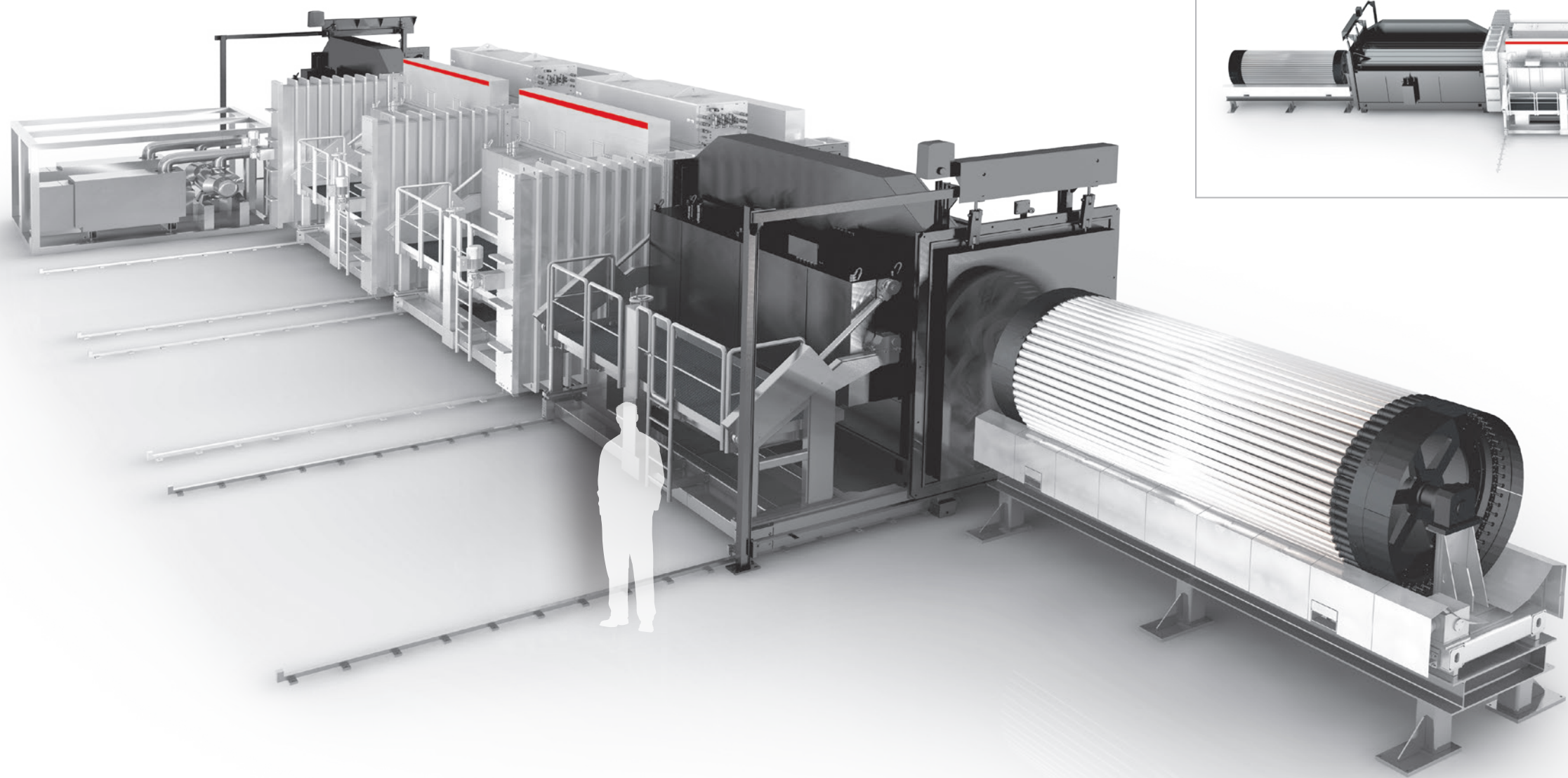


ADVANCED COATING EQUIPMENT

TSS4000 | TUBE SPUTTER SYSTEM

TSS4000 TUBE SPUTTER SYSTEM



APPLICATION

VON ARDENNE has joined the concentrated solar power (CSP) market with its TSS4000 Tube Sputter System several years ago. The system enables the coating of tubes of a standard length of 4 meters for solar power plants. A wide range of different absorber layers can be deposited with the system at a productivity of up to 200 000 coated tubes per year depending on the layer stack. Receiver tubes are among the key components of parabolic trough CSP plants. Their efficiency strongly depends on the quality of the absorber coating on the inner metal tube of the receiver.

The VON ARDENNE TSS4000 meets the highest standards of the industry and provides both high productivity and a low-cost solution.

- High-productivity sputtering equipment for coating stainless steel receiver tubes
- Receiver tubes are suitable for mineral oil or molten salt as heat transfer fluid
- Inline batch-type coater with four chambers
- Highly absorbing multi-layer / cermet coatings and transparent multi-layer coatings
- Coating at higher temperatures (typically at 250 °C)

TECHNICAL DATA

Subject to change without notice due to technical improvement.

SUBSTRATE

Material	stainless steel tubes
Length	4 060 mm to 4 120 mm
Diameter	70 mm (other diameters possible)

CHARGING SYSTEM/CAROUSEL

Number of carousels	6
Tubes per carousel for standard diameter	56 (= 1 batch)
Carousel rotation speed	2 rpm
Tube rotation	each tube rotates at its axis during carousel rotation

PRODUCTIVITY

Cycle time per batch (one carousel)	up to 2 h (depending on layer stack)
Annual productivity	up to 200 000 tubes/year (depending on layer stack)

PROCESS EQUIPMENT

Pretreatment	MF glow discharge, IR heating system, Enhanced H ₂ O pumping by Cryo Generator
Deposition temperature	250 °C (typically)
Deposition type	DC, pulsed DC, MF
Magnetron type	VON ARDENNE single planar magnetron (SSM/WSM), VON ARDENNE dual planar magnetron (SDM)

TARGET

Material	metals, oxides, ceramics (with residual conductivity)
Target length, max.	4 600 mm

PROCESS MEASUREMENT

Process control system VAprocos®	optional
for reactive sputtering	
In-situ optical measurement (reflectance)	optional

UTILITIES & POWER SUPPLY

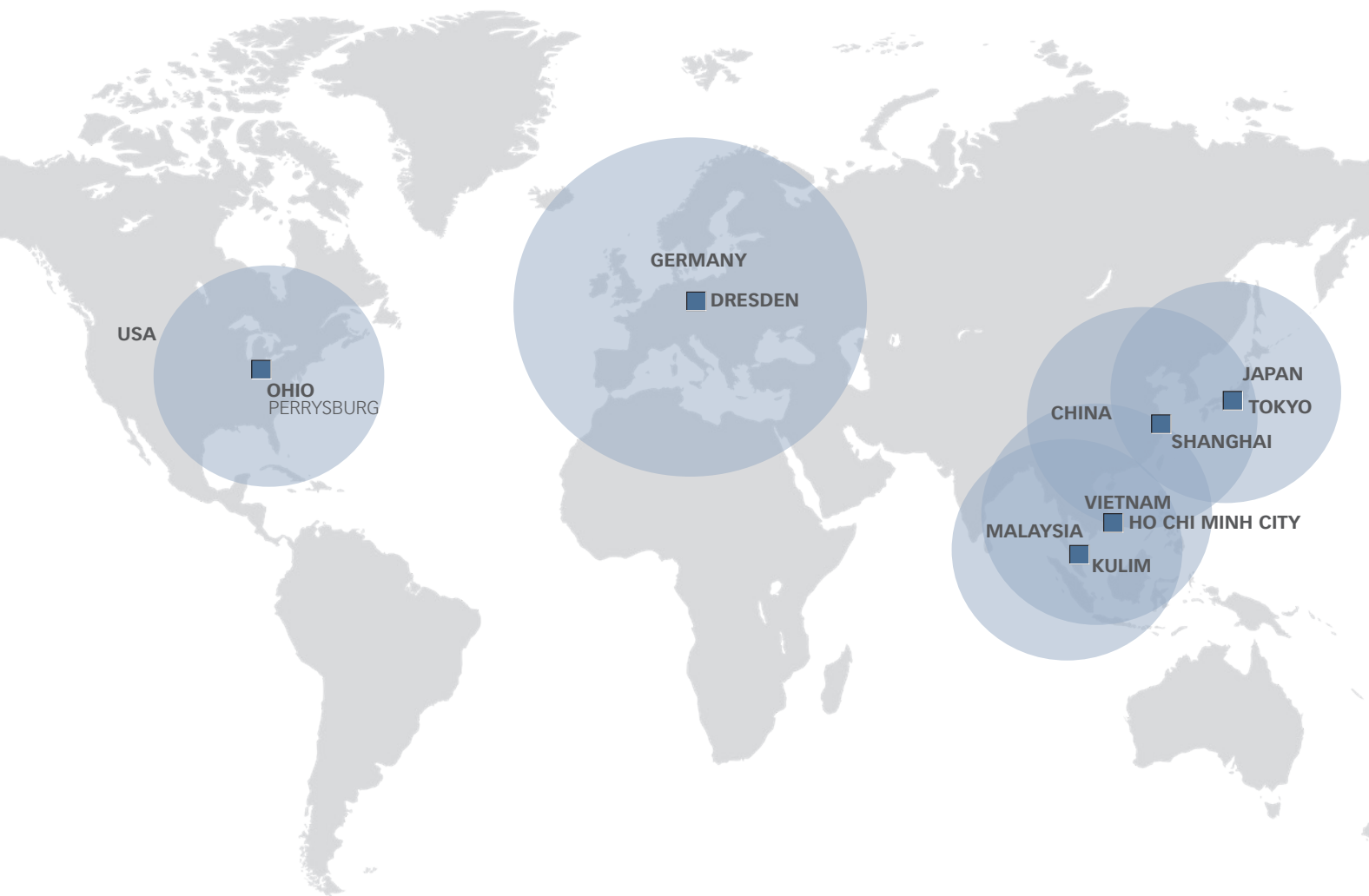
Utilities (phase I voltage I frequency)	3 phases I 230 V, 400 V, 480 V I 50 Hz, 60 Hz
Power, max.	depending on configuration
Average power consumption	depending on configuration
Cooling system	3 closed secondary systems
Venting system	venting valves on each chamber
Venting medium	compressed dry air and/or ambient air
Process gases	cabinets or central supply by customer

SYSTEM CONTROL & SOFTWARE

Computer hardware	PLC, Siemens S7
MES link	possible, according to customer specification

SYSTEM DIMENSIONS

Total system size (L × W × H)	40 m x 16 m x 5 m (approximately)
Total system weight	depending on configuration



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COMPONENTS



www.vonardenne.biz

WHO WE ARE & WHAT WE DO

VON ARDENNE develops and manufactures industrial equipment for vacuum coatings on materials such as glass, wafers, metal strip and polymer films. These coatings give the surfaces new functional properties and can be between one nanometer and a few micrometers thin, depending on the application.

Our customers use these materials to make high-quality products such as architectural glass, displays for smartphones and touchscreens, solar modules and heat protection window film for automotive glass.

We supply our customers with technologically sophisticated vacuum coating systems, extensive expertise and global service. The key components are developed and manufactured by VON ARDENNE itself.

Systems and components made by VON ARDENNE make a valuable contribution to protecting the environment. They are vital for manufacturing products which help to use less energy or to generate energy from renewable resources.



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CONTACTS**



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