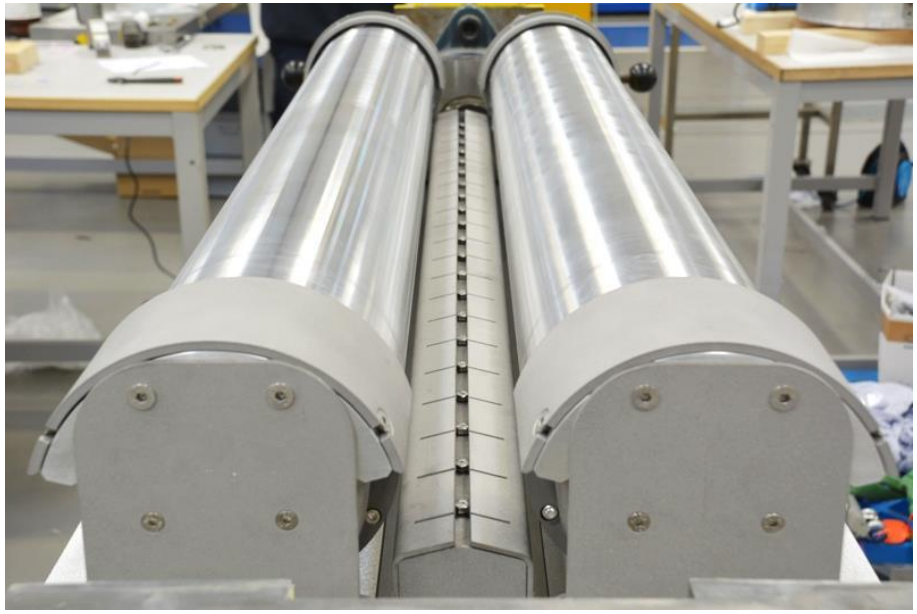
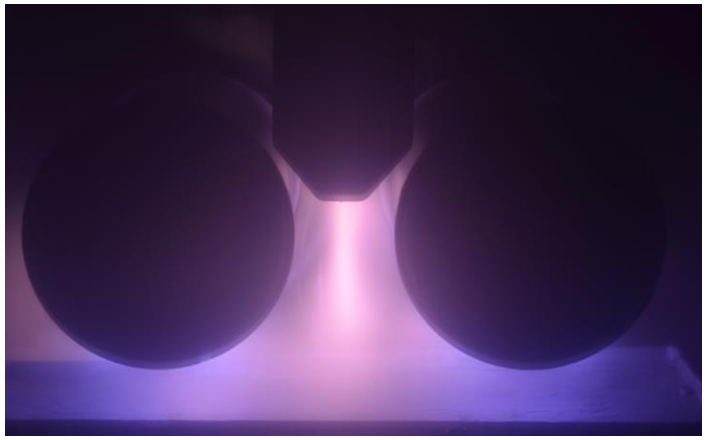
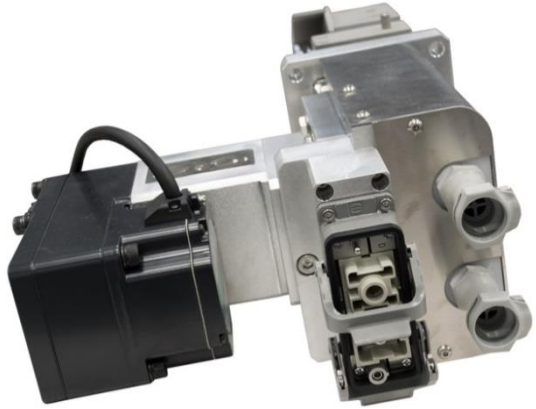
GRSM midsize drop-in rotatable end-block

- ***Components or Process Ready Modules with Process Tuning Available***

Rotatable Sputtering Solutions for Displays and Precision Optics

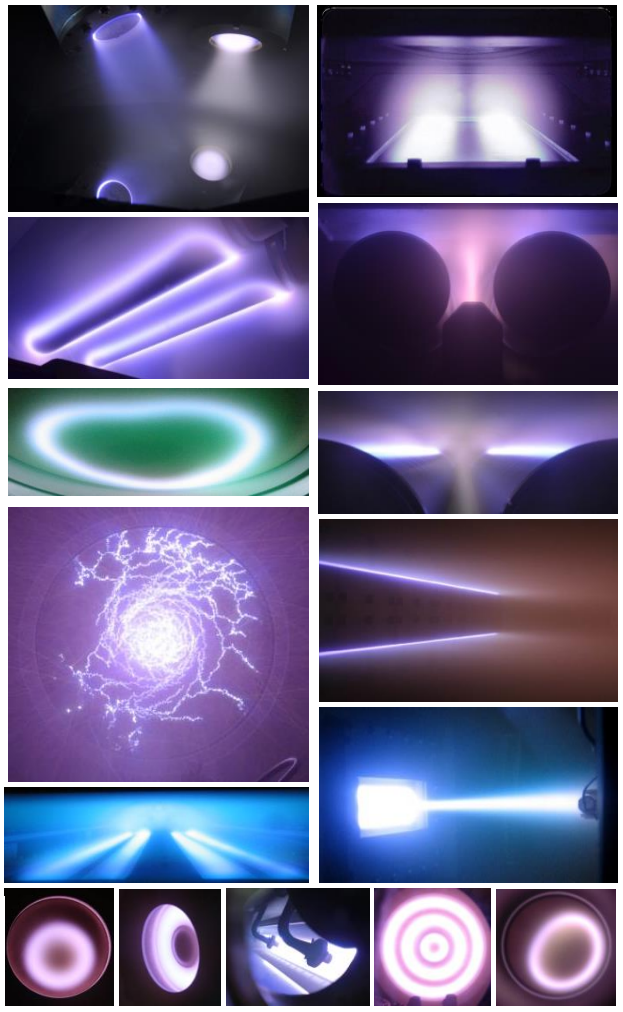


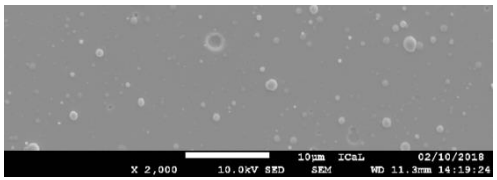


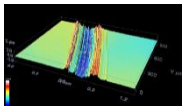


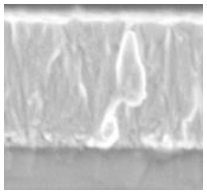
23 Years of of Products and Technology from Gencoa

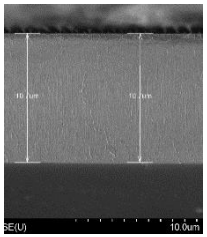
Rotatable & Planar Magnetron Sputter Cathodes • Retrofit magnetic packs • Plasma Treaters • Speedflo Reactive Gas Controllers • IM Ion Sources & power supplies • Arc MAX sources & power supplies • Active Anodes and Gas Delivery Bars • OPTIX Gas and Chemical Sensing • S and Se Sensor • PEC Pulsed Effusion Cell • V⁺DLC - Transparent DLC • IC Nano antimicrobial layer technology • Process implementation & tuning •

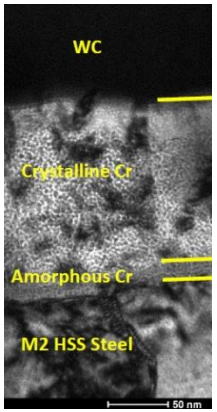


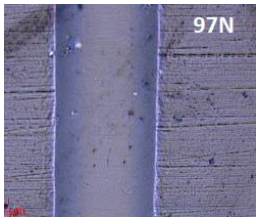


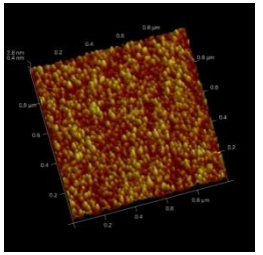


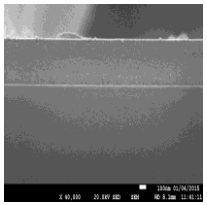


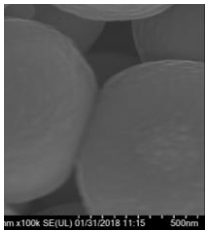


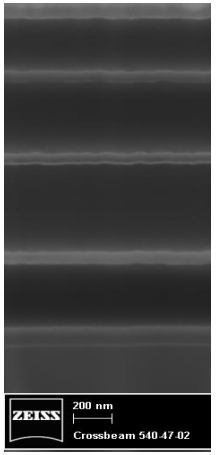


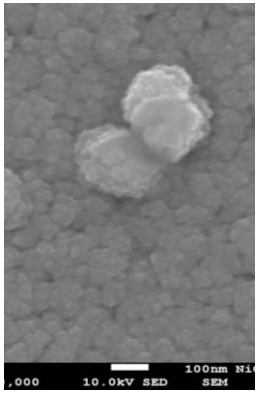












Gencoa Rotatable System GRS end-blocks

GRS-S

GRS-V

End Block	Target Diameter	Target Length	Power
Gencoa GRS-S Ultra compact drop-in flange plate mounted	75, 90, 100/105mm	0.15 to 1.2m – target weight and orientation dependant	40 kW
Gencoa GRS-C Side mounted - cantilever	75, 90, 105, 152-165mm	0.15 to 1.2 m pure cantilever Upto 2.4m with outer end support	>100 kW
Gencoa GRS-M Drop-in flange plate mounted	75, 90, 105, 152-165mm	≤ 1.8 m vertical (up) ≤ 2.5 m horizontal with end support	<100 kW
Gencoa GRS-V Top mounted hanging down	75, 100/105, 152-165mm	≤ 2.5 m vertical	>100 kW

GRS-M

GRS-C

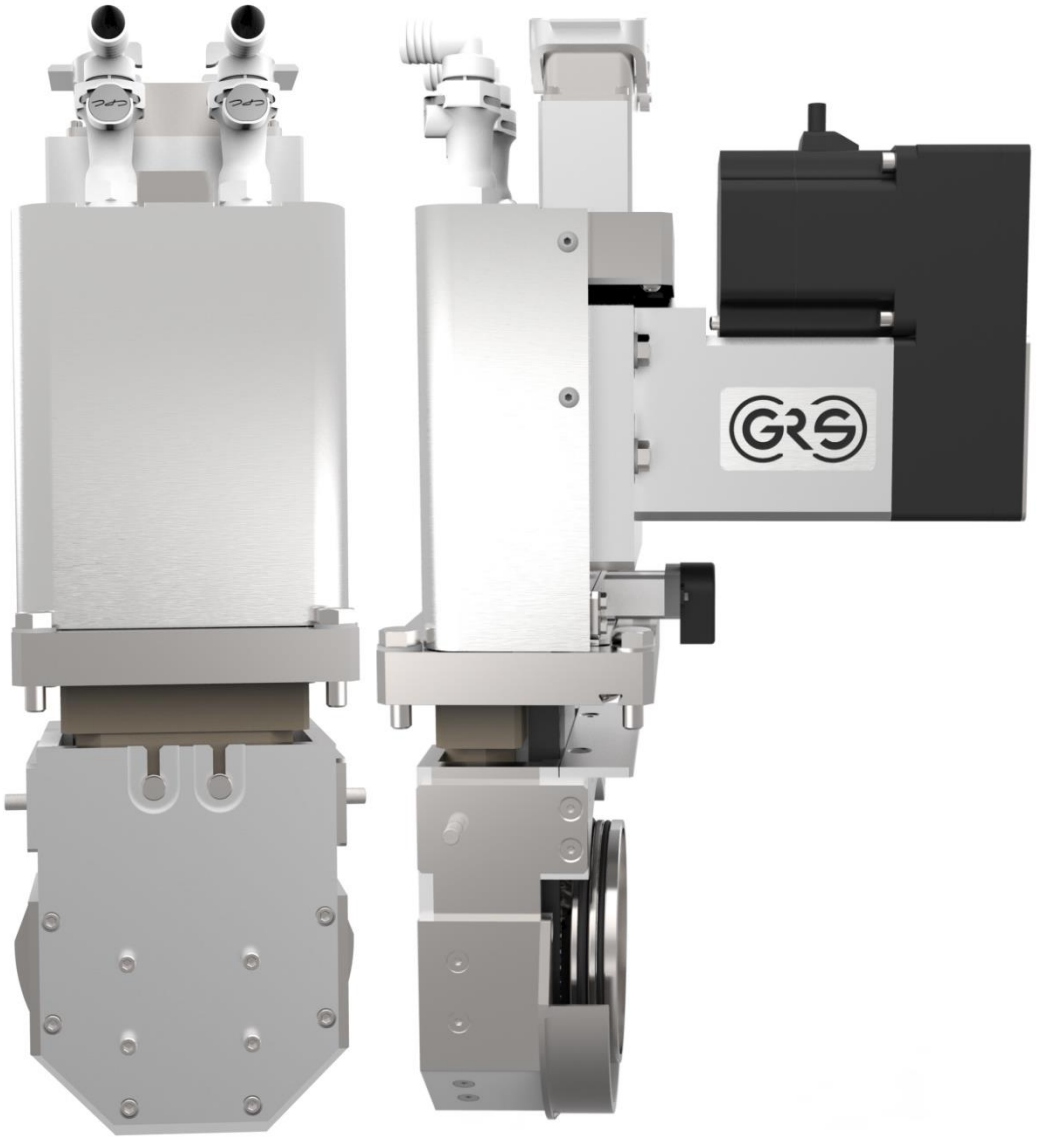
Gencoa Rotatable System GRS-M for drop-in mounting

Gencoa GRSM drop-in end-block is a low maintenance mid-sized product for use in vertical or horizontal orientations

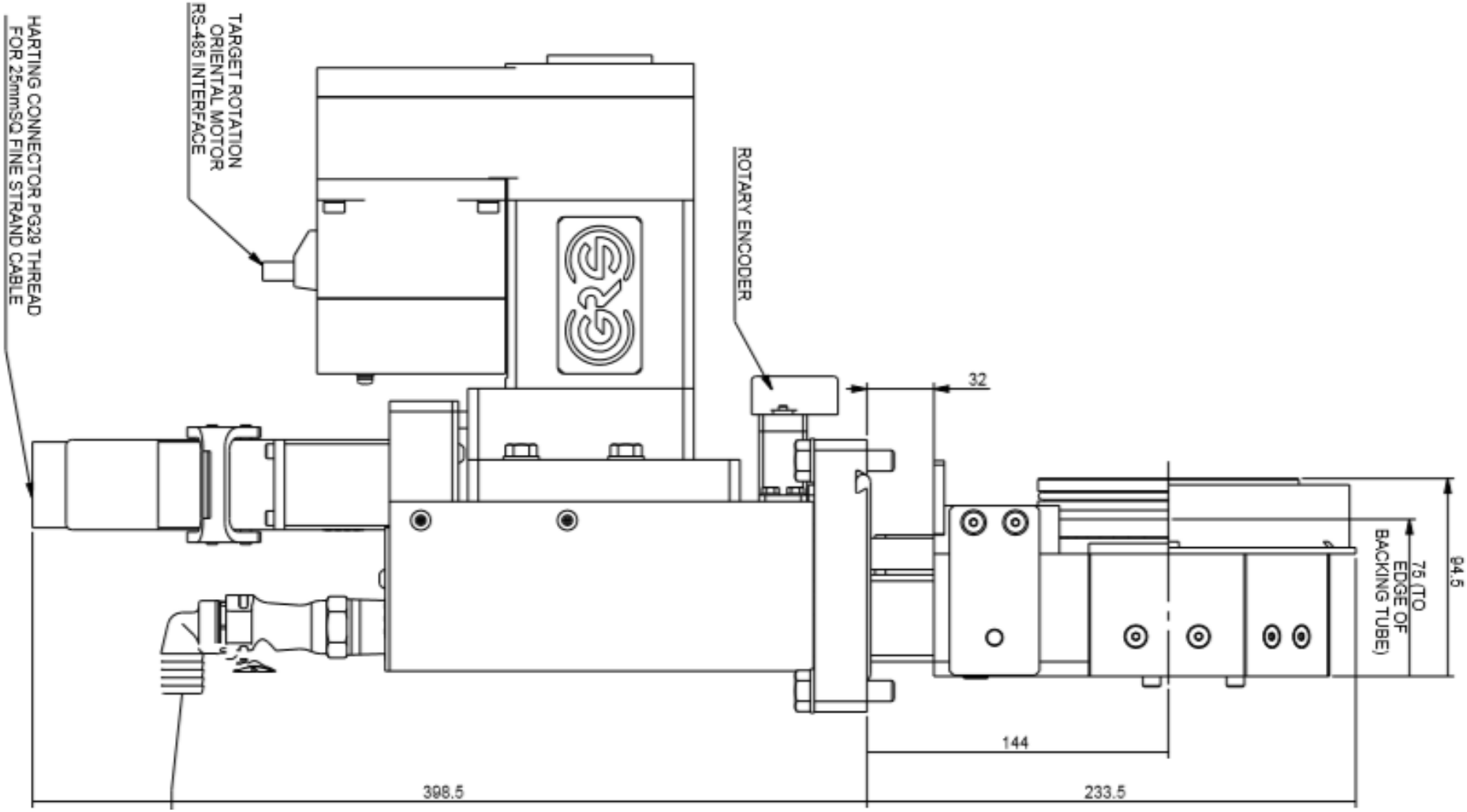
- Up to 180Amps of current ~ 100 kW of power, DC/AC, 0-250 kHz
- 5 kV DC voltage capacity, 2.5 kV AC
- Targets up to 2.5m long, out-bound support recommended in all arrangements
- Gencoa patented in-vacuum target rotation
- Fully EMC shielded
- Sealed unit – no debris or water ingress from atmosphere side
- Harting type power connection
- Rotation encoder
- Helium leak rates in the $<5 \times 10^{-8}$ mbar l/s range

Gencoa Rotatable System GRS-M for drop-in mounting

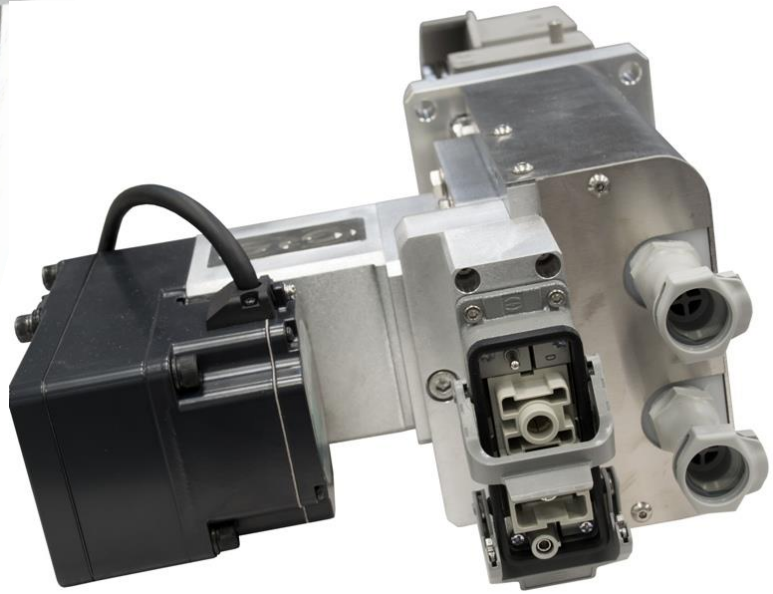
- Auto shut-off insulated water connections
- Precision location of floating shield with target clamp covering to reduce charge build-up & arcing
- Optional load support brackets – for higher target loads
- Optional water cooled floating shield – additional cooled part to connect to existing shield
- Just ***75mm*** wide to the edge of the target backing tube for extra target length and better process uniformity



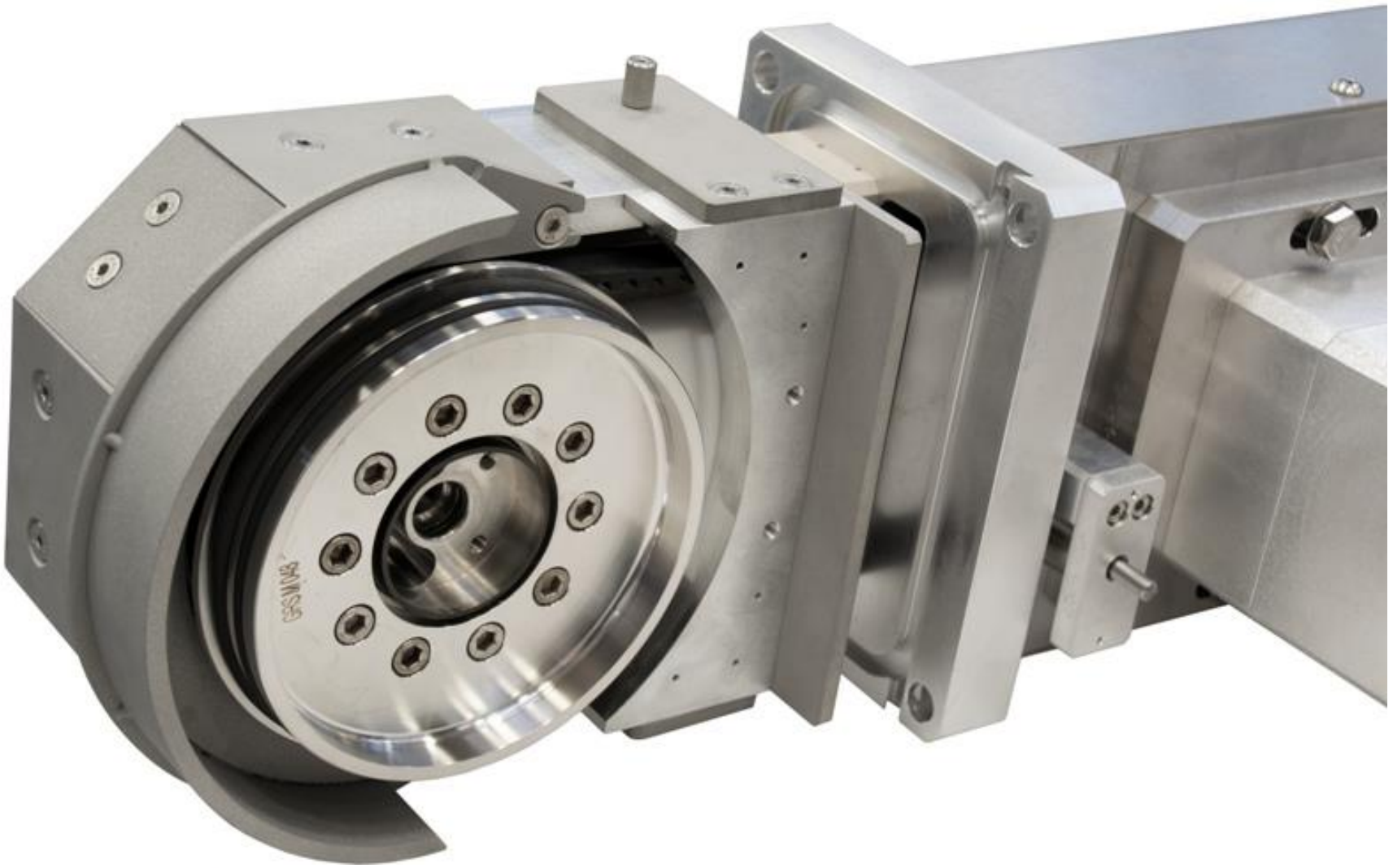
Gencoa Rotatable System GRS-M for drop-in mounting



Gencoa Rotatable System GRS-M
Mid Sized Drop-in End Block



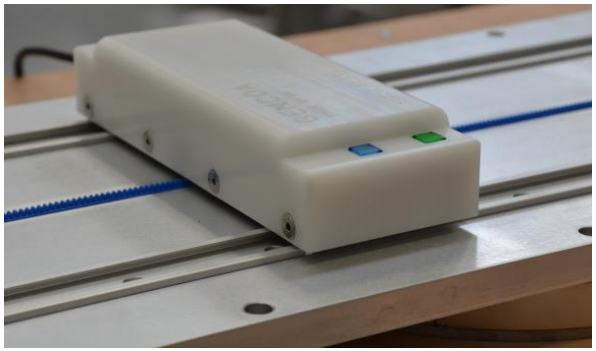
Gencoa Rotatable System GRS-M
Easy servicing and maintenance



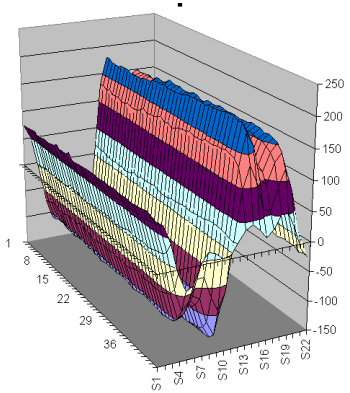
Gencoa magnet bars with pre-tuned and scanned magnetics fit all types of end-block

Mounted on ‘free-span’ HU high rigidity support tubes
Typical Magnetic Array Process Recommendations

Process Type	Magnetic Array	Active Anode
DC high rate metallizing	SSR 550 Gauss	Connected to DC +ve
DC ceramic ITO	SSR 550 or HSR 1000	Connected to DC +ve
Reactive oxides dual AC or square wave switching	SSR 550 or SAR 550	1 and per single or dual connected to earth
Reactive oxides / nitrides single or Duals DC pulse	SSR 550 or SAR 550	1 and per single or dual connected to DC +ve
Magnetic Materials	HSR 1000 or HAR 1000	Connected to DC +ve

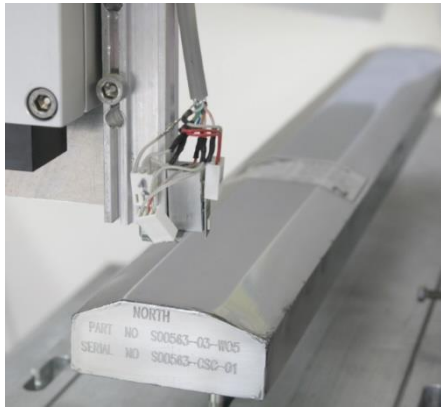


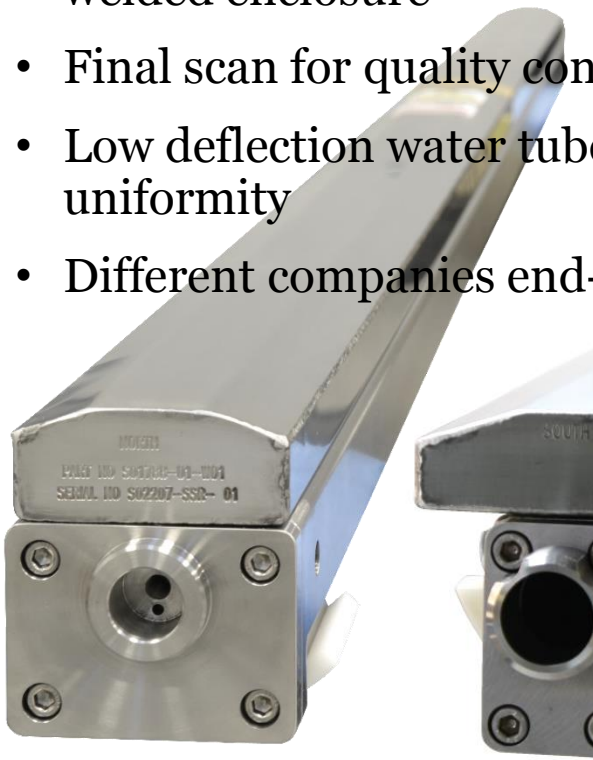
Codes	
Balanced 150	SSR
Balanced Asymmetric 150	SAR
Unbalanced 150	PSR
Unbalanced Asymmetric 150	PAR
High Strength 150	HSR
High Strength Asymmetric 150	HAR
Balanced 75, 90, 100	GSW
Unbalanced 75, 90, 101	GPP
High Strength 75, 90, 102	GSH

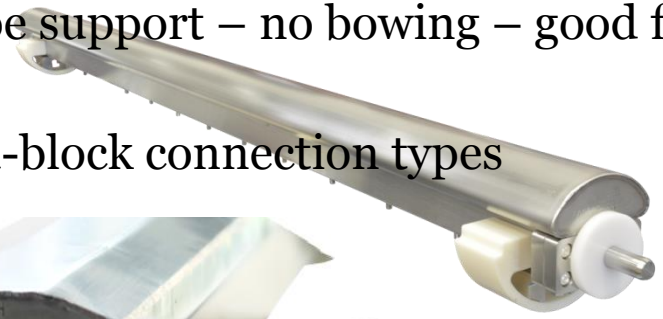


Gencoa magnet bars with pre-tuned and scanned magnetics fit all types of end-block mounted on standard or ‘free-span’ HU support tubes

- Variable magnetic bar designs – 550, 750, 1000 Gauss. Unbalanced designs. Mag bars for 152 & 75 to 105mm OD
- Pre-checked magnets, precise alignment, no water contact – welded enclosure
- Final scan for quality control and uniformity checking
- Low deflection water tube support – no bowing – good field uniformity
- Different companies end-block connection types



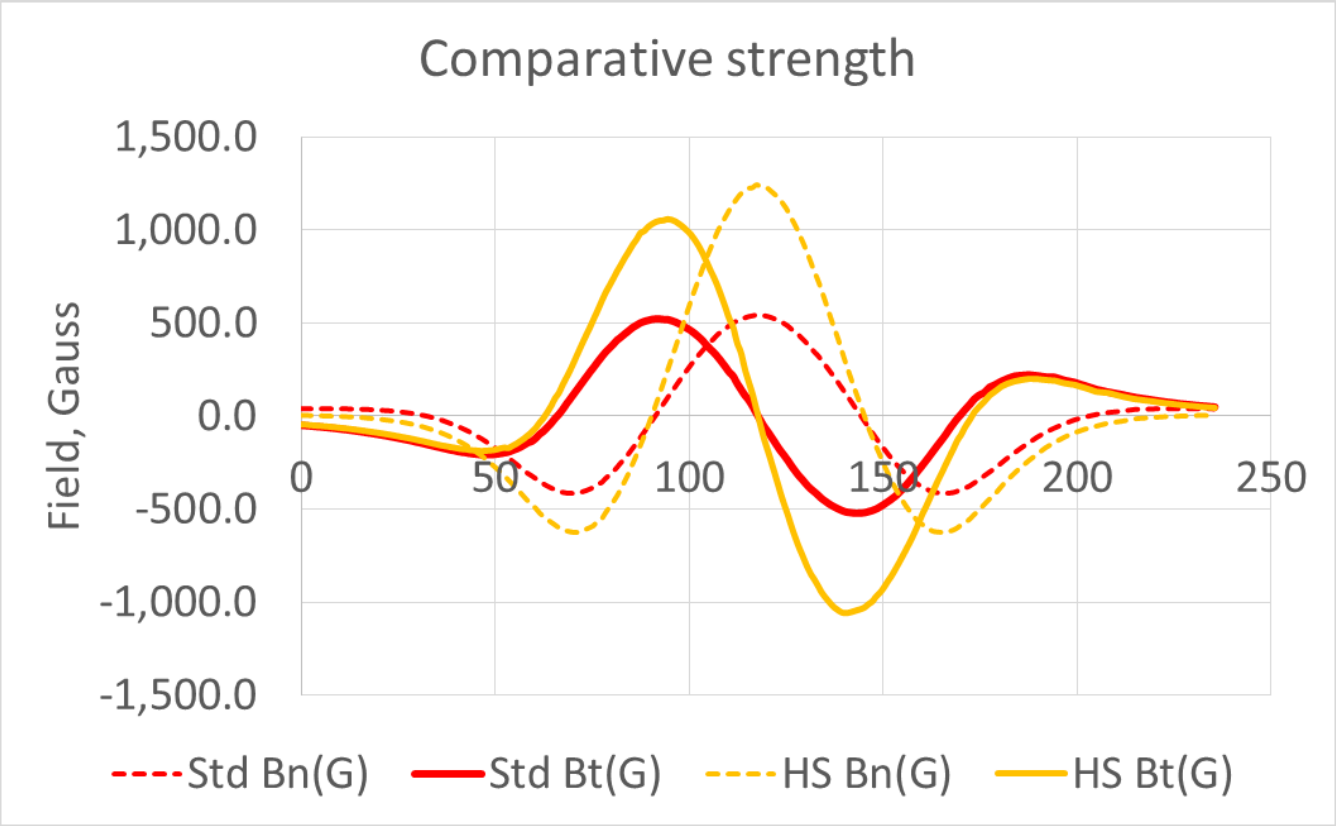


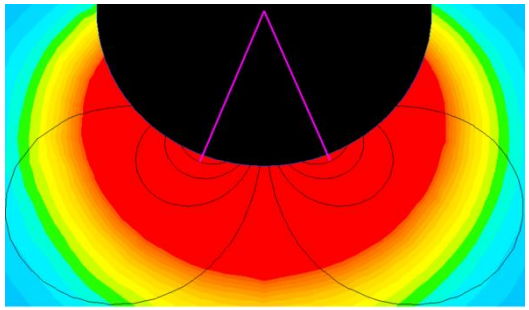


Different magnetic and anode designs for rotatable magnetrons based upon needs

One solution does not fit all for optimum production!

Rotatable Series	150						75			100		
Array Type	HSR	HAR	SSR	SAR	PSR	PAR	GSH	GSW	GPP	GSH	GSW	GPP
Angle	±21°	±21°	±20°	±20°	±19°	±19°	±35°	±32°	±22°	±17°	±16°	±11°
Strength	1000G	1000G	540G	540G	540G	540G	700G	400G	350G	700G	400G	350G





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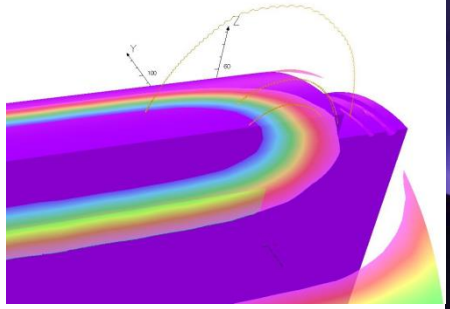
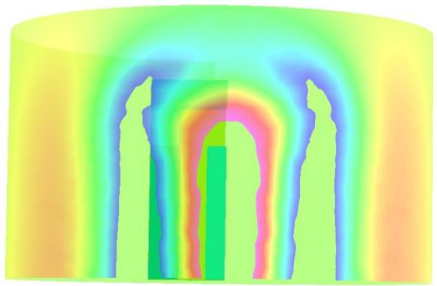
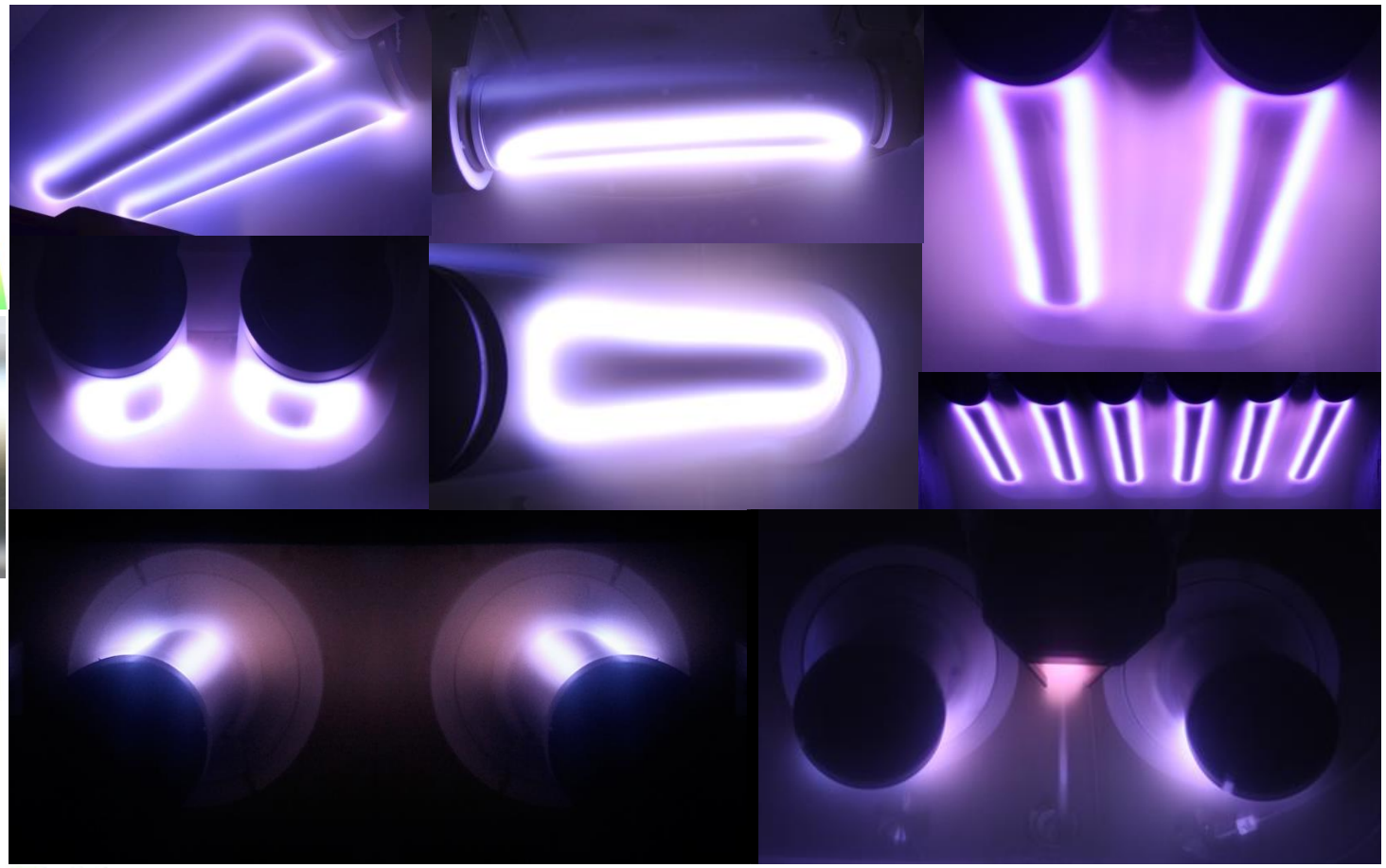
Balanced Asymmetric 150	SAR
Unbalanced 150	PSR
Unbalanced Asymmetric 150	PAR
High Strength 150	HSR
High Strength Asymmetric 150	HAR
Balanced 75, 90, 100	GSW
Unbalanced 75, 90, 101	GPP
High Strength 75, 90, 102	GSH

GRS different processes by switching the magnetic pack – DC, AC, RF/DC, PECVD available in target diameter from 75 to 160mm.

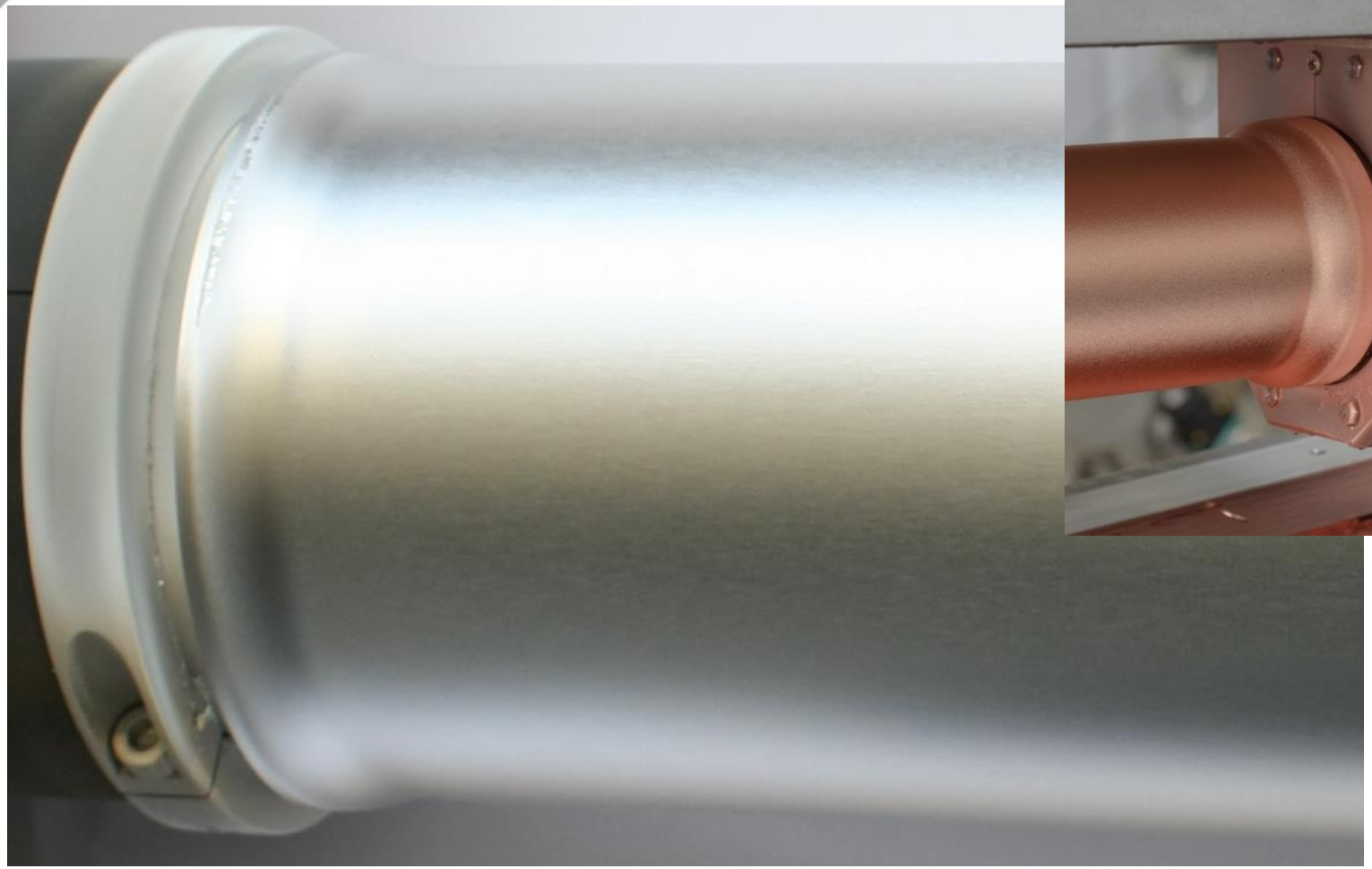


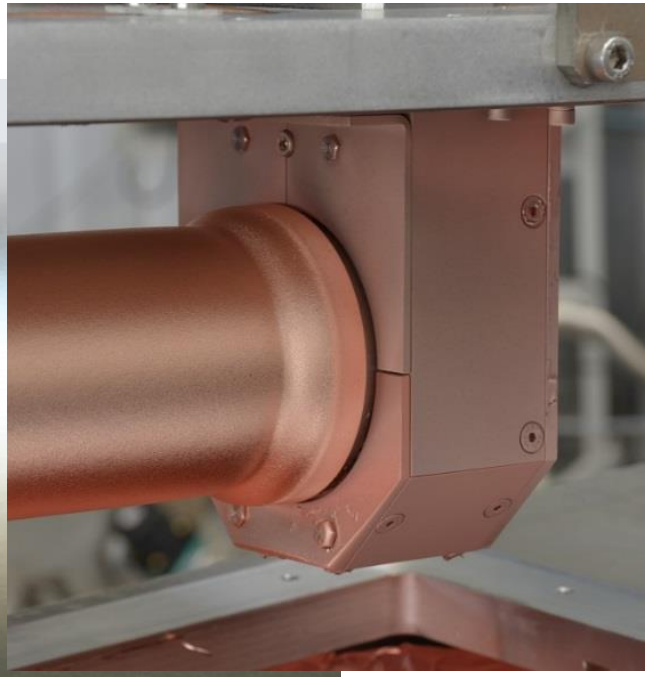




Uniform erosion of target with minimum re-deposition, Al_2O_3 process

Erosion to the target ends even in reactive mode

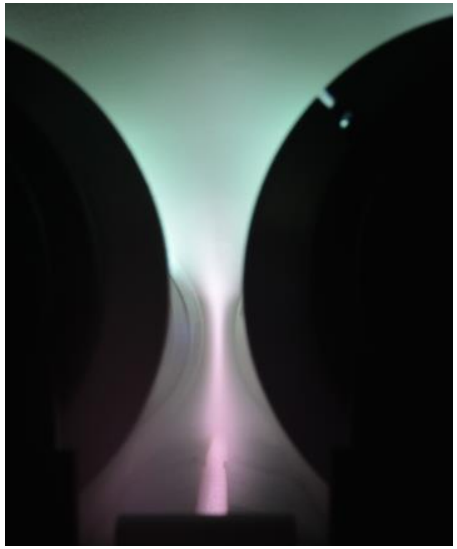
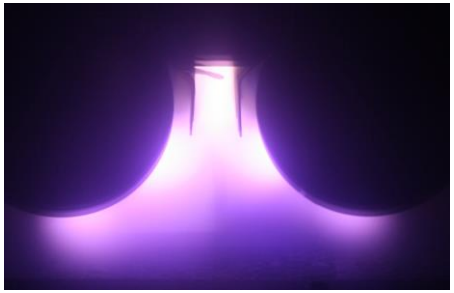
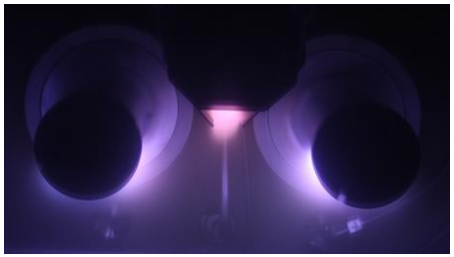
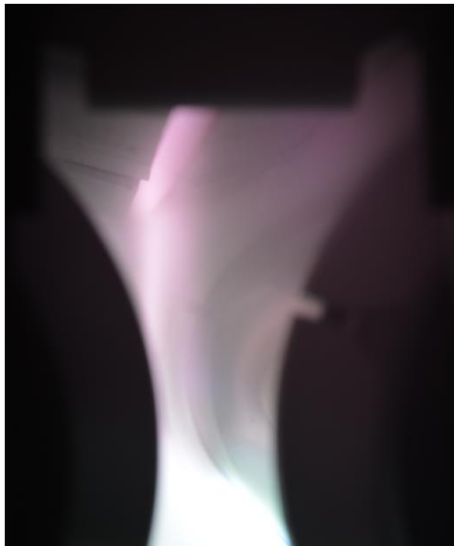




Gencoa have developed and patented a method to provide an effective anode away from the coating flux that can collect all electrons escaping the plasma

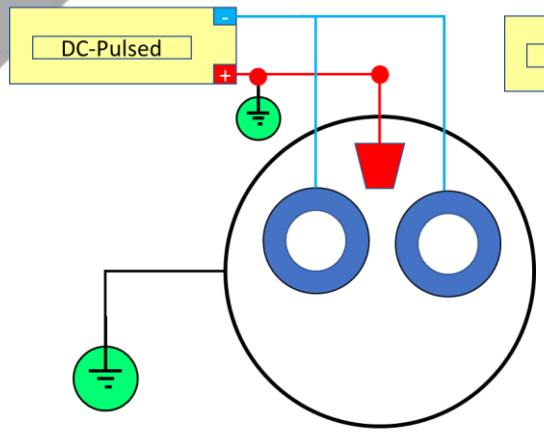
The method effectively combines magnetic trapping with electrostatic attraction of electrons

- The magnetic field from a single or double magnetron (shown) combined with the magnetic field of the anode to form a closed trap for the electrons to guide them to the anode – electrons do not possess sufficient energy pass the field lines and escape the trap.
- The anode can be at varying potentials but the most convenient and cost effective method is to have the anode at earth potential.
- For example, when used with AC power between two targets, the active anode improves process stability.

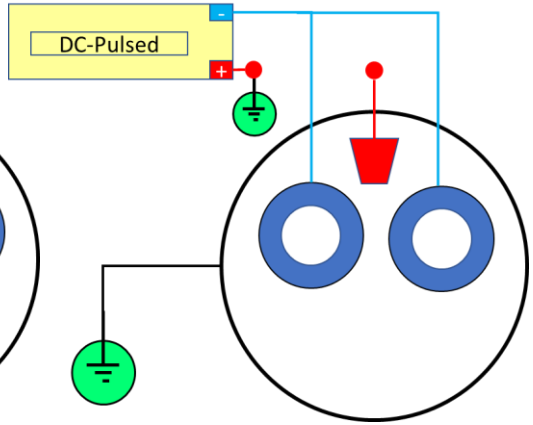






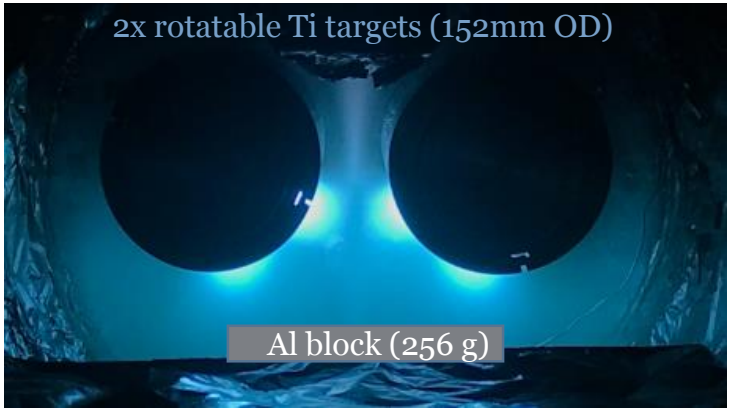
Substrate temperature reduction for DC-Pulsed configurations

Grounded anode

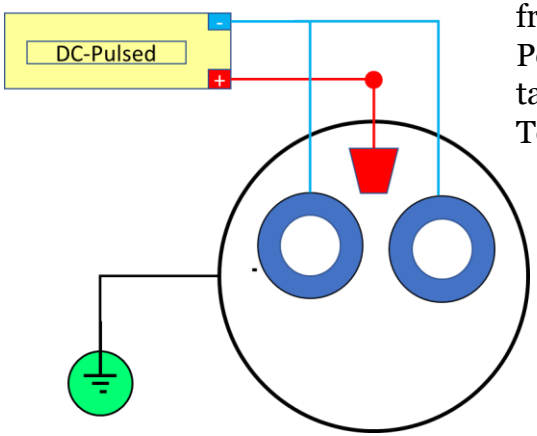


Floating anode

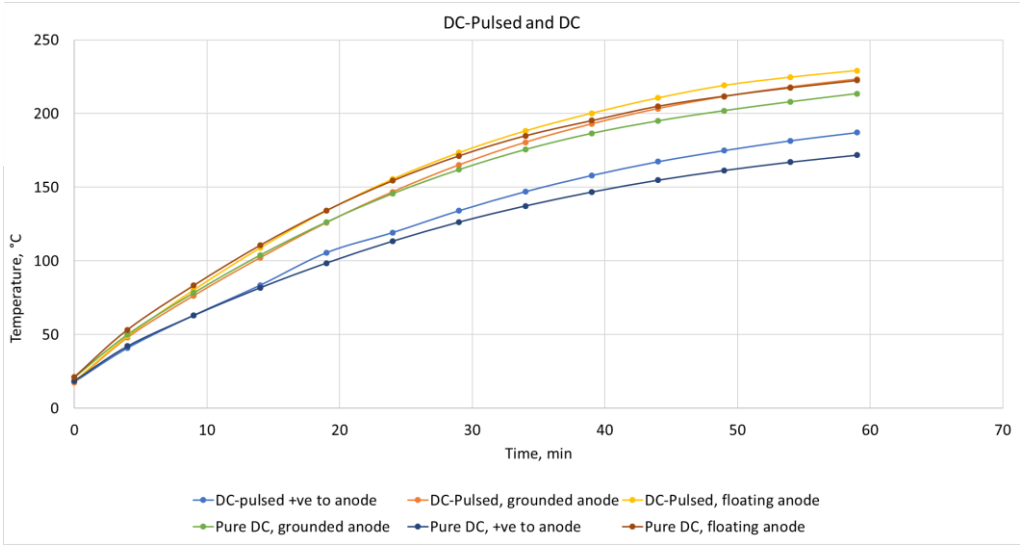




Positive output to anode



Power on (6kW)
100 kHz pulse frequency
Power split to 2 targets
Total time: 60 mins



Gencoa is actively combining technologies and developing ways to enhance thin film devices –
Thank you for your attention