ASC® BUILDING PRODUCTS

TECHNICAL BULLETINS

TABLE OF CONTENTS

TECHNICAL BULLETIN

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

ROOF SYSTEM CARE & MAINTENANCE

Thank you for choosing an ASC Building Products standing seam metal roof system. Our high quality roof systems are designed to be installed to offer uncompromising value and ease of maintenance throughout the life of the roof. Your roof system should be inspected annually to ensure flashings, roof panels, and roof conditions are still in good working order.

The following operating and maintenance instruction will ensure that your roof system performs for years to come.

CLEAR ROOF PANELS AND GUTTERS FROM DEBRIS ACCUMULATION: The build-up of foliage and dirt can block runoff and clog gutters and downspouts. Ensure the roof system and gutters are cleared of any accumulating debris.

CHECK EXPOSED FASTENERS (If applicable): Though your roof is designed for concealed fastener attachments, some flashing and roof penetration conditions may utilize exposed fasteners. Those fasteners include self-sealing gasket head fasteners and pop rivets. Check the condition of the fasteners to ensure the self-sealing gaskets are in good working order and have not been over driven or deteriorated. Rivets and fasteners should be secured tightly to the roof panels or flashing and should not be loose or backed out.

CHECK CONDITION OF EXPOSED SEALANTS (If applicable): Just like fasteners, ASC Building Products roof systems are design to be used with little to no exposed sealant. Exposed sealant may have been used to seal roof penetrations and select flashing conditions. If there is any exposed sealants on your roof system, check that the sealant is in good working order. Deterioration, cracks, or pinholes in the sealant are a red flag that the sealant may have reached the end of its lifecycle and should be replaced.

CHECK FOR STANDING OR PONDING WATER (low slope applications): Standing or ponding water can be detrimental to the coating of the roof system if left for an extended period of time.

MINIMIZE FOOT TRAFFIC: The paint systems are not design to handle a heavy volume of foot traffic and should be minimized to prevent damage. Periodic inspections and maintenance are encouraged. However, if the roof system is intended for heavy foot traffic, roof mounted walkways should be utilized.

The factory-applied finish used on pre-painted steel is extremely durable and will last many years longer than ordinary conventional field applied paint. However, it may be desirable for cosmetic purposes to clean the finish occasionally to ensure the longevity of the paint and roof system.

Dirt pickup may cause discoloration on the finish when it has been exposed to dirt-laden atmospheres for long periods of time. Additionally, slight chalking will ultimately cause some change in appearance in areas exposed to sunlight. A thorough cleaning will often restore the appearance of the panels and render repainting unnecessary. An occasional subsequent light cleaning will help maintain good appearance.

RUST SPOTTING (Steel): During installation, improper techniques in cutting and drilling of pre-painted steel can cause rust spotting. Hot chips from drilling or self-tapping screws, or chips from metal saws or cutting discs may embed themselves in the paint finish. These chips can then rust and form unsightly red spots in the coating, giving the visual impression that the substrate may be rusting. It is imperative to brush off any chips which are stuck to the painted surface. A stiff bristle nylon brush is recommended.

CLEANING: In some cases, simply washing with plain water, using a hose or pressure spray, would be adequate. For areas where dirt collection is heavier or more persistent, a solution of water and detergent (1/3 cups of Tide® per gallon of water, for example) may be used. A clear water rinse should follow immediately. If Product is installed in a mild marine environment, less than 1 mile and greater than 1000 feet from breaking surf, Product should be washed two times per year.

Mildew may occur in areas subject to high humidity. Mildew spores can grow in dirt deposits, even on factory baked finishes. To remove mildew along with the dirt, the following solution is recommended:

- 1/3 cup detergent (Tide® for example)
- 2/3 cup Sodium Phosphate (Soilex for example)
- 1 quart 5% Sodium Hypochlorite solution (Clorox for example)
- 3 quarts of water

Strong solvent and abrasive type cleaners should be avoided, as they may damage the finish. Caulking compounds, oil, grease, tars, etc., can be removed by mineral spirits applied only to those areas which are contaminated. Always follow the use of the mineral spirits with detergent cleaning and clear rinsing.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

WALL SYSTEM CARE & MAINTENANCE

Thank you for choosing ASC Building Products as the manufacturer of your high quality wall system. Our wall systems are designed to be installed for years of uncompromising value and ease of maintenance throughout the life of the wall system. Your wall system should be inspected annually to ensure flashings, wall panels and wall conditions are still in good working order.

The following operating and maintenance instruction will ensure that your chosen wall system performs for years to come.

CLEAR WALL PANELS FROM DEBRIS ACCUMULATION: Keep dirt, irrigation, drainage, vegetation and weed whips away from all wall panels. Do not allow direct contact. Failure to do so can lead to early deterioration.

CHECK EXPOSED FASTENERS (If applicable): ASC Building Products manufactures wall panels with both concealed and exposed attachment. Select panels, flashing and wall penetration conditions may utilize exposed fasteners. Those fasteners include self-sealing gasket head fasteners and pop rivets. Check condition of the fasteners to ensure the self-sealing gaskets are in good working order and have not been over-driven or deteriorated. Rivets and fasteners should be secured tightly to the wall panels or flashing and should not be loose or backed out.

CHECK CONDITION OF EXPOSED SEALANTS (If applicable): ASC Building Products wall systems are design to be used with minimal exposed sealant. Exposed sealant may have been used to seal wall penetrations, windows, doors and select flashing conditions. If there is any exposed sealants, check that the sealant is in good working order. Deterioration, cracks or pinholes in the sealant are red flags that the sealant may need to be replaced.

CHECK FOR STANDING OR PONDING WATER ALONG THE BASE OF A WALL CONDITION: Standing or ponding water can be detrimental to the coating of the wall system if left for an extended period of time.

MINIMIZE EXPOSURE: Prolonged contact with vegetation, dirt or gravel, exposure to animal/animal waste, or contact with, or subject to runoff from lead, copper, CCA, ACQ, CA, pressure treated, green or wet lumber, or wet insulation or other treated lumber (outdoor wood) or fire retardant impregnated or treated wood shakes can all be detrimental to the steel and factory coating.

The factory-applied finish used on pre-painted steel is extremely durable and will last years longer than ordinary conventional field applied paint. However, it may be desirable for cosmetic purposes to clean it occasionally to ensure the longevity of the paint and wall system.

been exposed in dirt-laden atmospheres for long periods of time. Additionally, slight chalking will ultimately cause some change in appearance in areas exposed to sunlight. A thorough cleaning will often restore the appearance of the panels and render repainting unnecessary. An occasional subsequent light cleaning will help maintain good appearance.

RUST SPOTTING (Steel): During installation, improper techniques in cutting and drilling of pre-painted steel can cause rust spotting. Hot chips from drilling or self-tapping screws, or chips from metal saws or cutting discs may embed themselves in the paint finish. These chips can then rust and form unsightly red spots in the coating, giving the visual impression that the substrate may be rusting. It is imperative to brush off any chips which are stuck to the painted surface. A stiff bristle nylon brush is recommended.

CLEANING: In some cases, simply washing with plain water, using hoses or pressure sprays, will be adequate. For areas where dirt collection is heavier or more persistent, a solution of water and a detergent (1/3 cups of Tide per gallon of water, for example) may be used. A clear water rinse should follow immediately. If Product is installed in a mild marine environment, less than 1 mile and greater than 1000 feet from breaking surf, Product should be washed two times per year.

Mildew may occur in areas subject to high humidity, and mildew spores can grow in dirt deposits, even on factory baked finishes. To remove mildew along with the dirt, the following solution is recommended:

- 1/3 cup detergent (Tide® for example)
- 2/3 cup Sodium Phosphate (Soilex for example)
- 1 quart 5% Sodium Hypochlorite solution (Clorox for example)
- 3 quarts of water

Strong solvent, abrasive type cleaners and pressure washers should be avoided, as they may damage the finish. Caulking compounds, oil, grease, tars, etc., can be removed by mineral spirits applied only to those areas which are contaminated. Always follow the use of the mineral spirits with detergent cleaning and clear rinsing.

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For most current versions of literature please visit www.ascbp.com

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

CLEANING COIL COATINGS

Coil Coatings present a relatively non-adherent, inert surface to airborne soil. If needed, a variety of methods for removal of surface deposits is available. However, note these precautions: Do not use wire brushes, steel wool, sandpaper, abrasives or other similar cleaning tools which will mechanically abrade the coating surface. Some of the cleaning agents listed below should be tested in an inconspicuous area before use on a large scale. Always test a small area first.

HOT OR COLD DETERGENT SOLUTIONS: A 5% solution in water of commonly used commercial and industrial detergents will not have any deleterious effect on a Coil surface. These solutions should be followed by an adequate rinse of water. Use cloth, sponges or a soft bristle brush for application. Cleaning should be done on the shaded side of the building or, ideally, on a mild, cloudy day.

SOLVENTS: Most organic solvents are flammable and/or toxic, and must be handled accordingly. Keep away from open flames, sparks and electric motors. Use adequate ventilation, protective clothing and goggles. Remove non-water soluble deposits (tar, grease, oil paint, graffiti, etc.) from Coil surfaces using these solvents with caution:

Alcohols

- Denatured alcohol (ethanol)
- Isopropyl (rubbing) alcohol
- Methanol (wood alcohol)

Petroleum Solvents

- VM&P naphtha
- Mineral spirits
- Turpentine (wood or gum spirits)

Aromatic Solvents

- Xylol (xylene)
- Toluol (toluene)

These solvents should be used with caution on a Coil surfaces. Limit contact to five minutes. Test a small area first.

Ketones, Esters, Lacquer Thinner \

- Methyl ethyl ketone (MEK)
- Methyl isobutyl ketone (MIBK)
- Ethyl acetate (nail polish remover)
- Lacquer thinner

These solvents should be used with great caution on a Coil surface. Limit contact to one minute. Test a small area first. Panel manufacturer and coating supplier are not responsible for damage from unrestricted use of these.

Acetone/Paint Remover

Do not use acetone or paint remover on Coil surfaces.

CHEMICAL SOLUTIONS:

- Sodium hypochlorite solution (laundry bleach, Clorox)
- Hydrochloric acid (muriatic acid)
- Oxalic acid
- Acetic acid (vinegar)

Hydrochloric acid (10% muriatic acid), diluted with ten volumes of water, may assist in removing rust or alkali mortar stains from Coil surfaces. Limit contact to five minutes. Caution: Acid solutions are corrosive and toxic. Flush all surfaces with water after use. Oxalic acid solutions or acetic acid (vinegar) may be used for the same purpose. Flush with water after use. Laundry bleach may assist in removing certain stains.

CLEANING: In some cases, simply washing with plain water, using a hose or pressure spray, would be adequate. For areas where dirt collection is heavier or more persistent, a solution of water and detergent (1/3 cups of Tide® per gallon of water, for example) may be used. A clear water rinse should follow immediately. If Product is installed in a mild marine environment, less than 1 mile and greater than 1000 feet from breaking surf, Product should be washed two times per year.

Mildew may occur in areas subject to high humidity. Mildew spores can grow in dirt deposits, even on factory baked finishes. To remove mildew along with the dirt, the following solution is recommended:

- 1/3 cup detergent (Tide® for example)
- 2/3 cup Sodium Phosphate (Soilex for example)
- 1 quart 5% Sodium Hypochlorite solution (Clorox for example)
- 3 quarts of water

EXCESS SEALANT REMOVAL: Precautions should be taken to prevent sealants from getting on the painted surface. Sealants may be very difficult to remove. If any does get on a Coil surface, it should be removed promptly with a solvent such as alcohol or a naphtha type. Caution: It may be possible for solvents to extract materials from sealants which could stain the painted surface or could prove harmful to sealants; therefore, these possible effects must be considered. Test a small area first.

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ASC BUILDING PRODUCTS TECHNICAL BULLETIN

COLOR PERFORMANCE DATA

COLOR PERFORMANCE DATA

The Cool Roof Rating Council (CRRC) website lists ASC Building Products SRI Initial and Three-year Aged information. Note - CRRC data is based on averaged color families and does not reflect the actual performance of each specific ASC Building Products color. Therefore, under the LEED column header actual Initial SRI values are provided and reflect actual performance of each color. If required, please note that color specific CRRC Notification of Product Rating letters can be produced upon request.

PRODUCT DESCRIPTION	CRRC and CA Title 24					LEED										OTHER
	via CRRC product approvals (www.coolroofs.org)				CA Title 24	via Accredited Independent Testing Laboratory (using ASTM C1549, C1371, & E1980)										
	CRRC Reference Number	Solar Reflect - ance (Init.)	Thermal Emitt - ance (Init.)	SRI Initial and 3YR Aged SRI [B]		Solar Reflect - ance (Init.)	Thermal Emitt - ance (Init.)	SRI (Init.)	Low Slope	Steep Slope	Low Slope	Steep Slope	3YR Aged SRI	Low Slope	Steep Slope	LRV
	Based on CRRC Color Families					Actual tested performance			Leed V3		Leed V4 (Initial SRI)		LEED v4 (Aged SRI) Based on CRRC Color Families			
BARE ZINCALUME®																
ZINCALUME® Plus	1014-0002	0.68	0.30	**65**	REFER TO CALIFORNIA ENERGY COMMISSION (CEC) REQUIREMENTS	0.68	0.30	**64**		✓		✓	**65**	✓	✓	67
DURA TECH™ XL COLORS																
CANYON RED	0818-0024	0.35	0.83	**35**		0.42	0.84	**45**		✓		✓	**35**		✓	16
CASCADE GRAY	0818-0062	0.35	0.83	**35**		0.51	0.85	**58**		✓		✓	**35**		✓	41
CHESTNUT BROWN	0818-0034	0.32	0.83	**31**		0.35	0.83	**36**		✓			**31**			12
CLASSIC BROWN	0818-0041	0.25	0.83	**22**		0.29	0.84	**29**		✓			**22**			7
COPPER PENNY	0818-0032	0.35	0.75	**32**		0.48	0.83	**53**		✓		✓	**32**		✓	28
DENALI GREEN	0818-0028	0.25	0.83	**22**		0.30	0.83	**29**		✓			**22**			11
DESERT BEIGE	0818-0042	0.45	0.83	**49**		0.51	0.84	**58**		✓		✓	**49**		✓	39
EVERGLADE	0818-0043	0.32	0.83	**31**		0.34	0.85	**35**		✓			**31**			19
FOREST GREEN	0818-0029	0.32	0.83	**31**		0.35	0.85	**36**		✓			**31**			8
LIGHT STONE	0818-0033	0.55	0.83	**63**		0.60	0.84	**70**		✓		✓	**63**		✓	53
MATTE BLACK		*(no data)*					*(no data)*									5
OLD TOWN GRAY	0818-0039	0.35	0.83	**35**		0.40	0.84	**43**		✓		✓	**35**		✓	27
OLD ZINC GRAY	0818-0051	0.35	0.83	**35**		0.40	0.84	**43**		✓		✓	**35**		✓	22
PATINA STEEL	0818-0061	0.32	0.83	**31**		0.37	0.85	**38**		✓			**31**			17
RUSTIC RED	0818-0031	0.35	0.83	**35**		0.40	0.84	**43**		✓		✓	**35**		✓	13
SLATE GRAY	0818-0040	0.25	0.83	**22**		0.32	0.85	**32**		✓			**22**			13
SURF WHITE	0818-0036	0.55	0.83	**63**		0.63	0.84	**74**		✓		✓	**63**		✓	59
TAHOE BLUE	0818-0027	0.25	0.83	**22**		0.33	0.84	**33**		✓			**22**			14
TAUPE	0818-0025	0.45	0.83	**49**		0.48	0.83	**53**		✓		✓	**49**		✓	28
WEATHERED COPPER	0818-0035	0.32	0.83	**31**		0.32	0.83	**32**		✓			**31**			11
WINTER WHITE	0818-0044	0.70	0.83	**84**		0.73	0.83	**88**	✓	✓	✓	✓	**84**	✓	✓	74

[A] - Reflectivity data for Bare ZINCALUME is actual 3 year weathered solar reflectivity data.

[B] - CRRC has verified the Initial and 3YR Aged SRI Values have the same performance.

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ASCBP SRI Values Mar22.xls

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For most current versions of literature please visit www.ascbp.com

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

REFLECTANCE

The coatings world uses a lot of terminology that can become a bit confusing. "Reflectance" is a perfect example of a word that is used to describe two very different properties.

LIGHT REFLECTANCE VALUE

Light Reflectance Value, or LRV, measures the amount of visible or usable light that reflects from a surface. LRV is expressed as a percentage from 0 to 100; the higher the number the more visible light that is reflected. Typically, lighter colors will have a higher value than dark colors, but texture can impact LRV as well. Rough textures tend to reflect less visible light. Gloss and sheen are two other terms used to describe visible reflection of a surface. Gloss is the measurement of visible light at a 60° angle from the surface, while sheen is measured at 85°. High gloss/sheen results in high glare or shine from a surface, while low gloss/sheen surfaces have a flat or matte appearance. Glare, often a concern with pre-painted roofs, is controlled by lowering the sheen value.

SOLAR REFLECTANCE VALUE

Solar Reflectance Value, or SRV, measures the amount of total solar radiation, visible, infrared and ultraviolet, that is reflected from a surface (Total Solar Reflectance, TSR, is used as well). SRV is expressed as a percentage from 1 to 100; the higher the number the more solar radiation that is reflected. As with LRV, light colored objects often have a high SRV while dark colors are low. However, with the advent of "cool" pigments, it is possible for a medium to dark color to have a high SRV. The higher the SRV value the cooler the surface stays in direct sunlight. Gloss and sheen values have no impact on SRV. ***Note: Solar Reflectance Index, or SRI, is calculated from the SRV and emittance value of a material, therefore it is also different and independent from LRV.***

Light Reflectance Value ≠ Solar Reflectance Value ≠ Solar Reflectance Index

LRV and SRV and SRI are NOT the same property and cannot be used interchangeably!

While there is some overlap between LRV and SRV, and many coated surfaces may have similar LRV and SRV values, they are not the same measurement. The examples below demonstrate the differences; while LRV may be similar for colors that are visually the same, the SRV can be vastly different.

COLOR	SRV	LRV	SRI	60° Gloss	85° Sheen
FOREST GREEN 1	30	9	29	10	13
FOREST GREEN 2	17	15	12	13	28
DARK BRONZE 1	32	8	32	11	13
DARK BRONZE 2	6	7	3	7	11
PARCHMENT 1	51	40	58	11	12
PARCHMENT 2	50	51	56	11	20
BLACK 1	30	5	29	21	25
BLACK 2	6	6	3	19	26

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Spokane, WA Phone: 800-776-8771 Fax: 800-767-1346

For most current versions of literature please visit www.ascbp.com

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

FIELD CUTTING METAL PANELS

Cutting ASC Building Products' prefinished panels on a jobsite can create severe performance issues. Improperly cut panels can create corrosion and finish deficiencies that will compromise our Material and Paint Finish Warranties if this cut edge is exposed to weather.

There are specific reasons that factory-produced panels require cutting on a jobsite. Most common roof instances include the need to miter cut a panel end at a valley or hip, at an eave that is not perpendicular to the slope, and at penetrations. Another example is panels that require lengths shorter than can be produced on precut roll forming mills.

METHODS USED TO CUT METAL PANELS:

HAND TOOLS:

- SHEET METAL SHEARS. A heavy-duty, long handled pair of metal cutting scissors with short blades.

- AVIATION SNIPS. Left hand cuts, green handles; right hand cuts, red handles; straight cuts, yellow handles.

- GUILLOTINE-STYLE SHEARING BLADES. The most popular is a portable hinged devise manufactured by Swenson Shear. It is commonly used to field cut corrugated or trapezoidal ribbed panels at right angles to the ribs. Swenson also manufactures a portable field table that will notch-out standing seam panel ribs, and another adjustable table (for step #2) that slits the flat up to a 45° angle.

ELECTRICAL POWER TOOLS:

- NIBBLERS. A hand-held oscillating punch-and-die that removes consecutive moon-shaped pieces, progressing forward to make the cut. When using this tool, it is difficult to cut in a straight line, especially up and over standing seam or trapezoidal ribs.

- POWER SHEARS. Electrical scissors that cut a straight strip of material out of the panel approximately 1/8" wide and curls up the strip in a pig tail-type configuration. This is a good tool to cut parallel to ribs, but difficult to cut across a panel. It is a good tool to cut the flat pan of a standing seam panel and for cutting a panel parallel to ribs.

- CIRCULAR SAW BLADES ***(not recommended)*** Examples of these blades are found in lumber yards, hardware stores and home improvement stores:

  - **ABRASIVE METAL CUTTING BLADES.** In a circular saw this blade produces extreme noise levels, high velocity spark steams, and leaves a ragged edge similar to a serrated knife blade. A panel cut with this blade requires a scissors-type hand tool to trim back the cut edge ½" if the panel end is to be left exposed to weather.

  - **CARBIDE-TIPPED WOOD/LAMINATE BLADE OR REVERSED COMBINATION BLADE.** This blade is often used just for convenience. It also produces extreme noise, heat, and ragged edge as above.

Final cuts to steel panels should not be done with any heat-generating device. These include circular saw or reciprocating saw i.e. jigsaw or Sawzall™ by Milwaukee. Several well known power tool companies produce saws similar to Sawzall.

Lastly, it is common practice to mark a panel to be field cut with a guideline. Black lead pencils should not be used to indicate cutting lines. The carbon in the pencil will promote corrosion. Felt tip ink markers or pens similar to Sharpie® should be used for marking.

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For most current versions of literature please visit www.ascbp.com

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

JOBSITE STORAGE & REMOVAL

GUIDELINES FOR JOBSITE STORAGE AND REMOVAL OF PROTECTIVE FILMS

Jobsite storage of panels with protective films applied: Stored panels should be protected from exposure to moisture, sunlight and precipitation. It is recommended to store panels indoors, for the utmost protection from environmental conditions. If outdoor storage is the only means, it is recommended to store panels elevated under a water-proof tarp and tilted in such a way to not entrap moisture and facilitate drainage.

Best practice techniques for the removal of protective films from panels: Protective films should be removed gradually beginning at one end peeling back at a 180°degree angle with a smooth even motion. Do not quickly jerk the Protective film from the panel. Inspect panels for any adhesive residue once the protective film is removed. Contact your supervisor immediately if residue is observed. (See Technical Bulletin:“Guidelines for UV Exposed Protective Film” for residue removal techniques)

When removing the film in cold weather conditions it is not suggested to remove the protective films if the panels are frozen. If frozen, bring panels into an indoor environment to return them to a recommended film removal temperature. When removing film from panels, the temperature should be between 40° F (16° C and 90° F (32° C following the best protective film removal techniques stated above.

When removing the film in wet weather conditions it is not suggested to remove the protective films if the panels are wet and saturated with moisture. If wet, bring panels into an indoor environment and allow them to dry before removing film following the best practice removal techniques stated above.

In both weather conditions using sunlight to dry and or bring panels to the recommended film removal temperature can create a UV exposed residue condition. (See Technical Bulletin: “Removal of UV Exposed Protective Film” for residue removal techniques)

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Spokane, WA Phone: 800-776-8771 Fax: 800-767-1346

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

REMOVAL OF UV EXPOSED PROTECTIVE FILM

This bulletin covers a specific condition where a protective film that was not intended for outdoor exposures was not removed immediately before exposure to the elements. Please determine if it is applicable in your situation.

Exposure to UV light and weather elements can result in adhesives to bond and potentially leave residue to the surfaces they were applied to. The film can also degrade to the point it can no longer be peeled off.

Important Notice: Petroleum solvents, cleaners containing abrasives, strong alkaline or strong acidic levels should not be used. Guidelines from the specific substrate, paint or surface coatings manufacturers and best practices to clean the appropriate materials should be followed to ensure performance claims and warranties are protected.

Continued on next page...

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ASC BUILDING PRODUCTS TECHNICAL BULLETIN

REMOVAL OF UV EXPOSED PROTECTIVE FILM (CONTINUED)

REMOVAL OF FILM & RESIDUE

As a general rule the film backing will be resistant to the absorption of the GOO GONE PRO- POWER*, Citrus Power Remover or Citrus Based Adhesive Remover *

Remove as much of the film backing as possible, this will allow the GOO GONE PRO- POWER*, Citrus Power Remover or Citrus Based Adhesive Remover * to wick under the film backing.

With the dry substrate out of direct sunlight, saturate the film backing with GOO GONE PRO-POWER* Citrus Power Remover or Citrus Based Adhesive Remover *
Keep the film backing saturated with repeated applications of remover, until the film backing swells and softens. Do not allow the film backing to dry out. The key step is to allow some for the remover to wick under the edges of the film. This can be aided by gently agitating the film edges with a soft bristle brush.

Once film backing has softened, remove film backing by means of scraping with a soft non-abrasive scrapper, being careful not to scratch or damage the substrate. It is common for only the area of the film backing near the films edge or at film fractures to be removable; it may take numerous repeated cycles to remove all the film backing.

When film backing and adhesive residue are completely removed, a general purpose surface cleaner may be used on a clean soft cloth to remove any light residue/haze that may be present on the substrate.

Important note: Panel must be completely dry before applying full strength GOO GONE PRO-POWER*, Citrus Power Remover or Citrus Based Adhesive Remover.

*GOO GONE PRO-POWER or any Citrus Based Adhesive Remover can react with certain substrate surfaces, and should always be tested on a small area before use. Carefully read and follow the manufacturer’s precautions and directions for use when using any cleaner. The attached information is provided for general knowledge only; it is not to be considered an exact method for removal of protective films or adhesive residue transfer.

Care should be taken to avoid cleaners from contacting siding, windows, doors and vegetation. Always test cleaning methods in an inconspicuous area before proceeding.

Local environmental guidelines should be followed for disposal, of cleaning agents.

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Spokane, WA Phone: 800-776-8771 Fax: 800-767-1346

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

PREVENTING STORAGE CORROSION

INTRODUCTION

Pre-painted and galvanized building panels and components have been successfully used for many years. In general, properly installed building materials under normal service conditions have excellent corrosion resistance. However, pre-painted and bare building materials are subject to premature corrosion failures prior to installation, if they are not handled and stored properly. Excessive storage periods or poor storage conditions often result in water intrusion. Prolonged exposure to wet conditions can cause paint blistering and galvanized substrate corrosion or staining in as little as 2 weeks.

ENVIRONMENTAL AND SERVICE CONDITIONS

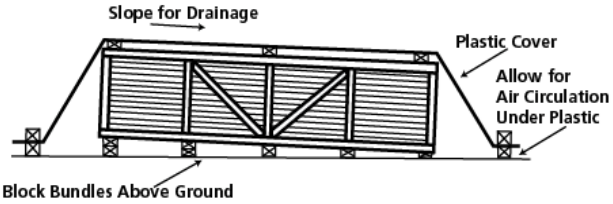
Water is a necessary prerequisite for corrosion of stored panels or components. When water or water vapor is available along the sides of a panel bundle or a column/purlin stack, it may penetrate between the panels or parts by capillary action. If proper precautions are not taken during transport, water may be present upon delivery at the job site. Material must be inspected at the time of delivery. Ambient humidity and temperature cycles will also promote water intrusion into stored bundles and stacks through condensation. Finally, rain and snow are other potential sources of water that can cause storage corrosion and staining.

Besides water, two other important factors that contribute to the corrosion are temperature and exposure time. Corrosion will accelerate with increased temperature. Given enough time, panel bundles, columns and/or purlins will eventually become wet and storage corrosion and staining may occur. Storage corrosion can be prevented by:

-Reducing site storage time.
-Decreasing water contact.
-Moderating temperature extremes.

STORAGE

Prolonged storage will always increase the likelihood of storage corrosion; therefore, the best prevention is to minimize the storage time. Proper storage limits the collection of water from rain, snow and condensation on the panel surfaces. Under roof storage is always preferred. If panel bundles or other components have to be stored outdoors, a number of precautions must be taken to prevent storage corrosion. Material should be stored in a level area out of the way of other activities to minimize the number of movements required. If the material is stored on the ground , i.e. dirt, grass or gravel, a plastic ground cover must be put down to minimize condensation of water from the ground onto the panels or components. The material must then be raised off the plastic ground cover to avoid contact with water puddles, and allow for air circulation to promote drying of condensed water. **The material must be stored on an angle, or slope, to promote drainage of water.**



Wet, uncured or pretreated lumber should not come in contact with the material. Sufficient support must be provided to the raised and angled material to avoid excessive bowing, which may result in low spots that could hold water.

Continued on next page...

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ASC BUILDING PRODUCTS TECHNICAL BULLETIN

PREVENTING STORAGE CORROSION (CONTINUED)

REMEDY

Storage corrosion on pre-painted material cannot be remedied. Once the corrosion process has begun the film integrity of the paint is compromised. Panels displaying any type of corrosion or paint bubbling should not be installed. Light corrosion or staining (white or black in color) on bare galvanized material may be cleanable; contact your ASC representative for proper cleaning techniques.

REFERENCES

National Coil Coating Association, Tool Kit #1 Preventing Job Site Storage Corrosion of PrePainted Building Materials

GalvInfo Center, GalvInfoNote 3.2 Protecting Galvanized Steel Sheet Products fromStorage Stain

.

Example of proper storage

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

FIELD CHECKING FOR OIL CANNING

WHAT IS OIL CANNING?

Oil Canning is an inherent characteristic of light gauge cold formed metal products, particularly products with broad flat areas. It is a visual phenomenon seen as waviness or distortion in the flat surfaces metal roofing and siding products. Oil canning is subjective and is normally an aesthetic concern only and does not affect a products strength or performance. Environmental conditions such as temperature, time of day, annual seasons, skies (sunny vs. cloudy) can enhance the appearance of oil canning.

WHAT CAUSES OIL CANNING?

Oil canning is caused by internal stresses within thin gauge metals. These stresses can be introduced during field installation, as well as mill production of the coil and during fabrication such as slitting and forming. Additionally, field installation conditions, techniques and tolerances will greatly impact the presence of oil canning:

1) **Misalignment of support system** – a support system with large tolerances may cause stresses on the panels as they are fixed to this surface. This stress on the panels can cause oil canning.

2) **Over engagement of panels** – Most panels allow for expansion and contraction by flexing of webs and slight room at the side joints. If the panels are pulled or pushed during engagement more than designed, the stress will cause deflection in the flat pan of the panel.

3) **Over driving of fasteners** – this operation causes stresses on the panel, particularly with concealed fastened panels connected directly into the support system. In addition if the fasteners are not driven into the panels or clips at the same level of tension, normal expansion and contraction of the panels due to regularly temperature changes can amplify a visual waviness. This waviness caused by thermal forces (expansion and contraction) is different from other forms of oil canning since it can appear and disappear daily as the sun rises and sets.

4) **Movement of primary structure** – if the primary structure of the building has excessive variation in deflection, racking, or drift it can cause waviness in the flat of the panel, once installed. In addition, settlement of the primary structure can also cause oil canning. This oil canning could be temporary or permanent.

5) **Handling of panels in the field** – The manner in which the panels are handled in the field can induce oil canning. Twisting the panels while lifting and removing from a bundle can induce a wavy appearance. Walking on panels can also cause oil canning.

There is no accepted Standard for field checking questioned flatness or oil canning. The following is a reasonable means to help determine the probable source or cause of oil canning. The intent is to systematically investigate the field conditions, handling, and installation process observing when the oil canning appears and therefore its most likely source or cause.

1) Examine the storage area and condition of the crated or packaged materials. Are the materials in a dry protected location, properly supported and retained in a natural manner that does not induce unusual twist or stress on the materials? OBSERVE
2) Remove a panel or two from its packaging. Orient it horizontally; allowing it to hang down on its side yet supported along its top rib approximately every 8 to 10 feet by workers or other aligned supports. OBSERVE
3) Have the panel(s) transported in the normal manner, both horizontally and vertically, to the location where they will be installed. OBSERVE
4) Lay the panel(s) flat and loosely on the substrate to which they will be installed without any clips or other means of attachment. OBSERVE
5) Install panel into (or on to) already installed adjoining panel. OBSERVE
6) Install clips/fasteners as required and fasten appropriately to the substrate. OBSERVE

If oil canning is a concern or issue discovered in the field, please contact your ASC Building Products sales representative before moving forward on your installation.

There is no ASTM or other identifiable standard for measuring oil canning on a job site. However, with close and judicious observation, one should be able to determine at which step(s) oil canning first appeared, if any subsequent step(s) changed its appearance, and what possible steps may be initiated to minimize its presence.

CONCLUSION:

Oil canning is an aesthetic issue that is subjectively identified and evaluated. System performance and structural integrity are not affected unless the distortion is extreme. Since many uncontrollable factors are involved in inducing oil canning, no manufacturer can assure the total elimination of oil canning. Oil canning is not a cause for rejection. However, if attention is paid to the selection of material, panel design and installation practice, oil canning can be effectively minimized.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

ADDRESSING SNOW & ICE

INTRODUCTION

The purpose of this technical bulletin is to provide a basic review of snow & ice retaining systems and heat tape systems and present ASC Building Products' position regarding their use. This document also presents some of the aspects design professionals should consider when developing a project design.

THERE ARE TWO SCHOOLS OF THOUGHT REGARDING THE RETENTION OF SNOW & ICE ON ROOFS

1) Do Not Retain: This approach requires that the roof be designed so that the snow & ice can melt and naturally exit off the roof. Careful attention should be used in configuring the building to prevent or minimize the possibility of retaining large accumulations of snow & ice on the roof. Also, the roof configuration itself should direct sliding snow or ice melt from discharging over entrances and walkways or other critical areas such as ground equipment and landscaping.

2) Retain: This approach intends to retain the snow & ice on the roof until it melts and exits the roof in a controlled manner. One concern of this approach is that amassing large accumulations of snow or ice could represent a dangerous potential should the snow & ice retaining system suddenly fail, be structurally inadequate, or be in a diminished condition due to lack of maintenance, improper installation, etc. A sudden release of large amounts of snow & ice accumulation could be dangerous, or even deadly.

COMMON SNOW & ICE MANAGEMENT SYSTEMS UTILIZED WITH METAL ROOFING

1) Snow & Ice Retaining System: Mechanical components (clamps, rails, bars, or individual snow stops/ guards, etc.) used on roofs in climates where moving or falling snow or ice could create a nuisance or hazard to people, equipment, or landscaping.

2) Heat Tape System: An electrically-heated cable or wire used to melt snow and ice on a roof so that the snow and ice does not accumulate in critical areas. Electrically-heated cable or wire (aka "heat tape") is often used to melt snow and ice in critical areas of a roof, such as valleys, gutters, and downspouts. Such systems must be designed and installed to endure the forces of moving ice and snow and allow easy replacement since they can burn out or need repair. The self-regulating type of heat tape, which adjusts its heat output to the temperature encountered, is the most popular type.

THERE ARE THREE PRIMARY WAYS TO ATTACH SNOW & ICE RETAINING SYSTEMS TO A METAL ROOF

1) Seam Clamps: These allow attachment of the retaining system to the roof panel's standing seam without penetrating the metal roof panel. This attachment method is probably the most reliable way to attach a retaining system to a metal roof system. Careful attention must be paid when locating seam clamps to ensure that the standing seam metal roof system's (including associated roof panel clips) ability to accommodate thermal expansion and contraction are not compromised by the seam clamps. In most cases seam clamps should be located mid-way between one-piece roof panel clips and at the location of two-piece clips.

2) Adhesive: Snow guards are attached to flat areas of the roof panels using adhesives. The strength of this type of attachment depends on how well the adhesive adheres to the metal roof panels. With painted roof panels, proper adhesion to the panel's coating can be a concern, along with the adhesives impact on panel coating warranties. Under snow retention loads there may also be the risk of coating separation from the underlying substrate.

3) Fasteners: Some snow guards utilize fasteners to attach them to the panel's flat areas or to the panel ribs. This approach is not normally recommended as it creates additional penetrations in the metal roof panels which can be points of possible water intrusion into the structure. These also have the potential to impede the thermal movement of the roof panel by "fixing" it to the substrate. Exposed fasteners are always a concern of any warranted roof system and should be avoided if possible.

SUGGESTED RESPONSIBILITIES

The following are suggested responsibilities of the design professional, roof panel manufacturer, and snow retaining/ heat tape manufacturer to ensure the successful installation of these products:

1) Design Professional:

- The overall design of the roof system and how it will function in varying climatic conditions (including the determination of what, if any, snow & ice retention or heat tape systems are used) is the responsibility of the design professional (i.e. architect, engineer, roofing contractor, roof consultant, etc.).

Continued on next page...

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ADDRESSING SNOW & ICE (CONTINUED)

- The design professional should determine what, if any, snow & ice retention and/or heat tape systems are to be used on a project. The design professional should also consider how snow and ice will exit the roof.

- The design professional should contact the snow & ice and/or heat tape system manufacturer for recommendations of which system(s) are best suited for the project and what layout, spacing, attachment, etc. should be used to handle the anticipated snow and ice loads for the structure. As a minimum, the design snow loads required by building codes and local building authorities shall be used in this determination.

- The type of roof material, the panel finish, and the roof panel's configuration (e.g. minor ribs, embossed panels, etc.) may limit which type of snow-retaining system can be used.
- Advise the roof panel manufacturer of any increased design loads due to the weight of the retained snow and ice.

- Include snow & ice retaining and/or heat tape system installation and layout requirements in the project documents (i.e. plans and specifications, addendums, etc.).

3) Roof Panel Manufacturer:
- Provide a sample roof panel or a dimensioned drawing of the roof panel when requested by the design professional so that suitable attachment of the retaining system to the roof panel can be determined.

- Though mechanically seamed panel samples are available, final seam configuration is not achievable without special tools. Dimensioned drawings of the installed roof panel configuration are typically used with these types of roof panels.

- Advise the design professional how the method of attaching the snow or ice retaining system may affect the performance of the roof system. Snow & Ice Retaining or Heat Tape

4) Manufacturer:
- Advise the design professional on which of their systems are best suited for the roof panel and climatic conditions of the project.

- Recommend a layout of the snow & ice retaining and/or heat tape system or supply the design professional with sufficient information to allow them to determine an appropriate system layout.

- Recommend procedures for attaching the snow & ice retaining or heat tape system to the roof panels.

- Exposed copper or other metals that react negatively to steel should be avoided at all costs to prevent dissimilar metals from interacting.

IN SUMMARY

ASC Building Products' position is neutral regarding the use of snow & ice retaining and/or heat tape systems. We recommend neither for, nor against, their usage. If such devices are ultimately used, they must not impede the thermal movement (expansion & contraction) of the metal roof system, compromise its weather tightness, or be of a dissimilar metal to the roof materials.

Note that this bulletin is not intended to be a complete or exhaustive discussion of these specialty products or systems but rather to present common aspects of their use with metal roofing. The designer or manufacturer of these specialty products or systems should be consulted for project specific recommendations and guidance.

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Spokane, WA Phone: 800-776-8771 Fax: 800-767-1346

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

SOLAR & YOUR ASC BUILDING PRODUCTS' ROOF

SUMMARY

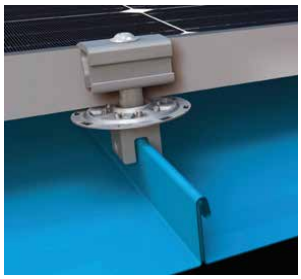
- ASC Building Products recommends the use of standing seam metal roofing (Design Span hp® and Skyline® Metal Roofing) with seam clamps (such as S-5! clamps or similar) to attach photovoltaic arrays (solar panels) to metal roofs.
- Alternative methods that use multiple fasteners that penetrate through the roof surface could affect the performance of the roof over time.
- For additional information please contact ASC Building Products.

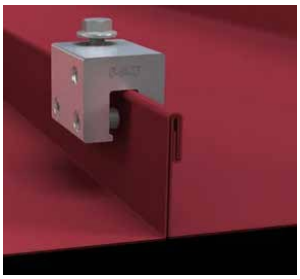
OVERVIEW

Installing solar photovoltaic (PV) panels offer several benefits, including lower electricity costs, a reduced carbon footprint, and increased home value. Federal and state incentives can also offset solar installation costs, such as The Inflation Reduction Act, which offers a 30% federal tax credit on solar installations.

Skyline roofing featuring solar panels

Metal roofs are an excellent roofing substrate for solar photovoltaic (PV) panels. The recommended approach for metal roofing is to install PV panels on standing seam roofing, such as Skyline, Skyline hp, and Design Span hp, using solar clamps. Solar clamps attach to the raised ribs of the standing seam profile and are fastened without penetrating the metal. Some solar clamps may also eliminate the need for solar PV racking, reducing the weight of the solar installation on the roof. There are different solar clamp designs available based on the type of standing seam panel used. Note that the seam is different between Skyline® and Design Span hp® and each product will require different solar clamp designs. Skyline uses a nailing flange and snap interlocking seam, whereas Design Span uses a clip and folded panel seam.





Pictured above are examples of different S-5! Standing Seam Clamps for different panel designs
(Images courtesy of S-5!)

A standing seam roof offers the advantage of concealed fasteners that limit the number of exposed roofing penetrations, extending the lifespan of the roof. By attaching solar panels to the roofing panel seam instead of through multiple penetrations, the solar clamps allow the panels to expand and contract with seasonal temperature variations. Allowing for thermal movement can help avoid aesthetic and performance issues from deformation, including oil canning (aesthetic waviness) and the elongation of exposed attachment holes over time, a potential source of roof leaks.

Design Span hp with solar panels

In addition to the performance and durability benefits, standing seam solar clamps can be installed on new or existing metal roofs. Solar panels are installed after the metal roof is installed and flashed. As the solar array is an accessory to the metal roofing system, it is imperative that the frequency of attachment points to the roof, and the roof to the building, be checked to meet any performance or building code standards. It is the responsibility of the installer to verify this information or seek assistance from a qualified design professional if necessary.

Continued on next page...

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ASC BUILDING PRODUCTS TECHNICAL BULLETIN

SOLAR & YOUR ASC BUILDING PRODUCTS' ROOF (CONTINUED)

Design Span hp with solar panels

For additional information please submit your question via 'Ask ASC'
https://www.ascbp.com/resource-center/ask-asc/

Other Solar Installation Considerations

Avoid Unintentional Corrosion – In solar installations, premature corrosion can occur where exposed copper wire from the panels is in contact with the metal roof. This includes direct metal to metal contact, or indirect through rain or condensation run off. This issue is most prevalent in corrosive environments, such as marine settings but can occur in other settings. If the use of copper cannot be avoided, it is recommended to use insulated copper or a protective coating over the copper to prevent contact. Any electrical terminals that use exposed copper should also be sealed. This includes but is not limited to grounding wire for PV arrays and lightning protection.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

TOUCH-UP PAINT

Scratches and very minor damage may occur during handling and installation of painted roofing and wall panels. In these instances, it may be desirable to use touch-up paint to repair the blemishes. Keep in mind, touch-up paints are quick fixes and when used properly, will result in a satisfactory appearance. Misuse or over-use can result in spoiling the overall appearance.

The paint systems used on factory painted steel have a built-in color and gloss retention that is only achieved through the oven-baked process. Air-dried paints will fade and chalk much faster than the oven-baked. These different weathering characteristics must be taken into consideration when touch-up work is contemplated. Nothing looks worse than the blotchy appearance of excessive touch-up painting. Superficial scratches which are not too obvious from a distance of 6-9 feet will likely be obscured by normal soiling and weathering. If you decide to use touch-up paint, use it sparingly and only to cover up those areas where paint has been removed. A paint pen or 1/4" artist brush should be used for these repairs.

Edges of deep scratches should be lightly sanded or “feathered” with #400 grit sandpaper. If a scratch extends through the paint and the protective metal layer exposing raw steel, it should be treated with a zinc-rich or similar primer before touch-up application. If feathering and/or priming are not necessary, areas to be touched-up should at least be wiped with mineral spirits to remove dirt, wax or other contaminants before colored touch-up is applied.

The recommended paint type for touch-ups is an acrylic silicone paint. This paint type can be found at local paint stores or anAir Dried Kynar system (ADS II), can be sourced through PPG Industries at the following link.

http://corporate.ppg.com/Media/Newsroom/2016/PPG-announces-licensing-agreement-for-KYNAR-ADS-II

Special attention should be given to the manufacturer’s instructions; including direct skin or eye contact, ventilation and potential flammability. Aerosol or spray applications are not recommended for blemish or scratch repairs. The best tool for this type of repair is a paint pen or good quality, 1/4-in. artist brush. Only the narrow edge of the paintbrush should actually contact the scratch or blemish.

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www.ascbp.com

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

REMOVAL OF STUBBORN STAINS, SEALANTS, & PEEL COAT

This bulletin defines what chemicals are acceptable for cleaning stubborn stains, sealant, or strippable film from the surface of ASC Building Products roof or wall panels.

STUBBORN STAINS OR SEALANT

ASC Building Products recognizes the following chemical solutions to be used to removed stains while not adversely affecting the paint coatings:

- **Prep® Prep™400*** https://www.ppgpaints.com/products/duraprep-prep400-overspray-remover
- **Denatured Alcohol**
- **Mineral Spirits**
- **Naptha** (Not available in California)
- **WD-40®**
- **Goo Gone**

Note: A small panel area should be initially selected to determine what the best course of action should be before larger panel areas are subjected to cleaning using these methods.

PEEL COAT (STRIPPABLE FILM)

Prolonged exposure to UV, heat or cold may make removal of the factory applied peel coat difficult.

ASC Building Products stresses the importance of removing peel coat as soon as possible after receiving products to ensure easy film removal. Prolonged UV exposure, wet conditions or long-term panel storage with film applied will likely make removal very difficult.

For detailed guidelines on removing peel coat or left-over residue see **Technical Bulletin *"Peel Coat Guidelines and Best Practices"*** by clicking here.

* DuraPrep PrepTM400 not compatible with Polyester and Silicon Modified Polyester (SMP) coatings.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

PEEL COAT GUIDELINES & BEST PRACTICES

INTRODUCTION

This bulletin details proper jobsite storage, removal and clean-up of panels and flashings supplied with protective peel coat film..

JOBSITE STORAGE

Stored panels and flashings should be protected from exposure to moisture, sunlight and precipitation. It is recommended to store panels and flashings indoors for the utmost protection. If outdoor storage is the only means, it is recommended to store panels and flashings elevated under a water-proof tarp and tilted in such a way to not entrap moisture and facilitate drainage. Exposure to UV light and weather elements can result in excessive adhesion to the surface. The film can also degrade to the point it can no longer be peeled off.

Material with peel coat applied should not be stored for longer than 30 (thirty) days.

REMOVAL OF PEEL COAT

Protective films should be removed gradually beginning at one end peeling back at a 180°degree angle with a smooth even motion. Do not quickly jerk the protective film. Inspect for any adhesive residue once the peel coat is removed. If residue remains on the surface, follow the below cleaning guidelines.

DO NOT remove peel coat in freezing conditions. The recommended temperature range for film removal is between 40°F (16°C) and 90°F(32°C).

DO NOT remove peel coat if panels are wet. Panels and flashings should be moved indoors and allowed to dry before removing the protective film.

Using sunlight to warm or dry the panels and flashings could result in UV degradation of the peel coat. Heat lamps or dryers can be used to warm up or dry off panels.

Peel coat should be removed from installed panels and flashings within 24 (twenty-four) hours.

REMOVAL OF STUBBORN PEEL COAT & RESIDUE

There are several options available that may aid in removing stubborn peel coat and/or left-over residue.

- Citrus-based hand cleaners (non-abrasive)
- Goo Gone Pro-Power Adhesive Remover
- PPG DuraPrep® Prep 400 Overspray & Graffiti Remover (For use on Dura Tech™ 5000 paint systems only)
- Water applied with portable steam cleaner

As a general rule the peel coat will be resistant to the absorption of the Goo Gone Pro-Cleaner, Citrus-based cleaner and DuraPrep Prep 400 cleaners.

- Remove a much of the film or residue as possible.
- Panels and flashings must be completely dry before applying cleaners. With the dry substrate out of direct sunlight, saturate the film backing with the selected cleaner. Keep the film saturated with repeated applications until the film swells and softens. The remover needs to wick under the edges of the film which can be aided by gently agitating the film edge with soft bristle brush.

Once the film has softened, lift and remove with fingernail or by means of scraping with a soft, non-abrasive scraper, being careful not to scratch or damage the panel surface. It is common for only the area of film near the edge to be removed; it may take repeated cycles to remove all the film or residue. For left-over residue, saturating then wiping with a soft cloth may be sufficient.

- When peel coat or residue is completely removed, a general-purpose surface cleaner may be used with a soft cloth to remove any light haze or residue that remains. Please reference Technical Bulletin #13 Cleaning Coil Coatings for approved painted surface cleaners.
- A portable steam cleaner can also be used to swell and soften the film for easier removal.

Cleaners should always be tested on a small area first. Carefully read and follow the manufacturer's precautions and directions. The information provided in this technical bulletin is for general knowledge only; it is not to be considered an exact method for removal of peel coat or adhesive residue.

Care should be taken to avoid cleaners from contacting siding, windows, doors and vegetation. Follow all local environmental guidelines for proper disposal of cleaning agents.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

ROOFING UNDERLAYMENTS

INTRODUCTION

Specifying underlayments for metal roofing often comes down to three basic needs. The first need for the installer and general contractor is to “dry the building in” so other work can proceed within the building. Second is for the owner and pursuer of a weathertightness warranty is to protect against the chance that moisture will penetrate the metal roof system and act as a secondary moisture barrier. Third is to allow a means of escape for ‘back side’ condensation which may occur in certain metal roof applications; this condensation must be directed out of the system. In all three cases the underlayment is intended to ultimately direct any moisture to the outside of the building envelope.

This technical bulletin will look at the different types of underlayments used with metal roofing. The discussion of underlayments within this document does not include internally driven vapor barriers; those used to block moisture originating from inside the building (ie. such as a natatorium). The main types of underlayment reviewed within this bulletin are: felts, rosin paper, polyethylene plastic, synthetic underlayments, and self-adhering membranes.

ASPHALT SATURATED FELT

The selection of this felt is often driven by the project specifications and cost. 30# asphalt saturated felt is perhaps the most widely used underlayment and most readily available. 30# felt installed and lapped horizontally with roofing nails and caps is adequate as a moisture barrier. Alternatively, two layers of 15# felt can be used but it does not lend itself to installation activity and wind conditions. Often one layer of 15# is installed and then shortly before the panel installation another layer is added. The down side of felt is that it may not be a durable, lasting underlayment for metal panel installation activities, it is not durable during windy conditions and has a relatively short life when exposed to the elements.

The use of asphalt saturated felt under metal roofing is perhaps the cheapest, most accessible, and most widely used. Unfortunately, even after a few short weeks of exposure, it will have less and less effectiveness as a water shedding material. Exposed and weathered felt eventually becomes a liability and must either be replaced or covered. The use of asphalt felt may work well if metal roofing can be installed within a few weeks. Asphalt roofing felts that have been over-exposed, dried out, curling, wrinkled, torn from wind damage, and/or patched may not provide the protection and performance that is needed. Extremely weathered felt may actually retain moisture under the metal roofing and exacerbate water infiltration damages. Additionally, temperatures reached in certain conditions underneath the metal roof may cause the asphaltic material to become viscous and “run”, potentially leaving unsightly streak marks outside of the building envelope.”

ROSIN PAPER

Rosin paper is not considered a moisture barrier under metal roofing. The discussion of rosin paper within this bulletin is to clarify its use as a slip sheet. Slip sheets are traditionally used to prevent adhesion of asphalt felt to the back side of metal roof panels. As the metal roofing expands and contracts during the daily thermal cycle the movement can displace, and even tear, the asphalt felt underlayments. Because aluminum and copper have much higher thermal expansion rates than steel the use of a rosin paper slip sheeting is more prevalent with these roofing materials. The use of a slip sheet under steel roofing is not a requirement for roofing warranties. There are questions as to whether rosin paper could actually retain any moisture that may infiltrate into the system rather than encouraging moisture to migrate out of the building envelope.

POLYETHYLENE PLASTIC

Polyethylene plastic is not a recommended underlayment for metal roofing. Even though polyethylene is an effect water barrier and is inexpensive, the material does not hold up well under prolonged expose to sun and heat. The long-term effects from radiant heat under metal panels is unknown with this product. Polyethylene does not perform well with fastener penetrations and has poor resistance to tears in the installation process. Plastic also does not provide adequate slip resistance on sloped surfaces and gets worse with the presence of dust and moisture. The perm rate for this material is very high, to the point that it can possibly trap moisture at its’ surface.

SYNTHETIC UNDERLAYMENT

Synthetic underlayments are relatively new in the U.S. and have continued to evolve over the last ~20 years. A number of these polymer based synthetic underlayments have been used with considerable success. The initial aim of synthetic underlayments was to replace asphalt saturated felt in the market. The success of these products has been overwhelming. The cost of synthetic underlayments is roughly double that of asphalt felt. That said, the list of advantages that synthetic has over asphalt felt is significant. Some of the key advantages:

Lighter Weight: Synthetics are roughly 1/5 the weight of asphalt felt. This allows for bigger rolls, and significantly more coverage per roll, resulting in lower installation costs. Resistance to tearing – These underlayments have up to 10X the tear strength of asphalt felt. The tear resistance is very effective against winds as well as installation traffic and other construction activity.

Exposure or UV Resistance: Most synthetic brands list acceptable exposure times of up to six months. The much improved tear resistance and long-term exposure are perhaps the biggest advantages of synthetics.

Continued on next page...

RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

ROOFING UNDERLAYMENTS

Moisture Penetration: Appears to be very good for synthetic underlayments with data sheets indicating perm rates such as .05. Perm rates for asphalt felt in good condition are in the range of .02.

Some concerns exist regarding how well the synthetics manage fastener penetration. With 30# asphalt felts the theory is that the fastener head compression against the felt will cause the oil in the felt to flush together creating an added level of moisture protection. With synthetic underlayments the protection is less clear; underlayment manufacturers strongly encourage the use of plastic capped underlayment fasteners to both reduce the opportunity for water intrusion, as well as improve the retention of the underlayment to substrate. Synthetic underlayments don't have to be used across the entirety of the roof; they can be used in combination with self-adhering membranes in the lower slopes, valleys, eaves, etc. (the more risk prone areas) to provide a more complete, cost effective underlayment solution.

Future use of synthetic underlayments will only continue to expand and continued product improvements will occur as well. Note that exact compositions of synthetic underlayments are very proprietary and vary notably from one manufacture to another. Proper research should be done to select the most appropriate underlayment for the application. Synthetic underlayments are allowed for AEP Span Weathertightness Warranty purposes if specified and approved for use under metal roofing by the underlayment manufacturer.

SELF-ADHERING MEMBRANE

Self-adhering membranes are considered the foremost underlayment for metal roofing. The key attributes of these products provide for the best protection. Some of these attributes are:

Self Healing: Holes created by fasteners installed through membrane underlayments tend to seal around the fasteners, reducing the possibility of moisture penetration.

Preparation: Each of these products have specific requirements at installation such as surface priming of substrates. Thorough cleaning of substrates and removal of protrusions, decking voids, etc. may be required to improve adhesion and reduce opportunity for underlayment damage.

Exposure Time: Ranges from 30 to 90 days. Longer exposure times may produce uneven underlayment surfaces.

Temperature Resistance: Self-adhering, high-temperature underlayments are designed specifically for use under metal roofing systems in order to protect against the high temperatures that are possible under metal roofing systems.

Variations: Some versions of this product are only made for composition shingles and may not have enough temperature ratings or flow temperature to be suited for metal roof applications.

Targeted Usage: Self adhering membranes are often used in combination with felts or synthetics such that eaves, valleys and perhaps hips and ridges are stripped with several feet of membrane and the balance of the roof with the less expensive product.

Compatibility: Some self-adhering underlayment manufacturers caution against physical contact with EPDM, creosote, wood pitch (resin), gasoline/oil/diesel fuels, flexible PVC and numerous solvents. Adhesion can also be an issue for some substrates such as polystyrene (Styrofoam).

As with any underlayment usage, consult all product usage and installation requirements with the manufacturer and also ensure the product's compatibility with metal roofing.

The only requirement for AEP Span warranty purposes is that the membrane not have a granular surface. There is a great concern that the granular surface may scratch and damage the wash coat and metallic coating on the underside of the metal panels allowing any moisture to deteriorate the panel integrity.

FIRE RATED UNDERLAYMENTS

A number of the underlayments on the market have obtained fire resistance ratings. Use of these underlayments as a component of a fire rated UL790 assembly is generally allowed. Consult the UL website for AEP Span fire listings and acceptable underlayment types. As of the writing of this bulletin, only one synthetic underlayment is available in the market that can boost most of AEP Span's metal roofing panels to a Class A fire rated assembly over combustible decking. The product is GAF Versashield. Consult the AEP Span UL listings for approved underlayments and constructions for Class A rated assemblies. [UL Link]

RADIANT BARRIERS

In recent years, radiant barriers with very low perm rates are also being utilized under metal roofing. These radiant barriers not only act as vapor barriers but also provide resistance to heat transfer into or out of the building envelope.

IN SUMMARY

There are a few primary types of roofing underlayments used with metal roofing – asphalt saturated felt, rosin paper (slip sheeting), synthetic underlayments, and self-adhering membranes. There is also a large number of variations/ formulations to these as well, especially with the synthetics. This bulletin provides some general guidance however it is ultimately the responsibility of the specifier or design professional to select the proper underlayment based on each project's physical and environmental requirements.

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RETURN TO TABLE OF CONTENTS

ASC BUILDING PRODUCTS TECHNICAL BULLETIN

RECOMMENDED SEALANTS & USAGE

INTRODUCTION

This technical bulletin addresses the specific use and application of the three primary types of sealants used in the installation of ASC Building Products' steel roof and siding products.

NON-SKINNING/NON-CURING BUTYL SEALANT

These types of sealants are used purposely in metal roofing and siding applications because panel joints and laps create a very thin space between the materials that are subject to continual dynamic movements which will subject the sealant to shear force. Only a non-skinning, non-curing sealant can perform under such extreme conditions as these types of sealant will never cure or harden over the life of the roof or siding.

Butyl sealants should only be used where dynamic movement of the material will take place due to thermal expansion and contraction and are not subjected to exposure to ultra violet light. UV light will break down these types of sealants overtime making them impractical in exposed applications.

Recommended sealants in this group include, but are not limited to, the following:

- PTI® 707
- SikaLastomer®-511
- Pecora® BA-98
- TremPro® JS-773
- Acryl-R® SM5430

EXTRUDED BUTYL TAPE

These types of sealants are used in a similar fashion to the non-skinning/non-curing sealants as butyl tape will never cure or harden over its lifetime. Butyl tapes main use is for high infiltration areas such as under the joggle cleat at the eave or valley condition or in areas where a continuous aggressive bead of sealant is recommended such as used to seal the top and bottom of the zee closures on ridge or peak condition.

Butyl tape is also recommended at the side lap condition of through-fastened (corrugated) panels due to the fact that gun grade sealants are impractical and messy to apply in a thick continuous bead. Like nonskinning/non-curing sealants, Butyl tape should never be used in applications that are subjected to UV exposure. UV light will break down the sealant overtime. Varying sizes of butyl tape are available in the market. The following sizes are available from ASC Building Products.

Please consult the appropriate panel installation guide or ASC Building Products representative for appropriate size recommendations.

- 3/32" thick x 3/8" wide
- 1/16" thick x 1/2" wide
- 1/16" thick x 1/4" wide
- 1/8" thick x 1" wide
- 3/16" thick x 7/8" wide

CURING SEALANTS

This group of sealants fall into two categories,Urethane and Siliconized. These types of sealants require a specific mass of material, cures relatively hard, and will easily fail when subjected to shear and dynamic forces. ASC Building Products recommends urethane and siliconized sealant only for non-moving joinery and perimeter seals that are exposed to sunlight and require a curing UV resistant sealant.

It should be noted that although these sealant are recommended for use on ASC Building Products roof and siding products their use should be limited, as most of ASC Building Products' details utilize concealed gun grade Non-skinning/Non-curing butyl sealants or butyl tape sealants.

Recommended sealants in this group include, but are not limited to, the following:

Urethane Sealant

- MasterSeal® NP 1™
- Sikaflex®-201 US
- Sikaflex®-1a
- Dynatrol® I-XL
- Dymonic® FC

Siliconized Sealant

- Dow Corning® 795 Silicone Building Sealant
- Titebond® Weathermaster® Metal Roof Sealant

All of the sealants listed in this letter have specific uses and applications. Please consult our Technical Department or ASC Building Products Representative for questions concerning specific use and applications or if a sealant not listed needs to be reviewed for use on ASC Building Products supplied materials.

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