



THIN FILM

Equipment and Process Technology
for Thin Film Photovoltaics

— **Solar technology**

— Semiconductor technology

— Microsystems technology

— Medical technology

— Circuit board technology



WELCOME TO THE FUTURE!

SOLUTIONS FOR WET CHEMICAL THIN FILM PV TECHNOLOGIES

RENA offers production equipment and process technology for cost-effective automated mass production of thin-film solar cells. The delivery programme covers all wet-chemical process steps - including handling and automation.

RENA stands for a new generation of process equipment as a result of its intensive research and development into the production of thin-film cells with greater raw material and performance efficiency.

MAXIMUM QUALITY

PROCESS GUARANTEE

HIGH YIELD

HIGH UPTIME

LOWER DEVICE COST PER WP

THE WET PROCESSING COMPANY

THIN FILM SOLAR CELL PROCESSING

CIS/CIGS Processing



CdTe Processing



a-Si:H/ μ -Si Processing



RENA PRODUCTS OVERVIEW

GLASS SUBSTRATES

- PVGlassClean
- PVGlassEtch
- PVGlassCoat

FLEXIBLE SUBSTRATES

- PVFlexxClean
- PVFlexxPlate
- PVFlexxEtch

SUBSTRATE CLEANING

OPTIMISED PRODUCTION
PROCESSES ON GLASS AND
FLEXIBLE SUBSTRATES

HIGH THROUGHPUT

SMALL FOOTPRINT

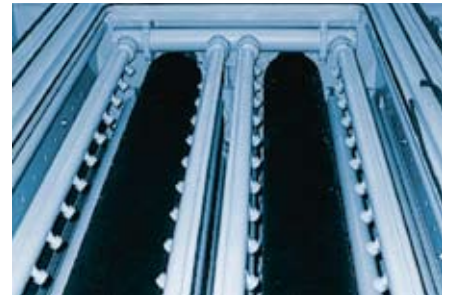
INDIVIDUAL PROCESS SOLUTIONS

UPTIME > 98 %

PVGlassClean

PVFlexxClean

High-performance cleaning equipment with RENA's own process technology ensures optimum cleaning results.



Features and benefits

- Standard and customer-specific substrate sizes up to 2,400 mm
- Inline system
- Modular design
- Brushing technology
- Transport system with lateral guides
- HDF Tsunami Flow for highly efficient cleaning
- Low noise level < 75 dB
- Anti-UV-light equipment design
- Ultrasonic technology
- Substrate breakage rate < 0.01%
- "No tool philosophy" for transport maintenance
- Automatic dosing system for chemicals
- Water recycling system
- Automatic height adjustment for different substrate thicknesses
- Low COO

Application examples

- High-quality cleaning
- Income cleaning



DEPOSITION

INNOVATIVE DEPOSITION PROCESSES FOR GLASS AND FLEXIBLE SUBSTRATES

DEPOSITION ON GLASS SUBSTRATES

DEPOSITION ON FLEXIBLE SUBSTRATES

UPTIME > 98 %

BREAKAGE RATE < 0.01 %

PVGlassCoat

Proven future-oriented process for inline coating of glass and flexible substrates.

PVFlexCoat

PVFlexPlate

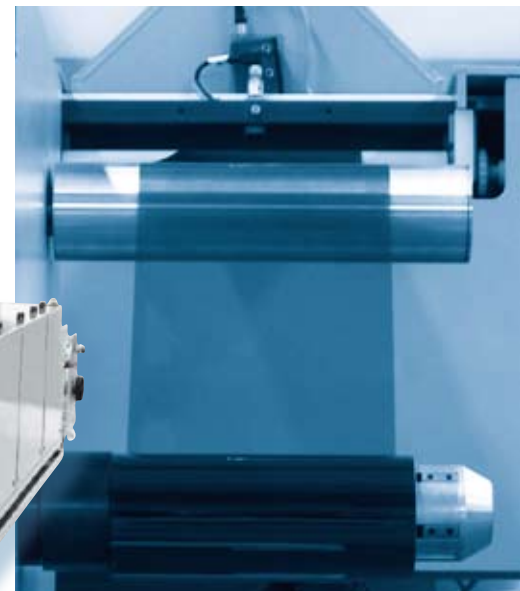
Inline equipment for galvanic deposition (electroplating).

Features and benefits

- Customised equipment solutions
- Standard and customer-specific substrate sizes
- Inline system
- Modular design
- High chemical efficiency
- Transport system with lateral guides
- Customised safety solutions
- Throughput increase by high speed processes
- Deposition process technology

Application examples

- Chemical bath deposition (CBD) for active, buffer and window layers
- Buffer layer (i.e. CdS, ZnS, InS)
- CdCl₂-activating deposition
- Metal stack electro-deposition (i.e. Ga-Cu-In)



ETCHING

PIONEERING TECHNOLOGIES FOR
ETCHING PROCESSES WITH GLASS
AND FLEXIBLE SUBSTRATES

HIGH THROUGHPUT

UPTIME >98%

BREAKAGE RATE <0.01 %

HIGH ETCHING EFFICIENCY

PVWetEtch

PVFlexEtch

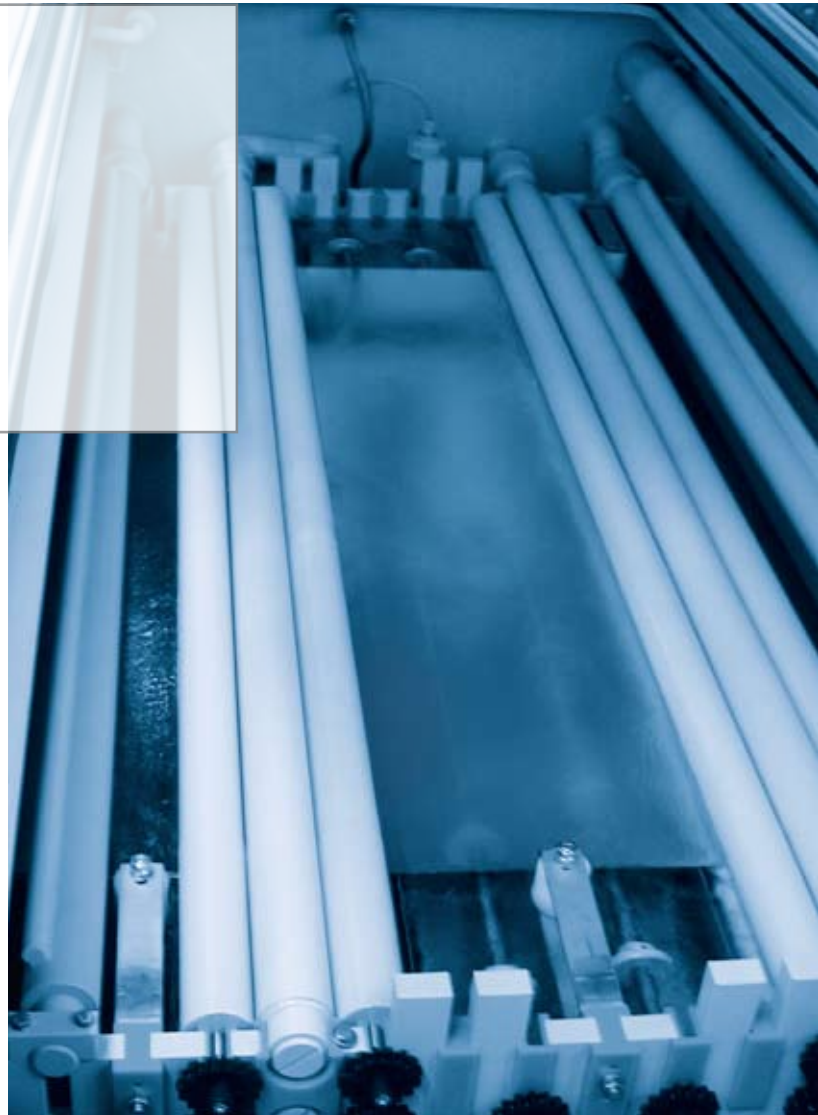
State-of-the-art equipment and process technology offers high etching rates and homogeneous results.

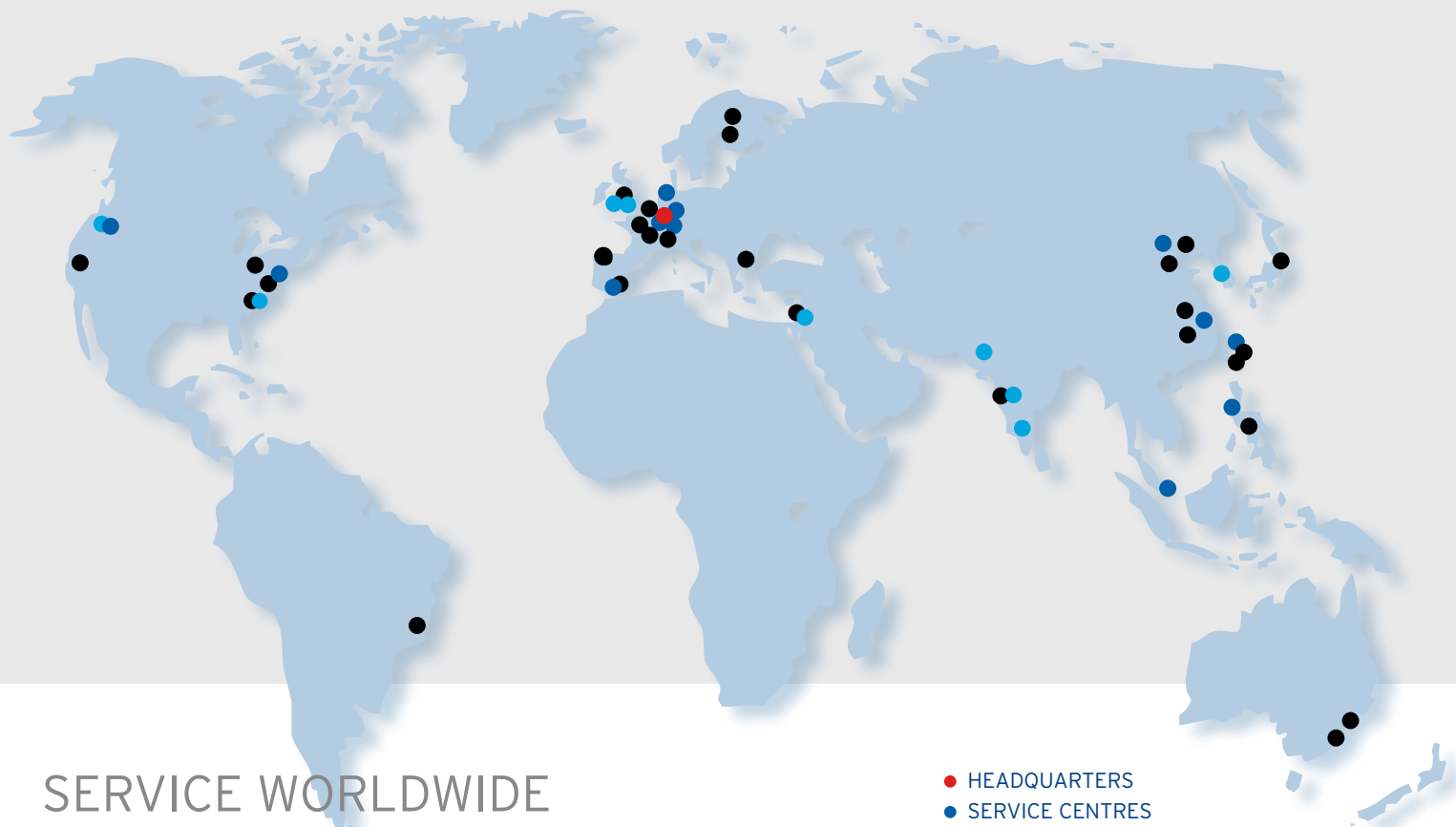
Features and Benefits

- Etching process technology
- Standard and customer-specific substrate sizes
- Inline system
- Modular design
- Transport system with lateral guides
- Customised module integration solutions
- Customised safety solutions
- Double glass covers with safety codes

Anwendungsbeispiele

- KCN etching
- HCl etching after TCO deposition
- "NP" etching (HNO_3 / H_3PO_4)





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CONTACT US TO FIND A SOLUTION
 FOR YOUR CHALLENGE!

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