

APPLIED MULTILAYERS Advanced systems for research into thin film PV

Applied Multilayers offers a range of systems specially configured for research into thin film photovoltaics. These systems range from affordable load locked systems for sputtering research with small circular six inch magnetron targets through to pilot scale batch systems for full module work with 1.2m magnetrons. Systems can be configured for glass substrates or flexible metal or polymer substrates, including sheet winding facilities. These systems can be equipped with 2, 4, 6 or 8 linear magnetrons each with different target materials to offer full process research flexibility. Larger systems can also accommodate evaporation, K-cells, radiant heating and reactive gas control. Systems from Applied Multilayers offer a number of important advantages for process R&D for thin film photovoltaics:

- The rotating drum substrate carrier allows up to eight linear magnetrons to be located around the

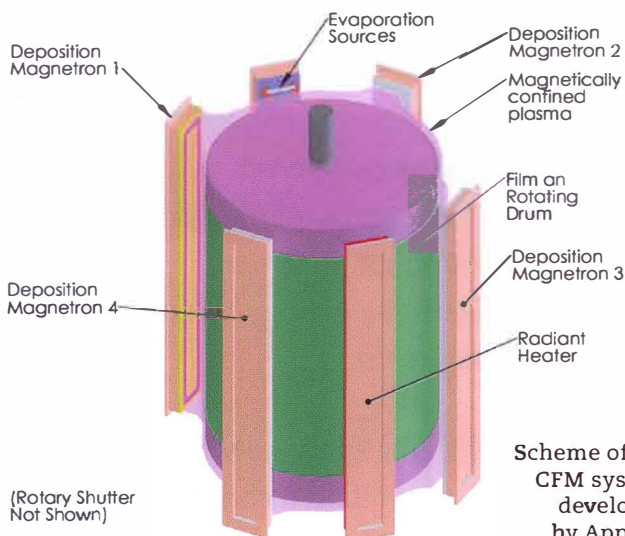


CFM1050 is equipped with 6 or 8 1.2m magnetrons.

chamber walls offering the possibility of using eight different target materials for maximum process flexibility.

- The rotating drum can be specified to coat flat glass substrates or flexible metal or polymer sheet.
- Software allows ultimate process flexibility controlling thin film thickness (time), gas pressure, stoichiometry, thin film microstructure etc...
- Co-deposition from two or more magnetrons.
- Optional incorporation of Thermal Evaporation or K-cell processes.

All systems from Applied Multilayers configure the magnetrons in a Closed Field arrangement result-



Scheme of the CFM system developed by Applied Multilayers.

ing in high plasma density and low bias Voltages. Allowing high deposition rates, the thin films are characteristically dense, stable, low stress and super-smooth.

BOSCH REXROTH TSSolar a new handling system for PV panels

An important aspect in the PV industry is the transfer of materials between the processing stations. The large and sensitive glass panels, which must not be allowed to sag, must be

moved in a manner that is free of all vibrations. With TSSolar, Rexroth has developed a transfer system that satisfies these strict demands and that can be flexibly adapted to a wide range of demands. TSSolar supports the gentle flow of solar panel materials of any required width by using special, fabric-coated toothed belts aligned in many parallel tracks. Long transfer distances are subdivided into shorter segments, each of which has its own drives. Frequency converters provide for delicate braking and accelerating, and gently stop the workpieces at the processing points, or if

AMB APPARATE + MASCHINENBAU

Wet Wafer Separator 3000+ for ultrathin wafers

AMB Apparate + Maschinenbau GmbH is launching the Wet Wafer Separator 3000+, a new high-throughput wafer handling system designed for the thinnest 150 micron wafers in production through to 300 micron-thick wafers. The WWS 3000+ is focused on water bath system integration requirements where emphasis is placed on wafers being handled safely and reliably by gentle separation of the wafers from the stack in the water bath with reduced breakage rates without an impact on high throughput. Problem: The continued high cost of solar-grade wafers due to demand from the PV industry has led to wafer cost reductions focused on reducing the thickness of wafers to current leading-edge thicknesses of 150 microns. These ultra-thin wafers are prone to breakage without correctly selected wafer handling systems specifically designed to limit wastage while enabling high-throughput in volume production applications.

Solution: The loaded carriers are lowered into a water bath. A feeder system brings the stack of wafers automatically to the pickup point. A newly developed pickup system separates the foremost wafer from the stack without any mechanical stress which results in reduced breakage rates. After separation, the wafers are moved out of the water bath to the transfer station along a special conveyer belt with a non-slip surface. The belt creates a large surface contact with the wafers which guarantees a gentle transport.

Applications: Wafer type: multi- and mono-crystalline silicon. Wafer geometry: Square and pseudo-square. Wafer thickness: 150 - 300 micrometers

Platform: With the technology used in the system, wafer damage and breakage is reduced to a minimum. High efficiency separating unit, combined with wafer control units and buffer systems, guarantee high production and yield.