

# OMX-Plus™ Purification Medium

## NANOCHEM® Inert and Flammable Gas Purifiers

### The Next Generation Purifier for Inert & Flammable Gases

#### All the Benefits of NANOCHEM® OMX™ with Efficient Hydrocarbon Removal

NANOCHEM® OMX™ purification medium has long been *the industry standard* for purifying inert and flammable gases for a variety of semiconductor applications, including low temperature SiGe Epi. NANOCHEM® OMX-Plus™ offers all the benefits of NANOCHEM® OMX™ medium — the highest lifetimes and the best efficiencies for impurity removal as well as patented true endpoint detection to give advance warning of purifier depletion. OMX-Plus™ also offers removal of trace non-methane aliphatic and aromatic hydrocarbons from source gases and system component outgassing.

#### Features and Benefits

- Direct purification of inert and flammable gases used in ultra-high purity applications:

##### Inert Gases:

N<sub>2</sub> – Nitrogen  
Ar – Argon  
He – Helium  
Xe – Xenon  
Kr – Krypton  
Ne – Neon  
CF<sub>4</sub> – Carbon Tetrafluoride

##### Flammable Gases:

H<sub>2</sub> – Hydrogen  
CH<sub>4</sub> – Methane  
D<sub>2</sub> – Deuterium

- Highest Lifetimes
- Best Impurity Removal Efficiencies
- Patented Fiber-Optic End-Point Detection available
- Removes Oxygenated Species (H<sub>2</sub>O, O<sub>2</sub>, CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, etc.) and non-Methane Hydrocarbons (NMHC)
- Improves and ensures gas purity for process consistency: higher yield / device quality
- No external power source required
- Does not require heating or cooling

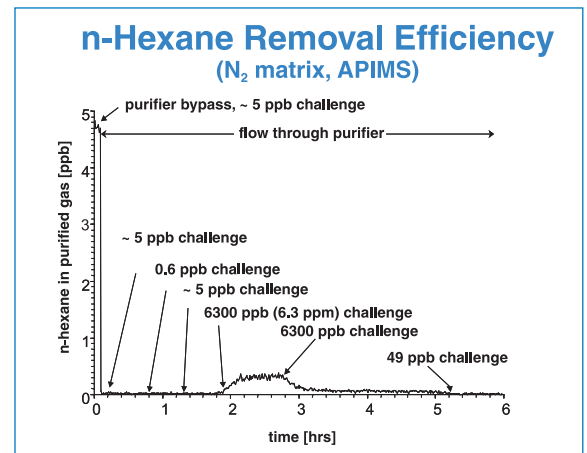
|                  | Specification | Typical Performance |
|------------------|---------------|---------------------|
| H <sub>2</sub> O | < 100 ppt     | < 100 ppt (APIMS)   |
| O <sub>2</sub>   | < 100 ppt     | < 50 ppt (APIMS)    |
| CO <sub>2</sub>  | < 100 ppt     | < 50 ppt (APIMS)    |
| CO               | < 1 ppb*      | < 1 ppb (APIMS)*    |
| NMHC             | < 100 ppt     | < 100 ppt (APIMS)#  |

\* < 1 ppb CO is obtained at low flow rates and low CO challenge (< 1 ppm) only.

# NMHC – Non-Methane Hydrocarbons. Typical performance expressed for Butane.

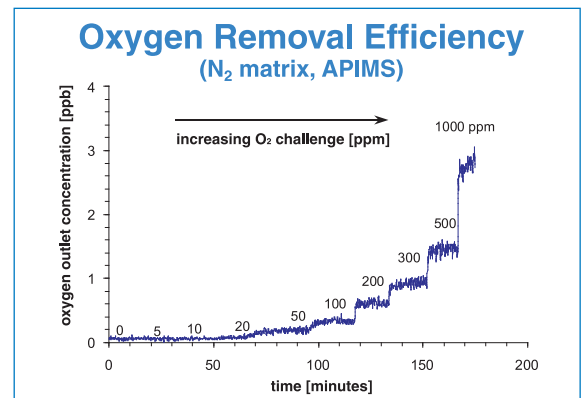
#### Remove Harmful Non-Methane Hydrocarbons

Typical performance of OMX-Plus™ Resin for the removal of NMHC, such as n-Hexane, is shown below:



#### Remove Killer Oxygenated Impurities

The removal efficiency of OMX-Plus™ for oxygen-containing impurities remains essentially unchanged from the efficiency expected with NANOCHEM® OMX™. Shown below is typical performance upon exposure to progressively increasing oxygen impurity concentration. Even with a 200 ppm O<sub>2</sub> challenge, the residual oxygen in the purified N<sub>2</sub> is < 1 ppb.

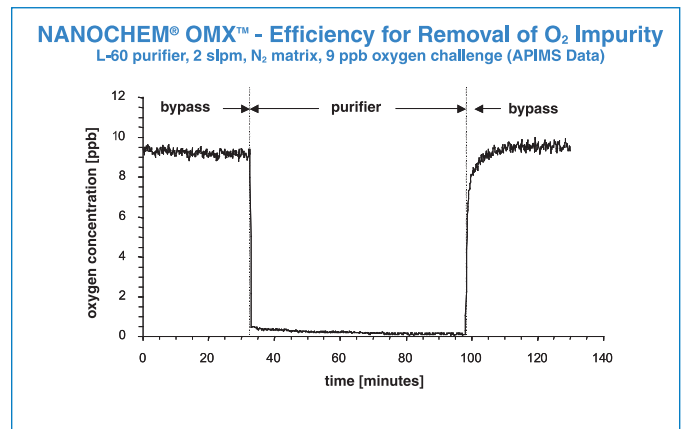
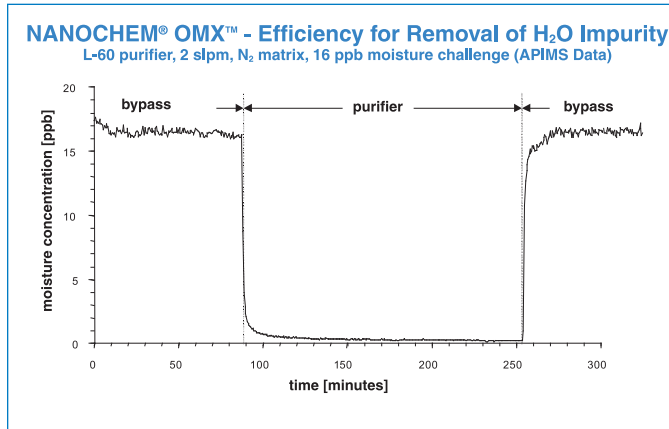


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## Pure "PPT" Performance (H<sub>2</sub>O and O<sub>2</sub>)

Removal of oxygen and moisture impurities is typically at the detection limits of APIMS, 30-100 ppt (parts per *trillion*) measured at the outlet of the purifier.



## Purifier Models / Sizes

NANOCHEM® OMX-Plus™ purification medium is available in a wide variety of hardware configurations for point-of-use, distribution, source and bulk purification applications:

| Model                      | Maximum Recommended  |                       | Media Volume<br>ml or liters | Maximum Allowable Operating Pressure |                                 |
|----------------------------|----------------------|-----------------------|------------------------------|--------------------------------------|---------------------------------|
|                            | Flow Rate***<br>slpm | (NM <sup>3</sup> /hr) |                              | With End-Point<br>psig (MPa)         | Without End-Point<br>psig (MPa) |
| A-Series™*                 | 50                   | (3)                   | 300, 500, 2000 ml            | 150 (1.14)                           | 500 (3.55)                      |
| L-Series™                  | 50-150**             | (3-9)**               | 300, 500, 2000 ml            | 150 (1.14)                           | 500 (3.55)                      |
| H-Series™                  | 50                   | (3)                   | 300, 500 ml                  | 150 (1.14)                           | 500 (3.55)                      |
| HP-Series™                 | 50                   | (3)                   | 300, 500 ml                  | N/A                                  | 2,850 (19.8)                    |
| MS-Series™                 | 1000                 | (60)                  | 4, 8, 16, 32 liters          | 150 (1.14)                           | 300 (2.17)                      |
| White Knight™ (WK-Series)* | 60-300               | (3.6-18)              | 500, 2500 ml                 | N/A                                  | 500 (3.55)                      |
|                            | 1000                 | (60)                  | 9 liters                     | N/A                                  | 350 (2.51)                      |

\*Drop-in replacements available for competing hardware designs.

\*\* 150 slpm (9 NM<sup>3</sup>/hr) with "High flow" option.

\*\*\*For higher flow rates, contact Matheson Tri-Gas, Inc.

Please contact your local MATHESON Sales Engineer or call (215) 648-4000 to obtain a purifier lifetime estimate for your specific operating conditions.

## Options

- Pneumatically-actuated Valves for all models.
- Bypass Module for L-Series™ & MS-Series™ with either manual valves or pneumatically-actuated valves.
- Inlet & Outlet Isolation Valves for White Knight™ Series
- "High Flow" Option for L-Series™ with upgraded particle filter
- End-Point Detection – DC powered. Not available for HP-Series™ & White Knight™ Series.
- 0.003 µm particle filter with 99.999999% 9-Log retention (standard on most models, optional for MS-Series™).

## Equipment Technology Center

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Specifications are subject to change. Please check [www.mathesongas.com](http://www.mathesongas.com) for most current information.

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