

VITRUM GEN 2

Inline Wet Process Equipment,
Etching, Cleaning & Single Side Coating for
Thin Film Solar Cells



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Inline Wet Process Equipment, Etching, Cleaning & Single Side Coating



The new VITRUM GEN 2 platform is a modular inline system for the processing of glass substrates. The modular design allows the easy integration of different process steps according to the requirements of CIS, a-Si or CdTe technology (etching, single side and pencil etching, cleaning, single side coating).

As part of the product family VITRUM GEN 2 the new processing machine simultaneously cleans back-sides and edges of thin film solar cells in a single working step. In addition to the automated process control, the new single-side etching tool protects the active layer by process hoods and performs pencil and rear side etching with brushes and chemicals. VITRUM GEN 2 is the only tool on the market that cleans the rear side and the edges in one single step without any harm to the active layers. It is used for cleaning after oven processes as well as for etching of undesirable coatings on rear side and edges, for example CdTe or CdS.

Main Features

- _ New, modular design
- _ Up to 30 % cost reduction
- _ Better accessibility
- _ Smaller footprint
- _ Low cost of ownership
- _ High throughput
- _ High availability (uptime > 99* %)
- _ Standard and customer specific substrate sizes up to 2,600 mm
- _ Parallel carrier transport for higher throughput
- _ Reproducible process results

*depends on application

The VITRUM GEN 2 provides the platform for several different process steps:

At a CdTe manufacturing process it performs six steps, starting with glass washing, back side cleaning CdTe, CdCl₂ deposition using roller and salt removal to glass washing and developer. When producing a-Si/μc-Si and CIS/CIGS cells VITRUM features glass washing as well as TCO etching, KCN etching or NH₃ treatment respectively. In addition it also provides NP, DAE and EDTA etching for substrate sizes up to 2,200.

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In comparison to dipping processes, our unique soft shower process implemented in the second generation VITRUM enables homogeneous, reliable and reproducible etching. It features further advantages in compared to a dipping bath such as a smaller process volume, and therefore faster temperature and concentration changes as well as a higher process speed of up to 5 m/min and minimized carryover.

The new design of the VITRUM GEN 2 improves the accessibility for optimized maintenance work in a large installation cabinet. Piping is similar for all liquid circuits. It offers a high cycle rate and is also easy to integrate into existing production lines. The new VITRUM GEN 2 substantially reduces the investment outlay and very rapidly pays its way.

VITRUM – Clean

- _ Inline cleaning equipment (2200/1400/600)
- _ Pre-rinse and single side brush off (acid/caustic)
- _ Inline final rinse (cascade cleaner), metal free
- _ Inline standard cleaning, polishing and brushing machine (glass corrosion)
- _ Ultrasonic and megasonic support

VITRUM – Etch

- _ Inline etching equipment (2200/1400/600)
- _ Inline TCO (0.3-3 % HCl) etcher
- _ Inline KCN etcher
- _ Inline NP etcher
- _ Inline CuCl_2 etcher
- _ Inline H_2O_2 developer
- _ Inline CdCl_2 salt removal

VITRUM – Backside & Pencil Etch

- _ Inline etching equipment
- _ Removal of wrap around coating on edges and rear side
- _ Active layer protection (no liquid or vapor affects active layer)

Facility Management

SINGULUS STANGL SOLAR also supplies the following facility

management systems:

- _ Chemical supply systems
- _ Chemical mixing systems
- _ Waste water treatment
- _ Exhaust scrubber
- _ DI-water make up



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