

# BLUESHIELD & ARCAL - Optimized Shielding Gases for Welding Application

CYLINDER GASES



Regardless of the type of steel your are welding, whether thick or thin, Air Liquide has the optimal shielding gas for your applications.

## Application Guide - Choose the right shielding gas for your application

NAME	COMPOSITION	GMAW (MIG)						GTAW (TIG)						FCAW (FLUX CORED)		MCAW	
		CARBON STEEL		STAINLESS STEEL		ALUMINUM		CARBON STEEL		STAINLESS STEEL		ALUMINUM		CARBON STEEL	STAINLESS STEEL	STEEL	STAINLESS
		thin	thick	thin	thick	thin	thick	thin	thick	thin	thick	thin	thick				
Argon	Ar					X	X	X		X		X					
BLUESHIELD 1	Ar He						X		X		X		X				
BLUESHIELD 2	Ar He						X		X		X		X				
BLUESHIELD 3	Ar He						X		X		X		X				
BLUESHIELD 4	Ar He						X		X		X		X				
BLUESHIELD 6	Ar CO <sub>2</sub>	X	X														X
BLUESHIELD 7	Ar CO <sub>2</sub>	X	X														X
BLUESHIELD 8	Ar CO <sub>2</sub>	X	X											X	X	X	
BLUESHIELD 9	He Ar CO <sub>2</sub>				X												
BLUESHIELD 11	Ar H <sub>2</sub>									X (1)	X (1)						
BLUESHIELD 12	Ar H <sub>2</sub>									X (4)	X (1)						
BLUESHIELD 14	Ar H <sub>2</sub>																
BLUESHIELD 15	N <sub>2</sub> H <sub>2</sub>																
BLUESHIELD 21	Ar CO <sub>2</sub>	X	X														X
BLUESHIELD 23	Ar CO <sub>2</sub> O <sub>2</sub>	X	X														X
ARCAL 14	Ar CO <sub>2</sub> O <sub>2</sub>	X	X	X	X												X
ARCAL 21	Ar CO <sub>2</sub>	X	X														X
ARCAL 39	Ar He N <sub>2</sub>									X (2)	X (2)						
ARCAL 121	Ar He CO <sub>2</sub>	X (3)		X	X												
ARCAL 129	Ar He CO <sub>2</sub> N <sub>2</sub>			X (2)	X (2)												
ARCAL 211	Ar CO <sub>2</sub> He	X	X											X	X	X	
ARCAL-ALMIG	Ar CO <sub>2</sub> O <sub>2</sub>	X	X														X
ARCALTIG	Ar He					X	X	X	X	X	X	X	X				
ARCALFLUX	Ar CO <sub>2</sub>	X	X											X	X	X	

<sup>(1)</sup> Austenitic only (300 series)

<sup>(2)</sup> For use on duplex and super duplex stainless steels

<sup>(3)</sup> Galvanized or coated steels

<sup>(4)</sup> Automatic processes

## Cylinder color: Dark blue

Air Liquide offers the complete line of Blueshield welding shielding gas mixtures. These blends became industry standards because of their performance and consistency.

The Blueshield shielding gas family covers most of your needs for quality and consistency in the GMAW, FCAW, MCAW and GTAW processes.

## Improve your welding application with Blueshield



NAME	COMPONENTS	SIZE	VOLUME <sup>1</sup>		CGA CONNECTION	MAIN APPLICATIONS	ITEM NUMBERS	TYPICAL CYLINDER PRESSURES @ 15°C (70°F)
			m <sup>3</sup>	scf				
BLUESHIELD 1	Ar He	50 50 XPR 16 x 50 xpr	8.61	310.59	580	<b>GMAW and GTAW</b> Steel, and stainless steel with <b>GTAW</b> only, aluminum, copper, nickel, magnesium, titanium Short circuit, spray and pulse	<b>GAS-BLU150</b> <b>GAS-BLU150XPR</b> <b>GAS-BLU1BP50XPR</b>	16 820 kPa (2492 psig) 30 380 kPa (4500 psig) 30 350 kPa (4500 psig)
			15.48	558.19	680			
			247.36	8920.69	680			
BLUESHIELD 2	Ar He	50	8.32	300.02	580	<b>GMAW and GTAW</b> Aluminum, copper, nickel, magnesium, titanium Short circuit and spray and pulse	<b>GAS-BLU250</b>	16 820 kPa (2492 psig)
BLUESHIELD 3	Ar He	50 16 x 50	8.06	290.66	580	<b>GMAW and GTAW</b> Aluminum, copper, nickel, magnesium, titanium Short circuit and spray	<b>GAS-BLU350</b> <b>GAS-BLU350BP</b>	16 820 kPa (2492 psig) 16 820 kPa (2492 psig)
			128.96	4650.64	580			
BLUESHIELD 4	Ar O <sub>2</sub>	50	8.84	318.98	580		<b>GAS-BLU450</b>	16 820 kPa (2492 psig)
BLUESHIELD 6	Ar CO <sub>2</sub>	50 50 XPR 16 x 50 XPR	9.35	337.02	580	<b>GMAW, MCAW</b> Steel Short circuit, spray and pulse	<b>GAS-BLU650</b> <b>GAS-BLU650XPR</b> <b>GAS-BLU6BP50XPR</b>	16 820 kPa (2492 psig) 30 380 kPa (4500 psig) 30 350 kPa (4500 psig)
			15.93	574.59	680			
			254.92	9193.48	680			
BLUESHIELD 7	Ar CO <sub>2</sub>	50	9.48	341.72	580	<b>GMAW, MCAW, FCAW</b> Steel Short circuit and spray	<b>GAS-BLU750</b>	16 820 kPa (2492 psig)
BLUESHIELD 8	Argon CO <sub>2</sub>	9 COP 22 50 16 x 50	1.50	54.07	580	<b>GMAW, MCAW, FCAW</b> Steel, and stainless steel with <b>FCAW</b> Short circuit, and globular	<b>GAS-BLU89COP</b> <b>GAS-BLU822</b> <b>GAS-BLU850</b> <b>GAS-BLU8BP50</b>	14 175 kPa (2100 psig) 14 175 kPa (2100 psig) 16 820 kPa (2492 psig) 16 820 kPa (2492 psig)
			3.74	134.94	580			
			10.28	370.99	580			
			164.59	5935.83	580			
BLUESHIELD 9	He Ar CO <sub>2</sub>	50	7.53	271.59	580	<b>GMAW</b> Stainless steel Short circuit	<b>GAS-BLU950</b>	16 820 kPa (2492 psig)
BLUESHIELD 11	Ar H <sub>2</sub>	44	6.24	224.86	350	<b>GTAW</b> Stainless steel (300 series only)	<b>GAS-BLU1144</b>	13 500 kPa (2000 psig)
BLUESHIELD 12	Ar H <sub>2</sub>	44	6.22	224.39	350	<b>GTAW (Automatic)</b> Stainless steel (300 series only), nickel	<b>GAS-BLU1244</b>	13 500 kPa (2000 psig)
BLUESHIELD 14	Ar H <sub>2</sub>	50	8.16	294.39	350	<b>Plasma arc cutting (PAC)</b> Stainless steel, aluminum and other non-ferrous metals	<b>GAS-BLU1450</b>	16 210 kPa (2400 psig)
BLUESHIELD 15	Ar H <sub>2</sub>	44	5.85	211.05	350	<b>GMAW and GTAW, PAC</b> Stainless steel (300 series only) Back purging or trailing gas	<b>GAS-BLU1544</b>	13 500 kPa (2000 psig)
BLUESHIELD 23	Ar CO <sub>2</sub> O <sub>2</sub>	50 50 XPR 16 x 50 XPR	9.11	328.57	580	<b>GMAW and MCAW</b> Steel Short circuit, spray and pulse	<b>GAS-BLU2350</b> <b>GAS-BLU2350XPR</b> <b>GAS-BLU23BP50XPR</b>	16 820 kPa (2492 psig) 30 380 kPa (4500 psig) 30 380 kPa (4500 psig)
			15.56	561.14	680			
			248.95	8978.16	680			

<sup>1</sup> m<sup>3</sup> @ 15°C; scf @ 70°F

<sup>2</sup> Volume is equal to 16 standard cylinders. For more information on BULKPAKS, contact your Air Liquide representative.

<sup>3</sup> More information on COP cylinders on page 3.

NOTE: All of the above bold applications are preferred choices. Applications other than those mentioned are possible. Contact your Air Liquide representative to discuss your application.



## Cylinder color: Light blue

The Arcal line was created to assure optimized performance such as:

- Improved productivity and quality
- Reduced fume emissions and spatter
- Optimized packaging with more gas in every cylinder (XPR packaging)
- Increase safety with the tulip cap protecting the valve at all times
- Better manoeuvrability of the cylinder with the protective cap

## Optimize your welding applications with Arcal

MIXTURE	COMPOSITION	APPLICATIONS	REPLACES	SIZE	VOLUME <sup>1</sup>		ITEM NUMBER	TYPICAL CYLINDER PRESSURES @ 15°C (70°F)
					m <sup>3</sup>	scf		
ARCAL 14	Ar CO <sub>2</sub> O <sub>2</sub>	<b>GMAW (MIG)</b> welding of carbon steels in all transfer modes, short-circuit, globular, spray, and pulsed-spray transfer. Excellent for jobs requiring painting or coating due to low-silicate formation. <b>GMAW (MIG)</b> welding of stainless steels, especially in spray transfer. <b>MCAW</b> (metal core) welding where low smoke is a concern.	Can replace standard Ar/CO <sub>2</sub> Ar/O <sub>2</sub> and Ar/CO <sub>2</sub> /O <sub>2</sub> mixtures	50 XPR 16 x 50 XPR	15.23 243.70	549.28 8788.53	<b>GAS-ARC1450XPR</b> <b>GAS-ARC14BP50XPR</b>	30 380 kPa (4500 psig) 30 380 kPa (4500 psig)
ARCAL 21	Ar CO <sub>2</sub>			50 XPR 16 x 50 XPR	16.08 257.25	579.83 9277.29	<b>GAS-ARC2150XPR</b> <b>GAS-ACR2150BPXPR</b>	30 380 kPa (4500 psig) 30 380 kPa (4500 psig)
ARCAL 39	Ar He N <sub>2</sub>	<b>GTAW (TIG)</b> welding of duplex and super duplex stainless steels.	"The" choice for <b>GTAW (TIG)</b> welding of duplex materials	50 XPR	15.35	553.64	<b>GAS-ARC3950XPR</b>	30 380 kPa (4500 psig)
ARCAL 121	Ar He CO <sub>2</sub>	<b>GMAW (MIG)</b> welding of all stainless steels in all transfer modes, short-circuit, globular, spray, and pulsed-spray transfer. <b>GMAW (MIG)</b> welding of galvanized carbon steels.	Can replace standard Ar/O <sub>2</sub> and Ar/CO <sub>2</sub> /H <sub>2</sub> mixtures	50 XPR 16 x 50 XPR	13.96 223.36	503.44 8055.17	<b>GAS-ARC12150XPR</b> <b>GAS-ACR121BP50XPR</b>	30 380 kPa (4500 psig) 30 380 kPa (4500 psig)
ARCAL 129	Ar He CO <sub>2</sub> N <sub>2</sub>	<b>GMAW (MIG)</b> welding of duplex and super duplex stainless steels.	"The" choice for <b>GMAW (MIG)</b> welding of duplex materials	50 XPR	14.82	534.50	<b>GAS-ARC12950XPR</b>	30 380 kPa (4500 psig)
ARCAL 211	Ar CO <sub>2</sub> He	<b>FCAW (flux core)</b> welding of carbon steel and stainless steel where lower smoke emissions and increased productivity are desired. <b>MCAW (metal core)</b> welding of carbon steels. <b>GMAW (MIG)</b> welding of carbon steels in all transfer modes.	The ideal "clean" alternative to standard CO <sub>2</sub> and Ar/CO <sub>2</sub> mixtures	50 XPR 16 x 50 XPR	15.36 245.81	554.04 8864.64	<b>GAS-ARC21150XPR</b> <b>GAS-ARC211BP50XPR</b>	30 380 kPa (4500 psig) 30 380 kPa (4500 psig)
ALMIG	Ar CO <sub>2</sub> O <sub>2</sub>	<b>GMAW</b> welding of carbon steels and regular carbon level stainless steel and non-critical stainless steel applications. <b>MCAW</b> welding of carbon steels Short-circuit, spray and pulse transfer.	Can replace standard Ar/CO <sub>2</sub> Ar/O <sub>2</sub> and Ar/CO <sub>2</sub> /O <sub>2</sub> mixtures	16	2.81	101.42	<b>GAS-ALMIG16</b>	16 820 kPa (2492 psig)
ALTIG	Ar He	<b>GTAW</b> welding of all base metals. <b>GMAW</b> welding of non-ferrous metals. Application requiring higher heat inputs or faster travel speeds compared to pure argon.	Can replace argon or other argon/helium mixtures	16	2.61	94.24	<b>GAS-ALTIG16</b>	16 820 kPa (2492 psig)
ALFLUX	Ar CO <sub>2</sub>			16	3.05	109.99	<b>GAS-ALFLUX16</b>	16 820 kPa (2492 psig)

<sup>1</sup> m<sup>3</sup> @ 15°C; scf @ 70°F

<sup>2</sup> Volume is equal to 16 standard cylinders.

For more information on BULKPAKS, contact your Air Liquide representative. NOTE: All Arcal cylinders CGA 680. All Almig and Altig cylinders CGA 580.