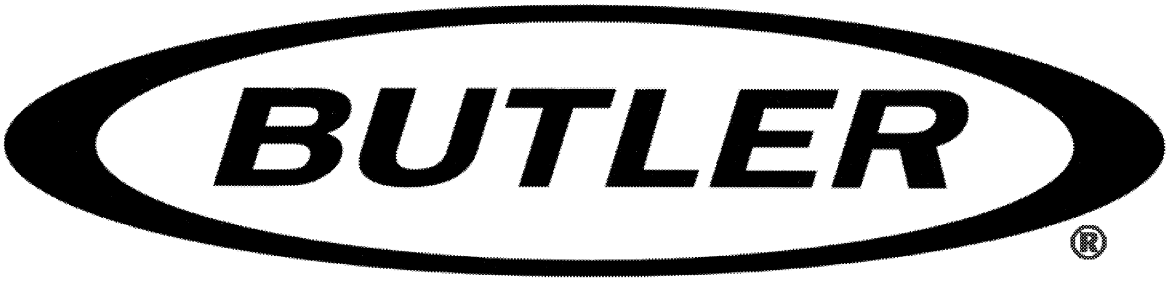
BUTLER ROOF SYSTEMS



ROOF OWNER'S MAINTENANCE MANUAL

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ROOF SYSTEM MAINTENANCE MANUAL

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INTRODUCTION

Now that your new Butler roof system is complete, Butler Manufacturing wishes to inform you, the building owner, of those things you must do to insure years of satisfactory performance from your Butler product. In the following pages, we will address important issues, which are vital to the performance of your Butler roof.

A preventative maintenance program is a key factor in maximizing the life expectancy and dependability of your Butler roof system. As a part of your on-going maintenance program, periodic inspections, beginning at the completion of your building, are of utmost importance. These inspections will be discussed in more detail in later sections of this manual.

To enable you to more easily access information regarding your roof, we will address specific issues individually, e.g., sealants, finishes, etc. We have also included a chart of “do’s” and “don’ts” as a quick reference to key items.

If you have any questions regarding information contained in this manual or other warranty or maintenance items, call Butler Manufacturing Company, Warranty Department, at (816) 968-3806.

SAFETY

Whenever you perform maintenance on your roof system, safety must be a prime concern. OSHA requires fall protection and other personnel protection. State and local laws and regulations may also impose additional safety requirements. Failure to follow these laws and regulations can result in serious personal injury or even death to your maintenance personnel. Furthermore, OSHA and other state or local agencies can also levy substantial fines.

A completed Butler roof is a safe walking surface except near the edge of the roof and when any moisture (such as dew, frost, snow, etc.) makes the surface of the roof very slippery. Butler roof installations with steep slopes can also be hazardous without proper safety equipment. Appropriate safety measures and extra caution should be exercised whenever these conditions are present.

Make sure your maintenance personnel are adequately instructed in safety and that they are provided with appropriate safety equipment. Working off the ground, even a few feet, can be dangerous and falls from any height can be fatal.

Whenever performing building maintenance, the following precautions must be taken:

- Always use fall protection, especially near building edges or eaves.
- Do not walk on Lite*Panls®.
- Do not walk on wet roof panels.
- Do not walk, step or sit on skylights or ridge cap.
- Do not walk in gutters.
- Guard all skylights and other roof openings or holes.

For further information on all fall protection and other safety issues, contact your local OSHA office.

DO		DON'T
Inspect roof regularly.		Don't walk on high corrugation or roof panels, ridge cap, light panels, skylights, or in gutter.
Follow these maintenance procedures.		Don't allow condensation lines or run-off from rusty areas to drain onto roof panels.
Keep roof, curbs, gutters, downspouts, collector box screens and collector boxes free of debris.		Don't use wood blocking on roof (redwood may be acceptable when properly laid in a bed of approved mastic.
Inspect roof after heavy storms or unusual weather, which may cause damage.		Don't add to load on structural components without consulting Butler.
Inspect and reseal joints in ancillary flashings at roof edges and terminations.		Don't use dissimilar material on roof (galvanized steel, copper, lead, wood, unpainted steel, etc.
Inspect and reseal as necessary all roof penetrations – pipe flashings, curbs, etc.		Don't allow mortar or concrete to dry on roof.
Caution workers on roof – help prevent roof punctures.		Don't walk or work near edge of the roof without appropriate fall protection.
Thoroughly wash and clean area of all debris, solutions, etc. after maintenance on roof top mechanical units.		Don't walk on wet panels

DO		DON'T
Check air conditioning units frequently for proper condensate disposal.		Don't write on ALZN coated materials with graphite (lead) pencil.
Empty air conditioning units' evaporation pans as necessary to prevent overflow onto roof.		
Remove excessive snow and ice as necessary.		Do not use metal shovels or other objects that will gouge or otherwise damage panel surface.
Repaint as necessary surfaces susceptible to rust.		
Always walk in flat of roof panel, near supporting roof structural.		
Request manufacturer approval prior to making any modifications or additions to roof system.		
Contract only approved Butler Roofing Specialists to make modifications and additions to roof system.		

ROOF MAINTENANCE

Your Butler roof system is an area that is seldom seen and consequently too often forgotten in planning routine building maintenance. Butler roof systems are designed to withstand the most severe weather conditions and provide years of maximum protection at the lowest possible maintenance cost. No roof, however, is completely maintenance free or immune to abuse or the continuing effects of severe weather. A comprehensive roof maintenance program is as important as proper installation of the Butler roof system. Failure to properly maintain the roof may cause any warranties to be voided and may shorten the life of the roof. The following maintenance suggestions will greatly enhance the probability of continuing trouble-free service.

I. REGULAR ROOF INSPECTIONS / CLEAN-UP OF DEBRIS

Butler roof systems should be inspected at least semi-annually. Each spring, the Butler Manufacturing Company Warranty Department, will mail a copy of the **"Annual Roof Inspection Report and Certification"** form to owners with Butler roof systems covered by the Weathertight Gold™ Endorsement Program. In order to keep the roof warranty coverage in place, these forms must be completed and returned to Butler within sixty (60) days of receipt.

In addition to the regularly scheduled inspections, roof inspections should also be conducted whenever any of the following conditions occur.

- Exposure of the roof to severe weather conditions, such as strong winds, hail or continued heavy rain. Examine the roof for severely ponded conditions, debris, and any other damage to the roof components that may allow moisture to infiltrate. The roof panels should be carefully examined for punctures or loose fasteners in areas where damage has been identified.

- After repair or replacement of rooftop equipment, rooftop work by other trades, and at any other time when the roof may become exposed to activities where damage may occur. Examine the roof for spills, debris, sharp objects, and punctures.

- After excessive foot traffic, for any reason.

Careful cleanup of all materials and debris following any roof activity or maintenance is extremely important. Drill chips, wire, metal scrap, insulation, and other debris left on the roof will weather and/or corrode, and can be very damaging to metal roof materials. Therefore, these items should be removed from the roof immediately.

Sharp metal scraps can stick in the soles of workers' shoes, and then scratch the roof coating as they walk on the roof. These scraps should be removed immediately.

Mortar from masonry walls, chimneys, etc. will severely etch the coating of roof panels. Roof panels in areas where this type of work is being done should be protected. If mortar is spilled on the panels, it should be cleaned off before drying.

Flying debris from tools such as abrasive saws (hot saws) and welding equipment can create much roof damage. Extreme care and skill must be used with these tools. Corrugated cardboard cartons or other protective material should be used to cover and protect the roof surface areas where abrasive sawing, drilling and welding is done.

Immediately remove all spills of materials, which may degrade the roof coating (such as solvent based materials, oil-based paint, etc.).

II. PROTECT THE ROOF FROM FOOT TRAFFIC

Roof traffic should be kept to a minimum! Heavy traffic may damage roof coatings.

Butler roof systems are designed to withstand normal traffic without sustaining damage. When access to the roof is required, always walk in the flat of the panel (between the corrugations) and as near the supporting roof structurals as possible.

Where frequent or heavy traffic is anticipated, we recommend you use Butler roof service ways to protect the roof. This is particularly helpful where regular servicing of roof-mounted mechanical equipment is required, or during the installation of such equipment that was not part of the original construction.

III. ROOF MOUNTED EQUIPMENT

In a normal rain, most air conditioning and heated unit cabinets will not leak. However, many air conditioning and heating unit cabinets will leak in a wind-driven rain. If these cabinets are checked from the inside looking out and you can see daylight, chances are these cabinets will leak. If leaks appear to be located near an equipment cabinet, investigate the cabinet before calling Butler or your Butler Roofing Specialist. Service calls on non-roof system leaks will be billed to the owner.

Roof mounted equipment should be maintained to prevent rust from supports dropping onto the roof surface, and to prevent any drainage onto the roof surface that might contain corrosives.

Welds on roof component curbs should be inspected periodically for corrosion. If corrosion is present, the weld should be cleaned and repainted with Uniflex 500 or a zinc-rich primer to prevent additional corrosion from occurring.

Workers should exercise care with tools and equipment to avoid puncturing the roof. When servicing units, extra care should be taken when placing metal doors, lids, pans, or sharp objects on the roof surface.

When moving units or equipment on roofs, avoid overloading roof. Avoid roof damage by laying smooth plywood over the roof panels prior to moving the equipment. Plywood should be laid in the flat of the panels, and removed when work is completed.

When work is complete, clean work area, checking for loose screws, scraps, etc.

IV. DRAINAGE FROM EQUIPMENT AND OTHER ROOFS

A corrosive condition can occur when water from air conditioner condensate lines, copper flashing, lead and other heavy metals is drained directly onto aluminum, aluminum coated steel (ALCO) or aluminum-zinc alloy coated steel (ALZN) roofs.

The following are the most common causes of damage:

- Copper in direct contact with the roof
- Drainage from copper onto the roof
- Condensate drainage from air conditioners
- Drainage from roof-mounted equipment having copper fin condensers and piping
- Continuous spray or flow of water on roof as may occur at the outlet of a drain line
- Copper cable from lightning rods
- Rust particles or run-0ff from rusty surfaces onto the roof panels

Water drippings from bare copper wire, copper pipe, or copper flashings contain copper ions, which are very corrosive to ALZN panel materials. These items and adjacent panels should be painted or coated with Uniflex 500 to minimize the problem if the copper source cannot be eliminated.

Condensate from air conditioners or evaporators should never be allowed to drain directly onto the roof. This condensate should be piped off the roof into the gutter. PVC pipe with flexible joints is recommended. Never use copper pipe. Steel pipe is undesirable unless painted.

Roof panels exposed to condensate water may deteriorate in as short a time as six months. If roof panels have been in contact with condensate, thoroughly clean the panels using a fiber brillo clothe (Scotchbrite pad), and if necessary coat with 15 mils dry film of Uniflex 500.

Do not use lead flashing on vent pipes. The same galvanic corrosion that occurs with copper condensate lines will occur with lead.

Sometimes “black steel” is used for gas pipe and supports of roof-mounted equipment. If these items are not cleaned and painted, mill scale and rust will peel off and fall on the roof below the equipment. This rust will not only stain the roof, but will induce rusting on the panel itself.

V. RESTORE SEALANTS AROUND ROOF OPENINGS

Sealants around roof openings for mechanical equipment, vents, and flexible pipe flashings are particularly susceptible to deterioration from weathering. These areas should be inspected frequently and resealed as needed.

All roof penetrations require an approved roof curb and/or an industrial-type flexible flashing to be properly sealed. Only Butler IFCurb roof curbs are approved for use under the Weathertight Gold™ Endorsement.

VI. ICE AND SNOW REMOVAL

Excessive ice and snow build-up should be removed from roof immediately to prevent damage from the freeze/thaw cycles and possible overload.

To avoid damaging the roof during snow removal, use plastic shovels and pay close attention when working around curbs, pipes, and other areas where flashings can be damaged. Snow blowers and shovels with sharp edges must not be used.

VII. WOOD BLOCKING

It is **not** recommended to use any wood on Butler roofs. Treated lumber contains salt that can cause deterioration to panel finish. Wood, in general will hold moisture and trap it against the panel creating premature deterioration.

If a condition arises where wood must be used, the wood should be redwood laid in a bed of Panlastic®. The wood should be placed on top of and perpendicular to the major corrugations. The Panlastic® will help hold the lumber in place and will act as a barrier to separate the wood from the metal roof panels. Panel design loading and structural design loadings must not be exceeded.

VIII. ANCILLARY FLASHINGS

At locations where your new Butler roof meets adjoining construction, there are most often flashings, which your Butler Roofing Specialist has fabricated and installed to complete the roof installation. These flashings, which include copings and counter flashings, require close inspection and proper maintenance to ensure a long service life. Ancillary flashings are not covered by any Butler weathertightness warranty.

General inspection practices for ancillary flashings include careful examination of all visible sealant joints for cracks, splits, and other signs of failure. Sealant joints exhibiting these characteristics should be re-worked before they fail and cause a leak. Remove the existing sealant and thoroughly clean the adjacent surfaces before applying new sealant. See next section for sealant application instructions.

Ancillary flashings should also be closely inspected for corrosion. If minor corrosion is evident, the flashings can often be cleaned and treated with a protective coating of Uniflex 500. If the corrosion has caused material failure, the flashing should be replaced.

MASTICS, SEALANTS, COATINGS

I. MASTICS AND SEALANTS

Butler uses several types of mastics, including gun grade "Panlastic®" (part #025392), which comes in tubes and can be used with common caulking guns. Butler also uses a more solid Panlastic®, which comes in tape form, and has shims in the mastic to prevent over-compression when applied between two surfaces.

Although Butler Panlastic® mastics are of the best quality, they will not work well when totally exposed to the sun. Butler uses a urethane sealant (part #044804) in cases where the sealant will be exposed to ultra-violet rays (not a common condition on Butler roof systems).

The surfaces to which mastics or sealants will be applied must be clean and free of moisture. Mastics and sealants will not adhere to dirt, oil, or moisture. To prepare an aged or dirty metal surface for mastic/sealant application, use a clean cotton cloth with mild detergent. If the surface requires heavier cleaning, use a solvent-based cleaning product like MEK (methyl ethyl ketone). **Note:** MEK has a low flash point and is extremely combustible. However, MEK will evaporate quickly, and mastics will adhere very well to surfaces cleaned with this product. Extreme care should be taken when using MEK and, also, consideration given to storage location. Rubber gloves should be worn while using MEK.

II. COATINGS

Uniflex 500 is an excellent coating product used to protect ALZN and galvanized materials from corrosion. Uniflex 500 may be used where a small amount of water is standing in the flat of a panel, around a curb opening, or along a flashing. Uniflex 500 may also be used to prolong the life of materials, which have already begun to corrode.

Uniflex 500 is available in one gallon and five gallon pails. Uniflex 500 must be mixed thoroughly until it has an aluminum color. Uniflex 500 can be applied with a brush or paint roller. The surface to be coated must be free of oil, dirt, corrosion, and moisture. It is best to start any work using Uniflex 500 after 10:00 a.m. (or after the air temperature has risen above the dew point) to prevent condensation on the metal surface. Do not apply Uniflex 500 if rain is predicted within 24 hours, or when the roof surface temperature is below 50° F. or above 110° F. For best effect, Uniflex 500 should be applied to a minimum dry thickness of 15 mils, which equates to a coverage rate of one (1) gallon per forty (40) square feet of surface.

Rusted and/or corroded roof surfaces should be cleaned thoroughly before coating with Uniflex 500. Remove all corrosion with a wire brush, then clean the area with a soft cloth and mineral spirits. After surface has dried, apply Uniflex 500 as listed above. This treatment should stop the rust/corrosion action.

Uniflex 500 is compatible with all Butler mastics and sealants. Uniflex 500 is an excellent protective coating but it will not bridge an area where thermal movement is occurring. For conditions such as this, bridge the area with a flexible flashing or Butler urethane sealant. After the expansion area has been bridged, Uniflex 500 makes an ideal protective coating.

Uniflex 500 will do an excellent job of protecting a surface in the following areas:

- Inside surface of exterior gutters.
- Welded joints in stainless steel gutters.
- Roof areas where air conditioning condensate water has drained onto roof panels.

CLEANING "ALZN" ROOF PANEL COATING

Care should be taken when handling or traveling on ALZN coated roof materials. When the ALZN material surface is abraded or burnished by agents such as hard-soled shoes or objects sliding over the surface, the coating becomes darkened. Although they might have a different appearance, these dark areas are not material defects and will not limit the life of the roof.

Removal of darkened areas is generally impractical once the coating has been abraded, but cleaning with a mild detergent or gentle wiping with mineral spirits (and a thorough rinsing) may help in some cases. Contaminants such as oils, mastics, and paint overspray may be removed from the ALZN roof coating by using the following recommended cleaning methods.

To remove the following contaminates:	Use:
Dirt, mud, light oils	"Formula 409" and soft cotton cloth
Mastics, heavy oils	VM&P naphtha and soft cotton cloth
Paint, overspray, permanent marker	Methyl ethyl ketone (MEK) and soft cotton cloth
Corrosion, rust and/or rust marks lead pencil marks	Clean surface and apply Uniflex 500 as directed in previous section directed in previous section

Note: Exercise extreme care when using (and storing) naphtha and/or MEK. These solvents have a low flash point and are EXTREMELY COMBUSTIBLE! Do not use (or store) these solvents near open flames or high temperatures. Storage areas must be well ventilated. Always use rubber gloves when using these solvents.

BUTLER PAINTED SURFACES

I. BUTLER-COTE® PAINT FINISH

The factory applied Butler-Cote® finish on hot-dipped galvanized sheets is a premium quality, long-life, weatherable PVDF coating. This finish will retain its uniform quality appearance for many years with very minimal attention.

In some geographic areas, dirt pickup may cause an unsightly appearance. In most cases a good cleaning will restore the original appearance.

Please read the following cleaning and refinishing procedures carefully to insure the satisfactory results, which can be expected with the recommended material.

II. CLEANING BUTLER-COTE® SURFACES

Because of the non-adherent nature of the fluoropolymer coating of Butler-Cote 500FP, most normal cleaning can be accomplished with clear water and a soft brush, sponge or cloth. The use of stiff brushes, abrasive pads, abrasive cleaners, etc. which will abrade the surface, is to be avoided. Also, some standard cleaning agents and solvents may damage the coating. Before using any cleaning solution or process, make a test on an inconspicuous section of a panel to determine any adverse effects.

Solvents and cleaning agents that may be useful are listed below in descending order of preference. In all cases, follow with a clear water rinse and adhere to all manufacturers' cautions, as some are highly toxic and/or flammable.

Detergent Solutions:

A 5% solution of most commonly used commercial and industrial detergents should not harm Butler-Cote 500FP.

Solvents:

USE SOLVENTS LISTED BELOW WITH CAUTION. LIMIT CONTACT TO FIVE (5) MINUTES MAXIMUM.

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

Petroleum solvents and turpentine -- VM&P naphtha
-- Mineral spirits
-- Kerosene
-- Turpentine (wood or gum spirits)

Aromatic and chlorinated -- Toluene (toluol)
-- Perchloroethylene (perclene)
-- Trichloroethylene (triclene)
-- Xylene (xylol)

USE SOLVENTS LISTED BELOW WITH CAUTION. LIMIT CONTACT TO ONE (1) MINUTE MAXIMUM.

Ketones, esters, lacquer, thinner -- Methyl isobutyl ketone (MIBK)
-- Ethyl acetate
-- Butyl acetate
-- Lacquer thinner
-- Paint remover (non-flammable)
-- Methyl ethyl ketone (MEK)

III. TOUCH-UP PAINTING

Clean scratch or abrasion with cheesecloth or soft rag saturated with VM&P naphtha or a good grade of mineral spirits. Wipe dry with a clean cloth.

Using a small artist brush or toothpick, apply the Butler-Cote® FP Air Dry Enamel unreduced to only the damaged area. Keep the size of the coated area to an absolute minimum.

Use MEK (methyl ethyl ketone) for a clean-up solvent.

Protect eyes, face and hands. Wash thoroughly with water in the event of contact. Provide good ventilation in the work area. Use approved breathing apparatus during application. These materials are flammable; remove all sources of ignition with 50’ and enforce no smoking.

Butler-Cote® FP Air Dry Enamel is a 70% Kynar system formulated for Butler to use with the Butler-Cote 500FP panel systems. It has the best weathering properties available for a fluorocarbon air-dry system. However, field application techniques are not as advanced as those of the factory applied and baked Butler-Cote 500FP system. Excessive panel touch-up may result in a spotted appearance after a few years of weathering. Scratches and abrasions that are not aesthetically objectionable should not be touched up. If a panel has excessive scratch or abrasion damage, it should be replaced.