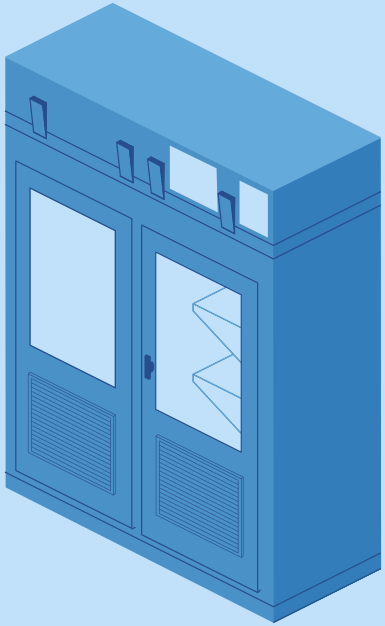
NIPPON SANSO

Additive Manufacturing

3DPro® Powder DryCabinet
Overview



Defining the problem

Quality assurance for an additive manufacturing process already begins with the best possible storage of the base materials. This is particularly true for metal melting processes.

Reproducible production of high-quality components in today's high-performance metal AM systems requires a non-contaminated metal powder as base material.

However, the small particle size of the powder and the resulting large surface area lead to adsorption of moisture and oxygen from the surrounding atmosphere and contamination of the material.

This contamination can lead to problems with:

- Mechanical integrity of the components
- Inconsistent component qualities
- Gas inclusions in the manufactured products
- A variable gas purity in the building chamber

Comparison between two 3D printed samples with a different result due to oxidation.



Metal powder for 3D printing.

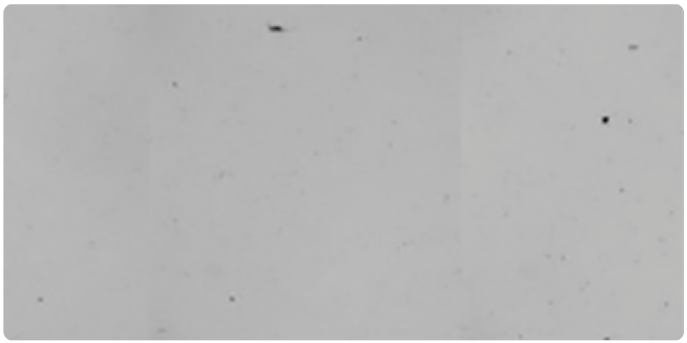


Our solutions
3DPro® Powder DryCabinet

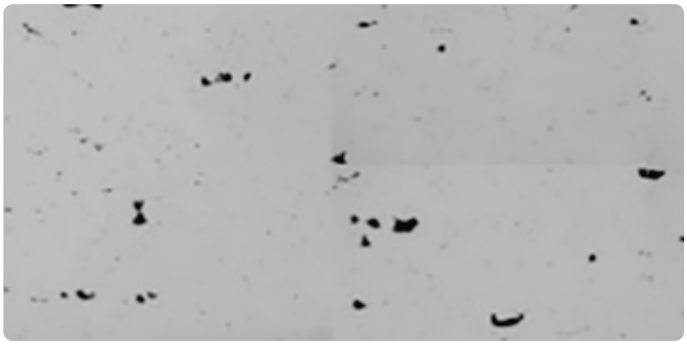
The 3DPro® Powder DryCabinet enables the storage of metal powders for additive manufacturing in a controlled and inert atmosphere, through a continuous purging process of the storage cabinet with high purity gas. The integrated oxygen and humidity sensors, in combination with the built-in heating system, allow the user to precisely adjust the storage atmosphere.

With the 3DPro® Powder DryCabinet, the powder can be reliably supplied to the production process in a consistently high quality.

Example of printed parts with dry powder.



Example of printed parts with moist powder.



Features

3DPro®
Powder DryCabinet



1. Constant powder quality through oxygen and moisture control

- Oxygen and humidity sensors for continuous monitoring of the atmosphere in the cabinet
- Integrated heating system in the back wall
- Status detection of the door
- Configurable target value for oxygen and humidity via digital touch panel display

Example of standard industrial desiccators, typically developed for electronic components:

- No oxygen humidity measurement
- No heat-up/temperature control
- No status detection of the door
- No regulation of oxygen/humidity values



2. Latest IoT technology integrated

- The fully automatic inert gas flow control makes it possible to reach a preset oxygen and/or humidity level in a short time and with minimal gas consumption
- 3DPro® MiruGas® telemetry system for data monitoring from customer PC or other smart-devices (service contract required) - 7-inch full-color touch panel display

Example of standard industrial desiccators developed for electronic components:

- Fixed flow rate with standard flow meters
- No oxygen and/or humidity measurement
- Does not support telemetry system

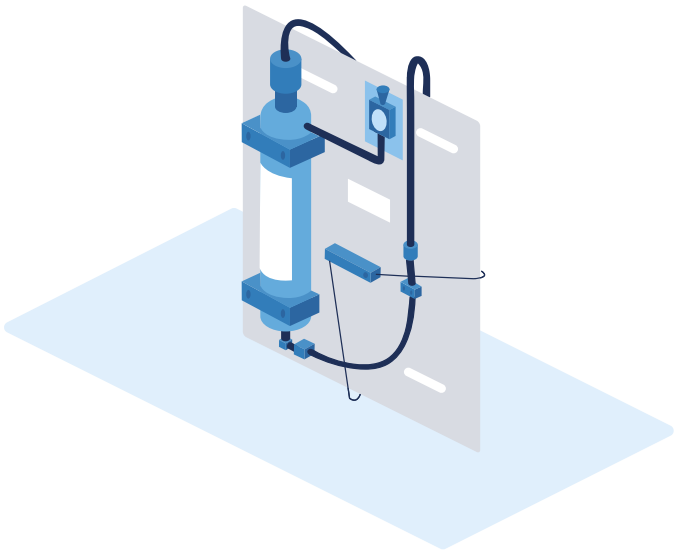
3. Safety

- Emergency stop switch for disconnecting all circuits
- 120 kg max. load per shelf
- Total of 4 shelves, 3 of which are height adjustable.
- Before door opening, air purge function to minimise the risk of asphyxiation

Example of standard industrial desiccators developed for electronic components:

- Lower maximum weight per shelf
- No air purge function available



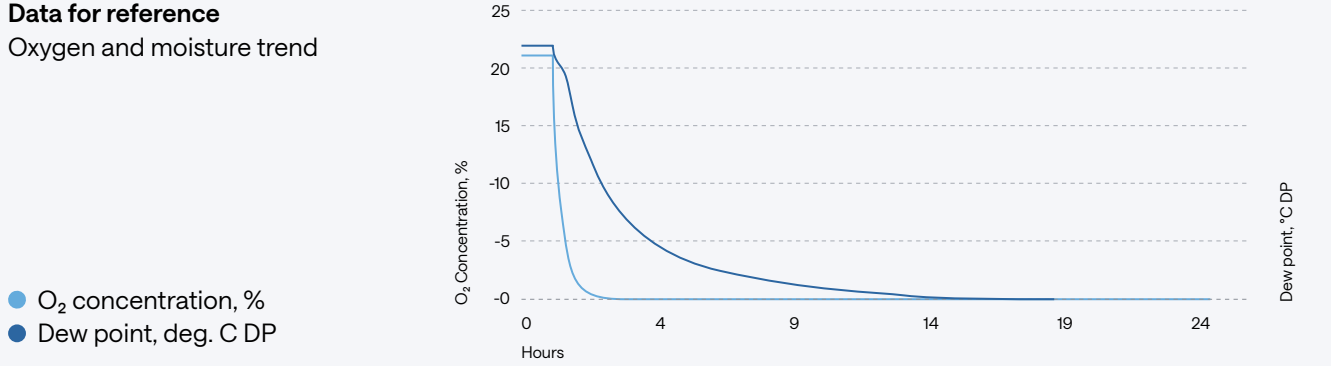


3DPro® Powder DryCabinet

Specifications

Feature	3DPro® **Powder DryCabinet**
Storage	Sealed or closed powder drums only. Shall be NON-explosive atmosphere
HMI	7-inch colour touch panel
Total storage weight	300 kg Total (120 kg max. distributed-weight load per shelf table) Height position adjustable panel
Oxygen sensor	Type: Zirconia Transmitter Meas. Range: 0 to 25% O_2 Accuracy: ±0.5% FS
Moisture sensor	Type: Capacitive Meas. Range: -110 to 20°C DP Accuracy: +/-2°C DP
Dimension	1,183 x 2,075 x 750mm (WxHxD)
Material & color	Stainless steel
Reachable oxygen level	Less than 50 ppm
Reachable moisture level	Lower than -65°C DP
European compliance	EMC Directive 2004/108/EC (Non-complying ATEX Directive) Optional for storage area: ATEX II Ex “p” IIIC 3D Dc pz

Data for reference
Oxygen and moisture trend



Making life better through gas technology



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