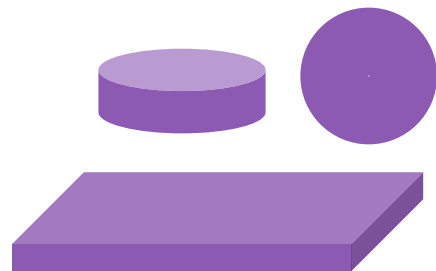


# SPUTTERING TARGET

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## Manufacturing Process

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VI HALBLEITERMATERIAL can produce and supply most of the metals on the periodic table of elements, including rare earth metals. We generally use the production process of vacuum melting and hot pressing. By controlling the technical parameters of the forging, rolling and annealing processes, the sputtering targets made are characterized by high density, low gas content and uniform internal structure, and the user can obtain a constant erosion rate and a high purity uniform film during use.

### The process flow:

1. Powder Smelting
2. Powder Mixing
3. Pressing and Forming
4. Atmosphere Sintering
5. Plastic deformation
6. Heat Treatment
7. Ultrasonic flaw detection
8. Mechanical
9. Metallization
10. Bonding

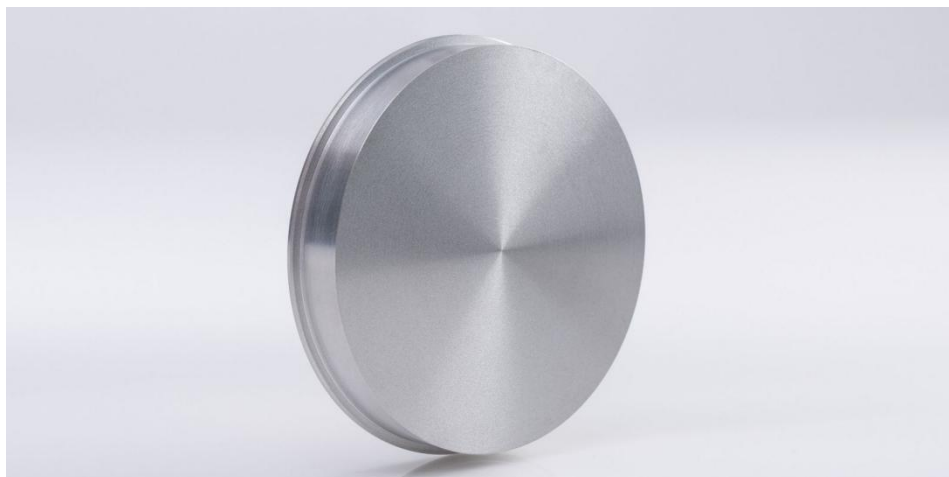


Most sputtering targets can be fabricated to any shape and size from drawings. For those with technical limitations on the maximum size of a single piece, the segments can be joined together by butt or angled joints to produce a multi-segment target.

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### Sputtering Targets We can Offer

- Pure metal targets
- Metal alloy targets
- Ceramic targets
- Precious metal targets
- Circular, rectangular, Delta, ring, tube and any other shape on request.
- Purity from 99%~99.9999%.
- All targets are delivered with a certificate of analysis



## Sputtering Targets List

Al

### Aluminum-Base

CHEMICAL NAME	FORMULA	PURITY %
Aluminum	Al	99.9-99.999
Aluminum Oxide	Al <sub>2</sub> O <sub>3</sub>	99.99-99.999
Aluminum Oxide-Yttrium Oxide	Al <sub>2</sub> O <sub>3</sub> -Y <sub>2</sub> O <sub>3</sub>	99.99
Aluminum Oxide-Magnesium Oxide	Al <sub>2</sub> O <sub>3</sub> -MgO	99.99
Aluminum Oxide-Zinc Oxide (AZO)	Al <sub>2</sub> O <sub>3</sub> -ZnO	99.9
Aluminum Oxynitride	Al <sub>23</sub> O <sub>27</sub> N <sub>5</sub>	99.9-99.995
Aluminum Antimonide	AlSb	99.95/99.99
Aluminium Beryllium	AlBe	99.99-99.995
Aluminium Boride	AlB <sub>2</sub>	99.9
Aluminum Chromium	AlCr	99.95
Aluminum Chromium Boron	AlCrB	99.5
Aluminum Cobalt	AlCo	99.5
Aluminum Copper	AlCu	99.99
Aluminum Copper Iron	AlCuFe	99.5
Aluminum Copper Silicon	AlCuSi	99.999
Aluminum Iron	AlFe	99.5
Aluminum Indium	AlIn	99.99
Aluminum Lithium	AlLi	99.9
Aluminum Magnesium	AlMg	99.95
Aluminum Magnesium Silicon	AlMgSi	99.99
Aluminum Neodymium	AlNd	99.95
Aluminum Nickel	Al <sub>3</sub> Ni	99.9
Aluminum Nitride	AlN	99.9
Aluminum Scandium	AlSc	99.9-99.99
Aluminum Silicon	AlSi	99.95-99.999
Aluminum Tin Copper	AlSnCu	99.9
Aluminum Tantalum Zirconium	AlTaZr	99.9
Aluminum Titanium	AlTi	99.9-99.995
Aluminium Yttrium	AlY	99.95/99.99
Aluminium Zinc	AlZn	99.5
Aluminium Zirconium	AlZr	99.95/99.99

Sb

### Antimony-Base

CHEMICAL NAME	FORMULA	PURITY %
Antimony	Sb	99.5-99.999
Antimony Oxide	Sb <sub>2</sub> O <sub>3</sub>	99.99
Antimony Sulfide	Sb <sub>2</sub> S <sub>3</sub>	99.99
Antimony Telluride	Sb <sub>2</sub> Te <sub>3</sub>	99.999

Ba

### Barium-Base

CHEMICAL NAME	FORMULA	PURITY %
Barium	Ba	99.9
Barium Oxide	BaO	99.95
Barium Ferrite	BaFe <sub>12</sub> O <sub>19</sub>	99.9
Barium Fluoride	BaF <sub>2</sub>	99.9-99.995
Barium Strontium Titanate (BST)	BaSrTiO <sub>3</sub>	99.95
Barium Tin Oxide	BaSnO <sub>3</sub>	99.9
Barium Titanate	BaTiO <sub>3</sub>	99.9-99.95
Barium Zirconate	BaZrO <sub>3</sub>	99.99
Barium Zirconium Titanate	BaZrTiO <sub>3</sub>	99.9

\*All purities indicated in the tables are based on metallic impurities.

## Bi

## Barium-Base

CHEMICAL NAME	FORMULA	PURITY %
Bismuth	Bi	99.9-99.999
Bismuth Antimonide	BiSb	99.99
Bismuth Antimony Telluride	BiSbTe	99.999
Bismuth Ferrite	BiFeO <sub>3</sub>	99.99
Bismuth Oxide	Bi <sub>2</sub> O <sub>3</sub>	99.9-99.999
Bismuth Selenide	Bi <sub>2</sub> Se <sub>3</sub>	99.999
Bismuth Telluride	Bi <sub>2</sub> Te <sub>3</sub>	99.999
Bismuth Telluride Selenide	BiTe <sub>1-x</sub> Se <sub>x</sub>	99.999
Bismuth Vanadate	BiVO <sub>4</sub>	99.9

## Bi

## Bismuth-Base

CHEMICAL NAME	FORMULA	PURITY %
Boron	B	99.9-99.999
Boron Carbide	B <sub>4</sub> C	99.5/99.9
Boron Nitride	BN	99.9
Boron Oxide	B <sub>2</sub> O <sub>3</sub>	99.9-99.99

## Cd

## Cadmium-Base

CHEMICAL NAME	FORMULA	PURITY %
Cadmium	Cd	99.9-99.999
Cadmium Oxide	CdO	99.99
Cadmium Selenide	CdSe	99.99/99.995
Cadmium Stannate	Cd <sub>2</sub> SnO <sub>4</sub>	99.99
Cadmium Sulfide	CdS	99.99-99.999
Cadmium Telluride	CdTe	99.999

## Ca

## Calcium-Base

CHEMICAL NAME	FORMULA	PURITY %
Calcium Fluoride	CaF <sub>2</sub>	99.9-99.995
Calcium Oxide	CaO	99.99
Calcium Titanate	CaTiO <sub>3</sub>	99.99

## Ce

## Cerium-Base

CHEMICAL NAME	FORMULA	PURITY %
Cerium	Ce	99.9/99.95
Cerium Fluoride	CeF <sub>3</sub>	99.9
Cerium Gadolinium	CeGd	99.95
Cerium Oxide	CeO <sub>2</sub>	99.9
Cerium Samarium	CeSm	99.95

## Cs

## Cesium-Base

CHEMICAL NAME	FORMULA	PURITY %
Cesium Iodide	CsI	99.99

\*All purities indicated in the tables are based on metallic impurities.

**Cr****Chromium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Chromium	Cr	99.5-99.99
Chromium Aluminide	CrAl	99.99
Chromium Boride	CrB <sub>2</sub>	99.5
Chromium Carbide	Cr <sub>3</sub> C <sub>2</sub>	99.5/99.95
Chromium Nitride	Cr <sub>2</sub> N	99.5
Chromium Oxide	Cr <sub>2</sub> O <sub>3</sub>	99.5-99.95
Chromium Nickel	CrNi	99.9
Chromium Nickel Aluminum	CrNiAl	99.9
Chromium Molybdenum	CrMo	99.5
Chromium Molybdenum Iron	CrMoFe	99.5
Chromium Niobium	CrNb	99.9
Chromium Silicide	CrSi <sub>2</sub>	99.95
Chromium Silicion Aluminum	CrSiAl	99.5
Chromium Titanium Aluminum	CrTiAl	99.9
Chromium Vanadium	CrV	99.9
Chromium Yttrium	CrY	99.5
Chromium Zirconium	CrZr	99.9

**Co****Cobalt-Base**

CHEMICAL NAME	FORMULA	PURITY %
Cobalt	Co	99.5-99.99
Cobalt Boride	Co <sub>2</sub> B	99.9
Cobalt Chromium	CoCr	99.95
Cobalt Chromium Oxide	CoCr <sub>2</sub> O <sub>4</sub>	99.9
Cobalt Gadolinium	CoGd	99.95
Cobalt Iron Boron	CoFeB	99.9
Cobalt Oxide	Co <sub>3</sub> O <sub>4</sub>	99.95
Cobalt Oxide	CoO	99.95
Cobalt Silicon	CoSi <sub>2</sub>	99.5

**Cu****Copper-Base**

CHEMICAL NAME	FORMULA	PURITY %
Copper	Cu	99.99-99.999
Copper Aluminum	CuAl	99.9
Copper Aluminum Oxide	CuAlO <sub>2</sub>	99.9
Copper Chromium Zirconium	CuCrZr	99.9
Copper Germanide	CuGe	99.99
Copper Indium	CuIn	99.99
Copper Indium Gallium Selenide	CuInGaSe	99.99
Copper Nickel	CuNi	99.99
Copper Oxide	CuO	99.5/99.9
Copper Oxide	Cu <sub>2</sub> O	99.9
Copper Selenide	CuSe	99.99
Copper Selenide	Cu <sub>2</sub> Se	99.5
Copper Sulfide	Cu <sub>2</sub> S	99.95
Copper Sulfide	CuS	99.999
Copper Telluride	Cu <sub>2</sub> Te	99.99
Copper Titanium	CuTi	99.9
Copper Titanium Oxide	CuTiO <sub>3</sub>	99.99
Copper Zinc	CuZn	99.9
Copper Zirconium	CuZr	99.9

**Cu****Copper-Base**

CHEMICAL NAME	FORMULA	PURITY %
Dysprosium	Dy	99.95

**Er****Erbium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Erbium	Er	99.95
Erbium Fluoride	ErF <sub>3</sub>	99.99
Erbium Oxide	Er <sub>2</sub> O <sub>3</sub>	99.95/99.99

**Gd****Gadolinium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Gadolinium	Gd	99.9/99.95
Gadolinium Oxide	Gd <sub>2</sub> O <sub>3</sub>	99.9

**Ga****Gallium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Gallium Antimonide	GaSb	99.999
Gallium Arsenide	GaAs	99.999
Gallium Nitride	GaN	99.999
Gallium Oxide	Ga <sub>2</sub> O <sub>3</sub>	99.995/99.999
Gallium Phosphide	GaP	99.999

**Ge****Germanium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Germanium	Ge	99.999
Germanium Antimonide	GeSb	99.999
Germanium Antimony Telluride(GST)	Ge <sub>2</sub> Sb <sub>3</sub> Te <sub>5</sub>	99.999
Germanium Sulfide	GeS <sub>2</sub>	99.995
Germanium Oxide	GeO <sub>2</sub>	99.99
Germanium Selenide	GeSe	99.999
Germanium Telluride	GeTe	99.999

**Au****Gold-Base**

CHEMICAL NAME	FORMULA	PURITY %
Gold	Au	99.95/99.999
Gold Germanium	AuGe	99.999

**C****Graphite-Base**

CHEMICAL NAME	FORMULA	PURITY %
Graphite	C	99.5-99.999
Carbon Nickel	C-Ni	99.95

**Hf****Hafnium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Hafnium	Hf	99.9-99.99
Hafnium Boride	HfB <sub>2</sub>	99.5
Hafnium Carbide	HfC	99.5/99.95
Hafnium Indium Zinc Oxide	HfO <sub>2</sub> -In <sub>2</sub> O <sub>3</sub> -ZnO	99.99
Hafnium Nitride	HfN	99.5
Hafnium Oxide	HfO <sub>2</sub>	99.95
Hafnium Silicide	HfSi <sub>2</sub>	99.5

**In****Indium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Indium	In	99.99/99.999
Indium Antimonide	InSb	99.99/99.999
Indium Arsenide	InAs	99.999
Indium Gallium Zinc Oxide(IGZO)	InGaZnO	99.99
Indium Gallium Tin Oxide(IGTO)	In <sub>2</sub> O <sub>3</sub> /Ga <sub>2</sub> O <sub>3</sub> /SnO <sub>2</sub>	99.99
Indium Oxide	In <sub>2</sub> O <sub>3</sub>	99.99/99.999
Indium Oxide Gallium Oxide(IGO)	In <sub>2</sub> O <sub>3</sub> -Ga <sub>2</sub> O <sub>3</sub>	99.99
Indium Oxide Zinc Oxide(IZO)	In <sub>2</sub> O <sub>3</sub> -ZnO	99.99
Indium Selenide	In <sub>2</sub> Se <sub>3</sub>	99.9/99.99
Indium Sulfide	In <sub>2</sub> S <sub>3</sub>	99.99/99.999
Indium Telluride	InTe	99.999
Indium Tin	InSn	99.995
Indium Tin Oxide(ITO)	In <sub>2</sub> O <sub>3</sub> -SnO <sub>2</sub>	99.99/99.999
Indium Tin Zinc Oxide(ITZO)	In <sub>2</sub> O <sub>3</sub> -SnO <sub>2</sub> -ZnO	99.99/99.999
Indium Zinc	InZn	99.99
Indium Zirconium Oxide	In <sub>2</sub> O <sub>3</sub> -ZrO <sub>2</sub>	99.99

Ir

## Iridium-Base

CHEMICAL NAME	FORMULA	PURITY %
Iridium	Ir	99.5-99.95
Iridium Manganese	IrMn	99.9

Fe

## Iron-Base

CHEMICAL NAME	FORMULA	PURITY %
Iron	Fe	99.5-99.99
Iron Boride	FeB	99.5
Iron Chromium Aluminum	FeCrAl	99.9
Iron Chromium Molybdenum Niobium Boron	FeCrMoNiB	99.9
Iron Gallium	FeGa	99.9
Iron Magnesium	FeMg	99.95
Iron Nickel	FeNi	99.95
Iron Oxide	Fe <sub>2</sub> O <sub>3</sub>	99.9
Iron Oxide	Fe <sub>3</sub> O <sub>4</sub>	99/99.95
Iron Sulfide	FeS	99.9
Iron Silicide	FeSi <sub>2</sub>	99.9/99.99
Iron Silicon Boron	FeSiB	99.95
Iron Zirconium	FeZr	99.9

La

## Lanthanum-Base

CHEMICAL NAME	FORMULA	PURITY %
Lanthanum	La	99.5-99.95
Lanthanum Aluminum Oxide	LaAlO <sub>3</sub>	99.9
Lanthanum Barium Tin Oxide	La-BaSnO <sub>3</sub>	99.9
Lanthanum Boride	LaB <sub>6</sub>	99.5
Lanthanum Nickel Oxide	LaNiO <sub>3</sub>	99.9
Lanthanum Nickel Aluminum Oxide	LaNi <sub>x</sub> Al <sub>1-x</sub> O <sub>3</sub>	99.9
Lanthanum Oxide	La <sub>2</sub> O <sub>3</sub>	99.95
Lanthanum Zirconium Oxide	La <sub>2</sub> Zr <sub>2</sub> O <sub>7</sub>	99.9
Lanthanum Yttrium	LaY	99.95

Pb

## Lead-Base

CHEMICAL NAME	FORMULA	PURITY %
Lead	Pb	99.99
Lead Chloride	PbCl <sub>2</sub>	99.999
Lead Iodide	PbI <sub>2</sub>	99.99
Lead Oxide	PbO	99.9
Lead Selenide	PbSe	99.999
Lead Telluride	PbTe	99.99
Lead Titanate	PbTiO <sub>3</sub>	99.9
Lead Zirconate Titanate(PZT)	Pb(ZrTi)O <sub>3</sub>	99.95

Li

## Lithium-Base

CHEMICAL NAME	FORMULA	PURITY %
Lithium Cobalt Oxide	LiCoO <sub>2</sub>	99.9
Lithium Cobalt Phosphate	LiCoPO <sub>4</sub>	99.9
Lithium Fluoride	LiF	99.9/99.99
Lithium Iron Phosphate	LiFePO <sub>4</sub>	99.9
Lithium Manganate	LiMn <sub>2</sub> O <sub>4</sub>	99.5
Lithium Nickel Phosphate	LiNiPO <sub>4</sub>	99.9
Lithium Niobate	LiNbO <sub>3</sub>	99.9
Lithium Phosphate	Li <sub>3</sub> PO <sub>4</sub>	99.99
Lithium Silicate	Li <sub>2</sub> SiO <sub>3</sub>	99.9
Lithium Zirconate	Li <sub>2</sub> ZrO <sub>3</sub>	99.9

\*All purities indicated in the tables are based on metallic impurities.



**Mg****Magnesium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Magnesium	Mg	99.9-99.999
Magnesium Aluminum Oxide	MgAl <sub>2</sub> O <sub>4</sub>	99.99
Magnesium Fluoride	MgF <sub>2</sub>	99.5/99.99
Magnesium Gallium Oxide	MgGa <sub>2</sub> O <sub>4</sub>	99.9
Magnesium Germanide	Mg <sub>2</sub> Ge	99.99
Magnesium Lithium	MgLi	99.5
Magnesium Nickel Oxide	MgNiO	99.9
Magnesium Oxide	MgO	99.95
Magnesium Silicide	Mg <sub>2</sub> Si	99.9
Magnesium Tin	Mg <sub>2</sub> Sn	99.9
Magnesium Titanate	MgTiO <sub>3</sub>	99.99
Magnesium Yttrium	MgY	99.5

**Mn****Manganese-Base**

CHEMICAL NAME	FORMULA	PURITY %
Manganese	Mn	99.95/99.99
Manganese Cobalt	MnCo	99.8
Manganese Gallium Nitride	Mn <sub>3</sub> GaN	99.5
Manganese Oxide	MnO	99.9/99.95
Manganese Oxide	MnO <sub>2</sub>	99.95
Manganese Tin	MnSn	99.9

**Nd****Neodymium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Neodymium	Nd	99.95
Neodymium Magnet(NiB)	Nd <sub>2</sub> Fe <sub>14</sub> B	99.95
Neodymium Oxide	Nd <sub>2</sub> O <sub>3</sub>	99.95

**Mo****Molybdenum-Base**

CHEMICAL NAME	FORMULA	PURITY %
Molybdenum	Mo	99.95
Molybdenum Carbide	Mo <sub>2</sub> C	99.5/99.95
Molybdenum-Lanthanum Oxide	Mo/La <sub>2</sub> O <sub>3</sub>	99.9
Molybdenum Niobium	MoNb	99.95
Molybdenum Nickel	MoNi	99.9
Molybdenum Oxide	MoO <sub>3</sub>	99.95/99.99
Molybdenum Selenide	MoSe <sub>2</sub>	99.99
Molybdenum Silicide	MoSi <sub>2</sub>	99.5-99.995
Molybdenum Sulfide	MoS <sub>2</sub>	99.9
Molybdenum Sulfide-Antimony Oxide	MoS <sub>2</sub> -Sb <sub>2</sub> O <sub>3</sub>	99.9
Molybdenum Sulfide-Tantalum	MoS <sub>2</sub> -Ta	99.9
Molybdenum Tantalum	MoTa	99.9
Molybdenum Telluride	MoTe <sub>2</sub>	99.99
Molybdenum Tungsten	MoW	99.9

**Ni****Nickel-Base**

CHEMICAL NAME	FORMULA	PURITY %
Nickel	Ni	99.5-99.995
Nickel Aluminum	NiAl	99.95/99.99
Nickel Chromium	NiCr	99.95
Nickel Chromium Aluminum	NiCrAl	99.9
Nickel Chromium Silicon	NiCrSi	99.9
Nickel Cobalt Oxide	NiCoO <sub>4</sub>	99.9
Nickel Copper	NiCu	99.9
Nickel Copper Iron	NiCuFe	99.95
Nickel Copper Titanium	NiCuTi	99.9
Nickel Iron	NiFe	99.95
Nickel Molybdenum	NiMo	99.9
Nickel Niobium	NiNb	99.95
Nickel Oxide	NiO	99-99.995
Nickel Silicide	NiSi <sub>2</sub>	99.5
Nickel Titanium	NiTi	99.9
Nickel Vanadium	NiV	99.95

**Nb****Niobium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Niobium	Nb	99.9/99.95
Niobium Aluminide	Nb <sub>3</sub> Al	99.95
Niobium Chromium	NbCr	99.5
Niobium Carbide	NbC	99.5
Niobium Molybdenum	NbMo	99.9
Niobium Molybdenum Tantalum	NbMoTa	99.9
Niobium Nitride	NbN	99.5
Niobium Oxide	Nb <sub>2</sub> O <sub>5</sub>	99.5-99.995
Niobium Oxide- Chromium Oxide	Nb <sub>2</sub> O <sub>5</sub> /Cr <sub>2</sub> O <sub>3</sub>	99.95
Niobium Oxide- Nickel Chromium	Nb <sub>2</sub> O <sub>5</sub> -NiCr	99.9
Niobium Silicide	NbSi <sub>2</sub>	99.5
Niobium Titanium	NbTi	99.9
Niobium Titanium Zirconium Chromium	NbTiZrCr	99.9
Niobium Titanium Zirconium Molybdenum	NbTiCrMo	99.9
Niobium Zirconium	NbZr	99.5

**Pd****Palladium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Palladium	Pd	99.95/99.99
Palladium-Silver	Pd-Ag	99.95
Palladium-Nickel	Pd-Ni	99.95

**Pt****Platinum-Base**

CHEMICAL NAME	FORMULA	PURITY %
Platinum	Pt	99.95/99.99
Platinum Palladium	Pt-Pd	99.99

**Re****Rhenium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Rhenium	Re	99.95/99.99

**Rh****Rhodium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Rhodium	Rh	99.5/99.95

**Ru****Ruthenium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Ruthenium	Ru	99.95

**Sm****Samarium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Samarium	Sm	99.9
Samarium Boride	SmB <sub>6</sub>	99.5
Samarium Cobalt	SmCo <sub>5</sub>	99.9
Samarium Oxide	Sm <sub>2</sub> O <sub>3</sub>	99.95

**Se****Selenium-Base**

CHEMICAL NAME	FORMULA	PURITY %
Selenium	Se	99.9-99.9999

Si

## Silicon-Base

CHEMICAL NAME	FORMULA	PURITY %
Silicon	Si	99.999
Silicon Aluminum	SiAl	99.99-99.999
Silicon Carbide	SiC	99.5-99.95
Silicon Chromium	SiCr	99.9
Silicon Dioxide	SiO <sub>2</sub>	99.9-99.999
Silicon Germanium	SiGe	99.999
Silicon Monoxide	SiO	99.9/99.99
Silicon Nitride	Si <sub>3</sub> N <sub>4</sub>	99.5-99.95

Ta

## Tantalum-Base

CHEMICAL NAME	FORMULA	PURITY %
Tantalum	Ta	99.95
Tantalum Carbide	TaC	99.5
Tantalum Nitride	TaN	99.5
Tantalum Oxide	Ta <sub>2</sub> O <sub>5</sub>	99.9-99.995
Tantalum Selenide	TaSe <sub>2</sub>	99.8
Tantalum Silicide	TaSi <sub>2</sub>	99.5/99.99
Tantalum Sulfide	TaS <sub>2</sub>	99.999
Tantalum Telluride	TaTe <sub>2</sub>	99.9

Ag

## Silver-Base

CHEMICAL NAME	FORMULA	PURITY %
Silver	Ag	99.9-99.999
Silver Chromium	AgCr	99.99
Silver Copper	AgCu	99.99
Silver Germanium	AgGe	99.995

Te

## Tellurium-Base

CHEMICAL NAME	FORMULA	PURITY %
Tellurium	Te	99.5-99.999
Tellurium Oxide	TeO <sub>2</sub>	99.99

Sr

## Strontium-Base

CHEMICAL NAME	FORMULA	PURITY %
Strontium	Sr	99.9
Strontium Aluminate	Sr <sub>3</sub> Al <sub>2</sub> O <sub>6</sub>	99.5
Strontium Fluoride	SrF <sub>2</sub>	99.9
Strontium Niobate	SrNbO <sub>3</sub>	99.9
Strontium Titanate	SrTiO <sub>3</sub>	99.9
Strontium Zirconate	SrZrO <sub>3</sub>	99

Sn

## Tin-Base

CHEMICAL NAME	FORMULA	PURITY %
Tin	Sn	99.9-99.999
Tin Antimonide	SnSb	99.99
Tin Monoxide	SnO	99.99
Tin Oxide	SnO <sub>2</sub>	99.9/99.99
Tin Selenide	SnSe	99.99
Tin Silver	SnAg	99.9
Tin Sulfide	SnS <sub>2</sub>	99.999
Tin Zinc	SnZn	99.95

Ti

## Titanium-Base

CHEMICAL NAME	FORMULA	PURITY %
Titanium	Ti	99.5-99.995
Titanium Aluminum	TiAl	99.9-99.99
Titanium Aluminum Silicon	TiAlSi	99.9
Titanium Aluminide	Ti <sub>3</sub> Al	99.9
Titanium Boride	TiB <sub>2</sub>	99.5
Titanium Carbide	TiC	99.5
Titanium Niobium	TiNb	99.9
Titanium Nitride	TiN	99.95
Titanium Oxide	TiO <sub>2</sub>	99.9-99.998
Titanium Oxide	Ti <sub>2</sub> O <sub>3</sub>	99.9/99.95
Titanium Silicide	TiSi <sub>2</sub>	99.5/99.95
Titanium Silicide Carbide	Ti <sub>3</sub> SiC <sub>2</sub>	99.95
Titanium Tantalum	TiTa	99.9
Titanium Zirconium	TiZr	99.9

W

## Tungsten-Base

CHEMICAL NAME	FORMULA	PURITY %
Tungsten	W	99.95
Tungsten Boride	W <sub>2</sub> B	99.5
Tungsten Carbide	WC	99.5
Tungsten Disulfide	WS <sub>2</sub>	99.9
Tungsten Molybdenum	WMo	99.95
Tungsten Oxide	WO <sub>3</sub>	99.99
Tungsten Oxide-Rhenium Oxide	WO <sub>3</sub> -ReO <sub>2</sub>	99.99
Tungsten Selenide	WSe <sub>2</sub>	99.8
Tungsten Silicide	WSi <sub>2</sub>	99.5
Tungsten Sulfide	WS <sub>2</sub>	99.8
Tungsten Telluride	WTe <sub>2</sub>	99.5-99.995
Tungsten Tantalum	WTa	99.95
Tungsten Titanium	WTi	99.95
Tungsten Rhenium	WRe	99.95

V

## Vanadium-Base

CHEMICAL NAME	FORMULA	PURITY %
Vanadium	V	99.9
Vanadium Boride	VB <sub>2</sub>	99.5
Vanadium Carbide	VC	99.5
Vanadium Dioxide	VO <sub>2</sub>	99.9
Vanadium Nitride	VN	99.5/99.9
Vanadium Oxide	V <sub>2</sub> O <sub>5</sub>	99.5/99.9
Vanadium Silicide	VSi <sub>2</sub>	99.5
Vanadium Titanium	VTi	99.9
Vanadium Tungsten	VW	99.9

Yb

## Ytterbium-Base

CHEMICAL NAME	FORMULA	PURITY %
Ytterbium	Yb	99.95
Ytterbium Fluoride	YbF <sub>3</sub>	99.95
Ytterbium Oxide	Yb <sub>2</sub> O <sub>3</sub>	99.95

Y

## Yttrium-Base

CHEMICAL NAME	FORMULA	PURITY %
Yttrium	Y	99.9-99.99
Yttrium Barium Cuprate(YBCO)	YBa <sub>2</sub> Cu <sub>3</sub> O <sub>7</sub>	99.9
Yttrium Fluoride	YF <sub>3</sub>	99.9
Yttrium Iron Garnet(YIG)	YFe <sub>2</sub> O <sub>4</sub>	99.9
Yttrium Manganate	YMnO <sub>3</sub>	99.9
Yttrium Oxide	Y <sub>2</sub> O <sub>3</sub>	99.9-99.99
Yttria-stabilized Zirconia(YSZ)	Y <sub>2</sub> O <sub>3</sub> -ZrO <sub>2</sub>	99.9
Yttrium Silicide	YSi <sub>2</sub>	99.9

Zn

## Zinc-Base

CHEMICAL NAME	FORMULA	PURITY %
Zinc	Zn	99.5-99.999
Zinc Aluminum	ZnAl	99.99
Zinc Antimony	Zn <sub>4</sub> Sb <sub>3</sub>	99.99
Zinc Copper	ZnCu	99.99
Zinc Oxide	ZnO	99.95
Zinc Oxide Aluminum Oxide(AZO)	ZnO-Al <sub>2</sub> O <sub>3</sub>	99.99/99.999
Zinc Oxide Gallium Oxide	ZnO-Ga <sub>2</sub> O <sub>3</sub>	99.99
Zinc Oxide Magnesium Oxide	ZnO-MgO	99.9
Zinc Oxide Molybdenum Oxide	ZnO-MoO <sub>3</sub>	99.9
Zinc Oxide Tin	ZnO-Sn	99.99
Zinc Selenide	ZnSe	99.99/99.995
Zinc Sulfide	ZnS	99.99
Zinc Telluride	ZnTe	99.99
Zinc Tin	ZnSn	99.99
Zinc Tin Oxide(ZTO)	Zn <sub>2</sub> SnO <sub>4</sub>	99.95

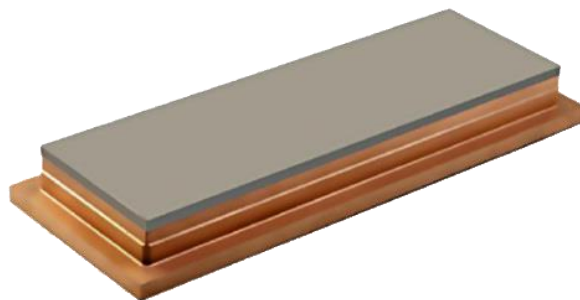
Zr

## Zirconium-Base

CHEMICAL NAME	FORMULA	PURITY %
Zirconium	Zr	99.5-99.99
Zirconium Boride	ZrB <sub>2</sub>	99.5
Zirconium Carbide	ZrC	99.5
Zirconium Chromium	ZrCr	99.9
Zirconium Copper Aluminum	ZrCuAl	99.5
Zirconium Molybdenum	ZrMo	99.9
Zirconium Nitride	ZrN	99.5
Zirconium Oxide	ZrO <sub>2</sub>	99.9-99.995
Zirconium Silicide	ZrSi <sub>2</sub>	99.5
Zirconium Vanadium Titanium	ZrVTi	99.5
Zirconium Yttrium	ZrY	99.95

\*All purities indicated in the tables are based on metallic impurities.

## Backing Plates



The perfect bonding of the target and backing plate is a key part of the sputtering process. The backing plate is mainly used to hold the sputtering target material and needs to have good electrical and thermal conductivity. In the magnetron sputtering coating process, the target must withstand both the cooling water pressure on the back side and the negative vacuum pressure on the front side, so the target backing plate is especially important. Depending on the material, the sputtering target backing plate also varies. The proper selection and bonding of target backing plates can improve the life of the target and the efficiency of the coating, and also improve the film coefficient achievement rate. At present, the common sputtering target backplane materials are mainly oxygen-free copper, molybdenum, stainless steel tube, indium and other backplane materials.

### Backing Plate Materials We Can Offer

#### Oxygen-Free Copper (OFC)

The most common material used for backplanes today is OFC because it has good electrical and thermal conductivity and is easy to work with. If properly maintained, OFC backplanes can be reused more than ten times.

#### Molybdenum (Mo)

Used for special conditions, such as high temperature bonding. Copper backsheets are more likely to oxidize or warp at high temperatures, so when copper backsheets do not match the coefficient of thermal expansion of the target, molybdenum backsheets can be matched with some targets that have a low coefficient of thermal expansion.

#### Stainless steel tube (SST)

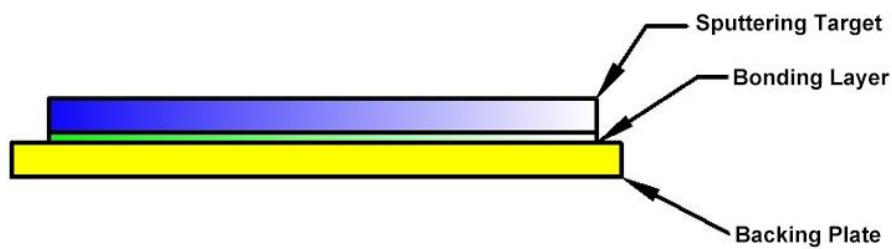
Currently, stainless steel tube is most commonly used as the backing tube for rotating targets. Stainless steel tube has good strength and thermal conductivity and is very economical.

Most backing plate are reusable, especially those with indium, which are easy to clean and reuse. If other coating agents (including epoxy) are used, the backing plate surface may need to be mechanically treated before it can be reused.

VI HALBLEITERMATERIAL process target backing plate of different specifications according to different machine requirements, materials include copper, titanium, molybdenum, aluminum, etc. We can also provide bonding services for targets and backing plates.

## Sputtering Target Bonding Service

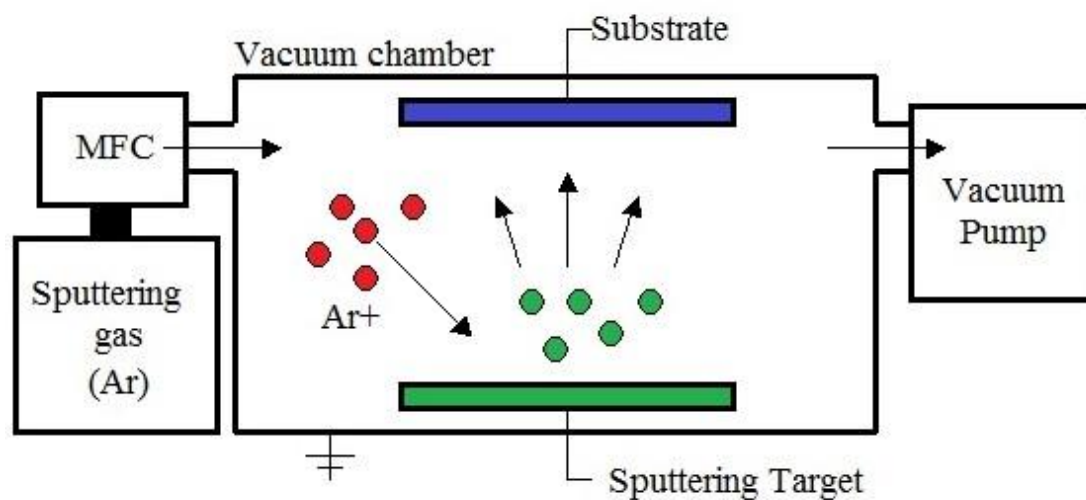
The three commonly used target bonding methods are adhesive, solder and high temperature welding (including brazing and diffusion welding). With these three bonding techniques, we can provide the best target bonding solutions for our customers' applications.



**Target Bonding Diagram**

Types	Advantage	Disadvantage
<b>Adhesive bonding</b>	Low cost, easy rework	Relatively high thermal resistance
<b>Solder Bonding(Indium)</b>	Low thermal resistance, low cost	
<b>High Temperature Soldering</b>	Very low thermal resistance, allowing the highest possible power density	Higher cost, Can't rework

## Vacuum coating



VI HALBLEITERMATERIAL offers you sputtering targets of high purity, low impurities, uniform grain size, less grain defects.

Sputtering targets are mainly used in electronic and information industries, such as integrated circuits, information storage, liquid crystal displays, laser memory, electronic control devices, etc.; they can also be used in the field of glass coating; they can also be applied to wear-resistant materials, high-temperature corrosion resistance, high-grade decorative supplies and other industries.