



**TRUSTED LEADERS IN
INNOVATIVE ROOF
COATINGS
SINCE 1978.**



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The Commercial Roofing Resurfacing & Restoration Marketing includes:

- Metal Roofs – fastened and clip systems
- EPDM mechanically fastened & fully adhered
- Smooth surfaced APP Modified Bitumen
- Granulated SBS Modified Bitumen
- Heat welded membranes, TPO & PVC
- Reinforced Hypalon (CSPE)
- Smooth BUR Roofs
- CMU & metal sidewalls



Thermoplastic Rubber (SEBS) Coatings

Basic Properties

- Low Perm, vapor barrier coating
- Very strong adhesive qualities - “bites” into most substrates
- Self-priming and durable in low slope conditions
- High tensile properties, similar to urethanes
- High solar reflectance value (SRI=100+) combines reflectivity and emissivity data
- Meets Energy Star, CRRC & California Title 24
- Single-component, mineral spirit carrier - wash off resistant



Thermoplastic Rubber (SEBS) Coatings

Basic Properties

- Sustainable for long term resurfacing and compatible with most conventional coatings
- Long, indefinite storage life
- Best suited for white, gray or pastel shades
- Class “A” rating via FM, UL governs flame spread, hail resistance, etc.
- Stated properties correspond with 3rd party ASTM testing
- High quality product is not a “miracle in a can”. It relies upon meticulous, quality minded installers responding to thoughtful, holistic restoration
- SEBS is the quantitative choice for metal roofing if that choice is predicated on adhesion or bond strength, tensile strength, ultimate elongation and resistance to heat aging



Application Methods

Rolling Method

- Grid pour method used - calibrated amount is poured out in an area at a rate of 1.5 gallons/per square.
- Seams are back rolled
- 3/8 Microfiber Nap to roll

Spraying Method

- 4000 PSI capacity with 0.028 - 0.031 tip with 10" fan with 1/2" hose with 3/8" taper to final 50'
- Upper limit for consumption per square is 1.75 gallons
- Lines can be capped off for extended periods as application is on going. Cleaning is quick and easy



SEBS Overview

- Market or real world experience for the past 35 years
- Most applications require no primer
- Adhesive strength on most substrates is expressed on multiple [times x] basis to acrylics and silicones
- SEBS systems create impermeable vapor barriers meaning they can keep or lock moisture out but also lock moisture in
- Installed per specification these system have proven to last significantly past their warranty lives



Silicone: Solvent Based & High Solids

- Silicone Caulk is not the same as Roof Coatings
- Some suppliers use MEK (Methyl Ethel Ketoxime) for off gas (toxic)
- Others use methanol which is benign and not harmful
- Some use adhesion promoters to increase the adhesion to some substrates that attain minimal bond strength otherwise
- Tremendous short-term growth has produced technical confusion in the marketplace between those who are experts vs. those who are not



Application Methods

Preferred Method: Rolling

- Ribbon pour
- Squeegee
- 3/8 Microfiber Nap to roll

Option: Spraying

- 3500 PSI needed at the tip
- Usually backrolled
- Negatives – very tedious to clean / Expensive equipment



Silicone Overview

- Silicone coatings are sold by many producers and applied by many contractors creating value for building owners from competitive pressure
- High solids Silicone can be installed in occupied buildings without concern for MSDS related problems
- Single coat systems are available
- Restoration with high solids Silicone over lower slope conditions and/or negative slope areas, while done judiciously are acceptable for warranty applications



Metal Roof Restoration

Effects from the Environment

Temperature

- Rapid expansion of metal panels under thermal loading applies considerable stress to fasteners and weatherproof sealing materials
- ΔT – change in temperature
- X – length of the panel in inches
- Y – coefficient of expansion of the metal
- (steel is approximately 8.9, aluminum 12.9)
- Z – annual surface temperature rang

Wind

- High building movement and racking of structural elements created by wind will transfer loads to fasteners which can create strain on the attachment of repair or restoration materials



Metal Roof Assessment

The first issue to observe is the condition of the mechanical attachment of the panels. Examine the roof for loose or missing fasteners that have no seal or seals/mastic that are broken, cracked or in a phase of disintegration.



Over the course of time the first place that water will infiltrate a metal roof is at the fasteners.

In this particular metal roof design, the fasteners at the horizontal seam also hold down a metal strap.

If the repair contractor is unfamiliar with this design, they will often use materials that do NOT allow the free flow of water through the strap, therefore trapping water at the seam and creating a new problem while attempting to remedy an existing one.



A typical field condition found at horizontal seams



Metal Roof Assessment Continued...

In many instances, as just observed in the previous slide, the horizontal seam at the ends of the overlay of the panels exhibit excessive rust. This is normally caused by either poor repair techniques or simply aging of the metal roof.

On low slope metal roofs, 2:12 or less that utilize bar straps is frequently found that repair materials have been applied that block the flow of water that has been engineered into the bar strap design.

If left too long, the end of the metal panel cannot be preserved and replacement of this metal design element is necessary as shown here.



Low slope metal roof repair

In almost every case existing repairs are removed before any permanent repairs or restoration work begins.

First, in many instances, the material used was not designed for the extreme environment of metal roofing.

Second, even if the material is one designed for this purpose, the condition of the metal panel needs to be examined which requires removal of the material.





Metal Roof Assessment Continued...

Corrosion Evaluation: once the metal has passed the test for structural soundness, it often exhibits a great deal of surface rust. This rust must be treated and removed before restoration can begin.





Metal Panel Partial Replacement On a Large Scale

When a metal roof has significant rust it normally starts at the horizontal seams

In this example, approximately 10% of the metal panels were replaced due to excessive corrosion.

The calculus to determine whether or not to use an engineered restoration coating or to retrofit the roof with new metal is often solely based upon the cost of metal panel replacement plus the coating versus new metal panels throughout.





Restoration Application Process

Rust remover and conditioner

Most rust removing agents are irritants so a breathing mask is recommended. A simple garden style pump is sufficient to spot apply material left in place for 12 hours.



An important design consideration is to use a low perm/vapor barrier material to prevent moisture and oxygen from reaching the treated surface in the future. SEBS has extremely low permeance and therefore, would be the design consideration of choice specified with enough dry mils to create an impenetrable moisture barrier.





Restoration Application Process

Power Washing with oscillating turbo tip

Often there are existing materials in place that must be removed to achieve minimum adhesion of new materials. The oscillating turbo tip removes most previously applied coatings.

*Helpful Tip - Large scale projects can be more cost effective using spray equipment. However, operators must watch dew point, temperature limitations, wind and wind direction





SEBS coating used on a large scale metal roofing used in warehousing



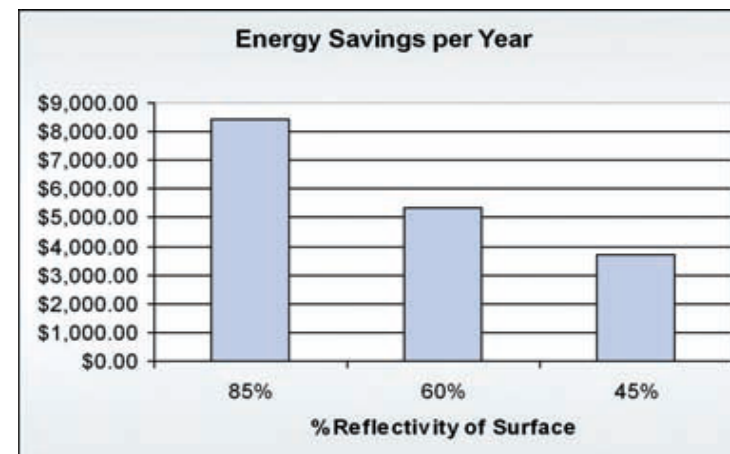
Energy Star Reflective Coatings: Significant kwh reduction for air conditioned facilities typically range 7-14%



Steep slope on high rise construction offers difficult challenges, much higher labor and specialized tools to cope with difficult angels and slope. Range of colors often necessary to match cosmetic expectations.



Savings estimate over EPDM 100,000ft² - Dallas, TX, assuming \$0.07/kwh





Single Ply Restorations

Low Slope Commercial Roofing Restorations

Primary design issues

Identify the membrane type, approximate age, adhesion method and roof components

Evaluate existing conditions

Especially entrapped moisture in boards, felts etc.

Focus on overall roof assembly

Insulation boards, fasteners, seam strength, dimensional stability, flashing shrinkage, field capillarity...



Moisture Entrapment

Low vapor permeance coatings trap existing moisture in restorations over low slope roofs. Removal of high areas of moisture concentration is required to minimize moisture entrapment post restoration

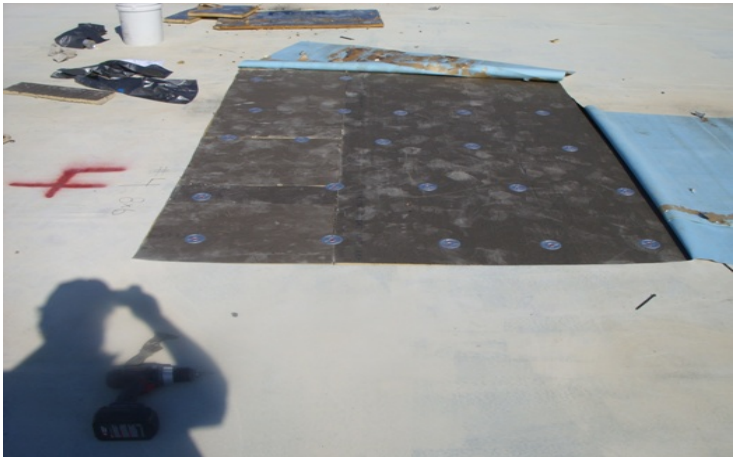




Moisture Entrapment: Low vapor permeance coatings trap existing moisture in restorations over low slope roofs. Removal of high areas of moisture concentration is required to minimize moisture entrapment after the fact of restoration



All saturated insulation is replaced with identical insulation material



All substrates need to be evaluated for material compatibility and adhesion capability before proceeding with any design proposals.



New insulation is covered with identical membrane to prevent capillarity and to apply seam free coating over entire roof area.





Why Coat PVC?

PVC membranes are prone to cracking from hail damage, often subsequent to plasticizer migration.

Some brands are susceptible to capillarity from thinning, especially where the mils are thin on the top portion of the membrane.

Coating PVC results in excellent adhesive characteristics. However, the solvent in various coatings can extract the remaining plasticizer and cause a tackiness.



Restoration of Modified Bitumen App & SEBS Granulated Modified Bitument

Weathering can lead to granule loss that can lead to an increase in heat and energy loss. The lack of granular protection accelerates the heat aging problem of MB's.

All voids must be repaired before any repair or restoration may begin.

Reflective qualities of a white coating can reduce surface temperature for HVAC air intake.

Lower membrane temperature will reduce the aging rate of the modified bitumen (number one aging factor) and adds years of continuous service and proper function.

Restoration Portfolio

A full restoration of an SEBS Granulated Modified Bitumen





PVC Restoration



Factory with 300,000ft² of Hypalon Single Ply with a 20+ coating with perimeter bar straps to insure mechanical attachment integrity of system



Engineered coating over Single Ply



Fully adhered EPDM with an engineered coating progressively installed for continued protection and preservation of capital dollar expenditures for school systems





Careful and competent application yields great cosmetic results over metal roofing



Specialty applications like this over faux copper coating over standing seams



Irregular geometry with constant wind and difficult access can be overcome with expertise and careful planning



Distribution Center – 600,000ft² engineered coating over metal roofing





The progression from rust removal to a finished system



A White Finish: has the highest reflectivity but light gray is close in reflectivity and helps hide accumulations of dirt and stains from normal atmospheric contributions



Hypalon weathering – 0.30 & 0.35mil thickness resurfaced to .50mils



EPDM Restoration: resurfacing aged EPDM will provide high reflectivity and lower perm rating.

