



PRAXAIR® STAR™ GASES:
A UNIVERSE OF
SHIELDING GASES



Key Reasons To Choose Praxair *Star*[™] Shielding Gases

Some look to us for our quality, dependability and consistency. Others for our service and technology. All these are important reasons why metal fabricators around the world rely on Praxair *Star*[™] gases and blends.

They know that the quality of their finished products depends upon the quality of the shielding gases used. And the name they trust most is Praxair, a technology leader in shielding gas applications.

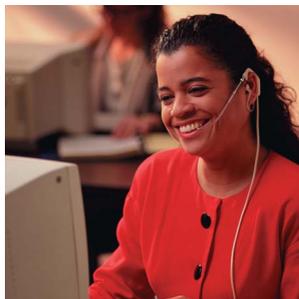
Quality

Gas purity is essential to high quality, and Praxair *Star* pure gases and blends surpass all industry standards. To accomplish this, Praxair operates ISO-certified production facilities, which can deliver the supplies you need, from small high-pressure cylinders to large liquid bulk tanks.

Consistency

Consistent product quality around the world. That's a Praxair trademark. It's a result of ongoing evaluation and re-evaluation of our production and delivery systems — in real-world situations.

Our production and cylinder-filling technology have been shown to consistently produce the highest mixture integrity. Praxair's patented *Starblend*[™] mixing system utilizes a patented eductor tube designed to produce consistent



argon/carbon dioxide blends. This allows you to operate with the highest level of confidence.

Dependability

Why does Praxair continue to be the industrial gases industry resource of choice? Because of Praxair's vast distribution network that includes over 600 locations and our versatile supply systems — from cylinder to bulk — your shielding gases are delivered cost-effectively, no matter what the demands are for your specific application.

Technology

Ours is a history of leading shielding gases technology and innovation. It results from our worldwide R&D efforts, which focus on application-based solutions for all your arc plasma, laser welding and cutting needs.

Technical Support

Our commitment to customer service is unquestioned. You see it in the rapid response of our technical support teams, our local sales representatives, and our shielding gases engineers. In short, it's the cornerstone of all we do.

To support our efforts, we use tools such as Praxair's *StarSolver*[®] Productivity Enhancement Program. With this advanced software tool, we can help you achieve:

- Increased productivity
- Lower fume levels
- Improved product quality
- Optimized gas utilization
- Reduced rework

You'll also realize:

- Lower bottom-line costs
- Better working environment
- Improved market competitiveness

Often these improvements can be made with little or no capital investment. You save time and money, enhance productivity and improve quality — cost-effectively.



Praxair Star™ Gases And Blends

Pure

Argon	Nitrogen
Carbon Dioxide	Hydrogen
Helium	Oxygen

2-Part Blends

Praxair's *StarGold™* C-2, C-5 and C-8
Praxair's *StarGold* C-10, C-15, C-20, C-25,
C-40 and C-50
Praxair's *StarGold* O-1, O-2 and O-5

Praxair's *Mig Mix Gold™*

Praxair's *HeliStar®* A-25

Praxair's *HeliStar* A-75

Praxair's *HydroStar®* H-2

Praxair's *HydroStar* H-5, H-10, H-15 and H-35

Praxair's *RoboStar™* AL

Praxair's *LaserStar™* Blends

3-Part Blends

Praxair's *HeliStar®* CS
Praxair's *HeliStar* GV
Praxair's *HeliStar* SS
Praxair's *HeliStar* A-1025

Praxair's *Stargon®*

Praxair's *Stargon* SS

Praxair's *RoboStar™* CS

Praxair's *RoboStar* SS

Praxair's *LaserStar™* Blends

One Source For All Your Needs

One source, for all your metal joining and shielding gases needs, committed to helping you increase your output and improve your bottom line. That's Praxair.

One phone call. 1-800-PRAXAIR. Call today. The solutions start here.

Rely On Our Family: Praxair Star™ Gases And Blends

More than just the most advanced shielding gases available, Praxair Star™ gases and blends are ideally suited to the most challenging Gas Metal Arc Welding (GMAW or MIG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW) Robotic and Laser applications, including:

- Praxair's StarGold™ Gases — Argon-based blends for general fabrication of mild steel.
- Praxair Stargon® CS and SS Blends — The standard for versatile high-speed welding of mild steel (CS) and stainless steel (CS).
- Praxair's Mig Mix Gold™ Blend — High-productivity mild steel welding.
- Praxair's HeliStar® Blends — Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper and some carbon steel welding applications.
- Praxair's HydroStar® Blends — Hydrogen-enhanced blends for increased productivity during GTAW, plasma welding, gouging and cutting of stainless steel.
- Praxair's RoboStar™ CS, AL and SS Blends — Shielding gas blends for robotic welding of carbon steel (CS), aluminum (AL) and stainless steel (SS).
- Praxair's LaserStar™ Gases and Blends — Enhanced quality and purity to meet demanding laser

The Praxair Difference

■ Comprehensive, High-Quality Product Line

A full range of pure gases and mixtures, welding and cutting machines, filler metals, gas apparatus, hand and power tools and safety equipment.

■ Application-Based Solutions with Praxair's StarSolver® Productivity Enhancement Program

Praxair's team integrates research, development and testing with Praxair's StarSolver® Productivity Enhancement Program. That translates into increased productivity, improved product quality, and lower overall cost for our customers.

■ Praxair's StarDirect™ World Class Distribution System

- With over 500,000 square feet of warehouse space in strategically located distribution centers, Praxair's StarDirect™ Distribution System is uniquely equipped to offer outstanding customer service.
- Over 30,000 items stocked at all times, from more than 200 of the best manufacturers.
- Instant, Accurate Order Processing and Tracking
- Automated Warehousing Management Systems
- Extended Hours of Operation

■ Praxair's Exclusive ProStar® Brand – The Metal Fabricator's Choice For High-Quality, Premium Products

Choose from a wide range of products from the industry's top manufacturers, including filler metals, gas apparatus, safety equipment and welding accessories and consumables.

■ Praxair's Express™ Extranet – Your Online Window Business Opportunity

Designed to make your business more productive, Praxair's Express™ Extranet is the perfect online business tool for keeping pace with today's demanding marketplace.

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The Key To Increased Welding Productivity And Profits

Looking for the key to consistent welds under the most challenging situations? Look to Praxair® StarGold™ argon-based shielding gases. Our argon-based family of blends is available for top-quality welding in a variety of precision formulations. Praxair StarGold blends are also designed to meet your specific Gas Metal Arc Welding (GMAW or MIG/MAG) application requirements.

Top Quality And Consistency

Every Praxair StarGold shielding gas blend you order is mixed consistently at every level. Praxair's patented Starblend™ mixing system technology is specially designed for maintaining mixture integrity with argon-based blends containing carbon dioxide. Complete evacuation and purging of empty cylinders is required before filling using our patented eductor tube blending system. There's no residual gas waste from stratification so you can use all the gas you've ordered every time — while also reducing your costs.

Who Benefits From Praxair StarGold Argon-Based Blends?

Anyone who welds carbon and low alloy steel...manufacturers of:

- Steel structures
- Automotive OEM and repair
- Poles, rebar and frames
- Motorcycles



PRAXAIR® STARGOLD™ GASES: ARGON-BASED BLENDS FOR GENERAL FABRICATION OF MILD STEEL



- Ships
- Trailers, tractors, plows, farm equipment and implements
- Pressure vessels
- Transformers
- Lawn mowers and garden equipment
- Air conditioners
- Office furniture
- Steel girders and beams
- Related sheet metal products

What Do They Say About Praxair StarGold Shielding Gases?

Users of Praxair StarGold blends report reduced spatter with little or no residual slag, so there's little or no post-weld cleanup. This allows welders to spend more time welding, for greater productivity. Praxair StarGold blends also improve your operation by producing less overwelding, reduced grinding, less fume and faster travel speeds. You get better weld bead shape and excellent weld metal mechanical properties.

StarGold

More Than A Gas Blend

When you select the Praxair StarGold blend that's right for your application, you also select consistent, dependable Praxair service and technical expertise. Nearly a century of experience helps make Praxair the leader in shielding gases technology. Let us help you solve your most challenging welding problems while improving your welding performance, productivity and profits. You can rely on Praxair.

The Praxair Difference

■ Comprehensive, High-Quality Product Line

A full range of pure gases, mixtures, gas handling equipment, supply systems and related products and services.

■ Application-Based Solutions

Sales, production and research capabilities to supply you with the technical solution that best suits your needs around the world.

■ Reliable Production And Distribution Network

Production plants and more than 600 distribution locations in North America — all serving you with the gases you need, when and where you need them.

■ Outstanding Technical Support

A highly trained team of field sales representatives, shielding gases engineers and technical service personnel work in concert with dedicated market specialists to quickly provide the guidance and cost-effective solutions you deserve.

■ Global Supplier

Production, distribution and application technology in over 40 countries.

Praxair StarGold Family Of Argon-Based Blends

- Argon/Oxygen
 - Praxair StarGold O-1, O-2, O-5
- Argon/Carbon Dioxide
 - Praxair StarGold C-5, C-10, C-15, C-20, C-25, C-40, C-50
 - Praxair Mig Mix Gold Blend
- Argon/Carbon Dioxide/Oxygen
 - Praxair Stargon Blend

All In The Family: Praxair Star™ Gases And Blends

Praxair Star™ gases and blends are unsurpassed. These shielding gases are ideal for Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW) and Laser applications, including:

- Praxair StarGold™ Gases — Argon-based blends for general fabrication of mild steel.
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- Praxair Mig Mix Gold™ Blend — High-productivity mild steel welding.
- Praxair HeliStar™ Gases — Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper and some carbon steel welding applications.
- Praxair HydroStar™ Gases — Hydrogen-enhanced blends for increased productivity during GTAW, plasma welding, gouging and cutting of stainless steel.
- Praxair LaserStar™ Gases — Enhanced quality and purity to meet demanding laser needs.

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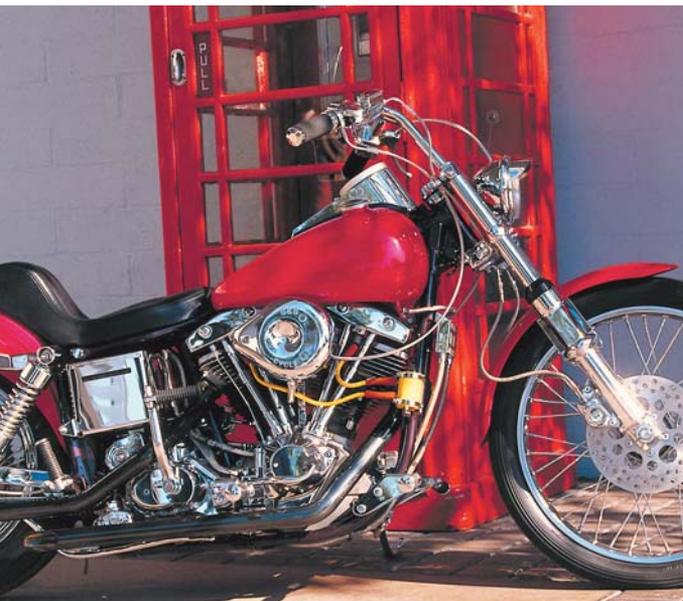


Improved Welding Performance Is Just The Beginning

High-quality welds, under the most unyielding circumstances...Praxair® Stargon™ blend delivers this and more. Praxair Stargon's precise formulation for top-quality welding is designed to meet the demands of your specific Gas Metal Arc Welding (GMAW or MIG/MAG) application. It's especially beneficial for customers who use a number of (GMAW) process variations since Praxair Stargon blend can be used for short circuiting, globular, spray or pulsed arc transfer.

Quality And Consistency You Can Rely On

Praxair's argon-based Stargon blend offers consistency from start to finish. Praxair's patented Starblend™ mixing system is designed for mixing argon-based blends containing carbon dioxide. Complete evacuation and purging of empty cylinders is required before filling using our patented eductor tube blending system. It gives you a consistent composition of gases at every pressure. So, you can use all the gas you've received, eliminate residual gas waste due to stratification and save money.



PRAXAIR® STARGON™ BLEND: THE STANDARD FOR HIGH-SPEED WELDING OF MILD STEEL



Who Benefits From Praxair Stargon Blend?

Anyone who welds carbon and low alloy steel...manufacturers of:

- Steel structures
- Automotive OEM and repair
- Poles, rebar and frames
- Motorcycles
- Ships
- Trailers, tractors, plows, farm equipment and implements
- Pressure vessels
- Transformers
- Lawn mowers and garden equipment
- Air conditioners
- Office furniture
- Steel girders and beams
- Related sheet metal products

Stargon



Making our planet more productive™

What Do They Say About Praxair Stargon Blend?

Stargon blend users report:

- Reduced spatter, less fume and no residual slag
- Increased welder productivity
- Less overwelding and faster travel speeds
- Better weld metal bead shape
- Excellent weld mechanical properties

A Gas Blend To Build On

When you choose Praxair Stargon blend, you also receive consistent, dependable Praxair service and technical expertise. All backed by nearly 100 years of experience. Praxair, the leader in shielding gases technology, can help you solve your most challenging welding problems, improve your welding performance, productivity and profits.

The Praxair Difference

- **Comprehensive, High-Quality Product Line**
A full range of pure gases, mixtures, gas handling equipment, supply systems and related products and services.
- **Application-Based Solutions**
Sales, production and research capabilities to supply you with the technical solution that best suits your needs around the world.
- **Reliable Production And Distribution Network**
Production plants and more than 600 distribution locations in North America — all serving you with the gases you need, when and where you need them.
- **Outstanding Technical Support**
A highly trained team of field sales representatives, shielding gases engineers and technical service personnel work in concert with dedicated market specialists to quickly provide the guidance and cost-effective solutions you deserve.
- **Global Supplier**
Production, distribution and application technology in over 40 countries.

Choose From The Praxair Star™ Gases And Blends

Rely on the most advanced shielding gases available — Praxair Star gases and blends. They are ideally suited to the most challenging Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW) and Laser applications.

- Praxair StarGold™ Gases — Argon-based blends for general fabrication of mild steel.
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- Praxair Mig Mix Gold™ Blend — High-productivity mild steel welding.
- Praxair HeliStar™ Gases — Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper and some carbon steel welding applications.
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PRAXAIR'S STARGON® SS – ARGON/CARBON DIOXIDE/NITROGEN BLEND FOR ALL FORMS OF GAS METAL ARC WELDING (GMAW OR MIG/MAG) OF STAINLESS STEEL

Praxair's *Stargon*® SS gas blend is a carefully controlled blend of argon, carbon dioxide and nitrogen that is designed for joining a wide variety of stainless steels. It is well-suited for all-position welding as it can be used with all types of metal transfer (i.e. short-circuiting, pulsed, and conventional spray). It produces excellent quality welds when joining light gauge material with short-circuiting transfer and offers cost savings when compared with the high-helium content gases currently used today.

With its controlled CO₂ content, the *Stargon* SS blend can be utilized in most austenitic stainless steel applications, particularly where weld metal carbon control is required. The addition of nitrogen to the *Stargon* SS blend enhances arc performance by increasing its stability, improves weld penetration, and reduces distortion in the welded part. It also assists in maintaining weld metal nitrogen levels for materials such as duplex stainless steels where such chemistry control is critical to maintaining microstructural integrity and increased corrosion resistance.

Product Features

- Nitrogen-enhanced shielding gas blend.
- Low oxidizing potential.
- Very good performance over a wide range of welding parameters.

Benefits

- Very good arc stability
- Good weld penetration and surface appearance.
- Excellent chemistry control for good corrosion resistance.
- Reduced base metal distortion
- Controlled CO₂ level for reduced weld carbon content resulting in improved corrosion properties; low levels of welding fume.
- Improved color match
- Very good short-circuiting performance – good bead shape with minimal spatter.
- Very good performance in pulsed spray – good bead shape and optimized travel speed.

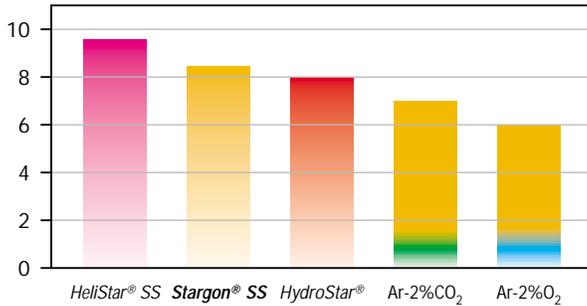
Typical Applications

- Pulsed and spray welding of dump truck bodies – excellent appearance, minimum spatter, little post-weld clean-up.
- Joining thin gauge stainless in the food service industry where bead shape is important.
- Duplex stainless steel pipe and other pipe alloys commonly used in the chemicals industry.
- Architectural applications where minimal distortion and appearance are of concern.
- Thin gauge applications where low base material distortion is required.

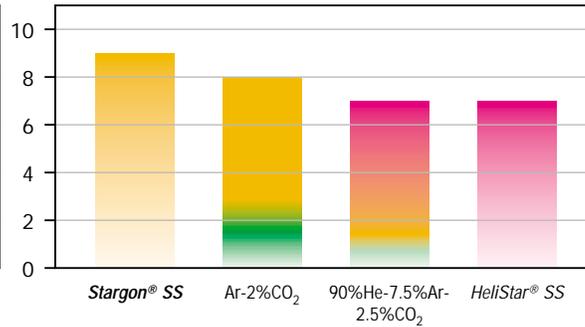
Performance Characteristics

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

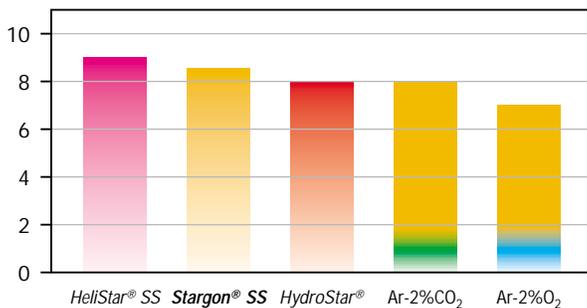
Travel Speed – Pulsed Spray (10 = most, 1 = least)



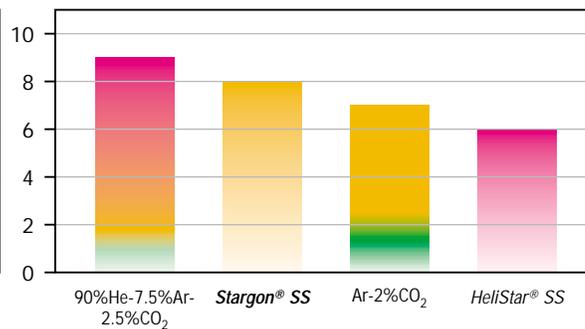
Travel Speed – Short Arc (10 = most, 1 = least)



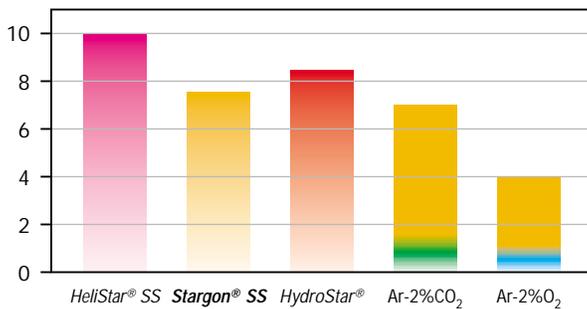
Bead Shape – Pulsed Spray (10 = most, 1 = least)



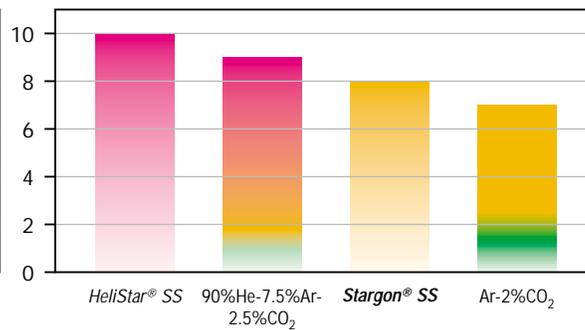
Bead Shape – Short Arc (10 = most, 1 = least)



Bead Color – Pulsed Spray (10 = most, 1 = least)



Bead Color – Short Arc (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 – thickness and type, metal transfer, wire selection, welding position, etc). Please consult your Praxair representative for the best options 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)	275-375	115-145 (short arc)	18-20
0.035 (1.0 mm)	250-350	90-120 (pulsed spray)	20-22
0.045 (1.2 mm)	200-275	150-195 (short arc)	19-21
0.045 (1.2 mm)	200-275	150-195 (pulsed spray)	21-23

*Voltage level for 60 Hz power supply. Add 2-3 volts for 50Hz models.



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P-8785 5M 3/03



A Higher Level Of Welding Performance, Productivity And Profits

What makes welds using Praxair® Mig Mix Gold™ blend so reliable? Praxair Mig Mix Gold blend is manufactured with precision, for top-quality welding. It's designed to meet your specific Gas Metal Arc Welding (GMAW or MIG/MAG) application needs, even under the most demanding conditions.

Quality And Consistency Without Exception

From beginning to end, your Praxair Mig Mix Gold shielding gas is blended for consistency throughout using Praxair's patented Starblend™ mixing system technology. Complete evacuation and purging of empty cylinders is required before filling using our patented eductor tube blending system. This produces a consistent blend at every pressure, so you can use your entire gas supply, eliminate residual gas waste from stratification and reduce costs.

Who Benefits From Using Praxair Mig Mix Gold Blend?

Anyone who welds carbon and low alloy steel...manufacturers of:

- Steel structures
- Automotive OEM and repair
- Poles, rebar and frames
- Motorcycles
- Ships

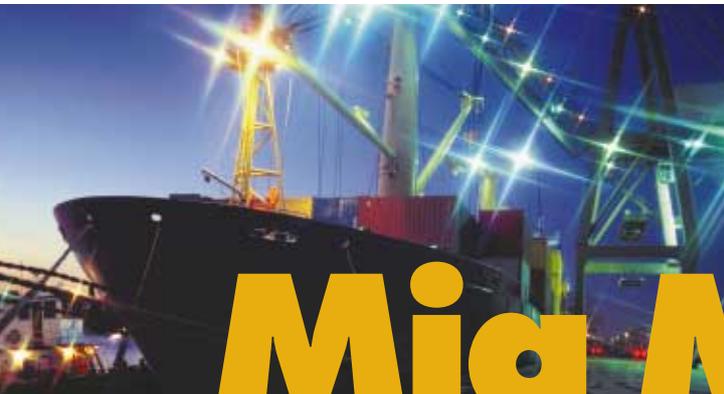
PRAXAIR® MIG MIX GOLD™ BLEND: HIGH-PRODUCTIVITY WELDING OF MILD STEEL



- Trailers, tractors, plows, farm equipment and implements
- Pressure vessels
- Transformers
- Lawn mowers and garden equipment
- Air conditioners
- Office furniture
- Steel girders and beams
- Related sheet metal products

What Do They Say About Praxair Mig Mix Gold Blend?

Praxair Mig Mix Gold blend users report reduced spatter, and less fume with little or no residual slag, so there's little or no post-weld cleanup. Welders spend more time welding and less time cleaning, for greater productivity. With Praxair Mig Mix Gold blend, expect improved productivity in other ways, too, with less overwelding, less fume and faster travel speeds. You'll also get better weld bead shape and excellent weld metal mechanical properties.



Mig Mix Gold

The Right Blend For You

By choosing Praxair pure gases or blends that are right for your application, you'll also benefit from consistent, dependable Praxair service and technical expertise. It's what you'd expect from the leader in shielding gases technology, with almost a century of metal fabrication experience. We will help solve your most challenging welding problems, and improve your welding performance, productivity and profits.

The Praxair Difference

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Welcome To The Family of Praxair Star™ Gases And Blends

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Enhanced Welding Performance, Productivity And More

When you want to ensure precision high-quality welds in the most pressing environments, you want Praxair® HeliStar™ helium-enhanced shielding gases. These helium-enhanced blends are available in a variety of precise formulations. That means there's a Praxair HeliStar gas blend to meet your specific Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW), Plasma Arc Welding (PAW) and Laser welding applications.

Who Benefits From Using Praxair HeliStar Helium-Enhanced Blends?

Anyone who welds a broad range of ferrous (steel, stainless) and non-ferrous (aluminum, copper, etc.) materials...shielding gas users with pulse welding capabilities...auto repair shops (aluminum panels)...and manufacturers of:

- Carbon, stainless steel and aluminum tanks
- Transformers (copper windings)
- Stainless steel components
- Aluminum truck bodies
- Boats
- Monel piping

What Do They Say About Praxair HeliStar Helium-Enhanced Blends?

- Users report greater speed, reduced costs, lower reject rates, increased production rates, elimination of surface porosity, better weld quality, fewer weld failures and improved penetration profile.

PRAXAIR® HELISTAR™ GASES: HIGH-SPEED WELDING ON ALUMINUM, COPPER AND STAINLESS STEEL



- Praxair HeliStar blends increase the travel speed of welding dramatically, making them ideal for piece work, robotic systems and production applications.
- Better toe wetting and deeper root penetration add to the overall higher weld quality. A wider range of operating parameters is available with Praxair HeliStar blends.
- Praxair HeliStar blends produce strong welds which perform better than pure argon over minor surface contamination.



HeliStar

The Praxair Difference

- **Comprehensive, High-Quality Product Line**
A full range of pure gases, mixtures, gas handling equipment, supply systems and related products and services.
- **Application-Based Solutions**
Sales, production and research capabilities to supply you with the technical solution that best suits your needs around the world.
- **Reliable Production And Distribution Network**
Production plants and more than 600 distribution locations in North America — all serving you with the gases you need, when and where you need them.
- **Outstanding Technical Support**
A highly trained team of field sales representatives, shielding gases engineers and technical service personnel work in concert with dedicated market specialists to quickly provide the guidance and cost-effective solutions you deserve.
- **Global Supplier**
Production, distribution and application technology in over 40 countries.

Praxair HeliStar Family Of Helium-Enhanced Blends

- Helium/Argon
 - Praxair HeliStar A-25, A-50 and A-75
- Helium/Argon/Carbon Dioxide
 - Praxair HeliStar A-1025, CS and SS

Praxair Star™ Gases And Blends

Why rely on anything less than the most advanced shielding gases available? Praxair Star™ gases and blends are ideally suited to the most challenging Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW) and Laser applications, including:

- Praxair StarGold™ Gases — Argon-based blends for general fabrication of mild steel.
- Praxair Stargon™ Blend — The standard for versatile high-speed welding of mild steel.
- Praxair Mig Mix Gold™ Blend — High-productivity mild steel welding.
- Praxair HeliStar™ Gases — Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper and some carbon steel welding applications.
- Praxair HydroStar™ Gases — Hydrogen-enhanced blends for increased productivity during GTAW, plasma welding, gouging and cutting of stainless steel.
- Praxair LaserStar™ Gases — Enhanced quality and purity to meet demanding laser needs.

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Improved Welding Performance

By increasing arc stability and overall arc performance, Praxair's *HeliStar*[®] GV gas blend reduces spatter levels and improves bead appearance when welding coated (galvanized, galvanized) steel sheet, pipe, and other parts. Better weld quality, higher welding productivity, and minimal coating loss from the weld area are hallmarks of the *HeliStar* GV blend with an ER70S-3 solid wire in the pulsed Gas Metal Arc Welding (GMAW) mode of metal transfer. In addition to pulsed GMAW, this blend can be used with all types of metal transfer (short-circuiting, conventional spray) and other types of solid and metal-cored wires.

Top-to-Bottom Quality and Consistency

Praxair's helium-containing *HeliStar* GV shielding gas blend offers consistency at every pressure, throughout your application process. That means you can use all the gas delivered, since there's no residual gas waste from stratification, and reduce your costs as a result. Blend consistency comes from Praxair's *Starblend*[™] mixing system, designed specifically for gas mixtures containing argon and/or helium with carbon dioxide. Prior to filling, empty cylinders are completely evacuated and purged before they are filled using our patented eductor tube blending system. A uniform blend is produced upon filling the cylinder; and no post-fill rolling is required.



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PRAXAIR'S *HELISTAR*[®] GV
SHIELDING GAS: OPTIMIZED BLEND
FOR HIGH QUALITY JOINING OF
GALVANIZED/GALVANNEALED
CARBON STEEL SHEET MATERIAL



A Benefit for Many Applications

Praxair's *HeliStar* GV blend provides benefits to anyone who fabricates carbon steel with a galvanized or galvanized coating. This blend provides especially excellent results where manufacturers:

- Use pulsed-GMAW metal transfer to increase productivity, reduce spatter, and improve weld quality while minimizing the generation of welding fume
- Use short-circuiting transfer to joined coated steel sheet material
- Join both coated and uncoated carbon steel where good weld quality and reduced costs are critical
- Need one shielding gas to economically join both uncoated and coated materials

HeliStar GV

Who Benefits From Praxair's HeliStar GV Blend?

Users of the *HeliStar GV* gas blend report:

- Reduced spatter and better weld appearance
- Little or no visible surface porosity
- Minimal disturbance of coating in the weld area
- Less post-weld cleanup required
- Lower levels of welding fume than with other gas/wire combinations
- Versatile performance – works well in short-circuiting, pulsed and conventional spray GMAW
- Good for joining most coated and uncoated base materials

Proven Reliability

Along with Praxair's *HeliStar GV* blend, you're selecting:

- Consistent, dependable Praxair service and technical expertise
- The support of nearly a century of experience

As a leader in shielding gases technology, Praxair has the expertise to help you:

- Solve the most complex welding challenges
- Improve welding performance
- Boost productivity
- Increase profits

The Praxair Difference

- Full, Top-Quality Product Line
- Application-Based Solutions With Praxair's *StarSolver*[®] Productivity Enhancement Program
- Praxair's *StarDirect*SM World-Class Distribution System
- Praxair's Exclusive *PROSTAR*[®] Brand High-Quality Premium Products
- Praxair's *Express*SM Extranet

Choose From Praxair's Star™ Gases And Blends

Rely on the most advanced shielding gases available –

Praxair[®] *Star*[™] gases and blends. They are ideally suited to the most challenging Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW), Robotic and Laser applications.

- Praxair's *StarGold*[™] Blends – Argon-based blends for general fabrication of mild steel.
- Praxair's *Stargon*[®] CS and SS Blends – The standard for versatile high-speed welding of mild steel (CS) and stainless steel (SS).
- Praxair's *Mig Mix Gold*[™] Blend – High-productivity mild steel welding.
- Praxair's *HeliStar*[®] Blends – Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper, coated steel (GV) and some carbon steel welding applications.
- Praxair's *HydroStar*[®] Blends – Hydrogen-enhanced blends for increased productivity during GTAW, plasma welding, gouging and cutting of stainless steel.
- Praxair's *RoboStar*[®] CS, AL and SS Blends – Shielding gas blends for robotic welding of carbon steel (CS), aluminum (AL) and stainless steel (SS).
- Praxair's *LaserStar*[™] Blends – Enhanced quality and purity to meet demanding laser needs.

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Improve Your Welding Performance, Productivity And Profits

Praxair® shielding gases ensure the integrity of your welds, under the most exacting conditions. Praxair HydroStar™ gases are a family of hydrogen-enhanced blends available in a variety of precision formulations for top-quality welding and cutting. Each gas blend is designed to meet the demands of your specific Gas Tungsten Arc Welding (GTAW or TIG), Gas Metal Arc Welding (GMAW or MIG/MAG) and plasma welding, gouging or cutting applications.

Setting A Standard For Quality And Consistency

To maintain the highest quality hydrogen-enhanced blends, Praxair operates ISO-certified production facilities; offers supply options from high-pressure cylinders to bulk liquid tanks; and provides mixtures that are consistent from start to finish.

Who Benefits From Using Praxair HydroStar And The Family Of Hydrogen-Enhanced Blends?

Anyone who cuts or welds 300 series stainless steel and manufacturers of stainless steel parts, including:

- Tubing and piping
- Milk containers and equipment
- Beer and wine processing equipment
- Food processing equipment
- Water tanks
- Tanker trucks
- Airplane components and aerospace equipment
- Chemical plants and equipment
- Aerospace manufacturers using Inconel



PRAXAIR® HYDROSTAR™ GASES: INCREASED PRODUCTIVITY DURING WELDING AND CUTTING OF STAINLESS STEELS



What Do They Say About Praxair HydroStar Shielding Gases?

- Praxair hydrogen-enhanced gas blends produce faster travel speeds and let you do more welding, with less distortion, in less time.
- Because Praxair HydroStar blends increase the fluidity of the weld puddle, less manipulation of the puddle is required to achieve a satisfactory, good-looking weld.
- Praxair HydroStar blends offer reduced oxidation and superior corrosion resistance. They produce welds with a bright, attractive surface finish, which need little or no post-weld cleanup (300 series stainless and Inconel).
- Praxair HydroStar blends perform best in plasma welding applications, particularly when welding in the keyhole mode.
- Praxair HydroStar blends are widely applied with Gas Tungsten Arc Welding and plasma welding, gouging and cutting.
- Using Praxair HydroStar blends in plasma arc gouging, you realize low fume levels, controlled noise, minimal base metal treatment prior to welding and excellent arc stability. These make the noisy, hot carbon arc process a thing of the past.

HydroStar

A Blend That Fits

Once you choose the right blend for your application, you can also count on consistent, dependable Praxair service and technical expertise. With almost 100 years of experience, Praxair is the leader in shielding gases technology. We can help solve your most challenging welding problems to improve your welding performance, productivity and profit.

The Praxair Difference

■ Comprehensive, High-Quality Product Line

A full range of pure gases, mixtures, gas handling equipment, supply systems and related products and services.

■ Application-Based Solutions

Sales, production and research capabilities to supply you with the technical solution that best suits your needs around the world.

■ Reliable Production And Distribution Network

Production plants and more than 600 distribution locations in North America — all serving you with the gases you need, when and where you need them.

■ Outstanding Technical Support

A highly trained team of field sales representatives, shielding gases engineers and technical service personnel work in concert with dedicated market specialists to quickly provide the guidance and cost-effective solutions you deserve.

■ Global Supplier

Production, distribution and application technology in over 40 countries.

Rely On Praxair Star™ Gases And Blends

More than just the most advanced shielding gases available, Praxair Star gases and blends are ideally suited to the most challenging Gas Metal Arc Welding (GMAW or MIG/MAG), Gas Tungsten Arc Welding (GTAW or TIG), Flux-Cored Arc Welding (FCAW), Plasma (PAC, PAG, PAW) and Laser applications.

- Praxair StarGold™ Gases — Argon-based blends for general fabrication of mild steel.
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- Praxair Mig Mix Gold™ Blend — High-productivity mild steel welding.
- Praxair HeliStar™ Gases — Helium-enhanced blends for increased productivity on stainless steel, aluminum, copper and some carbon steel welding applications.
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Praxair HydroStar Family Of Hydrogen-Enhanced Blends

- Hydrogen/Argon
 - Praxair HydroStar H-2, H-5, H-10, H-15 and H-35

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A Gas Blend That Covers Every Angle

Praxair® RoboStar™ shielding gases for robotic welding offer metal fabricators a family of precision-formulated blends that deliver outstanding results, even when parts are positioned at difficult-to-weld angles. This all-position performance capability is especially critical for projects that require a variety of repetitive, multi-position welds.

The Praxair RoboStar™ shielding gas family consists of three unique blends, each designed for a specific material and set of applications:

- RoboStar™ CS Blend — for carbon steel
- RoboStar™ AL Blend — for aluminum
- RoboStar™ SS Blend — for stainless steel

Whether it's robotics or fixed automation, the results are the same in each application: high-quality welds regardless of the welding position, and increased levels of productivity.

RoboStar™ CS Blend

This universal shielding gas combines argon, carbon dioxide and oxygen for use in all types of carbon steel welding utilizing fixed automation and robotics. These applications include:

- Steel frame building components
- Automotive assemblies
- Rail car structures
- Earth-moving equipment
- Transmission poles
- Pressure vessels

Not only does RoboStar™ CS perform well in all types of metal transfer, but it also produces good arc characteristics and excellent weld penetration, with a minimum of spatter in all welding positions. Welds produced using RoboStar™ CS possess excellent weld metal strength and toughness as well as improved fatigue strength.



PRAXAIR ROBOSTAR™ BLENDS: CONSISTENT, PRECISE ROBOTIC WELDING OF ALUMINUM, CARBON AND STAINLESS STEEL



Productivity is enhanced by the high deposition rates and travel speeds achievable in spray transfer, especially when compared with conventional two-part gas blends.

RoboStar™ AL Blend

Designed for all-position welding of aluminum using 4000 and 5000 series filler wire, this argon-helium mix produces optimum penetration and bead shape, while retaining good arc starting and stability characteristics. It's suitable for both conventional or pulsed spray transfer, and CV or CC power.

As a result, RoboStar™ AL from Praxair is perfect for both robotics and fixed automation applications where items such as the following are fabricated:

- Boats
- Automotive panels and frames
- Light poles and tanks

RoboStar™ SS Blend

The precise blending of argon and helium with controlled additions of CO₂ help make this shielding gas right for stainless steel robotic welding. RoboStar™ SS produces excellent weld bead appearance with minimum spatter at higher

Robostar

productivity levels than other gas blends. Used with austenitic stainless steel consumables, RoboStar™ SS produces high-quality welds with superior mechanical and chemical properties in every welding position.

That is why RoboStar™ SS is used in applications where optimum weld chemistry, bead shape and appearance are critical, such as tanks and piping for chemical and food processing, and in areas where corrosion resistance is of primary importance, such as:

- Exhaust systems
- Storage tanks and containers
- Aircraft components
- Food processing equipment
- Tubing

A Blend That Fits

Once you chose the right blend for your application, you can also count on consistent, dependable Praxair service and technical expertise to support you. With almost 100 years of experience, Praxair is the leader in shielding gases technology. We can help solve your most challenging welding issues and improve your welding performance, productivity and profits.

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