

Ulvac's SIV 200 Reactive PVD tool configured for TCO films

The Ulvac SIV 200 is an inline Interback design reactive sputter tool specifically designed for transparent conductive oxides (TCO) like ITO (Indium Tin Oxide) and AZO (Aluminum Zinc Oxide). These transparent conductive oxides are used in many industries including touch screens for phones, laptops, ATMS etc., OLED displays, solar, material science research, thermal windows, EMI protection and many others.

With a six-carrier stocker, the SIV 200 is fully automated to run (18) six inch wafers making it ideal for low level or pilot production lines that demand highly repeatable, high yield processes. The single source Rf magnetron provides a stable plasma at most power levels without fear of arcing or heat defects on the target. The Rf magnetron features a variable speed moving magnet which provides a uniform, stable, repeatable process (not to mention uniform target wear) that is ideal for university environments where different less experienced operators get the same stable plasma under a plethora of process conditions.



System Specs:

- System is optimized to deposit transparent conductive oxides like ITO and AZO
- The SIV 200 can process substrates that fit on a 200 x 450mm carrier.
- System includes a stocker for automatic processing of six carriers (holding (3) 150mm wafers) so can process 18 wafers automatically.
- System uses side sputter technique to minimize particle generation. Carriers are set on edge with the cathodes and targets perpendicular to the floor .
- System utilizes a L/L and a vacuum system with 10 inch cryo pumps and 10 inch conductance to quickly achieve a low base and crossover pressure, increasing throughput
- System uses process cooling water to keep the cathode/targets, pumps and power supplies at a constant temperature.
- System uses an Rf magnetron powered by an A/E Pinnacle Plus 5k 13.56 MHz Rf generator and match. The magnet moves across the target via a worm drive mechanism that has variable speeds.
- The deposition thickness is inversely proportional to the carrier speed which is programable and precisely controlled by a motorized belt drive.

Features and Benefits of Rf Magnetron Design:

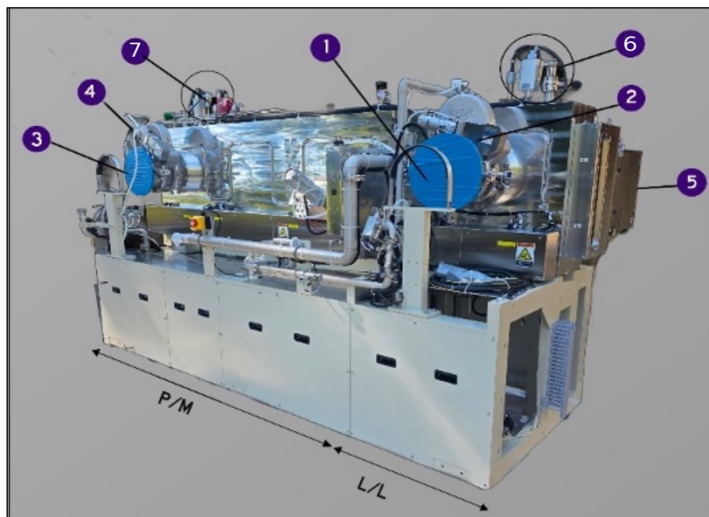
- Rf magnetrons provide Inherently stable, low-arc sputtering for semi-insulating ITO targets
RF power prevents charge buildup on the target surface, enabling smooth ignition and highly stable plasma operation even under oxygen-rich reactive sputtering conditions.
- Improved film uniformity and extended target life
The moving magnet mechanism sweeps the erosion zone across the target, reducing localized wear, suppressing nodule formation, and delivering consistent ITO thickness and properties.
- Operator-friendly performance for research and shared lab environments
RF magnetron operation is forgiving of recipe changes and power transitions, making the system easy to run, highly repeatable, and well suited for universities and R&D facilities.

System Specs

- Ulvac SIV 200
- Inline sputter configured for ITO

VACUUM COMPONENTS

1. Ulvac Cryo-U10HSP
2. VTEK Penduroll gate valve
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4. VTEK Penduroll gate valve
5. VTEK Twinrollcam gate valve for stocker - L/L interface
6. PM vacuum guages
All L/L guages + MKS capacitance Manometer
7. L/L Vacuum Gauges
Ulvac G-Tan SH2 ion gauge
Ulvac G-Tan SPI pirani guage sensor
SMC ZSE80F-A2-R-M



Vacuum side of L/L & P/M

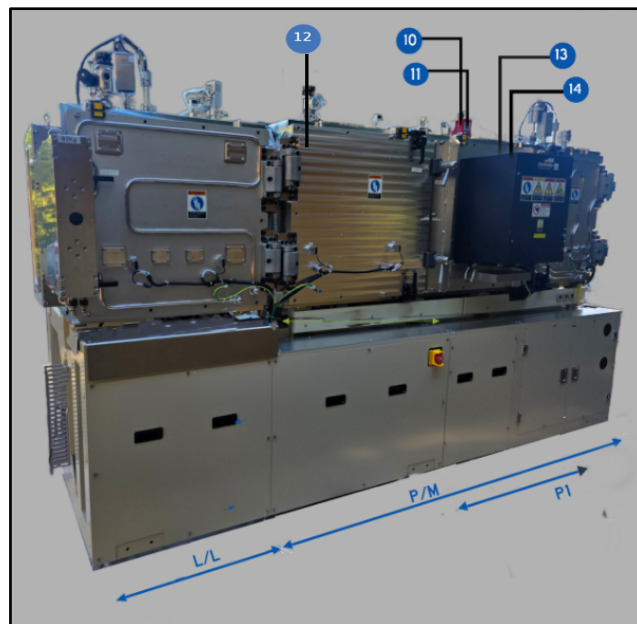


REMOTE VACUUM

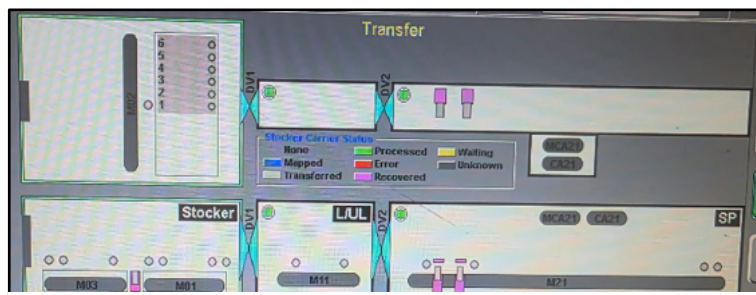
8. Edwards iXL 1000N
9. C30FX cryo compressor (both shared L/L, PM)

PROCESS SIDE

10. STEC Ar mfc (200sccm)
11. STEC O2 mfc (5 sccm)
12. VTEK Twinrollcam gate valve for L/L-PM interface
13. Rf Magnatron with variable speed moving magnet
- A/E Pinacles Plus 5kW 13.56 Rf generator (not shown as housed in PDCU)
14. A/E Rf match.



Process side of L/L & P/M



Software icons Top and side view showing transport system (with drives) for stocker, L/L and PM



Inside of Rf Magnatron