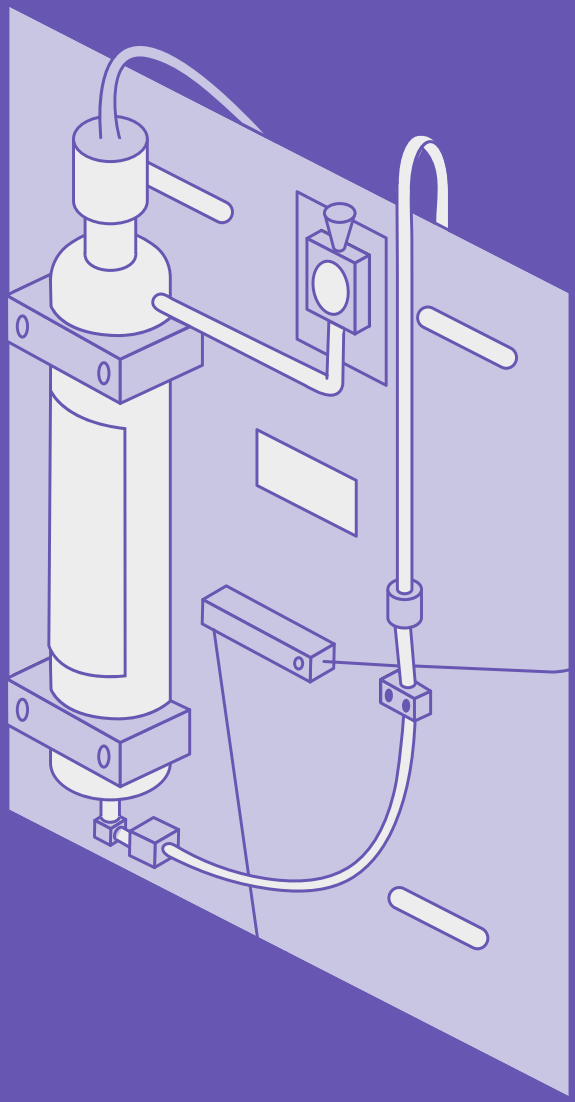
3DPro® **Purifier**

Nanochem® technology



ADDITIVE MANUFACTURING

NIPPON GASES

3D printing processes

Gases play a fundamental role in 3D printing processes for the reproducible production of defect-free components. Argon, nitrogen and various mixtures used in additive process chains are usually available in sufficiently high purity grades. However, leaky equipment parts, the use of metal powders with high moisture content, or errors during cylinder and equipment changes can lead to unwanted contamination by oxygen and/or moisture.

The resulting oxidation of the melt pool, increased spatter density, and increased powder aging, among other things, thus lead to reduced system performance as well as decreased mechanical component properties. Our 3DPro® **Purifiers** are capable of dramatically reducing oxygen and moisture levels during the process, eliminating gas-related contamination as another process variable. Filled with a granular media, 3DPro® **Purifiers** are filter cartridges capable of adsorbing oxygen and moisture contaminants with efficiencies up to 100 ppt. This technology is particularly suitable for DED and WAAM processes as well as for all additive arc processes.

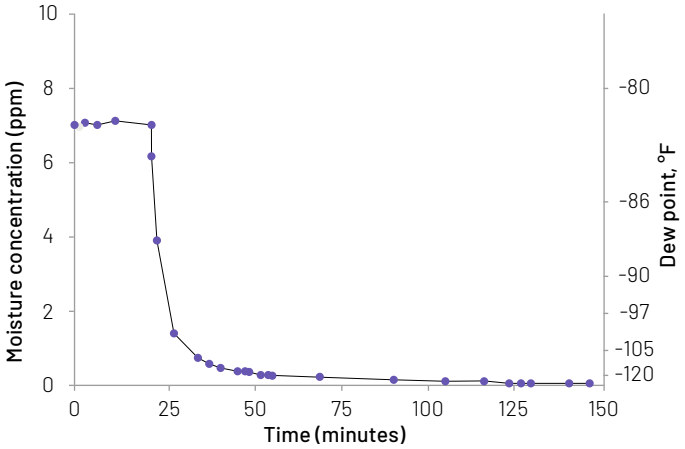
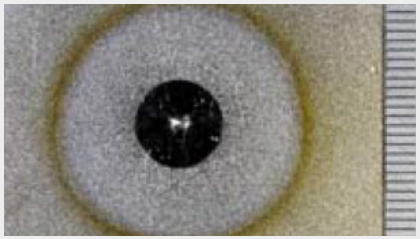
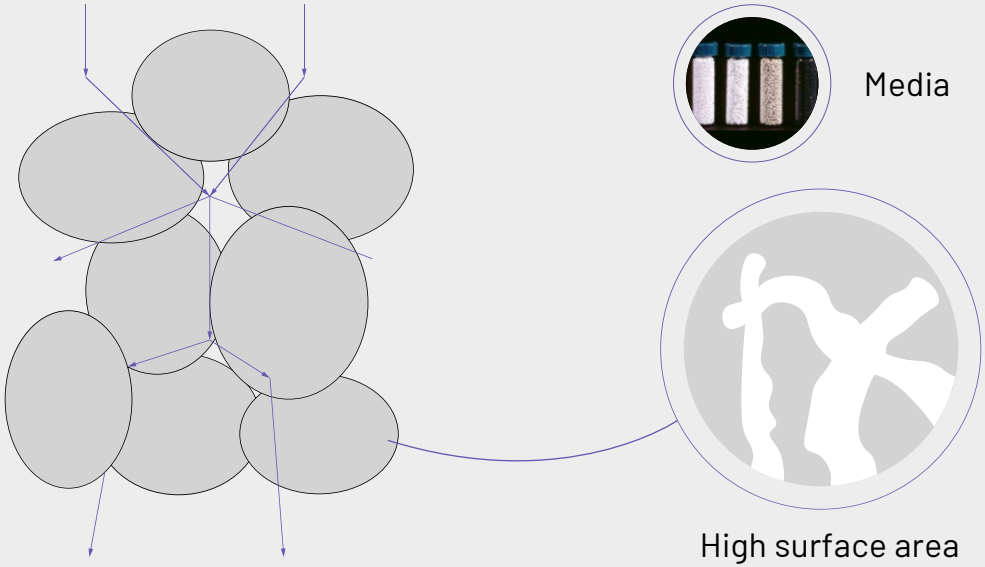


Fig. 4 - Removal of moisture with a resin-based purifier.

	Gas protection without Nanochem® (375 ppm of impurity)	Gas protection with Nanochem® (<0,1 ppm of impurity)
Titanium - surface welding spot		
Stainless steel Tube Inside of welded		
Surface aspect	Oxidized	Bright



Use

Purify Mode

- Gas flows from inlet, through cartridge, through check valve, to outlet.
- Used during operation and replacement cartridge installation.

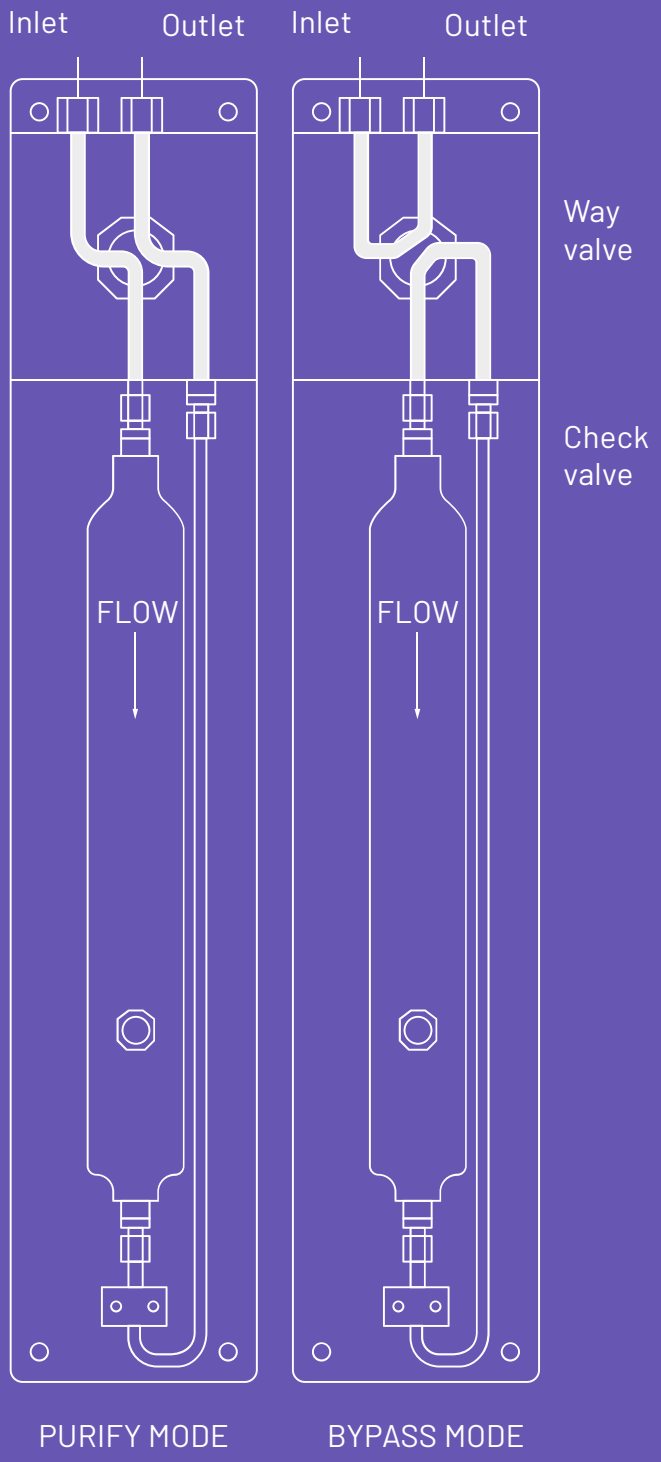
Bypass Mode

- Gas flows from inlet to outlet; bypasses cartridge and check valve.
- Used when cartridge is removed and for gas cylinder changes.

Product specifications

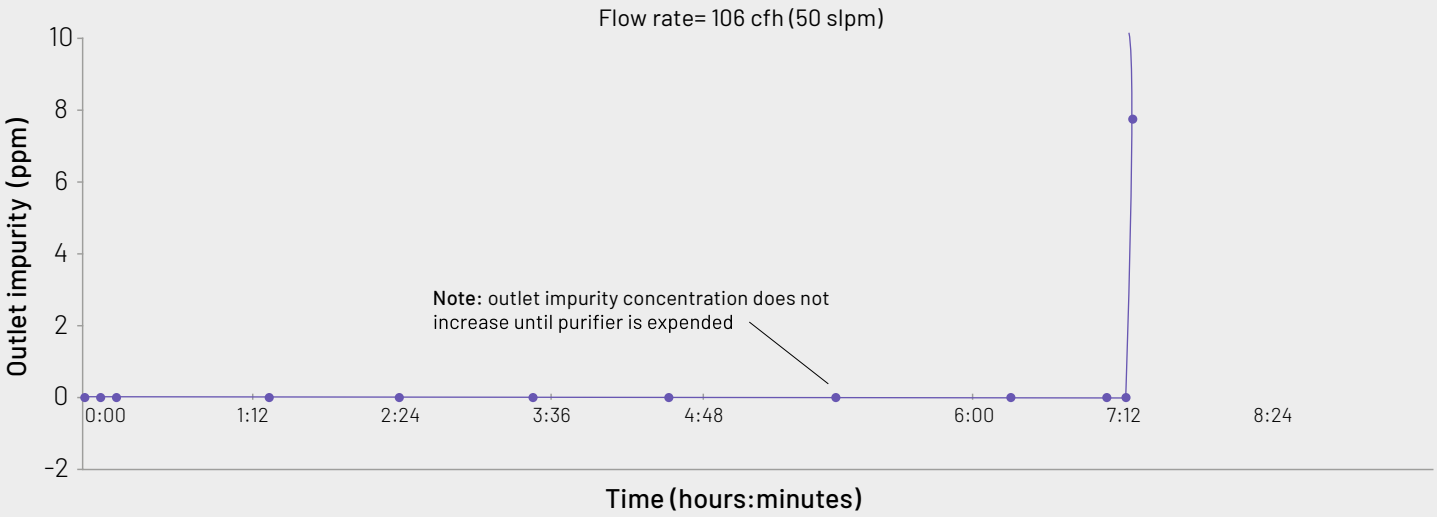
Purify argon, helium, nitrogen, hydrogen and gas blends.

- 500 ml sizes.
- Flow rates up to 50 lpm (~ 100 cfh).
- Simplified operation.
- One 4-way valve.
- Visual endpoint detection.
- Built-in bypass around purifier.
- Check valve to protect against back diffusion of air.
- Cartridges also sold separately.
- Field replaceable.



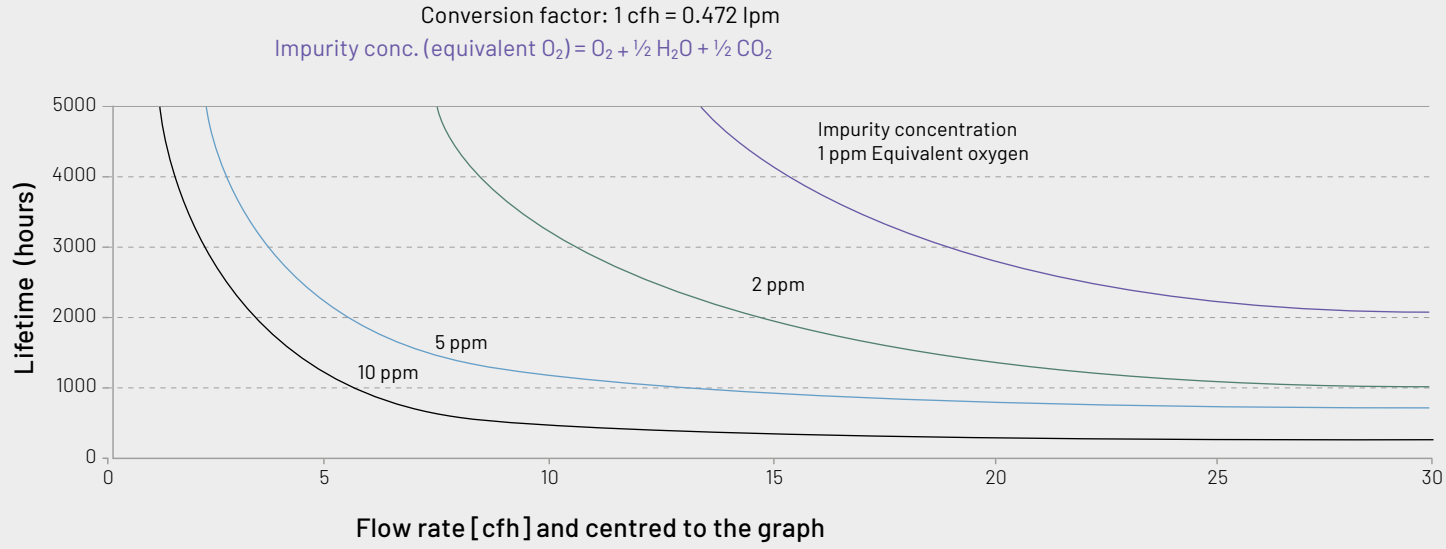
MATHESON EPG L200 Capacity test

Impurity challenge: 1000 ppm oxygen in nitrogen
50 slpm flow; 10 ppb detection limit



Lifetime of WA-150 Purifier

Inert gas service, 30 psig Operating pressure



info@nippongases.com