



**ShineOn**

**Daylight + Rain + ShineOn =  
self-cleaning windows for 25 years**



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# ShineOn

## Summary

- ShineOn can be applied on all glass windows
- It gives self-cleaning windows for up to 25 years
- It is the only high performing after treatment product for window glass
- It saves significant costs for the building owner
- It is a green product which uses only nature's own resources to clean the windows
- ShineOn is patent protected
- ShineOn is guaranteed for at least 10 years



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As it appears



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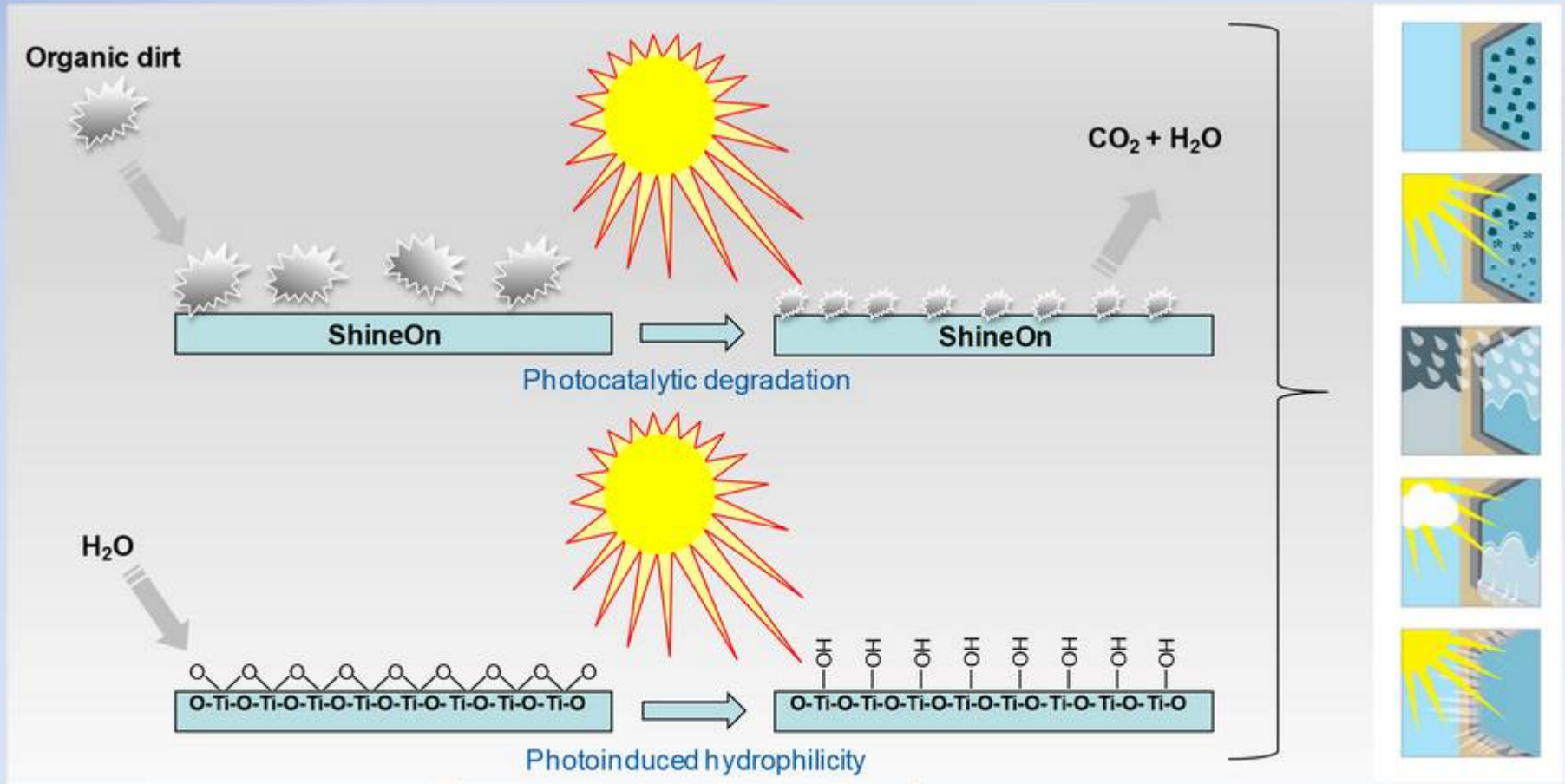


## Another big market: Solar Pannels

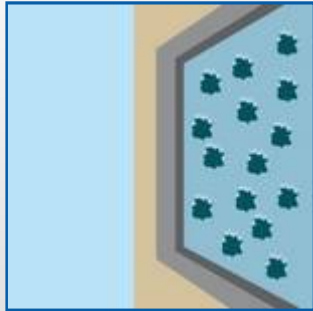


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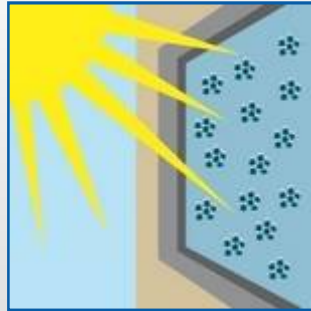
# Photocatalysis – Dual Mechanism



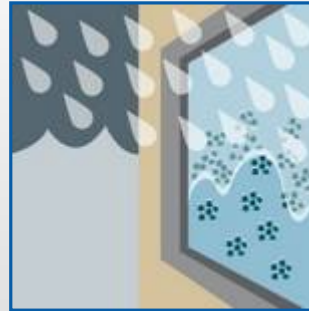
## Self-cleaning windows with daylight, rain and ShineOn



Dirt and particle  
stick to the  
window surface



With ShineOn  
applied, daylight  
activates a photo-  
catalytic process  
that breaks down  
dirt and particles



Raindrops are  
transformed into  
a thin film of  
water all over  
the window  
surface



As the rain slides  
down the window  
surface, dirt and  
particles are  
removed



This results in  
clean and clear  
windows for  
years



# ShineOn

## The ShineOn Product

- ShineOn comprises two fluids – the first rinses and prepares the window surface for application and the second (two-component fluid) is mixed before being sprayed on the window ensures the self cleaning effect on the window
- ShineOn is delivered in bottles or small containers which makes it easy to work with
  - Due to the low weight of the bottle no arm fatigue for the ShineOn applicator
  - Easy to transport and easy to dose
  - Special equipment necessary to pre-treat and apply the fluid on the window pane
- ShineOn delivers special pre-treatment polishing equipment and advices on the active fluid application.



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## Application Process

- Cleaning the glass with osmosis water



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## Application Process

- Application of the pre-treatment with our special brush





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## Application Process

- Application of the final coat with a Wireless Electrostatic gun



The whole process must be done in a methodical and precise way.



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## Application Data – Marriott Copenhagen

### Ground Level

Peak Time: 21.5 m<sup>2</sup>/man/hr (2 man team for 1 hours)

Average Time: 10-15 m<sup>2</sup>/man/hr (2 man teams)

### 3 Sectioned Scaffold

Peak Time: 10 m<sup>2</sup>/man/hr (2 man team 1 hour)

Average Time: 8-9 m<sup>2</sup>/man/hr (2 man teams)

### Average Consumption

Pre-Treatment ~ 20-30 ml/m<sup>2</sup>

Active Fluid ~ 8-10 ml/m<sup>2</sup>





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## Application Data – Rødovre Centrum

### ShineOn – Before Installation Application

Average Time: 6 windows/man/hr (2 man team)

Average Volume: 10-20 m<sup>2</sup>/man/hr (2 man team)

Completed Sept. 4, 2014 – 250 windows





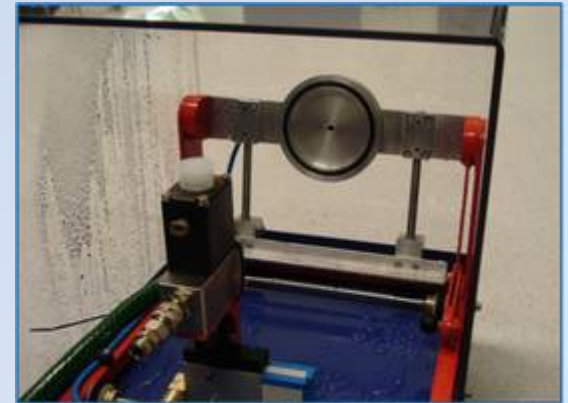


# ShineOn

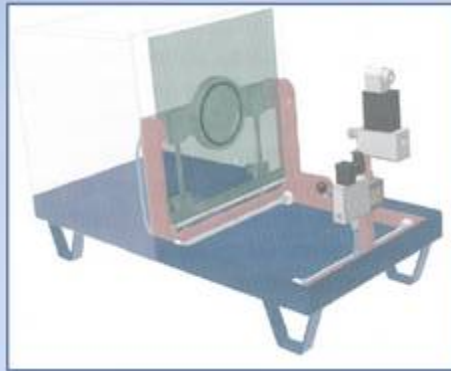
## Endorsement and Validation by Danish Technological Institute

- ShineOn™ independently certified self-cleaning by Danish Technological Institute (government endorsed, non profit organisation)
- A thorough and valid test based on 192 samples

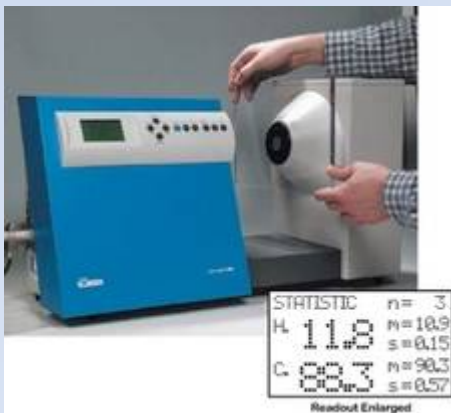
**ShineOn™ is the first self-cleaning after treatment window product which has been certified**



## Self-Cleaning Test Procedure (NMP3-CT-2003-505-952)



Test Rack



Haze measurement  
(Haze Gard)

### Test Procedure

- 1) Prepare glass sample(s) 150 x 150 mm
- 2) Rinse the glass with dem. Water.
- 3) UVA irradiate the samples for 12 hours according to ISO 4892 -3 and ISO 4892 -1:2000.
- 4) Haze measurement ( $H_{\text{original}}$ ) according to ASTM D 1003.
- 5) Place the glass sample in the test rack (seen on the left).
- 6) Spray the dirt mixture on the glass (definition of dirt mixture and the spray conditions are listed in the EU report).
- 7) Dry the glass sample vertically at room temperature and for 1 hour at 50 °C.
- 8) Haze measurement ( $H_{\text{cycle x dirt}}$ ).
- 9) UVA irradiate the sample for 12 hours.
- 10) Haze measurement ( $H_{\text{cycle x SUN}}$ ).
- 11) Insert the glass sample in the test rack and spray the dem. water (the spray conditions is listed in the EU report).
- 12) Vertically drying of the sample.
- 13) Haze measurement ( $H_{\text{cycle x RAIN}}$ ).
- 14) Repeat step 3 -13.



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The test is designed to be able to confirm the self cleaning ability of the product under test. The cleaning ability of the coating is defined by the equation

$$\% \text{ Cleaning Effect} = 100 \times \frac{H_{\text{cycle2dirt}} - H_{\text{final}}}{H_{\text{cycle2dirt}} - H_{\text{original}}}$$

The % Cleaning effect value is the average of the 5 % Cleaning effect calculus corresponding to the 5 samples

For the coating to be "Self Cleaning" and significantly reduce the amount of maintenance required this figure should be >85%.

### Dual action coatings evaluation

Generally such coatings will utilise both the sun and the rain in the cleaning effect and as such are often referred to as "Dual Action" coatings exhibiting both a change in the contact angle as well as demonstrating some photodecomposition of organic dirt.

This dual action effect can be confirmed if:

$$H_{\text{cycle1sun}} < H_{\text{cycle1dirt}} \text{ and } H_{\text{cycle2sun}} < H_{\text{cycle2dirt}}$$

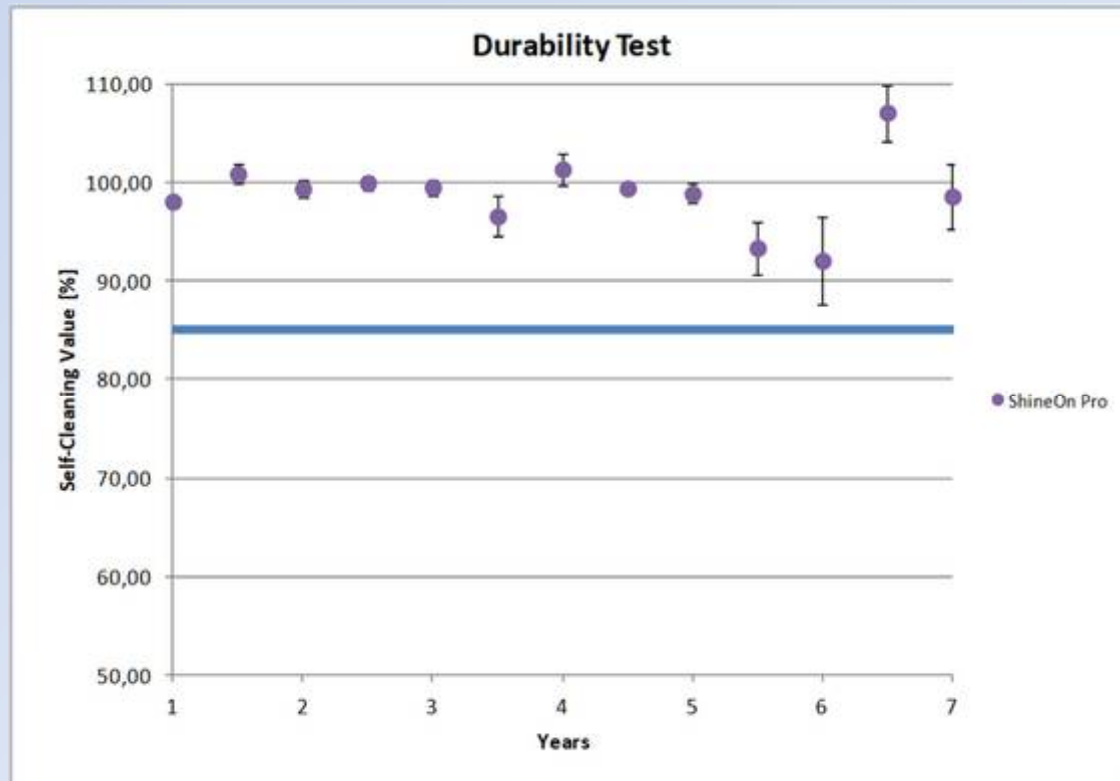


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## Estimated Durability for ShineOn > 10 years



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Conclusion: It works!



- ShineOn is proven self-cleaning in accordance with EU project NMP3-CT-2003-505952
- Laboratory tests show that ShineOn chemically bonds with the entire surface of the glass and has long lasting cohesive properties
- Other products only deposit in the recesses of the glass surface, like a filler, and not the full surface
- ShineOn's properties give the product its unique features
- Environment benefits from a reduced chemical usage and water consumption



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## Mariott Copenhagen



## Private House



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