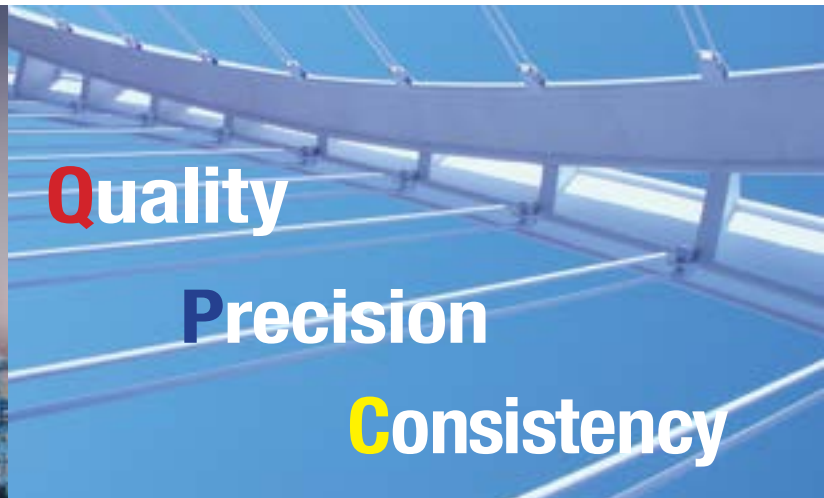




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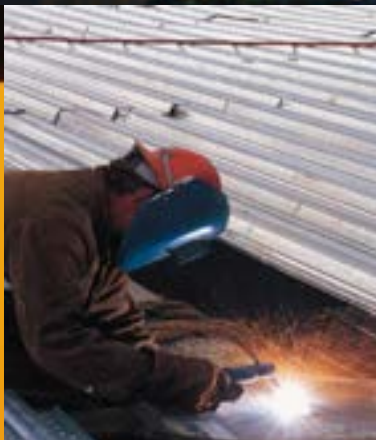
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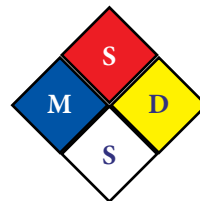
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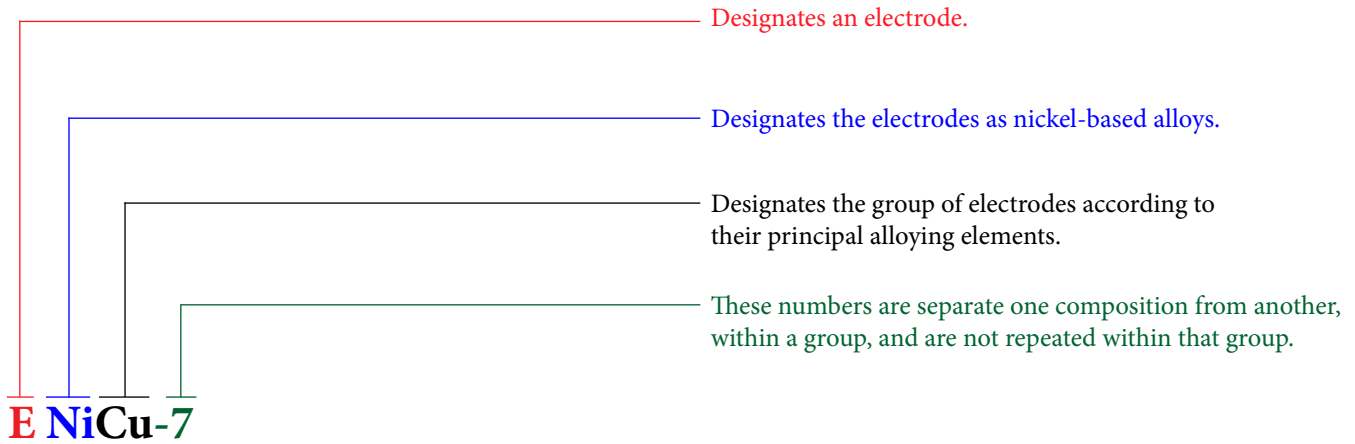
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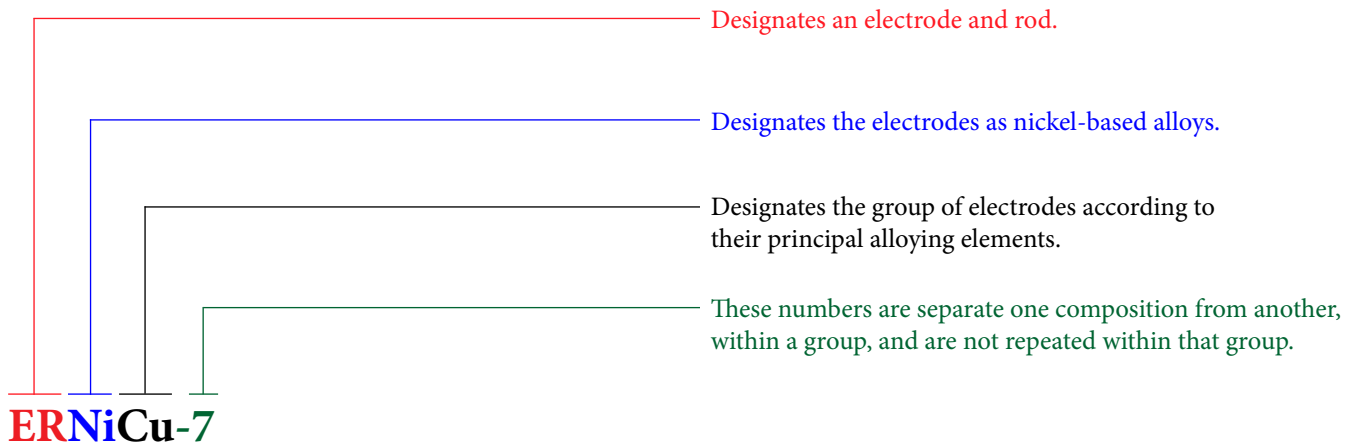
Order of Mandatory Classification Designators

AWS/SFA A5.11



Order of Mandatory Classification Designators

AWS/SFA A5.14



AFM 112

AWS/SFA A5.11 ENiCrMo-3

DC+ (Reverse Polarity)

Description:

AFM 112 is designed for welding alloy 625 to itself and for joining many dissimilar nickel bearing alloys and iron-base metals.

AFM 112 is also recommended for welding nickel base alloys 600 and 601 and nickel-iron-chrome alloys 800 and 801.

It also can be used for joining nickel based alloys 625, 718, X750 and 706 to 9% nickel steel and for overlaying carbon steel.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 65	65 ~ 90	90 ~ 125	125 ~ 160

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.10	1.00	7.0	0.03	0.02	0.75	0.50
Ni*	Co	Cr	Nb + Ta	Mo	Total Other	
55.00 Min.	(a)	20.00 ~ 23.00	3.15 ~ 4.15	8.00 ~ 10.00	0.50	

All values are considered maximum, unless otherwise noted.

*Includes incidental Cobalt.

(a) Cobalt - 0.12 % Maximum, when specified by the purchaser.

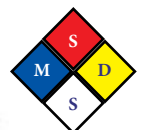
All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	110,000
	MPa	760
Elongation	(%)	30

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 117

AWS/SFA A5.11 ENiCrCoMo-1

DC+ (Reverse Polarity)

Description:

AFM 117 is designed for use on nickel chromium-cobalt-molybdenum alloys (alloy 617) to themselves and to steel and for surfacing steel with nickel-chromium-cobalt-molybdenum weld metal (alloy 600, 601, & 800). AFM 117 is also used for applications where optimum strength and oxidation resistance is required above 1500°F up to 2100°F, especially when welding on base metals of nickel-iron-chromium alloys.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 60	75 ~ 100	90 ~ 130	125 ~ 150

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.05 ~ 0.15	0.30 ~ 2.50	5.0	0.03	0.015	0.75	0.50
Ni*	Co	Cr	Nb + Ta	Mo	Total Other	
Bal.	9.00 ~ 15.00	21.00 ~ 26.00	1.00	8.00 ~ 10.00	0.50	

All values are considered maximum, unless otherwise noted.

*Includes incidental Cobalt.

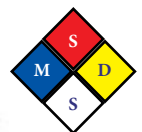
All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	90,000
	MPa	620
Elongation	(%)	25

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 122

AWS/SFA A5.11 ENiCrMo-10

DC+ (Reverse Polarity)

Description:

AFM 122 is used for welding nickel chromium-molybdenum alloys, for the welding of the clad side of joints in steel clad with nickel chromium-molybdenum alloy, to steel and to their nickel-base alloys; and for joining nickel chromium-molybdenum alloys.

Typical specifications for the nickel-chromium molybdenum base metals have UNS Number N06022.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 60	75 ~ 100	90 ~ 130	125 ~ 150

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.02	1.00	2.00 ~ 6.00	0.03	0.015	0.20	0.50
Ni*	Co	Cr	Mo	V	W	Total Other
Bal.	2.50	20.00 ~ 22.50	12.50 ~ 14.50	0.35	2.50 ~ 3.50	0.50

All values are considered maximum, unless otherwise noted.

*Includes incidental Cobalt.

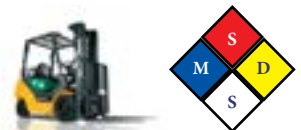
All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	90,000
	MPa	620
Elongation	(%)	25

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 141

AWS/SFA A5.11 ENi-1

DC+ (Reverse Polarity)

Description:

AFM 141 is used for welding commercially pure nickel to itself, for overlaying nickel on steel, and for joining nickel to steel.

AFM 141 is commonly used in applications with nickel alloys 200 and 201.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	65 ~ 85	90 ~ 125	125 ~ 170	170 ~ 225

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.10	0.75	0.75	0.03	0.02	1.25
Cu	Ni*	Al	Ti	Total Other	
0.25	92.00 Min.	1.00	1.00 ~ 4.00	0.50	

All values are considered maximum, unless otherwise noted.

*Includes incidental Cobalt.

All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	60,000
	MPa	410
Elongation	(%)	20

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 182

AWS/SFA A5.11 ENiCrFe-3

DC+ (Reverse Polarity)

Description:

AFM 182 is a coated electrode designed to weld nickel-chromium alloys, the clad side of nickel-chromium-iron clad steel and for welding iron and nickel-base alloy dissimilar metal combinations such as nickel 600, 601, and 800.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 65	65 ~ 95	95 ~ 125	125 ~ 165

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.10	5.00 ~ 9.50	10.00	0.03	0.015	1.00	0.50
Ni*	Co	Ti	Cr	Nb + Ta	Total Other	
52.00 Min.	(a)	1.00	13.00 ~ 17.00	1.00 ~ 2.50**	0.50	

(a) Cobalt - 0.12 Maximum, when specified by the purchaser.

* Ni - Includes incidental cobalt.

** Tantalum - 0.30 Maximum, when specified by the purchaser.

All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	80,000
	MPa	550
Elongation	(%)	30

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 187

AWS/SFA A5.6 ECuNi

DC+ (Reverse Polarity)

Description:

AFM 187 is an all position copper-nickel core electrode. AFM 187 is excellent for welding wrought or cast 70/30, 80/20, and 90/10 copper-nickel alloys and dissimilar applications of nickel-copper alloys.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	60 ~ 85	70 ~ 120	100 ~ 145	130 ~ 190

Chemical Composition Requirements for Undiluted Weld Metal (%):

Mn	Fe	Si	Ni*	Cu
1.00 ~ 2.50	0.40 ~ 0.75	0.50	29.0 ~ 33.0	Bal.
P	Pb	Ti	Total Other	
0.020	0.02	0.20	0.50	

All values are considered maximum, unless otherwise noted.

* Includes cobalt.

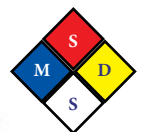
All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	50,000
	MPa	350
Elongation	(%)	20

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 190

AWS/SFA A5.11 ENiCu-7

DC+ (Reverse Polarity)

Description:

AFM 190 is an electrode designed to weld nickel-copper to itself, such as alloy 400 and 404. It is also used to overlay nickel-copper alloy on steel and to weld dissimilar nickel-copper alloys to steel.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	55 ~ 75	75 ~ 110	110 ~ 150	150 ~ 190

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.10	4.00	2.50	0.02	0.015	1.50
Cu	Ni*	Al	Ti	Total Other	
Bal.	62.00 ~ 69.00	0.75	1.00	0.50	

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	70,000
	MPa	480
Elongation	(%)	30

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM C276

AWS/SFA A5.11 ENiCrMo-4

DC+ (Reverse Polarity)

Description:

AFM C276 is used for welding low-carbon nickel-chromium-molybdenum alloy, for welding the clad side of joints in steel clad with lowcarbon nickel-chromium-molybdenum alloy, and for welding low-carbon nickel-chromium-molybdenum alloy to steel and to other nickel base alloys.

AFM C276 electrodes normally are used only in the flat position.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 75	70 ~ 110	80 ~ 125	80 ~ 130

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.02	1.00	4.00 ~ 7.00	0.04	0.03	0.20	0.50
Ni*	Co	Cr	Mo	V	W	Total Other
Bal.	2.50	14.50 ~ 16.50	15.00 ~ 17.00	0.35	3.00 ~ 4.50	0.50

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	100,000
	MPa	690
Elongation	(%)	25

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM A

AWS/SFA A5.11 ENiCrFe-2

DC+ (Reverse Polarity)

Description:

AFM A is an electrode used for welding nickel-chromium-iron alloys (alloy 800), 9% nickel steel, and a variety of dissimilar metal joints (involving carbon steel, stainless steel, nickel, and nickel-base alloys). The base metals can be wrought or cast (welding grade), or both.

The electrodes may be used for applications at temperatures ranging from cryogenic to around 1800°F (980°C).

However, for temperatures above 1500°F (820°C), weld metal produced by AFM A does not exhibit optimum oxidation resistance and strength.

Recommended Amperage (DC+):

Dia. (inch)	3/32"	1/8"	5/32"	3/16"
Dia. (mm)	2.4 mm	3.2 mm	4.0 mm	4.8 mm
Length	12"	14"	14"	14"
AMPS	40 ~ 75	70 ~ 110	80 ~ 125	80 ~ 130

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.10	1.00 ~ 3.50	12.00	0.03	0.02	0.75	0.50
Ni*	Co	Cr	Nb + Ta**	Mo	Total Other	
62.00 Min.	(a)	13.00 ~ 17.00	0.50 ~ 4.00	0.50 ~ 2.50	0.50	

All values are considered maximum, unless otherwise noted.

a. Cobalt-0.12 maximum, when specified by the purchaser.

* Includes incidental cobalt.

** Tantalum-0.30 maximum, when specified by the purchaser.

All-Weld-Metal Tension Test Requirements:

Tensile Strength	psi	100,000
	MPa	690
Elongation	(%)	25

Standard Packaging:

All sizes are packaged in 10 Lb containers.

6 containers per 60 Lb Master Carton.



AFM 60

AWS/SFA A5.14 ERNiCu-7

Description:

AFM 60 is a titanium bearing filler metal for gas shielding welding of nickel-copper alloys, (alloy 400 and 404) and dissimilar welding applications including joining alloy 200 and copper-nickel alloys using the GTAW, GMAW, SAW, and PAW processes.

AFM 60 contains sufficient titanium to control porosity with these welding processes.

AFM 60 can also be used for a MIG overlay on steel after using AFM 61 for the first layer.

Corresponding Classification in AWS A5.11 is **AFM 190** ENiCu-7.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.15	4.00	2.50	0.03	0.015	1.25
Cu	Ni*	Al	Ti	Total Other	
Bal.	62.00 ~ 69.00	1.25	1.50 ~ 3.00	0.50	

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	70,000
	MPa	480
Elongation	(%)	30

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 61

AWS/SFA A5.14 ERNi-1

Description:

AFM 61 is used for welding wrought and cast forms of commercially pure nickel alloy (alloy 200 and 201) to itself using the GTAW, GMAW, SAW, and PAW processes.

AFM 61 contains sufficient titanium to control weld-metal porosity with these welding processes.

Corresponding Classification in AWS A5.11 is **AFM 141** ENi-1.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.15	1.00	1.00	0.03	0.015	0.75
Cu	Ni*	Al	Ti	Total Other	
0.25	93.00 Min.	1.50	2.00 ~ 3.50	0.50	

All values are considered maximum, unless otherwise noted.

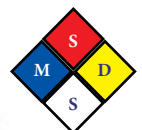
* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	60,000
	MPa	410
Elongation	(%)	20

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 62

AWS/SFA A5.14 ERNiCrFe-5

Description:

AFM 62 is used for welding nickel-chromium-iron alloy (600) to itself using the GTAW, GMAW, SAW, and PAW processes.

The higher niobium content of AFM 62 is intended to minimize cracking where high welding stresses are encountered, as in thick-section base metal up to 2”.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.08	1.00	6.00 ~ 10.00	0.03	0.015	0.35
Cu	Ni*	Co	Cr	Nb + Ta	Total Other
0.50	70.00 Min.	(a)	14.00 ~ 17.00	1.50 ~ 3.00	0.50

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

a. Co is 0.12 maximum when specified by the purchaser.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	80,000
	MPa	550
Elongation	(%)	30

Standard Sizes:

36” TIG Wire		30 Lb ~ 33 Lb Spool	
1/16”	1.6 mm	0.035”	0.9 mm
3/32”	2.4 mm	0.045”	1.2 mm
1/8”	3.2 mm	1/16”	1.6 mm
5/32”	4.0 mm		



AFM 67

AWS/SFA A5.7 ERCuNi

Description:

With the addition of nickel, AFM 67 strengthens the weld metal and improves the corrosion resistance, particularly against salt water.

The weld metal has good hot and cold ductility.

AFM 67 is used for welding 70/30, 80/20, and 90/10 copper-nickel alloys.

To MIG overlay on steel, first overlay with a layer of AFM 61.

It is also used for dissimilar welding of alloy 200 to copper-nickel alloys.

When gas tungsten or gas metal arc welding with AFM 67, preheating is not required.

Welding is done in all positions.

The arc should be kept as short as possible to assure adequate shielding gas coverage and thus minimize porosity.

Corresponding Classification in AWS A5.6 is [AFM 187](#) ECuNi.

Chemical Composition Requirements for Undiluted Weld Metal (%):

Cu*	Mn	Fe	Si	Ni**
Bal.	1.00	0.40 ~ 0.75	0.25	29.00 ~ 32.00
S	P	Pb	Ti	Total Others
0.01	0.02	0.02	0.20 ~ 0.50	0.50

All values are considered maximum, unless otherwise noted.

* Including silver

** Includes incidental cobalt

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	50,000
	MPa	345
Elongation	(%)	20

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 82

AWS/SFA A5.14 ERNiCr-3

Description:

AFM 82 is designed for welding nickelchromium-iron alloy (600) to itself, for the clad side of joints in steel with nickel-chromium-iron alloy, for surfacing steel with nickel-chromiumiron weld metal, for dissimilar welding of nickelbase alloys (600, 601 & 800), and for joining steel to nickel-base alloys.

Corresponding Classification in AWS A5.11 is **AFM 182** ENiCrFe-3.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.10	2.50 ~ 3.50	3.00	0.03	0.015	0.50
Ni*	Ti	Cr	Nb + Ta	Cu	Total Others
67.00 Min.	0.75	18.00 ~ 22.00	2.00 ~ 3.00	0.50	0.50

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt, Co is 0.12 when specified by the purchaser.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	80,000
	MPa	550
Elongation	(%)	30

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 92

AWS/SFA A5.14 ERNiCrFe-6

Description:

AFM 92 is used for cladding steel with nickel-chromium-iron weld metal and for joining steel to nickel-base alloys using the GTAW, GMAW, SAW, and PAW processes. The weld metal will age harden on heat treatment.

Corresponding Classification in AWS A5.11 is **AFM A** ENiCrFe-2.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.08	2.00 ~ 2.70	8.00	0.03	0.015	0.35
Ni*	Ti	Cr	Cu	Total Others	
67.00 Min.	2.50 ~ 3.50	14.00 ~ 17.00	0.50	0.50	

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	80,000
	MPa	550
Elongation	(%)	30

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 601

AWS/SFA A5.14 ERNiCrFe-11

Description:

AFM 601 is used for welding nickelchromium-iron-aluminum alloy (601) to itself and to other high temperature compositions using the GTAW process.

It is used for severe applications where the exposure temperature can exceed 2100°F (1150°).

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si
0.10	1.00	Bal.	0.03	0.015	0.50
Cu	Ni*	Al	Cr	Total Others	
1.00	58.0 ~ 63.0	1.00 ~ 1.70	21.00 ~ 25.00	0.50	

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	94,000
	MPa	650
Elongation	(%)	42

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 617

AWS/SFA A5.14 ERNiCrCoMo-1

Description:

AFM 617 is used for welding nickelchromium-cobalt-molybdenum alloy to itself using the GTAW and GMAW processes.

AFM 617 can also be used for welding joints of dissimilar steels and for elevated temperature service.

Corresponding Classification in AWS A5.11 is **AFM 117** ENiCrCoMo-1.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.05 ~ 0.15	1.00	3.00	0.03	0.015	1.00	0.50
Ni*	Co	Al	Ti	Cr	Mo	Total Others
Bal.	10.00 ~ 15.00	0.80 ~ 1.50	0.60	20.00 ~ 24.00	8.00 ~ 10.00	0.50

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	90,000
	MPa	620
Elongation	(%)	25

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 622

AWS/SFA A5.14 ERNiCrMo-10

Description:

AFM 622 is used for welding nickelchromium-molybdenum alloy (622) to itself, to steel, to other nickel-base alloys (such as 625 & C276), and for cladding steel with nickelchromium-molybdenum weld metal using the GTAW, GMAW, and PAW processes.

Corresponding Classification in AWS A5.11 is **AFM 122 ENiCrMo-10**.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.015	0.50	2.00 ~ 6.00	0.02	0.010	0.08	0.50
Ni*	Co	Cr	Mo	V	W	Total Others
Bal.	2.50	20.00 ~ 22.50	12.50 ~ 14.50	0.35	2.50 ~ 3.50	0.50

All values are considered maximum, unless otherwise noted.

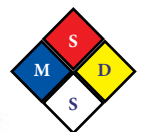
* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	100,000
	MPa	690
Elongation	(%)	25

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 625

AWS/SFA A5.14 ERNiCrMo-3

Description:

AFM 625 is used for welding nickelchromium-molybdenum alloy (625) to itself, to steel, to other nickel-base alloys (601 & 800), for cladding steel with nickel-chromiummolybdenum weld metal, and for welding the clad side of joints in steel with nickel-chromiummolybdenum alloy using the GTAW, GMAW, SAW, and PAW processes.

AFM 625's outstanding strength and toughness in the temperature range cryogenic to 2000°F (1093°C) are derived primarily from the solid solution effects of the refractory metals, columbium and molybdenum, in a nickel-chromium matrix.

AFM 625 has excellent fatigue strength and stress-corrosion cracking resistance to chloride ions.

Corresponding Classification in AWS A5.11 is [AFM 112 ENiCrMo-3](#).

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.010	0.50	5.00	0.02	0.015	0.50	0.50
Ni*	Al	Ti	Cr	Nb + Ta	Mo	Total Others
58.00 Min.	0.40	0.40	20.00 ~ 23.00	3.15 ~ 4.15	8.00 ~ 10.00	0.50

All values are considered maximum, unless otherwise noted.

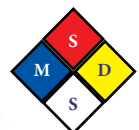
* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	110,000
	MPa	760
Elongation	(%)	30

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM C276

AWS/SFA A5.14 ERNiCrMo-4

Description:

AFMC 276 is used for welding nickelchromium-molybdenum alloy (C276) to itself, to steel, to other nickel-base alloys, and for cladding steel with nickel-chromium-molybdenum weld metal using the GTAW and GMAW processes.

AFM C276 has exceptional corrosion resistance to a wide variety of chemical processing environments including strong reducing environments, chloride-contaminated media, chlorine, and sea water.

AFM C276 has excellent resistance to pitting and stress-corrosion cracking.

Corresponding Classification in AWS A5.11 is [AFM C276 ENiCrMo-4](#).

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.02	1.00	4.00 ~ 7.00	0.04	0.03	0.08	0.50
Ni*	Co	Cr	Mo	V	W	Total Others
Bal.	2.50	14.50 ~ 16.50	15.00 ~ 17.00	0.35	3.00 ~ 4.50	0.50

All values are considered maximum, unless otherwise noted.

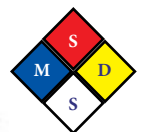
* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	100,000
	MPa	690
Elongation	(%)	25

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM 718

AWS/SFA A5.14 ERNiFeCr-2

Description:

AFM 718 is used for welding nickelchromium-niobium-molybdenum alloy (718) to itself using the GTAW processes.

AFM 718 is a precipitation hardenable nickel-base alloy designed to display exceptionally high yield, tensile and creep-rupture properties at temperatures up to 1300°F (704°C).

The sluggish age-hardening response of AFM 718 permits annealing and welding without spontaneous hardening during heating and cooling.

AFM 718 has excellent weldability when compared to the nickel-base superalloys hardened by aluminum and titanium.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	B	Mn	Fe	P	S	Si
0.08	0.003	0.35	Bal.	0.015	0.015	0.35
Cu	Ni*	Al	Ti	Cr	Nb + Ta	Mo
0.30	50.00 ~ 55.00	0.20 ~ 0.80	0.65 ~ 1.15	17.00 ~ 21.00	4.75 ~ 5.50	2.80 ~ 3.30
Total Others	All values are considered maximum, unless otherwise noted.					
0.50	* Includes incidental cobalt.					

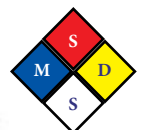
Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	165,000
	MPa	1140*
Elongation	(%)	25

* Age-hardened condition: Heat treated at 1325°F (718°C) for 8 hours, then furnace cooled to 1150°F (620°C) at 100°F (56°C) per hour, held for 8 hours, then air cooled.

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM Alloy X

AWS/SFA A5.14 ERNiCrMo-2

Description:

AFM ALLOY X is used for welding nickelchromium-molybdenum alloy to itself, to steel, to other nickel-base alloys, and for cladding steel with nickel-chromium-molybdenum weld metal using the GTAW, GMAW, and PAW processes.

AFM ALLOY X is a nonmagnetic, heat and corrosion resistant, nickel-base alloy.

It derives its exceptional properties, up to 2200°F (1200°C), from solid solution strengthening.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.05 ~ 0.15	1.00	17.00 ~ 20.00	0.04	0.03	1.00	0.50
Ni*	Co	Cr	Mo	W	Total Others	
Bal.	0.50 ~ 2.50	20.50 ~ 23.00	8.00 ~ 10.00	0.20 ~ 1.00	0.50	

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	95,000
	MPa	660

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		



AFM Alloy W

AWS/SFA A5.14 ERNiMo-3

Description:

AFM ALLOY W is used for weld repair of various nickel-, cobalt-, and iron-base alloys and for dissimilar joining applications of nickel-, cobalt-, and iron-base alloys.

Chemical Composition Requirements for Undiluted Weld Metal (%):

C	Mn	Fe	P	S	Si	Cu
0.12	1.00	4.00 ~ 7.00	0.04	0.03	1.00	0.50
Ni*	Co	Cr	Mo	V	W	Total Others
Bal.	2.50	4.00 ~ 6.00	23.00 ~ 26.00	0.60	1.00	0.50

All values are considered maximum, unless otherwise noted.

* Includes incidental cobalt.

Typical As-Welded Tensile Strength (Min.):

Tensile Strength	psi	100,000
	MPa	690

Standard Sizes:

36" TIG Wire		30 Lb ~ 33 Lb Spool	
1/16"	1.6 mm	0.035"	0.9 mm
3/32"	2.4 mm	0.045"	1.2 mm
1/8"	3.2 mm	1/16"	1.6 mm
5/32"	4.0 mm		

