Praxair's StarGold™ O-1 – Argon / Oxygen Blend;
Praxair's StarGold™ C-2 and C-5 – Argon / Carbon Dioxide Blends;
Praxair's HeliStar™ SS and A-1025 – Argon / Helium / Carbon Dioxide Blends;
For all forms of GMAW (MIG / MAG Welding) of Stainless Steel

The best shielding gas blend for welding stainless steel frequently depends upon the desired bead shape, color and chemistry, and on the type of metal transfer used. Two part blends, either argon/oxygen or argon/carbon dioxide, provide good performance and reduced shielding gas costs. Three part blends containing helium, while more expensive to purchase, provide cost savings through increased productivity (higher speeds) and optimum bead characteristics.

Praxair's StarGold™ O-1 gas blend is primarily used for pulsed and spray metal transfer where a slightly oxidized weld bead surface is acceptable. Oxygen stabilizes the arc and improves metal transfer without a significant change in bead appearance.

Praxair's StarGold C-2 to C-5 argon/oxygen blends can be used for pulsed, short circuit and conventional spray welding where good bead appearance is desired and a slight increase in weld carbon content is acceptable. These blends are best matched with a low carbon filler wire. Inductance, steep slope and high silicon wire are recommended when using short-circuiting transfer.

The HeliStar™ SS gas blend from Praxair is used for all forms of metal transfer. It provides higher welding speeds, reduces distortion and provides a flat, broad weld bead with good color match. Excellent alloy retention for good corrosion resistance is also achieved. Optimum performance is obtained with high silicon wires.

Praxair's HeliStar A-1025 gas blend is widely used for the ultimate in short-circuiting performance. The balanced CO_2 addition minimizes carbon pick-up assuring good corrosion resistance. The high helium content produces increased puddle fluidity for good bead shape and faster travel speeds; weld penetration is also increased.

Product Features	Benefits
Praxair's StarGold O-1 Ar/O_2 blend: • Minimum oxidizing potential.	• Better color match than higher oxygen blends. • Good arc stability in spray and pulsed spray.
Praxair's StarGold C-2 to C-5 Ar/CO_2 blends: • Controlled CO_2 addition.	• Improved puddle fluidity for spray transfer. • Good bead shape/good weld chemistry control.
Praxair's HeliStar SS gas blend: • Balanced argon/helium blend. • Low oxidizing potential.	• Most versatile blend. • Improved productivity; excellent color match; improved corrosion resistance. • Short pulsed and spray arc transfer.
Praxair's HeliStar A-1025 gas blend: • High helium content. • Controlled CO_2 addition.	• Optimized for short circuit transfer/ low spatter/good bead profile. • Better puddle control/reduced distortion.

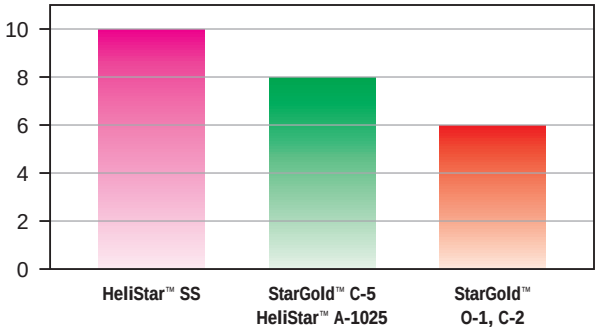
Typical Applications

- Praxair's StarGold O-1 Ar/O_2 blend – for spray welding thick sections of stainless steel.
- Praxair's StarGold C-2 and C-5 Ar/CO_2 blends – for pulsed and spray welding of stainless steel food equipment.
- Praxair's HeliStar SS gas blend – for fabricating stainless steel tanks and components for the chemical industry.
- Praxair's HeliStarA-1025 gas blend – for short arc welding thin stainless steel used in railcar siding and conveyor systems.

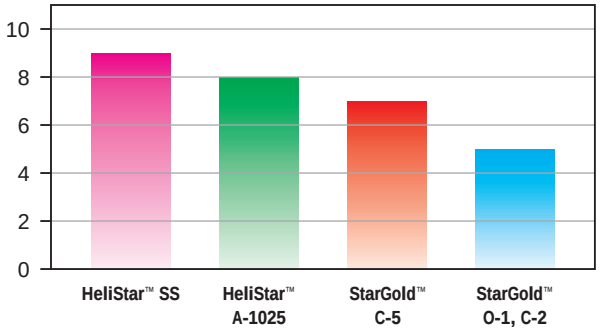
Performance Characteristics

Illustrated below are comparisons between shielding gas blends used with the MIG process and 308L filler wire, over a range of operating conditions. They should be used to aid in shielding gas selection for a specific application.

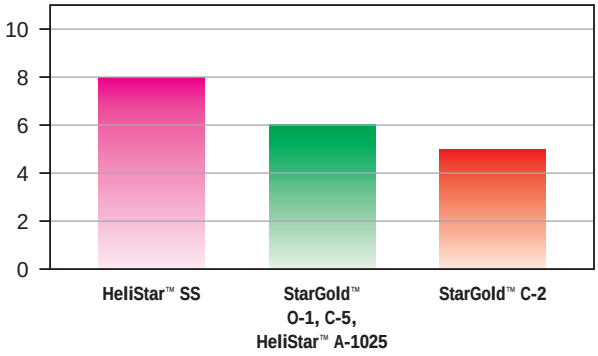
Puddle Fluidity (10 = most, 1 = least)



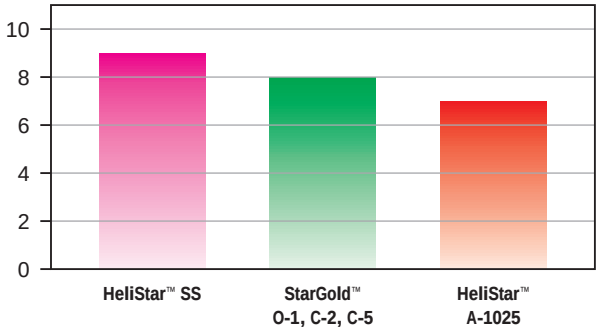
Distortion Control (10 = greatest, 1 = least)



Bead Color (1 = most oxidized, 10 = least oxidized)



Bead Shape (10 = best, 1 = poor)



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 (1.0 mm)	250-290	130-160 (short arc)	23-25
0.035 (1.0 mm)	350-500	190-240 (spray)	26-28
0.035 (1.0 mm)	200-250	90-110 (pulsed)	18-20
0.045 (1.2 mm)	250-300	225-250 (spray)	28-30
0.045 (1.2 mm)	350-500	175-225 (pulsed)	22-25

** Voltage level for 60 Hz power supply. With 50 Hz, add 3 volts. Lower voltage for Ar based blends.

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