

## PRAXAIR'S STARGold™ C-10 AND C-20 – ARGON/CARBON DIOXIDE BLENDS FOR CONVENTIONAL SPRAY GMAW (MIG/MAG WELDING)

Praxair's argon mixtures containing more than 10% but less than 20% CO<sub>2</sub> by volume (StarGold™ C-10 and C-20), can be used with a variety of wire types when joining carbon and low alloy steels. Within this range of these blends, it is still possible to obtain a fine droplet spray transfer with minimum spatter and high deposition rates while using slightly higher voltage levels. These blends work well for joining sheet metal as well as thicker plate. Increasing the CO<sub>2</sub> content increases penetration and generally produces greater travel speeds. For thinner material, it is important to balance increased penetration against the potential for possible burnthrough. Increasing the CO<sub>2</sub> content of the blend generally results in a more

convex weld bead and greater surface oxide, but wetting of the weld metal is enhanced. Slightly above 20% CO<sub>2</sub> conventional spray transfer can not be readily achieved, causing increased spatter while improving sidewall fusion.

Praxair's StarGold™ C-10 and C-20 gas blends can be used with solid, some specially formulated flux-cored and most metal-cored wires. If flux-cored wire is selected, care must be taken in the choice of the wire and gas blend combination, to ensure compatibility and optimum weld performance and properties. Refer to manufacturer's literature for shielding gas and filler metal combination.

### Product Features

- Optimized CO<sub>2</sub> content for wire type and application.

- Can be used in short, spray, pulsed-spray and globular transfer with either solid, metal-cored or flux-cored wires.
- Can be used with specially formulated flux-cored wires.

- Large operating range for many applications.
- Ideal for bulk supply.

### Benefits

- Best arc performance over some minor surface scale and oil.
- Minimum spatter levels.
- Higher potential travel speeds.
- Improved penetration/fewer weld defects.

- Maximum process selection flexibility for improved productivity.
- Lower welding fume levels compared with standard CO<sub>2</sub>-shielded cored wires; higher deposition efficiency.

- Can optimize process for application.
- Reliable, low cost supply.
- Reduced gas costs when supplied as liquid.

### Typical Applications

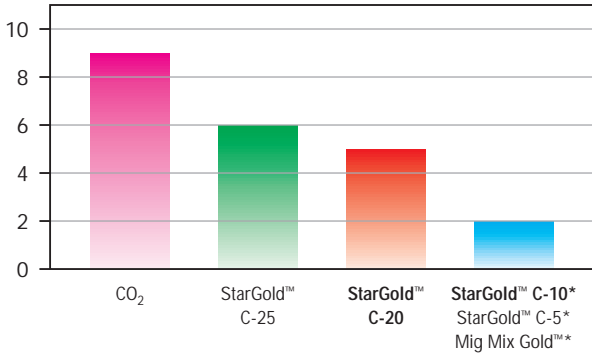
- Storage racks for automotive industry.
- Railcar center sills and side panels (metal and flux-cored wires).
- Backhoes and front-end loaders.
- Wheel rims for cars and trucks.
- Motorcycle and truck frame fabrication; engine cradles.
- Farm implements.

## Performance Characteristics

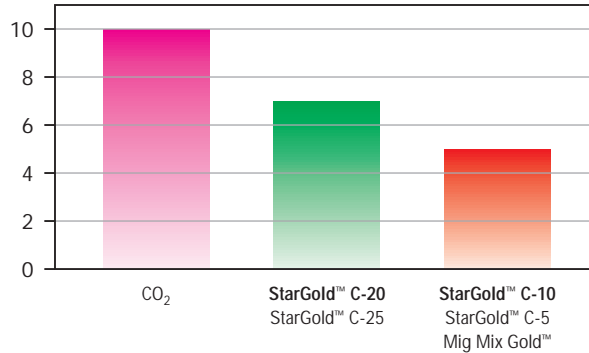
Illustrated below are comparisons between shielding gas blends used with ER70S-3 and ER70S-6 solid wire electrodes over a range of current levels.

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

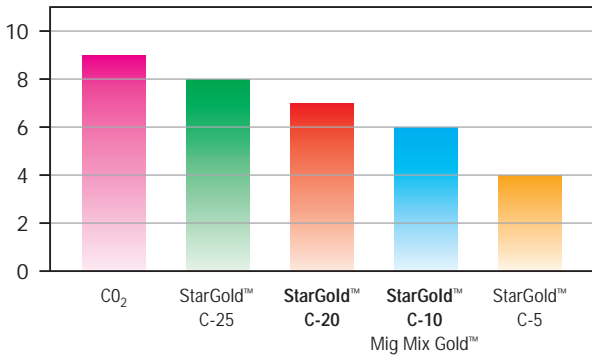
**Spatter** (10 = most, 1 = least) \* Spray arc transfer



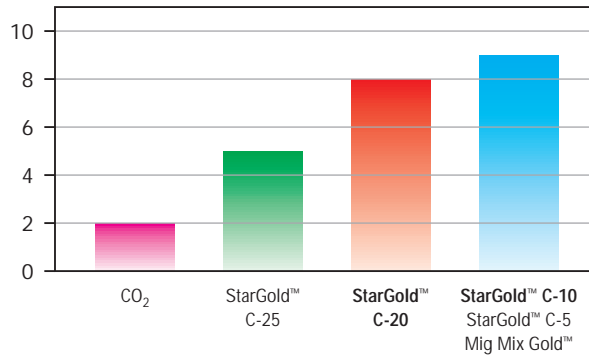
**Fume** (10 = most, 1 = least)



**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)*
0.035 (0.9 mm)	150-280	100-175 (short arc)	17-21
0.035 (0.9 mm)	350-550	180-230 (spray)	27-29
0.045 (1.2 mm)	150-280	100-175 (short arc)	17-21
0.045 (1.2 mm)	300-500	250-310 (spray)	28-31
0.063 (1.6 mm) metal-cored	150-300	250-400 (spray)	30-33

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



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