

# Photovoltaic

**Rivolta** special cleaner





# Rivolta P.H.C. - Photovoltaic cleaner

Our special cleaning agent **Rivolta P.H.C.** is a cost-effective, material-friendly, highly efficient and biodegradable cleaning concentrate which has been developed for the removal of dirt from photovoltaic systems. The combination of active ingredients reliably removes different kinds of dirt such as dust, soot, bird droppings, road dirt and other environmental deposits from photovoltaic modules.

**P.H.C.** is both user and environment friendly and is the first photovoltaic cleaning agent to be comprehensively tested for material compatibility by the Fraunhofer CSP Institute.

The **Rivolta P.H.C.** photovoltaic cleaner is suitable for both industrial and private users. The cleaning solution can be used on all systems – from solar parks to the roofs of private houses – using robots, brushes or sprayers.

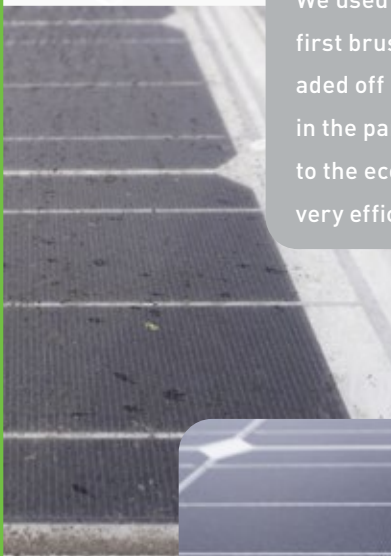
## Convincing in practice

“At first we were sceptical, as far as the cleaner was concerned. But after we were able to test it for several days in really tough circumstances, a large array on a barn for dairy cows, I am now convinced by Rivolta P.H.C. and we will now be using it permanently. The cleaning performance is really tremendous and ideal for use with our robots. For this test, we dispensed with reverse osmosis water and used well water. The fact that it is tested by Fraunhofer CSP also gives us and our customers security in the use of it.”

Pascal Liebold,  
Managing Director of  
sun-x GmbH



Before



“After several years, we cleaned our PV panels for the first time. We used Rivolta P.H.C., diluted with plain tap water. Even after the first brush strokes, an impressive effect was visible: the water beaded off like on a lotus leaf. The result was an immediate increase in the panels’ performance, noticeable even in diffuse light. Thanks to the economical dilution of 1:500, we can make future PV cleaning very efficient.”

Helmut Hummel,  
Hummel Elektrotechnik München



After



„Rivolta P.H.C. shows an impressive cleaning effect! Our test yielded a significantly better result when compared with cleaning PV modules with water purified by reverse osmosis. The modules were free from all residues and showed a smooth surface, which delays re-soiling and increases profitability. Because at ONESOLAR we attach great importance to nature conservation and Rivolta P.H.C. is easily biodegradable, it is perfectly suited for cleaning our ground-mounted solar panels. We are delighted that Bremer & Leguil have succeeded in developing such an effective and environmentally sustainable cleaning product for photovoltaic modules.”

Christoph Haas, Department Manager Service,  
Maintenance & Operations at OneSolar International GmbH



## Material compatibility - tested by the Fraunhofer CSP research institute

**Rivolta P.H.C.** is unique in the market. The photovoltaic cleaner is economical, highly efficient, non-hazardous, biodegradable with proven material compatibility. As the sole supplier to date, we have had the **P.H.C.** cleaner from Bremer & Leguil extensively tested by the Fraunhofer CSP research institute for its material compatibility.

In doing so, the following components were tested in PV modules commonly used in the industry:

- Aluminium frames with an anodic coating
- Silicone edge seal
- PV rolled plate glass with an anti-reflective coating

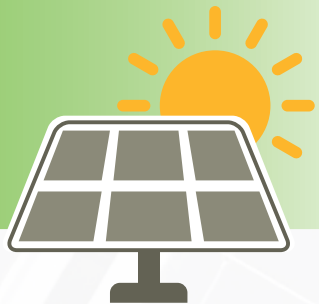
Based on the test results, no impairment of the tested functionalities of the modules due to chemical interactions as a result of contact with **Rivolta P.H.C.** can be expected during the entire service life of a PV system (approx. 25 years) – assuming an annual cleaning cycle and a maximum wetting time of the components of one hour per cleaning operation as well as use of the cleaner in the maximum application concentration.



## Recommended mixing ratios

We recommend the following ratios for cleaning:

For heavy soiling	1:100
For maintenance cleaning	1:500



## Benefits of Rivolta P.H.C.

- excellent cleaning properties
- extensively tested for material compatibility by the Fraunhofer CSP institute
- reduces further soiling and the formation of mosses, lichens & fungi
- does not require precautionary hazard labelling according to the CLP regulations
- improves the power output of the PV modules
- biodegradable



- suitable for both manual cleaning with brushes and large-area cleaning using cleaning robots or hydraulically operated brushes

# Maintenance products

Besides the cleaning of photovoltaic modules, we also offer further maintenance solutions. Our sales consultants can advise you on how the use of the right products can prolong the life of your components such as inverters, energy distributors, overvoltage components, transformers etc. We look forward to hearing from you.

	Product	Properties	Fields of application	
Clean	<b>E.V.R.</b>	<ul style="list-style-type: none"> <li>• compatible with metals, plastics, elastomers and solvent-resistant colours</li> <li>• low conductance value</li> <li>• water-based</li> </ul>	<ul style="list-style-type: none"> <li>• electrical switching systems/devices</li> <li>• transformers</li> <li>• components</li> <li>• casing and surfaces</li> </ul>	
	<b>O.C.X.</b>	<ul style="list-style-type: none"> <li>• cost-effective</li> <li>• highly effective</li> <li>• reduces repair and maintenance costs</li> <li>• non-conductive</li> </ul>	<ul style="list-style-type: none"> <li>• dissolves oxide and sulphide layers on all interfaces</li> </ul>	
	<b>S.L.X. Top</b>	<ul style="list-style-type: none"> <li>• intermediate and residue-free evaporation</li> <li>• dielectric strength up to 150,000 V/cm</li> </ul>	<ul style="list-style-type: none"> <li>• highly efficient cleaner for all electrical devices and components (e.g. switching systems, transformers, generators and e-motors)</li> </ul>	
	<b>S.L.X. 500</b>	<ul style="list-style-type: none"> <li>• rapid, residue-free evaporation</li> <li>• no flashpoint</li> <li>• dielectric strength up to 130,000 V/cm</li> </ul>	<ul style="list-style-type: none"> <li>• for the cleaning of all electrical systems and devices (e.g. electrical switchboards, distributors, inverters etc.)</li> <li>• enables work under voltage</li> </ul>	
	<b>S.U.W. Spray</b>	<ul style="list-style-type: none"> <li>• minimal labelling</li> <li>• mild smell</li> <li>• overhead spraying possible</li> </ul>	<ul style="list-style-type: none"> <li>• rapid degreasing</li> </ul>	
Lubricate	<b>S.I.L. Spray</b>	<ul style="list-style-type: none"> <li>• excellent lubrication &amp; protection properties</li> <li>• reduces the build-up of dirt</li> <li>• efficient application with spray can</li> </ul>	<ul style="list-style-type: none"> <li>• maintenance of rubber and plastic e.g. seals and ceramic components on transformers</li> </ul>	
	<b>S.K.D. 4002</b>	<ul style="list-style-type: none"> <li>• water-resistant</li> <li>• resistant against ageing and oxidation</li> <li>• does not crack</li> </ul>	<ul style="list-style-type: none"> <li>• maintains terminal lugs of low voltage high performance fuses</li> <li>• interface lubrication of disconnecting switches, switches etc.</li> </ul>	
Corrosion protection	<b>F.L.G. GT Spray</b>	<ul style="list-style-type: none"> <li>• prevents oxidation</li> <li>• optimum corrosion protection</li> <li>• minimal transition resistance</li> </ul>	<ul style="list-style-type: none"> <li>• improves contact mode</li> <li>• protects copper bars</li> </ul>	
	<b>W.S.X. Spray</b>	<ul style="list-style-type: none"> <li>• effective protection against moisture, water and deposits</li> <li>• protects against corrosion</li> <li>• maintains electrical properties</li> </ul>	<ul style="list-style-type: none"> <li>• protects electronics and other components against moisture and water</li> </ul>	
Equipment	<b>High pressure cleaning device 4L</b>	<ul style="list-style-type: none"> <li>• optimum dosing with nozzle</li> <li>• highly effective cleaning with minimal materials</li> <li>• compact and not sensitive to shocks</li> </ul>	<ul style="list-style-type: none"> <li>• electro wet cleaning</li> </ul>	
	<b>High pressure cleaning device SF 23 Plus</b>	<ul style="list-style-type: none"> <li>• 180 bar pressure, 2.2 l per minute</li> <li>• efficient cleaning even in the case of extreme dirt</li> <li>• with safety spraying fixture</li> </ul>	<ul style="list-style-type: none"> <li>• electro wet cleaning</li> <li>• transformer cleaning</li> </ul>	

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