



**Oxford**  
ALLOYS, Inc.  
Supplier of Welding Alloys

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Oxford Alloy Alum Bronze A-2  
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**MIG & TIG**

# MIG & TIG

## Oxford Alloy® C-276

AWS ERNiCrMo-4 • Nickel Alloys

### Key Features

- ❖ For welding materials of similar composition. This low carbon, nickel-chromium-molybdenum filler metal can also be used for dissimilar welding between nickel base alloys and stainless steels, as well as for surfacing and cladding.
- ❖ Due to high molybdenum content, this alloy offers excellent resistance to stress corrosion cracking and pitting and crevice corrosion.

### Conformances

AWS/ASME SFA 5.14  
ERNiCrMo-4  
UNS N10276



Chemical Composition - As required per AWS 5.14						
C	Mn	Si	Cr	Mo	W	S
0.02 max	1.0 max	0.08 max	14.5-16.5	15.0-17.0	3.0-4.5	0.03 max
P	V	Ni	Fe	Cu	Co	OET
0.04 max	0.35 max	Bal	4.0-7.0	0.50 max	2.5 max	0.50 max

Mechanical Properties - As required by AWS 5.14			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	690 (100) typical	Not Specified	Not Specified
Typical Results - As welded	730 (106)	540 (79)	39

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 59

AWS ERNiCrMo-13 • Nickel Alloys



### Key Features

- ❖ Nickel-chromium-molybdenum alloy with an extra low carbon and silicon content.
- ❖ Excellent corrosion resistance and high mechanical strength.
- ❖ Some typical base metals that this alloy is used on are ASTM and ASME B and SB 574, 575, 619, 622 and 626.

### Conformances

AWS/ASME SFA 5.14  
ERNiCrMo-13  
UNS N06059

### Chemical Composition - As required per AWS 5.14

C	Mn	Fe	P	S	Si	Ni
0.01 max	0.5 max	1.5 max	0.015 max	0.01 max	0.10 max	Bal
Co	Al	Cr	Mo	OET	Cu	
0.3 max	0.1-0.4	22.0-24.0	15.0-16.5	0.50 max	0.5 max	

### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	760 (110) typical	Not Specified	Not Specified
Typical Results - As welded	700 (102)	400 (58)	30

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 60

AWS ERNiCu-7 • Nickel Alloys

### Key Features

- ❖ Dissimilar welding applications include joining alloys to Nickel 200 and copper-nickel alloys.
- ❖ Widely used in marine applications because of its good resistance to the corrosive effects of seawater and brackish waters.
- ❖ Can be used for MIG overlay on steel after a first layer with nickel 208.

### Conformances

AWS/ASME SFA 5.14

ERNiCu-7

UNS N04060



### Chemical Composition - As required per AWS 5.14

Ni	C	Mn	Fe	Si	Cu	Al
62.0-69.0	0.15 max	4.0 max	2.5 max	1.25 max	Bal	1.25 max
Ti	P	S	OET			
1.5-3.0	0.02 max	0.015 max	0.50 max			

### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	480 (70) typical	Not Specified	Not Specified
Typical Results - As welded	530 (77)	360 (53)	34

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 61

AWS ERNi-1 • Nickel Alloys



### Key Features

- ❖ For welding of nickel 200 or 201.
- ❖ Also for overlay on steel as well as repairing cast iron castings.
- ❖ It can also be used for dissimilar joints between nickel or nickel alloys to stainless or ferritic steels.

### Conformances

AWS/ASME SFA 5.14  
ERNi-1  
UNS N02061

#### Chemical Composition - As required per AWS 5.14

Ni	C	Mn	Fe	S	Si	Cu
93.0 min	0.15 max	1.0 max	1.0 max	0.015 max	0.75 max	0.25 max
Al	Ti	P	OET			
1.5 max	2.0-3.5	0.03 max	0.50 max			

#### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	380 (55) typical	Not Specified	Not Specified
Typical Results - As welded	460 (67)	260 (38)	28

#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 67

AWS ERCuNi • Nickel Alloys

### Key Features

- ❖ For welding of 70/30, 80/20 and 90/10 copper-nickel alloys.
- ❖ Can be used for MIG overlay on steel after a first layer with Nickel 208.
- ❖ Dissimilar welding applications include joining copper-nickel alloys to Nickel 200 or nickel-copper alloys.

### Conformances

AWS/ASME SFA 5.7  
ERCuNi  
UNS C71581

#### Chemical Composition - As required per AWS 5.7

Ni+Co	Mn	Fe	Si	Cu+Ag	Ti	Pb
29.0-32.0	1.0 max	0.40-0.75	0.25 max	Bal	0.20-0.50	0.02 max
OET	P					
0.50 max	0.02 max					

#### Mechanical Properties - As required by AWS 5.7

	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	345 (50) min	Not Specified	Not Specified
Typical Results - As welded	360 (53)	140 (21)	32



#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 82

AWS ERNiCr-3 • Nickel Alloys



### Key Features

- ❖ For welding of base materials such as ASTM B163, B166, B167 and B168 – alloys which have UNS Number N06600.
- ❖ Suitable for applications ranging from cryogenic to high temperatures making this alloy one of the most used in the nickel family.
- ❖ Also be used for dissimilar welding applications between various nickel alloys and stainless or carbon steels, as well as for overlay.

### Conformances

AWS/ASME SFA 5.14  
ERNiCr-3  
UNS N06082

#### Chemical Composition - As required per AWS 5.14

Ni	C	Mn	Fe	S	Si	Cr
67.0 min	0.10 max	2.5-3.5	3.0 max	0.015 max	0.50 max	18.0-22.0
Ti	P	Nb+Ta	Cu	OET		
0.75 max	0.03 max	2.0-3.0	0.50 max	0.50 max		

#### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) typical	Not Specified	Not Specified
Typical Results - As welded	460 (67)	260 (38)	28

#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 617

AWS ERNiCrCoMo-1 • Nickel Alloys

### Key Features

- ❖ For welding of nickel-chrome-cobalt-molybdenum alloys to themselves as well as dissimilar metals such as stainless, carbon or low alloy steels.
- ❖ Also be used for overlay welding where similar chemical composition is desired.
- ❖ The weld metal provides optimum strength and oxidation resistance from 1500°F (815°C) up to 2100°F (1150°C).

### Conformances

AWS/ASME SFA 5.14  
ERNiCrCoMo-1  
UNS N06617



### Chemical Composition - As required per AWS 5.14

Ni	Cr	Co	Mo	Al	C	Fe
Bal	20.0-24.0	10.0-15.0	8.0-10.0	0.8-1.5	0.05-0.15	3.0 max
Mn	Si	S	Ti	Cu	P	OET
1.0 max	1.0 max	0.015 max	0.60 max	0.50 max	0.03 max	0.50 max

### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	620 (90) typical	Not Specified	Not Specified
Typical Results - As welded	770 (112)	610 (89)	28

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy<sup>®</sup> 622

AWS ERNiCrMo-10 • Nickel Alloys



### Key Features

- ❖ A nickel based alloy with chromium, molybdenum, and tungsten as the principal alloying elements.
- ❖ Used to weld alloys of similar composition as well as dissimilar joints between nickel-chromium-molybdenum alloys and stainless or carbon or low alloy steels.
- ❖ For cladding overlay as well as thermal spray applications.
- ❖ It offers an outstanding resistance to stress corrosion cracking, pitting and crevice corrosion.

### Conformances

AWS/ASME SFA 5.14  
ERNiCrMo-10  
UNS N06022

### Chemical Composition - As required per AWS 5.14

C	Mn	Si	Fe	S	P	Cr
0.015 max	0.50 max	0.08 max	2.0-6.0	0.010 max	0.02 max	20.0-22.5
Mo	W	Ni	Cu	Co	V	OET
12.5-14.5	2.5-3.5	Bal	0.50 max	2.5 max	0.35 max	0.50 max

### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	690 (100) typical	Not Specified	Not Specified
Typical Results - As welded	790 (115)	570 (82)	38

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 625

AWS ERNiCrMo-3 • Nickel Alloys

### Key Features

- ❖ Contains low iron (Fe less than 1%) and is used for welding of nickel-chromium-molybdenum alloys.
- ❖ Also for cladding and welding dissimilar base metals such as Ni-Cr-Mo alloys to stainless and carbon steels.
- ❖ The Ni-Cr-Mo alloy system provides excellent resistance to oxidizing and reducing environments. The high molybdenum content provides good stress, pitting and crevice corrosion resistance.

### Conformances

AWS/ASME SFA 5.14  
ERNiCrMo-3  
UNS N06625  
ABS Approved



Chemical Composition - As required per AWS 5.14						
Ni	C	Mn	Fe	S	Si	P
58.0 min	0.10 max	0.50 max	5.0 max	0.015 max	0.50 max	0.02 max
Cr	Al	Nb+Ta	Mo	Ti	Cu	OET
20.0-23.0	0.40 max	3.15-4.15	8.0-10.0	0.40 max	0.50 max	0.50 max

Mechanical Properties - As required by AWS 5.14			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	760 (110) typical	Not Specified	Not Specified
Typical Results - As welded	790 (115)	590 (85)	35

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 718

AWS ERNiFeCr-2 • Nickel Alloys



### Key Features

- ❖ Used for welding alloys 718, 706 and X-750.
- ❖ Primarily for welding high strength aircraft components and liquid rocket components involving cryogenic temperatures.
- ❖ High heat input processes such as MIG welding often result in micro fissuring. This alloy can be age hardened to higher strengths.

### Conformances

AWS/ASME SFA 5.14  
ERNiFeCr-2  
UNS N07718

#### Chemical Composition - As required per AWS 5.14

Ni	C	Mn	Fe	S	Si	Cu
50.0-55.0	0.08 max	0.35 max	Bal	0.015 max	0.35 max	0.30 max
Cr	Al	Ti	Nb+Ta	Mo	P	OET
17.0-21.0	0.20-0.80	0.65-1.15	4.75-5.50	2.80-3.30	0.015 max	0.50 max

#### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	1140 (165) typical	Not Specified	Not Specified
Typical Results - As welded	860 (125)	630 (91)	27

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 825

AWS ERNiFeCr-1 • Nickel Alloys

### Key Features

- ❖ Used for welding of nickel-chromium-molybdenum-copper alloys.
- ❖ Also can be used to overlay cladding where similar chemical composition is required.

### Conformances

AWS/ASME SFA 5.14

ERNiFeCr-1

UNS N08065

### Chemical Composition - As required per AWS 5.14

Ni	C	Mn	Fe	S	Si	Cu
38.0-46.0	0.05 max	1.0 max	22.0 min	0.03 max	0.50 max	1.5-3.0
Cr	Al	Ti	Mo	P	OET	
19.5-23.5	0.20 max	0.60-1.20	2.50-3.50	0.03 max	0.50 max	

### Mechanical Properties - As required by AWS 5.14

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) typical	Not Specified	Not Specified
Typical Results - As welded	550 (80)		25



### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	26-29	150-190	Spray Transfer 100% Argon
.045	1.2	GMAW	28-32	180-220	
1/16	1.6	GMAW	29-33	200-250	
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 308/308H

AWS ER308/308H • Stainless Steel



### Key Features

- ❖ Used to weld unstabilized austenitic stainless steels such as 302, 304H and 305.
- ❖ Provides a high carbon deposit (minimum of .04% carbon) for high temperature applications.

### Conformances

AWS/ASME SFA 5.9  
ER308/308H  
UNS S30880

### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	S	P
0.04-0.08	1.0-2.5	0.30-0.65	19.5-22.0	9.0-11.0	0.03 max	0.03 max
Mo	Cu					
0.50 max	0.75 max					

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	600 (87)	410 (59)	41

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 308/308L

AWS ER308/308L • Stainless Steel

### Key Features

- ❖ Weld deposit with reduced carbon levels (0.04% max) that offers increased resistance to inter-granular corrosion.
- ❖ Type 308L is ideal for welding Type 304L stainless steels.

### Conformances

AWS/ASME SFA 5.9  
ER308/308L  
UNS S30883



Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	S	P
0.03 max	1.0-2.5	0.30-0.65	19.5-22.0	9.0-11.0	0.03 max	0.03 max
Mo	Cu					
0.75 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	580 (84)	400 (58)	42

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> 308LSi

AWS ER308LSi • Stainless Steel



### Key Features

- ❖ Primarily weld equipment made with 304 type stainless steel.
- ❖ Higher silicon content improves wetting of the weld metal, and potentially higher travel speeds compared to standard 308L products.

### Conformances

AWS/ASME SFA 5.9  
ER308LSi  
UNS S30888

Chemical Composition - As required per AWS 5.9						
C	Cr	Ni	Mo	Mn	Si	P
0.03 max	19.5-22.0	9.0-11.0	0.75 max	1.0-2.5	0.65-1.00	0.03 max
S	Cu					
0.03 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	580 (84)	400 (58)	41

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 309/309L

AWS ER309/309L • Stainless Steel

### Key Features

- ❖ Reduced carbon levels (0.04% max) that offers increased resistance to inter-granular corrosion.
- ❖ Type 309/309L is ideal for joining stainless steels to themselves or to carbon or low alloy steels.
- ❖ Can be used at temperatures of up to 700°F (371°C).

### Conformances

AWS/ASME SFA 5.9  
ER309/309L  
UNS S30983



### Chemical Composition - As required per AWS 5.9

C	Cr	Ni	Mo	Mn	Si	P
0.03 max	23.0-25.0	12.0-14.0	0.75 max	1.0-2.5	0.30-0.65	0.03 max
S	Cu					
0.03 max	0.75 max					

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	590 (86)	400 (58)	40

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy® 309LSi

AWS ER309LSi • Stainless Steel



### Key Features

- ❖ Same composition as Oxford Alloy® 309L, with higher silicon content to improve the bead appearance and increase welding ease.
- ❖ Used for mild steel to stainless joining applications. Excellent contour of the weld minimizes the need for grinding.

### Conformances

AWS/ASME SFA 5.9  
ER309LSi  
UNS S30988

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	S	P
0.03 max	1.0-2.5	0.65-1.00	23.0-25.0	12.0-14.0	0.03 max	0.03 max
Mo	Cu					
0.75 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	570 (83)	410 (60)	38

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 309LMo

ER309LMo • Stainless Steel

### Key Features

- Similar to 309 with the exception for the addition of 2.0 - 3.0% molybdenum to increase its pitting corrosion resistance in halide-containing environments.
- Primary application for this filler metal is surfacing of base metals to improve their resistance to corrosion. The 309LMo is used to achieve a single-layer overlay with a chemical composition similar to that of a 316L stainless steel.
- Also used for the first layer of a multilayer overlays with filler metals such as 316L or 317L stainless steel.

### Conformances

BS EN ISO 14343:2009 23 12 2L

Chemical Composition - As per typical heat						
C	Si	Cr	Ni	Mo	Mn	S
0.03 max	1.00 max	21.0-25.0	11.0-15.5	2.0-3.5	1.0-2.5	0.02 max
P	Cu	OET				
0.03 max	0.50 max	0.50 max				

Mechanical Properties - As per typical heat			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	620 (90)	440 (64)	42



Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 310

AWS ER310 • Stainless Steel



### Key Features

- ❖ Used for welding stainless steels of similar composition in cast and wrought forms.
- ❖ The weld deposit is fully austenitic, and as such, calls for minimal heat input during welding.

### Conformances

AWS/ASME SFA 5.9  
ER310  
UNS S31080

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	S	P
0.08-0.15	1.0-2.5	0.30-0.65	25.0-28.0	20.0-22.5	0.03 max	0.03 max
Mo	Cu					
0.75 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	610 (88)	480 (70)	41

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 312

AWS ER312 • Stainless Steel

### Key Features

- ❖ Used to weld cast and wrought alloys of similar compositions.
- ❖ Also be used for joining hard to weld materials and dissimilar metals.
- ❖ Applications should be limited to 800°F (420°C). The weld deposits exhibit high tensile strength and offer some resistance to abrasion.

### Conformances

AWS/ASME SFA 5.9  
ER312  
UNS S31380

#### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	S
0.15 max	1.0-2.5	0.30-0.65	28.0-32.0	8.0-10.5	0.75 max	0.03 max
P	Cu					
0.03 max	0.75 max					

#### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	710 (103)	590 (86)	40



#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 316/316H

AWS ER316/316H • Stainless Steel



### Key Features

- ❖ For welding 316H base metal. This filler metal is the same as Oxford Alloy® ER316, except that the allowable carbon content has been restricted to the higher portion of the 316 range.
- ❖ Carbon content in the range of 0.04 to 0.08 wt.% provides higher strength at elevated temperatures.

### Conformances

AWS/ASME SFA 5.9  
ER316/316H  
UNS S31680

#### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	S
0.04-0.08	1.0-2.5	0.30-0.65	18.0-20.0	11.0-14.0	2.0-3.0	0.03 max
P	Cu					
0.03 max	0.75 max					

#### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	580 (84)	400 (58)	38

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 316/316L

AWS ER316/316L • Stainless Steel

### Key Features

- ❖ For welding 316L base metals.
- ❖ The 2-3% molybdenum in the electrode improves pitting corrosion resistance of the weld deposit.
- ❖ Low carbon content reduces the possibility of carbide precipitation and intergranular corrosion.

### Conformances

AWS/ASME SFA 5.9  
ER316/316L  
UNS S31683



### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	S
0.03 max	1.0-2.5	0.30-0.65	18.0-20.0	11.0-14.0	2.0-3.0	0.03 max
P	Cu					
0.30 max	0.75 max					

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	550 (80)	380 (55)	40

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% CO <sub>2</sub>
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 316LSi

AWS ER316LSi • Stainless Steel



### Key Features

- Similar to 316L, with higher silicon content for optimum ease and speed in MIG welding and smooth bead appearance.

- This alloy is intended for joining 316 type stainless steels.

### Conformances

AWS/ASME SFA 5.9

ER316LSi

UNS S31688

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Mo	S
0.03 max	1.0-2.5	0.65-1.00	18.0-20.0	11.0-14.0	2.0-3.0	0.03 max
P	Cu					
0.03 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	550 (80)	380 (55)	39

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 317L

AWS ER317L • Stainless Steel

### Key Features

- ❖ Weld deposit similar to 316L with a higher molybdenum content.
- ❖ Used for welding alloys with similar compositions used in highly corrosive environments.

### Conformances

AWS/ASME SFA 5.9

ER317L

UNS S31783

### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	S	P
0.03 max	1.0-2.5	0.30-0.65	18.5-20.5	13.0-15.0	0.03 max	0.03 max
Cu	Mo					
0.75 max	3.0-4.0					

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	570 (83)	410 (60)	42



### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy® 320LR

AWS ER320LR • Stainless Steel



### Key Features

- ❖ Used for welding base metals with similar compositions including alloy 20.
- ❖ Typical applications include tanks, process piping, and heat exchangers.

### Conformances

AWS/ASME SFA 5.9  
ER320LR  
UNS N08022

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Mo	Nb+Ta
0.025 max	1.5-2.0	0.15 max	19.0-21.0	32.0-36.0	2.0-3.0	8 x C min / 0.40 max
S	P	Cu				
0.02 max	0.015 max	3.0-4.0				

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	590 (86)	400 (58)	35

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 330

AWS ER330 • Stainless Steel

### Key Features

- ❖ Used to weld wrought and cast forms of stainless steels of similar chemical compositions, which offer good heat and scale resistance to 1800°F (980°C).
- ❖ High sulfur environments can adversely affect the high temperature performance.
- ❖ The heat input must be kept to a minimum during welding to avoid the possibility of micro-fissuring.

### Conformances

AWS/ASME SFA 5.9  
ER330  
UNS N08331



### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	S
0.18-0.25	1.0-2.5	0.30-0.65	15.0-17.0	34.0-37.0	0.75 max	0.03 max
P	Cu					
0.03 max	0.75 max					

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	580 (84)	390 (57)	29

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 347

AWS ER347 • Stainless Steel



### Key Features

- ❖ Niobium stabilized stainless steel used for the welding of types 347 and 321 stainless and stainless clad steels.
- ❖ The addition of niobium reduces intergranular corrosion in severe operating conditions.

### Conformances

AWS/ASME SFA 5.9  
ER347  
UNS S34780

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Mo	S
0.08 max	1.0-2.5	0.30-0.65	19.0-21.5	9.0-11.0	0.75 max	0.03 max
P	Cu	Nb+Ta				
0.03 max	0.75 max	10 X C min / 1.0 max				

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	620 (90)	450 (65)	41

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 385

AWS ER385 • Stainless Steel

### Key Features

- ❖ For welding materials of similar chemical composition (Type 904L).
- ❖ Used in fabrication of equipment and vessels for handling and storage of sulfuric acid and phosphoric acid.
- ❖ The weld metal is fully austenitic, and must be done with low heat input, using a stringer bead technique.

### Conformances

AWS/ASME SFA 5.9  
ER385  
UNS N08904

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Cu	Mo
0.025 max	1.0- 2.5	0.50 max	19.5- 21.5	24.0- 26.0	1.2- 2.0	4.2- 5.2
S	P					
0.03 max	0.02 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	600 (87)	410 (59)	36



Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> 410 AWS ER410 • Stainless Steel



### 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.
- ❖ Being an air-hardening type, calls for a pre-heat and inter-pass temperature of not less than 400°F (200°C) during welding.

### Conformances

AWS/ASME SFA 5.9  
ER410  
UNS S41080

#### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Mo	S	P
0.12 max	0.6 max	0.5 max	11.5-13.5	0.75 max	0.03 max	0.03 max
Ni	Cu					
0.6 max	0.75 max					

#### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	540 (78)	340 (49)	25

#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 410NiMo

AWS ER410NiMo • Stainless Steel

### Key Features

- ❖ Designed to weld materials of similar chemical composition in cast and wrought forms as well as to overlay mild and low alloy steels.
- ❖ Preheat and inter-pass temperatures of not less than 300°F (150°C) are recommended during welding. Post-weld heat treatment should not exceed 1150°F (620°C) as higher temperatures may result in hardening.

### Conformances

AWS/ASME SFA 5.9  
ER410NiMo  
UNS S41086



Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Mo	S
0.06 max	0.6 max	0.5 max	11.0-12.5	4.0-5.0	0.4-0.7	0.03 max
P	Cu					
0.03 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	820 (119)	630 (91)	20

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 420

AWS ER420 • Stainless Steel



### Key Features

- ❖ Used for surfacing applications that call for superior resistance to abrasion.
- ❖ Similar to the Oxford Alloy ER410, except for the higher carbon content.
- ❖ Requires preheat and interpass temperatures of not less than 400°F, followed by slow cooling.

### Conformances

AWS/ASME SFA 5.9  
ER420  
UNS S42080

Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Mo	S	P
0.25-0.40	0.6 max	0.5 max	12.0-14.0	0.75 max	0.03 max	0.03 max
Ni	Cu					
0.6 max	0.75 max					

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	1,000 (145)	830 (120)	45

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 630

AWS ER630 • Stainless Steel

### Key Features

- ❖ Precipitation hardening stainless steel used for welding materials of similar chemical composition such as 17-4 and 17-7.
- ❖ Can be used in the as welded condition or may be heat treated to obtain higher strength.
- ❖ Mechanical properties of the alloy are greatly influenced by the heat treatment.

### Conformances

AWS/ASME SFA 5.9  
ER630  
UNS S17480



Chemical Composition - As required per AWS 5.9						
C	Mn	Si	Cr	Ni	Mo	Cu
0.05 max	0.25-0.75	0.75 max	16.0-16.75	4.5-5.0	0.75 max	3.25-4.00
Nb+Ta	S	P				
0.15-0.30	0.03 max	0.03 max				

Mechanical Properties - As required by AWS 5.9			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	990 (144)	850 (123)	10

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy® 16-8-2

AWS ER16-8-2 • Stainless Steel



### Key Features

- ❖ With molybdenum specifically at the lower limit 16-8-2, it is essentially a dilute hybrid between E308H and E316H. Rather than matching any single parent material, it has applications for welding all the '3XXH' series of stainless steels with 0.04-0.10% carbon, which combine creep, oxidation and general corrosion resistance.
- ❖ A low total Cr+Mo with controlled carbon and ferrite content ensures high resistance to thermal embrittlement by intermetallic phases.

### Conformances

AWS/ASME SFA 5.9  
ER16-8-2  
UNS S16880

#### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	Cu
0.10 max	1.0- 2.0	0.30- 0.65	14.5- 16.5	7.5- 9.5	1.0- 2.0	0.75 max
S	P					
0.03 max	0.03 max					

#### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	620(90)		37

#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 2209

AWS ER2209 • Duplex

### Key Features

- ❖ Used to weld duplex stainless steels such as (Type 2205).
- ❖ The welds offer excellent resistance to stress corrosion, cracking and pitting. The microstructure of the weld metal consists of austenite and ferrite.
- ❖ Welding of duplex stainless steels calls for controlled welding parameters to achieve specified mechanical and corrosion resistant properties.

### Conformances

AWS/ASME SFA 5.9  
ER2209  
UNS S39209



### Chemical Composition - As required per AWS 5.9

C	Mn	Si	Cr	Ni	Mo	S
0.03 max	0.50 -2.0	0.90 max	21.5- 23.5	7.5- 9.5	2.5- 3.5	0.03 max
P	Cu	N				
0.03 max	0.75 max	0.08- 0.20				

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	720 (104)	560 (81)	26

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 ½ % Argon / 2 ½ CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> 2594 AWS ER2594 • Super Duplex



### Key Features

- ❖ Super-duplex grade 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).
- ❖ Over-alloyed 2-3% in nickel to provide the optimum ferrite/austenite ratio in the finished weld. This structure results in high tensile and yield strengths and superior resistance to stress corrosion cracking (SCC) and pitting corrosion.

### Conformances

AWS/ASME SFA 5.9  
ER2594  
UNS S32750

### Chemical Composition - As required per AWS 5.9

C	Cr	Ni	Mo	Mn	Si	P
0.03 max	24.0-27.0	8.0-10.5	2.5-4.5	2.5 max	1.0 max	0.03 max
S	N	Cu	W			
0.02 max	0.20-0.30	1.5 max	1.0 max			

### Mechanical Properties - As required by AWS 5.9

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	850 (123)	650 (94)	28

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-23	180-210	Spray Transfer 98% Argon / 2% Oxygen
.045	1.2	GMAW	23-25	195-260	
1/16	1.6	GMAW	25-28	260-390	
.035	0.9	GMAW	19-23	55-170	Short Circuiting Transfer 90% Helium / 7 1/2 % Argon / 2 1/2 CO <sub>2</sub>
.045	1.2	GMAW	19-23	100-185	
1/16	1.6	GMAW			
1/16	1.6	GTAW	14-18	90-130	100% Argon
3/32	2.4	GTAW	15-20	120-175	100% Argon
1/8	3.2	GTAW	15-20	150-220	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 80S-B2

AWS ER80S-B2 • Chrome Moly

### Key Features

- ◆ Designed for welding on 1-1/4 Cr / 1/2 Mo steels, which are used for high temperature service.
- ◆ Preheating and interpass temperatures of not less than 300°F must be used during welding.

### Conformances

AWS/ASME SFA 5.28  
ER80S-B2  
UNS K20900

#### Chemical Composition - As required per AWS 5.28

C	Mn	Si	Cr	Mo	P	S
0.07-0.12	0.40-0.70	0.40-0.70	1.20-1.50	0.40-0.65	0.025 max	0.025 max
Cu	Ni	OET				
0.35 max	0.20 max	0.50 max				

#### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	515 (75) min	470 (68) min	19 min
Typical Results <sup>(9)</sup> - As welded	590 (86)	500 (73)	26



#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

<sup>(9)</sup> Typical Results are based on Preheat, Interpass, and PWHT temperatures per AWS 5.28. Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 80S-B6

AWS ER80S-B6 • Chrome Moly



### Key Features

- ❖ Designed for welding of materials of similar composition, for high temperature service conditions.
- ❖ Air-hardening material therefore calls for preheat and interpass temperatures of 350°F minimum during welding.
- ❖ Typical applications include power generation, pressure vessels, petrochemical, and process piping.

### Conformances

AWS/ASME SFA 5.28  
ER80S-B6  
UNS S50280

### Chemical Composition - As required per AWS 5.28

C	Mn	Si	Cr	Mo	S	P
0.10 max	0.40- 0.70	0.50 max	4.50- 6.00	0.45- 0.65	0.025 max	0.025 max
Ni	Cu	OET				
0.6 max	0.35 max	0.50 max				

### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) min	470 (68) min	17 min
Typical Results <sup>(a)</sup> - As welded	630 (91)	480 (70)	25

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

<sup>(a)</sup> Typical Results are based on Preheat, Interpass, and PWHT temperatures per AWS 5.28. Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 80S-B8

AWS ER80S-B8 • Chrome Moly

### Key Features

- ❖ Designed for welding materials of similar composition.
- ❖ Air hardening type that calls for preheat and interpass temperatures of not less than 350°F during welding.
- ❖ Typical applications include power generation, pressure vessels, petrochemical, and process piping.

### Conformances

AWS/ASME SFA 5.28  
ER80S-B8  
UNS S50480



### Chemical Composition - As required per AWS 5.28

C	Mn	Si	Cr	Mo	S	P
0.10 max	0.40-0.70	0.50 max	8.00-10.5	0.8-1.2	0.025 max	0.025 max
Ni	Cu	OET				
0.5 max	0.35 max	0.50 max				

### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	550 (80) min	470 (68) min	17 min
Typical Results <sup>(9)</sup> -As welded	640 (93)	490 (71)	30

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

<sup>(9)</sup> Typical Results are based on Preheat, Interpass, and PWHT temperatures per AWS 5.28. Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 90S-B3

AWS ER90S-B3 • Chrome Moly



### Key Features

- ❖ Designed for welding 2-1/4 Cr / 1 Mo steels, which are used for high temperature applications.
- ❖ A preheat and interpass temperature of not less than 350°F should be maintained during welding.
- ❖ Typical applications include power generation, pressure vessels, petrochemical, and process piping.

### Conformances

AWS/ASME SFA 5.28  
ER90S-B3  
UNS K30960

### Chemical Composition - As required per AWS 5.28

C	Mn	Si	Cr	Mo	P	S
0.07-0.12	0.40-0.70	0.40-0.70	2.30-2.70	0.90-1.20	0.025 max	0.025 max
Cu	Ni	OET				
0.35 max	0.20 max	0.50 max				

### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	620 (90) min	540 (78) min	17 min
Typical Results <sup>(a)</sup> - As welded	670 (97)	550 (80)	26

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

<sup>(a)</sup> Typical Results are based on Preheat, Interpass, and PWHT temperatures per AWS 5.28. Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 90S-B9

AWS ER90S-B9 • Chrome Moly

### Key Features

- ❖ Designed to weld high temperature steels for hot hydrogen service.
- ❖ Suitable for 9% Chromium steels such as P91, T91 and F91.
- ❖ Applications include steam generation and petrochemical equipment. Preheat and interpass is required.

### Conformances

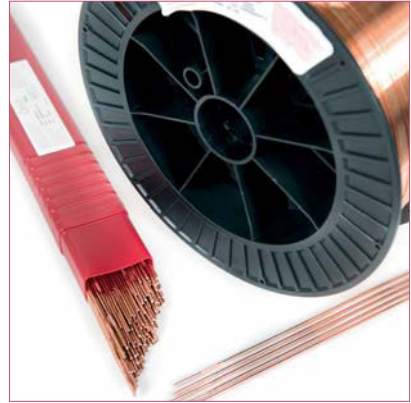
AWS/ASMS SFA 5.28  
ER90S-B9  
UNS S50482

#### Chemical Composition - As required per AWS 5.28

C	Mn	Si	Cr	Ni	Mo	Cu
0.07-0.13	1.20 max	0.15-0.50	8.0-10.50	0.80 max	0.85-1.20	0.20 max
V	P	S	Al	OET		
0.15-0.30	0.010 max	0.010 max	0.04 max	0.50 max		

#### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	620 (90) min	410 (60) min	16 min
Typical Results <sup>(9)</sup> -As welded	750 (109)	650 (94)	18



#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

<sup>(9)</sup> Typical Results are based on Preheat, Interpass, and PWHT temperatures per AWS 5.28. Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy<sup>®</sup> 70S-2

AWS ER70S-2 • Mild Steel



### Key Features

- ❖ Triple deoxidized (aluminum, titanium, zirconium) welding wire designed for welding over rust and mill scale.
- ❖ The less fluid weld puddle of Oxford Alloy ER70S-2 makes it easier to control when used out of position.
- ❖ This wire is preferred for all position welding of small diameter pipe.

### Conformances

AWS/ASME SFA 5.18  
ER70S-2  
UNS K10726

#### Chemical Composition - As required per AWS 5.18

C	Mn	Si	P	S	Ni	Cr
0.07 max	0.90- 1.40	0.40- 0.70	0.025 max	0.035 max	0.15 max	0.15 max
Mo	V	Al	Zr	Ti	Cu	
0.15 max	0.03 max	0.05- 0.15	0.02- 0.12	0.05- 0.15	0.50 max	

#### Mechanical Properties - As required by AWS 5.18

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	480 (70) min	400 (58) min	22 min
Typical Results - As welded	550 (80)	490 (71)	29

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 70S-3

AWS ER70S-3 • Mild Steel

### Key Features

- ❖ Silicon and manganese deoxidized wire used for mild and low alloy steel general purpose fabrication.
- ❖ Produces quality welds with rimmed steels, better welds on semi-deoxidized steels and excellent welds on fully deoxidized steels.
- ❖ Some typical applications include earthmoving and farm equipment, automobile frames, sheet metal, ships and barges, railcars, abcd trailers.

### Conformances

AWS/ASME SFA 5.18  
ER70S-3  
UNS K11022



### Chemical Composition - As required per AWS 5.18

C	Mn	Si	P	S	Ni	Cr
0.06-0.15	0.90-1.40	0.45-0.75	0.025 max	0.035 max	0.15 max	0.15 max
Mo	V	Cu				
0.15 max	0.03 max	0.50 max				

### Mechanical Properties - As required by AWS 5.18

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	480 (70) min	400 (58) min	22 min
Typical Results - As welded	520 (75)	430 (62)	33

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> 70S-6 AWS ER70S-6 • Mild Steel



### Key Features

- ❖ Contains high levels of manganese and silicon for stronger deoxidizing power where stringent cleaning procedures are not possible.
- ❖ The high silicon content increases the fluidity of the weld pool, creating a smoother bead appearance and resulting in minimal post-weld grinding.
- ❖ Designed to provide X-ray quality porosity-free welds and the highest tensile strength (as welded) of the plain carbon steel wires.

### Conformances

AWS/ASME SFA 5.18  
ER70S-6  
UNS K11140

### Chemical Composition - As required per AWS 5.18

C	Mn	Si	P	S	Ni	Cr
0.06-0.15	1.40-1.85	0.80-1.15	0.025 max	0.035 max	0.15 max	0.15 max
Mo	V	Cu				
0.15 max	0.03 max	0.50 max				

### Mechanical Properties - As required by AWS 5.18

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	480 (70) min	400 (58) min	22 min
Typical Results - As welded	550 (80)	450 (65)	30

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 80S-D2

AWS ER80S-D2 • Mild Steel

### Key Features

- ❖ Low alloy steel wire with 2% manganese and 0.5% molybdenum as alloying elements.
- ❖ The weld deposits of this wire have moderately high strength with adequate low temperature toughness.
- ❖ A pre-heat and interpass temperature of not less than 300°F is required during welding.

### Conformances

AWS/ASME SFA 5.28  
ER80S-D2  
UNS K10945



Chemical Composition - As required per AWS 5.28						
C	Mn	Si	Mo	P	S	Cu
0.07-0.12	1.60-2.10	0.50-0.80	0.40-0.60	0.025 max	0.025 max	0.50 max
Ni	OET					
0.15 max	0.50 max					

Mechanical Properties - As required by AWS 5.28			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) min	470 (68) min	17 min
Typical Results - As welded	640 (93)	590 (86)	22

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.035	0.9	GMAW	22-25	100-140	
.045	1.2	GMAW	23-26	120-150	100% Argon
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® 80S-Ni1

AWS ER80S-Ni1 • Mild Steel



### Key Features

- ❖ Used for welding low alloy high strength steels requiring good toughness at temperatures as low as -40°F (-40°C).

### Conformances

AWS/ASME SFA 5.28  
ER80S-Ni1  
UNS K11260

### Chemical Composition - As required per AWS 5.28

C	Mn	Si	P	S	Ni	Cr
0.12 max	1.25 max	0.40-0.80	0.025 max	0.025 max	0.80-1.10	0.15 max
Mo	V	Cu	OET			
0.35 max	0.05 max	0.35 max	0.50 max			

### Mechanical Properties - As required by AWS 5.28

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) min	470 (68) min	24 min
Typical Results - As welded	600 (87)	530 (77)	26

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 80S-Ni2

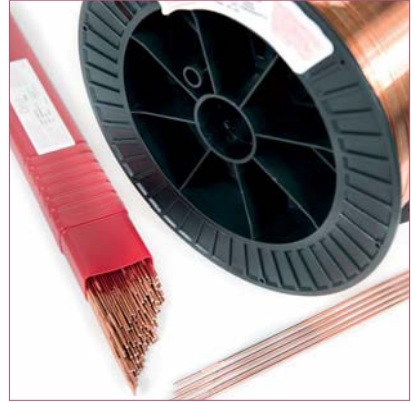
AWS ER80S-Ni2 • Mild Steel

### Key Features

- Used for welding 2-1/2 percent nickel steels and other materials requiring a tensile strength of 80 ksi (550 MPa) and good toughness at temperatures as low as -80°F (-62°C).

### Conformances

AWS/ASME SFA 5.28  
ER80S-Ni2  
UNS K21240



Chemical Composition - As required per AWS 5.28						
C	Mn	Si	P	S	Ni	Cu
0.12 max	1.25 max	0.40-0.80	0.025 max	0.025 max	2.00-2.75	0.35 max
OET						
0.50 max						

Mechanical Properties - As required by AWS 5.28			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	550 (80) min	470 (68) min	24 min
Typical Results - As welded	620 (90)	530 (77)	26

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	28-32	165-200	Spray Transfer 98% Argon + 2% Oxygen or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	30-34	180-220	
1/16	1.6	GMAW	30-34	230-260	
.035	0.9	GMAW	22-25	100-140	Short Circuiting Transfer 100% CO <sub>2</sub> or 75% Argon + 25% CO <sub>2</sub>
.045	1.2	GMAW	23-26	120-150	
1/16	1.6	GMAW	23-26	160-200	
1/16	1.6	GTAW	12-15	100-125	100% Argon
3/32	2.4	GTAW	15-20	125-175	100% Argon
1/8	3.2	GTAW	15-20	175-250	100% Argon

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> 4043 AWS ER4043 • Aluminum



### Key Features

- ❖ A 5% silicon aluminum recommended for welding 3003, 3004, 5052, 6061, 6063 and casting alloys 43, 355, 356 and 214.
- ❖ Has a melting range of 1065 - 1170°F and a density of .097 lbs./cu. in. The post-anodizing color tint of the weld area is gray.

### Conformances

AWS/ASME SFA 5.10  
ER4043  
UNS A94043

### Chemical Composition - As required per AWS 5.10

Si	Fe	Cu	Mn	Mg	Zn	Ti
4.5-6.0	0.8 max	0.30 max	0.05 max	0.05 max	0.10 max	0.20 max
OEE	OET	Al				
0.05 max	0.15 max	Bal				

### Mechanical Properties - As required by AWS 5.10

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	190 (27)	125 (18)	8

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-28	100-175	Spray Transfer 100% Argon
.045	1.2	GMAW	22-28	120-210	
1/16	1.6	GMAW	24-30	160-300	
.035	0.9	GMAW	17-19	50-150	Short Circuiting Transfer 100% Argon
.045	1.2	GMAW	16-20	60-175	
1/16	1.6	GMAW	16-20	60-175	
1/16	1.6	GTAW		60-100	100% Argon
3/32	2.4	GTAW		125-160	100% Argon
1/8	3.2	GTAW		180-240	100% Argon

### Diameters & Packaging

Oxford Alloys USA				Oxford Alloys Asia Pacific			
Diameter (in)	Form	Quantity (lbs)	Spool Dimension	Diameter (mm)	Form	Quantity (kgs)	Spool Dimension
.035	GMAW	16 lb	12 inch	0.9	GMAW	7 kg	300mm
.045	GMAW	16 lb	12 inch	1.2	GMAW	7 kg	300mm
1/16	GMAW	16 lb	12 inch	1.6	GMAW	7 kg	300mm
.035	GMAW	1 lb	4 inch	0.9	GMAW	0.5 kg	100mm
.045	GMAW	1 lb	4 inch	1.2	GMAW	0.5 kg	100mm
1/16	GMAW	1 lb	4 inch	1.6	GMAW	0.5 kg	100mm
1/16	GTAW	10 lb tube		1.6	GTAW	5 kg tube	
3/32	GTAW	10 lb tube		2.4	GTAW	5 kg tube	
1/8	GTAW	10 lb tube		3.2	GTAW	5 kg tube	

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® 5183

AWS ER5183 • Aluminum

### Key Features

- ❖ Used for joining and overlay processing of similar grades containing 4.5% magnesium.
- ❖ Common uses include pressure vessels, ship building, and boilers. The post-anodizing color tint of the weld area is gray.

### Conformances

AWS/ASME SFA 5.10  
ER5183  
UNS A95183



Chemical Composition - As required per AWS 5.10						
Si	Fe	Cu	Mn	Mg	Cr	Zn
0.40 max	0.40 max	0.10 max	0.05-1.0	4.30-5.20	0.05-0.25	0.25 max
Al	Ti	OEE	OET			
Bal	0.15 max	0.05 max	0.15 max			

Mechanical Properties - As required by AWS 5.10			
	Tensile Strength MPa (kst)	Yield Strength MPa (kst)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	275 (40)	125 (18)	17

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-28	100-175	Spray Transfer 100% Argon
.045	1.2	GMAW	22-28	120-210	
1/16	1.6	GMAW	24-30	160-300	
.035	0.9	GMAW	17-19	50-150	Short Circuiting Transfer 100% Argon
.045	1.2	GMAW	16-20	60-175	
1/16	1.6	GMAW	16-20	60-175	
1/16	1.6	GTAW		60-100	100% Argon
3/32	2.4	GTAW		125-160	100% Argon
1/8	3.2	GTAW		180-240	100% Argon

Diameters & Packaging							
Oxford Alloys USA				Oxford Alloys Asia Pacific			
Diameter (in)	Form	Quantity (lbs)	Spool Dimension	Diameter (mm)	Form	Quantity (kgs)	Spool Dimension
.035	GMAW	16 lb	12 inch	0.9	GMAW	7 kg	300mm
.045	GMAW	16 lb	12 inch	1.2	GMAW	7 kg	300mm
1/16	GMAW	16 lb	12 inch	1.6	GMAW	7 kg	300mm
.035	GMAW	1 lb	4 inch	0.9	GMAW	0.5 kg	100mm
.045	GMAW	1 lb	4 inch	1.2	GMAW	0.5 kg	100mm
1/16	GMAW	1 lb	4 inch	1.6	GMAW	0.5 kg	100mm
1/16	GTAW	10 lb tube		1.6	GTAW	5 kg tube	
3/32	GTAW	10 lb tube		2.4	GTAW	5 kg tube	
1/8	GTAW	10 lb tube		3.2	GTAW	5 kg tube	

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy® 5356

AWS ER5356 • Aluminum



### Key Features

- ❖ A 5% magnesium aluminum filler metal commonly used on base metals 5050, 5052, 5083, 5356, 5454 and 5456.
- ❖ The weld deposit of this filler metal offers good corrosion resistance when exposed to salt water.
- ❖ The post-anodizing color tint of the weld area is white.

### Conformances

AWS/ASME SFA 5.10  
ER5356  
UNS A95356

### Chemical Composition - As required per AWS 5.10

Si	Fe	Cu	Mn	Mg	Cr	Zn
0.25 max	0.40 max	0.10 max	0.05-0.20	4.5-5.5	0.05-0.20	0.10 max
Ti	Al	OEE	OET			
0.06-0.20	Bal	0.05 max	0.15 max			

### Mechanical Properties - As required by AWS 5.10

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	270 (39)	130 (19)	17

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	22-28	100-175	Spray Transfer 100% Argon
.045	1.2	GMAW	22-28	120-210	
1/16	1.6	GMAW	24-30	160-300	
.035	0.9	GMAW	17-19	50-150	Short Circuiting Transfer 100% Argon
.045	1.2	GMAW	16-20	60-175	
1/16	1.6	GMAW	16-20	60-175	
1/16	1.6	GTAW		60-100	100% Argon
3/32	2.4	GTAW		125-160	100% Argon
1/8	3.2	GTAW		180-240	100% Argon

### Diameters & Packaging

Oxford Alloys USA				Oxford Alloys Asia Pacific			
Diameter (in)	Form	Quantity (lbs)	Spool Dimension	Diameter (mm)	Form	Quantity (kgs)	Spool Dimension
.035	GMAW	16 lb	12 inch	0.9	GMAW	7 kg	300mm
.045	GMAW	16 lb	12 inch	1.2	GMAW	7 kg	300mm
1/16	GMAW	16 lb	12 inch	1.6	GMAW	7 kg	300mm
.035	GMAW	1 lb	4 inch	0.9	GMAW	0.5 kg	100mm
.045	GMAW	1 lb	4 inch	1.2	GMAW	0.5 kg	100mm
1/16	GMAW	1 lb	4 inch	1.6	GMAW	0.5 kg	100mm
1/16	GTAW	10 lb tube		1.6	GTAW	5 kg tube	
3/32	GTAW	10 lb tube		2.4	GTAW	5 kg tube	
1/8	GTAW	10 lb tube		3.2	GTAW	5 kg tube	

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® Ti-1

AWS ERTi-1 • Titanium

### Key Features

- ❖ Commercially Pure Titanium with good balance of strength, formability and weldability.
- ❖ Typical applications include cryogenic and petrochemical applications such as chemical process heat exchangers, pressure vessels and piping systems, pulp bleaching systems, electro chemical and chemical storage tanks.

### Conformances

AWS/ASME SFA 5.16

ERTi-1

UNS R50100

### Chemical Composition - As required per AWS 5.16

C	O	H	N	Fe	Ti	
0.03 max	0.03-0.10	0.005 max	0.012 max	0.08 max	Bal	

### Mechanical Properties - As required by AWS 5.16

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	240 (35)	170 (25)	24



### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW	16	180	100% Argon
3/32	2.4	GTAW	17	190	100% Argon
1/8	3.2	GTAW	19	205	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	5 lb tube   20 lb carton	1.6	GTAW	2 kg tube   8 kg carton
3/32	GTAW	5 lb tube   20 lb carton	2.4	GTAW	2 kg tube   8 kg carton
1/8	GTAW	5 lb tube   20 lb carton	3.2	GTAW	2 kg tube   8 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® Ti-2 AWS ERTi-2 • Titanium



### Key Features

- ❖ Commercially Pure Titanium with good balance of strength, formability and weldability.
- ❖ Typical applications include cryogenic and petrochemical applications such as chemical process heat exchangers, pressure vessels and piping systems, pulp bleaching systems, electro chemical and chemical storage tanks.

### Conformances

AWS/ASME SFA 5.16  
ERTi-2  
UNS R50120

#### Chemical Composition - As required per AWS 5.16

C	O	H	N	Fe	Ti	
0.03 max	0.08-0.16	0.008 max	0.015 max	0.12 max	Bal	

#### Mechanical Properties - As required by AWS 5.16

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	345 (50)	275 (40)	20

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW	16	180	100% Argon
3/32	2.4	GTAW	17	190	100% Argon
1/8	3.2	GTAW	19	205	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	5 lb tube   20 lb carton	1.6	GTAW	2 kg tube   8 kg carton
3/32	GTAW	5 lb tube   20 lb carton	2.4	GTAW	2 kg tube   8 kg carton
1/8	GTAW	5 lb tube   20 lb carton	3.2	GTAW	2 kg tube   8 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® Ti-5

AWS ERTi-5 • Titanium

### Key Features

- ❖ Used for welding 6% Aluminum – 4% Vanadium alloys. Commonly referred to as 6AL/4V
- ❖ The weld deposits of exhibit high fatigue strength, toughness, ductility and are heat treatable.
- ❖ Widely used in the cryogenic, petrochemical and aircraft industry.

### Conformances

AWS/ASME SFA 5.16  
ERTi-5  
UNS R56402

#### Chemical Composition - As required per AWS 5.16

C	O	H	N	Al	V	Fe
0.05 max	0.12- 0.20	0.015 max	0.03 max	5.5- 6.75	3.5- 4.5	0.22 max
Ti						
Bal						

#### Mechanical Properties - As required by AWS 5.16

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	895 (130)	830 (120)	10



#### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW	16	180	100% Argon
3/32	2.4	GTAW	17	190	100% Argon
1/8	3.2	GTAW	19	205	100% Argon

#### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	5 lb tube   20 lb carton	1.6	GTAW	2 kg tube   8 kg carton
3/32	GTAW	5 lb tube   20 lb carton	2.4	GTAW	2 kg tube   8 kg carton
1/8	GTAW	5 lb tube   20 lb carton	3.2	GTAW	2 kg tube   8 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy® Ti-7 AWS ERTi-7 • Titanium



### Key Features

- ❖ Titanium grade 7 has outstanding corrosion resistance and useful strength at low density.
- ❖ A small addition of palladium has been made to this alloy for a substantial increase in corrosion resistance.
- ❖ Typical applications include reactor autoclaves, piping and fittings, valves, heat exchangers and condensers.

### Conformances

AWS/ASME SFA 5.16  
ERTi-7  
UNS R52401

#### Chemical Composition - As required per AWS 5.16

C	O	H	N	Fe	Pd	Ti
0.03 max	0.08- 0.16	0.008 max	0.015 max	0.12 max	0.12- 0.25	Bal

#### Mechanical Properties - As required by AWS 5.16

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	345 (50)	275 (40)	20

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW	16	180	100% Argon
3/32	2.4	GTAW	17	190	100% Argon
1/8	3.2	GTAW	19	205	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	5 lb tube   20 lb carton	1.6	GTAW	2 kg tube   8 kg carton
3/32	GTAW	5 lb tube   20 lb carton	2.4	GTAW	2 kg tube   8 kg carton
1/8	GTAW	5 lb tube   20 lb carton	3.2	GTAW	2 kg tube   8 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® Zr2

AWS ERZr2 • Zirconium

### Key Features

- ❖ Excellent corrosion resistance to many chemical solutions.
- ❖ Typical applications include heat exchangers, stripper columns, reactor vessels, pumps, valves, and corrosive media piping.
- ❖ Can be machined, welded and fabricated using the same equipment and processes used in fabrication of stainless steel, nickel-based alloys and titanium.

### Conformances

AWS/ASME SFA 5.24

ERZr2

UNS R60702

### Chemical Composition - As required per AWS 5.24

Zr+Hf	Hf	Fe+Cr	H	N	C	O
99.0 min	4.5 max	0.20 max	0.005 max	0.015 max	0.03 max	0.11- 0.15

### Mechanical Properties - As required by AWS 5.24

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	380 (55)	210 (30)	16



### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW	12-15	80-150	100% Argon
3/32	2.4	GTAW	12-15	130-200	100% Argon
1/8	3.2	GTAW	112-15	180-225	100% Argon

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	5 lb tube   20 lb carton	1.6	GTAW	2 kg tube   8 kg carton
3/32	GTAW	5 lb tube   20 lb carton	2.4	GTAW	2 kg tube   8 kg carton
1/8	GTAW	5 lb tube   20 lb carton	3.2	GTAW	2 kg tube   8 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

## Oxford Alloy<sup>®</sup> Aluminum Bronze A-2

AWS ERCuAl-A2 • Bronze Alloys



### Key Features

- ❖ Used to weld and join many ferrous and nonferrous metals and combinations of dissimilar metals.
- ❖ Contains an additive to inhibit inter-granular stress corrosion cracking. This is particularly important when welding on C61300 and C61400 base metal.
- ❖ Some applications include building up bearing surfaces, joining and fabricating copper alloys, overlaying for resistance to corrosion and erosion.

### Conformances

AWS/ASME SFA 5.7  
ERCuAl-A2  
UNS C61800

### Chemical Composition - As required per AWS 5.7

Cu+Ag	Al	Fe	Si	Zn	Pb	OET
Bal	8.5-11.0	0.5-1.5	0.10 max	0.02 max	0.02 max	0.50 max

### Mechanical Properties - As required by AWS 5.7

	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	415 (60) min	Not Specified	Not Specified
Typical Results - As welded	545 (79)	240 (35)	28

### Typical Welding Parameters

Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	20-26	100-200	100% Argon
.045	1.2	GMAW	22-28	100-250	
1/16	1.6	GMAW	29-32	250-400	
1/16	1.6	GTAW		70-120	100% Argon
3/32	2.4	GTAW		120-160	
1/8	3.2	GTAW		170-230	

### Diameters & Packaging

Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® Deox Copper

AWS ERCu • Bronze Alloys

### Key Features

- ❖ Developed to provide dense, high quality deposits with relatively high electrical conductivity for use in joining and overlay with the inert-gas processes.
- ❖ Primarily used to fabricate deoxidized copper and to weld repair copper castings. It may also be used to weld galvanized steel and deoxidized copper to mild steel where high strength joints are not required.

### Conformances

AWS/ASME SFA 5.7

ERCu

UNS C18980



Chemical Composition - As required per AWS 5.7						
Cu+Ag	P	Sn	Pb	Mn	Si	Al
98.0 min	0.15 max	1.0 max	0.02 max	0.50 max	0.50 max	0.01 max
OET						
0.50 max						

Mechanical Properties - As required by AWS 5.7			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	170 (25) min	Not Specified	Not Specified
Typical Results - As welded	200 (29)	55 (8)	29

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	20-26	100-200	100% Argon
.045	1.2	GMAW	22-28	100-250	
1/16	1.6	GMAW	29-32	250-400	
1/16	1.6	GTAW		70-120	100% Helium
3/32	2.4	GTAW		120-160	
1/8	3.2	GTAW		170-230	

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.



## Oxford Alloy® Low Fuming Bronze

AWS RBCuZn-C • Bronze Alloys



### Key Features

- ❖ General purpose brazing rod used for steel, copper alloys, cast iron, nickel alloys and stainless steel.
- ❖ Low silicon content, which keep fumes to a minimum.

***This alloy also is available in a flux coated tig.***

### Conformances

AWS/ASME SFA 5.8  
RBCuZn-C  
UNS C68100

Chemical Composition - As required per AWS 5.8						
Cu	Mn	Sn	Pb	Fe	Si	Zn
56.0-60.0	0.01-0.50	0.80-1.10	0.05 max	0.25-1.20	0.04-0.15	Bal
Al	OET					
0.01 max	0.50 max					

Mechanical Properties - As required by AWS 5.8			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	Not Specified		
Typical Results - As welded	390 (56)		

Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
1/16	1.6	GTAW		70-120	100% Helium
3/32	2.4	GTAW		120-160	
1/8	3.2	GTAW		170-230	

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.

# MIG & TIG

## Oxford Alloy® Silicon Bronze

AWS ERCuSi-A • Bronze Alloys

### Key Features

- ❖ Used for the welding of copper, copper-silicon, and copper-zinc base metals to themselves
- ❖ Can also be used to surface areas subject to corrosion.

### Conformances

AWS/ASME SFA 5.7  
ERCuSi-A  
UNS C65600

Chemical Composition - As required per AWS 5.7						
Cu+Ag	Zn	Sn	Mn	Fe	Si	Al
Bal	1.0 max	1.0 max	1.5 max	0.50 max	2.8-4.0	0.01 max
Pb	OET					
0.02 max	0.50 max					

Mechanical Properties - As required by AWS 5.7			
	Tensile Strength MPa (ksi)	Yield Strength MPa (ksi)	Elongation %
AWS Requirements	345 (50) min	Not Specified	Not Specified
Typical Results - As welded	350 (51)		



Typical Welding Parameters					
Diameter		Process	Volt	Amps	Shielding Gas
in	(mm)				
.035	0.9	GMAW	20-26	100-200	100% Argon
.045	1.2	GMAW	22-28	100-250	
1/16	1.6	GMAW	29-32	250-400	
1/16	1.6	GTAW		70-120	100% Helium
3/32	2.4	GTAW		120-160	
1/8	3.2	GTAW		170-230	

Diameters & Packaging					
Oxford Alloys USA			Oxford Alloys Asia Pacific		
Diameter (in)	Form	Packaging (lbs)	Diameter (mm)	Form	Packaging (kgs)
.035	GMAW	33 lb spool   1980 lb pallet	0.9	GMAW	15 kg spool   900 kg pallet
.045	GMAW	33 lb spool   1980 lb pallet	1.2	GMAW	15 kg spool   900 kg pallet
1/16	GMAW	33 lb spool   1980 lb pallet	1.6	GMAW	15 kg spool   900 kg pallet
1/16	GTAW	10 lb tube   40 lb carton	1.6	GTAW	5 kg tube   20 kg carton
3/32	GTAW	10 lb tube   40 lb carton	2.4	GTAW	5 kg tube   20 kg carton
1/8	GTAW	10 lb tube   40 lb carton	3.2	GTAW	5 kg tube   20 kg carton

Actual test results may vary. Refer test result disclaimer on page 160.