



**StoLotusan**  
Facade coatings  
with Lotus-Effect<sup>®</sup> Technology

# StoLotusan

## Bionics: Technology inspired by nature

**Bionics is a relatively new scientific discipline that researches biological and technological compatibility and also examines the principles of natural compositions. This know-how is then subsequently transferred to technological applications.**

### **Why use the lotus leaf as a model?**

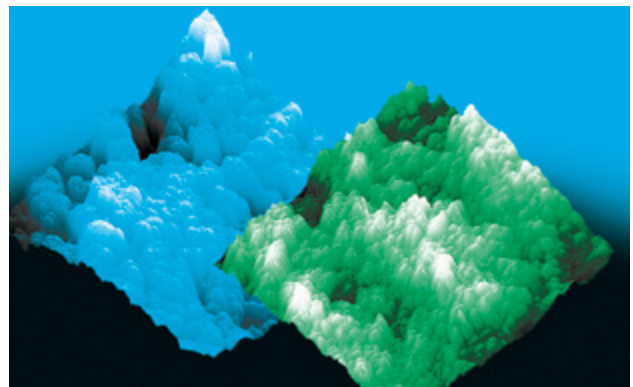
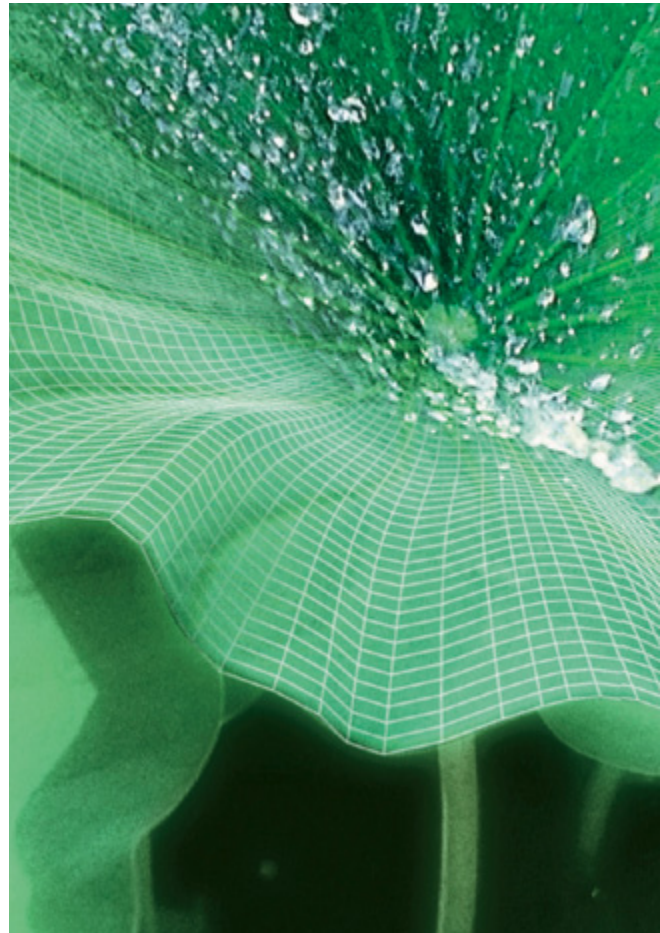
The permanently clean lotus leaf has always fascinated researchers and engineers. After a rain shower the leaves of a lotus plant always look dry and freshly cleaned. The process involved is naturally extremely interesting with regard to the development of new products – especially for a render and paint manufacturer like Sto.

### **How is the lotus leaf able to clean itself?**

Smooth, polished surfaces with a high level of water repellency – such as freshly-waxed car paintwork – were viewed as resembling the lotus leaf the most; however, it turns out that a different principle has asserted itself in nature. Under the microscope it is apparent that the surface of the

leaf has a finely nubbed, almost rough character. In conjunction with its tremendous water repellency, the microstructure – which is imperceptible to the naked eye – creates an astounding effect: dirt particles only cling loosely to the highest points of the microstructure and do not rest entirely on the surface. As a result, the surface tension of raindrops is enough to remove these particles from the structure and to simply carry them off the surface of the leaf with each raindrop.

The leaf effectively cleans itself in a wholly natural way as **dirt simply runs off with the rain.**



A view through an electron microscope: left, the surface of the lotus leaf, and right, the technically-engineered surface of StoLotusan.



Sto has been conducting intensive research in the field of bionics for many years. The result: facade paint with iQ – Intelligent Technology where innovative surface functions provide clear added value.



### How does the **Lotus-Effect®** Technology work technically?

Two attributes make a coating a **Lotus-Effect®** Technology facade coating: firstly, extreme water repellency, which is achieved by using specially selected raw materials and binder combinations; and secondly, a microstructure composed of very fine mineral rock flour and metal oxides.

This simple-sounding formulation, which nevertheless required great effort to create and implement, enabled the lotus leaf principle to be transferred from biology to technology for the first time ever: dirt runs off with the rain – a claim that now also applies to facade paints. Essentially, this is one of the most impressive examples of successful bionics to date.


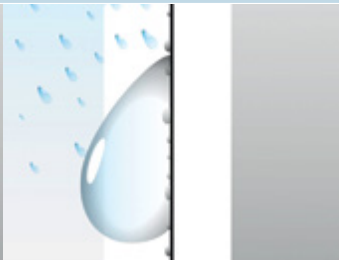
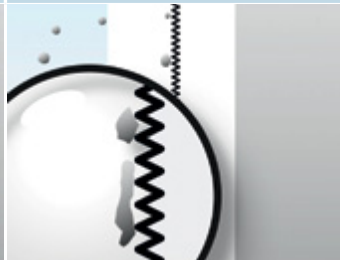
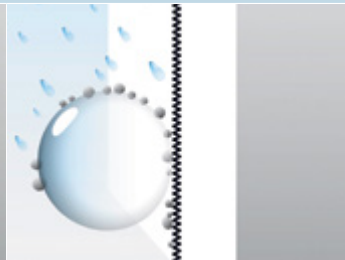


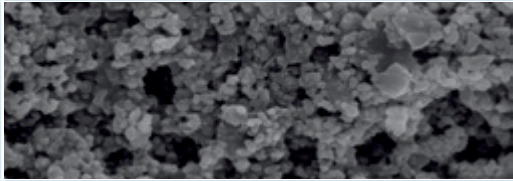
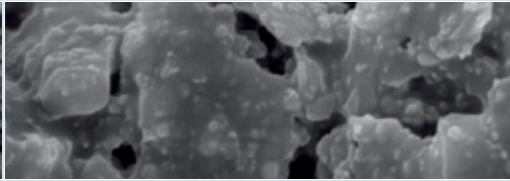
Beautiful, clean, reliable and as smart as nature: facades coated with Lotusan offer long-term appeal for house owners.



**The result:**  
Optimum facade protection  
as the facade remains dry and  
pristine for longer.



How facade coatings work			
Conventional facade coatings		Dual features of facade coatings with <b>Lotus-Effect®</b> Technology	
			
Dirt particles form a deposit on the surface.	The surface is only minimally hydrophobic. Water and dirt particles cling to it.	<b>Feature 1:</b> Lotusan is microtextured. The contact area for dirt particles and water is therefore significantly reduced.	<b>Feature 2:</b> Lotusan is also extremely hydrophobic. Raindrops run off straight away and simply take the loosely attached dirt particles with them.

Properties comparison: StoLotusan Color - StoSilco Color - siliconised paint		
<b>Description</b>	<b>Lotusan Paint</b> <b>Lotus-Effect® Technology Paint</b> microtextured, water-repellent coating	<b>low-grade silicone resin paint</b> water-repellent coating
<b>SEM image</b>		
<b>Building physical values</b>	<p><b>Water vapour diffusion sd value:</b> 0.01 m, class V1</p> <p><b>Water permeability w value:</b> 0.05 kg/m<sup>2</sup> √h, class W3</p> <p><b>Raindrop contact angle:</b> &gt; 140°</p> <ul style="list-style-type: none"> <li>Highly non-wettable by rainwater</li> <li>Reduced level of dirt adhesion thanks to microtexture</li> </ul> <p><small>*In the case of sustained exposure to moisture, the drip-off effect is not continuously maintained, but is fully restored after drying.</small></p>	<p><b>Water vapour diffusion sd value:</b> &gt; 0.14 m, class V2</p> <p><b>Water permeability w value:</b> &lt; 0.05 kg/m<sup>2</sup> √h, class W3</p> <p><b>Raindrop contact angle:</b> approx. 110°</p> <ul style="list-style-type: none"> <li>Water-repellent</li> <li>Diffusion-open</li> <li>Cost-efficient</li> </ul>



Dirt particles have little chance thanks to the microtextured surface.



Overview of Lotusan product benefits			
	Lotusan Color	Lotusan G	StoColor Maxicryl
<b>Stipulated feature / stress factor</b>			
Plinth areas	●	●	●●
Horizontally weathered surfaces/cornices			●
Weathered facade	●●	●●	●●
Non-weathered facade			●●
Water run-off effect	●●	●●	●
<b>Lotus-Effect®</b> Technology	●●	●●	
Dust exposure	●●	●●	●
Oily fine particles (soot)	●	●	●
Intensive colour shades	●	●	●●
Dark colour shades; lightness value less than 20%	●	●	●●
Microtextured surface	●●	●●	●
Prevents algae and fungal attack	●	●●	●
Refurbishment of algae and fungal attack	●	●●	●
Anti - graffiti			
Low sd value; water vapour	●●	●●	●
Low w value; water	●●	●●	●●
Low sd value CO <sub>2</sub> -permeability	●●	●●	●
Reinforced concrete	●	●	●●
Minimum susceptibility to chalking	●●	●●	●●
Public areas	●	●	●●
Ceiling soffits	●	●	●●
Without film conservation	●●		
Colour feasibility/selection	●	●	●●

●● very good ● good ● to a limited extent

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