

Dust Repellent Treatment for PV and Solar Thermal Installations

RepelSmartsolar

An invisible dirt repellent treatment that can maximise efficiency, reduce cleaning and lower costs

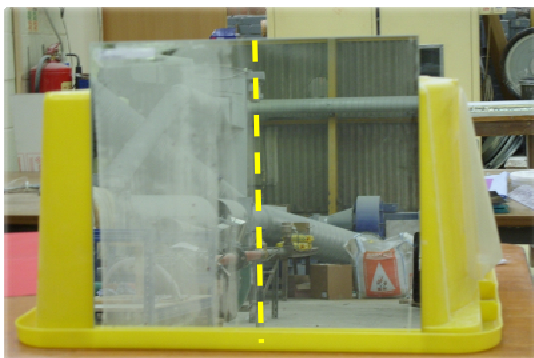
Chamelic Limited is a chemistry technology company based in Leeds in the UK. Chamelic was established in 2006 and was spun out of the research of Prof. Simon Biggs at the University of Leeds.

We have developed an **easy to apply** surface treatment that **prevents the build up of dirt and dust** on a wide range of surfaces.

Advantages of **RepelSmart**solar

- Easy to apply to large surfaces
- Spray-on product
- Dries in ambient conditions
- Can be applied on-site
- Can be applied to most surfaces

The treatment repels dirt and dust



*Mirror after exposure to dust
Right side is treated and is dust-free*

- The treatment does not absorb visible light
- The treatment does not reduce the reflectivity of a mirror
- The treatment is invisible and does not change the optical properties of glass or plastic



*Glass after exposure to dust
Right side is treated and is dust free*



Chamelic's surface treatment can be easily sprayed onto surfaces

Benefits for **Solar Thermal and PV Energy**

- Chamelic's surface treatment **repels dust**
- Can help **maintain** the solar conversion **efficiency**
- Can **reduce** the amount of **cleaning** required
- **Invisible**—does not change the optical properties of the surface

FAQ Sheet

Frequently Asked Questions

What is the coverage/usage rate?

1 litre will treat up to 10 square metres of surface.

What is the durability of the treatment?

The durability will depend on the weather conditions of the location where the PV units are installed.

We conducted tests at Particle Technology Limited to simulate hot dry desert conditions. Treated glass substrates and mirrors were exposed for 1 hour in sand storm conditions and repelled dust for the duration. This was an accelerated test.

For a different application we have conducted tests which suggest that the surface treatment can be effective for 1 year (depending on environmental conditions).

Is it a coating or a treatment?

The active ingredient forms a very thin layer on the surface (less than 50 nm thick). It is much thinner than traditional coatings such as paints and clear coats. This is why we call it a treatment. This thinness gives us an advantage — because it is so thin, the optical properties of the underlying surface are not changed. This does mean that the life-time is shorter than a traditional coating, however it is so simple and cost effective to use that it can be easily incorporated into routine maintenance procedures.

What is the lifetime of the treatment?

Our current products are not permanent treatments. This is something that we are working on for our future products. We anticipate that our current treatment can be incorporated into existing maintenance procedures and can be applied to PV panels or solar thermal mirrors on-site. The treatment is very easy to apply and can be simply sprayed onto the surface. We hope that, as a minimum, it will reduce the need for cleaning by half.

How much does it cost?

We are currently producing our products on a relatively small scale, however we are working very closely with a large European chemical manufacturer.

There will be a significant cost benefit from the use of **RepelSmart solar**

Is it resistant to water?

The surfaces are rendered hydrophilic so water spreads on the surface rather than forming beads. The hydrophilic nature of the surface means that any dirt or dust is rinsed away easily and prevents the formation of drying marks on the surface.

Is it resistant to sand storms?

We have conducted tests at Particle Technology to simulate these conditions—the treatment is effective.

What is your current product?

Our currently available product is an alcohol based formulation. We can supply this product now. We understand the need for developing a water based version of this product and we are working towards this.