



# WET CHEMICAL & VACUUM DEPOSITION

for Medical Technology  
GxP/FDA Compliance

# Wet Chemical & Vacuum Deposition for Medical Technology

*SINGULUS TECHNOLOGIES develops and supplies machines and systems for efficient and resource-saving production processes, which are used worldwide in the medical technology, solar, semiconductor, consumer goods and optical disc sectors. The company's core competencies include various processes of coating technology, surface treatment, wet-chemical and thermal production processes. For medical technology SINGULUS TECHNOLOGIES offers innovative wet chemical and vacuum deposition process solutions.*

## **Wet Processing Systems: Batch & Inline Systems as well as Customized Solutions**

SINGULUS TECHNOLOGIES presents with the MEDLINE platform, a modular system for wet chemical applications adaptable for different process applications. Eye lenses and dental implants are only two samples for the application. The spectrum ranges from manually loaded wet chemical tools for research and development applications to fully automated platforms for high volume mass production in demanding technologies. SINGULUS TECHNOLOGIES has geared its processes to the sophisticated characteristics and functionality expected in medical technology and therefore to the quality of the products and the production and processing methods required. With its process and machine technology SINGULUS TECHNOLOGIES is a reliable partner for international customers in the fields of pharmaceuticals and healthcare.

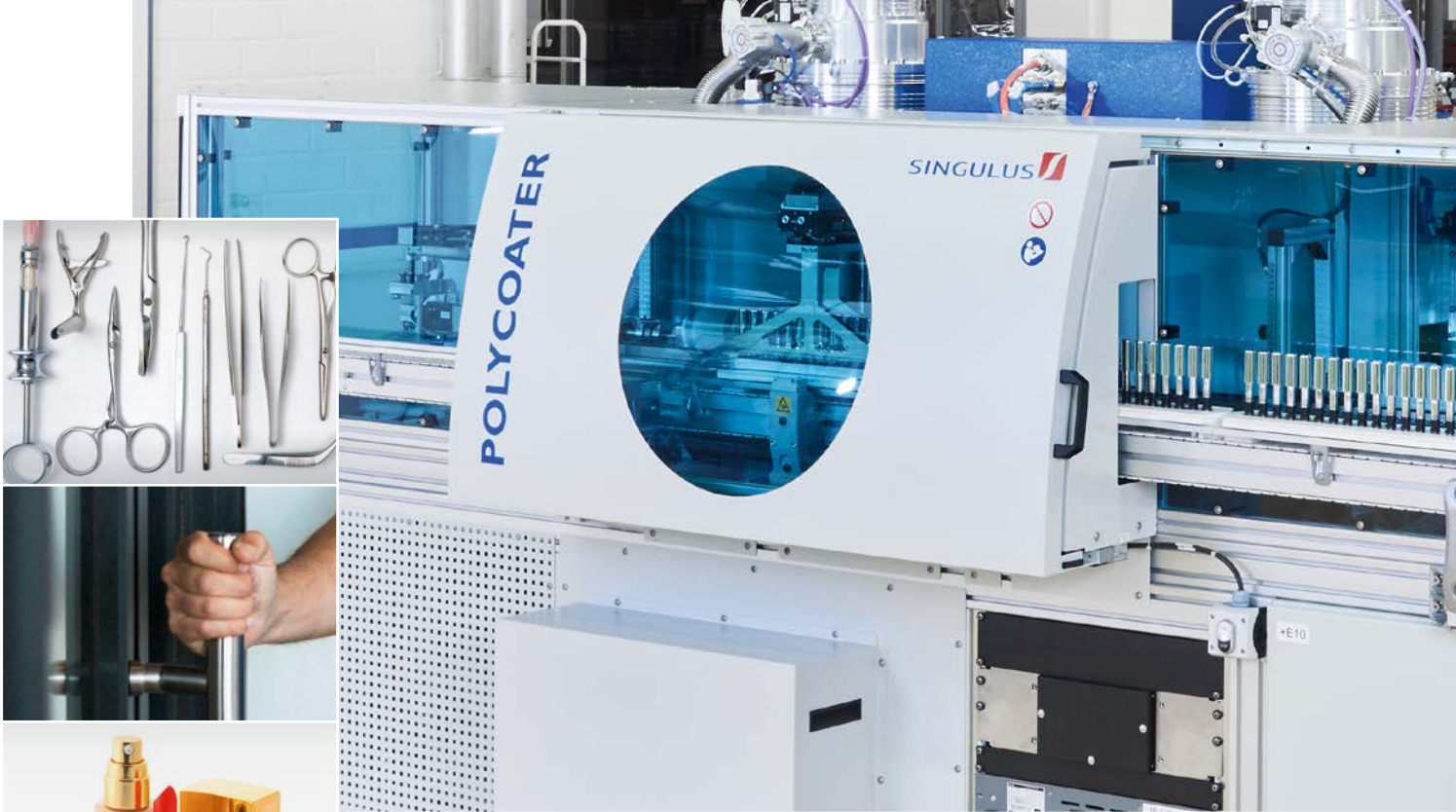
The MEDLINE system family offers high flexibility and customized solutions. The systems are available as inline as well as batch versions according to customer requirements. The modular design provides flexibility for both manual and fully automated operation. The systems can be easily integrated in every production process.

Flat substrates in large dimensions can be processed but also 3-dimensional and thin parts are typical or high volume production equipment as well as customized tools for special applications.

## **Typical Examples for Wet Chemical Processes:**

- Washing, cleaning and pre-cleaning
- Ultra- or mega-sonic cleaning
- Surface conditioning
- Coating, etching
- Surface modification
- Electrochemical etching





*POLYCOATER – Inline Sputtering System for 3D Parts e.g. Packaging for Cosmetics and Healthcare*

**Vacuum Deposition Technology:  
Sputtering & Plasma Enhanced  
Chemical Vapor Deposition**

For medical technology, SINGULUS TECHNOLOGIES offers processes and equipment for coating technology (sputtering, evaporation, PECVD, CVD). A common trait of all processes is the basic principle of efficient, low-resource production technology.

**Application Examples for Medical Devices:**

- Antibacterial coatings
- Dense barrier layers, gradient layers
- Antireflection coatings
- Hard coatings
- Adhesion promoting layers
- Plasma functionalization
- Plasma cleaning, plasma sterilization
- Decorative coatings

A variety of deposition materials with its wide range of metals, metal alloys, ceramics, etc. is available for the respective application. Inline sputtering systems, like the POLYCOATER, are the result of the combination of proven coating technologies, high performance expertise and unique experience bundled with a revolutionary concept for the application of 3-dimensional coatings onto parts. Not only decorative, but also functional layers e.g. for packaging of medical parts can be applied. Possible approaches are antibacterial coatings, EMV-shielding

or electrically conductive layers. The environmentally friendly, low-cost functional antibacterial coatings that are produced in SINGULUS TECHNOLOGIES vacuum coating systems minimize the risk of infection by the so-called "hospital superbug" MRSA (methicillin-resistant Staphylococcus aureus) and by E. coli bacteria, as various studies have shown.

SINGULUS TECHNOLOGIES pursues the integrative validation strategy and supports customers in the validation of machine technology. The corresponding quality management system has been adopted at SINGULUS TECHNOLOGIES. This serves to guarantee product quality and meet the binding marketing requirements of health agencies, in particular the rules of GxP/FDA.

*Inline Sputtering System with Horizontal Substrate Transport for Flat Substrates*





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THIN FILM  
DEPOSITION

SURFACE  
ENGINEERING

THERMAL  
PROCESSING

WET  
CHEMICAL

#### **SINGULUS TECHNOLOGIES – Innovations for New Technologies**

*SINGULUS TECHNOLOGIES develops and assembles innovative machines and systems for efficient and resource-saving production processes, which are used worldwide in the solar, semiconductor, medical technology, consumer goods and data storage.*

*The company's core competencies include various processes of coating technology, surface treatment and wet-chemical and thermal production processes.*