



Advancing Plasma-Based Technologies

PLASMIONIQUE

À l'Avant-Garde des Technologies Plasma

MAGNION Series Sputter Deposition Systems and Cathodes



MAGNION Series of Sputter Deposition systems offer Turnkey Integrated Systems for Research and Manufacturing. **MAGNION** series sputtering cathodes have the highest target utilization Efficiency. Choices of Balanced and Unbalanced Magnetrons in Circular or Rectangular shapes are available for all sizes.

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System Characteristics

Chamber: *Cylindrical, D-shaped or box chambers with depth or diameter ranging from 12" to over 24", typically, made of stainless steel 316 are available. Chambers include liners for simple maintenance.*

Access Ports: *Options for a quick connect port, a split chamber with electrically controlled hoist and Load-lock access are available. For service ports, in addition to pumping, vacuum gauge and visualization ports, user requested ports for diagnostic applications could be included.*

Pumping System: *Flexible. Typically, a turbomolecular pump or a cryogenic pump, backed with a two stage mechanical pump, equipped with mist trap, is included. Option for a dry pumping system is available. Typical base pressure is 10^{-7} - 10^{-8} torr.*

Vacuum Gauges: *Full range pressure gauge and an optional Capacitance gauge for process control.*

Pressure Control: *Throttle valve and user defined number of gas flow controllers are included.*

Gas Flow Control: *Typically, two gas injection zones are included. A gas flow panel with user defined number of mass flow controllers is included. The gas mix and gas injection zones could be controlled with manual and electropneumatic valves.*

Magnetron Cathodes: *Three basic types of Magnion Cathodes are offered. The choice of magnetron cathode is often made with typical applications in mind. Cross contamination shield and shutters are included in all multigun deposition systems. If in doubt, please feel free to consult our experts .*

Power Supplies: *DC, pulsed DC and RF generators (user defined) are included.*

Quartz Thickness Monitor: *Optional, but recommended. Note that absolute measurements would require priori calibration.*

Sample Stage: *Flexible size. Controlled sample heating is included. Sample motion for improved uniformity is integrated. Options for biasing is also available.*

Control System: *A sophisticated hybrid computer and PLC control system, with numerous SAFETY interlocks is included.*

Required Utilities:

Electrical Panel: *110 VAC, 100 A, 50/60 Hz, Single Phase with breakers included on control Cabinet*

Cooling: *Low conductivity Water, 1-2 GPM flow, User supplied*

Air: *40-80 PSI User supplied*

Pumping Exhaust: *User supplied*

MAGNION Magnetrons

PLASMIONIQUE offers 3 generic categories of Planar Magnetron Sputtering Cathodes:

MAGNION-B

A Balanced Magnetron sputtering Source

MAGNION-UI

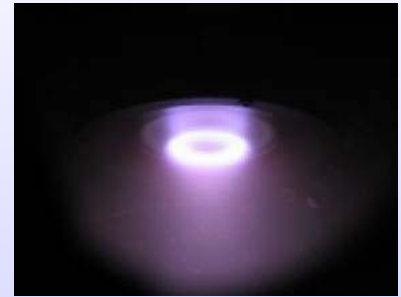
An Unbalanced Magnetron sputtering source of Type 1

MAGNION-UII

An Unbalanced Magnetron sputtering source of Type 2

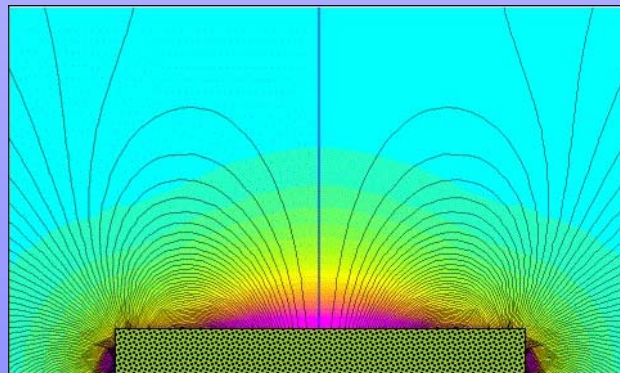
The three categories are distinguished by the shape of the magnetic field lines.

The choice of magnetron could influence the deposition process.



Differences Between the Three Models

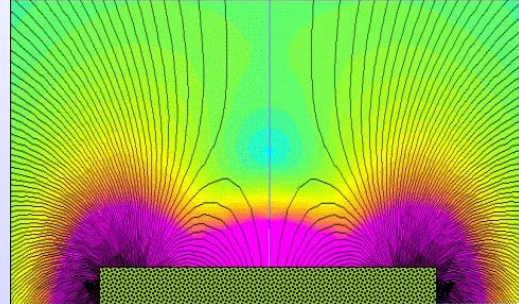
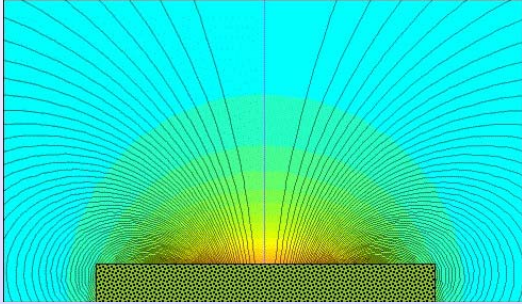
Balanced Magnetrons, to a very large extent, confine the plasma to near the cathode surface. This makes them useful as a general purpose sputtering sources. They are most suitable for deposition on polymers or substrates that require to be maintained at low deposition temperature. Confining the plasma prevents the flow of energetic ions and electrons to the sample.



Magnetic field structure for a balance Magnetron

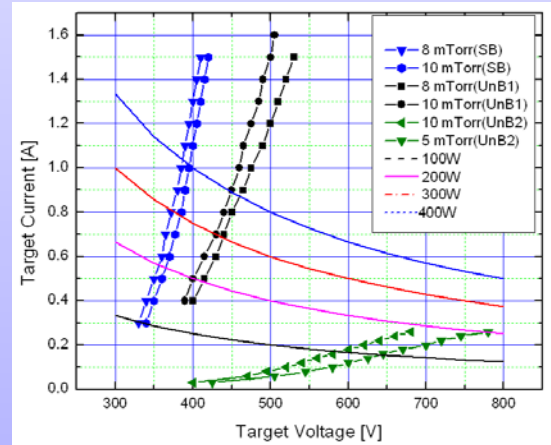
MAGNION Magnetrons

Unbalance Magnetrons have some open field lines, which allow electrons to escape from the plasma confinement zone (plasma expansion). The interaction of the expanding plasma with substrate influences the coating characteristics.



Magnetic field structure for unbalance Magnetrons of types 1 & 2

The magnetic field structure influences the I-V characteristics of the cathode. These variations are shown in the graph for a 2" circular magnetron, operating with DC bias, under two different operating pressures.

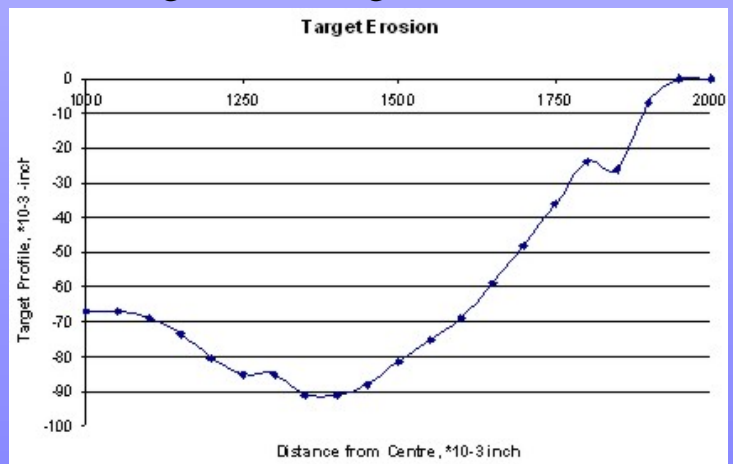


The Magnetic Field Configuration also influences the target utilization efficiency. As an example, in the following we have shown the erosion profile for a design of a 2" Unbalanced Magnetron Cathodes, which yields high target utilization efficiency, in excess of 50%. Larger diameter targets offer higher utilization efficiency.



If you need help, consult your local representative or contact our expert at

“info@plasmionique.com”



Ordering your *MAGNION*

Please build your magnetron model using the following format.

MAG-TY-S1-S2-MOUNT-MAT-G-CS-SH

<i>TY</i>	<i>S1</i>	<i>S2</i>	<i>MOUNT</i>	<i>MAT</i> *	<i>G</i>	<i>CS</i>	<i>SH</i> **
					Integrated Gas Injection	Cross Contaminatio	Shutter
B - Balanced	L - Length or	W - Width or	T - Tube	N -non magnetic	0- Not included	In- 0 - without	0- No shutter
U1 - Unbalanced Type 1	R - Radius	0	F - Flange	M - magnetic	1- Included	1-With	1- Manual
U2 - Unbalanced Type 2							2- Automatic

* For Magnetic Materials Unbalanced Magnetrons of Type 2 are not suitable

** For Magnetrons with Shutter, Flange mounting must be selected

Example for Selecting a Magnetron

Model **MAG-B-10-T-N-100** : 1" circular magnetron with Tube (for compression mounting) for non-magnetic materials, with local gas injection without a cross contamination shield and without a shutter

For MAGNION series multigun sputter deposition systems please use the following format to build your model

SPT-N-S1.S2.-HY

N- is the number of Magnetrons

S1.S2 - size of the magnetrons as described above

HY (S/H)- If letter H is used implies hybrid system, where one of the magnetrons is replaced by a Plasma (or Ion) source

Example

SPT420-H : Multigun sputtering system with 3 circular magnetron of 2" diameter and a Plasma/Ion source

SPT330-S : Multigun sputtering system with 3 circular magnetrons of 3" diameter

For all price enquiries please contact your local representative

For technical Information contact "**info@plasmionique.com**"