High Nickel Alloy Electrodes

Arcos

PREMIUM BARE WIRE & COVERED ELECTRODES

Arcos is the company with the reputation and experience you can rely on for a comprehensive line of superior quality bare and covered electrodes for high nickel alloys. Our wide selection of high nickel alloy products delivers the superb slag release, wetting action and weld profile characteristics you require with a smooth, stable arc.

You can be assured that our electrodes will meet your demanding applications because Arcos has earned these prestigious certifications among others:

- ASME Nuclear Certificate # QSC448
- ISO 9001: 2000 Certificate # GQC230
- Mil-I 45208A Inspection
- Navy QPL

Arcos will also provide you with a dedicated team of technical and customer service specialists to offer extensive testing and applications support.

Discover for yourself why, when it comes to the best in high nickel alloy electrodes, Arcos has you covered. Call today at **800-233-8468** or visit our website at **www.arcos.us**.

Arcos Has You Covered

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Classification

The industry defines "nickel-base" alloys as those containing more than 50% nickel (Ni). Arcos filler metals conform to this definition for high nickel alloys in all except one grade of copper-nickel alloy where nickel is only 30% with copper comprising the balance.

The classification of nickel alloys is subdivided into three classes depending on the principal element associated with the nickel: a) nickel-chromium; b) nickel-copper (including 70% Cu), and c) nickel-alloys for welding cast iron.

nickel electrode is sometimes preferred for low grades of cast iron with high phosphorus content which if welded with the higher nickel grades may result in weld cracks; it is not recommended for machineable welds, however, when only a single pass is required because dilution will reduce the nickel content below that needed for good machineability.

Alloying Elements

Besides the principal alloying elements, the high nickel filler metals often contain other elements which perform necessary functions.

Arcos High Nickel Alloys Information

Nickel-Chromium Alloys

These popular alloys are commonly referred to as "Inconel".* With the addition of 14-20% chromium, the oxidation resistance of nickel is greatly enhanced making these alloys especially useful at high temperatures, even higher than those of the iron-base chromium-nickel steels. When columbium or molybdenum is added, their strength properties at high temperatures are improved. Like many of the stainless steels, these alloys are widely used for joining a variety of dissimilar metals and for welding the 9% nickel steels for cryogenic service.

Nickel-Copper Alloys

Arcos filler metals fall into two composition types: nickel 63-70%, balance copper (Monel*) and nickel 29-32%, balance copper (commonly called cupro-nickel). They are especially suitable for resisting corrosion in a variety of aqueous solutions, most notably sea water. They have excellent properties at low temperatures, making them suitable for refrigerant coolant lines.

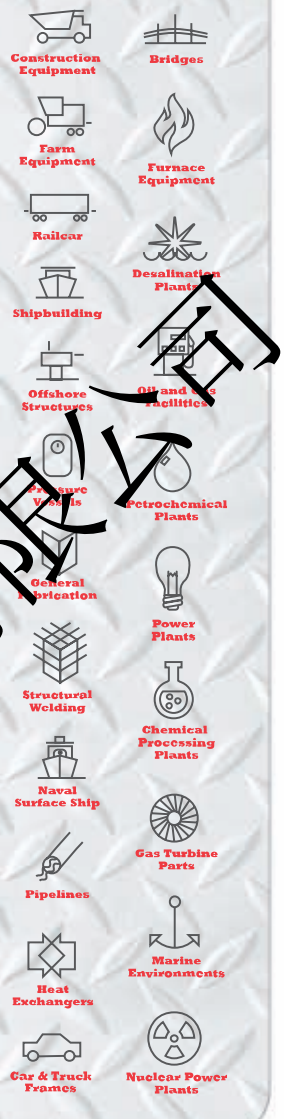
Nickel Alloys for Cast Iron

Materials with less nickel content are less expensive and are preferred except when color match or ease of machining are important considerations. The lower

Microstructure

Nickel-base alloys, when viewed under the microscope, are generally single-phase structures. Like the austenitic stainless steels, they are face-centered cubic crystals and are non-magnetic. They do not harden when quenched from high temperatures (again, like the austenitic stainless steels). Weld metals from such single-phase alloys have grains with large "dendrites" (a Christmas tree-like structure).

Applications



* The names Inconel and Monel are registered tradenames of the Special Metals group of companies.

Furnace Equipment

Desalination Plants

Petrochemical Plants

Power Plants

Nuclear Power Plants

ARCOS 382

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCr-3, AWS A5.14, ASME SFA 5.14, UNS N06082

APPROVALS: MIL-E-21562, MIL-EN/RN82; MIL-EN/RN82H

DESCRIPTION: Arcos 382 is designed for the welding of alloys 600, 601 and 800 to themselves, for the clad side of joints in steel clad with nickel-chromium-iron alloys and for dissimilar welding of nickel-based alloys. It is also utilized to join carbon steels to nickel alloys and for surfacing carbon steels. Arcos 382 provides high strength and good corrosion resistance, resists oxidation and delivers creep-rupture strength at elevated temperatures.

APPLICATIONS: Formulated to resist pitting corrosion and stress-corrosion cracking in chloride containing environments, Arcos 382 is ideal for welding in desalination plants. It is also well suited for welding in a variety of temperatures - from cryogenic to elevated - in such applications as piping, furnace equipment and petrochemical and power generation plants.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	96,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.05	7.0	.001	.002	.15	73.2
Cr	Fe	Ti	Cb+Ta		
19.5	1.2	.36	2.5		

ARCOS 8N12H

PROCESS: SMAW

CLASSIFICATIONS: ENiCrFe-3, AWS A5.11, ASME SFA 5. 11, UNS W86182

APPROVALS: MIL-E22200/3, MIL-8N12/8N12H

DESCRIPTION: When high strength, excellent ductility and superior corrosion resistance are required, Arcos 8N12H (high carbon) is used for welding similar composition base metals to themselves and to carbon steel. In addition, these all position alloys are commonly utilized for surfacing carbon steels.

APPLICATIONS: Arcos 8N12H offers exceptional high temperature strength and oxidation resistance and is designed to meet demanding radiographic requirements. It is designed for welding in harsh, corrosive environments such as desalination plants, petrochemical facilities and power generation plants and in temperature critical conditions such as furnace equipment and pipe work.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	98,000
Percent Elongation	44

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.04	6.0	.001	.005	.8	68.1
Cr	Fe	Ti	Cb+Ta		
15.6	6.7	.1	1.7		

Product headers in red indicate a bare wire electrode, i.e:

ARCOS 382

Product headers in blue indicate a covered electrode, i.e:

ARCOS 8N12H

ARCOS 352

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrFe-7, AWS A5.14, ASME SFA 5.14, UNS N06052

DESCRIPTION: Arcos 352 was designed to meet the critical requirements within the nuclear power industry. This nickel-chromium-iron welding wire provides corrosion-resistant welds on a broad range of low alloy and stainless steels and is utilized in applications requiring resistance to oxidizing acids.

APPLICATIONS: Arcos 352 delivers the higher chromium level needed for stress-corrosion cracking resistance in the vital pure water environments of nuclear power plants. This wire welds NiCrFe alloys ASTM B163, B166, B167and B168, to itself and to dissimilar joint configurations.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	90,000
Percent Elongation	40

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.03	.4	.001	.001	.23	58.5
Cr	**Fe**	**Al**	**Ti**	**Cb+Ta**	
29.9	9.6	.72	.47	.04	

ARCOS 352

PROCESS: SMAW

CLASSIFICATIONS: ENiCrFe-7, AWS A5.11, ASME SFA 5.11, UNS W86152

DESCRIPTION: Arcos 352 is used for welding nickel-chromium-iron alloy 690 (UNS N06690) to itself. It may also be utilized for welding NiCrFe alloys to steels and stainless steels as well as for corrosion resistant overlays on steel.

APPLICATIONS: All position Arcos 352 provides the higher chromium level required for stress-corrosion cracking-resistance in the critical pure water environments of nuclear power generation facilities.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	95,000
Percent Elongation	4[illegible]

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.03	.4	.001	.001	.2[illegible]	58.5
Cr	**Fe**	**Al**	**Ti**	**Cb+Ta**	
29.9	9.6	.4[illegible]	[illegible]	1.0	

applications

Nuclear Power Plants

Product headers in red indicate a bare wire electrode • Product headers in blue indicate a covered electrode

General Fabrication

Furnace Equipment

Petrochemical Plants

Power Plants

ARCOS 392

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrFe-6, AWS A5.14, ASME SFA 5.14, UNS N07092

DESCRIPTION: The primary use of Arcos 392 is for cladding steel with nickel-chromium-iron weld metal and for joining steel and stainless steel to nickel-base alloys. Weld deposits can be age-hardened with the degree of hardness depending on the time and temperature.

APPLICATIONS: Arcos 392 is well suited for applications requiring superior corrosion resistance from cryogenic to elevated temperatures (up to 1,800°F). Typical examples include power generation and petrochemical plants and furnace equipment.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	87,000
Percent Elongation	42

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.05	2.4	.004	.001	.17	70.4
Cr	Nb	Ti			
16.5	3.5	2.81			

ARCOS 4N1A

PROCESS: SMAW

CLASSIFICATIONS: ENiCrFe-2, AWS A5.11, ASME SFA 5.11, UNS W86133

DESCRIPTION: Arcos 4N1A is used to weld various dissimilar combinations of austenitic and ferritic steels and high nickel alloys. This electrode can also be utilized for welding 9% nickel, wrought or welding grade cast metals. Arcos 4N1A features outstanding strength and offers resistance to oxidation at high temperatures.

APPLICATIONS: Arcos 4N1A provides excellent results over a wide range of general fabrication welding requirements, especially those in harsh service environments.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	85,000
Percent Elongation	40

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.022	1.8	.001	.001	.24	73.9
Cr	Mo	Fe	Cu	Cb+Ta	
15.2	.8	6.7	< .001	1.1	

ARCOS 617

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrCoMo-1, AWS A5.14, ASME SFA 5.14, UNS N06617

DESCRIPTION: Arcos 617 is designed to weld nickel-chromium-molybdenum base material, as well as for joining various dissimilar high temperature alloys. It is designed for TIG, MIG and submerged arc welding. The weld metal provides excellent strength and oxidation resistance above 1,500˚F. Arcos 617 can also be used for overlay welding where a similar chemistry is desired.

APPLICATIONS: Arcos 617 features a good stability, high creep strength and resistance to oxidation, pitting and stress-corrosion cracking. This wire is ideal for high temperature applications such as heat exchangers, furnace components, gas turbine parts and pipelines.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	100,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.08	.26	.001	.001	.28	Bal.
Cr	Mo	Al	Cu	Fe	Co
22.0	8.8	1.36	.08	.1	11.2

ARCOS 617

PROCESS: SMAW

CLASSIFICATIONS: ENiCrCoMo-1, AWS A5.11, ASME SFA 5.11, UNS W86117

DESCRIPTION: Arcos 617 is used to weld nickel-chromium-cobalt-molybdenum base material, as well as for joining various dissimilar high temperature alloys. This covered electrode resists corrosion, pitting and stress-corrosion cracking. It offers superb strength and high temperature oxidation resistance.

APPLICATIONS: Arcos 617 is utilized for welding critical applications where optimum strength and oxidation resistance are required above 1,500˚F and up to 2,100˚F, especially when welding on base metals of nickel-iron-chromium alloys. Typical applications include furnace equipment, heat exchangers, pipelines and industrial plants.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	95,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.06	1.2	.001	.001	.28	Bal.
Cr	Mo	Al	Co		
22.2	9.8	1.3	11.2		

applications

Pipelines

Heat Exchangers

Furnace Equipment

Power Plants

Gas Turbine Parts

Offshore Structures

Pipelines

Furnace Equipment

Petrochemical Plants

Power Plants

Marine Environments

ARCOS 625

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrMo-3, AWS A5.14, ASME SFA 5.14, UNS N006625

APPROVALS: MIL-E-21562E, MIL EN/RN625

DESCRIPTION: Arcos 625 is a nickel-chromium-molybdenum wire primarily utilized for welding alloys 625, 601, 802 and 9% nickel using the gas arc metal and gas tungsten arc method of welding. Arcos 625 delivers moderate strengths, good fabricability and superior corrosion resistance from cryogenic to elevated (up to 1,800°F) temperatures. It also features good oxidation resistance.

APPLICATIONS: Arcos 625 is designed for welding NiCrMo to itself, to steel, to other nickel-base alloys and for cladding steel with NiCrMo weld metal. This wire is well suited for welding piping systems and reactor components in the power generation industry and for high temperature service in a wide variety of other engineering applications including furnace equipment and petrochemical plants and in marine and offshore environments.

DIAMETERS: .035", .045", .062", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	115,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.03	.05	.01	.001	.05	64.2
Cr	Mo	Al	Cu	Fe	Ti
22.4	9.0	.14	.1	.2	.22
Cb+Ta					
3.55					

ARCOS 1N12

PROCESS: SMAW

CLASSIFICATIONS: ENiCrMo-3, AWS A5.11, ASME SFA 5.11, UNS W86112

APPROVAL: MIL-E-22200/3

DESCRIPTION: Arcos 1N12, a high nickel electrode, is used for welding nickel-chromium-molybdenum alloys to themselves and to steel. It is also suitable for welding 5% and 9% nickel steels for low temperature service to themselves as well as to low alloys or stainless steel. Arcos 1N12 has moderate strength, good fabricability and exceptional corrosion resistance from cryogenic to elevated (up to 1,800°F). This electrode resists corrosive attack and is virtually immune to chloride-ion stress-corrosion cracking.

APPLICATIONS: Arcos 1N12 is used to join NiCrMo alloys such as 625, 800, 801 and 600. It is utilized for welding piping systems and reactor components in the power generation industry and for high temperature service in an array of other engineering applications including petrochemical plants and furnace equipment. This versatile electrode is excellent for overlaying on steel where exceptional corrosion resistance is required, such as chloride contaminated cooling water in heat exchangers, as well as offshore and marine environments.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	112,000
Percent Elongation	42

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.03	.27	.01	.01	.49	64.2
Cr	Mo	Cu	Fe		
21.3	8.4	.07	.8		

ARCOS 813

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERCuNi, AWS A5.7, ASME SFA 5.7, UNS C71580

APPROVALS: MIL-E-21562, MIL EN/RN67

DESCRIPTION: Arcos 813 is formulated for the welding of 70/30, 80/20 and 90/10 copper-nickel alloys. The weld metal provides outstanding corrosion resistance, particularly against sea water.

APPLICATIONS: Dissimilar welding applications for Arcos 813 include joining nickel-copper alloys and Nickel 200 to copper-nickel alloys. The exceptional resistance to corrosion in sea water makes Arcos 813 the ideal choice for welding in offshore construction and desalination and marine environments.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	52,000
Percent Elongation	30

TYPICAL CHEMICAL COMPOSITION:

Mn	P	Si	Ni+Co	Cu+Ag	Fe
.69	.001	.07	30.3	Bal.	.59
Pb	Ti				
.001	.3				

ARCOS 803

PROCESS: SMAW

CLASSIFICATIONS: ECuNi, AWS A5.6, ASME SFA 5.6, UNS W60715

APPROVAL: MIL-E-22200/4D

DESCRIPTION: Arcos 803 is designed for the shielded metal arc welding of wrought or cast 70/30, 80/20 and 90/10 copper-nickel alloys to themselves or to each other. It is also utilized to weld the clad side of copper-nickel clad steel.

APPLICATIONS: Due to its superb resistance to corrosion in sea water, Arcos 803 is used for welding desalination plants, offshore construction and marine environments.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	53,000
Percent Elongation	25

TYPICAL CHEMICAL COMPOSITION:

Mn	P	Si	Ni+Co	Cu+Ag	Fe
1.56	.01	.25	30.7	Bal.	.63
Pb	Ti				
.002	.01				

applications

Product headers in red indicate a bare wire electrode • Product headers in blue indicate a covered electrode

Desalination Plants

Marine Environments

ARCOS 816

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCu-7, AWS A5.14, ASME SFA 5.14, UNS N04060

APPROVALS: MIL-E-21562, MIL EN/RN60

DESCRIPTION: Arcos 816 is designed for welding nickel-copper alloys (ASTM B127, B163, B164 and B165).

APPLICATIONS: Dissimilar welding applications for Arcos 816 include joining nickel-copper and copper-nickel alloys to Nickel 200. The wire's strength and corrosion-resistance makes Arcos 816 the smart choice for welding in salt, seawater and reducing acids environments.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	78,000
Percent Elongation	42

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.05	3.5	.001	.001	.42	64.7
Al	Cu	Ti			
.02	Bal.	2.5			

ARCOS 9N10

PROCESS: SMAW

CLASSIFICATIONS: ENiCu-7, AWS A5.11, ASME SFA 5.11, UNS W84190

APPROVALS: MIL-E-22200/3, MIL-9N10

DESCRIPTION: This covered electrode is primarily used for welding nickel-copper alloys to themselves and to steel. Arcos 9N10 also is utilized for cladding steel joints with nickel-copper alloy and for surfacing steel with a nickel-copper weld method.

APPLICATIONS: Base metals ASTM B127, B163, B164 and B165 are welded with Arcos 9N10. This wire is well suited for welding in salt, seawater and reducing acid environments.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	78,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.03	3.7	.01	.004	.8	65.6
Al	Cu	Ti			
.09	Bal.	.6			

ARCOS C-276

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrMo-4, AWS A5.14, ASME SFA 5.14, UNS N10276

DESCRIPTION: Arcos C-276 is designed for welding nickel-chromium-molybdenum base metal to itself, to steel and to most other nickel-based alloys. This wire is generally used with ASTM B574, B575, B619, B622 and B626.

APPLICATIONS: Arcos C-276 provides excellent corrosion resistance in many harsh conditions and is particularly resistant to crevice corrosion and pitting. This wire is well suited for pipelines, pressure vessels, chemical processing plants, offshore oil and gas facilities and marine environments.

DIAMETERS: .035", .045", .063", 3/32", 1/8" 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	108,000
Percent Elongation	42

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.01	.5	.01	.001	.02	57.1
Cr	Mo	V	Cu	Fe	Co
16.1	16.1	.15	.15	5.9	4
W					
3.3					

ARCOS C-276

PROCESS: SMAW

CLASSIFICATIONS: ENiCrMo-4, AWS A5.11, ASME SFA 5.11, UNS W80276

DESCRIPTION: Arcos C-276 is intended for welding nickel-chromium-molybdenum alloys to itself and to most other nickel-based alloys. Typical base materials welded are ASTM B574, B575, B619, B622 and B626. This electrode is also used for cladding steel.

APPLICATIONS: This electrode offers exceptional resistance to pitting and crevice corrosion. Arcos C-276 is formulated to work well in harsh environments as well as pipelines, pressure vessels, chemical processing plants and oil and gas facilities.

DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	104,000
Percent Elongation	40

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.01	.3	.01	.007	.18	57.5
Cr	Mo	V	Cu	Fe	Co
15.7	15.6	.14	.04	6.2	.7
W					
3.5					

applications

Offshore Structures

Pressure Vessels

Pipelines

Oil and Gas Facilities

Chemical Processing Plants

Marine Environments

Product headers in red indicate a bare wire electrode • Product headers in blue indicate a covered electrode

Offshore Structures

Furnace Equipment

Petrochemical Plants

Power Plants

Marine Environments

ARCOS 622

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrMo-10, AWS A5.14, ASME SFA 5.14, UNS N06022

DESCRIPTION: Arcos 622 welds nickel-chromium-molybdenum to itself, to steel, to other nickel-base alloys and clads steel with NiCrMo weld metal. This wire offers good pitting and crevice corrosion resistance and is an excellent dissimilar welding alloy.

APPLICATIONS: Arcos 622 is designed to handle a broad range of industrial welding applications such as petroleum, chemical and power generation plants as well as offshore and marine facilities.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	105,000
Percent Elongation	40

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.01	.02	.005	.002	.04	Bal.
Cr	**Mo**	**Fe**	**Co**	**W**	
21.5	13.5	3.1	1.6	3.0	

ARCOS 622

PROCESS: SMAW

CLASSIFICATIONS: ENiCrMo-10, AWS A5.11, ASME SFA 5.11, UNS W86022

DESCRIPTION: Arcos 622 offers good pitting and crevice corrosion resistance and is an outstanding dissimilar welding alloy. This electrode welds nickel-chromium-molybdenum to itself, to steel, to other nickel-base alloys and clads steel with NiCrMo weld metal.

APPLICATIONS: Arcos 622 is formulated for welding a wide array of industrial applications including power generation, petroleum and chemical plants as well as offshore and marine facilities.

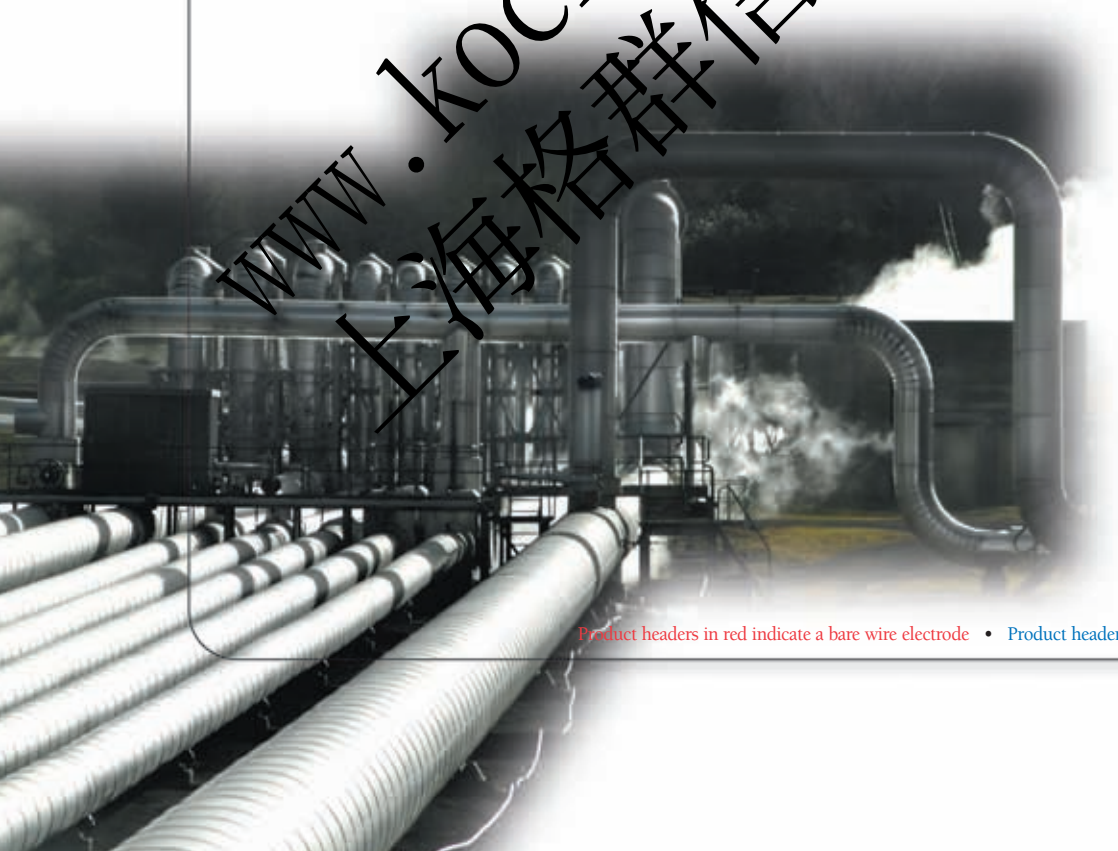
DIAMETERS: 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	105,000
Percent Elongation	38

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.01	.2	.01	<.001	.13	Bal.
Cr	**Mo**	**Fe**	**Co**	**W**	
21.0	14.0	2.6	.2	3.1	



ARCOS 59

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCrMo-13, AWS A5.14, ASME SFA 5.14, UNS N06059

DESCRIPTION: ARCOS 59 is a nickel-chromium-molybdenum alloy with extra low carbon and silicon contents. It offers excellent corrosion resistance, high mechanical strength and better thermal stability. Because of its low silicon and carbon contents and no tungsten, Arcos 59 is not prone to grain-boundary precipitation during hot forming and welding.

APPLICATIONS: Arcos 59 is well suited for welding in a wide variety of chemical processing facilities in both oxidizing and reducing media. This wire provides exceptional weldability and very low sensitivity to hot cracking.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32" 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	110,000
Percent Elongation	45

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.005	.3	.01	.003	.005	59.0
Cr	Mo	Al	Fe		
23.0	16.0	.2	.5		

ARCOS 59

PROCESS: SMAW

CLASSIFICATIONS: ENiCrMo-13, AWS A5.11, ASME SFA 5.11, UNS W86059

DESCRIPTION: Featuring outstanding weldability and very low sensitivity to hot cracking, Arcos 59 provides superb corrosion resistance and high mechanical strength. This electrode is a nickel-chromium-molybdenum alloy with extra low carbon and silicon contents. Due to its chemical composition, Arcos 59 is resistant to attack by chloride ions in low PH media.

APPLICATIONS: Arcos 59 is not prone to grain-boundary precipitation during hot forming and welding. It is, therefore, a good choice for welding in the corrosive environment of chemical processing plants.

DIAMETERS: 3/32" 1/8" 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	107,000
Percent Elongation	47

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si	Ni
.005	.3	.013	.002	.1	59.7
Cr	Mo	Fe			
22.9	15.1	1.1			

Product headers in red indicate a bare wire electrode • Product headers in blue indicate a covered electrode

ARCOS 72

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNiCr-4, AWS A5.14, ASME SFA 5.14, UNS N06072

DESCRIPTION: Arcos 72 is designed for welding GTAW/GMAW nickel-chromium alloy on to carbon and stainless steel and for cast repair.

General Fabrication

APPLICATIONS: Due to its exceptional resistance to high temperature and fuel-ash corrosion, Arcos 72 is ideal for the overlaying of carbon and stainless steels to provide a nickel-chromium alloy corrosion surface in high temperature sulphur and vanadium atmospheres.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	105,000
Percent Elongation	43

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si
.04	.03	.003	.002	.05

Ni	Cr	Fe	Ti
Bal.	43.6	.12	.5

Product headers in red indicate a bare wire electrode

ARCOS 651

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNi-CI, AWS A5.15, ASME SFA 5.15, UNS N02215

DESCRIPTION: This commercially pure nickel wire is designed for making easily machined welds by automatic or semi-automatic methods. This classification is intended for welding ductile, malleable and grey cast iron using gas metal arc, gas tungsten arc and submerged arc welding processes.

General Fabrication

Structural Welding

APPLICATIONS: Arcos 651 handles dissimilar welding applications which include the gas metal arc welding of cast irons to low alloy and carbon steels.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	50,000
Yield Strength (psi)	43,000
Percent Elongation	5

TYPICAL CHEMICAL COMPOSITION:

Ni	Others
99.80	<.50

Product headers in red indicate a bare wire electrode

ARCOS 861

PROCESSES: GTAW/GMAW/SAW

CLASSIFICATIONS: ERNi-1, AWS A5.14, ASME SFA 5.14, UNS N02061

APPROVALS: MIL-E-21562, MIL EN/RN61

DESCRIPTION: Arcos 861 is intended for welding wrought and cast forms of commercially pure nickel (ASTM B160, B161, B162 and B163) with the gas tungsten arc, gas metal arc and plasma arc welding processes. The weld metal has good corrosion resistance, particularly in alkalis.

APPLICATIONS: Arcos 861 is well suited for dissimilar welding including the joining of Nickel 200 and 201 to stainless steel. It can also be used for joining carbon steels to copper-nickel alloys.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	73,000
Percent Elongation	42

TYPICAL CHEMICAL COMPOSITION:

C	Mn	P	S	Si
.01	.4	.001	.001	.11
Ni	**Fe**	**Ti**		
96.2	.1	2.6		

Product headers in red indicate a bare wire electrode

ARCOS 2216

PROCESSES: GTAW/GMAW

CLASSIFICATIONS: ERNiFeMn-CI, AWS A5.15, ASME SFA 5.15, UNS N02216

DESCRIPTION: This 44% nickel alloy was developed for gas metal arc, gas tungsten arc and high speed automatic gas metal arc welding of nodular, grey, spheroidal graphite and malleable cast irons to themselves or to other materials including stainless steel, carbon steel, low alloy steel and various nickel alloys. Under compressive loading Arcos 2216 work hardens making it ideal for bearing surfaces and as a cushioning layer for hardsurfacing applications.

APPLICATIONS: Arcos 2216 has been designed for welding high strength cast irons that are used in critical applications such as automotive exhaust systems, catalytic converters, and other areas that demand high strength at relatively high temperatures combined with ease of fabrication.

DIAMETERS: .035", .045", .063", 3/32", 1/8", 5/32", 3/16"

TYPICAL MECHANICAL PROPERTIES:

Tensile Strength (psi)	85,000
Yield Strength (psi)	65,000
Percent Elongation	15

TYPICAL CHEMICAL COMPOSITION:

C	Mn	Ni	Fe
.3	12.3	42.8	Bal.

Product headers in red indicate a bare wire electrode

Arcos High Nickel Alloys Comparability Charts

Bare Wires

Arcos	AWS Specification	Military Specification	Comparable Wire*
382/382H	ERNiCr-3	EN/RN82/82H	Inconel 82
352	ERNiCrFe-7	N/A	Inconel 52
392	ERNiCrFe-6	EN/RN6A	Inconel 92
617	ERNiCrCoMo-1	N/A	Inconel 617
625	ERNiCrMo-3	EN/RN625	Inconel 625
813	ERCuNi	EN/RN67	Monel 67
816	ERNiCu-7	EN/RN60	Monel 60
C-276	ERNiCrMo-4	N/A	Filler C-276
622	ERNiCrMo-10	N/A	Filler 622
59	ERNiCrMo-13	N/A	Inco-Weld 686**
72	ERNiCr-4	N/A	Filler 72
651	ERNi-CI	N/A	Nickel 99
861	ERNi-1	EN/RN61	Filler 61
2216	ERNiFeMn-CI	N/A	Ni-Rod 44

Covered Electrodes

Arcos	AWS Specification	Military Specification	Comparable Wire*
8N12H	ENiCrFe-3	8N12H	Inconel 182
352	ENiCrFe-7	N/A	Inconel 152
4N1A	ENiCrFe-2	4N1A	IncoWeld A
617	ENiCrCoMo-1	N/A	Inconel 117
1N12	ENiCrMo-3	1N12	Inconel 112
803	ECuNi	MIL-CuNi (70/30)	Monel 187
9N10	ENiCu-7	9N10	Monel 190
C-276	ENiCrMo-4	N/A	Inco-Weld C-276
622	ENiCrMo-10	N/A	Inconel 122
59	ENiCrMo-13	N/A	Inco-Weld 686***

*Inconel, Monel, Ni-Rod and Inco-Weld are trademarks of the Special Metals group of companies.
**Similar to Inco-Weld 686 (ERNiCrMo-14)
***Similar to Inco-Weld 686 (ENiCrMo-14)

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06/09