SUNFIX

engineered solar support

Maintenance Manual

Roof Mounted Solar Support Systems

SOUTH AFRICAN DESIGNED & MADE

Contact Us

+27 31 207 1985 www.sunfix.co.za info@sunfix.co.za Head Office: Unit 10, 1 Randworth Close, Red Hill, Durban

Content

1. Introduction

This Maintenance Manual sets out the minimum inspection and maintenance requirements for all SunFix Roof Mounted Solar Support Systems and associated components.

Compliance with this manual is mandatory for the full duration of the service life of the System and forms an integral part of:

- The SunFix (Pty) Ltd Roof Mounted Limited Product Warranty;
- The SunFix (Pty) Ltd Standard Terms of Trade; and
- The SunFix (Pty) Ltd Roof Mounted Engineers Aid.

Failure to inspect and maintain the System in accordance with this Maintenance Manual may result in:

- Reduction in the service life of the System;
- Loss of structural performance;
- Loss of weathertightness of the roof covering; and
- Invalidation of the SunFix (Pty) Ltd Roof Mounted Limited Product Warranty.

The responsibility for inspection and maintenance rests solely with the Customer.

2. Definitions

For the purpose of this Maintenance Manual, the definitions contained in the SunFix Standard Terms of Trade and Roof Mounted Limited Product Warranty shall apply. In addition:

- "System" shall mean SunFix Roof Mounted Solar Support Systems and associated components.
- "Inspection" shall mean a visual and physical assessment of the System to confirm structural integrity, corrosion condition, fixation security and continued compliance with the installation requirements.
- "Maintenance" shall mean all actions required to restore or preserve the System to its designed condition, including but not limited to cleaning, tightening, replacement and sealing.
- "Service Life" shall mean the period during which the System is expected to perform its structural function when installed and maintained in accordance with SunFix documentation.

3. Environmental Classification and Inspection Frequency

General

The System shall be inspected at intervals determined by the corrosivity category of the environment in accordance with ISO 9223 and site-specific exposure conditions.

Excerpt from ISO 9223, Table C.1

Corrosivity Category	Corrosivity	Typical Environments – Outdoor Examples
C1	Very low	Dry or cold zone, atmospheric environment with very low pollution and time of wetness, e.g. certain deserts, Central Arctic/Antarctica
C2	Low	Temperate zone, atmospheric environment with low pollution (SO_2 < 5 µg/m^3), e.g. rural areas, small towns Dry or cold zone, atmospheric environment with short time of wetness, e.g. deserts, subarctic areas
C3	Medium	Temperate zone, atmospheric environment with medium pollution (SO_2: 5 µg/m^3 to 30 µg/m^3) or some effect of chlorides, e.g. urban areas, coastal areas with low deposition of chlorides Subtropical and tropical zone, atmosphere with low pollution
C4	High	Temperate zone, atmospheric environment with high pollution (SO_2: 30 µg/m^3 to 90 µg/m^3) or substantial effect of chlorides, e.g. polluted urban areas, industrial areas, coastal areas without spray of salt water or, exposure to strong effect of de-icing salts Subtropical and tropical zone, atmosphere with medium pollution
C5	Very High	Temperate and subtropical zone, atmospheric environment with very high pollution (SO_2: 90 µg/m^3 to 250 µg/m^3) and/or significant effect of chlorides, e.g. industrial areas, coastal areas, sheltered positions on coastline
CX	Extreme	Subtropical and tropical zone (very high time of wetness), atmospheric environment with very high SO_2 pollution (higher than 250 µg/m^3) including accompanying and production factors and/or strong effect of chlorides, e.g. extreme industrial areas, coastal and offshore areas, occasional contact with salt spray

Minimum Inspection Intervals

Corrosivity Category	Minimum Inspection Interval
C1 – C3	Every 12 months.
C4	Every 6 months.
C5 & CX	Consult with SunFix to establish inspection intervals.

Event-Based Inspections

Additional inspections shall be carried out immediately following:

- Extreme weather events;
- Seismic activity;
- Abnormal loading conditions;
- Any roof repairs or alterations within the vicinity of the System; and
- Any event that may have caused the System to be compromised.

4. General Inspection Requirements

All inspection and maintenance activities shall be carried out in compliance with all applicable health and safety procedures, industry standards and legal requirements.

SunFix System

At each inspection, the condition of the SunFix Roof Mounted Solar Support System shall be verified to confirm that:

- No loosening, displacement, or deformation of any SunFix component has occurred;
- No corrosion, crevice corrosion, pitting or coating failure is present beyond acceptable cosmetic limits;
- No damage is evident to roof sheeting, tiles, membranes or waterproofing interfaces associated with the System;
- No signs of water ingress are present at penetrations, fixings or sealing interfaces;
- No unauthorised modification, substitution or addition to the System has been made;
- All critical bolted connections retain the specified installation torque in accordance with the applicable SunFix Installation Manual.

Any non-conformance shall be recorded and rectified without delay.

Roof and Supporting Structure

During each inspection, the general condition and structural integrity of the roof covering and supporting structure (including, but not limited to, purlins, rafters, trusses, bracing and primary structural members) shall be assessed.

The Customer shall ensure that the roof and supporting structure remain structurally suitable to carry:

- The dead loads imposed by the SunFix System and supported PV modules;
- All applicable imposed loads, including maintenance loads; and
- Design wind loads in accordance with SANS 10160 and site-specific exposure conditions.

Any signs of deterioration, corrosion, decay, movement, excessive deflection, cracking, water damage or other structural distress that may compromise load transfer or the integrity of the connection between the SunFix System and the roof structure shall be reported without delay and referred to a suitably qualified Professional Structural Engineer for assessment.

Where roof repairs, alterations, strengthening works or changes in loading have been carried out, or where significant weather or abnormal loading events have occurred, the structural suitability of the roof and supporting structure shall be re-verified by a Professional Structural Engineer.

5. Cleaning and Corrosion Prevention

The System incorporates components manufactured from aluminium (including anodised aluminium), stainless steel, galvanised steel, EPDM sealing materials and other engineered materials selected for structural performance, durability, and long-term resistance to environmental exposure.

While the metallic components provide a high degree of corrosion resistance, the accumulation of dirt, debris, salts, industrial fallout and other contaminants may accelerate corrosion of metal components and contribute to premature degradation of coatings, seals and other materials if not periodically removed.

As part of routine maintenance, all exposed SunFix components shall be kept clean and free from the build-up of contaminants.

Cleaning of SunFix components shall always be undertaken using the least aggressive method capable of achieving the required result. Where contaminants cannot be removed using mild cleaning methods, progressively stronger methods may be used with care, provided that they do not damage protective coatings, anodised surfaces, passivation layers, sealing materials or roof finishes. Particular attention shall be given to locations where moisture and contaminants may accumulate.

Cleaning shall be performed using soft cloths, sponges, or nylon-bristle brushes, except for anodised aluminium and EPDM components, which shall be cleaned using soft cloths or sponges only.

Where a surface grain is present, cleaning shall be performed in the direction of the grain. All the below methods are listed from mildest to most aggressive.

Aluminium Components (Non-Anodised)

The use of abrasive methods shall be limited to situations where other cleaning methods are ineffective and shall not compromise component geometry, fitment or adjacent materials.

Recommended cleaning methods are as follows:

- Plain water.
- Mild soap or pH-neutral detergent.
- Solvents such as kerosene, turpentine and white spirits.
- Non-etching chemical cleaner.
- Wax-based polish.
- Abrasive wax.
- Abrasive cleaner.

Anodised Aluminium Components

Anodised aluminium components rely on an anodic oxide layer for corrosion resistance and surface durability. Cleaning methods shall not compromise, thin or remove the anodised coating. Cleaning shall be performed using soft cloths or sponges only.

Permitted cleaning methods for anodised aluminium are limited to:

- Plain water.
- Mild soap or pH-neutral detergent.
- Non-abrasive, non-etching cleaners specifically suitable for anodised aluminium.

The following shall not be used on anodised aluminium:

- Abrasive cleaners, polishes or waxes.
- Acidic or alkaline cleaning agents.
- Solvents that may attack or dull the anodised surface.

Stainless Steel Components

Recommended cleaning methods are as follows:

- Plain water.
- Mild soap or pH-neutral detergent.
- Stainless-steel-specific cleaners free of chlorides.

Galvanised Steel Components

Care shall be taken at all times to preserve the zinc coating. Abrasive cleaning methods shall not be used.

Recommended cleaning methods are as follows:

- Plain water.
- Mild soap or pH-neutral detergent.
- Light solvent cleaning where required.
- Diluted mild acid solution (e.g. diluted vinegar) only for the removal of white corrosion products, followed immediately by thorough rinsing with clean water.

EPDM Sealing Components

EPDM components shall be cleaned using a soft cloth or sponge only and allowed to air-dry naturally. EPDM shall not be exposed to solvents, oils, fuels or aggressive chemical cleaners.

Permitted cleaning methods are limited to:

- Plain water.
- Mild soap or pH-neutral detergent.

General Cleaning Requirements

Cleaning shall always be carried out in accordance with the manufacturer's instructions and safety recommendations for the cleaning agents used.

After any cleaning process, all surfaces in the work area shall be thoroughly rinsed with clean fresh water.

Prohibited Practices

The following practices are not permitted:

- Use of chloride-based cleaning chemicals.
- Use of high-pressure cleaning equipment directed at seals, roof penetrations or fasteners.
- Any cleaning method that may damage protective coatings, anodised layers, seals, passivation layers or roof sheet finishes.

Environmental Exposure

In Corrosivity Categories C4 and above, more frequent cleaning may be required to remove accumulated chlorides or industrial pollutants that may accelerate corrosion.

Inspection and Remedial Action

Where evidence of corrosion, coating degradation, anodised layer damage, pitting, crevice corrosion or galvanic staining is observed during cleaning, the condition shall be recorded and assessed as part of the maintenance inspection process and appropriate remedial action shall be undertaken without delay.

Routine cleaning of the System forms an integral part of preventative maintenance and contributes significantly to achieving the intended service life of the SunFix Roof Mounted Solar Support System.

6. Corrosion Assessment, Treatment and Monitoring

General

Corrosion on aluminium, stainless steel, or galvanised steel components may present as surface staining, oxidation products, pitting corrosion, or crevice corrosion, depending on the material type and environmental exposure.

For the purposes of this Maintenance Manual, corrosion shall be assessed as one of the following:

- Cosmetic corrosion, involving superficial staining, surface discolouration, or light surface deposits only;
- Early-stage or localised corrosion, including limited pitting or crevice corrosion that does not involve measurable loss of material section or compromise structural or fastening performance; or
- Advanced corrosion, involving significant pitting, crevice corrosion with material loss, coating failure over a significant area or any condition that may impair load-bearing function.

Only advanced corrosion shall necessitate component replacement.

Aluminium Components – Corrosion Assessment and Maintenance

Aluminium components develop a natural, self-forming oxide layer that provides inherent corrosion protection under normal atmospheric exposure. The presence of uniform surface oxidation, light staining, or dulling of the surface finish shall generally be regarded as cosmetic corrosion only and does not, of itself, indicate material degradation or loss of structural performance.

Regular inspection and cleaning of aluminium components remain essential to prevent the accumulation of salts, dirt, industrial pollutants or other contaminants that may retain moisture, promote localised pitting or crevice corrosion, or interfere with the long-term effectiveness of the protective oxide layer, particularly in coastal, industrial or high-corrosivity environments.

Aggressive mechanical or chemical corrosion treatment methods for aluminium are not generally required or recommended, as such methods may damage the protective oxide layer or any anodised surface finish and may accelerate future corrosion. Management of aluminium corrosion is therefore limited to cleaning, inspection, monitoring and replacement where corrosion exceeds cosmetic limits or results in measurable material loss or impairment of structural or fastening performance.

Stainless Steel – Corrosion Treatment

Where stainless steel components exhibit early-stage corrosion or crevice corrosion without material loss or structural impairment, the following treatment shall be undertaken:

- Clean and dry the affected area in accordance with this Manual.
- Where practical, disassemble affected joints to expose crevice areas.
- Remove corrosion (white powdery deposits, brown or orange surface residues or dark staining) using non-abrasive methods only.
- Apply a commercially available stainless steel corrosion treatment or passivation restoration product suitable for atmospheric exposure. Such products typically assist in restoring the passive layer and inhibiting further corrosion.
- Apply the product strictly in accordance with the product manufacturer’s instructions.
- Reassemble the joint using the specified fasteners and installation torque.

Galvanised Steel – Corrosion Treatment

Where galvanised steel components exhibit early-stage corrosion, localised zinc depletion or crevice corrosion without red rust or structural impairment, the following treatment shall be undertaken:

- Clean and dry the affected area in accordance with this Manual.
- Remove loose corrosion products using non-abrasive methods.
- Apply a commercially available zinc-rich corrosion protection or galvanised steel repair coating suitable for atmospheric exposure.
- Apply the product strictly in accordance with the product manufacturer's instructions, including surface preparation and curing requirements.

Limitations and Replacement Criteria

Component replacement shall only be required where corrosion has resulted in:

- Measurable loss of material section;
- Red rust on galvanised steel indicating base steel corrosion;
- Advanced pitting or crevice corrosion affecting load-bearing regions;
- Inability of fasteners or connections to retain specified installation torque; or
- Any condition that may compromise structural performance or safety.

Responsibility and Warranty Alignment

Early-stage pitting or crevice corrosion does not, of itself, constitute a product defect where appropriate materials were supplied and installed, provided such corrosion is identified, managed and monitored in accordance with this Maintenance Manual.

Failure to identify, clean, treat or monitor early-stage corrosion may allow deterioration to progress and may be regarded as a maintenance non-conformance rather than a product defect.

Records and Monitoring

All corrosion assessment, cleaning and treatment activities shall be recorded as part of the maintenance inspection records, including:

- Component location and identification.
- Type and extent of corrosion.
- Treatment product used (where applicable).
- Date of assessment or treatment.

Treated or monitored components shall be reviewed at subsequent inspections to confirm that corrosion has been stabilised.

7. Structural Connections

All connections forming part of the load path of the System, including all bolted, clamped, fastened and interlocking interfaces between components and between the System and the supporting roof structure, shall be regarded as critical structural connections and shall receive particular attention during inspection and maintenance.

Each such connection shall be inspected to verify that:

- No loss of preload, loosening or slip has occurred;

• No visible deformation, cracking, fretting or distress is present in any component forming part of the connection;
• No corrosion or material degradation is present that could compromise load transfer or long-term durability;
• All fasteners, clamps, and connection elements are correctly seated, fully engaged and in their intended installed positions.

The installation torque and/or clamping condition of all accessible bolted and clamped connections shall be verified against the values and requirements specified in the applicable SunFix Installation Manual.

Any fastener or connection element that cannot be tightened to the specified installation torque, that does not retain the specified torque under inspection, that exhibits rotation, slip, pull-out, withdrawal, embedment, or loss of engagement with the supporting structure, or that shows evidence of thread damage, bearing surface damage, or severe corrosion or material degradation that compromises load transfer or clamping force, shall be removed and replaced in order to ensure that the System remains structurally safe and that no part of the intended load paths are compromised.

8. Stitching Screws

Where SunFix components are fixed to metal roof sheeting using stitching screws, the stitching screws shall be inspected as part of routine maintenance to confirm that they are secure, free from corrosion, correctly seated, and that any protective coatings and seals remain intact.

As part of routine maintenance, stitching screws shall be kept clean and free from the build-up of dirt, debris, salts, or other contaminants that may accelerate corrosion, particularly in coastal, industrial, or high-humidity environments. Cleaning shall be carried out using a nylon bristle brush and either clean water or a mild soap or detergent, and shall not involve abrasive tools, harsh chemicals or cleaning methods that may damage protective coatings or roof sheeting finishes.

Inspections shall verify that stitching screws are not loose, backing out, or able to rotate freely, and that there is no visible deformation, elongation, cracking or damage to the roof sheeting at the fixing point. Any signs of water ingress, corrosion staining or deterioration of seals shall be addressed promptly.

Corroded, damaged or loose stitching screws shall be replaced to maintain the structural integrity and weathertightness of the roof covering.

Where removal of a stitching screw results in a compromised or enlarged fixing hole, the replacement stitching screw shall be selected and installed to restore adequate thread engagement and pull-out resistance. This may be achieved by installing a stitching screw of a larger diameter, suitable for the roof sheeting thickness, profile, and material.

Where upsizing of the stitching screw is not feasible, the original fixing hole shall be permanently sealed using an approved roofing sealant or compatible fastener, and a new stitching screw installed adjacent to the original location, subject to minimum edge distances and the roof sheet manufacturer’s installation requirements.

Replacement stitching screws shall be corrosion-resistant and compatible with the roof sheeting material and exposure conditions to prevent premature corrosion or galvanic action, in accordance with applicable corrosion protection requirement standards.

Re-use of stripped fixing holes, installation practices that reduce pull-out resistance or methods that compromise the structural performance or weathertightness of the roof covering are not permitted.

Any remedial work to roof fixings shall not reduce the original performance of the roof covering as required by the applicable standards and the roof sheet manufacturer's specifications.

9. Service Life

The System is designed for a service life comparable to that of the supported solar panels, typically 25 to 30 years, subject to:

- Compliance with the applicable SunFix Installation Manual and Engineers Aid;
- Ongoing inspection and maintenance in accordance with this Maintenance Manual;
- Environmental exposure not exceeding the corrosion classification for which the components were specified.

Failure to maintain the System in accordance with this Maintenance Manual may result in a reduced service life and loss of structural reliability.

10. Maintenance Records

The Customer shall maintain written records of all inspections, maintenance activities, cleaning operations and corrosion treatments carried out on the System.

Records shall include:

- Date of inspection or maintenance.
- Name of the responsible person or contractor.
- Observations and findings.
- Corrective actions undertaken.
- Components repaired or replaced.

These records shall be retained for the duration of the System service life and may be requested by SunFix in the event of warranty assessment or technical investigation.

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SunFix products are available throughout South Africa, and our team is here to assist with your solar support queries and answer any additional questions about our range of engineered mounting solutions. By partnering with SunFix, you are assured of the highest standards in both products and services.

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Head Office: Unit 10, 1 Randworth Close, Red Hill, Durban