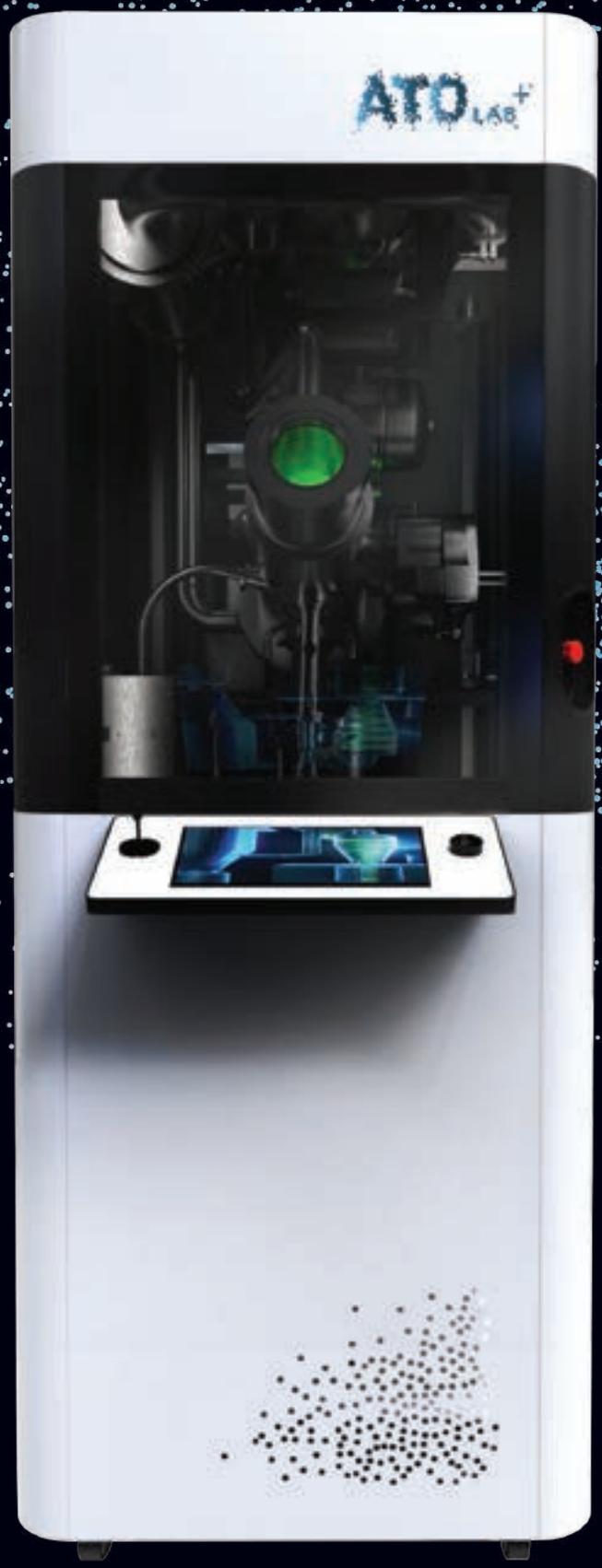
ATO LAB / LAB+

3D 3DLAB

LABORATORY METAL POWDER ATOMIZER

NECESSITY IS THE MOTHER OF INVENTION

ATO LAB / LAB+

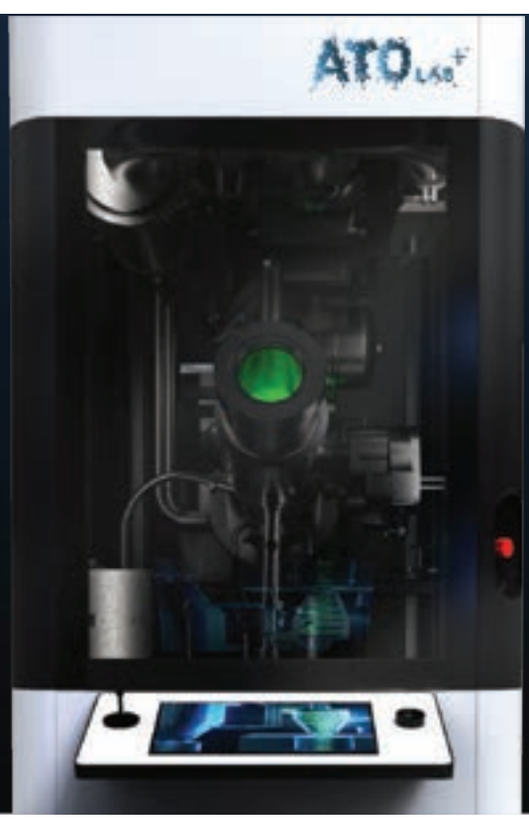


GO BEYOND THE STATE OF THE ART

Open a new chapter in your research
and development with ATO LAB.
Design your alloy and quickly produce
spherical metal powder with high flowability,
which is perfect for your additive manufacturing
and powder metallurgy needs.

DESIGNER POWDER METALLURGY SOLUTION

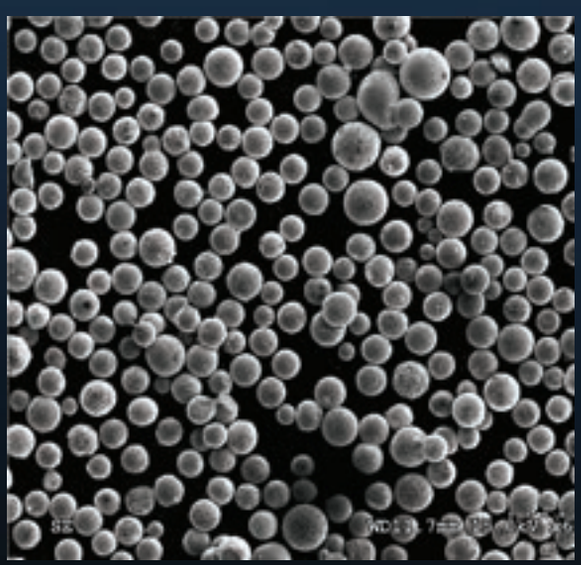
Our intensive development aimed at the optimization of the laboratory – used atomization process. It has resulted in a successful production of both reactive and non-reactive powders on a smaller, yet still completely self-sufficient scale. We have developed stable procedures for metals and their alloys such as: aluminum, titanium, stainless steel and lots more.



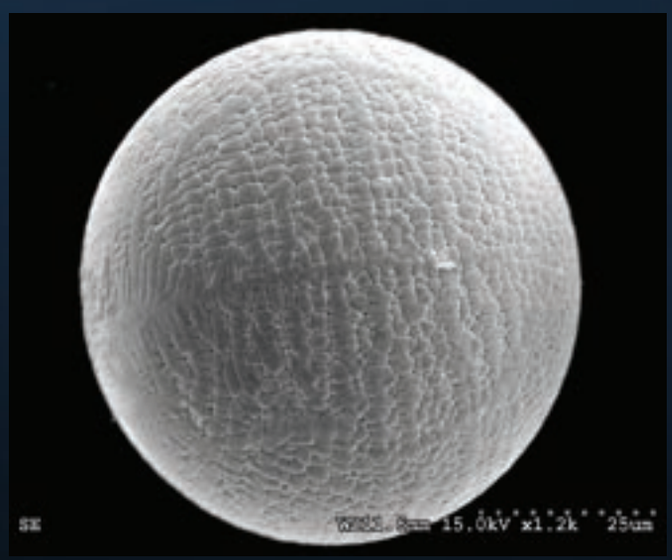
Must have solution for next generation metal materials designing

ATO LAB / LAB+

ATO LAB throughput reaches several hundered grams of metal powder with a particle size from 20 to 120 µm, with optional subsequent procedures leading to the separation of desired powder fractions.



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

HIGH-END ATOMIZATION IN YOUR LABORATORY

ATO LAB has been 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 a 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.

NEW GENERATION ATOMIZER

ATO LAB is a unique, compact machine for metal powders production, using a novel ultrasonic atomization technology. This breakthrough solution allows you to quickly produce metal powders with high flowability and narrow particle size distribution.

KEY FEATURES

- Highest quality powders
- Process flexibility
- No limitations on minimum powder quantity
- Wide range of alloys
- Cost-effective production
- Affordable price
- Scalable system structure

SOFTWARE

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

ATO LAB PLUS - ADDITIONAL CAPABILITIES

New, highly advanced version ATO LAB PLUS with a vacuum pump system for quick right atmosphere preparation and an extremely low oxygen level to achieve the best possible chemical purity of the materials.

Well sealed process chamber allows us to produce reactive metal powders and their alloys such as: titanium or aluminum.

NEW, MULTI BOLT ROD FEEDING SYSTEM

ATO LAB PLUS also extends productivity. New MBRFS module enables higher efficiency with a multi rod feeding mechanism, automated magazine for multiple bolt use in a single atomization process.

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 economical. Its compact size and unique technical solutions enabled 3D Lab company to offer a highly competitive price for the device itself – ATO LAB is an exceptionally attractive offer for small to medium-sized companies, metal powder manufacturers and research institutions.

ATO POWDER CAN ALSO BE USED IN THE FOLLOWING AREAS:

- Brazing
- Powder spraying
- Filters and foams
- Conventional powder metallurgy
- Laser cladding
- Chemical synthesis
- Catalysis

SPECIFICATION

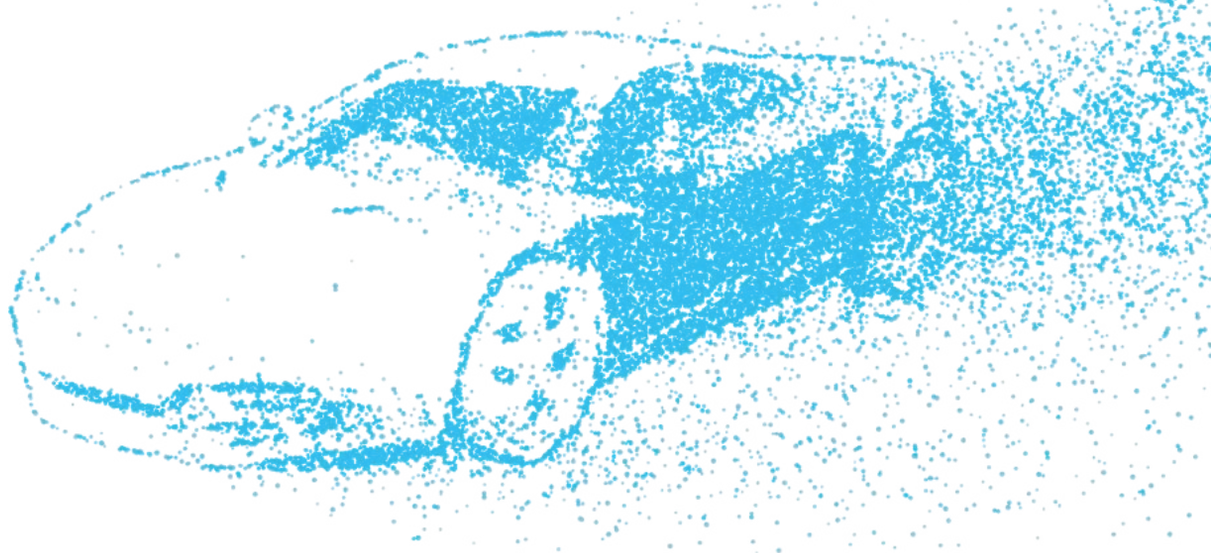
GENERAL INFORMATION	ATO LAB
process	metal powder production
technology	ultrasonic atomization
melting method	TIG
sonotrode type	half-wave nanoalloy sonotrode-patent pending
inert gas flushing method	purging
cooling method	liquid
processable materials	non reactive metal alloys (e.g. stainless steel, inconel, iron)
powder quality	high flowability, spherical particles shape, narrow PSD, low oxygen content
PSD (particle size distribution)	20-120 um
powder collecting system	cyclone
protective atmosphere preparation time	↓15 min.
input material	wire / rod (upgrade: SingleBoltFS)*
certfication	CE

PARAMETERS	
ultrasonic frequency	35 kHz
O2 level (delta)	↓ 500 ppm
system throughput	up to 0.3 l/h
machine weight (uncrated)	600 kg.
size (HxWxD)	1994 x 813 x 1138 [mm]

REQUIREMENTS	
air supply	compress air station
inert gas	Argon
power supply requirements / consumption	400V, 20 KVA / 3 phase
cleaning unit	ultrasonic cleaner
powder recycling system	sieving unit
water cooling	external chiller

ATO LAB PLUS
metal powders production
ultrasonic atomization
TIG
half-wave nanoalloy sonotrode - patent pending
vacuum pump
liquid
non-reactive & reactive alloys (e.g. Ti, Al., Zr alloys, intermetallics e.g. Zr-based bulk metalic glass TiAl, NiAl, NiTi) and other refractory metals
high flowability, spherical particles shape, narrow PSD, low oxygen content
20-120 um
cyclone
↓5 min.
wire / rod (upgrade: MultiBoltFS)**
CE
35kHz (+ upgrade to higher frequency)
↓ 150 ppm
up to 0.3 l/h
600 kg.
1994 x 813 x 1138 [mm]
compress air station
Argon
400V, 20 KVA / 3 phase
ultrasonic cleaner
sieving unit
external chiller

DISCOVER THE BREAKTHROUGH IN POWDER PRODUCTION



SEE THE UNMATCHED PARTICLE QUALITY

Due to the ordered nature of the ultrasonic atomization process, the output powder has a very narrow particle size distribution, depending on the 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.

TAKE YOUR PRODUCTION TO A NEW STAGE

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 to medium-sized companies, new material development projects, and research institutions.

WITH ATO IN YOUR LAB YOU WILL CHANGE THE WAY OF METAL POWDER PRODUCTION

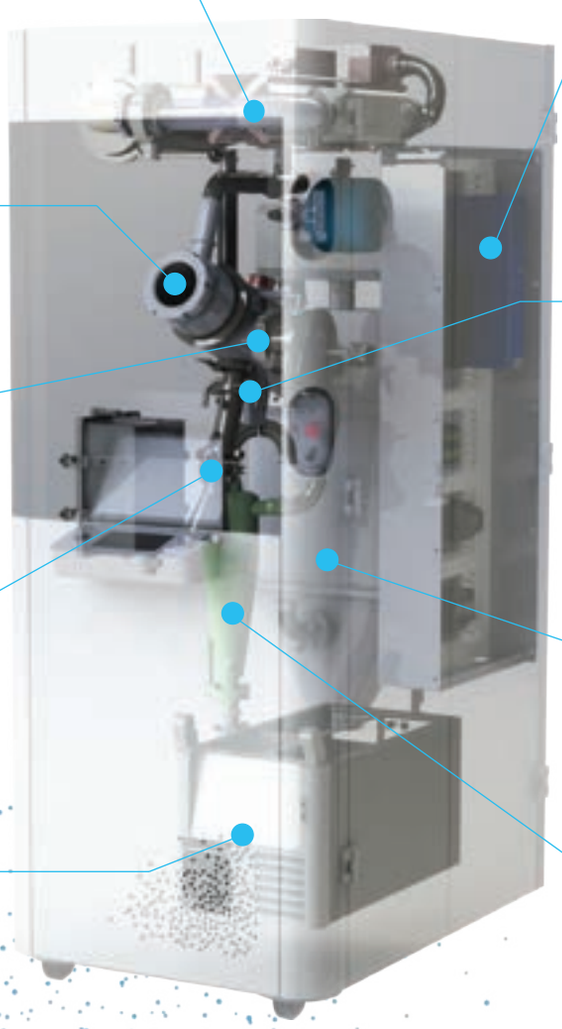
RECIRCULATION PUMP
gas-tight design keeps atmosphere oxygen - free during the process

PROCESS CHAMBER
designed to minimize powder left and keep compact size of the machine

TIG TORCH
welding arc is formed by a electrode and is maintained in a shielding gas covering

ULTRASONIC TRANSDUCER
the “vibration engine” brings energy necessary for melt atomization

TIG WELDING SOURCE
robust power supply guarantees stable process while efficient IGBT inverter minimize energy loss



ULTRASONIC GENERATOR
powers up the transducer, advanced control system allows for full process monitoring

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

FILTERS
designed to remove excessive fumes and allows to recirculate inert gas

CYCLONE
the element responsible for powder collection, it separates powder from inert gas


ATO LAB

ATO LAB / LAB+

3D 3DLAB

Headquarters: 3Dlab Sp. z o.o. • 63B Farbiarska St. • 02-862 Warsaw • Poland • www.metalatomizer.com

Indian Representative: Tesscorn Nano Science, Inc., | info@tesscorn-nanoscience.com | www.tesscorn-3d.com