

ZAO (AZO)

Rotatable Sputtering Targets for High Performance Al-doped Zn Oxide Coatings



Sputtering of Al-doped Zn oxide as dielectric, Ag-seed layer, or TCO from a ceramic target material has become widely accepted in the industry. Materion offers high quality, innovative ZAO rotatable targets that can significantly reduce production costs for our customers.

Our thermally sprayed ZAO rotatables increase target utilization thus saving raw materials costs. Due to their unparalleled sputter process stability, they enable highest homogeneity and enhanced layer properties of Al-doped Zn oxide coatings.

Quality & Reliable Products

- State of the art production facilities
- Proven capabilities for process upscaling
- 25+ years of experience in large area coating
- Highly integrated in-house manufacturing
- Targets qualified by system manufacturers
- All production and testing ISO 9001:2015 certified

Benefits

- Better sputter performance
 - No hard arcs
 - Almost no microarcing
- Greatly improved sputter yield up to 90%
- Reduced cost per kg
- No bonding gaps → strongly reduced arcing and no pollution issues out of gaps
- No risk of sleeves from mixed lots → improved film performance and homogeneity

Innovative Products

- Full range of R&D capabilities
- Targets optimized to your production requirements
- Close cooperation with system manufacturers

Customer Support

- Extensive process technology
- Global network conveniently close

- 100% homogeneous material reservoir improved layer uniformity and PV cell reliability and efficiency
- Increased deposition rate at cathode power levels > 20kW/m (DC mode)
- Customer specific target dimensions and dogbone configurations
- Highest sputtering power possible > 35 kW/m in DC mode, depending on ability of chamber cooling

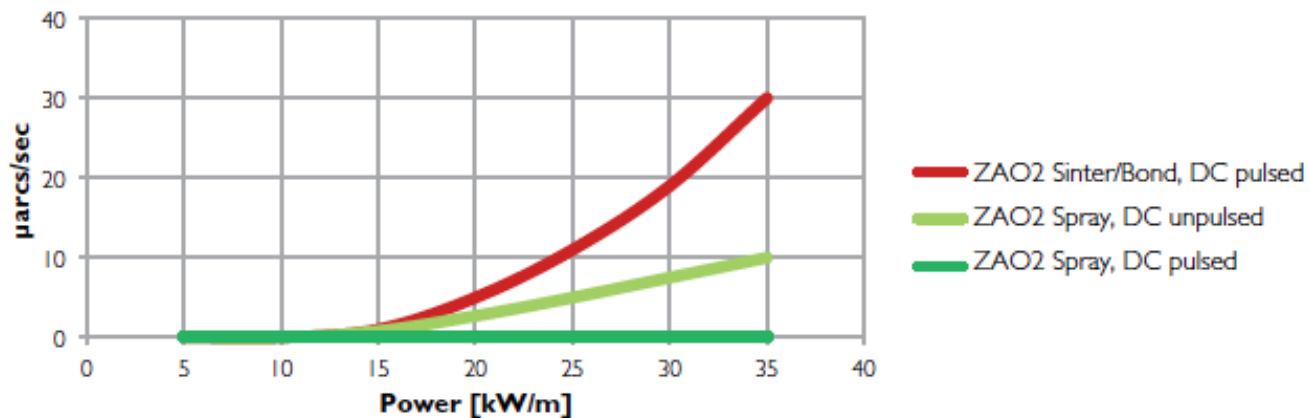
Technical Data

Application	TCO/seed layer, front/back contact
Production Method	Thermal spray
Material	ZnO/Al ₂ O ₃
Standard Composition (Al ₂ O ₃)	1 wt% / 2 wt%
Purity	3N5
Maximum Length	4 m
Standard Thickness	8 mm, 10 mm, others on request
Dogbone Configuration	According to customer requirement
Melting Point	Sublimates at approx. 1800°C
Thermal Conductivity	Approx. 25 W/m*K
Thermal Expansion Coefficient	Approx. 5*10 ⁻⁶ K ⁻¹
Sputter Rate at 20 kW/m DC mode	135 nm*m/min
Maximum Sputtering Power	35 kW/m ¹⁾
Recommended Power Ramp Up	0,6 kW/m* min
DC Mode	Non pulsed/pulsed
Process Pressure	Approx. 3*10 ⁻³ mbar
Arcing Rate	Almost not measurable
Typical Analysis Values	Cr, Co, Cu <10 ppm Ca, Mg <50 ppm Fe, Ni <20 ppm Si <120 ppm

1) Run with max cooling water flow, temp. of chamber increases at power densities ≥ 16 kW/m

Sputtering Data for ZAO Rotatable

Micro-Arcing of ZAO2 Rotatable Versions



Dynamic Deposition Rate of ZAO2 Rotatable Versions

