LINCOLN® ER308/308H

Stainless ▪ AWS ER308, ER308H

KEY FEATURES

- Provides a high carbon deposit (minimum of .04% carbon) for high temperature applications
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- The high carbon deposit provides creep strength and a high tensile strength at elevated temperatures
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS: A5.9/A5.9M: ER308, ER308H

TYPICAL APPLICATIONS

- Chemical
- Petrochemical industries
- Distillery
- Dairy
- Restaurant Equipment
- Catalytic Crackers
- Pulp and Paper
- Used to weld unstabilized austenitic stainless steels such as 302, 304H and 305

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035199
3/32 (2.4)	ED035200
1/8 (3.2)	ED035201

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER308H	0.04 - 0.08	19.5 - 22.0	9.00 - 11.00	0.50 max	1.0 - 2.5
Typical Results[2]	0.06	19.9	9.7	0.07	1.8
	%Si	**%P**	**%S**	**%Cu**	**FN**
Requirements AWS ER308H	0.30 - 0.65	0.04 max	0.03 max	0.75 max	Not Required
Typical Results[2]	0.44	0.02	0.006	0.10	5 - 12

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER308/308L

Stainless ▪ AWS ER308, ER308L

KEY FEATURES

- Balanced chromium and nickel levels provide enough ferrite in the weld for high resistance to hot cracking
- Dual classification ensures the maximum carbon content is 0.03%
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- 0.03% carbon content increases resistance to intergranular corrosion
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER308, ER308L
ASME SFA-A5.9:	ER308, ER308L
EN ISO 14343-B:	SS308L
MIL-E-19933E (SH)	MIL 308L, MIL 308

TYPICAL APPLICATIONS

- Sheet metal on the corresponding stainless steel base metals
- High pressure piping and tubing

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	1 lb (0.5 kg) Plastic Tube 10 lb (4.5 kg) Master Carton	10 lb (4.5 kg) Plastic Tube 30 lb (13.6 kg) Master Carton	10 lb (4.5 kg) Carton	50 lb (22.7 kg) Carton
1/16 (1.6)	ED025410	ED034439	ED025412	ED026655
3/32 (2.4)	ED025413	ED034440	ED025415	ED026656
1/8 (3.2)	ED025416	ED034441	ED025418	ED026657
5/32 (4.0)		ED036060		

WIRE COMPOSITION – *As Required per AWS A5.9/A5.9M*

	%C[2]	%Cr	%Ni	%Mo	%Mn
Requirements - AWS ER308L	0.03 max	19.5 - 22.0	9.0 -11.0	0.75 max	1.0 - 2.5
Typical Results[1]	0.02	20.2	9.2	0.03	1.6
	%Si	**%P**	**%S**	**%Cu**	**Total Others**
Requirements - AWS ER308L	0.30 - 0.65	0.03 max	0.03 max	0.75 max	0.50 max
Typical Results[1]	0.44	0.02	0.02	0.11	0.03

[1]See test results disclaimer [2]Requirements for ER308 is 0.08% max. carbon.

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER308/308LCF

Stainless ▪ AWS ER308/308L

KEY FEATURES

- Controlled Low Ferrite (Range 3-6)
- Charpy V-Notch test results capable of exceeding 27 J (20 ft▪lbf) @ -196°C (-320°F)
- Exceeds 15 mils (0.38 mm) of lateral expansion @ -196°C (-320°F)
- Q2 Lot® - Certificates showing actual wire composition, ferrite number, and impact properties tested at -196°C (-320°F) available online
- Batch Managed Inventory
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9:	ER308/308L
ASME SFA-A5.9:	ER308/308L

TYPICAL APPLICATIONS

- LNG Storage
- Cryogenic Vessels and Piping

SHIELDING GAS

100% Argon

TYPICAL BASE METALS

- 304L stainless steel
- 18/8 steels with service temperatures down to -196°C (-320°F)

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tubes 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED034911
3/32 (2.4)	ED034912
1/8 (3.2)	ED034913

MECHANICAL PROPERTIES[1]

	Yield Strength[2] MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft▪lbf) -196°C (-320°F)	Lateral Expansion mils (mm) -196°C (-320°F)
Typical Results[3] As-Welded with 100% Ar	430 (62)	590 (86)	42	62 (84)	38 (0.97)

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements - AWS ER308L	0.03 max	19.5 - 22.0	9.0 -11.0	0.75 max	1.0 - 2.5
Typical Results[3]	0.02	20.0	10.9	0.12	1.7
	%Si	**%P**	**%S**	**%Cu**	**Total Others**
Requirements - AWS ER308L	0.30 - 0.65	0.03 max	0.03 max	0.75 max	Not Required
Typical Results[3]	0.53	0.02	0.01	0.17	3-6

[1]Typical all weld metal [2]Measured with 0.2% offset [3]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER309/309L

Stainless ▪ AWS ER309, ER309L

KEY FEATURES

- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- 0.03% carbon content increases resistance to intergranular corrosion
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

CONFORMANCES

AWS A5.9/A5.9M:	ER309, ER309L
ASME SFA-A5.9:	ER309, ER309L
EN ISO 14343-B:	SS309L
MIL-E-19933E (SH)	MIL 309

TYPICAL APPLICATIONS

- Sheet metal on the corresponding stainless steel base metals
- High pressure piping and tubing
- Use for welding dissimilar alloys in wrought or cast form
- Occasionally used for welding "18-8" base metals when severe corrosion conditions exist or dissimilar metals

DIAMETERS / PACKAGING

Diameter in (mm)	1 lb (0.5 kg) Plastic Tube 10 lb (4.5 kg) Master Carton	10 lb (4.5 kg) Plastic Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED025419	ED034442
3/32 (2.4)	ED025422	ED034443
1/8 (3.2)	ED025425	ED034444

WIRE COMPOSITION – *As Required per AWS A5.9/A5.9M*

	%C[2]	%Cr	%Ni	%Mo	%Mn
Requirements - AWS ER309L	0.03 max	23.0 - 25.0	12.0 - 14.0	0.75 max	1.0 - 2.5
Typical Results[1]	0.02	23.7	13.9	0.04	1.8
	%Si	**%P**	**%S**	**%Cu**	**Total Others**
Requirements - AWS ER309L	0.30 - 0.65	0.03 max	0.03 max	0.75 max	0.50 max
Typical Results[1]	0.51	0.02	0.01	0.05	0.06

[1]See test results disclaimer [2]Requirements for ER309 is 0.12% max. carbon.

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER310

Stainless ▪ AWS ER310

KEY FEATURES

- The weld deposit is fully austenitic, and as such, calls for minimal heat input during welding
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER310
ISO 14343: 2009:	(25 20)
ASME SFA-5.9:	ER310

TYPICAL APPLICATIONS

- Head shields
- Furnace parts
- Ducting
- Used for welding stainless steels of similar composition in cast and wrought forms

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035214
3/32 (2.4)	ED035215
1/8 (3.2)	ED035216

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER310	0.08 - 0.15	25.0 - 28.0	20.0 - 22.5	0.75 max	1.0 - 2.5
Typical Results[2]	0.11	27.1	21.0		1.90
	%Si	**%P**	**%S**	**%Cu**	**FN**
Requirements AWS ER310	0.30 - 0.65	0.03 max	0.03 max	0.75 max	Not Required
Typical Results[2]	0.40	0.01	0.003	0.04	

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER312

Stainless ▪ AWS ER312

KEY FEATURES

- Weld deposit work-hardens, providing good wear resistance and high tensile strength
- Applications should be limited to 800°F (420°C)
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER312
ISO 14343: 2009:	(29 9)
ASME SFA-5.9:	ER312

TYPICAL APPLICATIONS

- Tool steels
- Hard to weld steels
- Cast and wrought alloys
- Dissimilar metals
- Used to weld cast and wrought alloys of similar compositions
- Can be used for joining hard to weld materials and dissimilar metals

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035217
3/32 (2.4)	ED035218
1/8 (3.2)	ED035219

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER312	0.15 max	28.0 - 32.0	8.0 - 10.5	0.75 max	1.0 - 2.5
Typical Results[2]	0.11	29.6	8.9		1.6
	%Si	**%P**	**%S**	**%Cu**	**FN**
Requirements AWS ER312	0.30 - 0.65	0.03 max	0.03 max	0.75 max	Not Required
Typical Results[2]	0.44	0.02	0.01	0.10	50 - 80

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER316/316L

Stainless ▪ AWS ER316, ER316L

KEY FEATURES

- The 2-3% molybdenum improves pitting corrosion resistance of the weld deposit
- Molybdenum grade increases corrosion resistance
- Use for high temperature service applications
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- 0.03% carbon content increases resistance to intergranular corrosion
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9/A5.9M:	ER316, ER316L
ASME SFA-A5.9:	ER316, ER316L
EN ISO 14343-B:	SS316L
MIL-E-19933E (SH)	MIL 316L

TYPICAL APPLICATIONS

- Sheet metal on the corresponding stainless steel base metals
- High pressure piping and tubing
- Use for welding similar alloys containing approximately 2% molybdenum

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	1 lb (0.5 kg) Plastic Tube 10 lb (4.5 kg) Master Carton	10 lb (4.5 kg) Plastic Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED025428	ED034445
3/32 (2.4)	ED025421	ED034446
1/8 (3.2)	ED025434	ED034447
5/32 (4.0)		ED036061

WIRE COMPOSITION – *As Required per AWS A5.9/A5.9M*

	%C[2]	%Cr	%Ni	%Mo	%Mn
Requirements - AWS ER316L	0.03max	18.0 - 20.0	11.0 - 14.0	2.0 - 3.0	1.0 - 2.5
Typical Results[1]	0.02	18.7	11.8	2.3	1.7
	%Si	**%P**	**%S**	**%Cu**	**Total Others**
Requirements - AWS ER316L	0.30 - 0.65	0.03 max	0.03 max	0.75 max	0.50 max
Typical Results[1]	0.52	0.02	0.01	0.10	0.30

[1] See test results disclaimer [2] Requirements for ER316 is 0.08% max. carbon.

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER316/316LCF

Stainless ▪ AWS ER316/316L

KEY FEATURES

- Controlled Low Ferrite (Range 3-6)
- Charpy V-Notch test results capable of exceeding 27 J (20 ft▪lbf) @ -196°C (-320°F)
- Exceeds 15 mils (0.38 mm) of lateral expansion @ -196°C (-320°F)
- Q2 Lot® - Certificates showing actual wire composition, ferrite number, and impact properties tested at -196°C (-320°F) available online
- Batch Managed Inventory
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9:	ER316/316L
ASME SFA-A5.9:	ER316/316L

TYPICAL APPLICATIONS

- LNG Storage
- Cryogenic Vessels and Piping

SHIELDING GAS

100% Argon

WELDING POSITIONS

All

TYPICAL BASE METALS

316L stainless steels

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED034927
3/32 (2.4)	ED034928
1/8 (3.2)	ED034929

MECHANICAL PROPERTIES[1] – *As Required per AWS A5.9/A5.9M*

	Yield Strength[2] MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft▪lbf) -196°C (-320°F)	Lateral Expansion mils (mm) -196°C (-320°F)
Typical Results[3] As-Welded with 100% Ar	430 (63)	570 (83)	42	70 (95)	42 (1.1)

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements - AWS ER316L	0.03 max	18.0 - 20.0	11.0 - 14.0	2.0 - 3.0	1.0 - 2.5
Typical Results[3]	0.02	18.5	12.3	2.6	1.7
	%Si	**%P**	**%S**	**%Cu**	**Total Others**
Requirements - AWS ER316L	0.30 - 0.65	0.03 max	0.03 max	0.75 max	0.50 max
Typical Results[3]	0.40	0.02	0.01	0.17	0.30

[1] Typical all weld metal [2] Measured with 0.2% offset [3] See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER317/317L

Stainless ▪ AWS ER317, ER317L

KEY FEATURES

- Weld deposit similar to 316L with a high molybdenum content for increased corrosion resistance
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER317, ER317L
ISO 14343: 2009:	(18 15 3 L)
ASME SFA-5.9	ER317, ER317L

TYPICAL APPLICATIONS

- FGP
- Chemical Processing Plants
- Condensers
- Petrochemical
- Used for welding alloys with similar composition in high corrosive environments

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035227
3/32 (2.4)	ED035228
1/8 (3.2)	ED035229
5/32 (4.0)	ED035230

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER317/317L	0.03 max	18.5 - 20.5	13.0 - 15.0	3.0 - 4.0	1.0 - 2.5
Typical Results[2]	0.01	18.9	13.7	3.5	1.4

	%Si	%P	%S	%Cu
Requirements AWS ER317/317L	0.30 - 0.65	0.03 max	0.03 max	0.75 max
Typical Results[2]	0.45	0.01	0.008	0.08

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER320LR

Stainless ▪ AWS ER320LR

KEY FEATURES

- Excellent corrosion resistance in highly acidic environments
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M: ER320LR
ASME SFA-5.9: ER320LR

TYPICAL APPLICATIONS

- Tanks
- Process Piping
- Heat Exchangers
- Typically used for welding base metals with similar compositions including alloy 20

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035231
3/32 (2.4)	ED035232
1/8 (3.2)	ED035233

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER320LR	0.025 max	19.0 - 21.0	32.0 - 36.0	2.0 - 3.0	1.5 - 2.0
Typical Results[3]	0.003	20.1	33.3	2.4	1.7
	%Si	**%P**	**%S**	**%Cu**	**%Nb**
Requirements AWS ER320LR	0.15 max	0.015 max	0.02 max	3.0 - 4.0	Required 8 x C / 1.0 max
Typical Results[2]	0.01	0.010	0.001	3.3	0.22

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER347

Stainless ▪ AWS ER347

KEY FEATURES

- Niobium stabilized stainless steel electrodes
- The addition of niobium reduces intergranular corrosion in severe operating conditions
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER347
ISO 14343: 2009:	(19 9 Nb)
ASME SFA-5.9:	ER347
MIL-E-19933E (SH)	MIL 347

TYPICAL APPLICATIONS

- Food Processing
- Pharmaceutical Equipment
- Used for welding Types 347 and 321 stainless and stainless clad steels

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035235
3/32 (2.4)	ED035237
1/8 (3.2)	ED035239

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Nb + Ta
Requirements AWS ER347	0.08 max	19.0 - 21.5	9.0 - 11.0	0.75 max	10 x C - 1.0
Typical Results[2]	0.03	19.5	9.3	0.25	0.60
	%Mn	**%Si**	**%P**	**%S**	**%Cu**
Requirements AWS ER347	1.0 - 2.5	0.30 - 0.65	0.03 max	0.03 max	0.75 max
Typical Results[2]	1.7	0.45	0.01	0.007	0.10

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

BEFORE USE, READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) FOR THIS PRODUCT AND SPECIFIC INFORMATION PRINTED ON THE PRODUCT CONTAINER.

LINCOLN® ER385

Stainless ▪ AWS ER385

KEY FEATURES

- Weld metal is fully austenitic and must be done with low heat input using a stringer bead technique
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

CONFORMANCES

AWS A5.9/A5.9M:	ER385
ISO 14343: 2009:	(20 25 5 Cu L)
ASME SFA-5.9:	ER385

TYPICAL APPLICATIONS

- Pipeline segment
- Agitotors
- Rotars
- Used in fabrication of equipment and vessels for handling and storage of sulfuric acid and phosphoric acid
- Used for welding materials of similar chemical composition (Type 904L)

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035240
3/32 (2.4)	ED035241

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER385	0.025 max	19.5 - 21.5	24.0 - 26.0	4.2 - 5.2	1.0 - 2.5
Typical Results[2]	0.010	19.9	25.0	4.2	1.8

	%Si	%P	%S	%Cu
Requirements AWS ER385	0.50 max	0.02 max	0.03 max	1.2 - 2.0
Typical Results[2]	0.3	0.01	0.001	1.4

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

Fumes from the normal use of some welding products can contain significant quantities of components - such as chromium and manganese - which can lower the 5.0 mg/m³ maximum exposure guideline for general welding fume.

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LINCOLN® ER409Nb

Stainless ▪ AWS ER409Nb

KEY FEATURES

- A ferritic stainless steel welding wire
- The addition of niobium improves corrosion resistance and promotes a ferritic micro-structure
- For the best results, welding must be done in a low heat input procedure and is not recommended for multi-pass applications
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9/A5.9M: ER409Nb
ASME SFA-5.9: ER409Nb

TYPICAL APPLICATIONS

- Automotive exhausts
- Used to weld Type 409 and 409Ti base materials

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035242
3/32 (2.4)	ED035243

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Nb
Requirements AWS ER409Nb	0.08 max	10.5 - 13.5	0.6 max.	0.50 max	0.075 max
Typical Results[2]	0.04	11.5	0.4	0.03	0.50
	%Mn	**%Si**	**%P**	**%S**	**%Cu**
Requirements AWS ER409Nb	0.8 max	1.0 max	0.04 max	0.03 max	0.75 max
Typical Results[2]	0.62	0.48	0.02	0.02	0.04

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

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LINCOLN® ER410

Stainless ▪ AWS ER410

KEY FEATURES

- Designed to weld stainless steels of similar chemical composition as well as to overlay carbon steels to impart corrosion, erosion and abrasion resistance
- This material, being an air-hardening type, calls for a pre-heat and inter-pass temperature of 400°F (200°C) or greater during welding
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M:	ER410
ISO 14343: 2009:	13
ASME SFA-5.9:	ER410
MIL-E-19933E (SH)	MIL 410

TYPICAL APPLICATIONS

- Surfacing Steel Mill Rolls
- Furnace and Burner Parts
- Turbine Parts

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035244
3/32 (2.4)	ED035245
1/8 (3.2)	ED035246

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER410	0.12 max	11.5 - 13.5	0.6 max	0.75 max	0.6 max
Typical Results[2]	0.11	12.5	0.1	0.03	0.45
	%Si	**%P**	**%S**	**%Cu**	
Requirements AWS ER410	0.5 max	0.03 max	0.03 max	0.75 max	
Typical Results[2]	0.39	0.01	0.01	0.14	

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

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LINCOLN® ER410NiMo

Stainless ▪ AWS ER410NiMo

KEY FEATURES

- Used to overlay mild and low alloy steels
- Preheat and inter-pass temperatures of 300°F (150°C) or greater is recommended during welding
- Post-weld heat treatment should not exceed 1150°F (620°C) as higher temperatures may result in hardening
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

WELDING POSITIONS

All

CONFORMANCES

AWS A5.9/A5.9M: ER410NiMo

ISO 14343: 2009: (13 4)

TYPICAL APPLICATIONS

- Turbines
- Valve Bodies
- High Pressure Piping
- Offshore
- Power Generation
- Designed to weld materials of similar chemical composition in cast and wrought forms

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035247
3/32 (2.4)	ED035248

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn
Requirements AWS ER410NiMo	0.06 max	11.0 - 12.5	4.0 - 5.0	0.4 - 0.7	0.6 max
Typical Results[2]	0.02	11.7	4.7	0.5	0.2
	%Si	**%P**	**%S**	**%Cu**	
Requirements AWS ER410NiMo	0.5 max	0.03 max	0.03 max	0.75 max	
Typical Results[2]	0.2	0.01	0.002	0.06	

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

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LINCOLN® ER630

Stainless ▪ AWS ER630

KEY FEATURES

- Precipitation hardening martensitic stainless steel used for welding materials of similar chemical composition such as 17-4 and 17-7 plates
- Can be used in as welded condition or may be heat treated to obtain higher strength
- Mechanical properties of the alloy are greatly influenced by the heat treatment
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9/A5.9M:	ER630
ASME SFA-5.9	ER630

TYPICAL APPLICATIONS

- Hydraulic Equipment Components
- Impellers
- Pump Shafts

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035250
3/32 (2.4)	ED035252

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Nb
Requirements AWS ER630	0.05 max	16.00 - 16.75	4.5 - 5.0	0.75 max	0.15 - 0.30
Typical Results[2]	0.03	16.5	4.8	0.2	0.22
	%Mn	%Si	%P	%S	%Cu
Requirements AWS ER630	0.25 - 0.75	0.75 max	0.03 max	0.03 max	3.25 - 4.0
Typical Results[2]	0.54	0.43	0.02	0.02	3.6

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

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LINCOLN® ER2209

Stainless ▪ AWS ER2209

KEY FEATURES

- The welds offer excellent resistance to stress corrosion, cracking and pitting
- The microstructure of the weld metal consists of austenite and ferrite
- The ferrite content of the weld metal will be lower than the ferrite content of type 2205 base metal
- Welding of duplex stainless steels calls for controlled welding parameters to achieve specified mechanical and corrosion resistant properties
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9/A5.9M: ER2209
ISO 14343:2009: (22 9 3 N L)

TYPICAL APPLICATIONS

- Offshore
- Oil and Gas
- Chemical
- Petrochemical
- Used to weld duplex stainless steels such as (Type 2205)

SHIELDING GAS

100% Argon

WELDING POSITIONS

All

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035191
3/32 (2.4)	ED035192
1/8 (3.2)	ED035193

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn	%Si
Requirements AWS ER2209	0.03 max	21.5 - 23.5	7.5 - 9.5	2.5 - 3.5	0.5 - 2.0	0.90 max
Typical Results[2]	0.01	22.7	8.5	3.0	1.4	0.4
	%P	**%S**	**%N**	**%Cu**	**FN**	
Requirements AWS ER2209	0.03 max	0.03 max	0.08 - 0.20	0.75 max	Not Required	
Typical Results[2]	0.01	0.001	0.15	0.06	30 - 60	

[1]Typical wire composition. [2]See test results disclaimer

IMPORTANT: SPECIAL VENTILATION AND/OR EXHAUST REQUIRED

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LINCOLN® ER2594

Stainless ▪ AWS ER2594

KEY FEATURES

- A super-duplex grade electrode that provides matching chemistry and mechanical property characteristics to wrought super-duplex alloys such as 2507 and Zeron 100, as well as to super-duplex casting alloys (ATSM A890)
- The electrode is over-alloyed 2-3% in nickel to provide the optimum ferrite/austenite ratio in the finished weld resulting in high tensile and yield strength and superior resistance to stress corrosion, cracking (SCC) and pitting corrosion
- Q2 Lot® - Certificate showing actual wire composition and calculated ferrite number (FN) available online
- Ink jet printing identification on entire length of electrode

CONFORMANCES

AWS A5.9/A5.9M:	ER2594
ISO 14343:2009:	25 9 4 N L
ASME SFA-5.9	ER2594

TYPICAL APPLICATIONS

- Process Pipework
- Pumps and Valves
- Pressure Vessels

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Tube 30 lb (13.6 kg) Master Carton
1/16 (1.6)	ED035194
3/32 (2.4)	ED035195
1/8 (3.2)	ED035196

WIRE COMPOSITION[1] – *As Required per AWS A5.9/A5.9M*

	%C	%Cr	%Ni	%Mo	%Mn	%Si
Requirements AWS ER2594	0.03 max	24.0 - 27.0	8.0 - 10.5	2.5 - 4.5	2.5 max	1.0 max
Typical Results[2]	0.02	24.6	8.6	3.8	0.8	0.3
	%P	**%S**	**%N**	**%Cu**	**%W**	**FN**
Requirements AWS ER2594	0.03 max	0.02 max	0.20 - 0.30	1.5 max	1.00 max	Not Required
Typical Results[2]	0.02	0.01	0.25	0.01	0.01	30 - 60

[1]Typical wire composition. [2]See test results disclaimer

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ER16.8.2

Stainless ▪ AWS ER16-8-2

KEY FEATURES

- 16% Chromium, 8% nickel, 2% molybdenum cut length
- Low ferrite weld deposit (1-5)
- Cyrogenic toughness properties down to -196°C (-320°F)
- Designed to weld 304H, 316H, 321 and 347H base materials

WELDING POSITIONS

All

SHIELDING GAS

100% Argon

CONFORMANCES

AWS A5.9	ER16-8-2
BS EN ISO 14343-A	16 8 2
BS EN ISO 14343-B	SS16-8-2

TYPICAL APPLICATIONS

- Furnace parts
- Gas and steam turbine
- Petrochemical
- Chemical process plants
- Power generation industries
- Cryogenic applications
- Catalytic crackers
- Steam Piping

DIAMETERS / PACKAGING

Diameter in (mm)	5.5 lb (2.5 kg) Tube
3/32 (2.5) 1/8 (3.2)	TER1682-24 TER1682-32

MECHANICAL PROPERTIES[1] – *As Required per AWS A5.9*

	Yield Strength[2] MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @-196°C (-321°F)
Requirements AWS ER16-8-2 As-Welded	-	550 (80)	35 min	-
Typical Results[3] As-Welded	420 (61)	620 (90)	40	30 (22)

DEPOSIT COMPOSITION[1] – *As Required per AWS A5.9*

	%C	%Mn	%Si	%S	%P
Requirements AWS ER16-8-2	0.10 max	1.0-2.0	0.3-0.6	0.02 max	0.03 max
Typical Results[3]	0.06	1.4	0.4	0.01	0.01
	%Cr	**%Ni**	**%Mo**	**%Cu**	
Requirements AWS ER16-8-2	14.5-16.5	7.5-9.5	1.0-2.0	0.75 max	
Typical Results[3]	15.5	8.5	1.3	0.1	

[1] Typical wire composition. [2] Measured with 0.2% offset. [3] See test results disclaimer.

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