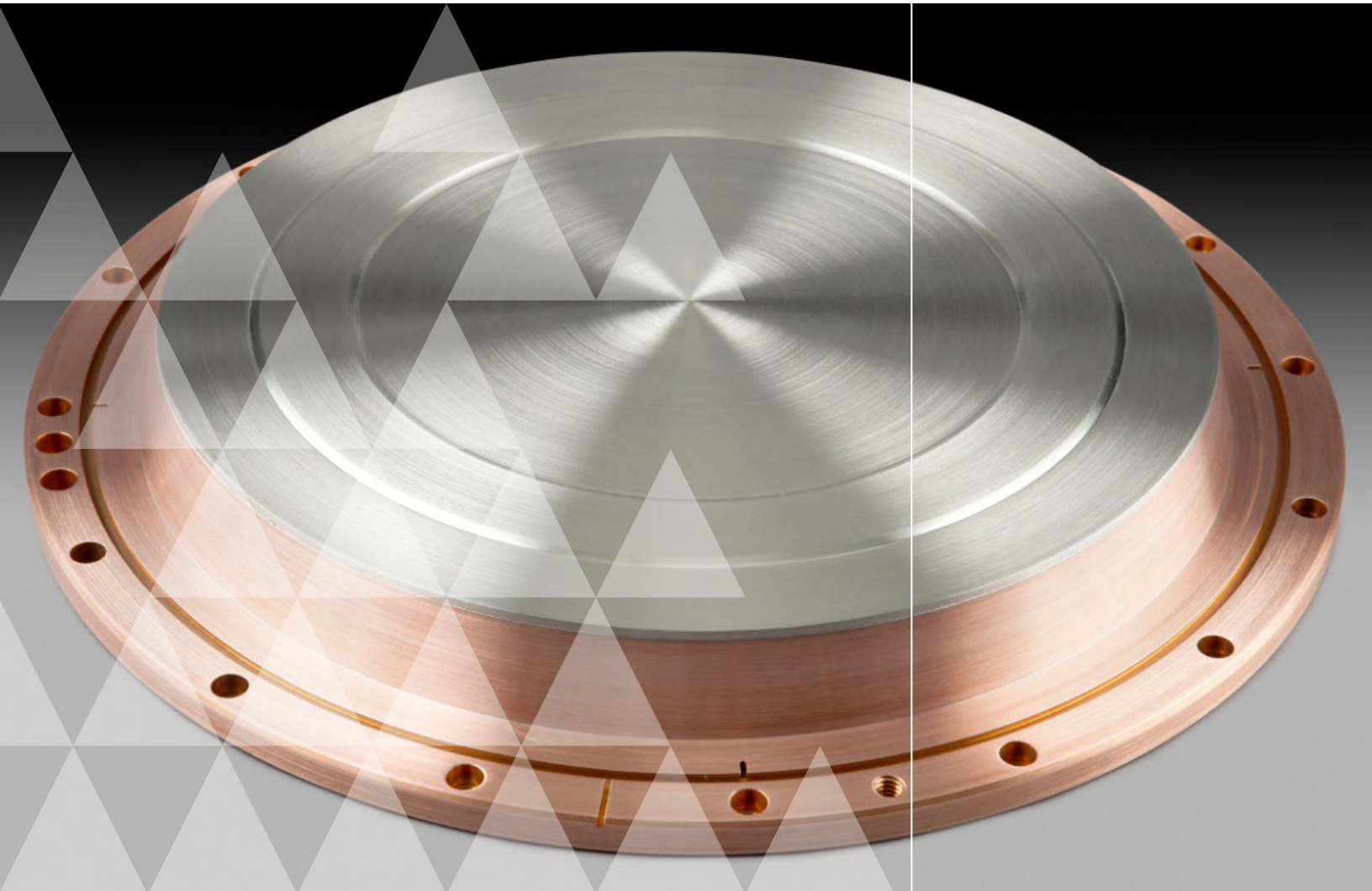




MATERION



**ADVANCED
MATERIALS**

Sputtering
Targets

Sputtering Targets

The Challenge

Every thin film coating application requires a specific combination of process and material to produce uniform thin film coatings and maximize tool uptime. The quality of a physical vapor deposition (PVD) coating is largely dependent on the source material. High purity materials with superior surface cleanliness are preferred for their ability to reduce “spitting.” To ensure coatings with dependable, reproducible properties, the source material must be specially engineered with a precise alloy composition, refined grain size and consistent phase content.

The Solution

Our broad line of PVD products and services can resolve your concerns for uniformity, reproducibility, purity, homogeneity and other challenges. Examples include:

- High purity, low particulation sputtering targets
- Proprietary sputter target designs that extend the life of the target
- Innovative manufacturing technologies including our patented VCT™ (Vibration Cast Technology) for fine grained targets
- Industry experts to help identify and customize optimal alloy compositions
- Relationships with OEMs to optimize coating performance and facilitate support

BENEFITS

With our expertise in PVD, we provide:

- Materials engineering support to devise customized optimal alloys and materials for your deposition processes
- Customized precious metal sputter target designs & forms which reduce costs and increase tool uptime
- Advanced testing techniques including GDMS, ICP-MS and LECO to ensure accurate purity analysis

PRECIOUS METALS MANAGEMENT

We offer a complete line of complementary services to lower your total cost of ownership.

- Vacuum chamber parts cleaning
- Twin Wire Arc Spray (TWAS) coatings
- Reclaim & recycling services
- Flexible refine settlement options



Materion ... Making Advanced Materials that Improve the World.



SPUTTERING TARGETS

Available Materials

- Precious metal & non-precious metal sputtering targets
- Standard and custom exotic alloys
- Ceramic and sputtering targets with customized chemistries

Available Forms

- Large area targets
- Rotary or planar
- Non-traditional materials
- Custom alloys
- Multiple shapes & sizes
- Extended life designs
- Ion Beam Deposition (IBD) Targets

ENVIRONMENTAL LEADERSHIP

All our disposal procedures comply with state & federal regulations. Accreditations and Certifications include:

- ISO 9001:2008 Quality Systems
- I4001:2004 Environmental Safety & Management Systems
- ISO 17025:2005 Analytical Laboratory
- LeanSigma

OEM PLATFORMS SUPPORTED INCLUDE

- | | |
|------------------------|---------------------|
| ■ Oerlikon | ■ Von Ardenne |
| ■ NEXX | ■ Evatec |
| ■ Leybold | ■ Temescal |
| ■ SPTS | ■ Veeco |
| ■ Anelva | ■ Metron (Varian) |
| ■ Applied Materials | ■ AJA |
| ■ Singulus | ■ MRC (KDF) |
| ■ Aviza | ■ CVC |
| ■ KDF | ■ Novellus (Varian) |
| ■ Sputtered Films Inc. | ■ Trikon |
| ■ Ulvac | ■ Unaxis |
| ■ Intevac | ■ Perkin Elmer |

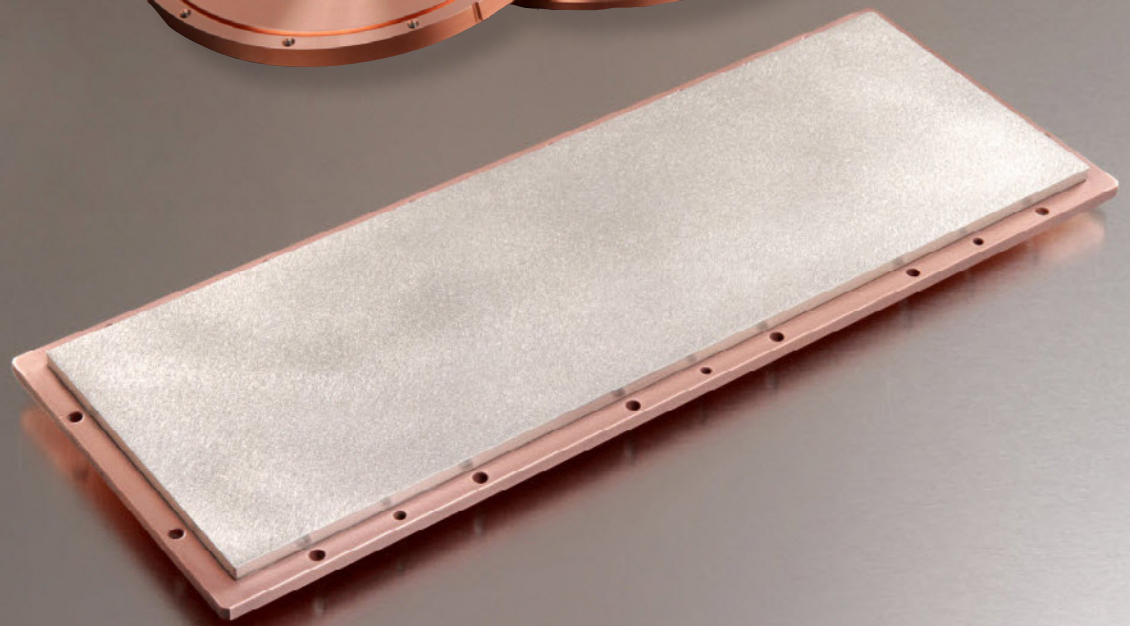
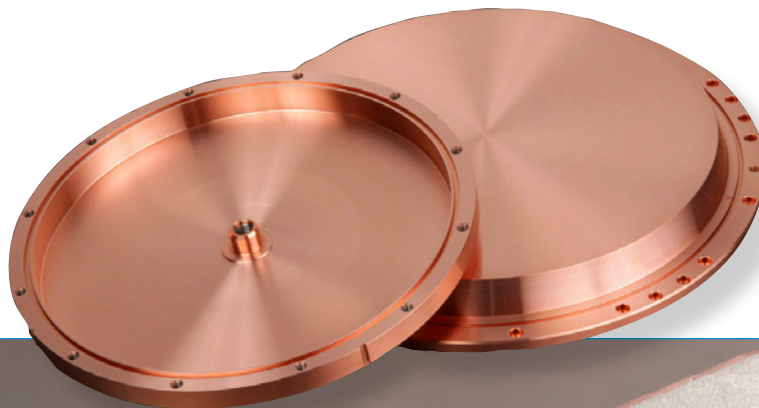
RELATED SERVICES

Sputtering Target Bonding

- Global service locations
- Metallic solders, elastomer, epoxy and diffusion bonding
- Metallic bonds C-scanned to ensure coverage and integrity

Precious Metal Refining

- 100 years experience refining, recycling & recovery of metals
- Conflict-Free metals
- Valuable materials reclaimed and refined to purest forms
- Complete traceability



Element	Symbol	Atomic #	Sputter Yield (atoms/ion)	Density g/cc	Ion Beam Etch Rate (Å/min)
Beryllium	Be	4	0.43	1.85	130
Carbon	C	6	0.36	2.25	110
Aluminum	Al	13	1	2.7	640
Silicon	Si	14	0.5	2.33	370
Titanium	Ti	22	0.5	4.54	330
Vanadium	V	23	0.6	6.11	310
Chromium	Cr	24	1.2	7.19	530
Manganese	Mn	25	1.9	7.43	870
Iron	Fe	26	0.8	7.86	350
Cobalt	Co	27	1.1	8.9	450
Nickel	Ni	28	1.3	8.9	530
Copper	Cu	29	2	8.96	880
Germanium	Ge	32	1.1	5.32	920
Yttrium	Y	39	0.77	4.47	950
Zirconium	Zr	40	0.63	6.51	570
Niobium	Nb	41	0.7	8.57	470
Molybdenum	Mo	42	0.7	10.2	410
Ruthenium	Ru	44	1.2	12.4	610
Rhodium	Rh	45	1.4	12.4	720
Palladium	Pd	46	2	12	1100
Silver	Ag	47	2.8	10.5	1800
Tin	Sn	50	1.2	7.31	1200
Samarium	Sm	62	0.87	7.52	1100
Gadolinium	Gd	64	0.9	7.9	1100
Dysprosium	Dy	66	0.96	8.55	1100
Erbium	Er	68	0.85	9.07	1000
Hafnium	Hf	72	0.79	13.3	660
Tantalum	Ta	73	0.62	16.6	420
Tungsten	W	74	0.6	19.3	340
Rhenium	Re	75	0.95	21	520
Osmium	Os	76	0.96	22.6	500
Iridium	Ir	77	1.1	22.4	590
Platinum	Pt	78	1.1	21.4	620
Gold	Au	79	1.7	19.3	1080
Lead	Pb	82	2.3	11.4	2600
Thorium	Th	90	0.66	11.7	810
Uranium	U	92	0.94	19	730



MATERION

ADVANCED MATERIALS

2978 Main Street
 Buffalo, NY 14214 USA
 Phone: +1 800.327.1355
 advancedmaterials@materion.com
 www.materion.com/advancedmaterials

Europe: +44.1635.223838
 Asia: +886.3.2226350

MATERION CORPORATION
 www.materion.com

MATERION ADVANCED MATERIALS is a global advanced materials and services company, dedicated to providing solutions that enable our customers' technologies and drive their growth. Our products include precious and non-precious specialty metals, precision optical filters, inorganic chemicals and powders, specialty coatings, specialty-engineered beryllium alloys, beryllium and beryllium composites, and engineered clad and plated metal systems. The Materion business is structured to enhance our ability to provide customers with innovative, best total-cost solutions.