



# ***Metal Technology***

ISO 9001 REGISTERED



TUNGSTEN

NICKEL

INCONEL

COPPER

TITANIUM

[www.mtialbany.com](http://www.mtialbany.com)



METAL TECHNOLOGY IS ON THE LEADING EDGE OF  
TECHNOLOGY IN REACTIVE METALS,  
REFRACTORY METALS AND HIGH TEMPERATURE ALLOYS.

# PUT METAL TECHNOLOGY TO WORK FOR YOU!



*Metal Technology (MTI) specializes in the manufacture of reactive and refractory metal components and a wide range of other high temperature and corrosion resistant metals. Our experience dealing with the intricacies, special design, fabrication and precision requirements of refractory and reactive metals assures you of the highest quality, most cost-effective products.*

## PRECISION DEEP DRAW FORMING

MTI's deep draw forming process eliminates seams and the problems associated with welded assemblies. Using our extensive tooling inventory, we can not only produce standard round vessels and tubing, we can also manufacture parts that go beyond common shapes, including multi-diameter tubes, hemispheres, nozzles and cones.

## PUNCH PRESS

MTI is able to produce small quantities and long runs of punch press parts, including knockouts, raised flanges and "dimples" with multiple radii.

## FORGING

MTI's near-net-shaped forgings greatly reduce the amount of material used, ensuring substantial cost savings and improved material properties.

## WELDING & FABRICATION

MTI utilizes arc, tig, gas inert atmosphere and vacuum-tank welding processes to work with the challenging refractory and reactive metals.

## SPINNING

MTI's computerized power spinning ensures precision, accuracy and uniform wall thicknesses in our high-quality formed parts.

## CNC PRECISION TURNING & MILLING

MTI's leading-edge equipment is unparalleled for four-axis contouring – eliminating much of the tooling required on conventional machines; often resulting in cost savings; supporting the most exacting tolerances; and achieving near-zero reject rates.

## PRECISION EDM

- EDM Machining of virtually any tough or exotic conductive materials
- Absolute accuracy and repeatability
- Contract Manufacturing
- Prototype to Production runs of nearly any geometric intricate EDM shape
- Complete EDM Machine shop and support.

## ADDITIVE MANUFACTURING (DMS)

- Precision laser melting
- Increased productivity, repeatability and flexibility
- Access to a wide range of metals and alloys
- Unmatched design and manufacturing freedom

The Direct Metal Sintering process builds up fully dense, metal parts from 3D CAD data by melting fine powder with a laser beam, layer by layer. With layer sizes ranging from 5–30 microns, there are no limitations to part complexity.



TANTALUM

NIObIUM



ZIRCONIUM

VANADIUM



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# OUR EXPERTS ARE HERE TO HELP!

*If your application requires specialized materials, call us. Our team of innovators and problem solvers has the knowledge and expertise you need. With over 40 years of experience working with reactive and refractory metals each with unique characteristics that makes it ideally suited for certain applications, our experts are here to help you select the right material for you next project.*

## TANTALUM

Tantalum is one of the most corrosion-resistant materials available. It is also dense and nuclear stable, as well as a superior heat conductor. It is ideal for use in the chemical processing industry; containers for radioactive elements; and as an efficient heat transfer surface (superior to that of nickel alloys), especially in acidic or corrosive environments.

The most common tantalum alloys include Ta-2.5W and Ta-10W (tantalum with 2.5% and 10% tungsten respectively).

## NIONIUM (COLUMBIUM)

Niobium's corrosion resistance is nearly equal to that of tantalum at about 1/4 the material cost. However, it has a lower melting point, lower modulus of elasticity and thermal conductivity, and a higher thermal expansion rate.

The most common niobium alloys include Nb-1Zr (niobium with 1% zirconium), which is now being studied as a possible low-cost replacement for tantalum in some applications; and C-103 (niobium with 10% hafnium and 1% titanium), which is used extensively for rocket engines with temperatures as high as 2700°F.

## TITANIUM

Titanium owes its corrosion resistance to the formation of a tenaciously adherent oxide film. It is resistant to most dilute acids and is excellent in sea water and brackish waters. It has a high strength to weight ratio which dictates many of its important applications in the aerospace industry.

## VANADIUM

Vanadium is a reactive metal; a sister to tantalum and niobium. It has many attractive properties like low fusion neutron capture cross-section, good corrosion resistance and a relative low density.

## TUNGSTEN

Tungsten refractory metal. Tungsten has the highest melting point and lowest vapor pressure of all metals, and at temperatures over 1650°C has the highest tensile strength. The metal oxidizes in air and must be protected at elevated temperatures. It has excellent corrosion resistance and is attacked only slightly by most mineral acids.

## ZIRCONIUM

Zirconium has exceptional resistance to corrosion from many common acids and alkalis, seawater and other agents, making it a good choice for the chemical industry. With a very low neutron absorption capability, it serves well as the inner lining of reactors in nuclear submarines and power plants.

## MOLYBDENUM

Molybdenum's corrosion resistance is similar to tungsten's. It is particularly resistant to non-oxidizing mineral acids and also provides good resistance to several liquid metals including bismuth, lithium, potassium and sodium. It is relatively inert to carbon dioxide, ammonia, nitrogen to 1100°C, and in reducing atmospheres containing hydrogen sulfide.

The prime alloy of molybdenum is TZM, which offers twice the strength of pure molybdenum at temperatures higher than 1300°C. TZM's re-crystallization temperature is approximately 250°C higher than that of molybdenum and it offers better weld ability.

## OTHER MATERIALS MTI WORKS WITH INCLUDE:

Copper, Inconel, Hastalloy, Stainless Steel and Aluminum.





TANTALUM

NIOBIUM

ZIRCONIUM

VANADIUM

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