

Praxair's StarGold™ C-20 and C-25 – ARGON/CARBON DIOXIDE BLENDS FOR SHORT-CIRCUITING GMAW (MIG/MAG WELDING) AND FCAW (FLUX-CORED WIRE WELDING)

Praxair's argon/carbon dioxide blends containing 20-25% CO₂ by volume (StarGold™ C-20 and C-25), are commonly used for shielding solid wire used in a short-circuiting and globular transfer mode. A variety of material types and thicknesses can be joined using this gas blend in all welding positions. These argon/CO₂ mixtures are formulated to provide enhanced arc stability in short-circuiting transfer by reducing spatter levels when using .030, .035 and .045 in (0.8, 1.0 and 1.2 mm) diameter wires. Weld appearance is good and fume is minimized.

Argon/25-50% CO₂ blends are also used to provide all-position welding capability with small diameter flux-cored wires. Excellent arc stability, good weld puddle control, and low spatter and fume levels are achieved with these blends. Higher levels of CO₂ provide increased weld penetration and a broader bead profile with only a slight decrease in other performance characteristics. These mixtures are also frequently used with stainless steel flux-cored wires.

Product Features	Benefits
<ul style="list-style-type: none"> • Excellent arc stability, smooth metal transfer. 	<ul style="list-style-type: none"> • Good operator appeal; minimum spatter loss with higher deposition efficiency vs. CO₂.
<ul style="list-style-type: none"> • Good high-speed welding capability on gauge material. 	<ul style="list-style-type: none"> • Higher productivity and lower weldment cost. • Improved torch cooling using gas-cooled welding guns when compared with high argon blends.
<ul style="list-style-type: none"> • Controlled weld penetration. 	<ul style="list-style-type: none"> • Less tendency to burn-through on gauge materials when compared with CO₂. • Maximum versatility for all position welding.
<ul style="list-style-type: none"> • Good performance on coated steels. 	<ul style="list-style-type: none"> • Reduced porosity, improved bead appearance on galvanized and aluminized steels (ER70S-3 wire recommended).
<ul style="list-style-type: none"> • Excellent operability with small diameter cored wires; optimum performance characteristics. 	<ul style="list-style-type: none"> • Minimum spatter and better bead shape control vs. CO₂. • Higher speeds possible in out-of-position welding due to less fluid puddle. • Lower welding fume when compared with CO₂.

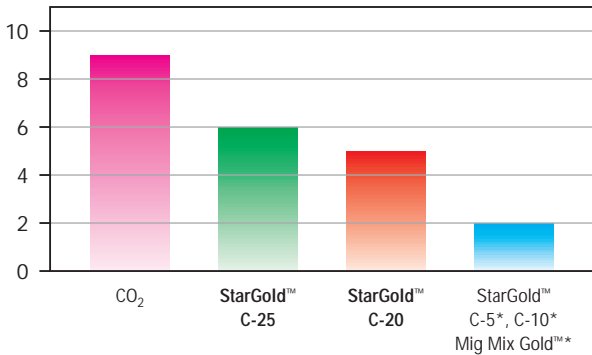
Typical Applications	
<ul style="list-style-type: none"> • All-position root pass welding of large diameter pipe. • Circumferential seam welding of light carbon steel tanks using shorting/globular transfer. 	<ul style="list-style-type: none"> • All-position flux-cored wires for ships, railcars, construction equipment. • High quality light gauge welds in furniture. • Suitable for use over mild base metal contamination (oil, light rust).

Performance Characteristics

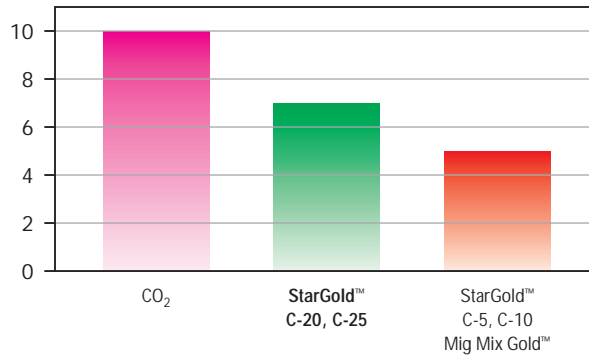
Illustrated below are comparisons between shielding gas blends used with ER70S-3 and ER70S-6 solid wire electrodes over a range of current levels.

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

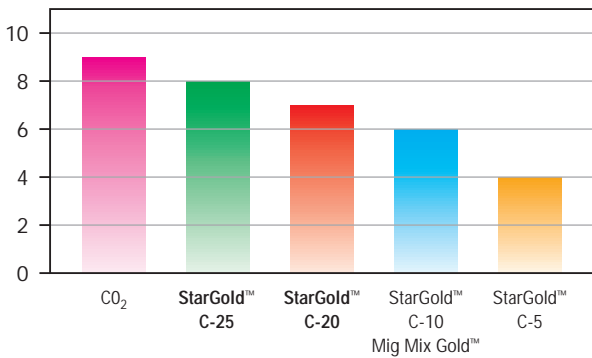
Spatter (10 = most, 1 = least) * Spray arc transfer



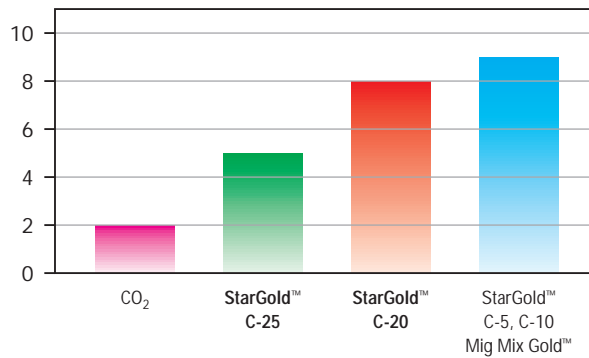
Fume (10 = most, 1 = least)



Penetration (10 = most, 1 = least)



Travel Speed (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)*
0.030 (0.8 mm)	250-400	90-140 (short arc)	15-18
0.035 (1.2 mm)	200-275	120-155 (short arc)	17-19
0.045 (1.2 mm)	150-230	165-215 (short arc)	18-20
0.045 (1.2 mm) flux-cored	250-425	160-250 (globular)	24-28
0.063 (1.6 mm) flux-cored	175-350	180-300 (globular)	25-29

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



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