

NANOCHEM[®]

Weld Knight™ 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**
- **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 the 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[®] Inorganic Media**
 - Prevents contamination from system upsets, such as air intrusion or connection of wrong gas cylinder
- **NANOCHEM[®] 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

Specifications

- Flow rates up to **530 cfh** (250 slpm / 15 NM³/hr)
- Gases Purified (with **OMX™, In2Go™, INX™ and INX-Plus™**):
 - Argon, helium, nitrogen, hydrogen, inerts and gas blends of these constituents (4N purity or better)
- Impurities removed (with **OMX™, In2Go™, INX™ and INX-Plus™**)
 - Moisture, oxygen, carbon monoxide, carbon dioxide, nitrogen oxides, sulfur oxides, hydrogen sulfide, others

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

- Gases Purified (with **MigMix Media**):
 - Argon/CO₂, Argon O₂, Inerts/CO₂ 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 – Stainless Steel, Type 316L
 - Valves & Fittings – Stainless Steel 316L



WK-500-PA

WK-2500-PA

Connections

- Purifier: **1/4" female NPT fittings**
- Canister: **1/4" male face seal fittings**

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.

Overview

NANOCHEM® Weld Knight™ 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.

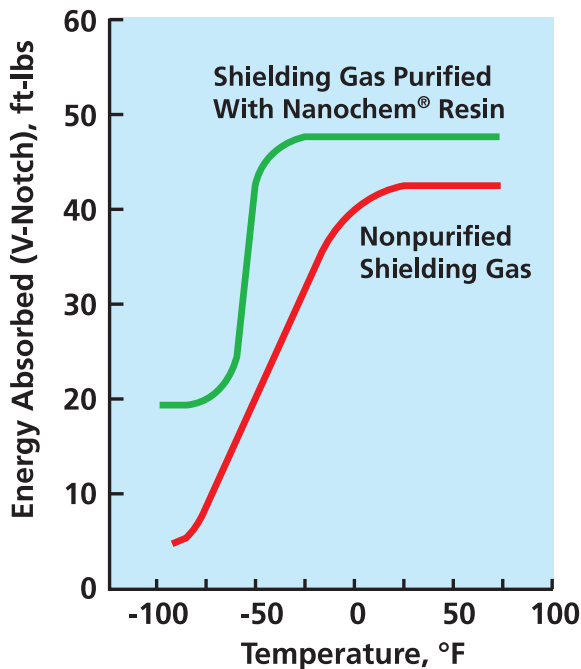
NANOCHEM® OMX™, In2Go™, INX™, and INX-Plus™ media react chemically and irreversibly with these impurities to deliver consistently pure gas to the weld site, improving weld quality. NANOCHEM® OMX™ resin also offers efficient removal of hydrocarbons, such as compressor oils, in the gas. NANOCHEM® In2Go™, INX™, and INX-Plus™ prevent 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/O₂, Ar/CO₂ and other O₂, or CO₂ 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.

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

- Flow Rates up to 530 cfh (250 slpm)
- Easy to use canister bypass mode for canister changes and extended shutdowns
- Field replaceable canisters available
- Canister can be refilled, enabling savings over purchase of spare canisters

Welding of Ferralium 255, GTAW Process



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

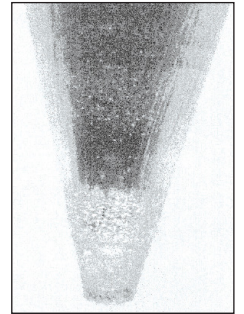


With Purification
No Porosity, Clean X-Rays Good Cleaning Action, Excellent Wetting, Excellent Ductility Very Smooth Surface

Welding of Titanium, PAW Process



Without Purification
Tungsten Deposits on electrode (5/32", EWTh-2)



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.

| Purifier Data | Purifier Model | | |
|--------------------------------------------------------------------|-------------------------------|-----------|------------|
| | WK-500-PA | WK-700-PA | WK-2500-PA |
| NANOCHEM® Media | OMX™, In2Go™, INX™, INX-Plus™ | | |
| NANOCHEM® Media for Ar/CO ₂ or Ar/O ₂ blends | MigMix | | |
| Canister | Stainless Steel 316L | | |
| Valves & Fittings | Stainless Steel 316L | | |
| Maximum Flow (cfh argon) | 106 | 148 | 530 |
| (slpm argon) | 50 | 70 | 250 |
| (NM ₂ argon) | 3 | 4.2 | 15 |
| Lifetime (approximate)# Number of cylinders purified | 105 | 147 | 525 |

#Based up 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 NANOCHEM® Weld Knight™ purifiers specifically labeled for CO₂ or O₂ applications can be used for purifying Ar/CO₂ and Ar/O₂ blends.

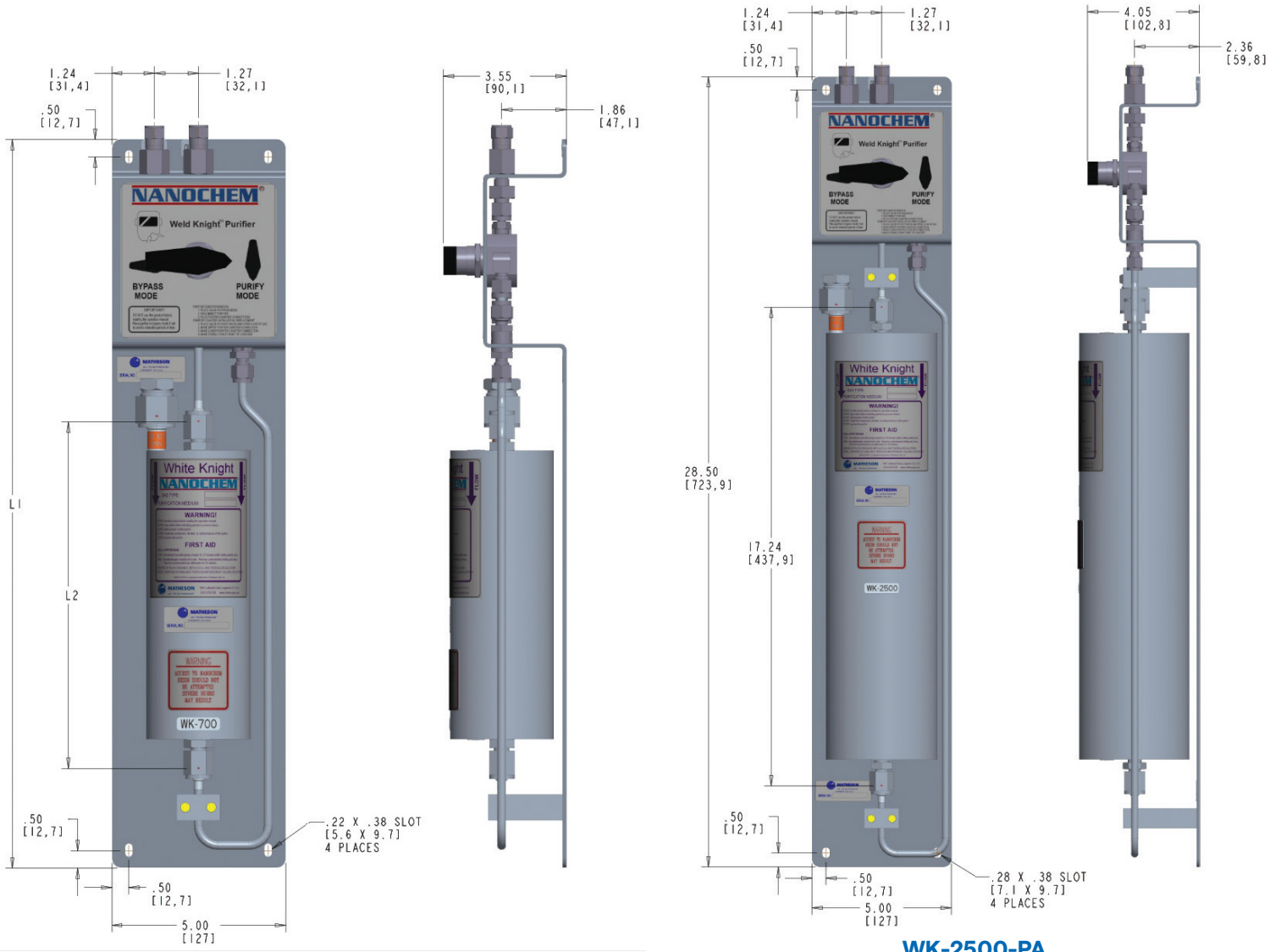
CAUTION! NANOCHEM Weld Knight purifiers are not for use with Acetylene.

DO NOT use NANOCHEM® Weld Knight™ purifiers containing NANOCHEM® 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, Nippon Sanso Matheson offers Weld Knight™ purifiers containing NANOCHEM® MigMix 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, Nippon Sanso Matheson 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



**WK-700-PA (shown)
WK-500-PA**

WK-2500-PA

| | Dimensions | |
|-----------|-----------------|-----------------|
| | L1 | L2 |
| WK-500-PA | 21.0 (533.4) | 7.49 (201.7) |
| WK-700-PA | 21.0 (533.4) | 10.0 (254.0) |

Dimensions in inches (mm)

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