

PRAXAIR'S STARGold™ O-1, O-2 AND O-5 – ARGON/OXYGEN BLENDS FOR GMAW (MIG/MAG WELDING)

Praxair's StarGold™ argon/oxygen blends are most widely used with conventional and pulsed spray transfer on clean (little or no scale or residual oil), plain carbon and stainless steels. These blends (typically 1, 2, or 5% oxygen by volume) provide good arc stability and very low levels of spatter. As the oxygen component increases, the minimum spray transition current decreases and the fine droplet spray operating range broadens. Higher oxygen levels also increase weld puddle fluidity (and potentially travel speed) and improve bead wetting characteristics. Very low levels of welding fume are produced with this family of gas blends.

Argon/oxygen blends are not recommended for short-circuiting transfer due to the increased chance of lack-of-fusion defects. Oxygen blends with greater than 5% oxygen exhibit greater tendency toward undercutting, poor bead shape and difficulty in puddle control. Gap-bridging ability is also reduced. Oxide build-up on the bead surface may also be excessive, which can be problematic when the weldment is painted.

The StarGold argon/oxygen blends from Praxair can readily be supplied as pre-mixed liquid in portable containers for reduced gas supply costs.

Product Features

Praxair's StarGold O-1 gas blend is primarily used for conventional and pulsed spray transfer for stainless steel:

- Minimum oxidizing potential.

Praxair's StarGold O-2 gas blend is primarily used for conventional and pulsed spray transfer of carbon and low alloy steels:

- Lower oxidizing potential.
- Specified in some military applications.

Praxair's StarGold O-5 gas blend is primarily used for conventional spray transfer for carbon steels:

- Higher level O₂ addition.
- Improved puddle fluidity limits undercut.

Benefits

- Acceptable spray arc stability.
 - Minimum bead surface discoloration.
 - Good weld chemistry control.
 - Acceptable weld puddle fluidity and bead shape.
 - Low base metal distortion.
-
- Good arc stability and puddle fluidity.
 - Minimum alloy loss; good mechanical properties.
 - Lowest level of welding fume.
 - May be used to weld both plain carbon and stainless steels.
-
- Very good arc stability; low fume levels.
 - More fluid, but controllable weld puddle.
 - Faster travel speeds possible in some applications.
 - Can be used with metal-cored wires.

Typical Applications

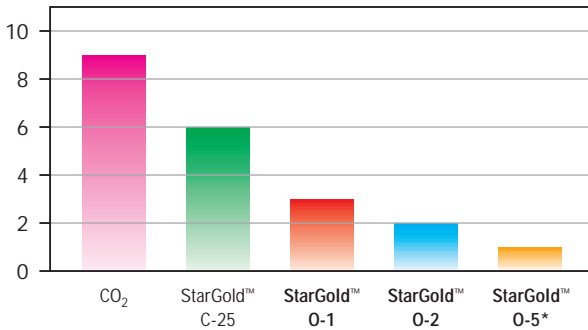
- Praxair's StarGold O-1 gas blend – for pulsed and conventional spray welding of heavy section stainless steel.
- Praxair's StarGold O-2 and O-5 gas blends – for spray arc welding of heavy section carbon steels for farm equipment and military transports such as armored tanks and ships.

Performance Characteristics

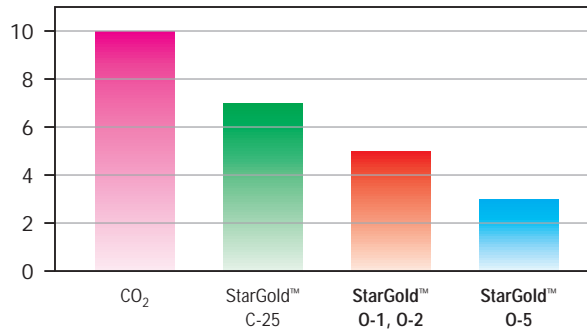
Illustrated below are comparisons between shielding gas blends used with ER70S-3 and ER70S-6 solid wire electrodes over a range of current levels.

They are intended to provide suggestions for gas blend selection based on the criteria indicated.

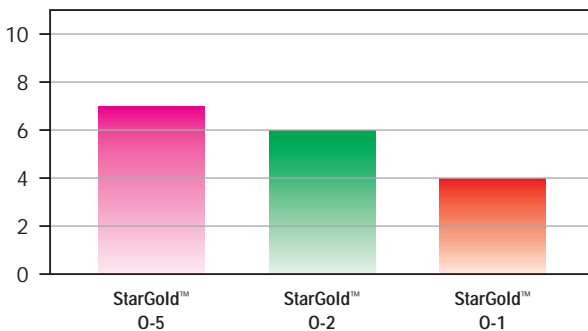
Spatter (10 = most, 1 = least) * Spray arc transfer



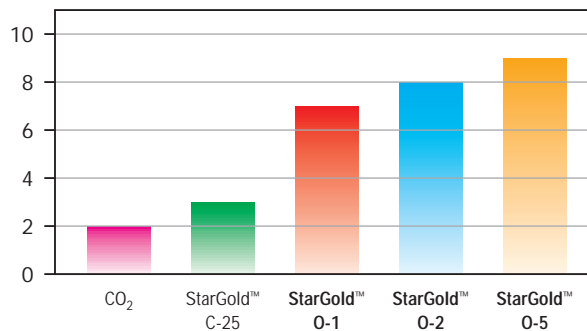
Fume (10 = most, 1 = least)



SS Surface Discoloration (10 = most, 1 = least)



Puddle Fluidity (10 = most, 1 = least)



Note: The selection of the appropriate shielding gas can become quite complex due to the large variety of operating conditions (base metal, chemistry and thickness, metal transfer, wire

selection, welding position, etc). Please consult with your Praxair representative for the best option available for your application.

Welding Conditions Selection Table

Wire diameter (inches)	Wire feed speed (ipm)	Current level (amps)	Voltage (volts)**
0.035 (0.9 mm)	350-500	190-240 (spray)	26-27
0.035 (0.9 mm)	275-400	100-150 (pulsed)	17-21 (average)
0.045 (1.2 mm)	300-475	260-340 (spray)	28-31
0.045 (1.2 mm)	200-250	175-200 (pulsed)	19-23 (average)
0.063 (1.6 mm)	185-245	310-370 (spray)	28-31

** Voltage level for 60 Hz power supply. With 50 Hz, add 3 volts.



Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113
Tel: 1-800-PRAXAIR
Fax: 1-800-772-9985
Internet: www.praxair.com
e-mail: info@praxair.com

The information contained herein is offered for use by technically qualified personnel at their discretion and risk, without warranty of any kind. PRAXAIR, the FLOWING AIRSTREAM design, MAKING OUR PLANET MORE PRODUCTIVE and STARGOLD are trademarks, service marks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

Copyright © 1999 Praxair Technology, Inc. All Rights Reserved.
P-8351 5M 6/99