



# ASX-II™ Purification Medium NANO-CHEM® Arsine Gas Purifier

## For III-V Compound Semiconductor Epitaxy

### Overview

The increasing demands for higher yields and more consistent performance in the fabrication of III-V compound semiconductor devices dictate the need for more stringent contamination control. Nowhere is this more evident than in III-V compound semiconductor epitaxy processes. Gas contaminants, especially moisture and oxygen-containing species, adversely affect film quality and reduce yields. Since contamination sources cannot be entirely eliminated, the most effective solution is to purify arsine as close to the point-of-use as possible with an effective and efficient purification medium.

ASX-II™ is a new inorganic purification medium that removes H<sub>2</sub>O and is expected to remove Oxy-acid impurities. ASX-II™ offers the highest lifetimes for the removal of moisture. ASX-II™ has a wide range of applications, including GaAs and InGaAsP MOCVD processes, and is available in a wide range of purifier sizes: from Point-of-Use to Proximate.

### Features and Benefits

- Direct purification of AsH<sub>3</sub> used in ultra-high purity applications
- Ideal for GaAs and InGaAsP processes
- Highest moisture capacity
- No pressure build-up
- Best impurity removal efficiencies
- Removes: H<sub>2</sub>O and is expected to remove other oxygenated species
- Minimizes fluctuations in volatile impurities as cylinder is depleted
- Minimizes cylinder-to-cylinder impurity variations
- Improves process yields & device quality
- Increased savings by using cylinder longer before change out
- No external power source required
- No heating or cooling required

### Specifications

- < 75 ppb H<sub>2</sub>O (LDL) in AsH<sub>3</sub> by MAH-2

### Typical Performance

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

Impurity/ Matrix	Efficiency (ppb)	Challenge (ppm)
H <sub>2</sub> O in N <sub>2</sub>	< 100 (LDL)	1,900
H <sub>2</sub> O in AsH <sub>3</sub>	< 75 (LDL)	660

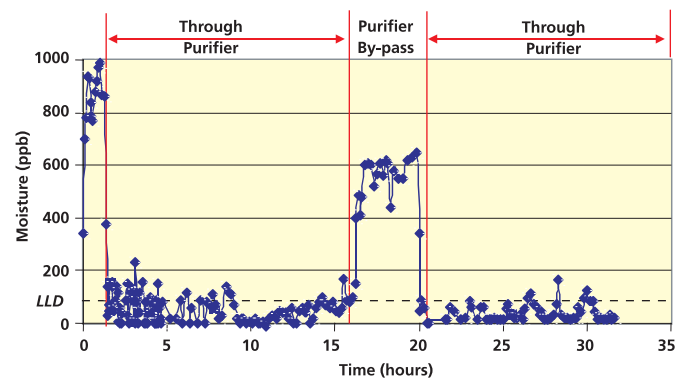
### Capacity & Efficiency in AsH<sub>3</sub>

ASX-II™ offers the highest lifetime and the best efficiency for the removal of moisture in arsine.

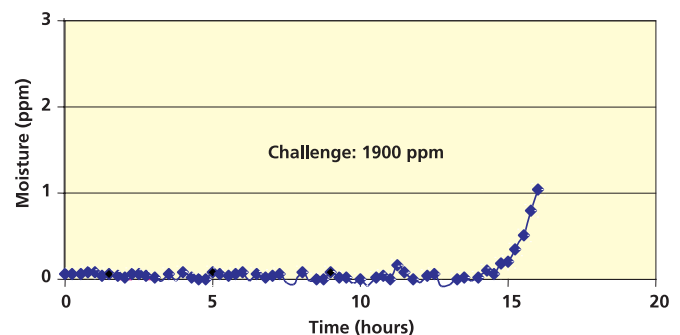
### Reduced Cost of Operation

By increasing the amount of arsine that can be consumed in each cylinder before a changeout, ASX-II™ enables significant raw material savings.

Efficiency of ASX-II™ for Removal of Moisture in AsH<sub>3</sub>  
(0.4 slpm flow & 600 ppb challenge)



Moisture Capacity in ASX-II™



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## Purifier Models / Sizes

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

Model	Maximum Flow Rates in AsH <sub>3</sub> Service		Maximum Allowable Media Volume Volume	Working Pressure	
	slpm	(NM <sup>3</sup> /hr)		psig	(MPa)
L-Series*	8-150	(0.5-9)	60, 300, 500, 2000 ml	60	(0.43)
A-Series*	50	(3)	60, 300, 500, 2000 ml	60	(0.43)
C-Series, CL-Series	50-150	(3-9)	300, 500, 2000 ml	60	(0.43)
H-Series	50	(3)	300, 500 ml	60	(0.43)

\*The most common hardware designs used are the L-60, L-300 and the A-300l.

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

## Options

Standard: 0.003 µm Teflon® particle filter with 99.999999% retention for arsine service.

End-Point Detection is not available

**\*\* NOTE: A particulate filter is required for the removal of particulates in the gas.**

Specifications are subject to change.

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