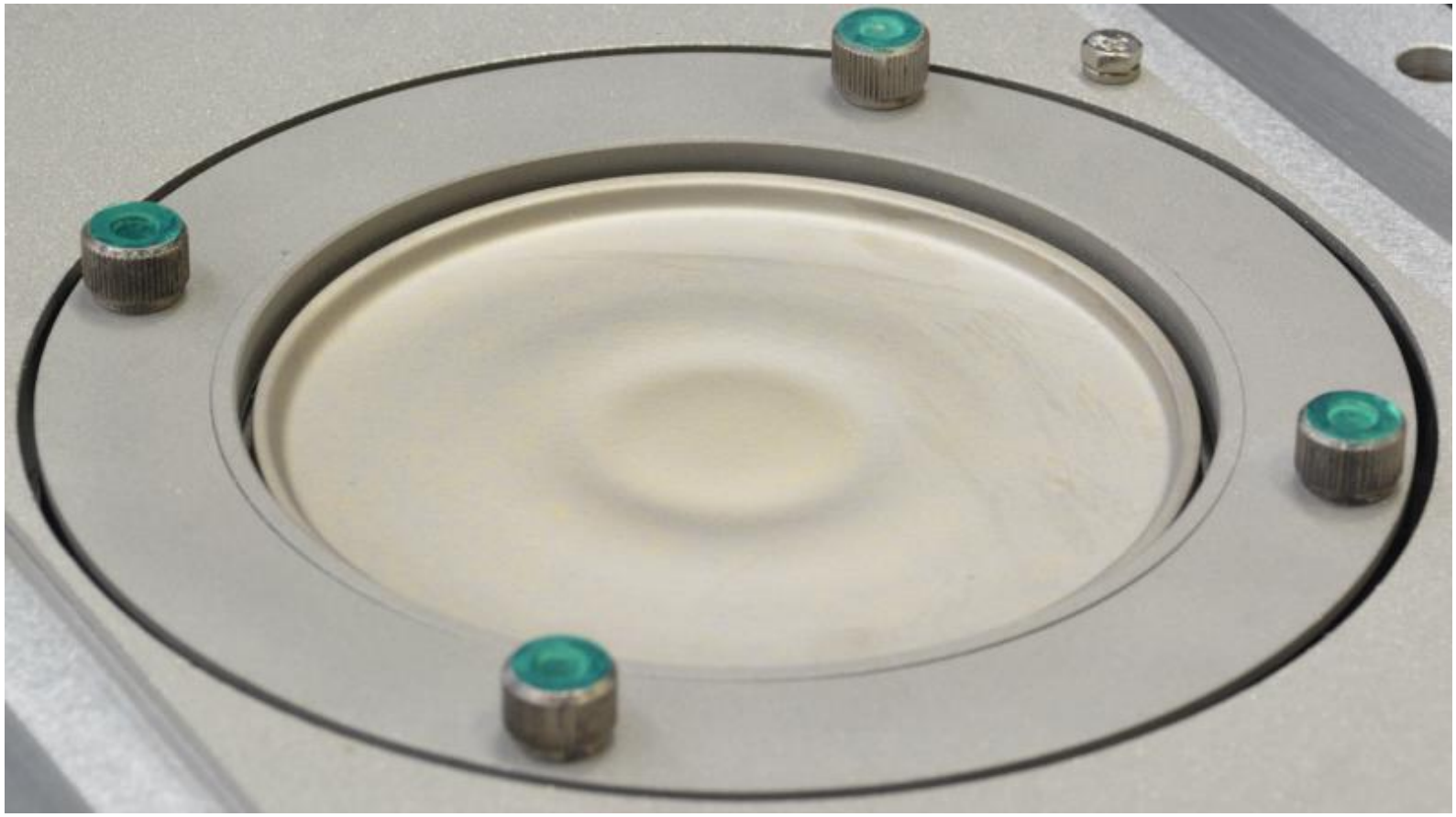
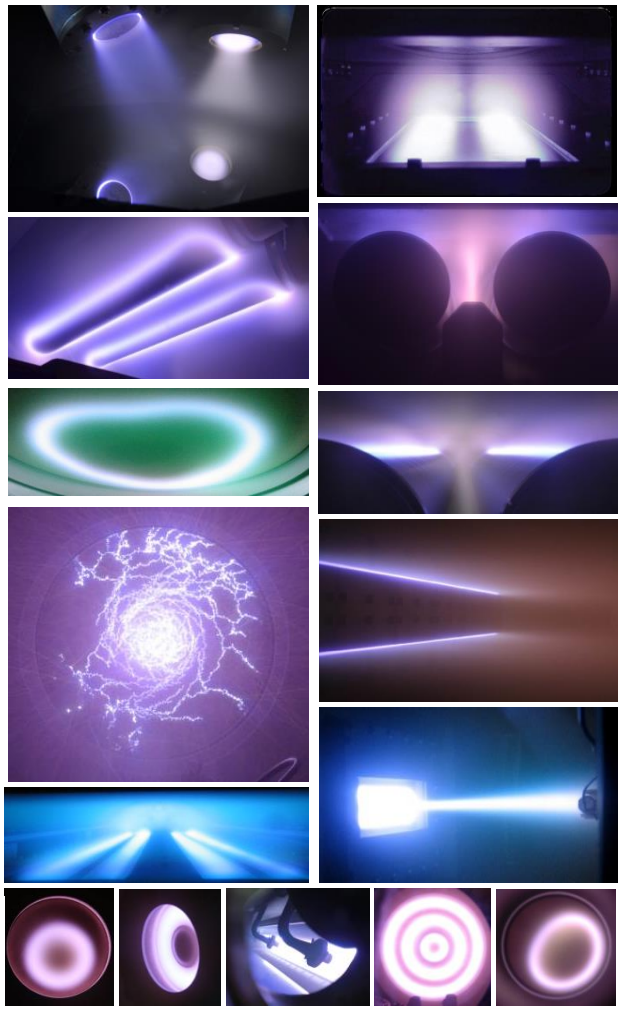
Gencoa ARC *Max*

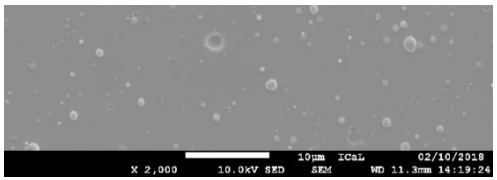
Magnetic field scanning, variable current pulsing, no mechanical trigger

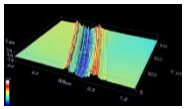


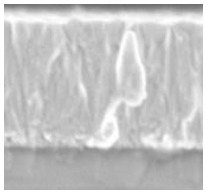
23 Years of of Products and Technology from Gencoa

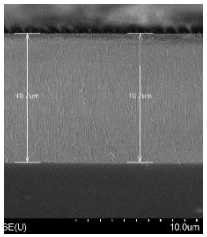
Rotatable & Planar Magnetron Sputter Cathodes • Retrofit magnetic packs • Plasma Treaters • Speedflo Reactive Gas Controllers • IM Ion Sources & power supplies • Arc MAX sources & power supplies • Active Anodes and Gas Delivery Bars • OPTIX Gas and Chemical Sensing • S and Se Sensor • PEC Pulsed Effusion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

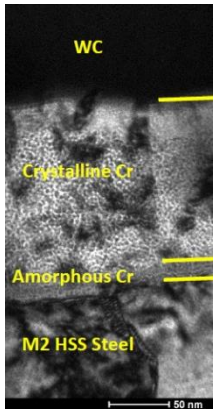


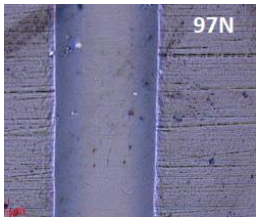


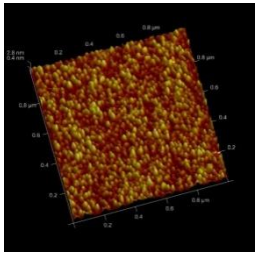


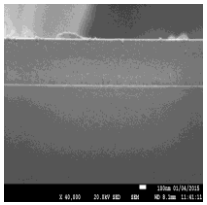


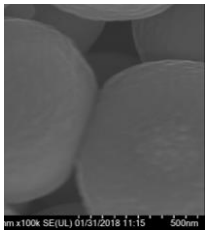


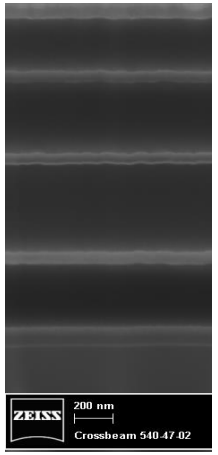


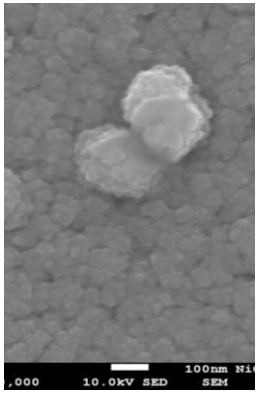












www.gencoa.com

Gencoa ARC *Max*

The Gencoa ARC Max package comprises:

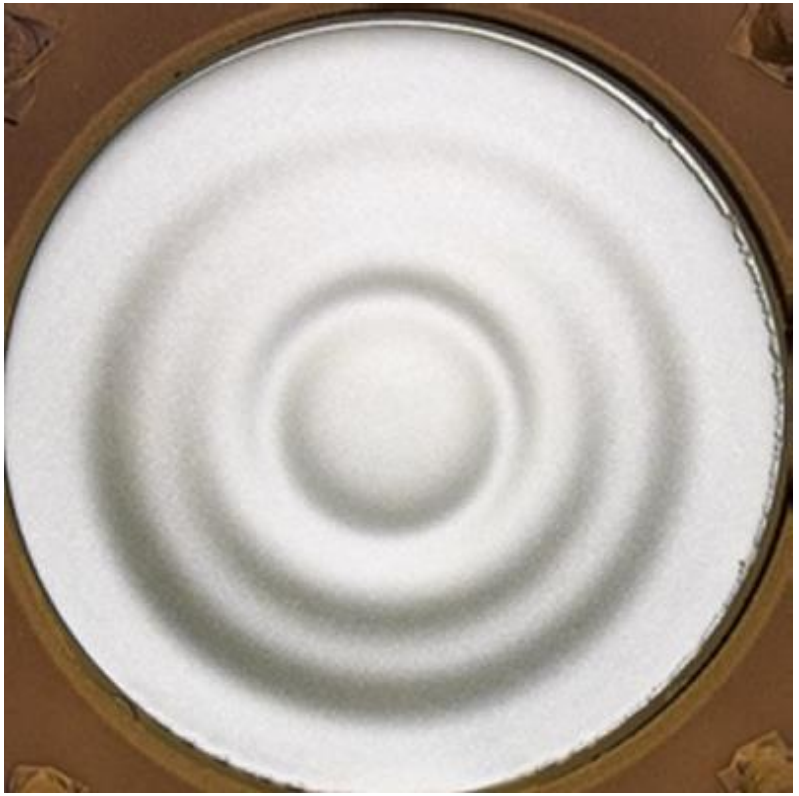
Scanning magnetic field 125mm circular arc source
Magnetic field sweep controller
Pulsed current arc generator

All 3 are required to operate in *Max* mode

No mechanical trigger required

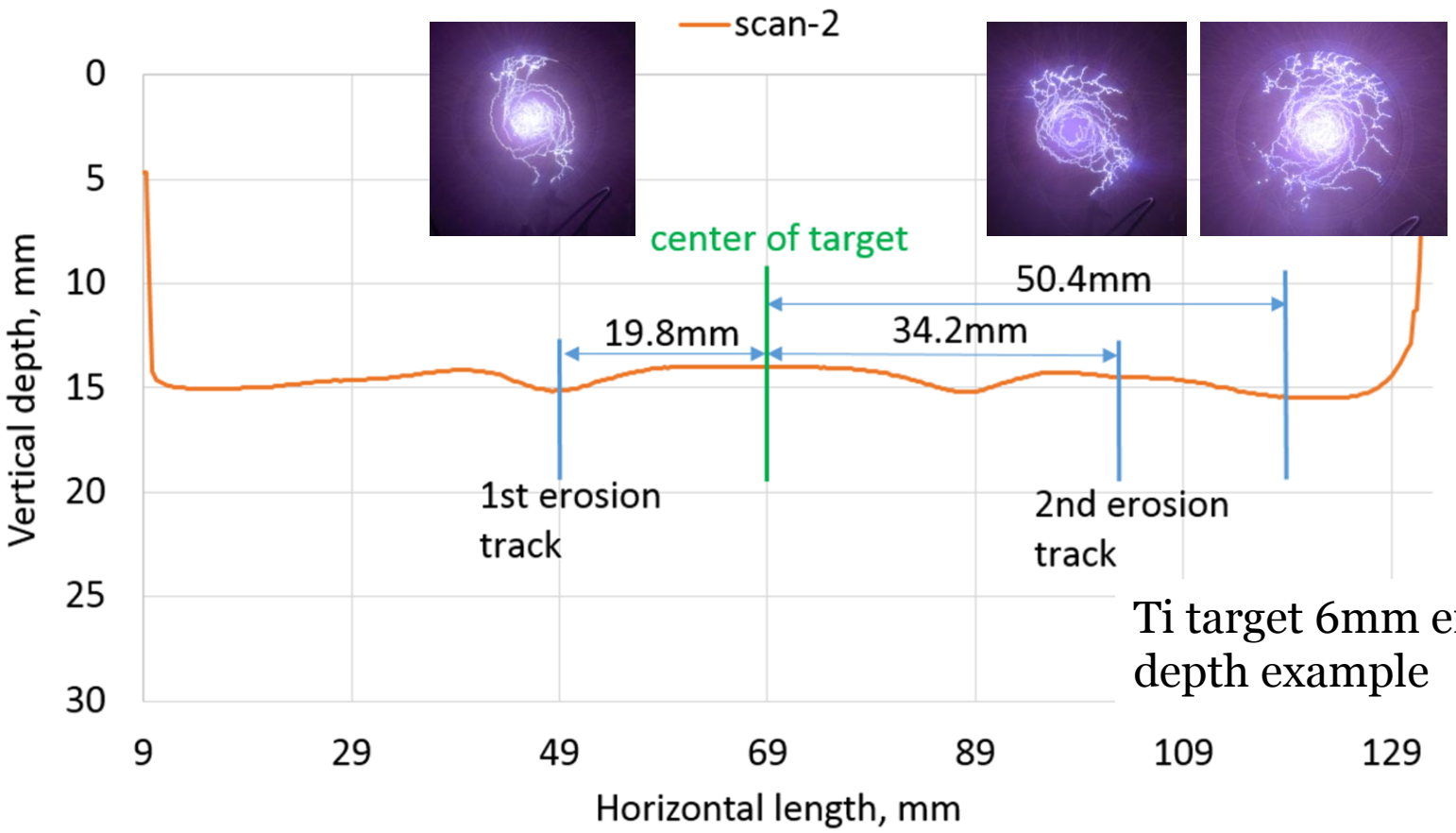
ARC *Max for* control of target erosion

The erosion profile of the 125mm circular arc target is controlled by the scan profile of the magnetic field and arc current.
Below shows the effect of different magnetic scan settings.



ARC *Max for* control of target erosion

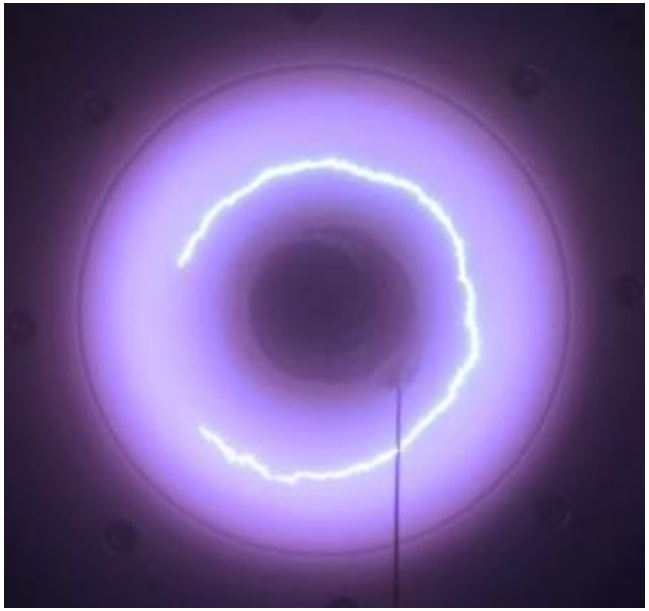
The scanning magnetic field moves the positions of 3 principle erosion tracks.
Different target materials can be optimised for 50-80% target use



Ti target 6mm erosion depth example

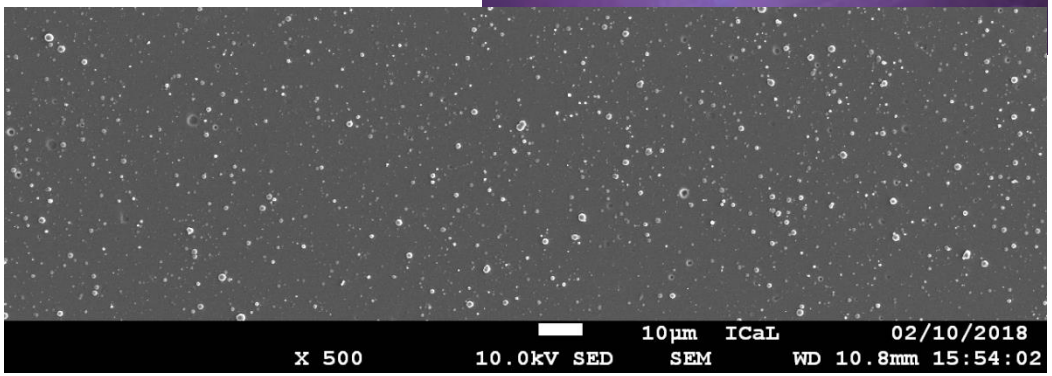
Gencoa ARC *Max for* fewer macro-particles & smoother coatings

The high current density combined with magnetic and discharge current variations allow the splitting of the arc and a reduction of the number macro-particles within the coating.



Single arc track and mechanical trigger results in larger and higher density of droplets

Arc “splitting” leads to fewer and much smaller droplets, less than 1 micron in size



ARC *Max Power Supply*

High reliability and high power efficiency (> 90 %)

GENCOA ARC 250 ARC DEPOSITION GENERATOR

DC generator with up to 250 A output, specifically designed for Gencoa ARC *Max* packages. The system comes in a compact and light 19 inches case.

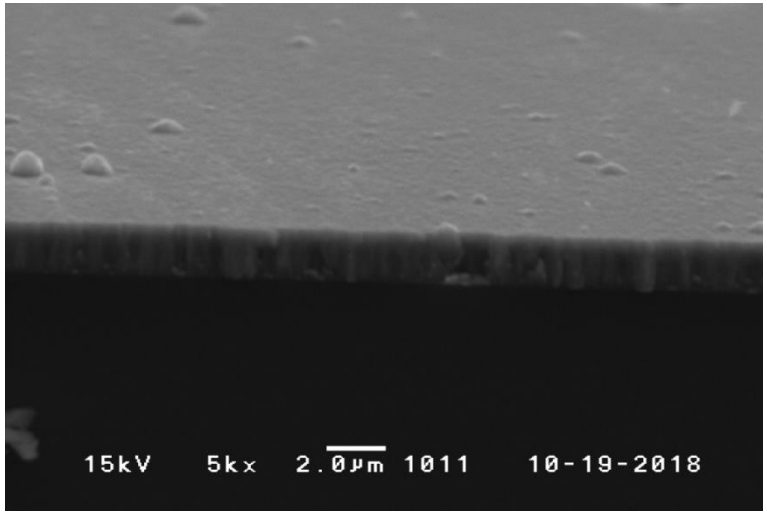
Flexible interfacing. Profibus (Optional), RS232 and analog user port provided.

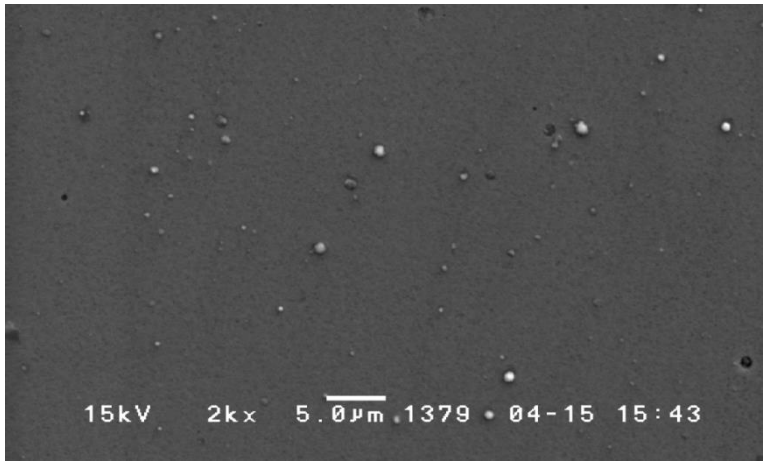
Works with the Gencoa Arc Plus cathode for contactless electronic ignition of the arc – no mechanical trigger.

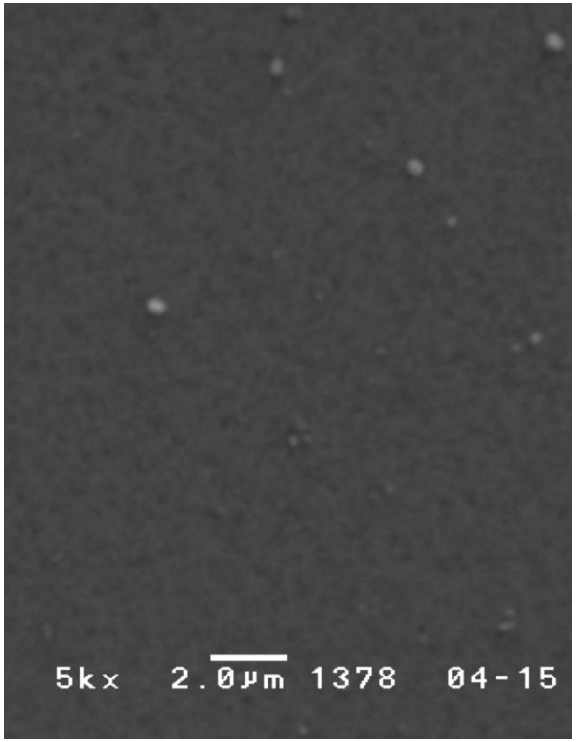
Output current modulation in the 1-50Hz frequency range (adjustable upper and lower current set-points). Provides arc guiding and splitting in combination with the magnetic field sweeping.

ARC *Max* Package gives high rates and ionisation levels, fewer and smaller droplets / macro-particles

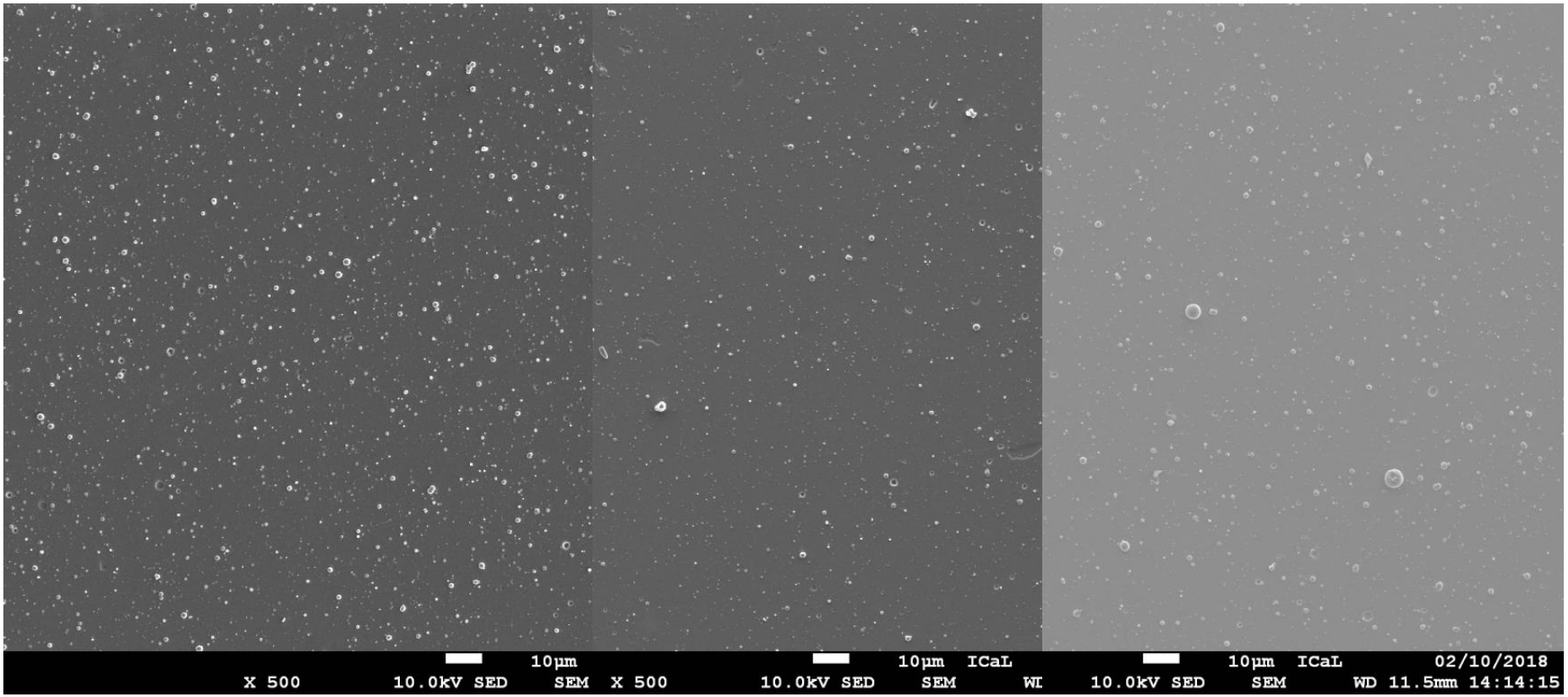
TiN coating of samples in a face down static arrangement – worst case



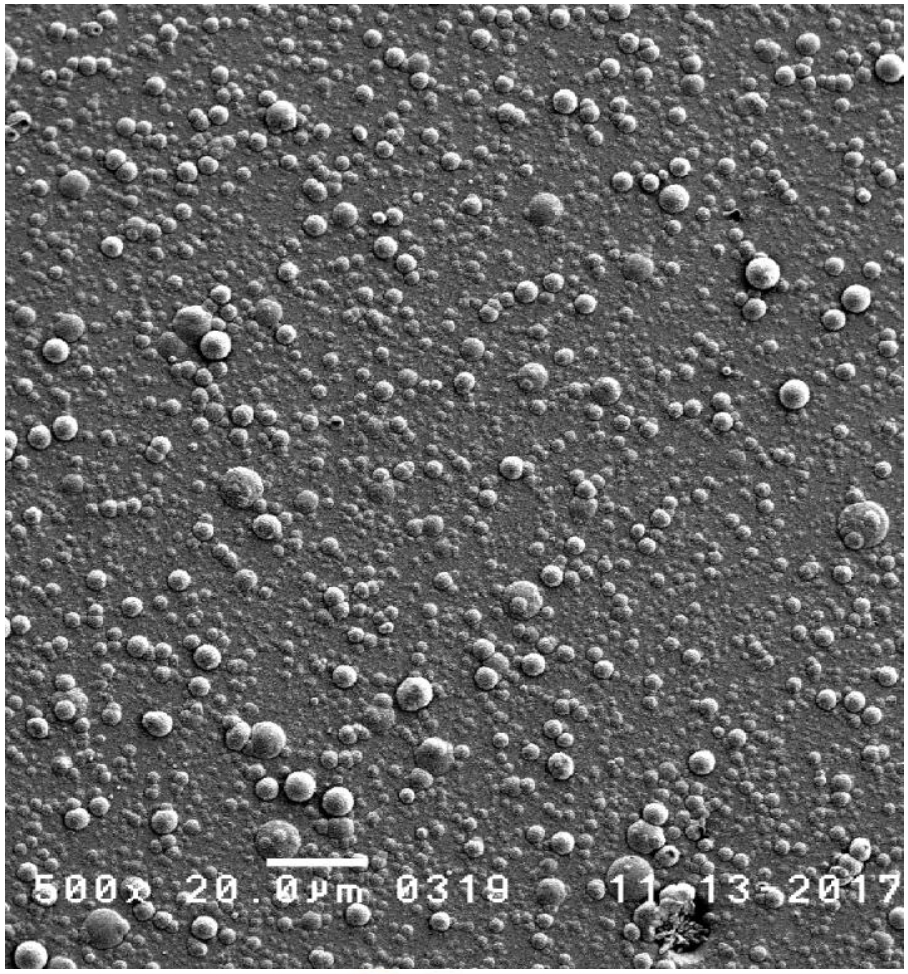


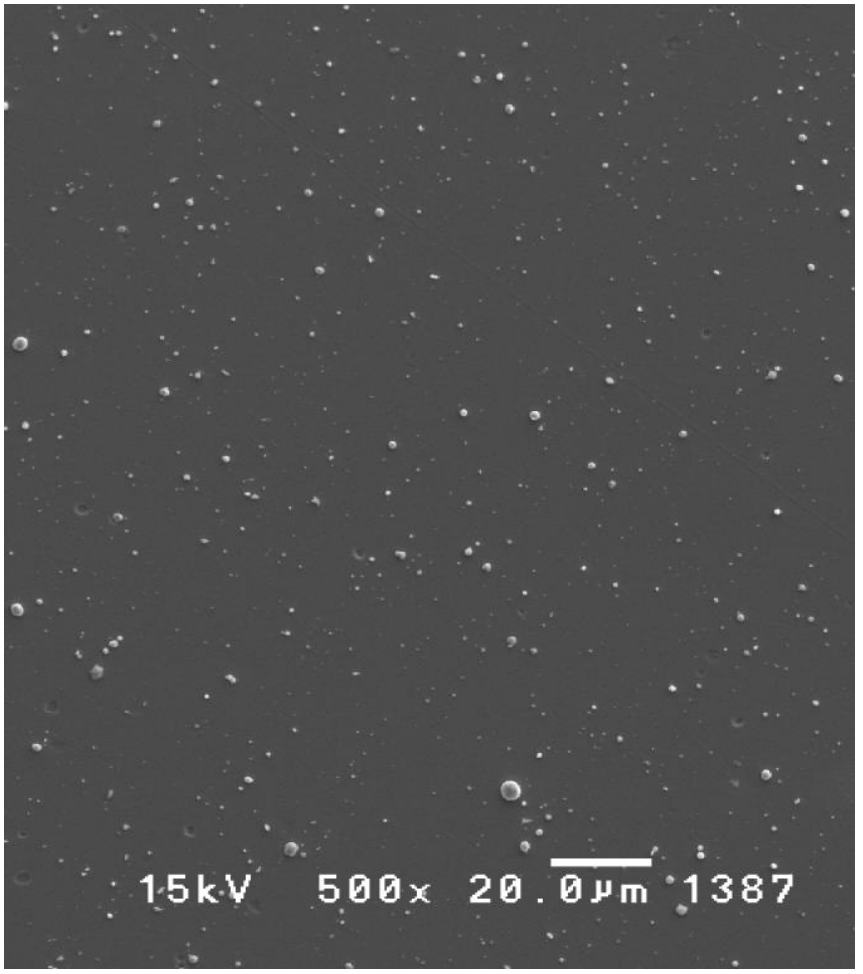


Oct 2018 face down sample coating of TiN at x 500

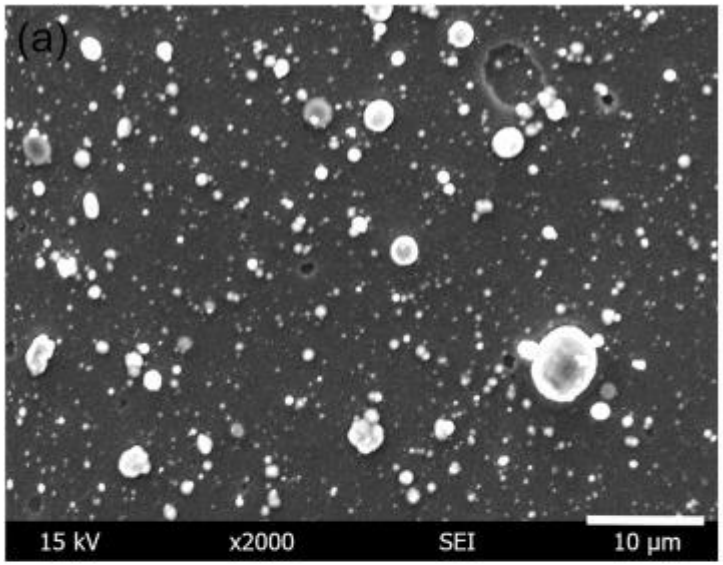


Nov 2017 & 2019 face down sample coating at x 500

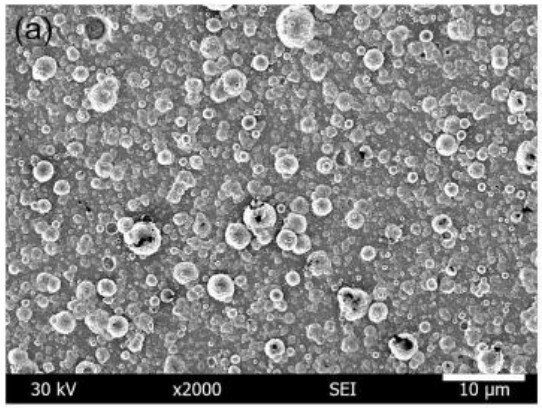




ArcMax Comparison to current state of the art at the same magnification

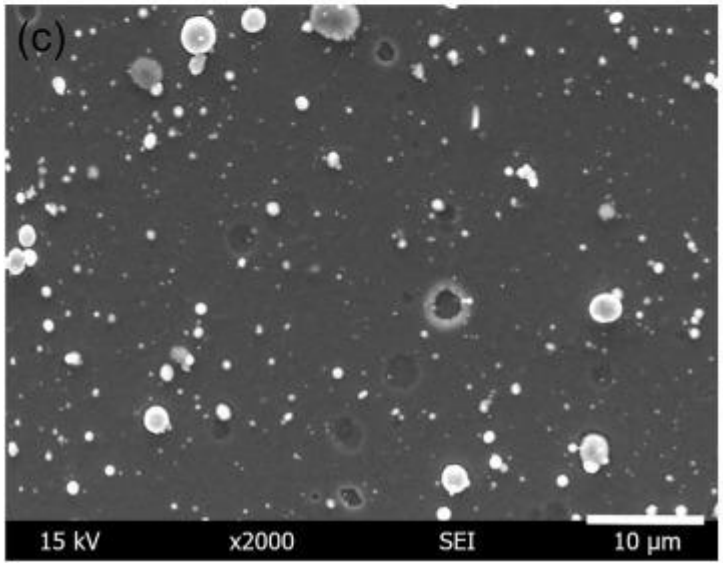


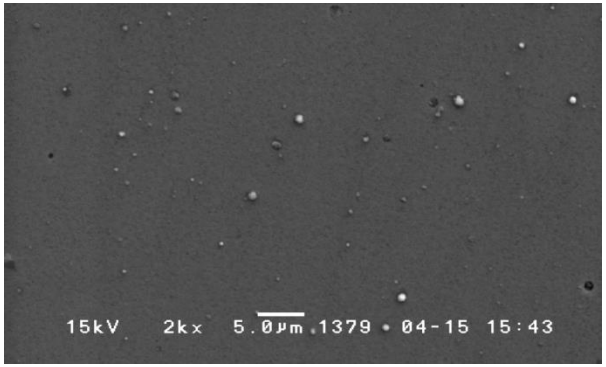
Standard ARC with pulse biasing – from the literature reference below



Standard ARC coating from reference below

Surface and Coatings Technology
Volume 350, 25 September 2018, Pages 1050-1057
Surface and Coatings Technology
The role of superimposing pulse bias voltage on DC bias on the macroparticle attachment and structure of TiAlN coatings produced with CA-PVD
Golnaz Taghavi Pourian Azar, Dilan Er, Mustafa Ürgen

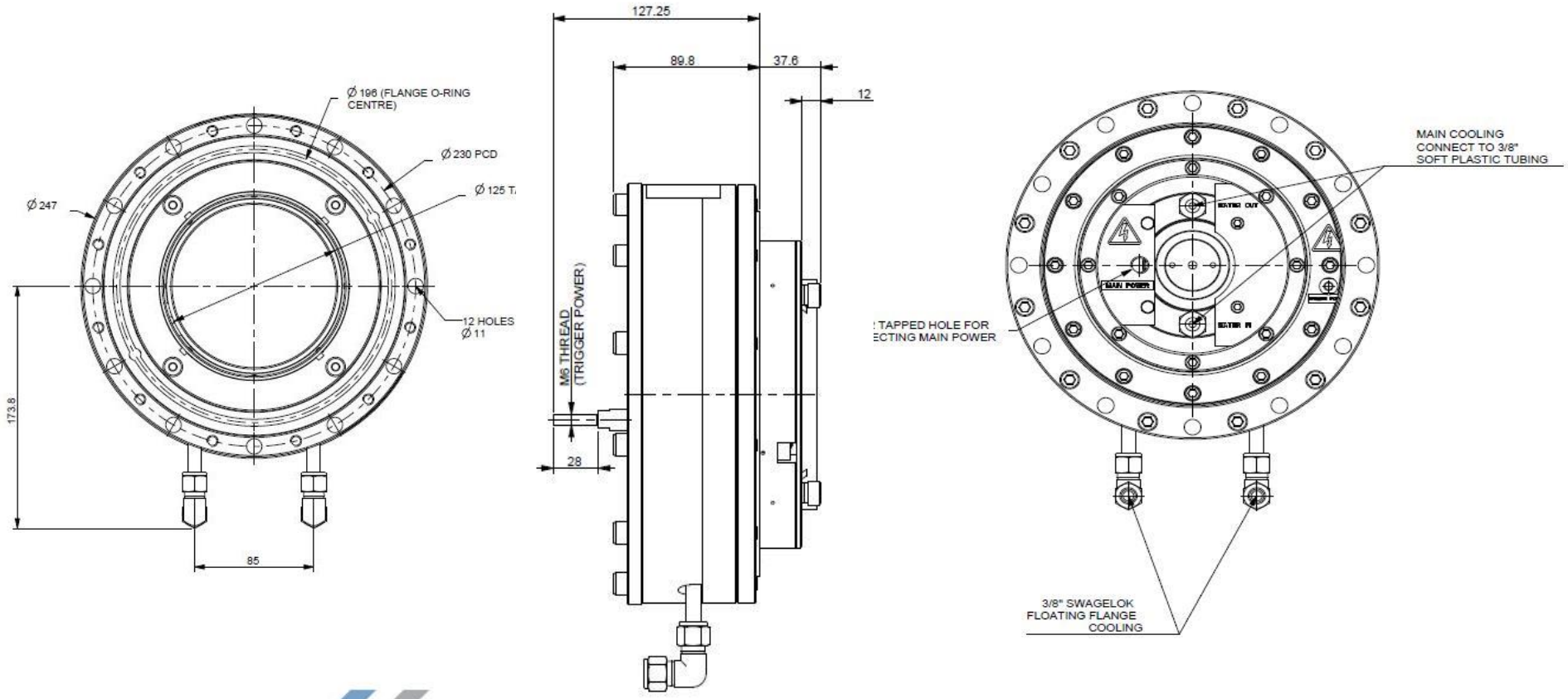




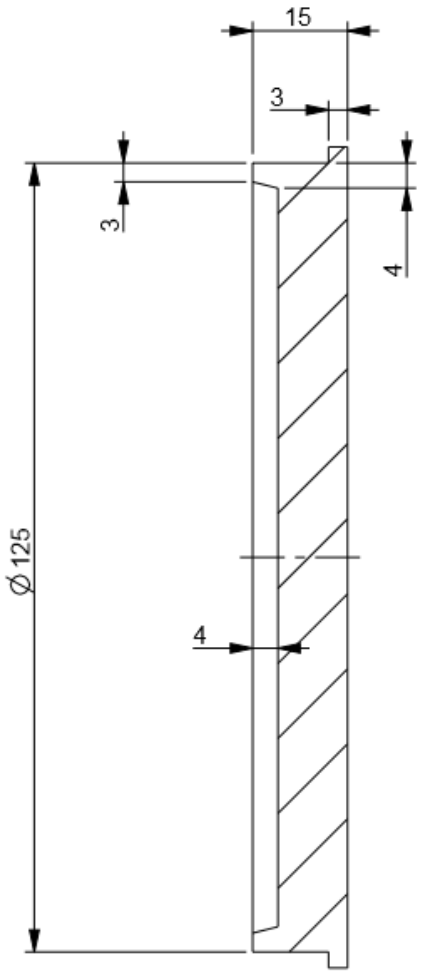
Gencoa ARC Max coating

ARC *Max* 125mm diameter target for 180 to 240 Amps for high uniformity and high rates

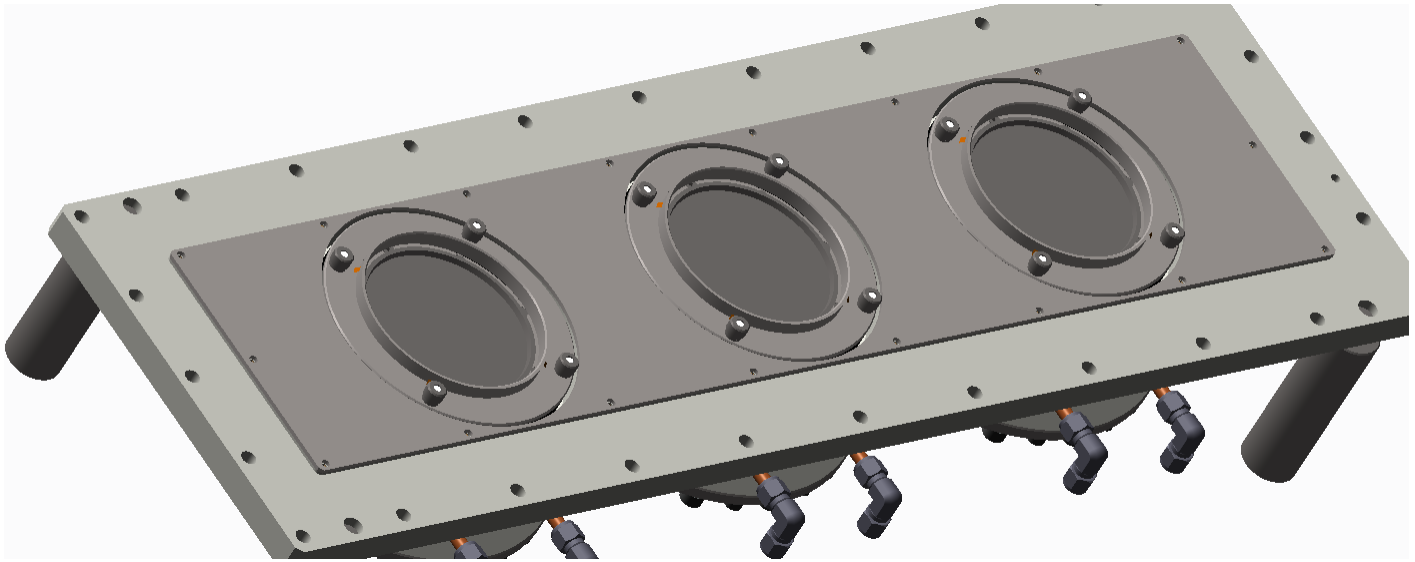
Source and floating front shield separately cooled for the highest powers



ARC *Max* 125mm diameter target with simple target fixing and with 15 or 21mm thickness



ARC *Max* 125mm diameter target combined to provide overall chamber uniformity



ARC *Max* Package gives high rates and ionisation levels, fewer and smaller droplets / macro-particles