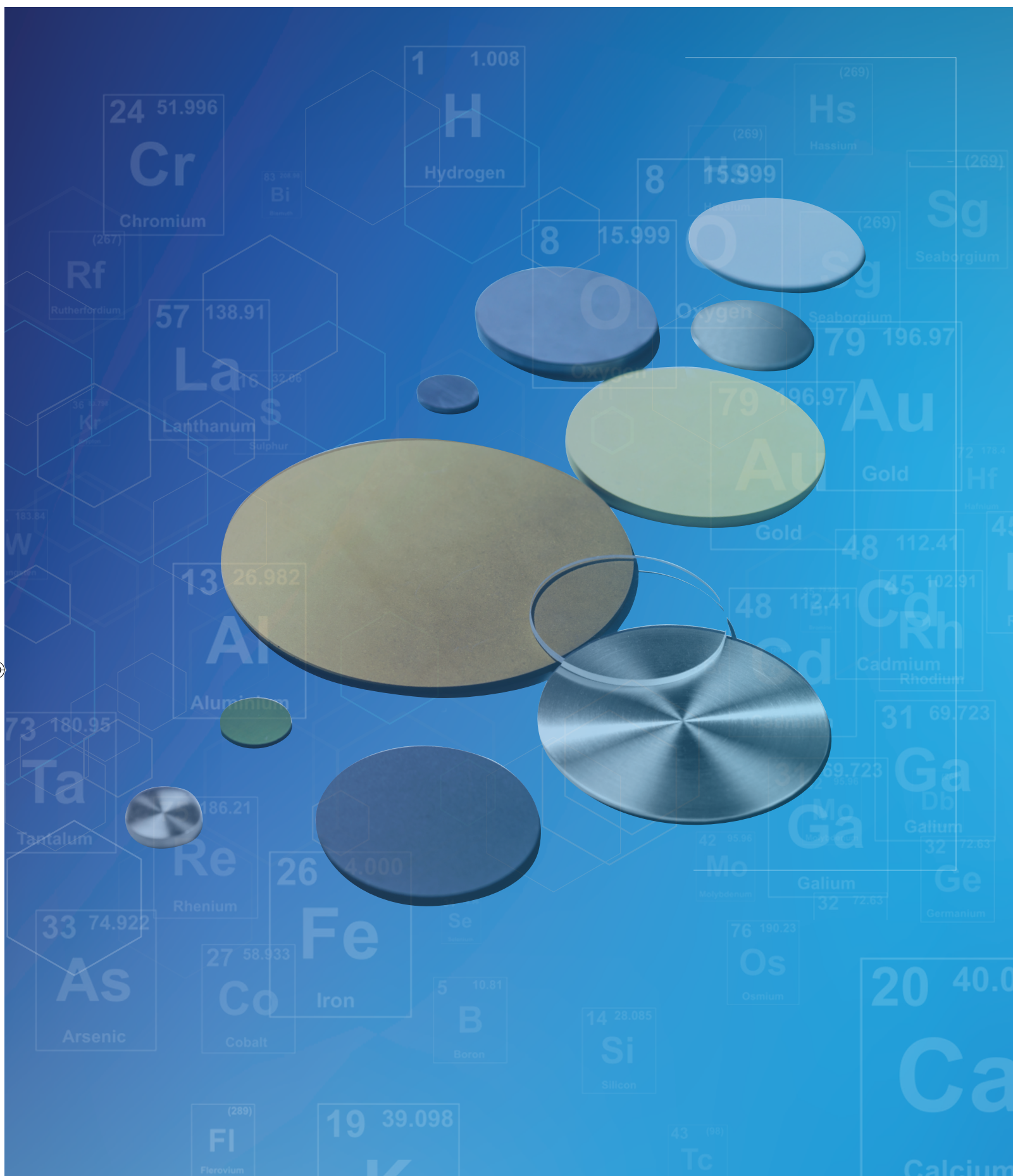




High Purity Sputtering Targets

Metals, Alloys & Compounds





High Purity Sputtering Targets

Metals, Alloys & Compounds

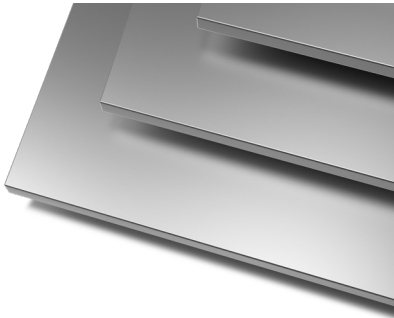
Introduction

Why choose Testbourne
as your supplier?

At Testbourne, we specialise in providing a comprehensive range of high-quality sputtering targets tailored to meet the diverse needs of our clients.

Our targets are available in a wide array of materials, including metals, alloys, and compounds. This combined with over 46 years of history and expertise, our goal is to deliver fast, efficient, and reliable service with full technical support worldwide.

We strive to offer quality raw materials for all processes, and back up by our certification in the form of ISO 9001.



Industries

- | | |
|---|---|
| <ul style="list-style-type: none">• Optics - Optoelectronics• Fibre Optics• Ophthalmology• Holographic Coatings• Laser - Lenses - Mirrors• LED/OLED• Fuel Cells• Batteries | <ul style="list-style-type: none">• Architectural and Automotive Glass Coating• Photovoltaic - Solar Thermal• Decorative and Hardwearing Coatings• Medical• Military - Aerospace• Semiconductor• R&D Research Establishments & Universities |
|---|---|

Support Services

Target Bonding
Testbourne provides a target bonding service for all your production and R&D needs.

Bonding for:

- > **Indium bonding** – the most commonly used bonding technology, rated to ~150 °C.
Key Benefits: High thermal conductivity, strong mechanical bond.
- > **Elastomer bonding** – Ideal for more fragile materials, higher temperatures ~270 °C.
Key Benefits: Stress reduction, thermal expansion flexibility vibration dampening.
- > **Silver Epoxy Kits** - Available in 50g, 100g and 250g packs
Key benefits: Low outgassing characteristics.

Metal Refining

Testbourne is able to provide a metal refining/reclaim service for both precious metals and other specific materials.

Whether you have spent sputtering targets, evaporation materials or alloy scrap, our refining solutions are designed to recover maximum value from your used materials.

Our service helps customers lower costs, reduce waste and increase sustainability, while

ensuring material quality remains uncompromised.

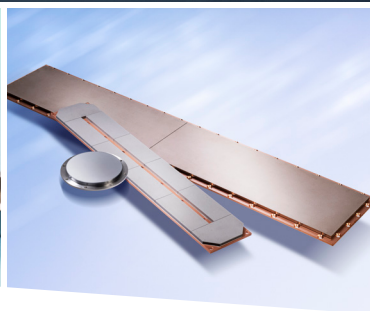
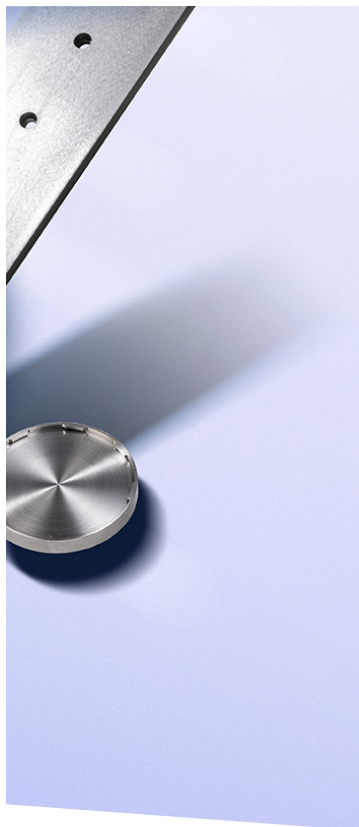
Typical materials we can refine: all precious metals, Chromium, Germanium, Hafnium, Indium, Titanium, Tungsten, Tantalum, Nickel, Molybdenum, Vanadium, Zirconium, and alloys of these.

Backing Plates
We offer a complete line of backing plates in planar and rotatable designs. Based on drawings supplied we can machine the following materials.

Standard materials

- > OFE Copper
- > CuCr1Zr alloy
- > Stainless steels
- > Molybdenum
- > Titanium
- > Aluminium alloy

We can also debond and reuse old backing plates, once cleaned and inspected we rebond to a new target.



Metal Sputtering Targets

The manufacturing methods for metal sputtering targets vary based on the material and application requirements. Processes include vacuum melting, rolling, hot-pressing, special press-sintering, vacuum hot-pressing, and forging.

Our standard round targets range from 25.4mm to ~500mm in diameter, while rectangular targets can reach 4000mm in length, depending on the metal. Purity levels range from 99.5% to 99.9999% for some metals, tailored to specific needs. Custom designs are also available to meet unique requirements.

Metal Sputtering Targets

Aluminium Al	Gadolinium Gd	Molybdenum Mo	Silver Ag
Antimony Sb	Germanium Ge	Neodymium Nd	Tantalum Ta
Bismuth Bi	Gold Au	Nickel Ni	Tellurium Te
Boron B	Hafnium Hf	Niobium Nb	Terbium Tb
Cadmium Cd	Holmium Ho	Palladium Pb	Thulium Tm
Carbon C	Indium In	Platinum Pt	Tin Sn
Cerium Ce	Iridium Ir	Praseodymium Pr	Titanium Ti
Chromium Cr	Iron Fe	Rhenium Re	Tungsten W
Cobalt Co	Lanthanum La	Ruthenium Ru	Vanadium V
Copper Cu	Lead Pb	Samarium Sm	Ytterbium Yb
Dysprosium Dy	Lutetium Lu	Scandium Sc	Yttrium Y
Erbium Er	Magnesium Mg	Selenium Se	Zinc Zn
Europium Eu	Manganese Mn	Silicon Si	Zirconium Zr



We offer a wide range of compound sputtering targets, including oxides, nitrides, borides, sulphides, selenides, tellurides, carbides, crystalline, and composite mixtures.

These targets are produced using methods like vacuum hot pressing, hot isostatic pressing, cold isostatic pressing, and cold press sintering. Sizes range from 25.4mm upwards in diameter, with rectangular targets up to and over 1000mm in length, designed for single or multi-section configurations. To enhance performance and durability, we recommend bonding these targets to backing plates.

Compound Sputtering Targets

Antimonide Sputtering Targets:

AlSb, CdSb, GaSb, InSb, In₂Sb₃, NiSb, Pbsb, SnSb & ZnSb.

Arsenide Sputtering Targets:

Cd₂As₂, GaAs, InAs, PbAs, SnAs, ZnAs₂ & Zn₂As₂.

Boride Sputtering Targets:

Cr₂B, CrB, CrB₂, Cr₅B₃, FeB, HfB₂, LaB₆, Mo₂B, Mo₂B₅, NbB, NbB₂, TaB, TaB₂, TiB₂, W₂B, WB, VB, VB₂, ZrB₂.

Carbide Sputtering Targets:

B₄C, Cr₃C₂, HfC, Mo₂C, NbC, SiC, TaC, TiC, TiCN, WC, W₂C, WC+Ni, WC+Co, VC, ZrC.

Fluoride Sputtering Targets:

AlF₃, BaF₃, CdF₂, CaF₂, CeF₃, DyF₃, ErF₃, HfF₄, KF, LaF₃, PbF₂, LiF, PrF₃, MgF₂, NdF₃, ReF₃, SmF₃, SrF₂, NaF, Cryolite Na₃AlF₆, YF₃, YbF₃.

Nitride Sputtering Targets:

AlN, BN, GaN, HfN, NbN, Si₃N₄, TiCN, TaN, TiN, VN, ZrN.

Oxide Sputtering Targets:

Al₂O₃, Sb₂O₃, ATO, BaTiO₃, Bi₂O₃, CeO₂, Cr-SiO, Cu₂O, ITO, CuO, Cr₂O₃, Dy₂O₃, Er₂O₃, Eu₂O₃, Gd₂O₃, Ga₂O₃, GeO₂, HfO₂, Ho₂O₃, IGZO, In₂O₃, ITO, Fe₂O₃, Fe₃O₄, LaAlO₃, La₂O₃, LaSrMnO₃, PbO, PbTiO₃, PbZrO₃, LiNbO₃, Lu₃Fe₅O₁₂, Lu₂O₃, MgO, MoO₃, NiO, Nb₂O₅, Nd₂O₃, PZT (PbZrTiO₃), Pr₆O₁₁, Pr(TiO₂)₂, Pr₂O₃, Sm₂O₃, Sc₂O₃, SiO₂, SiO, SrRuO₃, SrTiO₃, SrZrO₃, Ta₂O₅, Tb₄O₇, TeO₂, ThO₂, Tm₂O₃, TiO₂, TiO, Ti₃O₅, Ti₂O₃, TiZrO₃, SnO₂, SnO, WO₃, WO_{2.9}, V₂O₅, YAG, YBCO, Y₃Al₅O₁₂, Yb₂O₃, Y₂O₃, ZnO, AZO, ZnO:Al, ZrO₂(unstabilised), ZrO₂-5-15wt%CaO.

Selenide Sputtering Targets:

Al₂Se₃, Sb₂Se₃, As₂Se₃, Bi₂Se₃, CdSe, CuSe, Cu₂Se, Ga₂Se₃, GeSe, In₂Se₃, PbSe, MoSe₂, MnSe, NbSe₂, TaSe₂, WSe₂, ZnSe.

Silicide Sputtering Targets:

Cr₂Si, CrSi₂, Co₃Si, HfSi₂, FeSi₂, MoSi₂, Mo₅Si₃, NiSi, NbSi₂, Nb₅Si₃, TaSi₂, Ta₅Si₃, TiSi₂, Ti₅Si₃, WSi₂, Ws₂, V₃Si, VSi₂, ZrSi₂.

Sulphide Sputtering Targets:

As₂S₃, Ag₂S, Ag₂S, Bi₂S₃, Cu₂S, Cu₂S, Sb₂S₃, CdS, FeS, GaS, GeS, In₂S₃, PbS, MoS₂, Nb₅Si₃, TaS₂, SnS, WS₂, ZnS.

Tellurides Sputtering Targets:

Al₂Te₃, As₂Te₃, SbTe, Bi₂Te₃, CdTe, CuTe, GaTe, Ga₂Te₃, GeTe, PbTe, MoTe₂, NbTe₂, As₂Te, TaTe₂, SnTe, TmTe, WTe₂, ZnTe.

Alloy Sputtering Targets

Testbourne offers a range of alloys for use in thin film deposition. Our alloys can be tailored to specific compositions allowing unlimited combinations to any customer requirement. These applications include industries such as glass coating, hard wearing, decorative, electronics, optical coatings, R&D etc.

Our alloy sputtering targets are manufactured using various processes, depending on materials properties.

- > Powder metallurgy
- > Vacuum melting & casting
- > Hot Isostatic Pressing (HIP)
- > Electron beam melting
- > Cold rolling

We also offer custom alloy compositions based on your own requirements.

- > The range of alloys available from Testbourne is extensive. Listed below are a selection of more popular alloys that have been requested.

Alloy Sputtering Targets	
AlCu, AlCuMg, AlCuMo, AlMgCuNi, AlMgSi, AlCr, AlCo, AlLi, AlMg, AlMn, AlNd, AlNbTa, AlSc, AlSi, AlTi, AlSiCu, AlAg, AlV.	MoAl, MoCr, MoNb, MoRe, MoSi, MoTi.
AgCu, AgAu, AgPb, AgSi, AgSn.	NdAl, NdDyFeCo.
AuCu, AuGe, AuIn, AuPd, AuPt, AuSi, AuAg, AuSn, AuZn.	NiAl, NiB, NiCr, NiCu, NiGa, NiCrAl, NiCrB, NiCrCo, NiCrFe, NiCrSi, NiCrMo, NiCrW, NiCuFe, NiFe, NiFeCo, NiMo, NiMn, NiNbTi, NiTi, NiW, NiV, NiY, NiZr.
CaNiCrFe, CaNiCrFeMoMn.	NbZr, NbTi.
CeGd, CeSm.	OsRu.
CoAl, CoAlY, CoCrAl, CoCr, CoCrMo, CoFe, CoFeB, CoGd, CoMg, CoNi, CoNiCr, CoNbZr, CoPd, CoPt, CoSm, CoTaZr, CoTi, CoW, CoZr.	PdCu, PdPt, PdAg, PdNi.
CrAl, CrCo, CrFeNi, CrMg, CrNi, CrNiCu, CrNiSi, CrV, CrB, CrSi, CrCu, CrNiW, CrSn, CrTi, CrY.	PtAu, PtIr, PtMn, PtAg, PtRh.
Cu-B, CuCr, CuCrZr, CuFe, CuCo, CuGa, CuIn, CuPb, CuMg, CuMn, CuNi, CuNiTi, CoNiPt, CuNiZn, CuSi, CuSiTi, CuAg, CuSn, CuTi, CuZr.	SiAl, SiSb, SiFe, SiNi.
DyFe, DyFeCo.	SmCo.
FeAl, FeCe, FeCr, FeCrAl, FeB, FeC, FeGa, FeMn, FeNi, FeNiCr, FeNiCo, FeNiCoMn, FeTi, FeV.	SnCd, SnPb, SnZn.
GdFe, GdFeCo.	TaAl, TaTi, TaW, TaZr.
HfFe.	TbDyFe, TbFe, TbFeCo, TbGdFeCo.
IrMn, IrRe, IrPt.	TiAl, TiAlNb, TiAlV, TiNi, TiCo, TiC, TiCr, TiFe, TiMo, TiNi, TiNiAl, TiNiCu, TiNbTa, TiPd, TiTa, TiV, TiZr.
InPb, InSb, InSn.	WRe, WTi, WCu, WCr, WV.
LaMn, LaNi, LaSi, LaSr.	VAL, VCr, VTi, VW.
PbTe, PZT.	YCo, YEr, YCaBaCu, YPr, YYb.
MgNi.	ZrAl, ZrCu, ZrFe, ZrNb, ZrNi, ZrTi, ZrY.
MnCu, MnIr, MnNi.	ZnAl, ZnCu, ZnNi, ZnMg.



PLD Targets

Testbourne's offer a full range of pulsed laser deposition (PLD) targets for many applications from ferromagnetic, complex oxides, and superconducting films. Researchers can engineer targets to create multilayer films, alloy compositions, or graded structures, responding to the demands of modern technology.

Rotatable Targets

Rotatable targets are essential for large-area coating applications in architectural glass and flat panel displays. Rotatables are now also commonplace in other industries such as semiconductors, photovoltaics, optical coatings and tools.

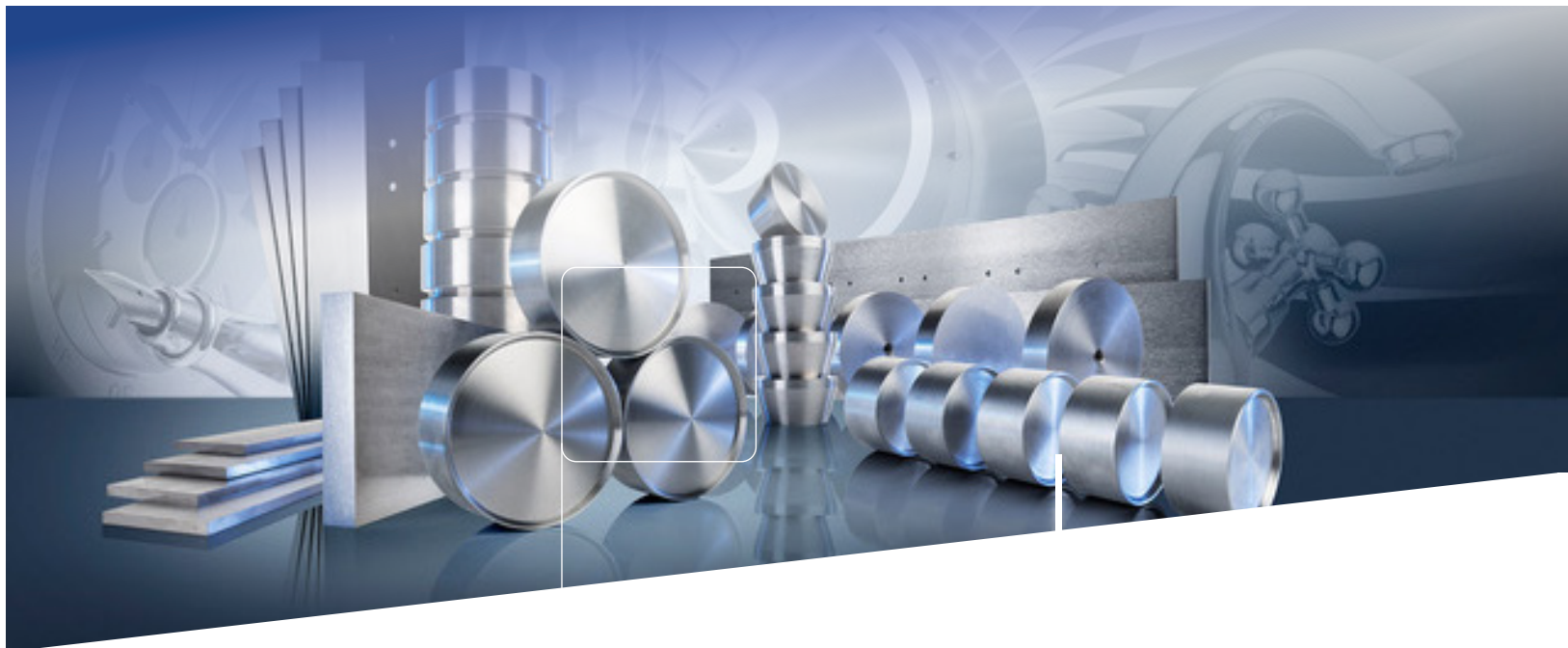
They offer advantages over planar targets, including higher material utilisation, longer production runs, reduced downtime and increased throughput. Our cylindrical magnetron sputtering targets range from 50mm to 219mm in diameter and up to 4000mm in length.

As technology improves, more and more materials are being able to be produced in rotatable form.

Various manufacturing processes are used in the production of rotatable targets:

- Sprayed:** Thermally sprayed rotary targets including plasma, arc and cold spray production methods. Common materials AZO, ITO, Mo, Si, Cr, NbOx, SiAl, TiOx, ZnO, ZnSn, ZnAl and ZTO.
- Cast:** Allows for consistence compositional and microstructure, this contributes to high process yield and longer target life. Example of materials InSn, Sn alloys, ZnAl and ZnSn materials.
- Extruded:** High-purity extruded Al, Cu, Mo, Nb, Ta, Ti, Zr, V and other materials with good purity and grain size.
- HIP/Sintered:** HIP products include Cr, Mo, ITO, AZO and ZnO sputtering targets.





Decorative & Wear Resistant Coatings

Physical vapor deposition technology (PVD) is being used extensively for decorative purposes in numerous applications where scratch and wear resistance are important.

Hard wearing coatings for:

For increased lifetime, higher productivity finishing for cutting tools, punching and forming tools.

Reduced coefficient of friction and reduced wear, tribological coatings on precision components, used in automotive engines.

Decorative Coatings for:

Scratch resistant and decorative colour finishes for hard coating on mobile phones, jewellery, watches, eyewear, automotive decoration, domestic appliances, bathroom and kitchen hardware.

Hard Wearing & Decorative Coatings

Aluminium-Chromium – various ratios available including 70:30, 50:50 at%

Chromium, 99.5%, 99.8%, 99.9%, 99.95%

Chromium-Tungsten alloy

Graphite, 99.9% & 99.99%

Titanium Grade 2, 99.9% and higher

Titanium-Aluminium Ratios: 25:75, 30:70, 33:67, 40:60, 50:50, 60:40, 67:33, 70:30, 75:25, 80:20 at%

Titanium-Zirconium (various ratios)

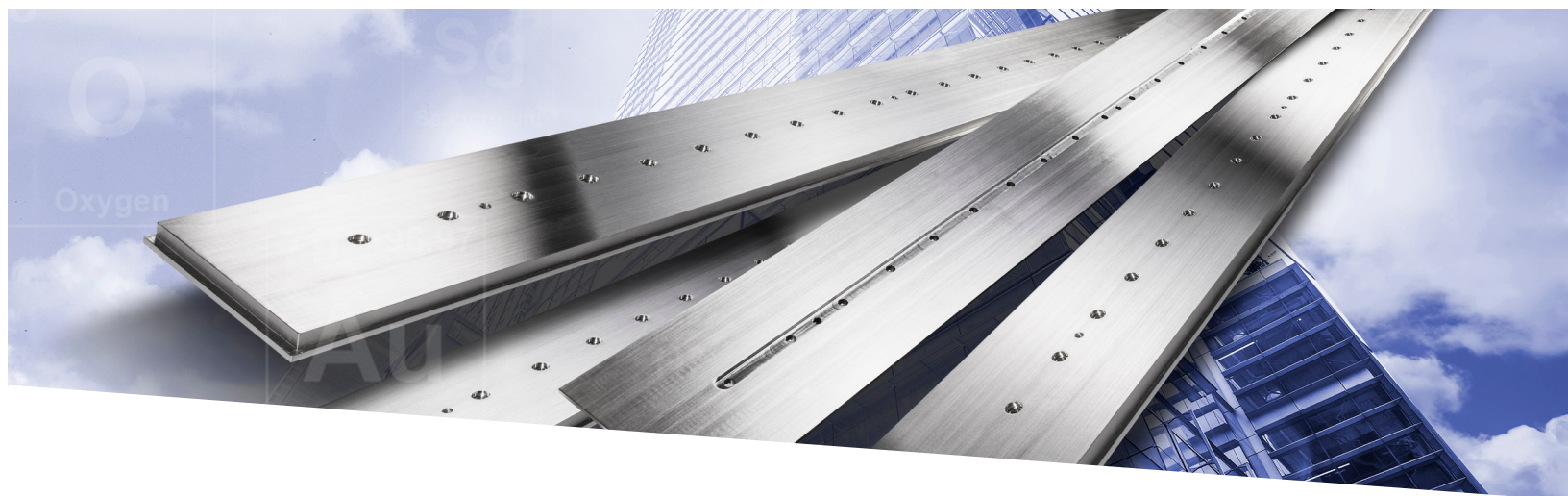
Titanium-Silicon (various ratios)

Titanium boride, 99.5% & 99.8%

Tungsten Carbide

Zirconium, 99.2%





Large Area Glass Coating

We offer a range of planar and rotatable targets for architectural glass coatings.

Testbourne is involved with our customers in the development and production of coating materials for architectural glass, automotive glass, photovoltaics, mirrors and other applications.

Production methods used are casting, powder metallurgy and spraying. Our product portfolio includes all the key pure metals, as well as popular alloys and ceramics. Our sputtering targets are produced in different shapes (planar and rotatable) with sizes – up to 4000mm in length.

Hard Wearing Decorative Coatings

Aluminium (Al)

Indium tin oxide (ITO)

Nickel-Chromium (NiCr)

Nickel alloy C-22

Niobium-Zirconium (NbZr)

Niobium oxide (Nb₂O₅)

Silicon (Si)

Silicon-Aluminium (SiAl)

Titanium (Ti)

Titanium oxide (TiO_x, TiO₂)

Tin (Sn)

Zirconium (Zr 702 Grade)

Zinc-Aluminium (ZnAl)

Zinc-Tin (ZnSn)

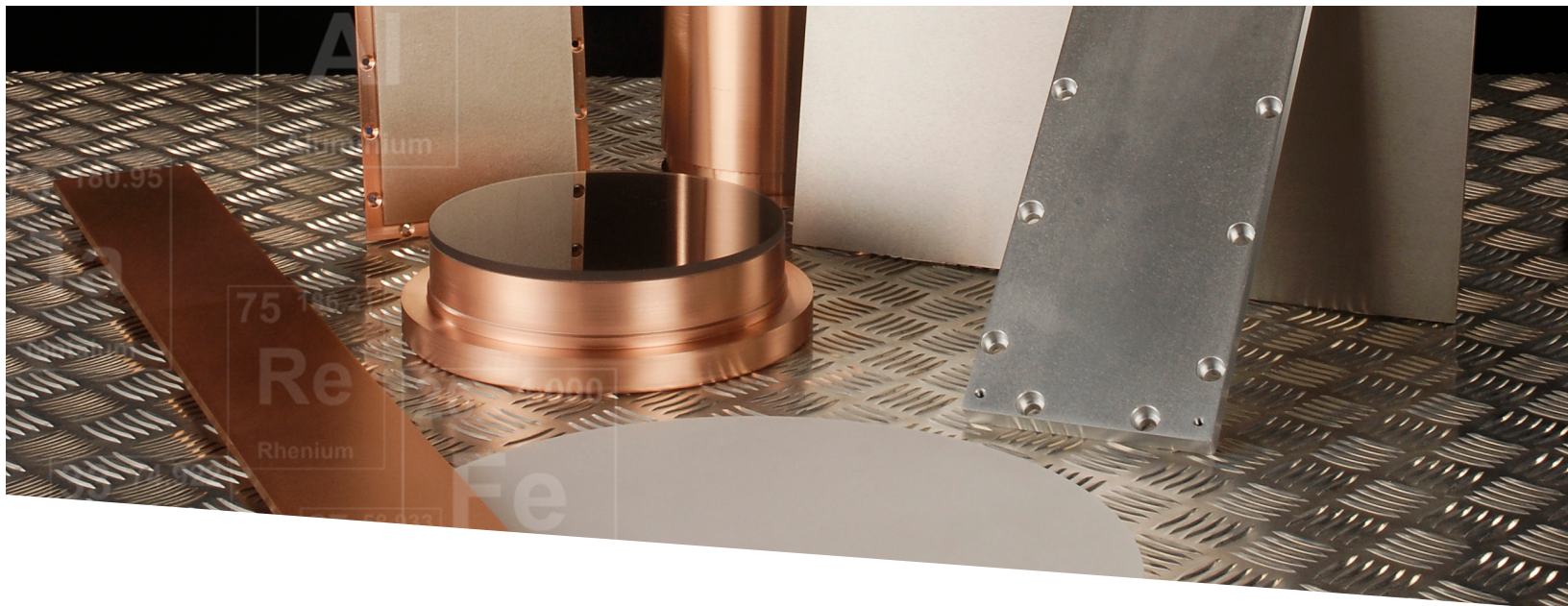
Zinc-Aluminium oxide (ZnO-Al₂O₃)

Zinc Tin oxide (ZnO-SnO₂)

Main applications are:

- ◆ Architectural Glass (low-e, solar control)
- ◆ Automotive Glass
- ◆ Anti-reflective and Antistatic Coatings (ARAS)





Electronics

Materials for Electronics Manufacturing

The electronics industry is rapidly evolving, driven by miniaturisation, speed and reliability. At Testbourne, we support innovation in semiconductors, passive electronic components and advanced microelectronics by supplying high-purity materials and precision-engineered components for next-generation technologies.

Supporting Precision in Electronic Applications

Our materials are critical to the production of:

- › Thin-film resistors (via PVD technology)
- › Capacitors and micro-resistors
- › Semiconductors and integrated circuits
- › High-frequency and power electronics
- › MEMS (Microelectromechanical Systems)

Research & Development

Testbourne is at the forefront of providing specialised materials and instrumentation for R&D purposes across multiple industries. We serve a diverse range of clients, from universities and research institutions to government labs and private companies, offering cutting-edge solutions that fuel research.

Our materials division focuses on providing the highest purity and most reliable materials for R&D, supporting advancements in a variety of high-tech fields. Custom materials are common practice for us.

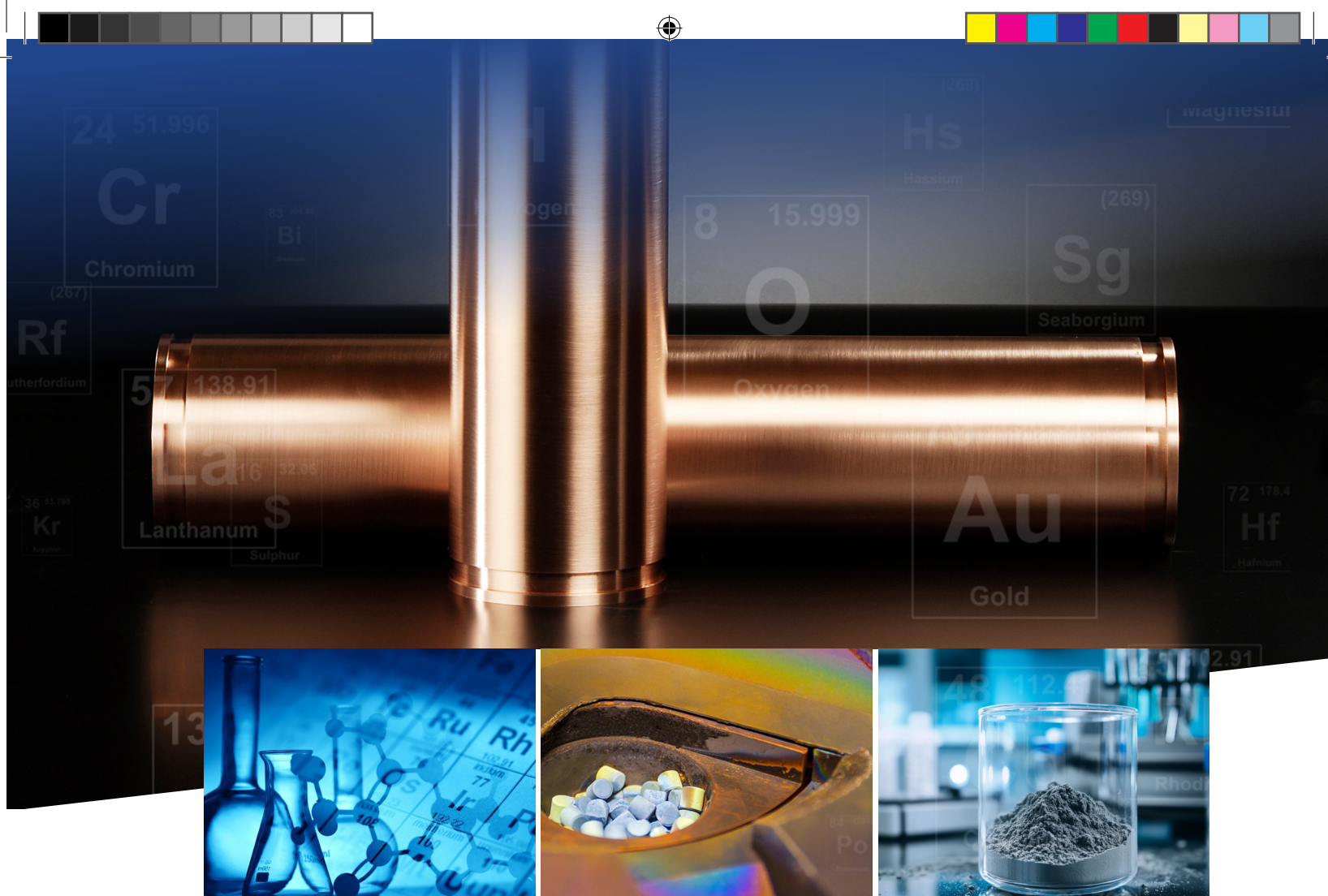
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Photovoltaic

With demand for renewable energies becoming more important, there has been considerable growth of the solar and photovoltaic industry. Along with thin film photovoltaics, solar thermal and concentrated solar power systems offer great alternatives for the energy requirements of the future.

Testbourne supplies a wide array of high-quality PVD sputter targets and evaporation materials specifically for solar applications. Essential materials include amorphous silicon (a-Si), CdTe, CdSe, CdTeZn, CdS, and CIGS, along with high-purity Cu, In, Ga, Se, and Te evaporation materials.

Optics

Optical coatings are commonly found in everyday items from sunglasses, eyeglasses to vehicle headlights, mirrors, windows, optical filters for laser technology. Testbourne range of materials offers a complete section of evaporation materials for use in PVD (Physical Vapour Deposition).

The most common types of coatings used on precision optics include:

- > Anti-reflection coatings
- > Highly refractive layer systems in fibre optics
- > Beam splitter coatings
- > Colour filters and special filters in the field of laser technology