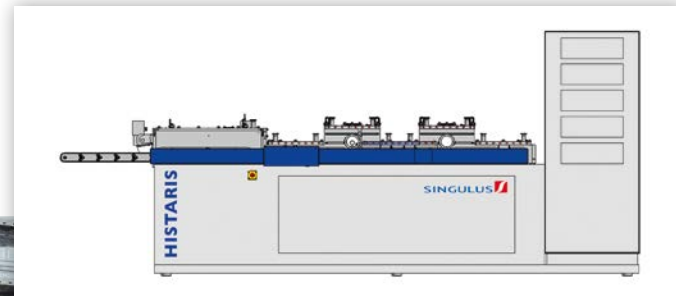
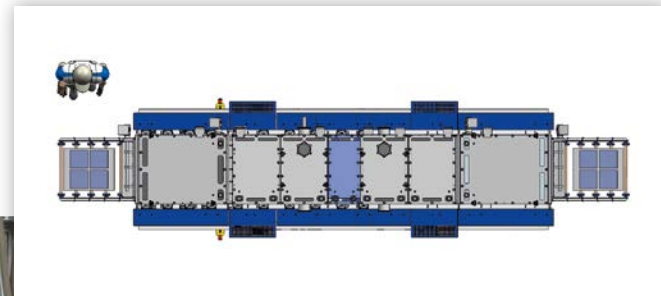


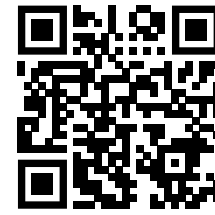


Horizontal cathode arrangement with usage of rotatable cylindrical magnetron for highest utilization of target material

**HISTARIS LAB**  
Inline sputtering system for R&D applications and pilot production



**HISTARIS**  
Flexible inline sputtering system with modular chamber arrangement for different applications



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**SINGULUS TECHNOLOGIES - Thin-Film Coating and Surface Treatment**

SINGULUS TECHNOLOGIES develops and assembles innovative machines and systems for efficient thin-film coating and surface treatment processes, which are used worldwide in the Photovoltaics, Semiconductor, Medical Technology, Packaging, Glass & Automotive as well as Battery & Hydrogen markets.

The company's core competencies include various processes of coating technology, surface treatment as well as wet-chemical and thermal production processes. SINGULUS TECHNOLOGIES sees sustainability as an opportunity to position itself with innovative products. In the focus are:

- » Environmental awareness
- » Efficient use of resources
- » Avoidance of unnecessary CO<sub>2</sub> pollution

SINGULUS TECHNOLOGIES attaches great importance to responsible and sustainable corporate governance.



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**HISTARIS**

Modular Inline Vacuum Sputtering System with Horizontal Substrate Transport





# HISTARIS – Inline Sputtering System

Modular Sputtering System for CIGS & CdTe Thin-Film Solar Modules as well as Applications with Large Glass Surfaces

## Sputtering Competence

SINGULUS TECHNOLOGIES has delivered far more than 8,500 vacuum sputtering machines since its foundation in 1995. The machines range from ultra-high vacuum deposition machines applying extremely thin layers of around 0.2 nm for the semiconductor industry down to high-throughput sputter machines for metallizing of e.g. a lipstick cover in 0.3 s.

PVD Systems from SINGULUS TECHNOLOGIES are mainly used in photovoltaics, data storage, sensor technology and decorative coatings but also in other applications such as hydrogen, battery, automotive, electrical shielding and advanced packing applications.

A close cooperation with scientific institutes like Fraunhofer ISE, Helmholtz-Zentrum Berlin (HZB), and SERIS as well as with research organizations and institutes in the USA and China allow SINGULUS TECHNOLOGIES to participate and make use of the latest solar research results worldwide.

## HISTARIS Inline Sputtering System

The SINGULUS TECHNOLOGIES HISTARIS system was developed for the requirements in the photovoltaic industry but also for applications in large area sputtering like architectural glazing, fuel cells and mobile devices. In photovoltaics the Inline sputtering systems are important in today's CIGS & CdTe thin-film solar cell production.

The HISTARIS system was designed to enhance the efficiency and cutting production costs by using the state-of-the-art technologies. The modular design includes process chambers equipped with rotatable magnetrons for the sputter deposition of high-performance TCO layers or several other materials,

such as metals and metal oxides. Pre-treating modules for cleaning or etching can be added. With its unique modular design, the HISTARIS system is ideally suited for challenging layer stacks and flexible product mixes.

Examples are transparent front or metallic back contact layers as well as multilayered precursors with a broad range of different materials. The main advantage of the system is that it can be used for horizontal vacuum-based coating of glass substrates

in solar and display industry. Typical applications include anti-reflection layers, barrier layers and precursor layers but also different metallic layers such as Al, Cu, NiV, etc.

For photovoltaic technology, SINGULUS TECHNOLOGIES develops and manufactures thin film deposition systems which can apply special layers and layer systems on different substrates. In the market for thin-film photovoltaic SINGULUS TECHNOLOGIES adds another production stage to its range of processing systems for the manufacture of CIGS & CdTe thin-film solar cells.

The HISTARIS is using an inline process in which the substrates are transported on specially designed carriers or directly on a customized roller drive system. Different automation options for loading and unloading are available.

## MAIN FEATURES HISTARIS

- » Modular machine concept
- » Integrated power supply design
- » Horizontal substrate transport – with and without carrier
- » Usage of rotatable cylindrical magnetron for highest utilization of target material
- » Highest deposition rates
- » Temperature processing before and during deposition available
- » Gas separation by dynamic slit valves and/or by individual lock chambers
- » Easy maintenance, low CoO
- » Fast target exchange, use any vendor target
- » Vacuum base pressure:  $< 1 \times 10^{-6}$  mbar
- » Typical process pressure:  $2 - 5 \times 10^{-3}$  mbar

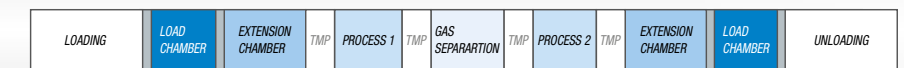


**HISTARIS**  
Modular Sputtering System with Horizontal Substrate Transport for Thin-Film Solar Modules as well as Applications with Large Glass Surfaces

### HISTARIS LAB



### HISTARIS STANDARD



### HISTARIS SPEED



The Modularity of the HISTARIS System Allows a High Degree of Flexibility