

# NANOCHEM<sup>®</sup>

## NANOCHEM<sup>®</sup> WeldAssure<sup>™</sup> Gas Purifiers

### Features and Benefits

- Low cost of ownership
  - Wall mount frame – easy to install and operate
  - Removes impurities to < 10 ppb (Dew Point = -150°F)
  - **Enhances weld quality, strength and appearance**
  - **Reduces weld porosity and oxidation**
  - **Visual endpoint detection\***
    - No guessing when to replace purifier canister
    - Color change in viewing window indicates 80% of purifier is spent
  - **Increases weld electrode lifetime**
    - No need to stop welding to grind/replace electrode
  - **Reduces weld rejects**
  - **Built-in Bypass around purifier canister**
    - Enables purging of gas lines without purifier deactivation during cylinder changeout
  - **Check valve at purifier outlet**
    - Prevents purifier deactivation from back diffusion of atmospheric air when gas flow is stopped
  - Filters at canister inlet and outlet
  - Operates at room temperature
  - No power requirements
  - **NANOCHEM<sup>®</sup> In2Go<sup>™</sup> and INX<sup>™</sup> Inorganic Media**
    - Prevents contamination from system upsets, such as air intrusion or connection of wrong gas cylinder
  - **NEW NANOCHEM<sup>®</sup> MigMix Purifier**
    - Designed for customers with gas blend welding needs
  - **Field Replaceable Canister**
  - **New Stainless Canisters can be refilled**
    - Savings over cost of replacement canister
    - Reduction in generation of solid waste
- \*NOTE:** Endpoint detection not available for Ar/O<sub>2</sub> or Ar/CO<sub>2</sub> gas blends.

### Specifications

- Flow rates up to **100 cfh** (47 slpm / 2.8 NM<sup>3</sup>/hr)
  - Gases Purified (with **OMX<sup>™</sup>**, **In2Go<sup>™</sup>** and **INX<sup>™</sup>**):
    - Argon, helium, nitrogen, hydrogen, inerts and gas blends of these constituents (4N purity or better)
  - Impurities removed (with **OMX<sup>™</sup>**, **In2Go<sup>™</sup>** and **INX<sup>™</sup>**):
    - Moisture, oxygen, carbon monoxide, carbon dioxide, nitrogen oxides, sulfur oxides, hydrogen sulfide, others
- NOTE:** OMX<sup>™</sup>-Plus also removes hydrocarbons. CO is more efficiently removed by In2Go<sup>™</sup>



Model WA-300  
Stainless Steel canister



Model WA-500  
Aluminum canister

- Gases Purified (with **MigMix** Media):
    - Argon / CO<sub>2</sub>, Argon / O<sub>2</sub>, Inerts / CO<sub>2</sub> blends
  - Impurities removed (with **MigMix** media):
    - Moisture, hydrocarbons
  - Maximum operating temperature – 65°C (170°F)
  - Maximum operating pressure – 200 psig (1.48 MPa)
  - Materials of Construction:
    - Canister (150 mL & 500 mL) – Aluminum 6061-T6
    - Canister (300 mL) – Stainless Steel, Type 304
    - Valves & Fittings – Naval Brass\*
- \*Also available in Stainless Steel, Type 316*



**MATHESON**  
The Gas Professionals

## Connections

- Purifier: 1/4" female NPT fittings
- Canister: 1/4" male Compression fittings

## Overview

NANOCHEM® WeldAssure™ purifiers provide purge and shield gas purification for welding applications. Weld gas impurities, such as moisture and oxygen, adversely affect weld quality. These impurities are present in gas cylinders, and can also be introduced through leaks in the line or during cylinder changes.

NANOCHEM® OMX™, In2GO™ and INX™ media react chemically and irreversibly with these impurities to deliver consistently pure gas to the weld site, improving weld quality. NANOCHEM® OMX™ resin also offers efficient removal of hydrocarbons, such as compressor oils, in the gas. A new inorganic media, NANOCHEM® In2Go™ prevents piping system contamination in the event of a major system upset, such as significant air intrusion or from the accidental connection of an improper cylinder to the purifier.

NANOCHEM® MigMix media is specifically designed to purify Ar/O<sub>2</sub>, Ar/CO<sub>2</sub> and other O<sub>2</sub>, or CO<sub>2</sub> blends. NANOCHEM® MigMix provides customers with the ability to use blended gas without the worry of reducing their tolerances or dilution ratios. MigMix is also better than any media for the removal of Moisture impurities. Endpoint detection is not currently available with MigMix media.

NANOCHEM® WeldAssure™ purifiers are an economical solution for GMAW (TIG) welding and other critical welding applications.

- Flow Rates up to 100 cfh (47 slpm)
- Available in 150 mL, 300 mL, and 500 mL sizes
- Easy to use canister bypass mode for canister changes and extended shutdowns
- Reliable endpoint detection to indicate when canister is spent
- Field replaceable canisters available
- 300 mL stainless canister can be refilled, enabling savings over purchase of spare canisters

## Applications

**GTAW** (TIG), **GMAW** (MIG), **PAW** (Plasma) and **LBW** (Laser Beam) welding applications and welding overlays with **GMAW** and **PTAW** (Plasma Transferred Arc). Aerospace, nuclear, petrochemical, pharmaceutical, petroleum drilling, ship-building, and other manufacturing industries.

**NOTE:** NANOCHEM® L-Series™ and MegaShield™ Purifiers with all stainless construction recommended for higher flow rates and for very clean welding in semiconductor and pharmaceutical applications. Maximum flow rates: 150 slpm (- 300 cfh) for L-Series and 1000 slpm (- 2000 cfh) for MegaShield™ Purifiers.

## Performance Benefits with NANOCHEM® Purifiers

### Welding of Aluminum 6061 T3, GTAW Process

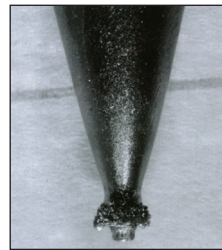


**Without Purification**  
(Impurity Content = 40 ppm)  
Surface Oxides, Porosity,  
Poor Cleaning Action,  
Poor Wetting  
Rough Weld Surface

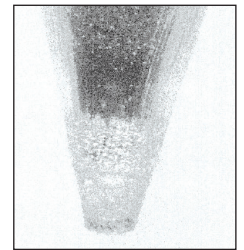


**With Purification**  
No Porosity, Clean X-Rays  
Good Cleaning Action,  
Excellent Wetting,  
Excellent Ductility  
Very Smooth Surface

### Welding of Titanium, PAW Process



**Without Purification**  
Tungsten Deposits on  
electrode (5/32", EWTh-2) after  
30 minutes.

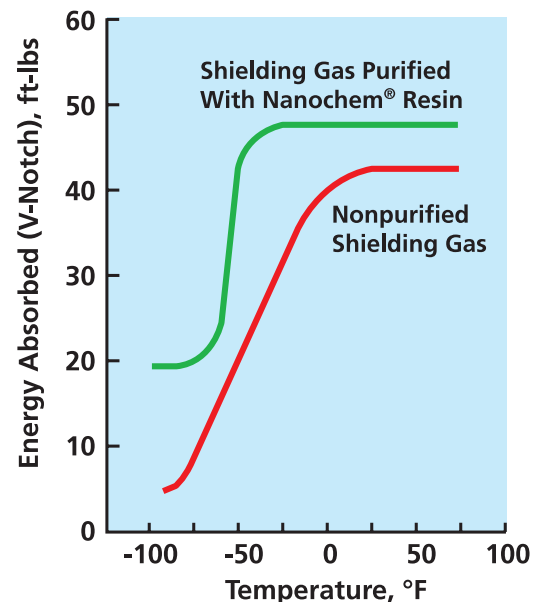


**With Purification**  
Tungsten erosion at electrode  
tip greatly reduced

### With Purification

Welds bright and shiny without oxidation or heat tints. Clean Radiographs – welds free of defects. Significant improvement in weld strength (Charpy V Notch impact energy) at lower temperatures. Improvements in Mils lateral expansion and percent ductile shear fracture.

### Welding of Ferralium 255, GTAW Process



Purifier Data	Purifier Model		
	WA-150	WA-300	WA-500
Media bed volume (mL)	150	300	500
NANOCHEM® Media	OMX™, In2Go™, INX™, INX-Plus™		
NANOCHEM® Media for Ar/CO <sub>2</sub> or Ar/O <sub>2</sub> blends	MigMix		
Canister	Aluminum Al6061-T6	Stainless SS 304	Aluminum Al6061-T6
Valves & Fittings	Brass	Brass*	Brass
Maximum Flow (cfh argon)	30	60	100
(slpm argon)	14	28	47
(NM <sub>2</sub> argon)	0.85	1.7	2.8
Dimension <b>A / B</b> (inches)	17 / 7	21 / 11.1	26 / 16.2
(mm)	432 / 178	533 / 282	660 / 411
<b>Lifetime</b> (approximate) <sup>#</sup> Number of cylinders purified	31	63	105

*\*Also available in Stainless Steel, Type 316*

*#Based upon argon of 99.998% purity ("Pre-purified" grade) containing 3 ppm O<sub>2</sub> and 10 ppm H<sub>2</sub>O.*

*Cylinder size – ~ 280 ft<sup>3</sup> (7.9 NM<sup>3</sup>) – MATHESON 1A, BOC 200, Air Products B, Air Liquide 44, Praxair K.*

*NOTE: Additional impurities contributed by the gas delivery system can significantly reduce predicted lifetime..*

**CAUTION! Only NANOCHEM® WeldAssure™ purifiers specifically labeled for CO<sub>2</sub> or O<sub>2</sub> applications can be used for purifying Ar/CO<sub>2</sub> and Ar/O<sub>2</sub> blends.**

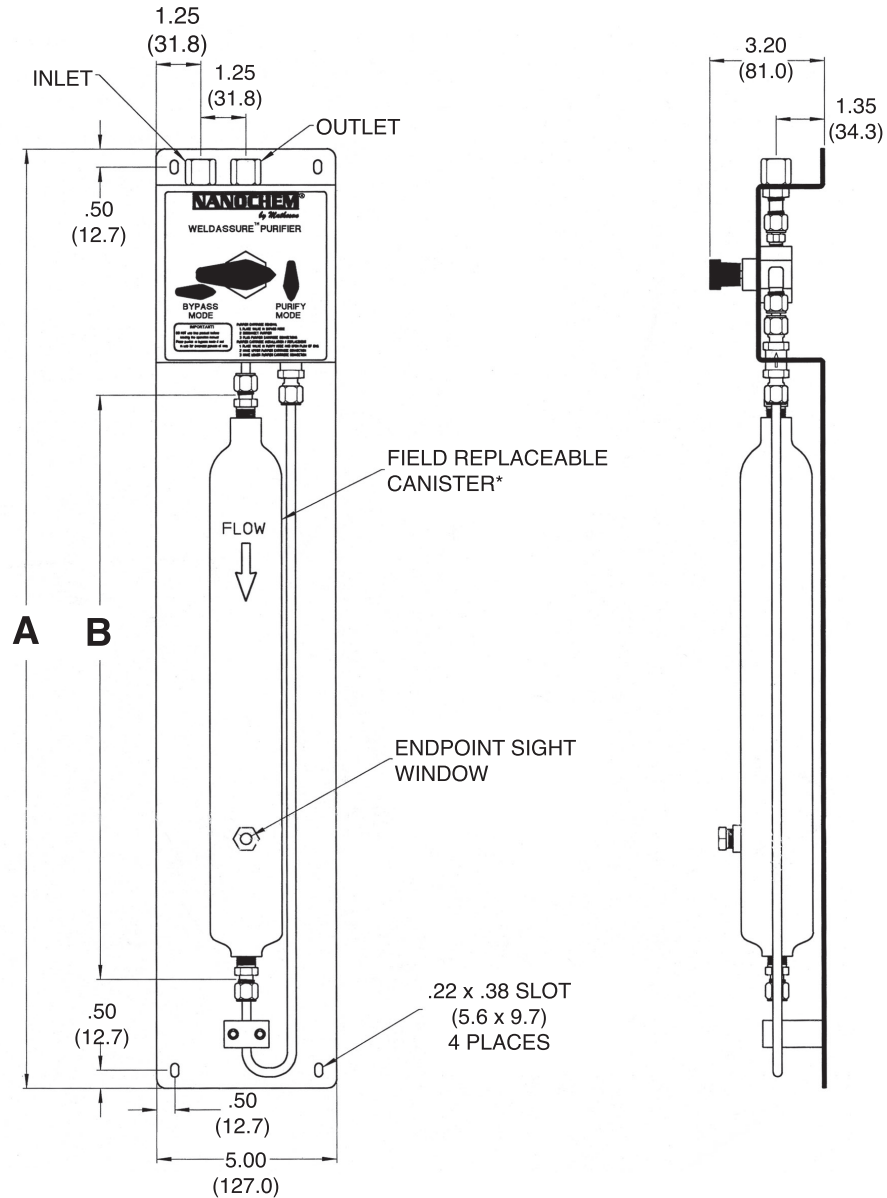
**CAUTION! NANOCHEM® WeldAssure™ purifiers are not for use with Acetylene.**

**DO NOT use NANOCHEM® WeldAssure™ purifiers containing NANOCHEM® OMX™ or In2Go™ media with Ar/CO<sub>2</sub> or Ar/O<sub>2</sub> blends. The Media will get very hot. OMX™ media will break down causing hydrocarbon contamination.**

Ar/CO<sub>2</sub> and Ar/O<sub>2</sub> blends are often used for GMAW (MIG) welding. Benefits include a stable arc, easier arc initiation, reduced arc wandering, and reduced arc spatter. For such applications, MATHESON offers WeldAssure™ purifiers containing NANOCHEM® MigMix media, specifically designed for CO<sub>2</sub> and O<sub>2</sub> blends.

Ar/CO<sub>2</sub> and Ar/O<sub>2</sub> blends, however, can result in deposition of oxides and carbides in the weld. Hence, for very clean GMAW welding, Matheson Tri-Gas recommends use of argon / helium blends. Use of a 75% Ar / 25% He blend and NANOCHEM® OMX™ purification has been demonstrated to provide a very stable arc with greatly reduced weld spatter, fumes, and pyrotechnics. Weld quality of GMAW (MIG) welds with aluminum and Ferralium 255 (a duplex stainless steel) is excellent; porosity is eliminated and weld strength is as good as welds made with the GTAW (TIG) process.

## Dimensions



All dimensions in inches (mm)

**NOTE:** Endpoint Sight Window not available for Ar/O<sub>2</sub> and Ar/CO<sub>2</sub> purifiers



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