

TITANIUM POWDERS

TECHNICAL DATA SHEET

High Purity, Hydride-Dehydride (HDH) Titanium Powders

Reading Alloys part of AMETEK Specialty Metal Products, is a global leader in producing master alloys, specialty alloys and high purity alloy powders as well as fine powders. Our alloys are manufactured in accordance with a certified ISO 9001 / AS 9100 quality management system and tested by a Nadcap accredited analytical laboratory.

Reading Alloys manufactures Titanium powders by specialized Hydride-Dehydride (HDH) processing and sizing equipment that allows us to customize particle size distribution to exact customer specifications.

POWDER CHARACTERISTICS

Typical particle size distributions (PSD) range from 45 microns (325 mesh) to 500 microns (35 mesh) with solid, angular, blocky or sponge morphology.

MARKETS SERVED

Powder Metallurgy processes such as Hot Isostatic Pressing, Cold Isostatic Pressing/Sintering, Metal Injection Moulding, Plasma Spraying/Coating and Additive Manufacturing.

POWDER APPLICATIONS

Coatings on Titanium alloy implants, net shape, thin film (sputtering target) and feedstock.

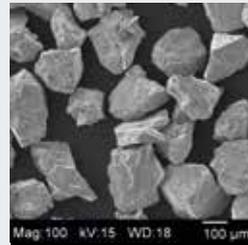
TECHNICAL SERVICES

New product development, applications engineering, alloy development, and pilot trails to full-scale production.

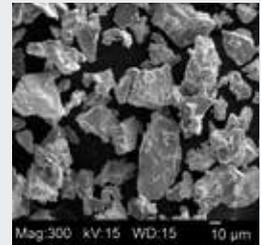
ADVANTAGES

HDH Titanium powders offer a wide range of PSD and chemistry grades and provide an affordable titanium powder alternative. HDH Titanium powders are also free flowing with careful selection of PSD, raw material feedstock, and powder morphology. These powders have been successfully used in a wide range of traditional PM applications to make cost effective net shape and near net shape products.

Morphology: HDH CP Titanium Powder

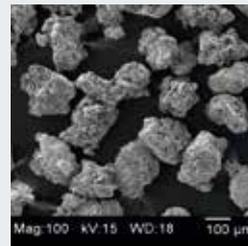


SEM image (x100) of HDH CP-Ti Powder, 70 mesh (212µm) x 100 mesh (150µm)

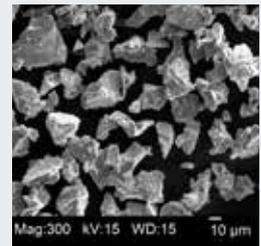


SEM image (x300) of HDH CP-Ti Powder, 325 mesh (45µm)

Morphology: HDH Magnesium Reduced Titanium Sponge Powder

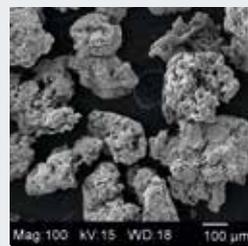


SEM image (x100) of HDH Magnesium Reduced Ti Sponge Powder, 70 mesh (212µm) x 100 mesh (150µm)

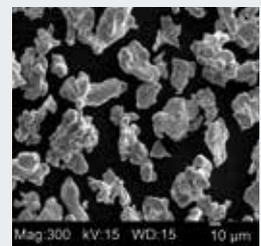


SEM image (x300) of HDH Magnesium Reduced Ti Sponge Powder, 325 mesh (45µm)

Morphology: HDH Sodium Reduced Titanium Sponge Powder



SEM image (x100) of HDH Sodium Reduced Ti Sponge Powder, 70 mesh (212µm) x 100 mesh (150µm)



SEM image (x300) of HDH Sodium Reduced Ti Sponge Powder, 500 mesh (<25µm)

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HYDRIDE-DEHYDRIDE (HDH) PROCESS

Titanium powder production via the Hydride-Dehydride (HDH) process has been an on going operation at Reading Alloys for over 25 years. Within the past decade, Reading Alloys has grown into a global commercial producer of HDH Titanium powders. Raw material selection and downstream finishing processes play important roles in determining key characteristics of the finished powder such as chemistry, morphology and particle size distributions (PSD).

The Hydride-Dehydride (HDH) process has been a long-recognized and well-established manufacturing process for the production of Titanium, Zirconium, Vanadium and Tantalum powders. These metals and their alloys readily form stable and brittle hydrides that can be easily crushed, milled and screened to produce fine hydride powders with controlled PSD.



Hydride-Dehydride Process Flow Diagram.

Particle Size Distribution (PSD) represents another important powder parameter. Many plasma spray coaters specify US sieve sizes for powders. For some finer Titanium powder grades, laser PSD measurement is preferred which significantly increases the PSD resolution below 75 microns (-200 mesh).

Reading Alloys offers either Microtrac or Malvern Laser PSD test methods. A representative Microtrac powder distribution is shown in Figure 1.

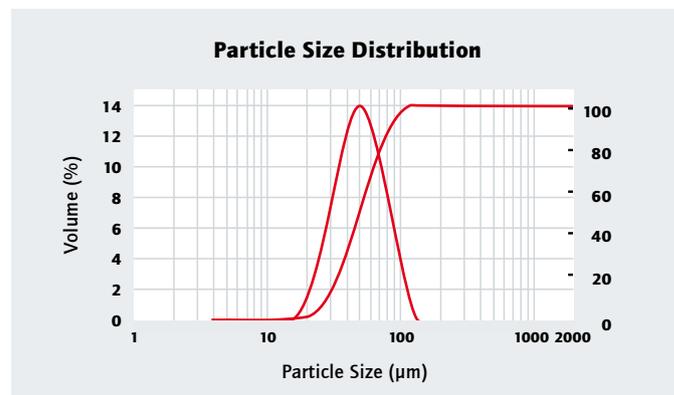


Figure 1: Microtrac Particle Size Distribution for a Typical CP Ti Powder

ABOUT READING ALLOYS

Reading Alloys is the world's premiere manufacturer of titanium powders and high-quality master alloys. Our products are approved for use in critical aerospace and medical applications that require the most stringent quality requirements and demand the highest purity. In addition, we offer a series of gas-atomized specialty powders.

ABOUT AMETEK SPECIALTY METAL PRODUCTS

AMETEK Specialty Metal Products (SMP) is a division of AMETEK, Inc. a leading global manufacturer of electronic instruments and electromechanical devices with annual sales of approximately \$5 billion.

AMETEK has 18,000 colleagues at more than 150 operating locations, and a global network of sales, service and support locations in 30 countries around the world.

The Specialty Metal division consists of six businesses and operating facilities in the United States and the United Kingdom, all proven experts in the manufacture of advanced metallurgical products including high purity powders, master alloys, precision metal strip, ultra-thin foil, specialty shaped wire, engineered shaped components, thermal management products, precision tube and clad plate.



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