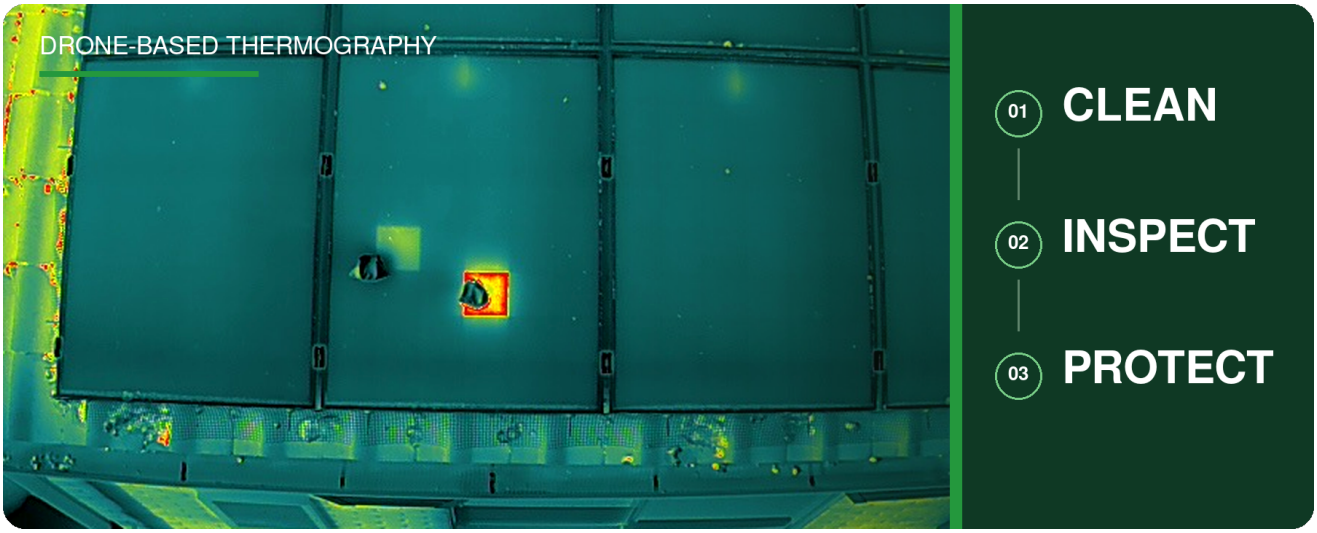
How Often Should I Clean My Solar Panels?

A practical guide to protecting performance, safety and warranty position.



Thermal imaging can reveal localised heating that ordinary photographs may miss.

THE SHORT ANSWER

Inspect your panels at least annually.

For commercial systems, use a planned annual clean as the baseline, then shorten the interval where soiling builds quickly, panels are shallow-pitched or bird activity is high.

INSPECT • CLEAN • VERIFY

How Often Should You Clean?

For commercial & industrial buildings, the Microgeneration Certification Scheme (MCS), the UK's recognised solar PV quality standards organisation, recommends cleaning your panels at least annually. Start with this baseline and then shorten or extend the programme using the actual rate of soiling, generation data and the requirements of the manufacturer and insurer.

LOWER SOILING EXPOSURE	STANDARD BASELINE	HIGHER SOILING EXPOSURE
Steeper pitch, little bird activity and low airborne dirt. Annual condition check; clean when deposits persist.	Most commercial and managed arrays. Planned annual clean with periodic visual checks.	Shallow pitch, birds, lichen, trees, agriculture, roads or industrial dust. Consider six-monthly or more frequent cleaning.

Clean sooner when you see:

- **Bird droppings** — particularly repeated deposits affecting the same cells
- **Lichen, moss or algae** — rain alone is unlikely to remove established growth
- **A residue band** — especially at the lower edge of shallow-pitched modules
- **Uneven soiling** — patches are more likely to create localised electrical mismatch
- **A sustained output reduction** — after allowing for weather and seasonal variation
- **A thermal anomaly** — investigate the cause; cleaning may not be the complete remedy

> **GOOD PRACTICE**
>
> Use an initial inspection and clean to establish the site's true rate of re-soiling. The next interval can then be based on evidence.

Why Cleaning Matters

Rain can remove loose dust from well-pitched panels, but it does not reliably remove bird droppings, lichen, algae or residue that has become bonded to the glass. Contamination is often uneven, so a small dirty area can affect individual cells even when most of a panel still looks clean.

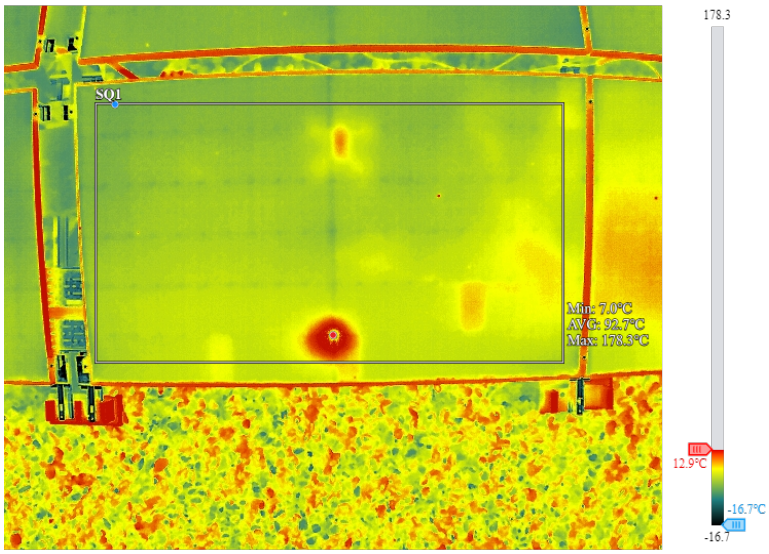
1. Hotspots and fire risk

Localised contamination can partially shade a cell while the remainder of the module continues to generate. This electrical mismatch can create a hotspot. RC62, the joint fire-safety code published by the Fire Protection Association and developed with MCS, warns that ingrained dirt and bird droppings contribute to overheating, module damage and **faults that can lead to fire**.

*"5.11.9 - A major issue for PV modules is bird droppings, which will adhere to the modules irrespective of angle. Bird droppings, more so than dust deposits, cause partial shading on individual PV cells, leading to **hot spots**; such hot spots have been known to **develop into faults leading to fire**. Insurers expect a regular cleaning programme for all commercial PV installations, carefully planned to suit the needs of each individual array."*

> **HIGHER-RISK CONTAMINATION -** Bird droppings deserve prompt attention because they can adhere at any panel angle and create concentrated partial shading.

[See "UK solar panel fire case studies" from page 7 onwards.]



Example 1 Thermal image of solar panel — localised overheating caused by panel damage presenting an immediate fire risk. Maximum measured temp of 178.3°C. Image taken using a thermal imaging drone.

2. Performance

Soiling reduces the light reaching the cells and can lower output. The loss depends on the type, location and distribution of the contamination, so generation data should be considered alongside visual evidence to evaluate revenue loss.

3. Product warranty and maintenance obligations

Manufacturer requirements vary, but maintenance instructions should be treated as part of the warranty record. Most solar PV manufacturer warranties **exclude modules affected by non-observance of its maintenance instructions**. Their installation manuals also require **regular inspection and maintenance**, advising that module surfaces should remain unobstructed.

Keep dated inspection reports, photographs, cleaning records and evidence of any remedial action. These records help demonstrate reasonable maintenance if a performance, insurance or warranty issue arises.

4. Insurance Compliance

A documented inspection and cleaning programme forms an important part of demonstrating that a commercial solar PV installation is being appropriately maintained and that **foreseeable fire and property risks are being managed**. RC62, the joint fire-safety guidance developed with input from MCS, the Fire Protection Association and the insurance industry, states:

“Insurers expect a regular cleaning programme for all commercial PV installations.”

To support insurance compliance, building owners should retain **clear evidence of maintenance**, including inspection reports, dated aerial and **thermal imagery, cleaning records**, contractor details, defects identified and remedial actions completed. Any significant hotspots or damaged components should be investigated promptly, with evidence of repair and subsequent verification retained.

Failure to adequately maintain your system could leave you without insurance cover when it’s needed most.

Zurich’s Real Estate Insurance Policy states:

*“The Insurers will **not be liable** for accidental loss or destruction of or damage caused by the Insured **knowingly omitting to inspect, maintain or perform necessary repairs** to the solar panels and/or photovoltaic panels.”*

The Importance of Drone-Based Thermographic Inspections

Cleaning does not reveal electrical faults

Cleaning removes dirt, dust, lichen and other surface contamination, but it cannot confirm that the underlying electrical system is operating correctly. A solar panel may look satisfactory in a standard photograph while still containing overheated cells, failed bypass diodes, defective connections or other hidden faults.

Drone-based thermography measures temperature differences across the array, allowing abnormal heat patterns to be identified, recorded and accurately mapped.

Safe and efficient inspection

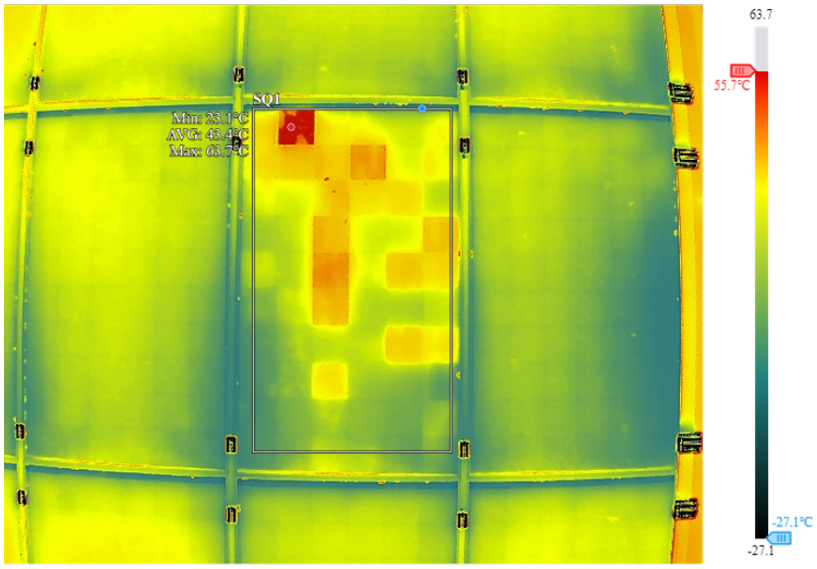
Using a drone enables large or difficult-to-access arrays to be inspected safely and efficiently, without requiring personnel to walk across the roof. It also provides consistent coverage of every accessible module and creates a permanent visual and thermal record for comparison with future inspections.

The value of a post-clean survey

Thermographic inspection is particularly valuable after cleaning. Once surface contamination has been removed, a post-clean survey can help distinguish between heat patterns caused by soiling and anomalies that remain due to module damage or an electrical fault.

The findings can then be used to:

- Prioritise repairs and further electrical investigation.
- Identify and monitor developing hotspots.
- Confirm the condition of the array following cleaning.
- Create a baseline for future inspections.
- Demonstrate that the system has been inspected while operating.



1 Thermal image of solar panel — irregular cell-level heating across a module caused by dirt & debris. Maximum measured temp of 63.7°C. Image taken using a thermal imaging drone.

RECOMMENDED INTERVALS

A Practical Cleaning Schedule

Use the following as a starting point, then adjust it using site evidence, performance data and the requirements of the manufacturer, insurer and maintenance contractor.

Installation	Condition check	Cleaning starting point	Bring cleaning forward when...
Commercial & industrial	Monthly visual review; professional review at least annually	Planned annual clean	Shallow pitch, birds, nearby industry, agriculture, trees, roads, dust, lichen or rapid output loss
Public buildings	Six-monthly visual review; professional review annually	Assess annually and clean when condition requires	Sensitive occupancy, difficult access, rapid soiling or insurer/site requirements
Domestic — shallow pitch or known soiling	At least annual visual review	Schedule periodically; annual is a sensible first interval until the soiling rate is known	Bird fouling, visible residue, moss/lichen, nearby trees or persistent output reduction
Domestic — steep pitch / low soiling	Annual visual review	Condition-led; rain may reduce the frequency	Deposits remain after rainfall, fouling is uneven, or performance data indicates a concern

Practical guidance prepared by DoubleSix Drones. "Condition check" intervals reflect the advisory MCS schedule for the relevant building category; the cleaning intervals are risk-based starting points, not a substitute for site assessment. ***See Appendix F***

What should influence the interval?

Panel pitch — steeper modules benefit more from rainfall; shallow modules retain residue.

Environment — roads, railways, agriculture, industry and construction can increase deposits.

Bird activity — droppings are persistent and may cause concentrated partial shading.

Biological growth — lichen, moss and algae usually require deliberate removal.

Access and occupancy — commercial, public and sensitive sites may require more structured planning.

Insurer and manufacturer — their requirements take priority over a generic schedule.

> **WHO ARE THE MCS –** The MCS is the UK's recognised quality standards organisation for small-scale renewable energy systems. It develops technical standards and certifies renewable energy products and installers, including those working with solar PV.

INDUSTRY GUIDANCE

MCS Appendix F — Maintenance Schedule

The MCS Solar PV Standard includes cleaning within intermediate and full contractor maintenance, particularly for shallow-pitched arrays and dusty environments. The complete advisory schedule is provided below.

APPENDIX F – MAINTENANCE SCHEDULE

	Customer	MCS Contractor	
		Intermediate	Full
Visual check of modules from ground level (check for slipped modules, damage, soiling etc)	✓	✓	✓
Visual check of inverter where safe access (check for indication of fault or damage)	✓	✓	✓
Recorded generation is increasing	✓	✓	✓
Visual check for signs of structural distress (Particularly after heavy winter snow)	✓	✓	✓
Reduce shading from vegetation growth where possible	✓	✓	✓
AC & DC isolators (Functional check, damage and ingress)		✓	✓
DC junction boxes where present (Damage and ingress)		✓	✓
Integrity of fuses and surge protectors where present		✓	✓
Generation in line with prediction		✓	✓
Inverter(s) mounted securely		✓	✓
Inverter(s) ventilated (Unobstructed airflow, fans operating etc)		✓	✓
Externally mounted inverters free of signs of water ingress		✓	✓
Inverter fault log(s)		✓	✓
AC voltage at inverter(s) and assess risk of overvoltage		✓	✓
DC connectors (Secure, free of damage, supported away from pooling water)		✓	✓
Clean modules (Particularly where shallow pitch and dusty environment)		✓	✓
Test DC circuits (Vsc, Isc, Earth leakage)		✓	✓
Cables adequately supported and free of damage		✓	✓
All labelling & signage present and correct (Including system schematic)		✓	✓
Emergency shutdown procedure visible		✓	✓
Module clamps secure (Check torque of random sample)			✓
Mounting rails secure and free of distortion (Including fixing brackets)			✓
String series resistance test			✓
String insulation resistance test (Riso)			✓
Potential Induced Degredation test			✓
Thermographic survey for faulty components and module cells			✓

Frequency:			
Domestic Privately Owned	1yr	10yr	15yr
Domestic Rented (Private or Social landlord)	-	5yr	10yr
Public Building (e.g. school, hospital)	6-monthly	1yr	5yr
Commercial and Industrial	monthly	1yr	2yr

Figure 4 — Appendix F maintenance schedule. Source: MCS MIS 3002, Issue 5.0, Appendix F, page 35.

FROM INSPECTION TO EVIDENCE

How DoubleSix Drones Can Help

DoubleSix Drones can provide a complete inspection, cleaning and preventative maintenance programme for commercial solar PV installations. Our services are designed to protect energy generation, identify developing faults and provide clear evidence that the system is being appropriately maintained.

Our services include:

- **Professional solar panel cleaning** – Removal of dirt, bird droppings, dust, lichen, moss, algae and other contamination using appropriate equipment and cleaning methods. The frequency can be tailored to the panel pitch, surrounding environment and observed rate of soiling.
- **Annual preventative maintenance** – Planned electrical and mechanical checks covering inverters, AC and DC isolators, connectors, junction boxes, cables, protective devices, mounting components, ventilation, labelling and system fault logs. Electrical testing can also be undertaken where required to identify insulation, resistance or performance issues.
- **Thermographic drone surveys** – Radiometric thermal inspection of the complete array to identify hotspots, defective cells, bypass-diode faults, disconnected or underperforming modules and other temperature anomalies that may not be visible during a conventional inspection.
- **Post-clean verification** – Visual and thermal inspection following cleaning to confirm that contamination has been removed and identify any remaining anomalies that may be caused by an electrical or module fault.
- **High-resolution aerial inspection** – Detailed RGB imagery of the panels, mounting system and surrounding roof areas, helping to identify damaged modules, displaced components, debris, shading and other visible concerns.
- **Fault mapping and reporting** – Clearly mapped findings showing the exact location of each affected module, supported by visual and thermal imagery, temperature measurements, severity classifications and recommended actions.
- **Maintenance records and ongoing monitoring** – A documented record of inspections, cleaning and remedial works that can support asset management, warranty claims and discussions with insurers. Repeat surveys also allow developing faults and recurring contamination to be monitored over time.

These services can be delivered individually or combined into a tailored annual maintenance package, giving clients a single, coordinated programme for cleaning, inspection, electrical maintenance and thermographic condition monitoring.

Sources and scope

1. MCS MIS 3002 Issue 5.0 — section 7 and Appendix F
2. RC62 Version 2 — sections 5.11.8–5.11.10

This guide provides general information, not a site-specific maintenance instruction, warranty determination, fire-risk assessment or insurance opinion. Always follow the current manufacturer's manual and the requirements of your installer, maintenance contractor and insurer.

UK Solar Panel Fire Case Studies

Solar PV fires remain uncommon, but the consequences can be significant. Particularly where faults occur on large commercial roofs or near combustible roof materials. Freedom of Information data collected from 37 UK fire services recorded 107 fires involving solar panels in 2022, rising to 171 in 2024. QBE Insurance

Sidegate Primary School, Ipswich — June 2026

On 24 June 2026, a fire broke out in the roof of the Early Years building at Sidegate Primary School in Ipswich. The entire school was evacuated after staff reported smelling smoke.

Initial discussions between Suffolk County Council and Suffolk Fire and Rescue Service indicated that the fire may have been associated with solar panels installed on the building in 2012. With the fire service later saying: "A fire investigation is no longer required, as it has been confirmed beyond reasonable doubt that the cause was a solar panel on the roof."

The incident was particularly significant because two other Suffolk schools with solar panels, Brooklands Primary School and East Bergholt Primary School, had experienced similar fires. Although there was no firm evidence that the three incidents shared the same cause, Suffolk County Council temporarily switched off solar installations at approximately 80 schools as a precaution. The affected systems had been installed through a council programme between 2011 and 2016.

This case demonstrates the importance of managing solar installations as long-term electrical assets. Systems installed more than a decade ago should be subject to regular electrical testing, visual inspection and thermographic surveying. Across a large property portfolio, drone thermography can provide consistent coverage and identify abnormal heating, damaged modules and underperforming areas that may require closer electrical investigation.

Sources: **Suffolk County Council's precautionary action statement**, **official fire incident record**

IKEA Wembley — October 2025

Approximately 100 solar panels were alight on the roof of IKEA's Wembley store. Around 250 people were evacuated while 30 firefighters tackled the fire using five fire engines and a 32-metre turntable ladder.

The fire was extinguished without injury, although part of the roof was damaged. London Fire Brigade subsequently stated that the fire was believed to have been caused by "resistive heating", although the precise component responsible was not publicly identified.

Excessive electrical resistance in a connector, termination or damaged component produces heat. Depending on its location and visibility, abnormal heating may be detectable through infrared inspection before burning occurs. This makes thermography particularly valuable when combined with electrical testing of strings, connectors, isolators and inverters.

Sources: London Fire Brigade, photographs and incident coverage

Lidl distribution centre, Peterborough — February 2024

More than 50 firefighters attended a fire involving solar panels on the roof of Lidl's large distribution centre in Peterborough. The response required breathing apparatus, hose reels, a turntable ladder and a water carrier.

Firefighters successfully contained the damage to the roof and saved the main building, enabling operations to resume on the same day.

The incident illustrates the scale of the emergency response that can be required when a fault develops within a large commercial array. Regular drone surveys allow thousands of modules to be inspected efficiently, while accurate panel and string mapping can help maintenance teams isolate and investigate suspect areas before a fault escalates.

Sources: Cambridgeshire Fire and Rescue Service incident report, Fire Authority annual report

We The Curious, Bristol — April 2022

A fire started within the rooftop solar installation at the We The Curious science centre in Bristol. Subsequent investigations indicated that birds had probably damaged part of the photovoltaic system, creating an electrical fault that allowed fire to spread to the roof.

Everyone inside was safely evacuated, but the building sustained significant fire and water damage affecting the roof, second floor and building services. The attraction remained closed for more than two years, eventually reopening in July 2024.

This incident demonstrates how bird activity and damage beneath panels can develop into a serious electrical fault. Regular visual inspections, bird-control measures and cleaning can identify nesting materials and physical damage. Thermographic surveys can supplement these checks by identifying modules or circuits displaying abnormal heating while the system is operating.

Sources: ITV News—cause and damage, We The Curious—closure and reopening

What these incidents demonstrate

No single inspection method can eliminate every risk. Effective solar PV maintenance should combine:

- Regular cleaning to remove dirt, lichen, vegetation, nesting material and other sources of shading or contamination.
- Drone-based RGB and thermographic surveys to locate damaged modules, hotspots, bypass-diode faults and abnormal temperature patterns.
- Preventative electrical maintenance covering inverters, isolators, cabling, connectors, earthing and string performance.
- Inspection following storms, high winds, building work or other events that could damage modules and cables.
- Proper isolation, documentation and removal of redundant or disused equipment.