

NANOCHEM[®]

NANOCHEM[®] 3DPro[™] Recirc Expendable Purifier

Features and Benefits

- High performance sub-PPB gas purification for recirculating gas in printer chamber
- Purifier designed to remove either water and oxygen from argon or just removal of water from oxygen (for Al printed materials)
- Simple, small-foot print, and easy to install and use
- Much lower cost and less complex relative to large regenerable purifiers
- Factory refillable or factory regenerable
- Customer simply removes purifier from recirculation loop, installs a new purifier and sends old purifier back for refill or regeneration
- Lifetime of approximately 1 year depending on impurity concentration entering purifier (Lifetime will be calculated based on individual user parameters)

Specifications

- 3DPro-w for removal of water only to less than 1 ppb
- 3DPro-wo for removal of water and oxygen to less than 1 ppb
- A414 grade G steel with high gloss enamel paint on exterior for cleanliness
- Temperature probe and readout is available to monitor the internal temperature of purifier bed
- High flow ball valves and gate valve used for lowest pressure drop
- Flow rates up to 5000 slpm depending on customer maximum allowable pressure drop
- Maximum operating pressure is 125 psig
- Maximum operating temperature is 40°C

Connections

- Easy to use KF40 ring seal flange connections with elastomer gaskets provide low leak rates and allow easy purifier changeouts compared to threaded or compression fittings

Options

- Bypass assembly is optional and available to divert gas around the purifier if necessary. Three-valve manifold with isolation and bypass valve allows disconnection of purifier without interrupting process gas flow
- Endpoint indicator is optional and available for some applications. This makes it easy to determine when the purifier should be changed. The number on digital readout drastically changes and light turns on to indicate purifier nearly consumed
- Optional 40 micron particle filter is available for particle removal in addition to removal of chemical impurities

Overview

MATHESON 3DPro[™] NANOCHEM[®] Purifiers are part of the MATHESON NANOCHEM[®] family of proprietary, advanced purification sorbents and systems. NANOCHEM[®] solutions are currently implemented on a global scale in difficult applications in the semiconductor, pharmaceutical, aerospace, welding, and manufacturing industries.

In a continuous-operation application such as 3D Printing, MATHESON 3DPro[™] NANOCHEM[®] Purifiers feature high purification capacity (i.e., long lifetime), meaning that a purifier can be left on-line for long periods of time before replacement is required.



Applications

MATHESON 3DPro[™] NANOCHEM[®] Purifiers are typically used to target the removal of water, oxygen, and carbon dioxide in argon, nitrogen, helium, and mixtures thereof.

MATHESON 3DPro[™] NANOCHEM[®] Purifiers are also suitable for removal of other impurities and may be used in other matrices. If your application interest involves impurities or gases not mentioned above, please contact us. Alternate purifier choices may be applicable.

Typical Performance

Impurities are typically removed to the detection limits of state-of-the-art analytical techniques:

Impurity/ Matrix	Efficiency (ppb)	Challenge (ppm)	Analytical Method
H ₂ O in Ar	< 0.3 (LDL)	35	API-MS
O ₂ in Ar	< 0.14 (LDL)	1	API-MS
CO ₂ in He	< 11 (LDL)	500	GC-DID

MATHESON can provide an expected lifetime projection calculation based on your expected conditions. Please contact us for details.

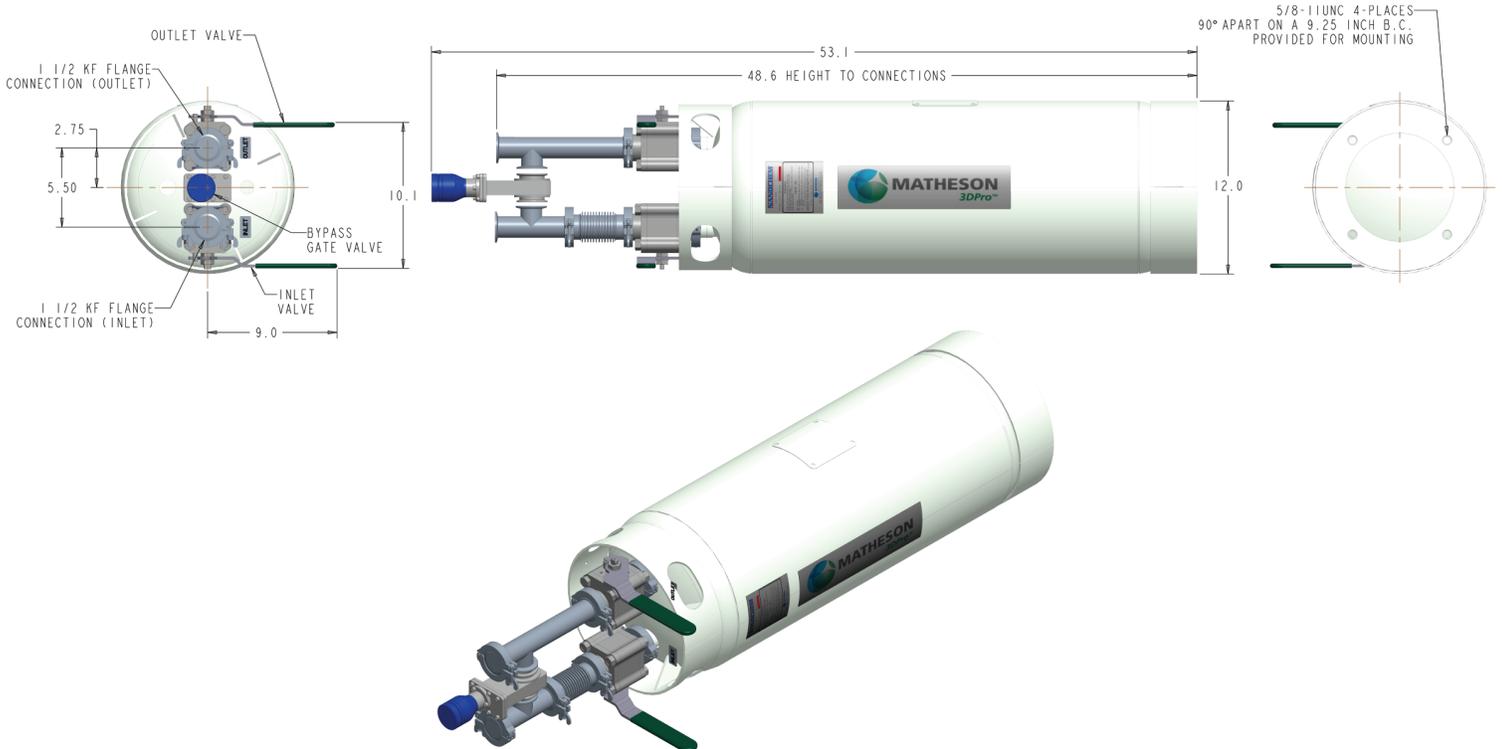
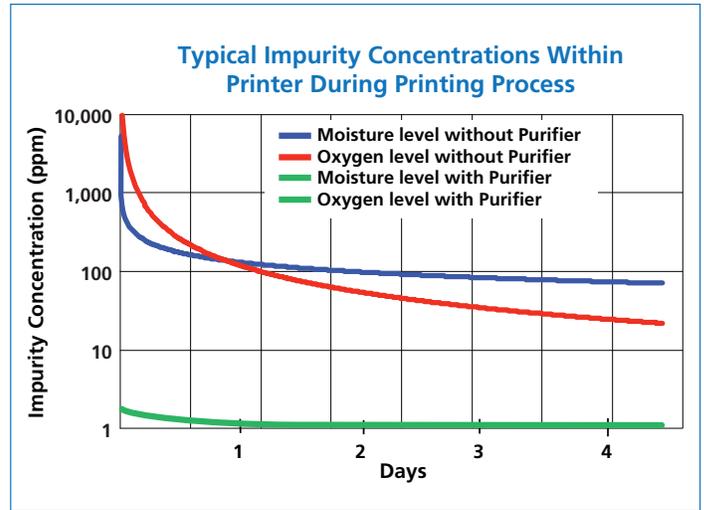
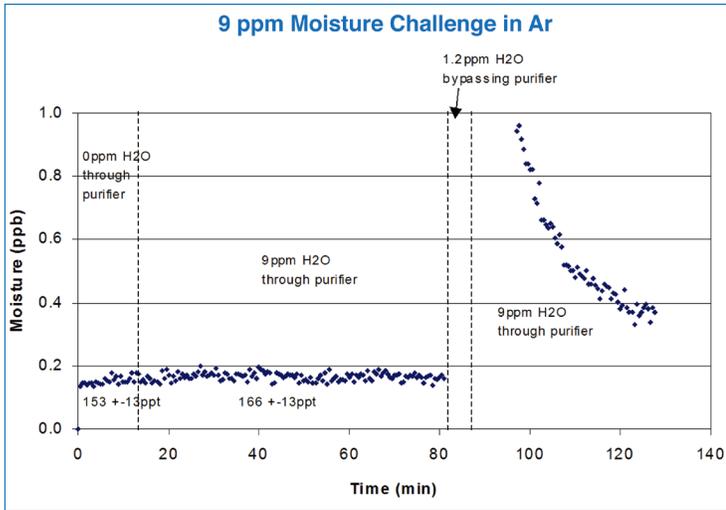


MATHESON
The Gas Professionals

Capacity & Efficiency in Argon

NANO-CHEM® 3DPro-wo Recirc purification offers high capacities and efficiencies.

The figure below shows that an inlet moisture content of 9 ppm in argon is reduced to < 0.2 ppb.



Specifications are subject to change.

Please check www.mathesongas.com for most current information.

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