# SOLAR GLASS — TECHNICAL FAQ

**Aqueous $SiO_2$ Anti-Soiling & Surface-Durability Platform**

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**1. What is the Solar Glass platform?**

The Solar Glass platform is an **aqueous, inorganic silicon dioxide ($SiO_2$) surface-engineering system** designed specifically for **photovoltaic (PV) cover glass and solar module glass**.

It modifies the glass surface to:

- Reduce soiling and contamination
- Improve cleanability
- Maintain optical performance
- Withstand long-term outdoor exposure

This is a **surface treatment**, not a film and not a polymer coating.

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**2. Why is solar glass treated differently than automotive or phone glass?**

Solar glass operates in a **fundamentally different environment**:

- Continuous outdoor exposure
- No mechanical abrasion from wipers or touch
- Large surface areas
- Extreme UV, heat, and humidity cycling
- Frequent dust, sand, and mineral deposition

As a result, the solar platform prioritizes:

- Environmental durability
- Optical neutrality
- Factory scalability
- Long-term stability over extreme abrasion resistance

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**3. Is this a solvent-based or aqueous system?**

The Solar Glass platform is **fully aqueous (water-based)**.

This is intentional to support:

- High-throughput factory processing
- Low VOC requirements
- Safer handling and cleanup
- Regulatory and environmental compliance
- Large-area glass coating lines

The same **inorganic $SiO_2$ network principles** are used as in solvent systems but delivered through water-based chemistry.

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**4. What is the functional goal of the coating on solar glass?**

The coating is designed to:

- Reduce adhesion of dust, sand, and airborne contaminants
- Promote water runoff during rain or cleaning
- Minimize mineral spotting
- Maintain usable light transmission over time

The goal is **functional anti-soiling**, not cosmetic water beading.

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**5. Is the coating hydrophobic?**

Yes — **controlled hydrophobicity** is a core function.

However, the platform avoids:

- Extreme short-lived beading
- Soft organic surface layers
- Fluorinated chemistry

Instead, hydrophobic behavior is achieved through **inorganic surface-energy modification**, designed to remain stable over long service intervals.

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**6. How does the Solar Glass coating reduce soiling?**

Soiling reduction occurs through a combination of:

- Modified surface energy that lowers particle adhesion
- Improved runoff of water and cleaning fluids
- Reduced binding of mineral residues
- A harder inorganic surface that tolerates cleaning cycles

This improves cleaning efficiency and helps panels stay cleaner between maintenance events.

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**7. Is this coating a film or a permanent treatment?**

It is a **chemically bonded surface treatment**, not a film.

The coating:

- Forms a sub-micron inorganic $SiO_2$ layer
- Chemically bonds to the glass surface
- Does not peel, flake, or delaminate
- Does not create a visible coating thickness

Performance comes from **surface chemistry**, not layer thickness.

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**8. Does the coating affect optical clarity or transmission?**

No.

The Solar Glass platform is engineered to be **optically neutral**:

- No haze
- No color shift
- No reduction in transparency

By reducing surface contamination over time, it helps **preserve effective light transmission** rather than degrade it.

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**9. How durable is the coating in outdoor environments?**

The coating is designed for continuous exposure to:

- UV radiation
- Heat and thermal cycling
- Rain and humidity
- Wind-borne dust and sand
- Routine cleaning processes

Because it is **inorganic and chemically bonded**, it remains stable where soft organic coatings fail.

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**10. How is the coating applied?**

The Solar Glass system is intended for **factory or controlled industrial application**, including:

- Flat-glass coating lines
- Solar glass manufacturing
- Module assembly operations

It is **not positioned as a consumer or field-applied wipe-on product**.

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**11. Does the coating require high-temperature curing?**

No high-temperature curing is required.

Depending on the production line:

- Ambient drying may be sufficient
- Mild thermal assistance may be used
- No specialty curing equipment is required

The system is designed to integrate into **existing solar glass manufacturing workflows**.

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**12. Is the Solar Glass platform PFAS-free?**

Yes.

The platform:

- Is **PFAS-free**
- Uses no fluorinated silanes or surfactants
- Achieves hydrophobic and durability performance through **inorganic $SiO_2$ structure**, not fluorine

This supports long-term regulatory viability.

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**13. How does this differ from traditional solar anti-soiling coatings?**

Many traditional solar coatings are:

- Organic or hybrid films
- Soft and abrasion-sensitive
- Designed for limited service life
- Prone to rapid performance loss

This platform is:

- Fully inorganic
- Chemically bonded to glass
- More resistant to cleaning-induced wear
- Designed for long-term outdoor exposure

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**14. How does the Solar Glass platform differ from other $SiO_2$ platforms?**

- **Solar Glass** → Aqueous, factory-applied, anti-soiling system
- **Automotive Glass** → Solvent-based, high-abrasion, wiper-resistant systems
- **Consumer Electronics** → Solvent-based, wipe-on durability systems

All share the same **$SiO_2$ surface-engineering philosophy** but are tuned for their environment.

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**15. Designed failure mode**

The designed failure mode is:

**Gradual surface wear overtime, not peeling, flaking, or delamination.**

This allows predictable performance decline and maintenance planning.

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**16. Key takeaway**

The Solar Glass platform is an aqueous, inorganic $SiO_2$ surface-engineering system designed to reduce soiling and maintain optical performance under harsh outdoor conditions, without relying on films, polymers, or PFAS chemistry.

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✅ **STATUS**

- ✅ **Solar Glass Platform FAQ — COMPLETE**
- ✅ Safe to delete older solar-specific FAQ drafts
- ✅ This becomes the **single source of truth**