



Company Presentation

Investor Relations 03-2023

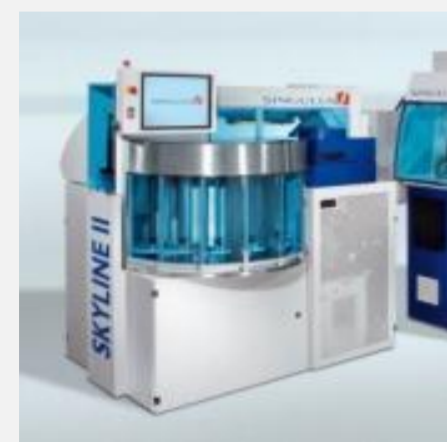
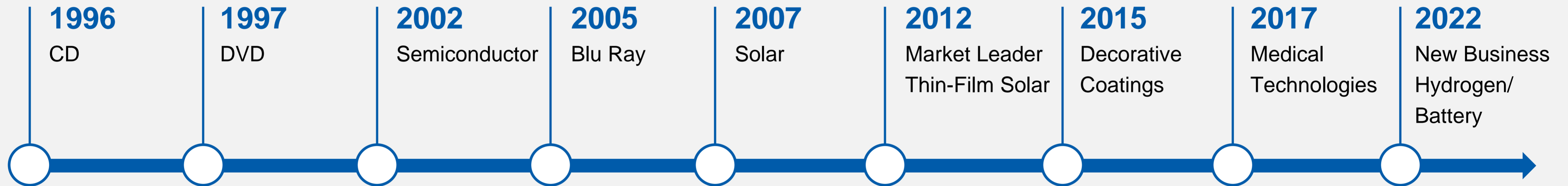
Thin-Film Coating and Surface Treatment

SINGULUS 

Where does SINGULUS TECHNOLOGIES come from?

Start of SINGULUS TECHNOLOGIES in 1995 and IPO in 1997 with Innovative Vacuum Technology

MILESTONES



SKYLINE



SPACELINE



TIMARIS



BLULINE



SILEX



VISTARIS



DECOLINE II



MEDLINE



GENERIS

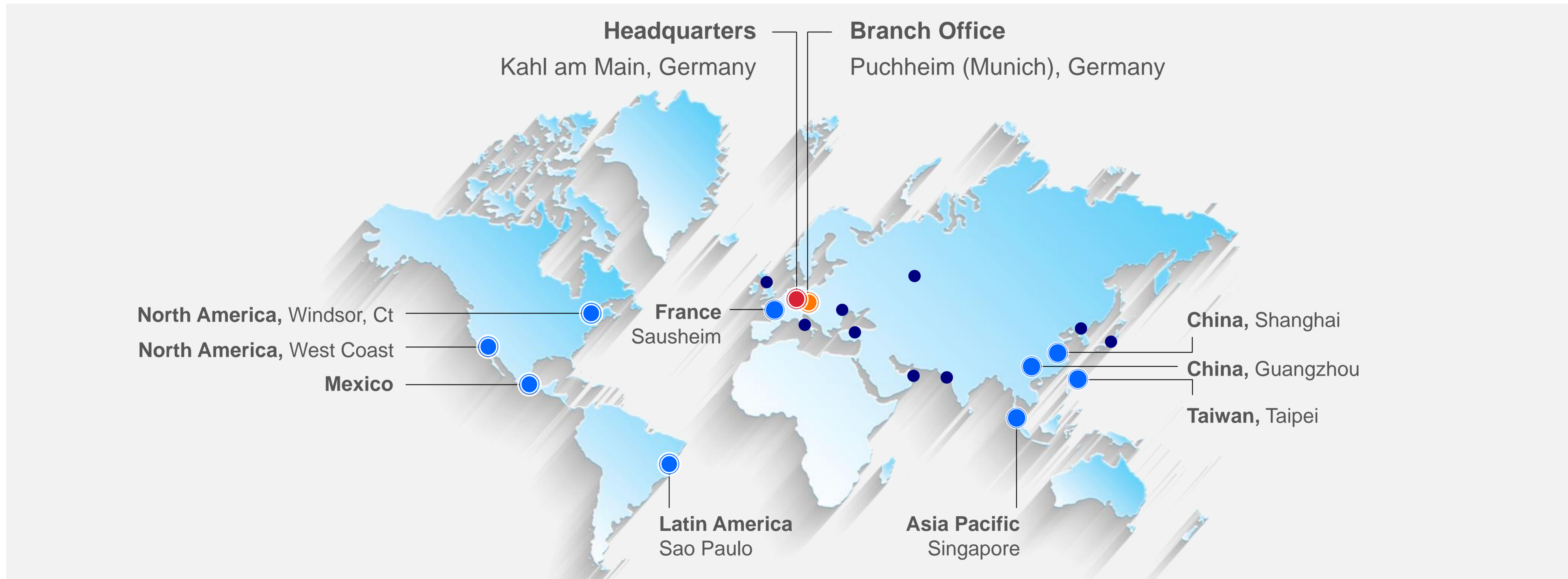
State-of-the-Art Technology Provider Equipment Supplier with Market Orientated Technology Know-How



- Established: 1995 (Buyout at Merger Balzers/Leybold)
- IPO: 1997
- Employees: 338, Domestic 288, Abroad 50

- Research & Development
- Consulting
- Engineering & Design
- Project Management
- Production
- Installation
- Commissioning
- Service & Maintenance
- Hotline 24/7
- Training

International Sales & Service Organization Close to the Customers



Subsidiaries & Agents Worldwide

- Headquarters
- Branch Office Puchheim (Munich)
- Subsidiaries/Sales & Services
- Agents

Preliminary, Unaudited Key Financial Figures for the Business Year 2022

- Revenues in a range of € 86 to 91 million
- Earnings before interest and taxes (EBIT) between €4 and €6 million
- Order intake reached €57 million
- Order backlog as of December 31, 2022, was between €82 million and €87 million

Leverage Technological Advantages and Innovation Across all Segments



Solar

SOLAR

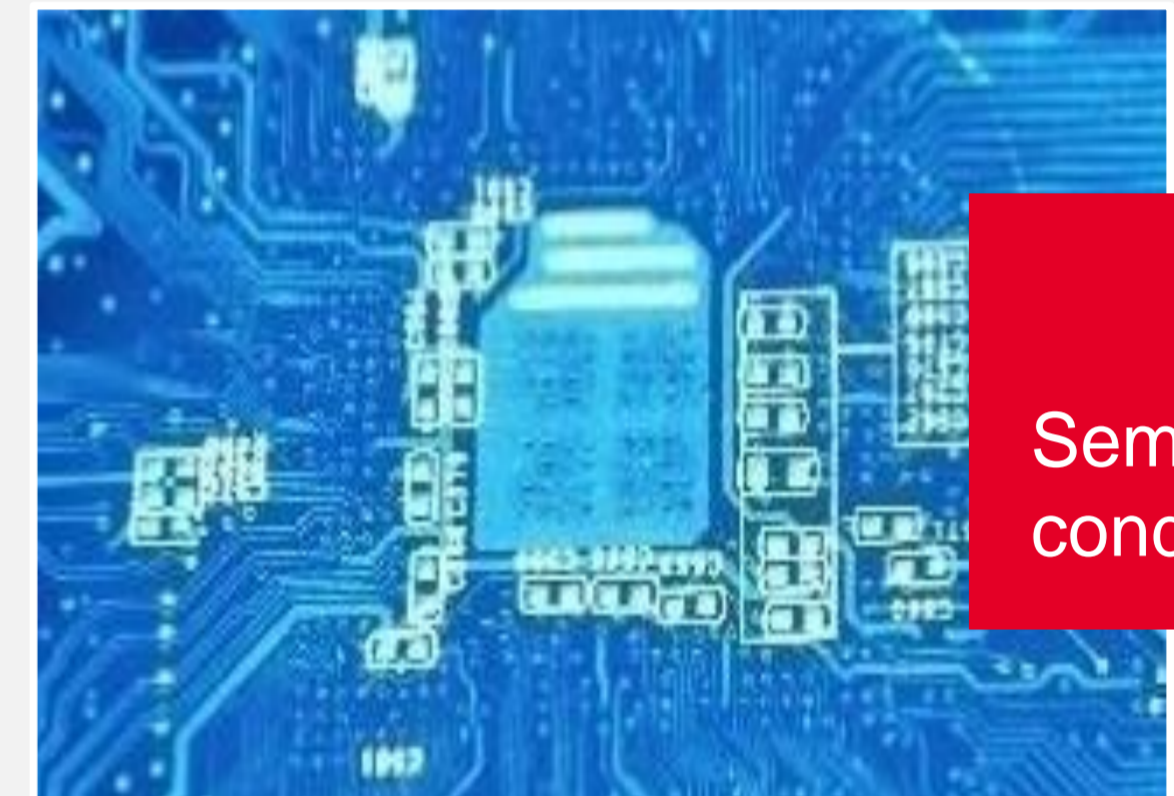
- Crystalline Solar
- Thin Film Solar



Life
Science

LIFE SCIENCE

- 3D Coating
- 3D Production Line
- Lacquering System
- Medical Technology
- Data Storage



Semi-
conductor

SEMICONDUCTOR

- Cluster Tool
for Vacuum Deposition

Advanced Process Technology opens new Business Opportunities



THIN FILM DEPOSITION

for a wide range of coating applications for the enhancement of surfaces with specific functionalities

- Sputter (PVD) deposition
- Evaporation (thermal evaporation)
- PECVD (ICP, μ -Wave)



SURFACE ENGINEERING

for a wide range of functional and optical properties on different substrates and materials

- Lacquering
- Embossing
- Plasma cleaning & etching



WET CHEMICAL

for a wide range of applications for the cleaning, etching, structuring and surface treatment of substrates

- Cleaning / washing
- Etching / polishing
- Texturing
- Coating and Developing

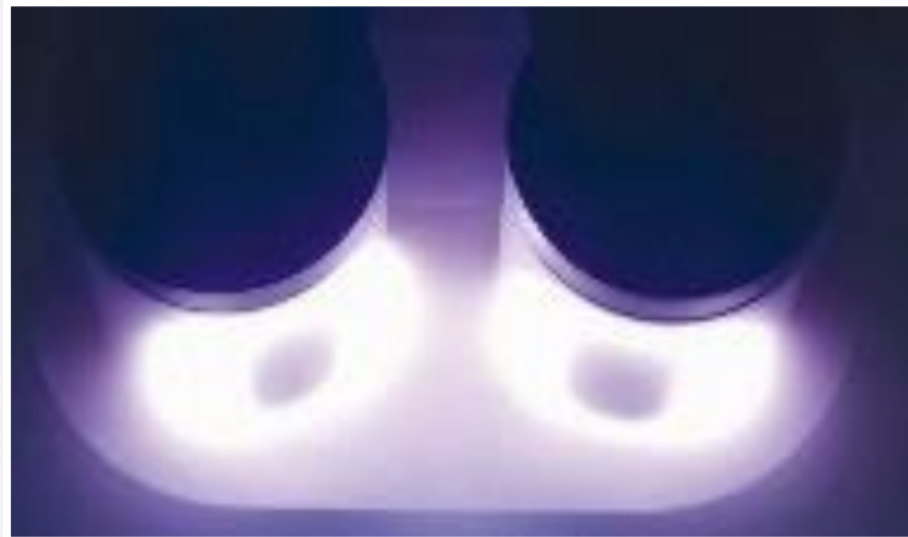


THERMAL PROCESSING

for a wide range of photovoltaics and semiconductor applications with core focus on high temperature and diffusion processes

- Rapid thermal processing (RTP)
- Conditioning
- Annealing

State-of-the-Art Equipment Supplier with Market Orientated Technology Know-How



PVD



PECVD



EVAPORATION



RTP / CSS



ETCHING



WET PROCESSING



LACQUERING

SINGULUS TECHNOLOGIES
develops and manufactures innovative
equipment, systems and technologies
for efficient and resource-saving
production processes

Product Portfolio

Vacuum Sputtering



GENERIS PVD
Inline Sputtering System with Horizontal Substrate Transport



HISTARIS
Inline Sputtering System with Horizontal Substrate Transport for Glass Applications



VISTARIS
Inline Sputtering System with Vertical Substrate Transport



SPUTTERING SYSTEMS
for R&D and Pilot Production



POLYCOATER
Inline Sputtering Machine for Metallization of 3D Parts



SEMICONDUCTOR
Cluster Tool



SEMICONDUCTOR
Cluster Tool

Plasma-Enhanced CVD (PECVD)



GENERIS PECVD
System for Plasma-enhanced CVD (PECVD) Processes

Evaporation/ Sublimation and RTP



SELENIUS
Processing Systems for Evaporation of CIGS Thin-Film Solar Cells



CSS
Close Spaced Sublimation (CSS) for the Production of CdTe Solar Modules



CISARIS
Selenization/Sulphurization with High-End Rapid Thermal Process

Wet Chemical Treatment



SILEX III
Batch System for High Performance Solar Cells



MEDLINE
Cleaning & Deposition of Medical Products

Surface Refinement



PAINTLINE
Inline Lacquering System for 3D Parts



DECOLINE II
With Integrated Lacquering System

SINGULUS TECHNOLOGIES is Active in Both Areas: Crystalline & Thin-Film

Silicon Wafer Material – PERC, HJT, IBC, HBC, TOPCon and Tandem Solar Cells

- High cell & module efficiency
- Largest market share
- Advanced technology potential



Thin Film Solar – Glass or Flexible Material – CIGS, CdTe and Perovskite Technology

- Excellent stability
- Good low light (including shade) performance
- Reduced sensitivity to overheating
- Full values chain in production
- Lower energy consumption in production (per Wp) versus c-Si

VISTARIS PVD - Large Inline Sputtering System for Thin-Film Solar & other Glass Applications

The System is Using Vertical Vacuum-based Deposition of Glass Substrates in Various Industries



Next Generation Production Equipment for CIGS & CdTe Thin-Film Solar

New RTP & CSS Equipment offers the Manufacturer a Greater Output
and Lower Production Costs per Watt



Reliable Production Equipment for High Performance Solar Cells

With the Production Equipment SINGULUS TECHNOLOGIES improves the Cell Efficiency and Reduces Manufacturing Costs



GENERIS PVD
Inline Sputtering System



GENERIS PECVD
Inline PECVD System



SILEX III
Wet Chemical System (Batch)

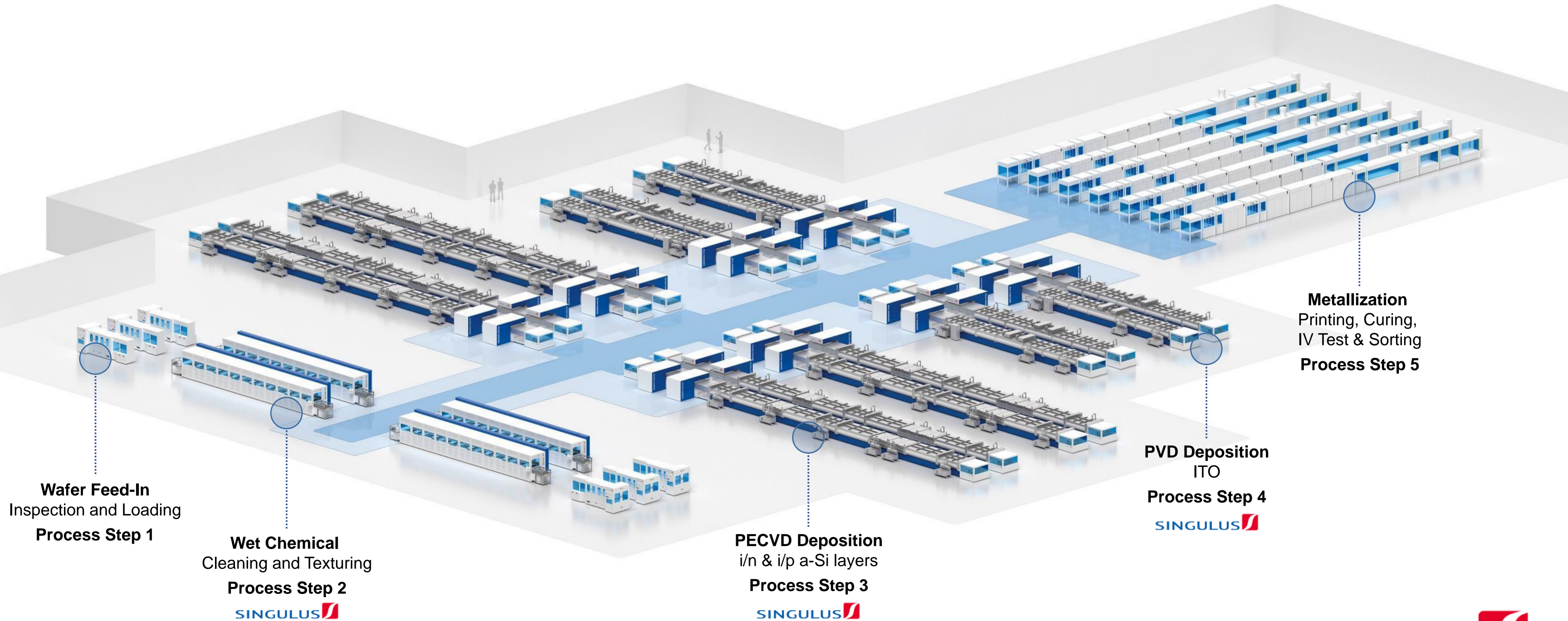
Key Advantages and Features



FEATURES ON SINGULUS TURN-KEY SOLUTION

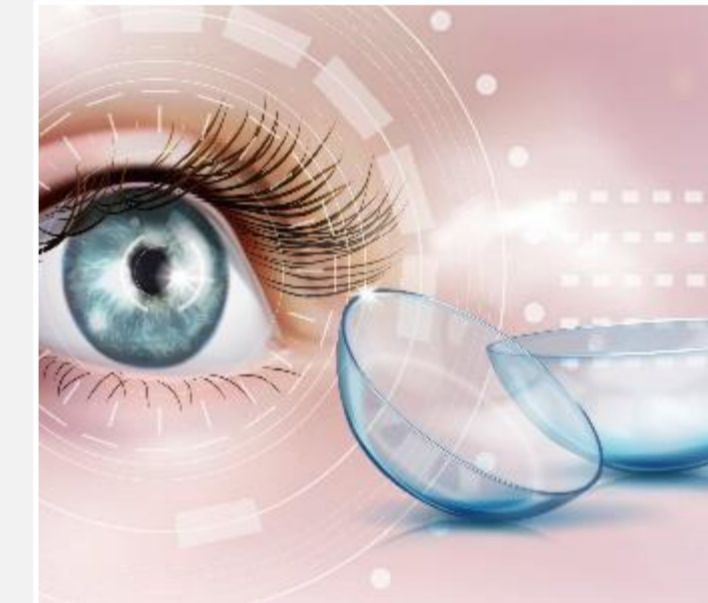
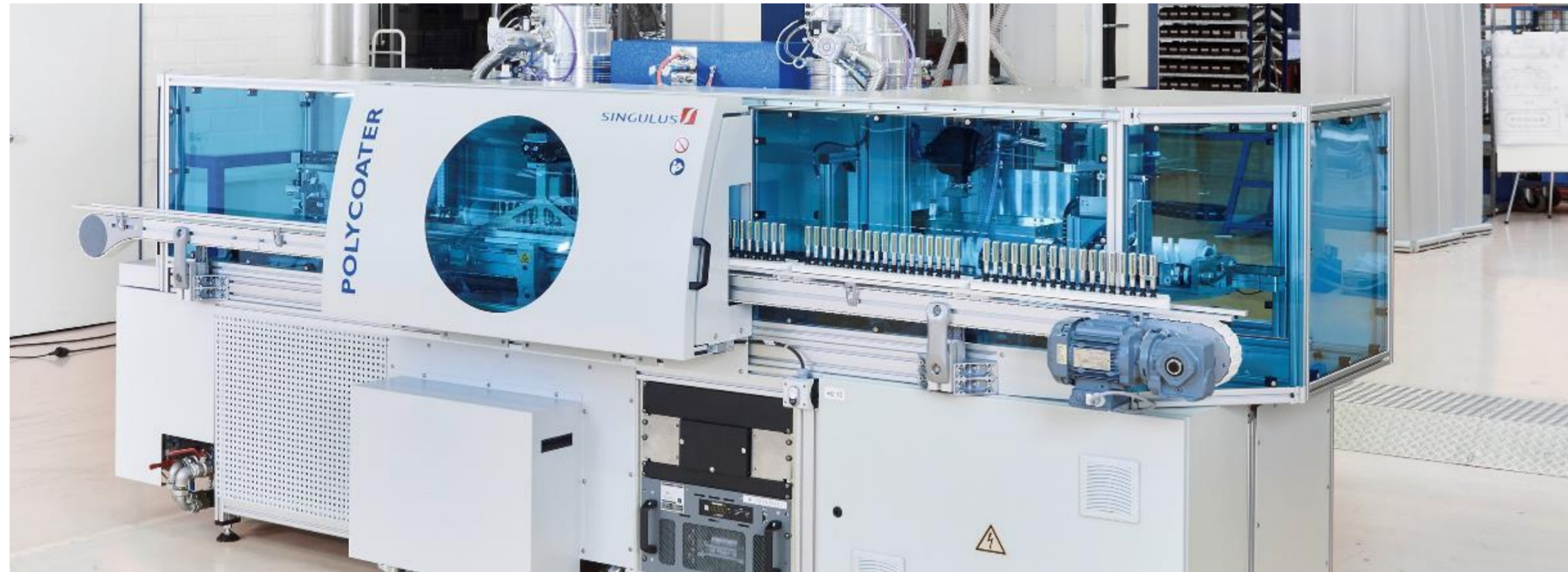
- One Contract – one central contact point
- **Project Management, from pre-engineering until production line hand-over, including guarantees**
- **Greenfield- or Building implementation Projects on HJT Technology**
- **Proven Boundary Conditions** and intensive Process Optimization to ensure successful project implementation
- Intensive collaboration in process development and sampling with all key equipment supplier
- **Partnership with leading Institutes** for secured process implementation and ramp-up
- High market placement of production equipment at the solar cell **production field**, with proven results and experience

Schematic Layout of HJT Solar Cell Production Line with Key Production Equipment



MEDLINE Wet Chemical and POLYCOATER Sputtering

Production Systems for Medical Technology Following GMP



Inline Production System for Sustainable Coating and Lacquering of 3D Parts

With Cleaning, Lacquering & Sputtering SINGULUS TECHNOLOGIES Offers all in Solution for Production



Green Metallizing



Chrome (VI)-free



Cost Effective



Reliable Process

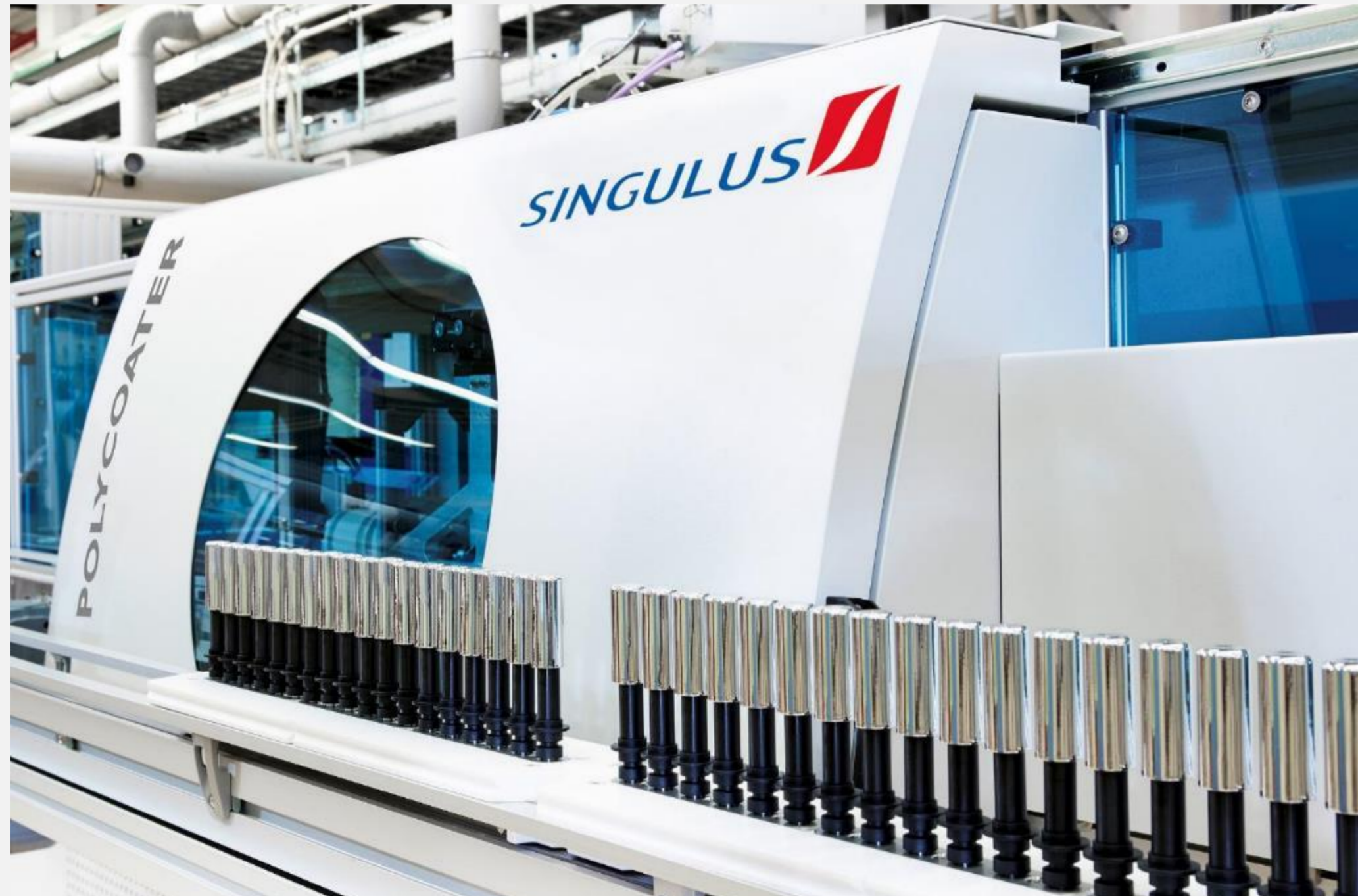


Sustainable Process



POLYCOATER

Decorative Coating with Inline Sputtering System



Advanced Surface Coating

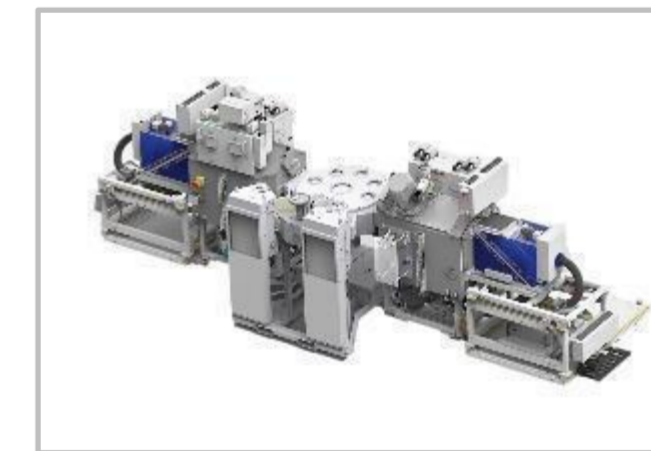
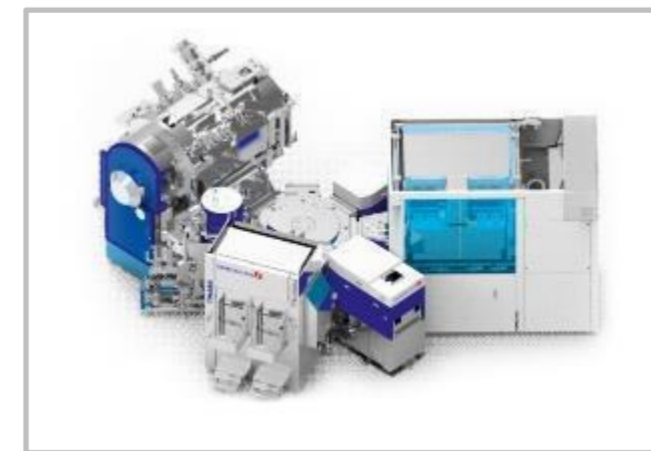
- Brilliant layers on 3-dimensional parts & individual design
- Inline metallization
- Fully automated processing & high productivity and flexibility
- Low cost of ownership & environment-friendly





SINGULUS TECHNOLOGIES

is a renowned Manufacturer of Advanced Thin-film Deposition Equipment for Magnetic Sensors (TMR, GMR, AMR), Integrated Inductors, MRAM, μ LED, Advanced Packaging (RDL/UBM), Interconnects, and other Semiconductor Applications.



SINGULUS TECHNOLOGIES starts new Business Area: Vacuum Deposition for Application in Fuel Cell Technology

The Use of Hydrogen only makes Ecological Sense if it is about “Green” Hydrogen

For global climate protection and the limitation of global warming to well below 2 °C, the global energy systems must reduce the proportion of fossil fuels in the energy mix to a minimum.

Hydrogen offers a great potential for the electrolysis, industrial and transport sectors and, also in electricity generation.



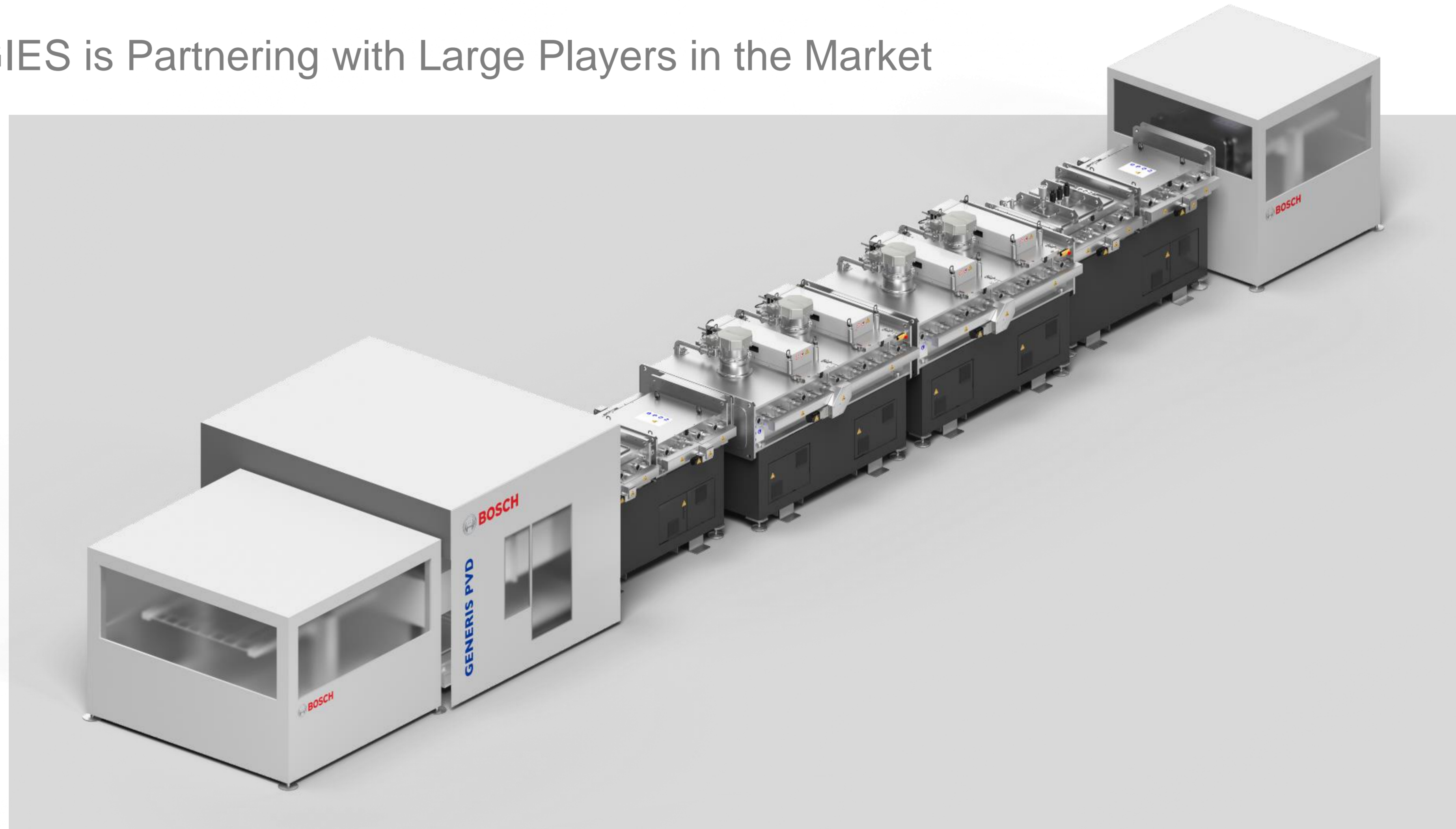
SINGULUS TECHNOLOGIES is Partnering with Large Players in the Market



Industry: Chemistry, Steel, etc.



Mobility, Cars, Busses, Transport



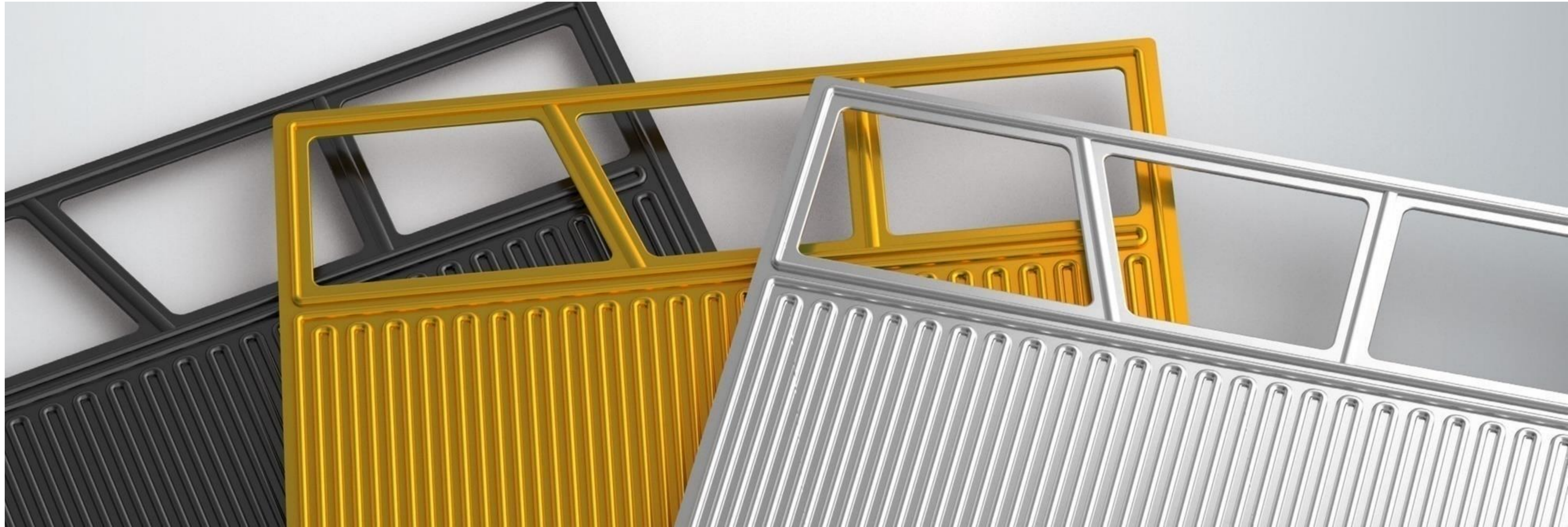
Fuel Cell Technology: SINGULUS TECHNOLOGIES works on the Deposition of Bipolar Plates & Electrolyzer

SINGULUS TECHNOLOGIES AG

03-2023

- 22 -

SINGULUS TECHNOLOGIES Concentrates on the Acidic Membrane or PEM Electrolysis (PEM: Proton Exchange Membrane)



SINGULUS TECHNOLOGIES – Innovations for New Technologies

Markets



Photovoltaics



Medical
Technology



Glass/
Automotive



Semiconductor



Packaging
Industry



Battery/
Hydrogen



CONTACT:

SINGULUS TECHNOLOGIES AG

Hanauer Landstrasse 103
63796 Kahl/Main, Germany

Dr.-Ing. Stefan Rinck

President and CEO

Stefan.Rinck@singulus.de

Markus Ehret, CFO

Markus.Ehret@singulus.de

Maren Schuster

Head of Investor Relations

Maren.Schuster@singulus.de

Bernhard Krause

Communications Worldwide

Bernhard.Krause@singulus.de

FORWARD-LOOKING STATEMENTS

This presentation contains forward-looking statements based on current expectations, assumptions and forecasts of the executive board and on currently available information. Various known and unknown risks, unpredictable developments, changes in the economic and political environment and other presently not yet identifiable effects could result in the fact that the actual future results, financial situation or the outlook for the company differ from the estimates given here. We are not obligated to update the forward-looking statements made in this presentation unless there is a legal obligation.