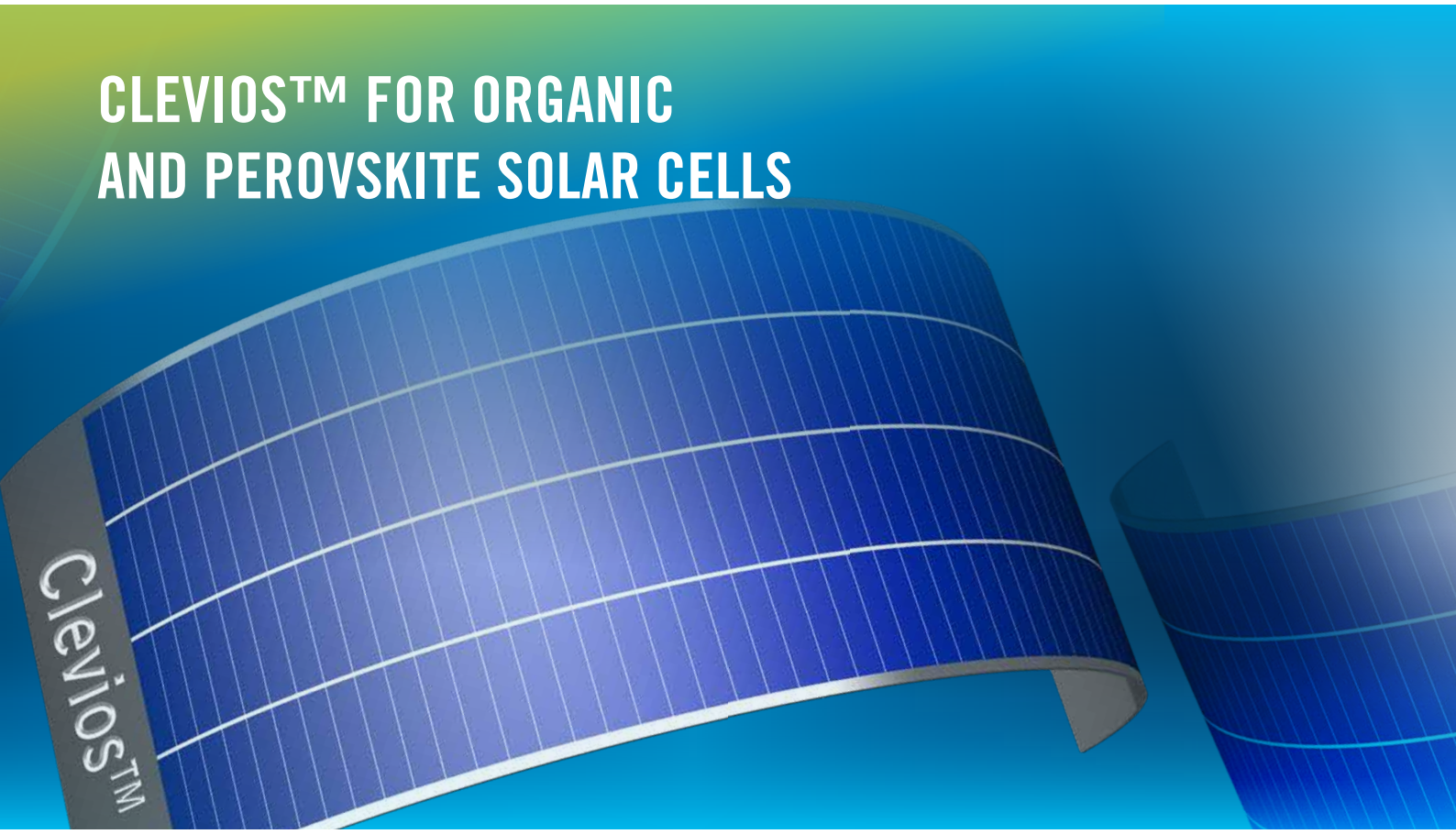
Heraeus

Epurio

CLEVIOS™ FOR ORGANIC AND PEROVSKITE SOLAR CELLS



Innovative Materials and Processing Technologies
for Organic and Perovskite Solar Cells

Heraeus offers Clevios™ conductive polymers, SOL silver pastes, and photonic curing and sintering process technologies for organic solar cell (OPV) and Perovskite applications:

All materials provide flexibility combined with low cost processing from solution by coating or printing. Organic solar cells – in contrast to their inorganic silicon counter-parts – are lightweight and portable, highly flexible, colorful and aesthetic. They can be recycled, have a low carbon footprint, and can be made transparent. Manifold new products and applications are being developed at the moment, for example building integrated photovoltaics (BIPV), portable or wearable chargers, indoor light harvesting, automotive, consumer electronics etc.

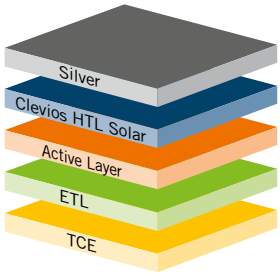
The new perovskite solar cell technology requires waterless hole-transport layers and Heraeus has developed new dedicated solvent-based PEDOT Dispersions Clevios™ HTL Solar 3 and 4 that can be directly coated on the perovskite layer.

Heraeus Noblelight, your experts for UV and IR photonic processing, provides convenient solutions for high efficient drying and curing of all OPV materials fitting to your production process and environment. With infrared drying of printed or coated Clevios™ materials the specified conductivity values can be achieved within a few seconds process time.

Product	Conductivity / Resistivity	Description
Clevios™ HTL Solar	0,1 – 1 S/cm	hole extraction/ transport layer
Clevios™ F HC Solar	> 500 S/cm	high conductive type
Clevios™ HY E	10 – 100 Ohm/sq	low resistive transparent electrode
Clevios™ HTL Solar 3	1 – 1k Ω·cm	for perovskite, toluene, acidic
Clevios™ HTL Solar 4	1 – 1k Ω·cm	for perovskite, anisole, non-acidic

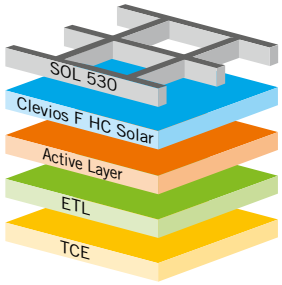
Innovative Materials and Processing Technologies
for Organic and Perovskite Solar Cells

Hole transport layer (HTL)



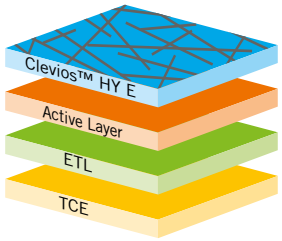
"Hole transport" layer (HTL) materials, improving the solar cell performance, ready to apply by slot-die coating. Clevios™ HTL Solar is applicable in both standard and inverted type organic solar cell architectures, exhibiting good wetting and coating properties on most active layer materials. Solvent-based, waterless Clevios™ HTL Solar 3 and HTL Solar 4 can be coated on perovskite active layers.

Transparent electrode



"Transparent electrode" materials, to replace ITO or to use as top electrode in semi-transparent OPV cells, e.g. in combination with printed silver busbars. Clevios™ F HC Solar can be coated as single layer hole-extraction electrode directly on active layers. It facilitates manufacturing processes and can help to reduce overall solar cell costs.

Hybrid transparent electrode



"Hybrid transparent electrode" materials, are new development products for low resistive transparent electrodes with high workfunction and hole-extraction properties. Clevios™ HY E combines PEDOT/PSS with AgNW and can be coated as single layer directly on active layers.

E 05.2022/VN, Layout: www.datagraphis.de

Heraeus Deutschland GmbH & Co. KG
Heraeus Epurio
Building B202, Chempark
51368 Leverkusen, Germany
clevios@heraeus.com
www.clevios.com I www.heraeus.com

Clevios™