

High-Purity Zirconium Specialty Metal Medical Devices

About Us

For more than a century, Stone & Webster has been among America's most iconic engineering, construction and industrial leaders. Now owned by the Westinghouse Electric Company, Stone & Webster provides advanced industrial solutions that draw upon the Westinghouse's vast range of technologies, products and services.

Vertically integrated to ensure the supply of metals for nuclear power generation, the Westinghouse Western Zirconium (WZ) facility is a global leader in the production of high-purity Zirconium (Zr).

Products for the Medical Devices

Western Zirconium's nuclear-grade metals are produced continuously in order to maintain the nuclear fuel supply that powers a substantial portion of the global electric grid. That quality, reliability and availability – all inherent to WZ zirconium products – are what distinguish Western Zirconium's specialty metals.

These same attributes are crucial to medical device applications where material integrity is paramount. Across the last decade, one of the industry's leading joint-replacement manufacturers has trusted WZ for their zirconium-based products.



Western Zirconium supplies human joint replacement manufacturers with high-purity zirconium extrusions that form the basis of knee (left) and hip joints.

High Purity Product Form

Zirconium

Following the chlorination and reduction of zirconium powder, a resulting "sponge" form of the metal is created. These rough particles are characterized by low density and high porosity. This form of our zirconium can subsequently be melted with other base metals into alloys.

For medical device applications such as joint replacement, the Zr sponge is melted, formed and extruded into bars for final shaping.

As a full-service metals production facility, Western Zirconium can forge and extrude our zirconium in addition to melting. The resulting high-purity Zr is available in a range of product types: flat strip coil, TREX tubing, bar (extrusions) and plate for structural applications. For processing and alloying, our Zr is also available in the forms of Sponge and Fines.



Zirconium being produced as flat strip coil (top left), TREX for tubing applications (top right), and hafnium sponge (bottom).

Common Chemistries

A Zirconium-Niobium alloy (Zr2.5Nb) has proven to be an extremely durable device for joint replacement.

This material is extruded into bars, further processed and then formed into their final medical device forms by health care equipment makers.

The Western Zirconium Facility

Since 1978, the Western Zirconium metal production facility located in Ogden, Utah has provided Zirconium and Hafnium-related products for nuclear power and other industrial uses like medical, aerospace, oil and gas, petrochemicals, and electronics. Guided by the policies and regulations that apply to global nuclear energy generation, the WZ facility operates within regulated quality compliance and requirements.

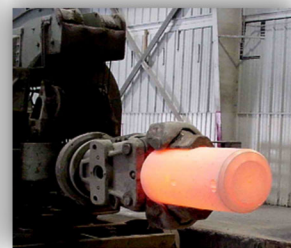
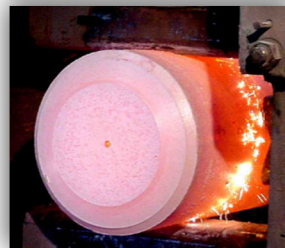


Situated near Utah's Great Salt Lake, the Western Zirconium plant is seen here in the foreground of the Wasatch Mountain Range.

Full-Service Metals Processing

In addition to producing world-class specialty metals products, the WZ facility operates unique processing systems that are available for toll processing. Our equipment systems include Electron Beam Melt furnaces, Vacuum Arc Remelt furnaces, Hot Forging, Large and Small Extrusion Presses, Hot Rolling and Cold Rolling operations, Vacuum Annealing furnaces and Bar processing equipment (e.g., Swaging, Centerless Grinding and Straightening).

The WZ facility has a long history of providing specialty metals to the nuclear power industry. We are trusted provided to the medical devices industry as well – where our processed alloys are crucial in human joint replacements. Regardless of the form of metal required, WZ's Specialty Metals can propose a solution to meet the needs for medical devices.



The zirconium ingots in the top left image can be shipped, as is, to customers. Others await further processing at WZ through many production techniques available – forging, extrusion, melting, rolling, chemical baths, annealing, lathin and/cutting.

Enabling a New Era in Medical Device Technology

As medical technology continues to astound and advance human well-being, the prospects for even greater achievement continues. Western Zirconium's specialty metals are enabling stronger, longer-lasting human joint replacement devices.



An example model of a zirconium knee replacement and femur ball joint