

# Low Alloy

## MMA Electrodes

### Ferrocrafft 61Ni H4

- Now in hermetically sealed 3kg cans
- Highly basic, E4818-G/E7018-G type hydrogen controlled electrode
- Very low 'H5/H4' diffusible hydrogen class
- C-Mn-Ni weld deposit for reliable impact properties to -50°C
- Batch number identification
- Recommended for the critical welding of C-Mn, micro-alloyed and low alloy structural steels in the 350–450 MPa yield strength class
- Applications include the all positional (except vertical-down) fillet and butt welding of pressure vessels, offshore platforms, pipes and earth-moving equipment

#### Classifications

AS/NZS 1553.2: E4818-G  
AWS/ASME-SFA A5.5: E7018-G

#### Typical all weld metal mechanical properties

Yield stress	450 MPa
Tensile strength	560 MPa
Elongation	27%
CVN impact values	130J av @ -20°C 80J av @ -40°C 60J av @ -50°C

#### Typical all weld metal analysis (%)

C	Mn	Si	Ni	S	P
0.07	1.20	0.25	0.9	0.007	0.012

#### Typical diffusible hydrogen levels to AS3752

3.0–3.5 ml of hydrogen / 100 gm of deposited weld metal\*

\*Reconditioned for 2 hours maximum at 350°C

#### Approvals

Lloyds Register of Shipping	Grade 3, 3YH5
American Bureau of Shipping	Grade 3H10, 3Y
Det Norske Veritas	Grade 3Y H5

#### Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity

Electrode		Approx No. (rods/kg)	Current Range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
2.5	350	53	80–110	3	12 (4x3)	611812
3.2	350	26	110–145	3	12 (4x3)	611813
4.0	350	17	140–200	3	12 (4x3)	611814

Ferrocrafft 61Ni H4i is formulated to operate with AC (min 70 OCV), DC+ or DC- polarity. The preferred polarity for fillet welding and fill and capping passes is DC+.

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## MMA Electrodes

### Alloycraft 70-A1

- Hermetically sealed cans
- Improved high strength, low alloy steel electrode
- Advanced moisture resistant flux coating
- Very low 'H5' diffusible hydrogen class
- 480 MPa tensile class
- Recommended for DC welding applications
- Batch numbered for identification

Classifications
AS /NZS 1553.2: E4818-A1. H5R AWS/ASME-SFA A5.5: E7018-A1 H4R.

Typical All Weld Metal Mechanical Properties	
Yield Stress	480 MPa.
Tensile Strength	570 MPa.
Elongation	25%.

Typical all weld metal analysis (%)						
C	Mn	Si	Mo	S	P	
0.03	0.77	0.37	0.53	0.013	0.015	

Typical Diffusible Hydrogen Levels to AS3752	
3.0–3.5 mls of hydrogen / 100gms of deposited weld metal	

Approvals	
Lloyd's Register of Shipping	Grade 3, 3YH5
American Bureau of Shipping	Grade 3H5, 3Y
Det Norske Veritas	Grade 3YH5

Packaging and operating data — AC (min. 75 OCV), DC+ or DC- polarity						
Electrode		Approx No. (rods / kg)	Current Range (A)	Can	Carton (kg)	Part No.
Size (mm)	Length (mm)					
*2.5	350	42	65–100	3kg	12 (3x4)	611842
*3.2	350	26	95–150	3kg	12 (3x4)	611843
*4.0	350	17	145–220	3kg	12 (3x4)	611844

Alloycraft 70-A1 is formulated to operate with AC (min 70 OCV), DC+ or DC- polarity. The preferred polarity for DC welding is DC+.

\*Non-stock item available on indent only.

### Alloycraft 80-B2

- Improved high strength, low alloy steel electrode
- Advanced flux coating
- Very low 'H5' diffusible hydrogen class
- 550 MPa tensile class
- Batch numbered for on-the-job traceability
- Recommended for the all positional (except vertical-down) welding of chromium and chromium-molybdenum bearing steels as used in elevated temperature applications
- Hermetically sealed cans

Classifications
AS /NZS 1553.2: E5518-B2 AWS/ASME-SFA A5.5: E8018-B2 H4

Typical all weld metal mechanical properties	
0.2% Proof stress	570 MPa
Tensile strength	670 MPa
Elongation	24%

Typical all weld metal analysis (%)						
C	Mn	Si	P	Mo	Cr	S
0.08	0.82	0.39	0.015	0.65	1.40	0.013

Typical diffusible hydrogen levels to AS3752	
3.0–3.5 ml of hydrogen / 100 gm of deposited weld metal*	

\*Reconditioned for 2 hours maximum at 350°C

Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity						
Electrode		Approx No. (rods / kg)	Current range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
2.5	350	40	65–100	3	12 (3x4)	611922
3.2	350	26	105–150	3	12 (3x4)	611923
4.0	350	17	145–200	3	12 (3x4)	611924

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## Alloycraft 80-C1

- Hermetically sealed cans
- Improved high strength, low alloy steel electrode
- Very low 'H5' diffusible hydrogen class
- 550 MPa tensile class, reliable impact toughness to -60°C
- Batch numbered for on-the-job traceability
- Suitable for the full or under matching strength welding of high strength nickel bearing steels as used for low temperature applications

Classifications
AS/NZS 1553.2: E5518-C1
AWS/ASME-SFA A5.5: E8018-C1 H4

Typical all weld metal mechanical properties	
0.2% Proof Stress	550 MPa
Tensile strength	630 MPa
Elongation	26%
CVN impact values	75J av @ -60°C

Typical all weld metal analysis (%)						
C	Mn	Si	Ni	S	P	
0.05	1.1	0.38	2.46	0.013	0.015	

Typical diffusible hydrogen levels to AS3752
3.0–3.5 ml of hydrogen/100 gm of deposited weld metal*

\*Reconditioned for 2 hours maximum at 350°C

Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity						
Electrode		Approx No. (rods/kg)	Current range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
3.2	350	26	110–145	3	12 (3x4)	611833
4.0	350	17	140–200	3	12 (3x4)	611834
5.0	350	11	190–270	3	12 (3x4)	611835

Alloycraft 80-C1 is formulated to operate with AC (min 70 OCV), DC+ or DC- polarity. The preferred polarity for DC welding is DC+.

## Alloycraft 90-B3

- Hermetically sealed cans
- Improved high strength, low alloy steel electrode
- Very low 'H5' diffusible hydrogen class
- 620 MPa tensile class
- Batch numbered for on-the-job traceability
- Recommended for the all positional (except vertical-down) welding of Cr-Mo and Cr-Mo-V bearing steels as used for high temperature applications

Classifications
AS/NZS 1553.2: E6218-B3
AWS/ASME-SFA A5.5: E9018-B3 H4

Typical all weld metal mechanical properties	
0.2% Proof Stress	630 MPa
Tensile strength	720 MPa
Elongation	20%

Typical all weld metal analysis (%)						
C	Mn	Si	Mo	Cr	S	P
0.08	0.85	0.35	1.05	2.20	0.013	0.015

Typical diffusible hydrogen levels to AS3752
3.0–3.5 ml of /100 gm of deposited weld metal*

\*Reconditioned for 2 hours maximum at 350°C

Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity						
Electrode		Approx No. (rods/kg)	Current range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
3.2	350	26	105–150	3	12 (3x4)	611963
4.0	350	17	145–200	3	12 (3x4)	611964

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## MMA Electrodes

### Alloycraft 90

- Hermetically sealed cans
- Improved high strength, low alloy steel electrode
- Very low 'H5' diffusible hydrogen class
- 620 MPa tensile class, reliable impact toughness to -40°C
- Batch numbered for on-the-job traceability
- Applications include the full or under matching strength welding of high strength steels, including Bisalloy 60, 70 and 80, Welten 60 and 80, AS2074 Gr L6, Comsteel 023/026, ASTM A514 and A517 used in structural, transport, mining and earthmoving applications

#### Classifications

AS/NZS 1553.2: E6218M  
AWS/ASME-SFA A5.5: E9018M H4

Typical all weld metal mechanical properties	
0.2% proof stress	590 MPa
Tensile strength	680 MPa
Elongation	26%
CVN impact values	90J av @ -40°C

Typical all weld metal analysis (%)				
C	Mn	Si	Ni	Mo
0.07	1.0	0.40	1.6	0.3

Typical diffusible hydrogen levels to AS 3752  
3.0–3.5 ml of /100 gm of deposited weld metal\*  
\*Reconditioned for 2 hours maximum at 350°C

Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity						
Electrode		Approx no. rods / kg	Current range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
3.2	350	26	110–145	3	12 (3 x 4)	611873
4.0	350	17	140–200	3	12 (3 x 4)	611874
5.0	350	11	190–270	3	12 (3 x 4)	611875

Alloycraft 90 is formulated to operate with AC (min 70 OCV), DC+ or DC- polarity. The preferred polarity for DC welding is DC+.

### Alloycraft 110

- Hermetically sealed cans
- Improved high strength, low alloy steel electrode
- Low 'H5' diffusible hydrogen class
- 760 MPa tensile class, reliable impact toughness to -40°C
- Batch numbered for on-the-job traceability
- Applications include the full strength welding of high strength steels, including Bisalloy 80, USST1 and T1A, welten 80, HY80, AS2074 Grade L6A and ASTM A533 type A, A514 and A517 grades used in structural transport, mining and earthmoving applications

#### Classifications

AS/NZS 1553.2: E7618-M  
AWS/ASME-SFA A5.5: E11018M H4

Typical all weld metal mechanical properties	
0.2% Proof stress	710 MPa
Tensile strength	820 MPa
Elongation	22%
CVN impact values	60J av @ -50°C

Typical all weld metal analysis (%)					
C	Mn	Si	Ni	Mo	Cr
0.07	1.5	0.45	2.1	0.4	0.2

Typical diffusible hydrogen levels to AS 3752  
3.0–3.5 ml of /100 gm of deposited weld metal\*  
\*Reconditioned for 2 hours maximum at 350°C

Packaging and operating data — AC (min. 70 OCV) DC+ or DC- polarity						
Electrode		Approx no. rods / (kg)	Current range (A)	Packet (kg)	Carton (kg)	Part No.
Size (mm)	Length (mm)					
3.2	350	26	110–145	3	12 (3 x 4)	611893
4.0	350	17	140–200	3	12 (3 x 4)	611894

Alloycraft 110 is formulated to operate with AC (min 70 OCV), DC+ or DC- polarity. The preferred polarity for DC welding is DC+.

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

### Autocraft Mn-Mo

- A manganese molybdenum steel wire for the GMA welding of higher strength steels
- For use with welding grade CO<sub>2</sub> or argon based shielding gases
- 550 MPa tensile class weld deposits
- Suitable for the all positional fillet and butt welding of a wide range of higher strength steels, particularly those used in the fabrication of pressure vessels, boilers and pipelines

Classifications
AWS/ASME-SFA A5.28: ER80S-D2

Typical all weld metal mechanical properties						
	Argon20–25% CO <sub>2</sub>					
Yield stress	580 MPa					
Tensile strength	680 MPa					
Elongation	24%					
CVN impact values	80J av @ +20°C					
Typical wire analysis (%)						
C	Mn	Si	Mo	S	P	
0.08	1.73	0.65	0.45	0.011	0.017	

Typical diffusible hydrogen levels to AS3752
1.0–2.0 ml of hydrogen/100 gm of deposited weld metal
Recommended shielding gas
Argoshield® 52
Argoshield® 54
Stainshield®
Welding Grade CO <sub>2</sub>

Packaging and operating data						
Dia. (mm)	Voltage (V)	Wire feed speed (m/min)	Current Range (A)	Pack type*	Pack weight (kg)	Part No.
0.9	16–28	3.5–15	70–230	Spool	15	720049
1.2	18–32	3.5–15	120–350	Spool	15	720052

\* Spool (ø300 mm)

### Autocraft NiCrMo

- A low alloy steel wire for the GMA welding of high strength steels
- For use with welding grade CO<sub>2</sub> or argon based shielding gases
- 760 MPa tensile class weld deposits
- Suitable for the all positional fillet and butt welding of a wide range of high strength steels, particularly quenched and tempered types such as Bisalloy 80, USS-T1 types and Welten 80C etc.

Classifications
AS/NZS 2717.1: ESMG-GC/M-W769AH AWS/ASME-SFA A5.28: ER110S-G

Typical all weld metal mechanical properties							
	Argon 1–3% O <sub>2</sub>			Argon 20–25% CO <sub>2</sub>			
Yield stress	730 MPa			707 MPa			
Tensile strength	790 MPa			770 MPa			
Elongation	17%			21%			
CVN impact values	130J @ -29°C 80J @ -51°C			72J @ -29°C 50J @ -51°C			
Typical wire analysis (%)							
C	Mn	Si	Ni	Cr	Mo	V	
0.08	1.40	0.60	1.40	0.40	0.25	0.10	

Typical diffusible hydrogen levels to AS3752
1.0–2.0 ml of hydrogen/100 gm of deposited weld metal
Recommended shielding gas
Argoshield® 52
Argoshield® 54
Stainshield®
Welding Grade CO <sub>2</sub>

Packaging and operating data						
Dia. (mm)	Voltage (V)	Wire feed speed (m/min)	Current Range (A)	Pack type*	Pack weight (kg)	Part No.
1.2	18–32	3.5–15	120–350	Spool	15	720053

\* Spool (ø300 mm)

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## GMAW Wire

### Autocraft CrMo1

- A low alloy steel wire for the GMA welding of matching Cr-Mo steels
- Recommended for the GMA welding of 1/2Cr-1/2Mo, 1Cr-1/2Mo and 1 1/4Cr-1/2Mo steel pipes, plates and castings

#### Classifications

AS/NZS 2717.1: ESB2-GM-W559AH  
AWS/ASME-SFA A5.28: ER80S-B2

#### Typical all weld metal mechanical properties

	Argon 1–3% O <sub>2</sub>
0.2% Proof stress	500 MPa
Tensile strength	600 MPa
Elongation	20%
CVN impact values	60J av @ +20°C

Post weld heat treated at 620°C as required by AWS A5.28

#### Typical wire analysis (%)

C: 0.09      Mn: 0.60      Si: 0.60

Cr: 1.30      Mo: 0.50      P: 0.015

S: 0.010      Fe: Balance

#### Typical diffusible hydrogen levels to AS 3752

1.0–2.0 ml of hydrogen / 100 gm of deposited weld metal

#### Recommended shielding gas

Argoshield® 52  
Stainshield®

#### Packaging and operating data

Dia. (mm)	Voltage (V)	Wire feed speed (m/min)	Current Range (A)	Pack type*	Pack weight (kg)	Part No.
1.2	18–32	3.5–15	120–350	Spool	15	720029

\* Spool (ø300 mm)

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

# SmoothCor™ 811K2

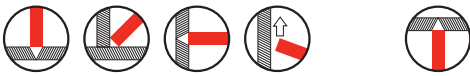
## Description

SmoothCor™ 811K2 is a rutile type flux cored wire designed to provide excellent low temperature impact toughness. It is suitable for use with both Ar/CO<sub>2</sub> or CO<sub>2</sub> shielding gas and can be used in all positions, including downhand, vertical-up and overhead. Designed for single and multi pass welding, SmoothCor™ 811K2 deposits a weld metal containing approximately 1.5% nickel. The nickel content of the weld metal ensures excellent impact properties at temperatures below -60°C, with radiographic quality that is consistently high. The very low H4 hydrogen class ensures superior crack resistance. A rutile based wire, SmoothCor™ 811K2 welds with a very smooth-running, low spatter arc and a fine spray type transfer to give excellent weld pool control. With its excellent feedability and easy arc starting characteristics, SmoothCor™ 811K2 has excellent operator appeal.

## Application

SmoothCor™ 811K2 is recommended for welding fine-grained, low alloy steels intended for service at low temperatures and for matching strength on 490 MPa yield strength steels. It is also eminently suitable for welding fine-grained and quench and tempered steels where undermatching strength weld metal is desirable.

## Welding Positions



Specifications				
Flux Type	Rutile			
Classification	AWS/ASME-SFA A5.29	E81T1-K2 H4, E81T1-K2M H4		
	AS 2203.1	ETP-GCp-W559A.K2 H5 ETP-GMp-W559A.K2 H5		
Approvals*	Lloyds Register of Shipping	Grade 5Y 40S H5		
	Det Norske Veritas	Grade 4YSA H5		
	American Bureau of Shipping	Grade 5YMS H5		
Welding Current	DC+			
*With Ar/CO <sub>2</sub> and CO <sub>2</sub> shielding gas				
Recommended Shielding Gases:				
Argoshield® 52 or Ar+20–25% CO <sub>2</sub> mixtures				
Welding Grade CO <sub>2</sub>				
Flow rate 15–20 L/min				
Chemical Composition, wt% – All Weld Metal				
Typical	C	Si	Mn	Ni
Argoshield® 52	0.05	0.45	1.15	1.54
CO <sub>2</sub>	0.04	0.38	1.07	1.54

Mechanical Properties – All Weld Metal		
As Welded	Using Argoshield® 52	Using CO <sub>2</sub>
Yield strength	490 MPa min	490 MPa min
Tensile strength	560–640 MPa	560–640 MPa
Elongation	25% min	25% min
Impact energy, CVN	125J av @ -29°C	120J av @ -29°C
	85J av @ -40°C	80J av @ -40°C
	76J av @ -60°C	73J av @ -60°C

PWHT*		
	Using Argoshield® 52	Using CO <sub>2</sub>
Yield strength	480 MPa min	470 MPa min
Tensile strength	550–620 MPa	550–620 MPa
Elongation	25% min	25% min
Impact energy, CVN	75J av @ -29°C	70J av @ -29°C
	65J av @ -40°C	60J av @ -40°C
	50J av @ -60°C	45J av @ -60°C

\* PWHT 625°C 2 hours

Diffusible Hydrogen	
1.2 mm, 100% CO <sub>2</sub> , DC+, 230 amps, 27 volts, 20 mm stick-out:	<4ml/100g (vacuum packed)
1.2 mm, Argoshield® 52, DC+, 230 amps, 27 volts, 20 mm stick-out:	<4ml/100g (vacuum packed)

Packaging Data		
Dia. (mm)	1.2	1.6
Part No.	10811K212	10811K216
Type	Spool (vacuum packed)	Spool (vacuum packed)
Weight (kg)	15	15

Welding Parameters						
Welding Position	Flat, Horizontal		Vertical-up		Overhead	
	1.2	1.6	1.2	1.6	1.2	1.6
Dia. (mm)	1.2	1.6	1.2	1.6	1.2	1.6
Current Range (A)	150–290	180–400	150–250	180–300	150–250	180–310
Voltage (V)	23–30	25–34	22–26	21–27	23–26	22–27
Electrode Stick-out (mm)	15–20	20–25	15–20	20–25	15–20	20–25

Deposition Data					
Dia. (mm)	Current (A)	Voltage (V)	Wire Feed Speed (m/min) Approx.	Deposition Rate (kg/h)	Efficiency (%)
1.2	150	28	5.08	1.91	86
	210	29	7.62	2.86	86
	250	30	10.16	3.86	87
	290	33	12.70	4.85	87
1.6	330	34	15.24	5.76	87
	190	27	3.81	2.77	87
	300	30	6.35	4.63	87
	365	33	7.62	5.58	86
	410	33	8.89	6.35	88

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## SmoothCor™ 115

### Description

SmoothCor™ 115 is a basic type flux cored wire designed for the welding of high tensile low alloy steels. It is suitable for use with both Ar / CO<sub>2</sub> or CO<sub>2</sub> shielding gas and can be used in both the flat and horizontal position. Designed for single and multi pass welding, SmoothCor™ 115 deposits a weld metal containing approximately 2.25% nickel, 0.5% molybdenum and 0.3% chromium which, apart from having good tensile properties, is extremely tough and ductile. The very low H4 hydrogen class ensures superior crack resistance. The wire produces weld metal of the highest radiographic and metallurgical quality. SmoothCor™ 115 welds with particularly stable running characteristics, a minimum amount of spatter and easy slag removal for this class of wire. Feedability is excellent.

### Application

SmoothCor™ 115 is recommended for welding a range of high strength, fine-grained structural steels, low temperature steels and quench and tempered steels. Produces matching strength and hardness on 690 MPa yield strength and 230 HB steels (e.g. AS 3597 grade 700, ASTM A514). Weld deposits are resistant to cracking in heavy sections or under high restraint.

### Welding Positions



### Specifications

Flux Type	Basic	
Classification	AWS/ASME-SFA A5.29	E110T5-K4 H4 E110T5-K4M H4
	AS 2203.1	ETD-GMp-W769A.K4 H5 ETD-GCp-W769A.K4 H5
Approvals*	American Bureau of Shipping	AWS A5.29 E110T5-K4M
Welding Current	DC+	

\*With Ar / CO<sub>2</sub> shielding gas

Recommended Shielding Gases	
Argoshield® 52 or Ar+20–25% CO <sub>2</sub> mixtures	
Welding Grade CO <sub>2</sub>	
Flow rate 15–20 L/min	

Chemical Composition, wt% – All Weld Metal						
Typical	C	Si	Mn	Ni	Mo	Cr
Argoshield® 52	0.07	0.38	1.55	2.29	0.44	0.27
CO <sub>2</sub>	0.06	0.30	1.40	2.29	0.44	0.22

Mechanical Properties – All Weld Metal		
As Welded	Using Argoshield® 52	Using CO <sub>2</sub>
Yield strength	690 MPa min	690 MPa min
Tensile strength	760–880 MPa	760–840 MPa
Elongation	17% min	17% min
Impact energy, CVN	30J min av @ -51°C	50J min av @ -51°C

Diffusible Hydrogen	
1.2 mm, 100% CO <sub>2</sub> , DC+, 230 amps, 27 volts, 20 mm stick-out:	<4ml/100g (vacuum packed)
1.2 mm, Argoshield® 52, DC+, 230 amps, 27 volts, 20 mm stick-out:	<4ml/100g (vacuum packed)

Packaging Data		
Dia. (mm)	1.2	1.6
Part No.	1011512	1011516
Type	Spool (vacuum packed)	Spool (vacuum packed)
Weight (kg)	15	15

Welding Parameters		
Dia. (mm)	1.2	1.6
Current Range (A)	150–290	180–400
Voltage (V)	23–30	25–34
Electrode Stick-out (mm)	15–20	20–25
Welding Position	Flat, Horizontal	

Deposition Data					
Dia. (mm)	Current (A)	Voltage (V)	Approx. Wire Feed Speed (m/min)	Deposition Rate (kg/h)	Efficiency (%)
1.2	170	29	7.24	3.20	96
	250	30	11.91	4.90	91
	300	32	15.39	6.44	92
1.6	300	30	5.74	4.45	92
	400	32	9.37	7.30	92
	450	32	10.72	8.40	93

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## Verti-Cor 81Ni1

- A higher strength low alloy steel, rutile type flux cored wire
- Formulated for use with argon +20–25% CO<sub>2</sub> shielding gases
- Versatile, all positional capabilities
- Excellent operator appeal
- Now precision layer wound
- A nominal 1% nickel steel deposit of the 550 MPa tensile class
- Typical applications include the under matching strength fillet welding of Bisalloy 60, 70 and 80 quenched and tempered steels

### Classifications

AS/NZS 2203.1: ETP-GMp-W554A. Ni1 H10  
 AWS/ASME-SFA A5.29: E81T1-Ni1MH8

### Typical all weld metal mechanical properties

Using Argon +20–25% CO <sub>2</sub>	
Yield stress	520 MPa
Tensile strength	600 MPa
Elongation	26%
CVN impact values	65J av @ -40°C

Typical all weld metal analysis (%)*		
C: 0.06	Mn: 1.35	Si: 0.35
Ni: 0.90	Ti: 0.035	B: 0.007

\*Using Argon +20–25% CO<sub>2</sub>

### Typical diffusible hydrogen levels to AS 3752

5.0–6.0 ml of hydrogen / 100 gm of deposited weld metal\*

\* For 'as manufactured' product using Argosshield® Argon +20–25% CO<sub>2</sub>

Recommended shielding gas
Argosshield® 52

### Packaging data

Dia. (mm)	Pack type	Pack weight (kg)	Part No.
1.2	Spool	15	720390
1.6	Spool	15	720391

### Operating data

All welding conditions recommended below are for use with semi-automatic operation, DC electrode positive and welding grade CO<sub>2</sub> shielding gas with a flow rate of 10–15 L/min.

Dia. (mm)	Current range (A)	Voltage (V)	Electrode stick-out ESO (mm)	Optimum amps	Volts	Welding positions
1.2	250–300	27–31	20–25	280	31	Flat
1.6	350–400	27–31	25–30	360	31	
1.2	230–280	26–30	20–25	260	28	HV Fillet
1.6	310–360	26–30	25–30	320	29	
1.2	170–220	24–28	15–20	200	24	Vertical-up
1.6	200–250	24–28	15–20	240	25	
1.2	160–210	24–28	15–20	200	24	Overhead
1.6	190–240	24–28	15–20	220	24	

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## Verti-Cor 81 Ni1 H4

- Higher strength copper-coated seamless low alloy, rutile type flux cored wire
- Formulated for use with either Argon + 20–25% CO<sub>2</sub> or CO<sub>2</sub> shielding gases
- Versatile, all positional capabilities
- Outstanding operator appeal
- Low fume levels
- Precision layer wound

Classifications
AS 2203.1: ETP-GC/Mp-W554A. Ni1 H5
AWS/ASME-SFA A5.29: E81T1-Ni1M H4; E81T1-Ni1 H4

Typical All Weld Metal Mechanical Properties		
	Using Argon +20–25% CO <sub>2</sub>	CO <sub>2</sub>
Yield Stress	540 MPa	500 MPa
Tensile Strength	600 MPa	560 MPa
Elongation	22%	23%
CVN Impact Values	85J av @ -40°C	75J av @ -50°C

Approvals*	
Lloyds Register of Shipping	Grade 4Y, 4YS H10
American Bureau of Shipping	Grade 4YSA H5
Det Norske Veritas	Grade 4YMS H10

\*with Argon +20–25% CO<sub>2</sub> or CO<sub>2</sub> shielding gases

Typical all weld metal analysis (%)			
C	Mn	Si	Ni
Using Argon + 20–25% CO <sub>2</sub>			
0.06	1.4	0.5	1.00
Using CO <sub>2</sub>			
0.05	1.1	0.38	1.16

Typical Diffusible Hydrogen Levels to AS3752
<3 mls of hydrogen / 100gms of deposited weld metal for 'as manufactured' product using Argon +20–25% CO <sub>2</sub> or CO <sub>2</sub>

Recommended Shielding Gas	
Welding Grade CO <sub>2</sub> Argoshield® 52	ISO14175: C1

Packaging data			
Wire Dia. (mm)	Pack Type	Weight (kg)	Part No.
1.2	Spool	15	720550
1.6	Spool	15	720551

Operating data				
All welding conditions recommended below are for use with semi-automatic operation, DC electrode positive and Argon +20–25% CO <sub>2</sub> shielding gas with a flow rate of 15–20 L/min.				
Wire Dia. (mm)	Current Range (A)	Voltage Range (V)	CTWD	Welding Positions
1.2	250–300	27–31	20–25	Flat
1.6	350–400	27–31	25–30	Flat
1.2	230–280	26–30	20–25	HV Fillet
1.6	310–360	26–30	25–30	HV Fillet
1.2	170–220	24–28	15–20	Vertical-up
1.6	200–250	24–28	15–20	Vertical-up
1.2	160–210	24–28	15–20	Overhead
1.6	190–240	24–28	15–20	Overhead

These machine settings are a guide only. Actual voltage, welding current and CTWD used will depend on machine characteristics, plate thickness, run size, shielding gas and operator technique etc.

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## Verti-Cor 91 K2 H4

- Copper coated seamless wire delivering very low H4 class hydrogen levels
- Higher strength low alloy, rutile type flux cored wire
- Formulated for use with Argon + 20–25% CO<sub>2</sub>
- Very low hydrogen status
- Low fume levels

### Classifications

AS 2203.1: ETP-GMp-W629A. K2 H5.  
AWS/ASME-SFA A5.29: E91T1-K2M H4

### Typical All Weld Metal Mechanical Properties

Using Argon + 20–25% CO <sub>2</sub>	
Yield Stress	560 MPa
Tensile Strength	670 MPa
Elongation	22%
CVN Impact Values	>40J av @ -40°C

Typical all weld metal analysis (%)*			
C	Mn	Si	Ni
0.05	1.3	0.3	1.2

\*Using Argon + 20–25% CO<sub>2</sub> shielding gas

### Typical Diffusible Hydrogen Levels to AS 3752:

<3.5 mls of hydrogen / 100gms of deposited weld metal \*

\* For 'as manufactured' product using Argon + 20–25% CO<sub>2</sub> shielding gas

Recommended Shielding Gas
Welding Grade Argon Argoshield® 52

### Packaging data

Dia. (mm)	Pack Type	Weight (kg)	Part No.
1.2	Spool	15	720554
1.6	Spool	15	720555

### Operating data

All welding conditions recommended below are for use with semi-automatic operation, DC electrode positive and Argon +20–25% CO<sub>2</sub> shielding gas with a flow rate of 15–20 L/min.

Wire Dia. (mm)	Current Range (A)	Voltage Range (V)	Electrode stick-out ESO (mm)	Welding Positions
1.2	250–300	27–31	20–25	Flat
1.6	350–400	27–31	25–30	Flat
1.2	230–280	26–30	20–25	HV Fillet
1.6	310–360	26–30	25–30	HV Fillet
1.2	170–220	24–28	15–20	Vertical-up
1.6	200–250	24–28	15–20	Vertical-up
1.2	160–210	24–28	15–20	Overhead
1.6	190–240	24–28	15–20	Overhead

These machine settings are a guide only. Actual voltage, welding current and CTWD used will depend on machine characteristics, plate thickness, run size, shielding gas and operator technique etc.

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

## FCAW Wire

## Gas Assisted

### Verti-Cor 111 K3

- A high strength low alloy steel, rutile type flux cored wire
- Formulated for use with argon + 20–25% CO<sub>2</sub> shielding gases
- Versatile, all positional capabilities
- A nickel molybdenum steel deposit of the 760 MPa tensile class
- Typical applications include the full strength butt welding and fillet welding of Bisalloy 80 and similar quenched and tempered steels
- Precision layer wound

Classifications	
AS/NZS 2203.1: ETP-GMp-W768A. K3 H10	
AWS/ASME-SFA A5.29: E111T1-K3M H8	
Typical all weld metal mechanical properties	
Using Argon +20–25% CO <sub>2</sub>	
0.2% Proof stress	775 MPa
Tensile strength	835 MPa
Elongation	18%
CVN impact values	55J av @ -20°C

Typical all weld metal analysis (%)*					
C: 0.06	Mn: 1.65	Si: 0.36			
Ni: 2.05	Mo: 0.46	B: 0.004			

\*Using Argon +20–25% CO<sub>2</sub>

Typical diffusible hydrogen levels to AS 3752	
5–6 ml of hydrogen / 100 gm of deposited weld metal*	

\* For 'as manufactured' product using an electrode stick-out ESO of 20mm with 1.2mm wire and 25 mm with 1.6 mm wire and mid-range current and voltage (V) settings.

Recommended shielding gas	
Argoshield® 52	

Packaging data			
Dia. (mm)	Pack type	Weight (kg)	Part No.
1.2	PLW	15	721381
1.6	PLW	15	721382

**Operating data**  
All welding conditions recommended below are for use with semi-automatic operation, DC electrode positive and Argoshield® 52 shielding gas with a flow rate of 15–20 L/min.

Dia. (mm)	Current range (A)	Voltage (V)	Electrode stick-out ESO (mm)	Optimum amps	Volts	Welding positions
1.2	250–300	27–31	20–25	280	31	Flat
1.6	350–400	27–31	25–30	360	31	Flat
1.2	230–280	26–30	20–25	260	28	HV Fillet
1.6	310–360	26–30	25–30	320	29	HV Fillet
1.2	170–220	24–28	15–20	200	24	Vertical-up
1.6	200–250	24–28	15–20	240	25	Vertical-up
1.2	160–210	24–28	15–20	200	24	Overhead
1.6	190–240	24–28	15–20	220	24	Overhead

### Tensi-Cor 110TXP H4

- Fully basic, high strength low alloy steel, seamless flux cored wire
- Formulated for use with CO<sub>2</sub> and Argon + 20–25% CO<sub>2</sub>
- Premium quality weld deposits
- 'Very low H<sub>5</sub>' hydrogen status
- For the crack-free, full strength butt welding of Bisalloy 80 and similar quenched and tempered steels
- Seamless copper coated
- Precision layer wound

Classifications	
AS/NZS 2203.1: ETD-GCn/p-W769A. K4 H5 ETD-GMn/p-W769A. K4 H5	
AWS/ASME-SFA A5.29: E110T5-K4	
Typical all weld metal mechanical properties	
Using welding grade CO <sub>2</sub>	
Yield stress	720 MPa
Tensile strength	800 MPa
Elongation	22%
CVN impact values	50J av @ -50°C

Typical all weld metal analysis (%)*						
C	Mn	Si	Ni	Mo	Cr	
0.08	1.50	0.40	1.90	0.4	0.3	

\*Using CO<sub>2</sub> shielding gas

Typical diffusible hydrogen levels to AS3752	
<3–5 ml of hydrogen / 100 gm of deposited weld metal*	

\*For 'as manufactured' product using welding grade CO<sub>2</sub> shielding gas

Recommended shielding gases	
Welding Grade CO <sub>2</sub> Argoshield® 52	

Packaging data			
Dia. (mm)	Pack type	Weight (kg)	Part No.
1.6	Spool	15	720387
2.4	Coil	25	720389

**Operating data**  
All welding conditions recommended below are for use with semi-automatic operation, DC electrode positive and welding grade CO<sub>2</sub> shielding gas with a flow rate of 15–20 L/min.

Dia. (mm)	Current range (A)	Voltage (V)	Electrode stick-out ESO (mm)	Optimum amps	Volts	Welding positions
1.6	300–350	28–32	25–30	320	29	Flat
2.4	400–450	28–32	25–35	450	32	Flat
1.6	280–330	27–31	25–30	300	28	HV Fillet
2.4	380–430	27–31	25–30	400	28	HV Fillet
1.6	220–270	25–30	25–30	280	26	Vertical-up
1.6	260–310	27–31	25–30	N/A	N/A	Horizontal
2.4	360–410	27–31	25–30	N/A	N/A	Horizontal

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Gas Assisted FCAW Wire

### Outershield 81Ni1-H

Produces weld deposits exhibiting excellent low temperature impacts and CTOD values. Ideally suited to applications requiring superior mechanical properties in the as welded condition.

Classifications	
AS 2203.1: ETP-GMp-W554. Ni1.H5;AWS A5.29: E81T1-Ni1	

Size (mm)	Weight (kg)	Part No.
1.2	15 Readireel	941357
1.6*	15 Readireel	942750

\*No spool adaptor required

### Outershield 91K2-H

For HY-80, HSLA-80 and similar steels. Produces weld deposits exhibiting excellent low temperature impact values.

Classifications	
AS 2203.1: ETP-GMp-W629A.K2.H5;AWS A5.29: E91T1-K2	

Size (mm)	Weight (kg)	Part No.
1.2	11.34 Readireel	ED017708
1.6	11.34 Readireel	ED017709

### Outershield 690-H

For high strength steel grades like grade S690. Outstanding operator appeal. Exceptional mechanical properties (CVN >50J @ -40°C). Good wire feeding. Superior product consistency with optimal alloy control.

Classifications	
AWS.A5.29: E111T1-K3 MJ H4	

Size (mm)	Weight (kg)	Product No
1.2	15	942422
1.6	15	942828

Self Shielded FCAW Wire

### Pipeliners NR-207

Primarily used for hot, fill and cap pass welding on cross-country pipelines. It is designed to produce weld deposits exceeding 490 MPa tensile strength with excellent low temperature impact properties.

Classifications	
AS 2203.1:ETP-GNn-W509A.Ni1.H15;AWS A5.29: E71T8-K6	

Size (mm)	Weight (kg)	Part No.
2.0	6.0* Coil	KC207206

\*4 per box

### Pipeliners NR-208P

Similar to NR-207-H, but with higher strength. Produces weld deposits exceeding 80,000psi yield strength with excellent low temperature impacts. Recommended for API Pipe Grade X80.

Classification	
AWS. E91T8-G	

Size (mm)	Weight (kg)	Product No
2.0	6.0*	KC208206

\*4 per box

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TIG

## Comweld CrMo 1

- Nominal 1.25% Cr 0.5% Mo steel TIG rod
- End stamped with AWS class 'ER80S-B2' for easy identification
- For the gas tungsten arc (TIG) welding of matching Cr-Mo creep resistant steels for elevated temperature and corrosive service

Classifications
AS/NZS 1167.2: RB2 AWS/ASME-SFA A5.28: ER80S-B2

Typical rod analysis (%)		
C: 0.09	Mn: 0.60	Si: 0.60
Cr: 1.30	Mo: 0.50	P: 0.015
S: 0.010	Fe: Balance	

Recommended shielding gases
Argon Welding Grade Alushield® Light

Packaging data			
Rod Size (mm)	Weight (kg), Pack type	Approx. (rods/kg)	Part No.
2.4 x 1,000	5 kg cardboard tube*	29	321379

\*Resealable

## Comweld CrMo 2

- Nominal 2.5% CR 1% Mo steel TIG rod
- End stamped with AWS class 'ER90S-B3' for easy identification
- For the gas tungsten arc (TIG) welding of Cr-Mo and Cr-Mo-V creep resistant steels for elevated temperature and corrosive service

Classifications
AS/NZS 1167.2: RB3 AWS/ASME-SFA A5.28: ER90S-B3

Typical rod analysis (%)		
C: 0.08	Mn: 0.70	Si: 0.60
Cr: 2.50	Mo: 1.00	P: 0.015
S: 0.010	Fe: Balance	

Recommended shielding gases
Argon Welding Grade

Packaging data			
Rod Size (mm)	Weight (kg), Pack type	Approx. (rods/kg)	Part No.
2.4 x 1,000	5 kg cardboard tube*	29	321383

\*Resealable

**WARNING** Welding can give rise to electric shock, excessive noise, eye and skin burns due to the arc rays, and a potential health hazard if you breathe in the emitted fumes and gases. Read all the manufacturer's instructions to achieve the correct welding conditions and ask your employer for the Materials Safety Data Sheets. Refer to [www.boc.com.au](http://www.boc.com.au) or [www.boc.co.nz](http://www.boc.co.nz)

Submerged Arc Wire

### L-70

Special purpose 0.5% Mo electrode recommended for multiple pass welding with 860 flux on 480 MPa tensile (stress relieved) applications when the use of Mo is not restricted. Also suitable for single pass welding with Lincoln 700 series fluxes.

Classification:
AS 1858.2: EA1; AWS A5.23: EA1

Size (mm)	Weight (kg)	Part No.
2.0	30 Coil	KC702030
3.2	30 Coil	KC703230
4.0	27.2 Coil	ED012053
4.0	30 coil	KC704030
4.0	600 Bulk reel spool	KC7040600

### LAC-B2

Alloy cored wire designed for welding chromium-molybdenum steels having 1.25% Cr – 0.5% Mo or less.

Classifications
AS 1858.2: ECB2; AWS A5.23: ECB2

Size (mm)	Weight (kg)	Part No.
2.4	22.68 Coil	ED010954
4.0	22.68 Coil	ED010955

### LAC-M2

Alloy cored wire designed to weld steels requiring 690 MPa yield strength (as welded or stress relieved) and 20 J minimum Charpy V-notch at -45°C.

Classifications
AS 1858.2: ECM2; AWS A5.23: ECM2

Size (mm)	Weight (kg)	Part No.
2.4	22.68 Coil	ED010981
4.0	22.68 Coil	ED010982

### LAC-Ni2

Alloy cored wire designed to weld weathering steels, 2.5% nickel steels, 3.5% nickel steels, and other steels requiring 480 MPa tensile strength (as welded or stress relieved) and excellent low temperature impact properties.

Classifications
AS 1858.2: ECNi2; AWS A5.23: ECNi2

Size (mm)	Weight (kg)	Part No.
2.4	22.68 Coil	ED010986

Submerged Arc Flux

Refer to page 491–492 for a listing of Submerged Arc Flux

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