

D

MATERIALS SPUTTERING TARGETS

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Most sputtering targets can be fabricated into a wide range of shapes and sizes. There are some technical limitations to the maximum size for a given single piece construction.

In such cases, a multi-segmented target can be produced with the individual segments joined together by butt or beveled joints.

OUR SPUTTERING TARGETS AT A GLANCE

- Pure metal and alloy targets (99% to 99.9999%), industrial application targets: Al, Ni/Cr, Mo, Ta, Ti, Ti/Al, W...
- Precious metal targets: Ag, Au, Ir, Pd, Pt, Rh... and alloys on request
- Hot pressed oxides and intermetallic targets without binder: Al_2O_3 , AZO, ITO, PZT, SiO_2 , ZnO...
- Circular, rectangular, Delta, ring, tube and any other shape on request
- All targets are delivered with a certificate of analysis

Neyco offers you specific composition according to your needs on request. Don't hesitate to ask us !

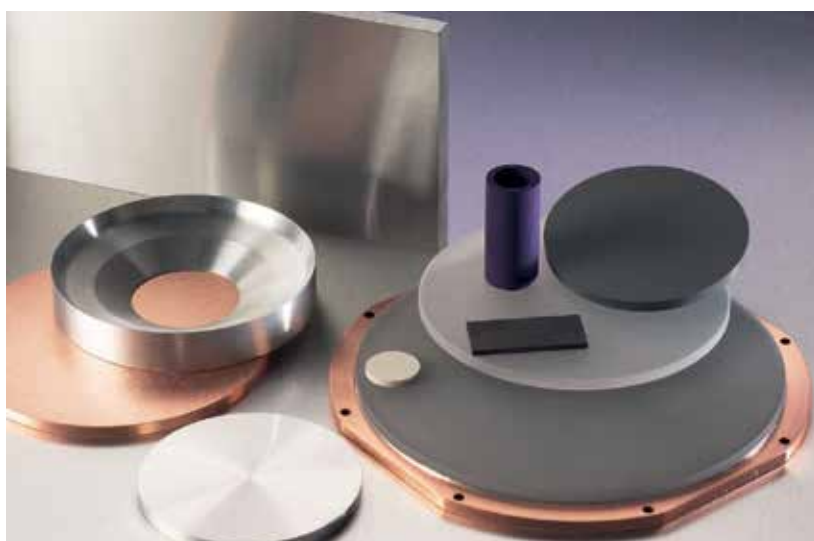


Manufacturing Processes

Neyco manufactures sputtering targets from a wide variety of compositions in various purity levels, allowing customers to match targets to their specific requirements and needs. We employ a number of different target manufacturing techniques to yield optimum grain size, density, hardness and composition. The specific manufacturing process depends on the properties of the target material and the end use of the target.

Manufacturing techniques used include:

- Casting
- Ceramic Sintering
- Cold and Hot Isostatic Pressing
- Extrusion
- Hot and Cold Rolling
- Inert Gas Hot-Pressing
- Plasma Spray
- Precision Machining
- Vacuum Hot-Pressing
- Vacuum Melting



Sputtering Targets

Al 13 ALUMINUM Base

CHEMICAL*	FORMULA	PURITY**
Aluminum	Al	99.99/99.999
Aluminum Antimonide	AlSb	99.99
Aluminum Chromium (95/5)	Al-Cr	99.95
Aluminum Copper (99.5/0.5)	Al-Cu	99.995
Aluminum Copper (90/10), (92/8), (95/5), (98/2), (99/1)	Al-Cu	99.99 to 99.999
Aluminum Copper Silicon (98/1/1)	Al-Cu-Si	99.999
Aluminum Magnesium	AlMg	99.995
Aluminum Magnesium Silicon	AlMgSi	99.99
Aluminum Neodymium	AlNd	99.95
Aluminum Nickel Boron (95.5/4/0.5 at%)	Al-Ni-B	99.99
Aluminum Nickelide	Al ₃ Ni	99.9
Aluminum Nitride	AlN	99 to 99.9
Aluminum Nitride Titanium Nitride	AlN-TiN	99.5
Aluminum Oxide	Al ₂ O ₃	99.99 to 99.999
Aluminum Oxide Tungsten Oxide (95/5 at%)	Al ₂ O ₃ -WO ₃	99.99
Aluminum Oxide Yttrium Oxide (95/5 at%)	Al ₂ O ₃ -Y ₂ O ₃	99.99
Aluminum Silicon Copper	AlSiCu	99.95
Aluminum Silicon (98/2), (99/1)	Al-Si	99.99/99.999
Aluminum Silicon	AlSi	99.999

Sb 51 ANTIMONY Base

CHEMICAL*	FORMULA	PURITY**
Antimony	Sb	99.5/99.999
Antimony Sulfide	Sb ₂ S ₃	99.99
Antimony Telluride	Sb ₂ Te ₃	99.999

Ba 56 BARIUM Base

CHEMICAL*	FORMULA	PURITY**
Barium	Ba	99.9
Barium Ferrite	BaFe ₁₂ O ₁₉	99.9
Barium Fluoride	BaF ₂	99.9/99.995
Barium Lead Oxide	BaPbO ₃	99.5
Barium Manganese Oxide	BaMnO ₃	99.9
Barium Oxide	BaO	99.95
Barium Strontium Titanate, BST	BaSrTiO ₃	99.95
Barium Titanate	BaTiO ₃	99.9/99.95
Barium Zirconate	BaZrO ₃	99.99
Barium Zirconium Titanate	BaZrTiO ₃	99.9

*All alloys are in wt% when not indicated.

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

Bi

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BISMUTH Base

CHEMICAL*	FORMULA	PURITY**
Bismuth	Bi	99.9 to 99.999
Bismuth Aluminum Oxide	BiAlO ₃	99.99
Bismuth Antimonide	BiSb	99.99
Bismuth Antimony Telluride	BiSbTe	99.999
Bismuth Cobalt Oxide	BiCoO ₃	99.95
Bismuth Ferrite	BiFeO ₃	99.99
Bismuth Gallate	BiGa ₂ O ₃	99.99
Bismuth Indium Oxide	BiInO ₃	99.9
Bismuth Iron Titanium Oxide	Bi _{1.02} Fe _{0.98} Ti _{0.02} O ₃	99.9
Bismuth Manganese Oxide	BiMnO ₃	99.95
Bismuth Neodymium Titanium Oxide, BNdT	(Bi _{3.15} Nd _{0.85})Ti ₃ O ₁₂	99.9
Bismuth Oxide	Bi ₂ O ₃	99.9 to 99.99
Bismuth Samarium Ferrite	BiSmFeO ₃	99.9
Bismuth Selenide	Bi ₂ Se ₃	99.999
Bismuth Silicon Oxide	Bi ₂ SiO ₅	99.99
Bismuth Strontium Calcium Copper Oxide, BSOCO (2212)	Bi ₂ Sr ₂ Ca ₁ Cu ₂ O ₈	99.9
Bismuth Strontium Calcium Copper Oxide, BSOCO (2223)	Bi ₂ Sr ₂ Ca ₂ Cu ₃ O ₁₀	99.9
Bismuth Telluride	Bi ₂ Te ₃	99.999
Bismuth Telluride Selenide	BiTe _{1-x} Se _x	99.999
Bismuth Titanate	Bi ₂ Ti ₄ O ₁₁	99.9
Bismuth Vanadate	BiVO ₄	99.99

B

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BORON Base

CHEMICAL*	FORMULA	PURITY**
Boron	B	99.9 to 99.999
Boron Carbide	B ₄ C	99.5 / 99.9
Boron Nitride	BN	97.5 to 99.9

Cd

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CADMIUM Base

CHEMICAL*	FORMULA	PURITY**
Cadmium	Cd	99.9 to 99.999
Cadmium Oxide	CdO	99.99
Cadmium Selenide	CdSe	99.99 / 99.995
Cadmium Stannate	Cd ₂ SnO ₄	99.99
Cadmium Sulfide	CdS	99.99 / 99.999
Cadmium Telluride	CdTe	99.999
Cadmium Tin	CdSn	99.99

Ca

20

CALCIUM Base

CHEMICAL*	FORMULA	PURITY**
Calcium Fluoride	CaF ₂	99.99 / 99.995
Calcium Manganate	CaMnO ₃	99.95
Calcium Oxide	CaO	99.99
Calcium Titanate	CaTiO ₃	99.99

Ce

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CERIUM Base

CHEMICAL*	FORMULA	PURITY**
Cerium	Ce	99.9 / 99.95
Cerium Fluoride	CeF ₃	99.9
Cerium Gadolinium	CeGd	99.95
Cerium Oxide	CeO ₂	99.9

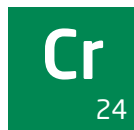
*All alloys are in wt% when not indicated.

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



CESIUM Base

CHEMICAL*	FORMULA	PURITY**
Cesium Iodide	CsI	99.99/99.999



CHROMIUM Base

CHEMICAL*	FORMULA	PURITY**
Chromium	Cr	99.8 to 99.99
Chromium Aluminide	CrAl	99.99
Chromium Boride	CrB ₂	99.5
Chromium Carbide	Cr ₃ C ₂	99.5/99.95
Chromium Diboride	CrB ₂	99.5
Chromium Nitride	Cr ₂ N	99.5
Chromium Oxide	Cr ₂ O ₃	99.8 to 99.95
Chromium Silicide	CrSi ₂	99.5/99.9
Chromium Silicide	Cr ₃ Si	99.5
Chromium Titanium (80/20), (95/5)	Cr-Ti	99.9
Chromium Nickel (60/40)	Cr-Ni	99.9
Chromium Nickel Aluminum	CrNiAl	99.9
Chromium Silicon Monoxide (60/40), (70/30)	Cr-SiO	99.5/99.9
Chromium Ruthenium	CrRu	99.95



COBALT Base

CHEMICAL*	FORMULA	PURITY**
Cobalt	Co	99.8 to 99.99
Cobalt Boride	Co ₂ B	99.9
Cobalt Chromium Aluminum	CoCrAl	99.95
Cobalt Chromium Iron Aluminum	CoCrFeAl	99.9
Cobalt Chromium Oxide	CoCr ₂ O ₄	99.9
Cobalt Gadolinium	CoGd	99.95
Cobalt Iron	CoFe	99.95
Cobalt Iron (50/50), (60/40), (70/30), (84/16), (90/10)	Co-Fe	99.9/99.95
Cobalt Iron Boron	CoFeB	99.95
Cobalt Oxide	Co ₃ O ₄	99.95
Cobalt Oxide	CoO	99.95
Cobalt Silicide	CoSi ₂	99.5
Cobalt Silicon	CoSi	99.95

*All alloys are in wt% when not indicated.

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

Cu
29**COPPER Base**

CHEMICAL*	FORMULA	PURITY**
Copper	Cu	99.99/99.995
Copper Aluminum Oxide	CuAl ₂ O ₃	99.9
Copper Aluminum Oxide	CuAlO ₂	99.99
Copper Boron (95/5 at%)	Cu-B	99.9
Copper Gallium	CuGa	99.99/99.995
Copper Germanide	CuGe	99.99
Copper Indium	CuIn	99.99
Copper Indium Gallium	CuInGa	99.99
Copper Indium Gallium Selenide	CuInGaSe ₂	99.99
Copper Iron (99/1)	Cu-Fe	99.95
Copper Magnesium	CuMg	99.99
Copper Nickel	CuNi	99.99
Copper Oxide	CuO	99.7/99.9
Copper Oxide	Cu ₂ O	99.9
Copper Selenide	CuSe	99.99
Copper Selenide	Cu ₂ Se	99.5
Copper Sulfide	Cu ₂ S	99.95
Copper Sulfide	CuS	99.999
Copper Telluride	Cu ₂ Te	99.99
Copper Tin (90/10)	Cu-Sn	99.99
Copper Titanium Oxide	CuTiO ₃	99.99

Dy
66**DYSPROSIUM Base**

CHEMICAL*	FORMULA	PURITY**
Dysprosium	Dy	99.95

Er
68**ERBIUM Base**

CHEMICAL*	FORMULA	PURITY**
Erbium	Er	99.95
Erbium Fluoride	ErF ₃	99.99
Erbium Oxide	Er ₂ O ₃	99.95/99.99

Eu
63**EUROPIUM Base**

CHEMICAL*	FORMULA	PURITY**
Europium	Eu	99.9
Europium Oxide	Eu ₂ O ₃	99.95

Gd
64**GADOLINIUM Base**

CHEMICAL*	FORMULA	PURITY**
Gadolinium	Gd	99.9/99.95
Gadolinium Oxide	Gd ₂ O ₃	99.9

Ga
31**GALLIUM Base**

CHEMICAL*	FORMULA	PURITY**
Gallium Antimonide	GaSb	99.999
Gallium Arsenide	GaAs	99.999
Gallium Indium Zinc Oxide	Ga ₂ O ₃ -In ₂ O ₃ -ZnO	99.99
Gallium Iron Magnesium Oxide	GaFeMgO ₃	99.9
Gallium Oxide	Ga ₂ O ₃	99.995/ 99.999
Gallium Phosphide	GaP	99.999
Gallium Selenide	Ga ₂ Se ₃	99.99

Ge
32**GERMANIUM Base**

CHEMICAL*	FORMULA	PURITY*
Germanium	Ge	99.999
Germanium Antimonide	GeSb	99.999
Germanium Antimony Telluride, GST	Ge ₂ Sb ₃ Te ₅	99.999
Germanium Oxide	GeO ₂	99.99
Germanium Selenide	GeSe	99.999
Germanium Telluride	GeTe	99.999

*All alloys are in wt% when not indicated. .

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

Au
79**GOLD Base**

CHEMICAL*	FORMULA	PURITY**
Gold	Au	99.95/99.999
Gold Boride	AuB	99.99
Gold Germanium (88/12)	Au-Ge	99.999
Gold Palladium (60/40)	Au-Pd	99.99
Gold Tin (70/30)	Au-Sn	99.99
Gold Zinc (92/8)	Au-Zn	99.99

➔ See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

C
6**GRAPHITE Base**

CHEMICAL*	FORMULA	PURITY**
Graphite	C	99.5/99.999
Carbon Nickel (95/5)	C-Ni	99.95

Hf
72**HAFNIUM Base**

CHEMICAL*	FORMULA	PURITY**
Hafnium	Hf	99.9 to 99.99
Hafnium Boride	HfB ₂	99.5
Hafnium Carbide	HfC	99.5/99.95
Hafnium Indium Zinc Oxide (0.3/1/1 mol%), (1/1/1 mol%)	HfO ₂ -In ₂ O ₃ -ZnO	99.99
Hafnium Nitride	HfN	99.5
Hafnium Oxide	HfO ₂	99.95
Hafnium Oxide Yttrium Oxide (90/10), (85/15)	HfO ₂ -Y ₂ O ₃	99
Hafnium Oxide Yttrium Oxide (92/8 mol%)	HfO ₂ -Y ₂ O ₃	99.95
Hafnium Silicide	HfSi ₂	99.5/99.8

Ho
67**HOLMIUM Base**

CHEMICAL*	FORMULA	PURITY**
Holmium	Ho	99.95
Holmium Manganese Oxide	HoMnO ₃	99.95

In
49**INDIUM Base**

CHEMICAL*	FORMULA	PURITY**
Indium	In	99.99/99.999
Indium Antimonide	InSb	99.99/99.999
Indium Arsenide	InAs	99.999
Indium Gallium Zinc Oxide	InGaZnO	99.99
Indium Oxide	In ₂ O ₃	99.99/99.999
Indium Oxide Gallium Oxide, IGO (90/10)	In ₂ O ₃ -Ga ₂ O ₃	99.99
Indium Oxide Zinc Oxide, IZO (90/10)	In ₂ O ₃ -ZnO	99.99
Indium Selenide	In ₂ Se ₃	99.9/99.99
Indium Sulfide	In ₂ S ₃	99.99/99.999
Indium Telluride	InTe	99.999
Indium Tin (90/10)	In-Sn	99.995
Indium Tin Oxide Iron	In ₂ O ₃ -SnO ₂ -Fe	99.99
Indium Tin Oxide, ITO (90/10), (85/15), (80/20)	In ₂ O ₃ -SnO ₂	99.99/99.999
Indium Tin Oxide (91/9 mol%)	In ₂ O ₃ -SnO ₂	99.99/99.999
Indium Tin Zinc Oxide, ITZO (90/3/7)	In ₂ O ₃ -SnO ₂ -ZnO	99.99
Indium Zinc (90/10)	In-Zn	99.99

*All alloys are in wt% when not indicated.

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

Ir

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IRIDIUM Base

CHEMICAL*	FORMULA	PURITY**
Iridium	Ir	99.8/99.95
Iridium Manganese (20/80), (75/25), (80/20)	Ir-Mn	99.95

➔ See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

Fe

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IRON Base

CHEMICAL*	FORMULA	PURITY**
Iron	Fe	99.6 to 99.99
Iron Boride	FeB	99.5
Iron Carbide	Fe ₃ C	99.9
Iron Copper (98/2 at%)	Fe-Cu	99.995
Iron Copper Niobium Silicon Boron	FeCuNbSiB	99.9
Iron Germanium	FeGe	99.95
Iron Magnesium	FeMg	99.95
Iron Manganese (50/50)	Fe-Mn	99.95
Iron Oxide	Fe ₂ O ₃	99.9
Iron Oxide	Fe ₃ O ₄	99/99.95
Iron Oxide	FeO	99.9
Iron Oxide Cobalt Oxide	Fe ₂ O ₃ -Co ₃ O ₄	99.9
Iron Silicide	FeSi	99.95
Iron Silicide	FeSi ₂	99.9/99.99
Iron Silicon Boron	FeSiB	99.95
Iron Terbium (67/33 at%)	Fe-Tb	99.9
Iron Terbium Cobalt	FeTbCo	99.9

La

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LANTHANUM Base

CHEMICAL*	FORMULA	PURITY**
Lanthanum	La	99.95
Lanthanum Aluminum Oxide	LaAlO ₃	99.9
Lanthanum Boride	LaB ₆	99.5
Lanthanum Calcium Manganate, LCM	La _{1-x} Ca _x MnO ₃	99.9
Lanthanum Fluoride	LaF ₃	99.9 to 99.998
Lanthanum Nickel Oxide	LaNiO ₃	99.9
Lanthanum Strontium	LaSr	99.95
Lanthanum Strontium Manganate, LSM	La _{1-x} Sr _x MnO ₃	99.9
Lanthanum Strontium Cobaltite	La _{0.9} Sr _{0.1} CoO ₃	99.9
Lanthanum Yttrium	LaY	99.95

Pb

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LEAD Base

CHEMICAL*	FORMULA	PURITY**
Lead	Pb	99.99
Lead Fluoride	PbF ₂	99.9
Lead Lanthanum ZirconateTitanate, PLZT	PbLa(ZrTi)O ₃	99.9
Lead Oxide	PbO	99.9
Lead Selenide	PbSe	99.999
Lead Telluride	PbTe	99.99
Lead Titanate	PbTiO ₃	99.9
Lead Titanate Lead	PbTiO ₃ -Pb	99.9
Lead Zirconate Titanate, PZT	Pb(ZrTi)O ₃	99.95

*All alloys are in wt% when not indicated.

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

Li

3

LITHIUM Base

CHEMICAL*	FORMULA	PURITY**
Lithium Cobalt Oxide	LiCoO ₂	99.9
Lithium Fluoride	LiF	99.9/99.99
Lithium Iron Phosphate	LiFePO ₄	99.9
Lithium Manganate	LiMn ₂ O ₄	99.5
Lithium Niobate	LiNbO ₃	99.9
Lithium Phosphate	Li ₃ PO ₄	99.99

Mg

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MAGNESIUM Base

CHEMICAL*	FORMULA	PURITY**
Magnesium	Mg	99.9 to 99.999
Magnesium Aluminum Oxide	MgAl ₂ O ₄	99.99
Magnesium Fluoride	MgF ₂	99.5/99.99
Magnesium Germanide	Mg ₂ Ge	99.99
Magnesium Oxide	MgO	99.95
Magnesium Silicide	Mg ₂ Si	99.9
Magnesium Titanate	MgTiO ₃	99.99

Mn

25

MANGANESE Base

CHEMICAL*	FORMULA	PURITY**
Manganese	Mn	99.95/99.99
Manganese Oxide	MnO	99.9/99.95
Manganese Oxide	MnO ₂	99.95
Manganese Titanium (50/50)	Mn-Ti	99.95

Mo

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MOLYBDENUM Base

CHEMICAL*	FORMULA	PURITY**
Molybdenum	Mo	99.95
Molybdenum Carbide	Mo ₂ C	99.5/99.95
Molybdenum Oxide	MoO ₃	99.95/99.99
Molybdenum Oxide Copper	MoO ₃ -Cu	99.9
Molybdenum Selenide	MoSe ₂	99.99
Molybdenum Silicide	MoSi ₂	99.5 to 99.995
Molybdenum Sulfide	MoS ₂	99/99.9
Molybdenum Telluride	MoTe ₂	99.99

Nd

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NEODYMIUM Base

CHEMICAL*	FORMULA	PURITY**
Neodymium	Nd	99.95
Neodymium Ferrite	NdFeO ₃	99.99
Neodymium Magnet, NIB	Nd ₂ Fe ₁₄ B	99.95
Neodymium Oxide	Nd ₂ O ₃	99.95

*All alloys are in wt% when not indicated.

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

Ni

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NICKEL Base

CHEMICAL*	FORMULA	PURITY**
Nickel	Ni	99.6 to 99.995
Nickel Aluminum (50/50 at%), (50/50)	Ni-Al	99.95 / 99.99
Nickel Aluminum Manganese Silicon, Alumei (95/2/2/1)	Ni-Al-Mn-Si	99.95
Nickel Boride	Ni ₂ B	99.5
Nickel Chromium	NiCr	99.95
Nickel Chromium (90/10), (80/20), (40/60)	Ni-Cr	99.9 / 99.95
Nickel Chromium Iron, Inconel 690	NiCrFe	99.95
Nickel Chromium Silicon (47.5/47.5/5)	Ni-Cr-Si	99.95
Nickel Iron (81/19), (80/20), (80/20 at%)	Ni-Fe	99.95
Nickel Nitride	NiN	99.5
Nickel Oxide	NiO	99 to 99.995
Nickel Platinum (95/5)	Ni-Pt	99.95
Nickel Silicide	NiSi ₂	99.5
Nickel Titanium (50/50)	Ni-Ti	99.95
Nickel Tungsten (50/50 at%), (95/5 at%)	Ni-W	99.9 / 99.95
Nickel Vanadium (93/7)	Ni-V	99.95

Nb

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NIOBIUM Base

CHEMICAL*	FORMULA	PURITY**
Niobium	Nb	99.9+ / 99.95
Niobium Aluminide	Nb ₃ Al	99.95
Niobium Carbide	NbC	99.5
Niobium Germanide	Nb ₃ Ge	99.95
Niobium Nitride	NbN	99.5
Niobium Oxide	Nb ₂ O ₅	99.5 to 99.995
Niobium Silicide	NbSi ₂	99.5

Pd

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PALLADIUM Base

CHEMICAL*	FORMULA	PURITY**
Palladium	Pd	99.95 / 99.99
Palladium Nickel (90/10)	Pd-Ni	99.95

➔ See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

Pt

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PLATINUM Base

CHEMICAL*	FORMULA	PURITY**
Platinum	Pt	99.95 / 99.99
Platinum Palladium (50/50)	Pt-Pd	99.99

➔ See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

*All alloys are in wt% when not indicated.

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

Pr

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PRASEODYMIUM Base

CHEMICAL*	FORMULA	PURITY**
Praseodymium	Pr	99.95
Praseodymium Calcium Manganese Oxide, PCMO	$\text{Pr}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$	99.9
Praseodymium Oxide	Pr_6O_{11}	99.9

Re

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RHENIUM Base

CHEMICAL*	FORMULA	PURITY**
Rhenium	Re	99.95 / 99.99

Rh

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RHODIUM Base

CHEMICAL*	FORMULA	PURITY**
Rhodium	Rh	99.8 / 99.95



See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

Ru

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RUTHENIUM Base

CHEMICAL*	FORMULA	PURITY**
Ruthenium	Ru	99.95



See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

Sm

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SAMARIUM Base

CHEMICAL*	FORMULA	PURITY**
Samarium	Sm	99.9 / 99.95
Samarium Aluminide	SmAl_2	99.99
Samarium Cobalt	SmCo_5	99.9
Samarium Oxide	Sm_2O_3	99.95 / 99.99
Samarium Zirconium (50/50), (40/60)	Sm-Zr	99.9

Sc

21

SCANDIUM Base

CHEMICAL*	FORMULA	PURITY**
Scandium	Sc	99.99 / 99.995
Scandium Oxide	Sc_2O_3	99.995

Se

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SELENIUM Base

CHEMICAL*	FORMULA	PURITY**
Selenium	Se	99.999
Selenium Germanium (70/30 at%)	Se-Ge	99.999

*All alloys are in wt% when not indicated.

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

Si

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SILICON Base

CHEMICAL*	FORMULA	PURITY**
Silicon	Si	99.999
Silicon Aluminum (92/8), (94/6), (95/5), (96/4), (98/2)	Si-Al	99.99 to 99.999
Silicon Carbide	SiC	99.5
Silicon Chromium	SiCr	99.99
Silicon Dioxide	SiO ₂	99.99 to 99.999
Silicon Germanium	SiGe	99.999
Silicon Germanium	SiGe	99.999
Silicon Monoxide	SiO	99.9 to 99.99
Silicon Nitride	Si ₃ N ₄	99.5/99.9

Ag

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SILVER Base

CHEMICAL*	FORMULA	PURITY**
Silver	Ag	99.99 / 99.999
Silver Germanium (96/4)	Ag-Ge	99.995
Silver Germanium Tin	AgGeSn	99.995

➔ See Section E - Precious Metals in this catalogue about Presentation and Precious Metal Recycling.

Na

11

SODIUM Base

CHEMICAL	FORMULA	PURITY*
Sodium Fluoride	NaF	99.9 to 99.99

Sr

38

STRONTIUM Base

CHEMICAL*	FORMULA	PURITY**
Strontium Copper Oxide, SCO	SrCu ₂ O ₂	99.9
Strontium Fluoride	SrF ₂	99.9
Strontium Ruthenate	SrRuO ₃	99.95
Strontium Titanate	SrTiO ₃	99.9
Strontium Titanium Niobium Oxide	SrTiNbO ₃	99.95
Strontium Zirconate	SrZrO ₃	99

Ta

73

TANTALUM Base

CHEMICAL*	FORMULA	PURITY**
Tantalum	Ta	99.95
Tantalum Aluminum	TaAl	99.9
Tantalum Carbide	TaC	99.5
Tantalum Nitride	TaN	99.5
Tantalum Oxide	Ta ₂ O ₅	99.99 to 99.997
Tantalum Selenide	TaSe ₂	99.5 / 99.8
Tantalum Silicide	TaSi ₂	99.5 / 99.99
Tantalum Silicide	Ta ₃ Si ₃	99.5
Tantalum Sulfide	TaS ₂	99.999
Tantalum Telluride	TaTe ₂	99.99

*All alloys are in wt% when not indicated.

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

Te
52**TELLURIUM Base**

CHEMICAL*	FORMULA	PURITY**
Tellurium	Te	99.5 to 99.999
Tellurium Oxide	TeO ₂	99.99

Tb
65**TERBIUM Base**

CHEMICAL*	FORMULA	PURITY**
Terbium	Tb	99.95
Terbium Manganate	TbMnO ₃	99.95

Sn
50**TIN Base**

CHEMICAL*	FORMULA	PURITY**
Tin	Sn	99.997/99.999
Tin Antimonide	SnSb	99.99
Tin Copper (63/35 at%)	Sn-Cu	99.99
Tin Monoxide	SnO	99.99
Tin Oxide	SnO ₂	99.9/99.99
Tin Oxide Zinc	SnO ₂ -Zn	99.99
Tin Oxide Antimony Oxide	SnO ₂ -Sb ₂ O ₃	99.99
Tin Selenide	SnSe	99.99
Tin Sulfide	SnS	99.999
Tin Sulfide	SnS ₂	99.999
Tin Zinc	SnZn	99.99

Ti
22**TITANIUM Base**

CHEMICAL*	FORMULA	PURITY**
Titanium	Ti	99.8 to 99.995
Titanium Aluminum (30/70), (50/50 at%), (65/35 at%)	Ti-Al	99.9 to 99.99
Titanium Aluminide	Ti ₃ Al	99.9
Titanium Boride	TiB ₂	99.5/99.8
Titanium Carbide	TiC	99.5
Titanium Cobalt (97/3)	Ti-Co	99.95
Titanium Monoxide	TiO	99.9/99.99
Titanium Neodymium (97/3)	Ti-Nd	99.95
Titanium Nickel (50/50)	Ti-Ni	99.95
Titanium Nitride	TiN	99.5/99.9
Titanium Nitride Titanium (90/10)	TiN-Ti	99.5
Titanium Oxide	Ti ₂ O ₃	99.9/99.95
Titanium Oxide	TiO ₂	99.9 to 99.998
Titanium Silicide	TiSi ₂	99.5/99.95
Titanium Silicide	Ti ₅ Si ₃	99.5

*All alloys are in wt% when not indicated.

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

W

74

TUNGSTEN Base

CHEMICAL*	FORMULA	PURITY**
Tungsten	W	99.95
Tungsten Boride	W ₂ B	99.5
Tungsten Carbide	WC	99.5
Tungsten Disulfide	WS ₂	99.9
Tungsten Molybdenum (90/10)	W-Mo	99.95
Tungsten Nickel (90/10)	W-Ni	99.95
Tungsten Oxide	WO ₃	99.99
Tungsten Selenide	WSe ₂	99.8
Tungsten Silicide	WSi ₂	99.5/99.95
Tungsten Sulfide	WS ₂	99.8
Tungsten Telluride	WTe ₂	99.9/99.995
Tungsten Titanium (90/10), (80/20)	W-Ti	99.9 to 99.995
Tungsten Rhenium	WRe	99.95

V

23

VANADIUM Base

CHEMICAL*	FORMULA	PURITY**
Vanadium	V	99.7/99.9
Vanadium Boride	VB ₂	99.5
Vanadium Carbide	VC	99.5
Vanadium Nitride	VN	99.5/99.9
Vanadium Oxide	V ₂ O ₅	99.5/99.9
Vanadium Silicide	VS ₂	99.5

Yb

70

YTTERBIUM Base

CHEMICAL*	FORMULA	PURITY**
Ytterbium	Yb	99.95
Ytterbium Fluoride	YbF ₃	99.995
Ytterbium Oxide	Yb ₂ O ₃	99.99

Y

39

YTTRIUM Base

CHEMICAL*	FORMULA	PURITY**
Yttrium	Y	99.9 to 99.99
Yttrium Barium Cuprate, YBCO	YBa ₂ Cu ₃ O ₇	99.9
Yttrium Fluoride	YF ₃	99.9
Yttrium Iron	Y ₃ Fe ₅	99.9
Yttrium Iron	Y ₂ Fe ₁₇	99.99
Yttrium Iron Garnet, YIG	YFe ₂ O ₄	99.9
Yttrium Manganate	YMnO ₃	99.9
Yttrium Oxide	Y ₂ O ₃	99.95/99.99
Yttrium Silicide	YSi ₂	99.9

*All alloys are in wt% when not indicated.

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

Zn
30

ZINC Base

CHEMICAL*	FORMULA	PURITY**
Zinc	Zn	99 to 99.999
Zinc Aluminum (98/2), (99/1)	Zn-Al	99.999
Zinc Antimony	Zn ₄ Sb ₃	99.99
Zinc Copper (65/35 at%)	Zn-Cu	99.99
Zinc Oxide	ZnO	99.99/99.999
Zinc Oxide Aluminum, AZO (97/3), (98/2), (99/1)	ZnO-Al	99.99/99.999
Zinc Oxide Aluminum Oxide, AZO (98/2)	ZnO-Al ₂ O ₃	99.99/99.999
Zinc Oxide Aluminum Oxide, AZO	ZnO-Al ₂ O ₃	99.995
Zinc Oxide Gallium	ZnO-Ga	99.99
Zinc Oxide Gallium Oxide (97/3)	ZnO-Ga ₂ O ₃	99.99
Zinc Oxide Manganese Oxide	ZnO-MnO	99.99
Zinc Oxide Molybdenum Oxide (97/3 at%)	ZnO-MoO ₃	99.99
Zinc Oxide Phosphorus Oxide	ZnO-P ₂ O ₅	99.99
Zinc Oxide Tin	ZnO-Sn	99.99
Zinc Selenide	ZnSe	99.99/99.995
Zinc Sulfide	ZnS	99.99
Zinc Sulfide Silicon Dioxide (80/20)	ZnS-SiO ₂	99.99
Zinc Telluride	ZnTe	99.99
Zinc Tin (50/50)	Zn-Sn	99.99
Zinc Tin Oxide	ZnSnO ₃	99.95/99.99
Zinc Tin Oxide, ZTO	Zn ₂ SnO ₄	99.95

Zr
40

ZIRCONIUM Base

CHEMICAL*	FORMULA	PURITY**
Zirconium	Zr	99.5 to 99.95
Zirconium Boride	ZrB ₂	99.5
Zirconium Carbide	ZrC	99.5
Zirconium Nitride	ZrN	99.5/99.8
Zirconium Oxide	ZrO ₂	99.95 to 99.995
Zirconium Oxide Calcium Oxide (95/5 mol%)	ZrO ₂ -CaO	99
Zirconium Oxide Yttrium Oxide, YSZ (92/8 mol%)/ (95/5 mol%)/ (85-90/10-15 mol%)	ZrO ₂ -Y ₂ O ₃	99.95
Zirconium Oxide Yttrium Oxide, YSZ (84/16)	ZrO ₂ -Y ₂ O ₃	99.99
Zirconium Silicide	ZrSi ₂	99.5
Zirconium Vanadium Titanium	ZrVTi	99.9
Zirconium Yttrium	ZrY	99.95

*All alloys are in wt% when not indicated.

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

Sputter Yield Guide

The following table of common target materials is useful in making comparisons between deposition processes. The first column lists the different materials.

The second column represents the etch rate data of a standard film deposition.

The sputter rate data in the third column are representative of the film deposition rate at maximum power density (i.e. about 39 W/cm², with direct cooling), a DC source and a 100 mm source-to-substrate distance. Rate will decrease linearly with power levels and depend upon the source-to-substrate distance.

A useful rule of thumb is that the film deposition rate:

1. Decreases by ~10%/cm beyond the 100 mm substrate distance.
2. Increases by ~14%/cm closer than the 100 mm substrate distance.

The fourth column represents the number of target atoms sputtered per argon ion striking the target with a kinetic energy of 500 eV (this energy is typical of an argon plasma) and at 0° incidence angle.

Magnetron design factors such as magnetic field strength – and process parameters such as gas composition and pressure – will affect these data. However, these typical data remain useful for comparison purposes.

TARGET MATERIAL	ETCH RATE (Å/min)	SPUTTER RATE (Å/sec)	YIELD 500 eV	POWER DENSITY (W/cm ²)	
				RECOMMENDED DC	RECOMMENDED RF
Ag	1800	380	2.8	25	10
Al	610	170	1	25	10
AlCu (98/2 wt%)	-	170	-		
Al ₂ O ₃	83	40	0.05	N/A	7.5
AlSi (99/1 wt%)	-	160	-		
As	-	-	4.40		
Au	1080	320	1.70	25	10
Ba	-	-	1.25		
Be	130	100	0.58		
B ₄ C	-	20	-		
BN	-	20	-		
Bi	8800	-	2.67		
C	110	20	0.20		
Ca	-	-	0.89		

TARGET MATERIAL	ETCH RATE (Å/min)	SPUTTER RATE (Å/sec)	YIELD 500 eV	POWER DENSITY (W/cm ²)	
				RECOMMENDED DC	RECOMMENDED RF
Cd	-	-	6.39		
CdS	2200	-	1.2		
Ce	-	-	0.83		
Co	450	190	1.25		
Cr	530	180	1.13	25	10
Cs	-	-	1.82		
Cu	880	320	1.75	25	10
Dy	1100	-	1.49		
Er	1000	-	1.36		
Eu	-	-	1.77		
Fe	350	180	1.16	20	7.5
Ga	-	-	1.57		
GaAs (100)	650	-	0.38		
GaAs (110)	1600	-	0.95		
GaP	1590	-	1.04		
GaSb	1870	-	0.88		
Gd	1100	-	0.92		
Ge	920	160	0.97	20	7.5
Hf	660	110	0.75	20	7.5
Hg	-	-	11.61		
Ho	-	-	1.42		
In	-	800	2.14		
In ₂ O ₃	-	20	-		
InSb	1520	-	0.6		
Ir	590	135	1.06		
ITO	-	20	-	7.5	7.5
K	-	-	1.17		
La	-	-	0.73		
Li	-	-	0.46		
LiNbO ₂	390	-	0.2		
Lu	-	-	0.95		
Mg	225	200	2.03		
MgO	-	20	-		
Mn	870	180	1.82		
Mo	410	120	0.86	20	7.5
Mo ₂ C	280	-	0.2		
MoS ₂	-	40	-		
MoSi ₂	-	110	-		
Na	-	-	1.70		
Nb	470	80	0.63	15	5
Nd	-	-	1.16		
Ni	530	190	1.28	20	7.5
NiFe (80/20 wt%)	500	-	1.2		
Os	500	120	0.84		
P	-	-	2.83		
Pb	2600	-	2.48		
PbTe	3770	-	1.48		

TARGET MATERIAL	ETCH RATE (Å/min)	SPUTTER RATE (Å/sec)	YIELD 500 eV	POWER DENSITY (W/cm ²)	
				RECOMMENDED DC	RECOMMENDED RF
Pd	1100	270	2.09		
Pm	-	-	1.60		
Pr	-	-	1.03		
Pt	620	205	1.27	25	10
Rb	4000	-	1.80		
Re	520	120	0.83		
Rh	720	190	1.30		
Ru	610	180	1.04	25	10
S	-	-	3.71		
Sc	-	-	0.56		
Sb	3238	-	2.83		
Se	-	-	5.16		
Si	370	80	0.54	N/A	7.5
SiC	350	50	0.45		
SiO ₂	330	70	0.23		
Si ₃ N ₄	-	800	-		
Sm	1100	-	2.13		
Sn	1200	800	1.57	25	10
SnO	-	20	-		
Sr	-	-	1.37		
Ta	420	85	0.66		
TaN	-	40	-		
Ta ₂ O ₅	600	40	0.18		
TaC	150	-	0.17		
Tb	-	-	1.00		
Tc	-	-	1.01		
Te	-	-	4.67		
Th	810	85	0.66		
Ti	330	80	0.58	25	10
TiN	-	40	-		
TiO ₂	-	40	-		
Tl	-	-	2.88		
U	730	155	0.94		
V	310	85	0.66		
W	340	80	0.66	20	5
WTi (90/10 wt%)	-	80	-		
WC	-	50	-		
Y	950	85	0.70		
Yb	-	-	2.45		
YBCO	-	10	-		
Zn	-	340	4.61		
ZnO	-	40	-		
ZnS	-	10	-		
Zr	570	-	0.63	20	7.5

This document is being made available to assist users. Every effort has been made to ensure accuracy, completeness and clarity. Unfortunately, in a work of this scope, errors are inevitable. Use this information as a general guide.

Do not hesitate to contact us if you see errors or if you have supplementary information.



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