Metal Powder Atomizer

Necessity is the mother of invention
GO BEYOND THE STATE OF THE ART

Open a new chapter in your research and development with ATO LAB. Design your alloy and quickly produce spherical metal powder with high flowability, perfect for your additive manufacturing and powder metallurgy needs.
Our intensive development aimed at the optimization of the laboratory – used atomization process. It has resulted in a successful production of both reactive and non-reactive powders on a smaller, yet still completely self-sufficient scale. We have developed stable procedures for metals and their alloys such as: aluminum, titanium, stainless steel, noble metals.

ATO LAB throughput reaches several hundred grams of metal powder with a particle size from 20 to 100 μm, with optional subsequent procedures leading to the separation of desired powder fractions.
HIGH-END
ATOMIZATION
IN YOUR
LABORATORY

ATO LAB was designed by industry-oriented researchers aiming to overcome traditional atomisation limitations. ATO LAB has a compact form, making it possible for comfortable usage even in limited space. Along with its innovative technology and no requirements for sophisticated infrastructure, it ensures exceptionally low operating costs and a quick return on the investment.

Unsieved, raw ATO LAB powder, note the uniform size and spherical shape of the particles
A spherical 316L steel powder particle produced in ATO LAB

NEW GENERATION
ATOMIZER

ATO LAB is an unique, compact machine for metal powders production, using a novel ultrasonic atomization technology. This breakthrough solution allows you to quickly produce free-flowing metal powders with narrow particle size distribution.
KEY FEATURES

1. Highest quality powders
2. Process flexibility
3. No limitations in minimum powder quantity
4. Wide range of alloys
5. Cost-effective production
6. Affordable price
7. Scalable system structure

SOFTWARE

Software quality lies at the heart of every user experience. Our team is aware of it; that is why we equipped ATO LAB with our dedicated, versatile and user-friendly software. The operator can execute processes using a conveniently placed touch screen. The purpose was to build, handy control system allowing independent regulation of every process parameter, including the ultrasonic and melting units.
# Specification

## General Information

<table>
<thead>
<tr>
<th>Process</th>
<th>Metal powders production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Ultrasonic atomization</td>
</tr>
<tr>
<td>Melting Method</td>
<td>Plasma torch</td>
</tr>
<tr>
<td>Sonotrode Type</td>
<td>Nanoalloy sonotrode - patent pending</td>
</tr>
<tr>
<td>Cooling Method</td>
<td>Liquid</td>
</tr>
<tr>
<td>Processable Materials</td>
<td>Fe, Al-, Ti, ... based alloys and more</td>
</tr>
<tr>
<td>Powder Quality</td>
<td>High flowability, spherical particle shape</td>
</tr>
<tr>
<td>PSD (Particle Size Distribution)</td>
<td>D90&lt;63μm for 316LSi, D50&lt;63μm for TiGr2</td>
</tr>
<tr>
<td>Powder Collecting System</td>
<td>Cyclone</td>
</tr>
<tr>
<td>Material Form</td>
<td>Wire / Rod</td>
</tr>
<tr>
<td>Certification</td>
<td>CE mark, ATEX</td>
</tr>
</tbody>
</table>

## Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultrasonic Frequency</td>
<td>40 kHz</td>
</tr>
<tr>
<td>Ultrasonic Power</td>
<td>Up to 400W</td>
</tr>
<tr>
<td>O₂ Level</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Plasma Current</td>
<td>Up to 100A</td>
</tr>
<tr>
<td>System Throughput</td>
<td>Up to 0.3l/h</td>
</tr>
<tr>
<td>Machine Weight</td>
<td>280 kg.</td>
</tr>
<tr>
<td>Size (WxDxH)</td>
<td>707x1206x1957</td>
</tr>
</tbody>
</table>

## Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed Air</td>
<td>4-8 bar</td>
</tr>
<tr>
<td>Inert Gas</td>
<td>Argon, Nitrogen or Helium</td>
</tr>
<tr>
<td>Powder Supply</td>
<td>400V, 20KVA / 3 phase</td>
</tr>
<tr>
<td>Gas Consumption</td>
<td>100l; purging / 10l / min: process</td>
</tr>
<tr>
<td>Powder Recycling System</td>
<td>Sieving unit</td>
</tr>
<tr>
<td>Water Cooling</td>
<td>External Chiller</td>
</tr>
</tbody>
</table>
AFFORDABLE PRICE

In comparison with currently available atomization units, ATO LAB has considerably lower media consumption. The cost-effective process is not only smooth and rapid, but also attractive from the economical point of view. Its compact size and unique technical solutions allowed 3D LAB company to offer a highly competitive price for the device itself – ATO LAB is an exceptionally attractive offer for small and medium - size companies, metal powder manufacturers and research institutions.

ATO POWDER CAN ALSO BE USED IN THE FOLLOWING AREAS:

1. Brazing
2. Powder spraying
3. Filters and foams
4. Conventional powder metallurgy
5. Laser cladding
6. Chemical synthesis
7. Catalysis
Due to the ordered nature of the ultrasonic atomization process, the output powder has a very narrow particle size distribution, depending on chosen ultrasound frequency. Since the material is melted directly on the surface of the atomizing unit, there is no risk of crucible-related impurities occurring in the product. Argon atmosphere is recommended but the setup also allows for processing with nitrogen and helium.

Focused power sources make it possible to overcome the material melting point limitation. ATO LAB can use even very brittle or soft input material, as long as it is provided in the form of a wire or rods. Perfect for usage in small and medium-sized companies, new material development projects and research institutions.
WITH ATO IN YOUR LAB
YOU WILL CHANGE
THE WAY OF METAL
POWDER PRODUCTION

**Recirculation Pump**
gas-tight design keeps atmosphere oxygen-free during the process.

**Filters**
second step of particulate filtration is designed to remove excessive fumes and allows to recirculate inert gas.

**Feeding System**
either rod- or wire-feed it is flexible option depending on the material form.

**Process Chamber**
designed to minimize powder left and keep compact size of the machine.

**Plasma Torch**
efficient internal cooling designed for the longest and most demanding processes.

**Sonotrode**
the very heart of the machine, build with patent pending technology and state-of-the-art nanoalloys, it provides unique process flexibility.

**Ultrasonic Transducer**
the “vibration engine” brings energy necessary for melt atomization.

**Control System**
highest quality electronic controls machines sensors and devices, it allows for both process monitoring and analysis.

**Ultrasonic Generator**
powers up the transducer, advanced control system allows for full process monitoring.

**Cyclone**
the element responsible for powder collection, it separates powder from inert gas.

**Vacuum Pump**
removing air at the begging of the process provides exceptionally high atmosphere purity with oxygen level below 0.01%.

**Plasma Generator**
robust power supply guarantees stable process while efficient IGBT inverter minimize energy loss.