

MATHESON Select® Shielding Gas APN-10 GMAW on Aluminum

Greatly reduced porosity and improved weld penetration

MATHESON Select® APN-10 is an exclusive* shielding gas mixture containing Argon doped with Nitrogen. Compared to 100% Argon, MATHESON Select® APN-10 delivers increased arc energy, reduced porosity, and an overall better weld.

Typical challenges when welding on aluminum

- 100% Argon leaves a clean and attractive surface, but the weld solidifies quickly, trapping porosity in the root
- Finger-style weld penetration can be problematic
- The low arc energy of 100% Argon fails to clean the oxides on the aluminum surface adequately, allowing them to be driven into the weld and cause contamination

Key Benefits of APN-10

- Porosity is greatly reduced - nearly eliminated enabling easier code compliance
- More stable arc with increased energy, but at lower voltages - contributes to weld integrity and better mechanical characteristics
- Improved weld shape and penetration
- Increased travel speed - higher productivity
- Improved performance at lower voltages compared to Ar/He mixtures (smaller heat affected zone)

Other Benefits

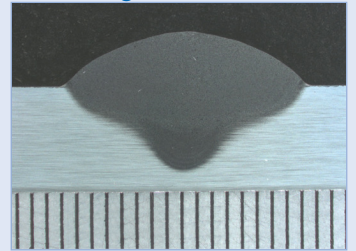
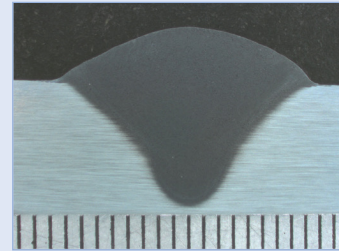
- Excellent arc stability
- Excellent wetting out characteristics
- Wider arc plasma allows larger gap and less demanding fit-up
- Less sensitive to arc voltage disruptions
- Can be applied in fabrication with copper, magnesium, titanium, zirconium, and nickel-steel alloys (ask about application advantages on these materials)

* Patent pending

Normal Spray Arc

MATHESON Select® APN-10

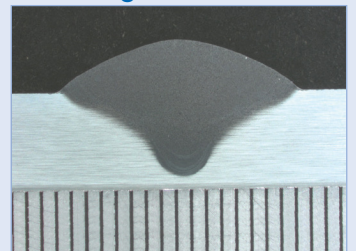
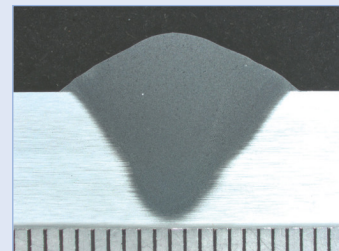
100% Argon



Pulsed Spray Arc

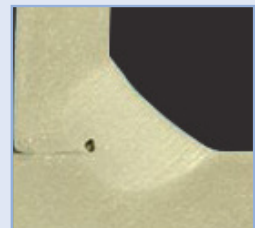
MATHESON Select® APN-10

100% Argon



Weld cross-sections from welds made with MATHESON Select® APN-10 (left) and 100% Argon (right). Normal Spray Arc shown at the top; Pulsed Spray Arc at the bottom. Note the improved penetration and shape of welds made with MATHESON Select® APN-10.

MATHESON Select® APN-10 100% Argon



Fillet welds made using APN-10 (left) versus 100% Argon (right). Weld made using APN-10 shows greater penetration; porosity is evident in the weld made with 100% Argon.

All MATHESON Select® Shielding Gas Mixtures are certified to AWS A5.32 and ISO 14.175 Standards - the best choice for mixture quality, welding efficiency, and to ensure compliance in certified welding operations.



American Welding Society
Sustaining Company Member

Copyright 2026 Nippon Sanso Matheson, Inc. All Rights Reserved. All contents of this document are subject to change without notice and do not represent a commitment on the part of Nippon Sanso Matheson, Inc. Every effort is made to ensure the accuracy of this information. However, due to differences in actual and ongoing operational processes and product improvements and revisions, Nippon Sanso Matheson, Inc. cannot guarantee the accuracy of this material, nor can it accept responsibility for errors or omissions. This document is intended to serve as a general orientation and cannot be relied upon for a specific operation. No warranties of any nature are extended by the information contained in these copyrighted materials

All names, products, and services mentioned herein are the trademarks or registered trademarks of their respective organizations and are the sole property of their respective owners. Nippon Sanso Matheson and the Nippon Sanso Matheson logo are registered trademarks of Nippon Sanso Matheson, Inc.



**NIPPON
SANSO**