NANOCHEM® WeldAssure™ Gas Purifiers

Features and Benefits
- Low cost of ownership
- Wall mount frame – easy to install and operate
- Removes impurities to < 10 ppb (Dew Point = -150ºF)
- Enhances weld quality, strength and appearance
- Reduces weld porosity and oxidation
- **New endpoint detection**
  - No guessing when to replace purifier canister
  - Color change in viewing window indicates 80% of media 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® In2Go™ Inorganic Media**
  - Prevents contamination from system upsets, such as air intrusion or connection of wrong gas cylinder
- **NEW NANOCHEM® Sun Arc® 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: End point detection not available for Ar/O₂ or Ar/CO₂ gas blends.

Specifications
- Flow rates up to 100 cfh (47 slpm / 2.8 NM³/hr)
- Gases Purified (with OMX™ or In2Go™):
  - Argon, helium, nitrogen, hydrogen, inerts and gas blends of these constituents (4N purity or better)
- Impurities removed (with OMX™ or In2Go™):
  - Moisture, oxygen, carbon monoxide, carbon dioxide, nitrogen oxides, sulfur oxides, hydrogen sulfide, others

*NOTE:* OMX™-Plus also removes hydrocarbons. CO is more efficiently removed by In2Go™

- Gases Purified (with Sun Arc® Media):
  - Argon / CO₂, Argon / O₂, Inerts / CO₂ blends
- Impurities removed (with Sun Arc® media):
  - Moisture, hydrocarbons
- Maximum operating temperature – 65ºC (170ºF)
- 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

Connections
- Purifier: Swagelok 1/4” female NPT fittings
- Canister: Swagelok 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™ and In2Go™ 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® Sun Arc® media is specifically designed to purify Ar/O₂, Ar/CO₂, and other O₂ or CO₂ blends. NANOCHEM® Sun Arc® provides customers with the ability to use blended gas without the worry of reducing their tolerances or dilution ratios. Sun Arc® is also better than any media for the removal of Moisture impurities. End point detection is not currently available with Sun Arc® 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 shut downs
- Reliable end point 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 Transfer 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 NANOCH EM® 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 (1/16", EWTh-2) after 30 minutes.

With Purification
Tungsten erosion at electrode tip greatly reduced

Welding of Ferralium 255, GTAW Process

Shielding Gas Purified
With Nanochem® Resin

Nonpurified Shielding Gas

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 Mil lateral expansion and percent ductile shear fracture.

Specifications are subject to change. Please check www.mathesongas.com for most current information.

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Want more information? Visit www.mathesongas.com

NOTE: Endpoint Sight Window not available for Ar/O2 and Ar/CO2 purifiers

<table>
<thead>
<tr>
<th>Purifier Model</th>
<th>Purifier Data</th>
<th>WA-150</th>
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<td>Media bed volume (mL)</td>
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<td>NANOCH EM® Media</td>
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<td>In2 Go</td>
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<td>(NM3 argon)</td>
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<td>(mm)</td>
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<td>660 / 411</td>
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<td>Lifetime (approximate)*</td>
<td>Number of cylinders purified</td>
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<td>63</td>
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*Also available in Stainless Steel, Type 316

*Based upon argon of 99.998% purity ("Pre-purified" grade) containing 3 ppm O2 and 10 ppm H2O.

Cylinder size — ~ 280 ft3 (7.9 NM3) — 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 NANOCH EM® WeldAssure™ purifiers specifically labeled for CO2 or O2 applications can be used for purifying Ar/CO2 and Ar/O2 blends.

DO NOT use NANOCH EM® WeldAssure™ purifiers containing NANOCH EM® OMX® or In2Go® media with Ar/CO2 or Ar/O2 blends. The media will get very hot. OMX® media will break down causing hydrocarbon contamination.

Ar/CO2 and Ar/O2 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 NANOCH EM® Sun Arc® media, specifically designed for CO2, and O2 blends.

Ar/CO2, and Ar/O2 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 NANOCH EM® 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.

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