofing systems have been utilized for an extended period. After World War II, metal roofs were implemented on industrial facilities like warehouses, as well as on farm and agricultural buildings. With changes in aesthetics, materials, and sound dampening, the use of metal roofs has increased. Since the late 1970s, modern roofing has commonly featured aluminum/zinc alloy-coated steel (known as galvalume®) as a primary material. Galvalume® steel provides enhanced resistance to corrosion. Traditional galvanized steel roofs continue to be manufactured and are currently the most prevalent type of metal roof panel. Metal roof panels may include baked-on finishes for specific aesthetic or functional purposes. These roofs can last many years, but their top coatings eventually deteriorate and may require recoating. Metal roofing with exposed fasteners can experience leaks at the attachment points, which may need repair or sealing before coating is applied.

Coatings for Metal Panels:

Several types of coatings are used to coat metal panels in the field. Products include asphalt and elastomeric coatings such as acrylic, thermoplastic rubber, silicone, polyurethane, and butyl.

The asphalt coatings may be a solvent or water-based coating. Reflective asphalt coatings are typically used as a coating for a metal roof. Polymer modified asphalt coatings, which offer improved elongation and recovery properties over conventional asphalt coatings, are also used.

Elongation and recovery are important properties in a metal roofing system, as the metal panels expand and contract with changes in temperature. Pigmented acrylic coatings are the most common materials used in coating metal panels, as they not only resist a wide range of chemicals, oils and solvents, but also exhibit good elongation and recovery properties. Polyurethane coatings are often used in areas where industrial chemicals or oils are present.

Solvent borne elastomeric coatings have good elongation and recovery and can be formulated for tenacious adhesion to metal. However, their resistance to solvents and oils is lower than acrylic or polyurethane coatings, and therefore these coatings are not used in areas such as restaurant roofs, where oils and solvents are present.

Roof Evaluation:

The metal roof should first be evaluated to determine the extent of the degradation, if any. The roofing manufacturer should be contacted if warranties are involved, or replacement is

required. The condition of the seams, both vertical and horizontal, should be determined first. The primary seal for the metal roofing system is the seam tape or caulk that is put in the joints between the metal panels. As the system ages, the primary sealant may degrade. Before repairing the primary sealant, seams that are leaking should be inspected; screws tightened, and washers replaced as needed.

Next the field of the panels should be inspected to determine if any of them need to be replaced, or if there is white or red rust present. Situations where red rust is prevalent, or has started to corrode the metal panel, require repair and are beyond the scope of this document. Structural metal roofs with red rust may be unsound and should not be walked on. White rust can develop on galvanized metal, presenting as a white or grayish chalky substance. This is the first stage of corrosion. If there is white rust on the roof, use a solvent-based or water-based rust preventative primer to seal the area. Red rust is a later stage of rust and will continue to grow unless it is removed from the panel. If there are small amounts of surface red rust, power washing, sand blasting or wire brushing can remove them. The area should then be sealed with a rust preventive primer.

Even if no rust is present, the roof should be cleaned and be free of any dirt, oil or residual coating. Sealing washers around fasteners may require replacement. If any screws are missing, replace them with larger screws fitted with rubber washers, and apply a small amount of caulk to the screw heads for proper sealing. The seams should then be sealed by using either elastomeric caulks, or specialty tapes designed for this purpose or fabric embedded in elastomeric sealant.

Coating the Metal Panels:

A primer is often used to improve the adhesion of the coating to the metal panels. The coating manufacturer should be contacted for recommendations on the use of a primer.

Depending on the chosen system, a base and a topcoat are usually required. Spray, squeegee, brush or roller may be used to apply coatings. The coatings are available in containers of various sizes, including 5-gallon pails, 55-gallon drums, totes, or bulk. The topcoat of the system is usually applied perpendicular to the base coat at the same rate as the base coat. The manufacturer should be consulted for recommended application rates.

Reflective pigmented roof systems are often used to reduce the energy consumption of a building. This is especially true on dark-colored roofs where there is little or minimal insulation.

Metal roofing is exceptionally durable and can last almost indefinitely with proper maintenance. For expert installation or repairs, contact a professional roofing contractor or your local National Roofing Contractors Association branch.