

# PRODUCT CATALOGUE



**WELDING SPECIALITIES (INDIA) PVT. LTD.**



## COMPANY PROFILE

---

We are part of a group engaged in manufacturing of 'Welding Consumables and Consultancy' from last more than two decades. The group is headquartered at Nasik, one of the fastest growing industrial cities of Maharashtra state in India.

We are an ISO certified company equipped with modern plants, sophisticated machines and complete in-house R&D facilities for development and manufacture of different types of 'Manual Arc Welding Electrodes and MIG/TIG/SAW/Flux Cored welding wires and fluxes'. The range of products includes Mild Steel, Low Hydrogen, High Efficiency, Hard Facing, Cutting and Gouging, Non-Ferrous, Cast Iron, Stainless Steel, Low Alloy High Tensile and Low Heat Input welding electrodes, Stainless Steel filler wires, SAW wires/Fluxes, Flux Cored Wires and MIG/CO<sub>2</sub> welding wires. We have a 'State-of-the-Art' precision layer CO<sub>2</sub> wires and Flux Cored wires manufacturing facility.

The company has established its name in last over 20 years as a reliable source of quality products and services.

**Cutting  
Edge  
Performance**



# INDEX - 1



Sr.No.	Description	Page. No.
1)	<b>MILD STEEL GENERAL PURPOSE ELECTRODES</b>	
	i) WELWELDER GP / WELWELDER XL      ii) WELWELDER 6013/ WELWELDER X .....	01
2)	<b>MILD STEEL SPECIAL ELECTRODES</b>	
	i) PREMIER 6013X / WELWELDER 6013X      ii) WELWELDER 6013XX .....	02
3)	<b>MILD STEEL HIGH EFFICIENCY ELECTRODES</b>	
	i) DEEPWELD      ii) SUPREMO-7014 .....	03
	iii) SUPREMO-7024 (140)      iv) SUPREMO-7024 (200) .....	04
4)	<b>LOW HYDROGEN ELECTRODES</b>	
	i) PREMIER-7016      ii) PREMIER-7018 .....	05
5)	<b>HARDFACING ELECTRODES</b>	
	i) HARDWELD-250      ii) HARDWELD-350 .....	06
	iii) HARDWELD-350 (LH)      iv) HARDWELD-V .....	06
	v) HARDWELD-600      vi) HARDWELD-600 (LH) .....	07
	vii) HARDMANGAN .....	08
6)	<b>STAINLESS STEEL ELECTRODES</b>	
	i) PRENOX-1A/ WELINOX 308      ii) PRENOX-1B .....	09
	iii) PRENOX-1C/ WELINOX 308L      iv) PRENOX-2A/ WELINOX 316 .....	10
	v) PRENOX-2B      vi) PRENOX-2C .....	11
	vii) PRENOX-D2/ WELINOX 309      viii) PRENOX-CW/ WELINOX 310 .....	12
	ix) PRENOX-D2 Mo      x) PRENOX-D2 Cb .....	13
	xi) PRENOX-312      xii) PRENOX-13 .....	14
	xiii) PRENOX-17 .....	15
7)	<b>CAST IRON ELECTRODES</b>	
	i) FORTECAST-CN      ii) FORTECAST-N .....	16
	iii) FORTECAST-FN      iv) FORTECAST-NM .....	17
8)	<b>HIGH TENSILE STEEL ELECTRODES</b>	
	i) PREMIER-8018 G      ii) PREMIER-8018 C1 .....	18
	iii) PREMIER-9018 G      iv) PREMIER-CHROME1 .....	19
	v) PREMIER-CHROME 2      vi) PREMIER-NMC .....	20
	vii) PREMIER-11016 G      viii) PREMIER-11018 M .....	21
9)	<b>LOW HEAT INPUT WELDING ALLOYS</b>	
	i) STEELS ASTRALLOY 662      ii) STEELS ASTRALLOY 663 .....	22
	iii) STEELS ASTRALLOY 664      iv) STEELS ASTRALLOY 665 .....	22
	v) STEELS ASTRALLOY 666      vi) STEELS ASTRALLOY 667 .....	23
	vii) STEELS ASTRALLOY 668      viii) STEELS ASTRALLOY 669 .....	23
	ix) STEELS ASTRALLOY 690 .....	24
	x) STAINLESS STEELS ASTRALLOY 708      xi) STAINLESS STEELS ASTRALLOY 709 .....	24
	xii) STAINLESS STEELS ASTRALLOY 710 .....	24
	xiii) STAINLESS STEELS ASTRALLOY 711      xiv) STAINLESS STEELS ASTRALLOY 712 .....	25
	xv) STAINLESS STEELS ASTRALLOY 714 .....	25
	xvi) CAST IRON ASTRALLOY 523      xvii) CAST IRON ASTRALLOY 524 .....	25 to 26
	xviii) CAST IRON ASTRALLOY 526      xix) CAST IRON ASTRALLOY 527 .....	26
	xx) COPPER, BRASS & BRONZE ASTRALLOY 328      xxi) COPPER, BRASS & BRONZE ASTRALLOY 329 .....	26 to 27
	xxii) NICKEL & NICKEL ALLOYS ASTRALLOY 210      xxiii) NICKEL & NICKEL ALLOYS ASTRALLOY 211 .....	27
	xxiv) WEAR FACING ALLOYS ASTRALLOY 430      xxv) WEAR FACING ALLOYS ASTRALLOY 432 .....	27 to 28
	xxvi) WEAR FACING ALLOYS ASTRALLOY 440      xxvii) WEAR FACING ALLOYS ASTRALLOY 444 .....	28
	xxviii) WEAR FACING ALLOYS ASTRALLOY 445      xxix) WEAR FACING ALLOYS ASTRALLOY 446 .....	28 to 29
	xxx) WEAR FACING ALLOYS ASTRALLOY 447      xxxi) WEAR FACING ALLOYS ASTRALLOY 448 .....	29
	xxxii) WEAR FACING ALLOYS ASTRALLOY 450      xxxiii) WEAR FACING ALLOYS ASTRALLOY 451 .....	29 to 30
	xxxiv) GOUGING & CUTTING ASTRALLOY 101      xxxv) GOUGING & CUTTING ASTRALLOY 102 .....	30



Sr.No.	Description	Page. No.
10)	<b>STAINLESS STEEL TIG WIRE</b>	
	i) GRADE ER 308L	ii) GRADE ER 309L .....31
	iii) GRADE ER 309Mo	iv) GRADE ER 310 .....31
	v) GRADE ER 310H	vi) GRADE ER 310L .....32
	vii) GRADE ER 312	viii) GRADE ER 316L .....32
	ix) GRADE ER 317L	x) GRADE ER 318 .....33
	xi) GRADE ER 318L	xii) GRADE ER 330 .....33
	xiii) GRADE ER 347 .....34	
11)	<b>TIG WELDING WIRE</b>	
	i) ASTRALLOY 70S-2 .....34	
12)	<b>FLUX CORED WELDING WIRE</b>	
	i) GRADE AWS E 71 T1	ii) GRADE AWS E 71 T5 .....35
13)	<b>ALUMINUM ALLOY WELDING WIRE</b>	
	i) GRADE : ER1050A, ER1080A, ER4043, ER4047, ER5356, ER5183 ..... 36 to 37	
14)	<b>SUBMERGED ARC WELDING WIRE</b>	
15)	<b>COPPER COATED SOLID WIRE FOR MIG/CO2 WELDING</b> ..... 39	
16)	<b>COPPER COATED SOLID WIRE FOR MIG/CO2 WELDING (JUMBO PAC)</b> ..... 39	
17)	<b>DATA SHEETS / ELECTRODE CONSUMPTION</b> ..... 40 to 41	
18)	<b>DATA SHEETS / CO2 / MIG / TIG WIRE CONSUMPTION</b> ..... 42	
19)	<b>DATA SHEETS / FLUX CORED WIRE CONSUMPTION</b> ..... 43	
20)	<b>SOLID WIRE VERSUS FLUX CORED WIRE</b> .....44 to 45	

## Serving Engineering Industry







## MILD STEEL GENERAL PURPOSE ELECTRODES

### WELWELDER GP WELWELDER XL

#### CHARACTERISTICS:

A medium coated, rutile type, general purpose electrode, with excellent ductility and good penetration. Designed for welding in all positions.

#### APPLICATIONS:

Structures, Steel Furniture's, Storage Tanks, Truck Bodies, Building Construction, Steel Window Frames, Grills, Trailers, Pipelines etc.

#### TYPICAL WELDMETAL COMPOSITION:

Element	Percent
C	0.064
Mn	0.48
Si	0.23
P	0.022
S	0.017

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL:

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
48	42	24	6.5

#### CLASSIFICATION:

AWS A5.1	:	E 6013
IS	:	ER 4211
BS 639	:	E 4211 R 11

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Case
6.30x450	220-280	25	300
5.00x450	170-220	40	480
4.00x450	140-170	60	720
3.15x450	90-110	90	1080
3.15x350	90-120	90	1080
2.50x350	60-80	125	1500



### WELWELDER 6013 / WELWELDER X

#### CHARACTERISTICS:

A medium coated rutile type electrode, for general purpose welding of structural steels. It is suitable for all welding positions including vertical downward. The electrode produces a smooth clean deposit with very little spatter and the slag is easy to remove. The weld metal is soft, ductile, defect free and provides sound mechanical properties.

#### APPLICATIONS:

Structural Steels, Steel Furnitures, Truck Bodies, Window Frames and Grills, Storage Tanks, Auto parts, Bridges, Wagons, Barges, Rail Coaches, Building Structures, Vessels, Agricultural Implements etc.

#### TYPICAL WELDMETAL COMPOSITION:

Element	Percent
C	0.070
Mn	0.59
Si	0.21
P	0.025
S	0.020

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL:

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
50	44	25	7.5

#### CLASSIFICATION:

AWS A5.1	:	E 6013
IS	:	ER 4211
BS 639	:	E 4211 R 11

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Case
6.30x450	240-280	25	300
5.00x450	180-240	40	480
4.00x450	140-180	60	720
3.15x450	100-120	90	1080
3.15x350	100-140	90	1080
2.50x350	60-90	135	1620





## MILD STEEL SPECIAL ELECTRODES

### PREMIER 6013X WELWELDER 6013X

#### CHARACTERISTICS :

A medium heavy coated, rutile type, general purpose, all position Mild Steel Electrode with good mechanical properties. Yields radiographic quality welds and excellent for sheet metal work

#### APPLICATIONS :

Heavy structural steel work, Ships, Boilers, Pressure pipelines, Oil tanks, Sheet metal welding etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.068
Mn	0.50
Si	0.23
P	0.025
S	0.020

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
55	49	26	8

#### CLASSIFICATION :

AWS A5.1	:	E 6013
IS	:	ER 4322 X
DIN 1913	:	E 4322 R 3
BS 639	:	E 4322 R

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
6.30x450	240-320	40	160
5.00x450	160-240	55	220
4.00x450	120-150	85	340
3.15x450	80-100	130	520
3.15x350	80-120	130	520
2.50x350	60-80	225	900
2.00x350	30-60	340	1360

Or, 5Kg per Packet and 4 Packets per Carton.

### Approved By:

**Lloyds Register of Shipping (LRS)**  
**American Bureau of Shipping (ABS)**  
**Bureau Veritas (BV)**

### WELWELDER 6013XX

#### CHARACTERISTICS :

A heavy coated, rutile type, all position general purpose electrode for radiographic quality welds at high welding speed. A very soft arc, medium penetration, uniform, smooth and shiny bead with self peeling slag.

#### APPLICATIONS :

Pressure vessels, Boilers, Locomotive fire boxes, Scooter frames, Heavy girder fabrication, Bridges, Cranes, Machinery base, Storage tanks and where strength combined with finish is necessary.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.075
Mn	0.55
Si	0.28
P	0.027
S	0.022

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
56	49	28	8.5

#### CLASSIFICATION :

AWS A5.1	:	E 6013
IS	:	E RR 4322 X
DIN 1913	:	E 4322 RR 6
BS 639	:	E 4322 RR

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
6.30x450	250-320	35	140
5.00x450	190-260	40	160
4.00x450	140-220	65	260
3.15x450	100-140	105	420
2.50x350	60-100	175	700
2.00x350	40-60	290	1160





## MILD STEEL HIGH EFFICIENCY ELECTRODES

### DEEPWELD

#### CHARACTERISTICS :

A heavy coated, iron powder, deep penetration electrode for butt & fillet welds. Steels up to 14 mm thickness can be welded without edge preparation of bevelling. To achieve production targets electrodes can be used at higher current and faster speed.

Deposition efficiency approx. 103%. Can be used only in flat and horizontal position. The deposited weldmetal is of Radiographic quality.

#### APPLICATIONS:

Welding of Heavy structures, Bridges, Tanks, Shipdeck plates by deep penetration technique thus eliminating beveling and refilling of the groove. Penetration beyond the root for depositing fillet weld.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.06-0.10
Mn	0.45-0.75
Si	0.45-0.65
P	0.03 Max
S	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

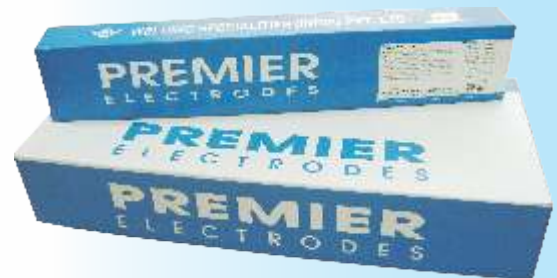
Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
46-55	37-46	26-28	7-9

#### CLASSIFICATION :

AWS A5.1	:	E 6027
DIN 1913	:	E 4152 AR 11 105
BS 639	:	E 4152 AR

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x350	250-300	40	160
4.00x350	180-250	65	260
3.15x350	150-180	105	420



### SUPREMO-7014

#### CHARACTERISTICS :

A heavy coated rutile based iron powder electrode. Deposition efficiency is above 110%. The electrode is suitable for all positions including vertical down. Excellent for contact welding. The weld metal is extremely ductile and is of radiographic quality. Also suitable for low alloy medium tensile steels.

#### APPLICATIONS:

Highly stressed structures, High pressure vessels, Boilers, Bridges, Machine parts, Bogies and under frames of Railway wagons, Cranes, Low alloy steels, Steel castings etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07-0.10
Mn	0.40-0.65
Si	0.15-0.40
P	0.03 Max
S	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
51-61	41-51	22-26	6-10

#### CLASSIFICATION :

AWS A5.1	:	E 7014
DIN 1913	:	E 5122 RR 11 110
BS 639	:	E 5122 RR

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
6.30x450	260-300	30	120
5.00x450	200-250	45	180
4.00x450	140-200	75	300
3.15x450	100-140	110	440





## MILD STEEL HIGH EFFICIENCY ELECTRODES

### SUPREMO-7024 (140)

#### CHARACTERISTICS :

A super heavy coated, rutile based, iron powder electrode suitable for butt and fillet down hand and horizontal welding, specially suitable for high current and high speed uses resulting in better output/time ratio. The deposition efficiency of electrode is 140% approx. It is a contact electrode that produces very smooth welds with least spattering tendency. It gives radiographic quality weld metal deposition.

#### APPLICATIONS:

Heavy structures like Cranes, Bridges & Girders, Earth moving equipment, Heavy machine parts, Fillet welding in mild steel, Heavy deck plates etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07-0.10
Mn	0.5-0.8
Si	0.2-0.4
P	0.03 Max
S	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

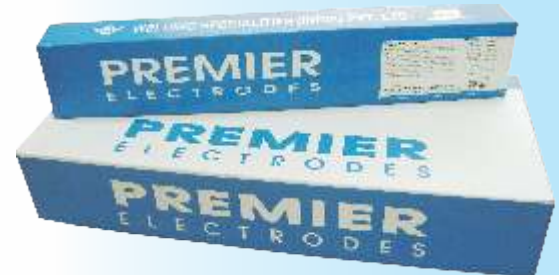
Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
50-60	40-50	24-28	6-10

#### CLASSIFICATION :

AWS A5.1	:	E 7024
DIN 1913	:	E 5132 RR 11 140
BS 639	:	E 5132 RR

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
6.30x450	300-360	15	60
5.00x450	250-300	20	80
4.00x450	200-250	30	120
3.15x450	150-170	45	180



### SUPREMO-7024 (200)

#### CHARACTERISTICS :

A super heavy coated, rutile based, iron powder electrode. This electrode is quite economical because of high deposition efficiency i.e 200% approx. It is suitable for high speed welding of butt, fillet welds in horizontal and downhand welding with radiographic quality welds.

#### APPLICATIONS:

Heavy structures like Cranes, Bridges & Girders, Earth moving equipment, Heavy machine parts, Fillet welding in mild steel, Heavy deck plates etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07-0.10
Mn	0.60-0.8
Si	0.3-0.5
P	0.03 Max
S	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at 0 °C. Kgm
50-57	41-48	22-29	6-10

#### CLASSIFICATION :

AWS A5.1	:	E 7024
DIN 1913	:	E 5132 RR 11 210
BS 639	:	E 5132 RR

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	250-320	20	80
4.00x450	200-250	30	120
3.15x450	150-180	45	180







## LOW HYDROGEN ELECTRODES

### PREMIER-7016

#### CHARACTERISTICS :

PREMIER-7016 is a heavy coated, all position, low hydrogen type electrode for the welding of medium high tensile structural steels, joining and surfacing of high strength steels such as Carbon Steel upto 0.4% C, Manganese Steel upto 2.0% Mn and Chromium Steel upto 0.4% C and 0.6% Cr. PREMIER-7016 is highly recommended for use on structures subject to impact and dynamic loading under severe service conditions.

#### APPLICATIONS :

Building structures, Rail coaches and wagons, steels of unknown composition, Welding of cast iron, Welding buffer layer before hardfacing, Earth moving machinery etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.075
Mn	0.32
Si	1.23
P	0.017
S	0.022

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL:

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at -20 °C. Kgm
57	48	26	8

#### CLASSIFICATION :

AWS A5.1	:	E 7016
IS	:	EB 5126 H 2 X
DIN 1913	:	E 5126 B 10
BS 639	:	E 5126 B 24 (H)

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	240-320	30	120
5.00x450	190-240	50	200
4.00x450	140-190	75	300
3.15x450	100-140	120	480
2.50x350	60-100	235	940

Or, 5Kg per Packet and 4 Packets per Carton.



### PREMIER-7018

#### CHARACTERISTICS :

PREMIER-7018 is a heavy coated, all position, low hydrogen type electrode, designed for welding of structural steels, high strength low-alloy steels, boiler plates and also low temperature steels. It permits crack resistant welding of high carbon steels. It produces high purity, radiographic quality weld deposits with excellent non-ageing properties. Deposition efficiency is about 115%.

#### APPLICATIONS :

Structural steels, Low alloy steels, Low temperature steels, High carbon steels, Rails, Wagons, Bridges, Boilers, Pressure vessels, Tanks, Ship-building, Cranes, Machine building etc. involving joining of dissimilar steels and welding of heavy mild steel sections. Specially recommended for heavy joints under restraint and subject to dynamic loading.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.063
Si	0.68
Mn	0.95
S	0.019
P	0.020

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL:

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at -20 °C. Kgm
61	51	28	8.5

#### CLASSIFICATION :

AWS A5.1	:	E 7018
IS	:	EB 5226 H 3 JX
DIN 1913	:	E 5226 B 10 120
BS 639	:	E 5226 B 120 24 (H)

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	240-320	25	100
5.00x450	190-240	40	160
4.00x450	140-190	70	280
3.15x450	100-140	100	400
2.50x350	60-100	150	600

Or, 5Kg per Packet and 4 Packets per Carton.

Approved By:

Lloyds Register of Shipping (LRS)  
American Bureau of Shipping (ABS)  
Bureau Veritas (BV)



## HARDFACING ELECTRODES

### HARDWELD-250

#### CHARACTERISTICS :

A medium heavy coated, rutile type, hardfacing electrode. Weld deposit is air hardening type and can withstand heavy impact load. It gives machinable weld deposit of approx. 250 BHN hardness. To be used with buffer layer of Premier-7016 on hard base material. Recommended for hardfacing on Mild Steel, Carbon steel & Low Alloy Steels.

#### APPLICATIONS :

The weld metal is hard, tough and easily machinable. It is used for Repair and Filling up worn out machine parts, Gear Teeth, Shaft Couplings, Mill Guide Plates, Pulleys, Axles, Clutches, Sugar Cane Crushers, Rail Ends and Crossing etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.20-0.30
Mn	0.25-0.60
Si	0.15-0.25
Cr	0.50-1.00

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	170-210	65	260
4.00x450	130-160	95	380
3.15x450	90-110	150	600

**HARDNESS :** 240-280 BHN approximately on 3 layer deposit.

### HARDWELD-350 (LH)

#### CHARACTERISTICS :

A medium heavy coated, basic type, hydrogen controlled electrode for hardfacing applications on mild steel, carbon steel and low alloy steels where hardness requirement is approximately 300 BHN. The weldmetal is machineable with carbide tools.

#### APPLICATIONS :

Hot & cold punching dies, Shear blades, Brake shoes, rail ends & crossings, Conveyor parts, Steel castings, Pulleys and Axles etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.20-0.30
Mn	0.25-0.50
Si	0.50-0.75
Cr	0.85-1.25

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
5.00x450	180-240	45	180
4.00x450	140-180	80	320
3.15x450	100-140	110	440

**HARDNESS :** 300-350 BHN approximately on 3 layer deposit.

### HARDWELD-350

#### CHARACTERISTICS :

A medium heavy coated, rutile base, air hardening type electrode for hardfacing on mild steel, carbon steel & low alloy steel. Weld deposit is machinable, resistant to moderate abrasion & heavy impact and has hardness of 350 BHN. On hard base material give buffer layer of Premier-7016.

#### APPLICATIONS :

Brake shoes, Shafts, Axles, Conveyor parts, Cams, Wobbler ends, Elevator buckets, Pulleys, shear blades, Cold punching dies etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.20-0.30
Mn	0.25-0.60
Si	0.15-0.25
Cr	0.75-1.50

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	170-230	65	260
4.00x450	130-170	95	380
3.15x450	100-130	150	600

**HARDNESS :** 340-380 BHN approximately on 3 layer deposit.

### HARDWELD-V

#### CHARACTERISTICS :

A medium heavy coated, rutile base, air hardening type hardfacing electrode. Gives weld deposit of 500 BHN. Weld is non-machinable but can be ground. It is resistant to severe abrasion & moderate impact. Two or three layer deposits are recommended as the first layer may not develop the full hardness due to dilution. Recommended for Mild Steel, structural steel & cast steels.

#### APPLICATIONS :

Reinforcing worn rails, Crane wheels, Wornout parts of Earth moving equipments, Bamboo chipper knives, Sprockets, Shears & Croppers, Muller tyres, Ploughshares, Drill bits, Mine rails, Oil expellers, Caterpillar threads etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.50-0.75
Mn	0.60-1.00
Si	0.50-0.75
Cr	3.0-4.0

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	160-200	65	260
4.00x450	120-160	80	320
3.15x450	90-120	150	600

**HARDNESS :** 480-530 BHN approximately on 3 layer deposit.



## HARDFACING ELECTRODES

### HARDWELD-600

#### CHARACTERISTICS :

A medium heavy coated, rutile base, air hardening type electrode for hardfacing applications on mild steel, carbon steel and low alloy steels. It gives non machineable 600 BHN hardness deposits which can only be ground. The weld deposit is suitable for abrasion and impact.

#### APPLICATIONS :

Crusher hammers, Mine rails, Cane & Bamboo cutting knives, Oil expellers, Drill bits, Metal cutting and forming tools etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.40-0.65
Mn	0.80-1.00
Si	0.50-0.75
Cr	4.00-6.00
Mo	0.50-0.70

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	170-210	65	260
4.00x450	120-170	95	380
3.15x450	90-120	150	600

**HARDNESS :** 560-600 BHN approximately on 3 layer deposit.



### HARDWELD-600 (LH)

#### CHARACTERISTICS :

A medium heavy coated, low hydrogen, air hardening type hardfacing electrode. It gives non-machinable hard deposits of 600 BHN. The low hydrogen coating enables its use on high carbon/sulphur steels without under bead cracking or porosity. It yields hard surface deposits, resistant to heavy-abrasion and moderate impact. When a heavy deposit is required, the initial and intermediate layers may be deposited with Premier-7016 using Hardweld 600 (LH) for final two or three layers.

#### APPLICATIONS :

Hot & cold punching dies, Oil expellers, Worms, Pan mixer blades, Dredger bucket lips, Drill bits, Caterpillar threads, Punches, Dies, Dipper teeth, Disintegrator Hammers, Sprockets, Cane & Bamboo cutting knives etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.40-0.65
Mn	1.00-1.25
Si	0.50-0.75
Cr	4.00-6.00
Mo	0.70-1.10
V	0.40-0.80

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current (Amps) AC or DC (-)	Pieces per Packet	Pieces per Carton
5.00x450	170-210	45	180
4.00x450	120-170	80	320
3.15x450	90-120	110	440

#### HARDNESS :

550-640 BHN approximately on 3 layer deposit.





## HARDFACING ELECTRODES

### HARDMANGAN

#### CHARACTERISTICS :

A medium heavy coated, low hydrogen type hardfacing electrode. It gives 11-14% austenitic manganese steel weld deposit which work hardens in service from 200 BHN to 500 BHN. It has excellent resistance to wear by impact. Recommended for abrasion resistant hardfacing of Manganese Steel, Cast & Mild Steel.

#### APPLICATIONS :

Filling up worn out parts such as Rock Crushing Jaws, Dredger Bucket Teeth, Rail Crossovers, Cement Grinder Rings, Austenitic Manganese Steel Castings, Muller Tyres, Manganese Steel Rails, various parts of Earth moving equipments.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.65-1.00
Mn	11.00-14.00
Si	0.25-0.65
Cr	1.50-2.00
Ni	2.00-2.50

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
5.00x450	170-220	45	180
4.00x450	140-170	80	320
3.15x450	100-120	110	440

#### HARDNESS :

As deposited 200 BHN approximately.  
Increase to 500 BHN under impact in service.

#### Instructions for All "Hardfacing" Products :

- Hold Short Arc.
- Use Medium Current.
- Store electrodes in warm dry place.
- Redry at 150°C for 30 minutes before use.
- Use suitable buffer layer and preheating depending on material composition.







## STAINLESS STEEL ELECTRODES

### PRENOX-1A/ WELINOX 308

#### CHARACTERISTICS :

It is a low carbon, medium heavy coated, rutile based, 18/8 austenitic stainless steel electrode. Controlled ferrite content of 3-7% gives maximum resistance to cracking, corrosion and at high temperatures upto 800 °C. The weld metal has excellent creep strength and is of radiographic quality. The electrode operates equally well on AC or DC (+) current. The electrode is noted for arc stability, low spatter loss and easy striking/restriking properties.

#### APPLICATIONS :

Welding of 18/8 stainless steels such as AISI 301, 302, 304 and 308. Welding of Hospital apparatus, Aircraft frames, apparatus for Nitric acid, Acetic acid, Milk and Soap industries etc.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.08 Max
Si	0.60-0.95
Mn	0.50-2.50
Cr	18-21
Ni	9-11
Ferrite	3-7

#### CLASSIFICATION :

AWS A5.4	:	E-308-16
DIN 8556	:	E 19 9 R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180



### PRENOX-1B

#### CHARACTERISTICS :

It is a low carbon, medium heavy coated, rutile based, 18/8 Cb stabilized stainless steel electrode. The weld metal is resistant to cracking, corrosion and at high temperatures upto 800 °C.. The weld metal has excellent creep strength and is of radiographic quality. Niobium prevents intergranular corrosion due to carbide precipitation in the temperature range 450-850°C..

#### APPLICATIONS :

For joining and welding of Corrosion resistant stainless steels such as AISI grade 321 and 347 in industries where material must withstand corrosion due to Hot exhaust gases and at high temperatures.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.08 Max
Si	0.60-0.95
Mn	0.50-2.50
Cr	18-21
Ni	9-11
Cb	0.-1.0
Ferrite	6-9

#### CLASSIFICATION :

AWS A5.4	:	E-347-16
DIN 8556	:	E 19 9 Nb R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180





## STAINLESS STEEL ELECTRODES

### PRENOX-1C/ WELINOX 308L

#### CHARACTERISTICS :

It is an extra low carbon, medium heavy coated, rutile based, 18/8 stainless steel electrode designed to weld in all positions. Ferrite content is maintained between 3-7 % for maximum resistance to cracking of welds. The weld metal has excellent creep strength and is of radiographic quality. The electrode has easy operating characteristics on AC as well as DC (+). Easy striking and restriking, soft and stable arc, low spatter and easy slag detachability are the main features.

#### APPLICATIONS :

Welding of Corrosion resistant stainless steels such as AISI 301, 302, 304L and 308L. Welding of Household utensils, foodstuff and Chemical process industries, Nuclear plants, Dairies, Distilleries etc.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.04 Max
Si	0.60-0.95
Mn	0.50-2.50
Cr	18-21
Ni	9-11
Ferrite	3-7

#### CLASSIFICATION :

AWS A5.4	:	E-308L-16
DIN 8556	:	E 19 9 LR 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180



### PRENOX-2A/ WELINOX 316

#### CHARACTERISTICS :

It is a low carbon, medium heavy coated, rutile based electrode for welding in all positions 18/8/Mo austenitic stainless steels. The presence of Molybdenum in weld metal provides excellent corrosion and creep resistance properties at elevated temperatures upto 850 °C.. Ferrite content is controlled between 4-8% which gives maximum resistance to cracking and corrosion. The electrode produces crack free, radiographic quality welds. It operates equally well on AC and DC (+). Easy striking and restriking, soft and stable arc, low spatter, easy slag detachability are the main characteristics.

#### APPLICATIONS :

Welding of stainless steels such as AISI 316, 317, Clad steel of the same grade, Ferritic and Mo alloyed Cr. Steels. Used in Fabrication of tanks and vessels, Acid resisting coils, Pipe fitting etc. in Paper & pulp, Chemicals, Paint & Dye industries. Also used for welding of stainless steels such as AISI 201, 202, 301, 302, 410, 414, 420.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.07 Max
Si	0.0-0.5
Mn	1.0-2.0
Cr	18-22
Ni	10-13
Mo	2-3
Ferrite	4-8

#### CLASSIFICATION :

AWS A5.4	:	E-316-16
DIN 8556	:	E 19 12 3 R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180



## STAINLESS STEEL ELECTRODES

### PRENOX-2B

#### CHARACTERISTICS :

PRENOX-2B is a low carbon, rutile based, medium heavy coated, all position austenitic type electrode with controlled ferrite content of 4-8% for maximum resistance to cracking due to stress corrosion and inter crystalline corrosion. The weld metal has excellent creep strength upto 850°C. and is of radiographic quality.

#### APPLICATIONS :

For welding and surfacing of 18/8/Mo Niobium or Titanium stabilized steels such as AISI 317 & 318 in Pickling plants, Bleaching equipments, Dyeing equipments, Heat resistant castings etc.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.08 Max
Si	0.2-0.5
Mn	1.0-2.0
Cr	17-20
Ni	9-12
Mo	2.0-2.5
Cb	0.6-1.2
Ferrite	4-8

#### CLASSIFICATION :

AWS A5.4	:	E-318-16
DIN 8556	:	E 19 12 3 Nb R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180



### PRENOX-2C

#### CHARACTERISTICS :

PRENOX-2C is an extra low carbon, medium heavy coated, rutile based, all position austenitic type electrode for welding of low carbon 18/8/3 Cr/Ni/Mo stainless steels. Controlled ferrite content of 4-8% gives maximum resistance to stress corrosion cracking, hot cracking and chemical corrosion at high temperatures upto 850°C. The Mo content makes it resistant to corrosive agents of reducing nature. The weld metal has excellent creep strength and is of radiographic quality.

#### APPLICATIONS :

For welding AISI 316 ELC or 317 ELC. Also suitable for welding AISI 316, 316L, 317L class fabrication in Chemical plants, paint & Dye industries.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.04 Max
Si	0.2-0.5
Mn	1.0-2.0
Cr	18-22
Ni	10-13
Mo	1.50-2.50
Ferrite	4-8

#### CLASSIFICATION :

AWS A5.4	:	E-316L-16
DIN 8556	:	E 19 12 3 LR 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180





## STAINLESS STEEL ELECTRODES

### PRENOX-D2/ WELINOX 309

#### CHARACTERISTICS :

It is a heavy coated, rutile based electrode suitable to weld in all positions 25/12 Cr/Ni stainless steels. The weld deposit offers excellent resistance to chemical corrosion and can stand upto 1100 °C. in continuous service. The electrode operates equally well on AC as well as DC (+). Easy striking and restriking, low spatter, easily detachable slag, stable arc and radiographic quality welds are the main characteristics.

#### APPLICATIONS :

For welding AISI 309 Stainless steel with 25 Cr/12Ni, Straight chrome steels for joining stainless steel to mild steel, Low alloy steel, Carbon steel, for stainless steel Castings and for overlays on Mild Steel to improve its wear and corrosion resistance.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.10 Max
Si	0.2-0.5
Mn	1.0-2.0
Cr	25-28
Ni	11-14

#### CLASSIFICATION :

AWS A5.4	:	E-309-16
DIN 8556	:	E 22 12 R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180



### PRENOX-CW/ WELINOX 310

#### CHARACTERISTICS :

It is a heavy coated, rutile based electrode for welding of 25/20 Cr/Ni stainless steels. The electrode is designed for high temperature applications where greater stability, corrosion resistance and oxidation resistance are required. The weld deposit can stand upto 1150°C. in continuous service. The electrode gives smooth arc, least spatter, easily removable slag and radiographic quality welds.

#### APPLICATIONS :

For welding AISI 309, 310, Cladding side of stainless clad steels, Straight chrome steels, Gas turbine combustion chamber parts, High temperature furnace parts, Hydrogenation plants. For joining Dissimilar steels, Mild Steel to Stainless Steel, Hardenable steels such as Automobile springs, broken dies and tools etc.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.10 Max
Si	0.2-0.5
Mn	1.0-2.0
Cr	25-28
Ni	20-22

#### CLASSIFICATION :

AWS A5.4	:	E-310-16
DIN 8556	:	E 25 20 R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	50-75	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180







## STAINLESS STEEL ELECTRODES

### PRENOX-D2 Mo

#### CHARACTERISTICS :

PRENOX-D2 Mo is a rutile based heavy coated electrode giving 25/13/2.5 Mo weld deposits. Addition of Mo improves Tensile strength and Corrosion resistance. Deposits Radiographic quality weld metal. Recommended for joining SS containing Mo to Carbon steel, for welding 309 Mo steel and for welding difficult to weld steels.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.12 Max
Mn	0.50-2.50
Si	0.90 Max
S	0.030 Max
P	0.040 Max
Cr	22.0-25.0
Ni	12.0-14.0
Mo	2.0-3.0

#### CLASSIFICATION :

AWS	:	E309Mo-16
IS	:	E23.12.2R26

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	55-70	100	600
3.15x350	80-110	60	360
4.00x350	110-140	40	240
5.00x350	150-170	30	180



### PRENOX-D2 Cb

#### CHARACTERISTICS :

A low carbon medium heavy coated, rutile based electrode suitable for welding in all positions and giving 25/12 Columbium stabilised deposit. The weld deposit offers excellent resistance to chemical corrosion and can stand upto 1100 °C. in continuous service. The electrode operates equally well on AC as well as DC (+). It gives soft and stable arc, low spatter, easily detachable slag and radiographic quality welds.

#### APPLICATIONS :

For welding 25/12 Columbium stabilised steels, straight Chrome steels and for joining stainless steels to lower alloy steels and carbon steels.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.10 Max
Si	0.2-0.5
Mn	1.0-2.0
Cr	23-26
Ni	12-14
Cb	2-3

#### CLASSIFICATION :

AWS A5.4	:	E-309-Cb-16
DIN 8556	:	E 22 12 R 26

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	70-90	100	600
3.15x350	90-110	60	360
4.00x350	110-140	40	240
5.00x350	140-170	30	180





## STAINLESS STEEL ELECTRODES

### PRENOX-312

#### CHARACTERISTICS :

PRENOX-312 is a medium heavy coated, highly alloyed AC/DC electrode for all positions welding. The electrode has quiet & stable arc, low spatter & easily detachable slag. It gives radiographic quality welds which are highly resistant to weld metal cracks and oxidation.

#### APPLICATIONS :

For welding difficult to weld & problem steels, tools & dies, leaf springs, gears, high temperature steels, stainless to high carbon steels, wear plates, dissimilar steels, furnace parts & combustion chamber parts etc.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.15 Max
Si	0.2-0.9
Mn	1.0-2.0
Cr	28-32
Ni	8.0-10.5
Mo	0.75 Max
S	0.03 Max
P	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)
70-80	22

#### CLASSIFICATION :

AWS A5.4	:	E-312 16
IS	:	5206 E 29.9 R 26

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.50x350	40-80	100	600
3.15x350	70-120	60	360
4.00x350	90-140	40	240
5.00x350	130-180	30	180



### PRENOX-13

#### CHARACTERISTICS :

A medium heavy coated, low hydrogen electrode which gives 13% Cr air hardenable welds. Hardening can be avoided through preheating and stress relieving.

#### APPLICATIONS :

Used for welding of AISI 410 and similar stainless steels, stainless steels cutlery, pump parts, oil refinery equipment and corrosion & heat resisting applications.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.10 Max
Si	0.20-0.70
Mn	1.00-Max
Cr	11-13
Ni	0.60 Max
S	0.03 Max
P	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)
45	20

#### CLASSIFICATION :

AWS A5.4	:	E-410-15
----------	---	----------

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	55-70	100	600
3.15x350	80-110	60	360
4.00x350	110-140	40	240





## STAINLESS STEEL ELECTRODES

### PRENOX-17

#### CHARACTERISTICS :

A medium heavy coated, low hydrogen electrode which gives 17% Cr air hardenable welds. Hardening can be avoided through preheating and stress relieving.

#### APPLICATIONS :

Used for welding of AISI 430 and similar stainless steels, stainless steels cutlery, pump parts, oil refinery equipment and corrosion & heat resisting applications.

#### WELDMETAL COMPOSITION :

Element	Percent
C	0.10 Max
Si	0.20-0.70
Mn	1.00-Max
Cr	15-17
Ni	0.60 Max
S	0.03 Max
P	0.03 Max

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)
47	21

#### CLASSIFICATION :

AWS A5.4 : E-430-15

#### CURRENT RANGE & PACKING DATA:

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
2.00x300	40-50	150	900
2.50x350	55-70	100	600
3.15x350	80-110	60	360
4.00x350	110-140	40	240

#### Instructions for All "Stainless Steel" Products :

- Keep electrodes dry.
- Do not use excessive current.
- Hold short arc.
- Use good fit-up on joints.
- Adopt proper sequence.
- Remove the slag with a stainless steel wire brush.

## Space Age Technology





## CAST IRON ELECTRODES

### FORTECAST-CN

#### CHARACTERISTICS :

FORTECAST-CN is a light coated electrode with graphite based coating for welding cast iron without preheating. The electrode gives a Nickel-Copper (Monel) weld deposit which is easily machinable. The electrode is suitable for welding in flat, horizontal, vertical and overhead positions. The electrode operates equally well on AC and DC. It has a soft and stable arc, easy striking and restriking properties, easy slag removal and provides good colour matching with parent metal.

#### APPLICATIONS:

Repair of broken castings, Filling defects in Castings, Rebuilding worn surfaces, Correcting machining errors on castings, joining cast iron to mild steel and monel overlaying on cast iron.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.85
Mn	2.01
Si	0.30
Ni	63.90
Fe	3.50
Cu	29.0

#### CLASSIFICATION :

AWS : E NiCu-B

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Qty per Packet (kg)	Qty per Carton (kgs)
5.00x350	150-180	1	10
4.00x350	120-150	1	10
3.15x350	80-120	1	10
2.50x350	50-70	1	10



### FORTECAST-N

#### CHARACTERISTICS :

FORTECAST-N is a light coated electrode depositing pure nickel, designed for welding cast iron in the cold way. The nickel weld deposit which bonds thoroughly with the cast iron, is soft and ductile and can be easily machined or filed to desired shape. The tensile strength of the weld metal is adequate for cast iron. Its main characteristics are stable and quiet arc, negligible spatter, easy and intimate fusion and easy striking/restriking.

#### APPLICATIONS :

Pump cases, Impellers, Gears, Sprockets, Engine heads, Rope drums, Machine bodies, CI dies, Correcting of machining errors on castings. Joining all kinds of Cast iron, Cast iron to steel, Monel, Copper or Copper alloys. For building up noncorrosive surface of Nickel on Cast iron parts.

#### TYPICAL WELDMETAL COMPOSITION:

Element	Percent
C	1.35
Mn	2.00
Si	2.70
Ni	91.67

#### CLASSIFICATION :

AWS : E NiCl

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Qty per Packet (kg)	Qty per Carton (kgs)
5.00x350	140-160	1	10
4.00x350	100-120	1	10
3.15x350	70-90	1	10
2.50x350	40-60	1	10







## CAST IRON ELECTRODES

### FORTECAST-FN

#### CHARACTERISTICS :

FORTECAST-FN is a light coated electrode designed to weld all weldable cast irons. The weld metal is fully machinable and has good colour match with the parent metal. The weldmetal contains 55% Ni, has good strength, toughness and is crack resistant. The electrode has a soft and stable arc, easy slag removal and good striking/restriking properties.

#### APPLICATIONS :

Welding of all types of Cast iron, Rectification of defects in Heavy castings, Correcting machining errors on Castings, Joining Cast Iron to Mild Steel, rebuilding work surfaces.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	1.43
Mn	2.30
Si	1.85
Ni	51.29
Fe	43.00

#### CLASSIFICATION :

AWS : E Ni Fe-CI

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Qty per Packet (kg)	Qty per Carton (kgs)
5.00x350	130-170	1	10
4.00x350	90-120	1	10
3.15x350	70-110	1	10
2.50x350	40-70	1	10



### FORTECAST-NM

#### CHARACTERISTICS :

FORTECAST-NM is a heavy coated, all position, low hydrogen type electrode for welding of medium high tensile structural steels, joining and surfacing of high strength steels such as carbon steel & also cast steels. It produces high purity, radiographic quality non machinable weld deposits.

#### APPLICATIONS :

Welding of cast iron parts, cast steels, cast iron to mild steel & all types of general reclamation work.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.085
Mn	1.10
Si	0.57
S	0.017
P	0.022

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at 20 °C. Kgm
57	48	26	8

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-360	30	120
5.00x450	190-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140-	110	440
2.50x350	60-90	160	640





## HIGH TENSILE STEEL ELECTRODES

### PREMIER-8018 G

#### CHARACTERISTICS :

A heavy coated, all position, hydrogen controlled, iron powder type electrode. It welds with a quiet, stable arc and gives very little spatter. The welds are of radiographic quality.

#### APPLICATIONS :

Welding of Si-Mn, Ni alloyed fine grained steels and high tensile steels for heavy construction work subject to dynamic loading.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07
Si	0.4
Mn	1.4
S	0.02
P	0.025
Ni	0.6

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

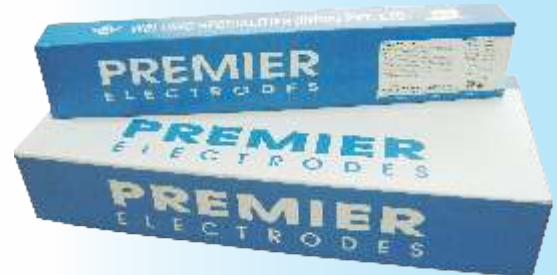
Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
64	53	24	15

#### CLASSIFICATION :

AWS A5.1 : E 8018 G

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640



### PREMIER-8018 C1

#### CHARACTERISTICS :

A basic coated, iron powder type electrode, specially designed for welding of 2.5% Nickel steels. The electrode gives a smooth arc, medium penetration & low spatter.

#### APPLICATIONS :

For welding of 2.5% Ni steels, high tensile steels, pressure vessels, valves, storage tanks and pipelines for liquid gases such as butane, propane etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.05
Si	0.3
Mn	0.8
S	0.02
P	0.015
Ni	2.50

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at 20 °C. Kgm
62	53	24	16

#### CLASSIFICATION :

AWS A5.1 : E 8018 C1

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640





## HIGH TENSILE STEEL ELECTRODES

### PREMIER-9018 G

#### CHARACTERISTICS :

A medium heavy coated, low hydrogen, all position electrode for welding of heavy sections & restrained joints in high tensile steels. It gives radiographic quality welds.

#### APPLICATIONS :

For welding of high tensile steels, power house construction, oil refinery, earth moving equipment etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.06
Si	0.4
Mn	1.4
S	0.015
P	0.025
Ni	1.0
Mo	0.4

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
65	55	21	15

#### CLASSIFICATION :

AWS A5.1 : E 9018 G

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640



### PREMIER-CHROME 1

#### CHARACTERISTICS :

A heavy coated, all position, low hydrogen, iron powder electrode with 1.25% Cr. 0.5% Mo. The weld deposit has excellent creep resistance at service temp. upto 550°C..

#### APPLICATIONS :

Well suited for welding of Chrome-Moly steels in oil refineries, boilers, power houses and repairing of automobile parts and earthmoving equipments.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.06
Si	0.3
Mn	0.7
S	0.017
P	0.02
Cr	1.2
Mo	0.5

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
62	53	21	16

#### CLASSIFICATION :

AWS A5.1 : E 8018 B2

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC (70V) or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640





## HIGH TENSILE STEEL ELECTRODES

### PREMIER-CHROME 2

#### CHARACTERISTICS :

A medium heavy coated, basic type, all position, iron powder electrode giving weld deposit resistant upto 650°C. specially designed to weld high tensile Chromium-Molybdenum heat & creep resisting steels.

#### APPLICATIONS :

Suitable to weld high tensile steels with 2.25% Cr and 1% Molybdenum, boilers, pressure vessels, pipelines in oil refineries, high temperature reaction vessels etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07
Si	0.3
Mn	0.7
S	0.02
P	0.025
Cr	2.2
Mo	1.0

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
67	58	20	15

#### CLASSIFICATION :

AWS A5.1 : E 9018 B3

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640



### PREMIER-NMC

#### CHARACTERISTICS :

A basic coated all position radiographic quality electrode with 1% Cr, 2.5% Ni, 0.7% Mo.

#### APPLICATIONS :

The electrode has very high tensile strength and is suitable for welding of Ni-Cr-Mo steels, steam turbine rotors & earthmoving equipment etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.05
Si	0.4
Mn	1.6
S	0.025
Ni	0.8
Cr	0.2
Mo	0.3

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm2	Yield Strength Kg/mm2	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
72	63	23	16

#### CLASSIFICATION :

AWS A5.1 : E 10016 G

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640







## HIGH TENSILE STEEL ELECTRODES

### PREMIER-11016 G

#### CHARACTERISTICS :

A basic coated Ni-Mo alloyed electrode for welding of high tensile steels such as N-A-XTRA 70, HY 100, Q2(N)

#### APPLICATIONS :

Suitable for all critical applications in high strength steels such as offshore and bridge structures.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.05
Si	0.3
Mn	1.6
S	0.015
P	0.02
Ni	2.0
Mo	0.4

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
75	65	22	16

#### CLASSIFICATION :

AWS A5.1 : E 11016 G

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640



### PREMIER-11018 M

#### CHARACTERISTICS :

A heavy coated, hydrogen controlled, iron powder type electrode, suitable for welding of high tensile steels having tensile strength of 110,000 psi upwards.

#### APPLICATIONS :

Suitable for welding of low alloy high tensile steels, Nickel steels, Ni-Moly steels, steels such as T-1, NA-XTRA 70, HY100, Q2(N), boilers, pressure vessels, earthmoving equipment, heavy structures etc.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.06
Si	0.3
Mn	1.5
S	0.02
P	0.015
Ni	2.0
Cr	0.2

#### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Strength at +20 °C. Kgm
80	71	22	15

#### CLASSIFICATION :

AWS A5.1 : E 11018 M

#### CURRENT RANGE & PACKING DATA :

Size MM DxL	Current Range (Amps) AC or DC (+)	Pieces per Packet	Pieces per Carton
6.30x450	250-330	30	120
5.00x450	200-240	45	180
4.00x450	140-190	80	320
3.15x450	100-140	110	440
2.50x350	60-90	160	640

#### Instructions for All "High Tensile" Products :

- Keep electrodes dry.
- Rebake electrodes at 350°C. for one hour.
- Do not use excessive current.
- Hold short arc.
- Use good fit-up on joints.
- Adopt proper sequence.
- Slow and uniform cooling is recommended.



## LOW HEAT INPUT WELDING ALLOYS

### STEELS

#### ASTRALOY 662

##### CHARACTERISTICS:

An all position AC/DC electrode for high strength, crack free joining of low/medium carbon, and medium tensile steels of various compositions.

##### APPLICATIONS :

Low alloy medium carbon steels, joining of dissimilar steels and welding of heavy sections, joints under restraint, pipes, steel castings and pressure vessels etc.

##### WELDING ALLOY PROPERTIES :

UTS	57Kg/mm <sup>2</sup>
Elongation	22%

##### WELDING DATA :

Size Dia (mm)	3.15	4.00
Welding Current (Amps)	100-140	140-190

### STEELS

#### ASTRALOY 663

A general purpose high speed welding electrode producing quality welds. Suitable to work on AC/DC (-)

##### CHARACTERISTICS :

Gives smooth, uniform, radiographic quality weld joints. Since contact welding is possible, no special skill is required for welding.

##### APPLICATIONS :

Bridges, cranes, storage tanks, pipes, sheet metal works, automobile chassis, heavy girder fabrication etc.

##### WELDING ALLOY PROPERTIES :

UTS	45- 52 Kgf/mm <sup>2</sup>
Elongation	20%

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps) AC/DC (-)	100-130	120-180	180-220

### STEELS

#### ASTRALOY 664

A high efficiency, contact welding type, AC/DC electrode for joining low carbon steel structures, sheet metal assemblies.

##### CHARACTERISTICS :

Electrode has easy arc strike and arc stability. Weld deposits are smooth, shiny and with good wash. Slag is easy to detach. Smooth and quiet arc eliminates burn through and warpage in this sheet welding.

##### APPLICATIONS :

Sheet metal work, frames, storage tanks, pipelines and fixtures etc.

##### WELDING ALLOY PROPERTIES :

UTS	48-52 Kgf/mm <sup>2</sup>
%elongation	28

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	80-130	100-160	150-200

### STEELS

#### ASTRALOY 665

A high efficiency, austenitic stainless steel type, AC/DC electrode for joining, cushioning and overlays on low and medium carbon, low alloy, manganese steels, stainless steels and welding dissimilar steels with high strength and ductility.

##### CHARACTERISTICS :

Specially formulated coating ensures easy arc strike and stability at low arc voltage. Weld deposits are smooth, shiny and have good wash. Slag coverage is full and easy to remove. Arc is soft and quiet.

##### APPLICATIONS :

Excavator and loader buckets, mill hammers, crusher mantles, crusher rolls and wear plates etc.

##### WELD ALLOY PROPERTIES :

UTS	54-58 Kgf/mm <sup>2</sup>
%elongation	30
Hardness (As welded)	150-170 VHN.

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	80-110	100-150	130-180



## LOW HEAT INPUT WELDING ALLOYS

### STEELS

#### ASTRALOY 666

A hydrogen controlled, all position, AC/DC electrode for high strength, crack free joining of medium carbon, low alloy and cast steels and for cushioning prior to harder overlays.

##### CHARACTERISTICS :

Electrode has easy arc strike, excellent arc stability and high deposit efficiency. Welds are of high strength ductility and radiographic quality. Weld deposit is smooth, good wash and good appearance. Slag coverage is full and easy to detach.

##### APPLICATIONS :

Trucks, Bus and trailer chassis, steel casting defects, storage vessels and tank, frames, cast gears, pump castings and crane booms etc.

##### WELD ALLOY PROPERTIES :

UTS	54-58 Kgf/mm <sup>2</sup>
% elongation	30

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	100-140	120-160	150-200

### STEELS

#### ASTRALOY 667

A highly alloyed AC/DC electrode, for high strength joining of carbon, alloy and heat resistant steels.

##### CHARACTERISTICS :

Electrode has easy arc strike, arc stability, soft and quiet arc. Welds are smooth, shining and have good wash. Slag is easy to chip and remove. Deposits have excellent corrosion and high temperature oxidation resistance upto 100°C.

##### APPLICATIONS :

Heat treatment fixtures, furnace parts, cooler plates, pump casings, valve bodies, hot dies, gears, rolls and combustion chamber parts etc.

##### WELD ALLOY PROPERTIES :

UTS	55-58 Kgf/mm <sup>2</sup>
% elongation	35

##### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	70-110	90-140	140-200

### STEELS

#### ASTRALOY 668

A versatile highly alloyed, chrome-nickel type, AC/DC, all position electrode for high strength, crack-free welding of carbon, alloy, tool, die, stainless steels, dissimilar steels and steels of unknown composition.

##### CHARACTERISTICS :

Easy to strike, soft, smooth and quiet arc. Exceptional arc stability for critical repairs. Easy slag removal with high weld metal strength and crack resistance for joining dissimilar steels. Weld deposit has good resistance to wear due to friction, impact and corrosion.

##### APPLICATIONS :

Shovel buckets, booms, tool and die repairs, leaf springs chassis, wear plates, splines, key way of shafts, threads form, press dies, gears and shafts etc.

##### WELD ALLOY PROPERTIES :

UTS	80-82 Kgf/mm <sup>2</sup>
% elongation	22
Hardness	220-240 BHN.

##### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	70-120	90-140	130-180

### STEELS

#### ASTRALOY 669

A unique chrome-nickel alloy electrode, for all position welding of carbon, alloy, stainless steel and dissimilar steels with high strength and ductility.

##### CHARACTERISTICS :

Easy arc strike and excellent arc stability. Arc is soft, quiet and smooth. Weld deposits are smooth, dense with good wash. Weld alloy has excellent corrosion and oxidation resistance at elevated temperatures upto 1000°C.. Slag is easy to chip and clean.

##### APPLICATIONS :

Stainless pump casings, shafts, valve bodies, excavator and loader buckets, shovels, wear plates, parting and forming tools, keyways, joining carbon and stainless steel flanges and clad steels etc.

##### WELD ALLOY PROPERTIES :

UTS	54-60 Kgf/mm <sup>2</sup>
% elongation	30
Hardness	150-170 BHN.

##### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	70-110	90-130	130-180



## STEELS

### ASTRALOY 690

An excellent electrode for joining Stainless Steel to Carbon Steel & for depositing Stainless Steel overlays on Carbon Steel.

#### CHARACTERISTICS:

Electrode gives a stable & smooth arc with rapid flow. Easy to operate, easy slag detachability & gives a shining bead. The weld metal has excellent mechanical properties & resistance to impact.

#### APPLICATIONS :

Welding Stainless Steel to Carbon Steel, Cast Steels & austenitic manganese steels. Deposits tough overlays on Cast Steel & austenitic manganese steel parts. Very useful for rebuilding shafts, valve faces & seats, turbine blades, impellers. Weld metal gives resistance to heat, abrasion & corrosion.

#### WELDING ALLOY PROPERTIES :

UTS	55-65 Kgf/mm2
Elongation	25-33 %
Metal Recovery	130%
Hardness of Deposit	200 Brinell

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00
Welding Current (Amps) AC/DC (+)	100-130	140-160	180-220

## STAINLESS STEELS

### ASTRALOY 708

A stabilized stainless steel electrode with extra low carbon for corrosion resistant welds on AISI 301, 302, 304, 304L, 308, 308L stainless steels.

#### CHARACTERISTICS :

Soft and stable arc for smooth, spatter-free welds with resistance to intergranular corrosion.

#### APPLICATIONS :

Dairy equipment, chemical plants, pump casings, sleeves, mechanical seals, sheet metal fabrication and pipelines etc.

#### WELD ALLOY PROPERTIES :

UTS	52 Kgf/mm2
% elongation	35

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	60-110	80-140	130-170

## STAINLESS STEELS

### ASTRALOY 709

A molybdenum alloyed excellent low heat input electrode for welding of difficult to weld steels.

#### CHARACTERISTICS :

All position Cr/Ni/Mo deposit with high tensile strength & excellent resistance to chemical corrosion & heat.

#### APPLICATIONS :

Dissimilar metals such as Ni-Cr-Mo stainless steel to carbon steel. 316 type clad steels & difficult to weld steels.

#### WELD ALLOY PROPERTIES :

UTS	65 Kgf/mm2
Elongation	33 %

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00
Welding Current (Amps) AC/DC (+)	40-75	70-110	90-120

## STAINLESS STEELS

### ASTRALOY 710

A high alloy Stainless Steel, AC/DC electrode for joining AISI 309, 310 and all grades of stainless steels.

#### CHARACTERISTICS :

Soft and stable arc for smooth, dense and spatter-free deposits. Slag coverage is full and easily detachable. Weld deposits are resistant to high temperature scaling and corrosion.

#### APPLICATIONS :

Heat treatment fixtures, baskets, annealing pots, furnace parts, cooler plates and heating elements etc.

#### WELD ALLOY PROPERTIES :

UTS	55 Kgf/mm2
% elongation	30

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	60-110	80-140	130-170



## STAINLESS STEELS

### ASTRALOY 711

A Stainless Steel electrode specially designed for welding of 13% chrome steels.

#### CHARACTERISTICS :

The electrode gives soft & stable arc and weld metal is of radiographic quality with resistance to corrosion, oxidation & frictional type of wear.

#### APPLICATIONS :

Welding & surfacing of 13% chrome steel, turbine constructions, steel armatures & for welding of similar corrosion resistance chromium steel & steel castings etc.

#### WELD ALLOY PROPERTIES :

UTS	46 Kgf/mm <sup>2</sup>
Elongation	15 %

#### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps) DC (+)	80-120	120-160	150-190

## STAINLESS STEELS

### ASTRALOY 712

An extra low carbon, molybdenum bearing stainless steel, AC/DC electrodes for joining AISI 316, 316L, 317, 318 grades of stainless steels with high strength.

#### CHARACTERISTICS :

Soft and stable arc for smooth, dense and spatter-free welds slag coverage is full and easy to chip. Deposits have excellent resistance to intergranular and pitting corrosion by strong acids.

#### APPLICATIONS :

For production and maintenance welding of chemical process pumps, valves, pipes and flanges, vessels and tanks etc.

#### WELD ALLOY PROPERTIES :

UTS	55 Kgf/mm <sup>2</sup>
Elongation	30 %

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	60-110	80-140	130-170

## STAINLESS STEELS

### ASTRALOY 714

A columbium stabilized austenitic stainless steel AC/DC electrode, for high strength welding of AISI 304, 304L, 308, 308L, 347 grades of stainless steels.

#### CHARACTERISTICS :

Soft and stable arc for smooth, dense and spatter-free welds slag is easy to chip. Deposits are resistant to intergranular corrosion by acids.

#### APPLICATIONS :

High strength and corrosion resistant welds in chemical process equipment, pumps, valves and vessels etc.

#### WELD ALLOY PROPERTIES :

UTS	55 Kgf/mm <sup>2</sup>
Elongation	30 %

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	60-110	80-140	130-170

## CAST IRON

### ASTRALOY 523

A Nickel-Iron alloy, all position, AC/DC electrode for high strength, crack-free welding of all grades of cast iron and for welding of cast irons to steel.

#### CHARACTERISTICS :

Electrodes has easy arc strike, arc stability and smooth arc. Weld deposits are smooth, shiny machinable with close colour match to cast irons. Slag is easy to chip and clean.

#### APPLICATIONS :

Casting defects, pump casings, valve bodies, pipe flanges, motor bases, bell housings and friction press discs etc.

#### WELD ALLOY PROPERTIES :

UTS	38-40 Kgf/mm <sup>2</sup>
Elongation	10 %
Hardness	170-210 BHN

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current	50-80	70-110	90-140	120-180





## LOW HEAT INPUT WELDING ALLOYS

### CAST IRON

#### ASTRALOY 524

A high Nickel alloy, all position, AC/DC electrode for high strength, machinable welding of cast irons without preheat.

##### CHARACTERISTICS :

Specially formulated coating for easy arc strike excellent arc stability, soft arc for minimal dilution and highly machinable deposits on grey, malleable and ductile irons.

##### APPLICATIONS :

Cast iron dies, pump casings, valve bodies, motor and generator housings, machine beds, gears, water jackets and cylinder blocks, glass moulds, neck rings and mill rolls etc.

##### WELD ALLOY PROPERTIES :

UTS	35 Kg/mm <sup>2</sup>
Elongation	15 %
Hardness	150-170 BHN

##### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-70	60-110	80-130	110-180

### CAST IRON

#### ASTRALOY 526

An economical nickel-alloy, AC/DC electrode for high strength, machinable welding of cast irons with good colour match to base metal.

##### CHARACTERISTICS :

Soft and stable arc. Easy arc strike produces smooth and dense weld deposits on grey cast irons.

##### APPLICATIONS :

Foundry Casting defects, pump casings, valve bodies, gear box, cast iron gears, dies moulds and sugar mill rolls etc.

##### WELD ALLOY PROPERTIES :

UTS	34 Kg/mm <sup>2</sup>
Hardness	150-170 BHN

##### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps)	40-80	80-110	100-130	120-170

### CAST IRON

#### ASTRALOY 527

An economical AC/DC iron base alloy for high strength welding, sealing and surface conditioning of old, dirty, greasy cast irons. For joining cast irons to mild steel where machinability is not essential.

##### CHARACTERISTICS :

A stable arc with spray-transfer and quick freezing alloy. Deposits are smooth, slag is minimum and easy to clean. Deposits can be finished by grinding and have good colour match to cast irons.

##### APPLICATIONS :

Motor and generator housings, machine guards, machine bases and sealing layer on dirty, greasy cast irons etc.

##### WELD ALLOY PROPERTIES :

UTS	40 Kg/mm <sup>2</sup>
Hardness	150-170 BHN

##### WELDING DATA :

Size Dia (mm)	3.15	4.00
Welding Current (Amps) AC/DC+	90-130	110-150

### COPPER, BRASS & BRONZE

#### ASTRALOY 328

A copper-base alloy, AD/DC electrode for high strength, machinable weld on phosphor-bronze, copper alloys and Bronze overlays on cast iron and steels.

##### CHARACTERISTICS :

A copper-base alloy with Tin and deoxidisers for smooth, dense and porosity free deposits. Weld alloy has high strength, wear resistance, machinability and good colour match with bronzes. Deposits have excellent resistance to friction.

##### APPLICATIONS :

Bronze castings, valves, pumps, rotors, impellers, bearings, bushes and sleeves. For bronze overlays on cast irons and steels etc.

##### WELD ALLOY PROPERTIES :

UTS	26-28 Kg/mm <sup>2</sup>
Hardness	80-85 BHN

##### WELDING DATA :

Size Dia (mm)	3.15	4.00
Welding Current (Amps) AC/DC+	100-140	120-160



## COPPER, BRASS & BRONZE

### ASTRALOY 329

A Copper Aluminium alloy electrode for joining, surfacing and building up aluminium bronzes, silicon bronzes, brasses, manganese bronzes.

#### CHARACTERISTICS :

A high strength welding alloy depositing two phase structure. Soft and stable arc, produces a smooth spatter free deposit with excellent resistance to friction and sea water corrosion. Deposits are machinable and have excellent colour match to aluminium bronzes.

#### APPLICATIONS :

Repair & rectification of aluminium bronze castings, marine propellers, pump castings, impellers, pump and valves etc.

#### WELD ALLOY PROPERTIES :

UTS	45 Kgf/mm <sup>2</sup>
Hardness	150-170 BHN

#### WELDING DATA :

Size Dia (mm)	3.15	4.00
Welding Current (Amps) DC(+) 70 V	100-130	120-160

## NICKEL & NICKEL ALLOYS

### ASTRALOY 210

An extremely good electrode for all position welding of Nickel, Inconel, Monel, Ni-Cr-Fe Alloys, HK Alloys, Stainless Steels & Heat Resistance Steels.

#### CHARACTERISTICS :

Electrode gives a deposit with good resistance to scaling at both normal and elevated temperature. It gives soft and stable arc at low currents & weld metal gives excellent resistance to corrosion, heat and oxidation.

#### APPLICATIONS :

For welding dissimilar metals such as carbon steels, stainless steels, nickel & nickel alloys to each other. Suitable for fabrication of corrosion resistant tanks & containers, heat exchangers, furnaces and boilers etc. Also suitable for use on equipment and components made of Nickel.

#### WELD ALLOY PROPERTIES :

UTS	55 Kgf/mm <sup>2</sup>
Elongation	29

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00
Welding Current (Amps) AC/DC+	40-60	60-90	100-140

## NICKEL & NICKEL ALLOYS

### ASTRALOY 211

A heavy coated electrode for cutting tools, dies has application which require heat & corrosion resistance.

#### CHARACTERISTICS :

Electrode has excellent welding characteristics . It gives free from crack & porosity which are resistance to corrosion & oxidation. The weld deposits resist deformation from static or cyclic loads at high temperature.

#### APPLICATIONS :

Drop Forge Dies, pumps, pipe lines, pickling/plating tanks, cutting tools, pump impellers, valves and for overlaying hot metal handling implements.

#### WELD ALLOY PROPERTIES :

UTS of Joint	50-63 Kgf/mm <sup>2</sup>
METAL RECOVERY	150%
HARDNESS : AS WELDED	250-300 Brinell
AFTER WORK-HARDENING	400-550 Brinell

#### WELDING DATA :

Size Dia (mm)	2.50	3.15	4.00	5.00
Welding Current (Amps) AC/DC+	90-120	110-150	150-190	190-230

## WEAR FACING ALLOYS

### ASTRALOY 430

An economical, low alloy steel type, all position AC/DC electrode for tough and wear-resistant build-up and overlays on low, medium carbon and low alloy steels, cushion layer prior to harder abrasion-resistant weld deposits.

#### CHARACTERISTICS :

Soft suitable arc for smooth and dense weld deposits. Slag is easy to detach and clean. Welds give moderate abrasion and friction.

#### APPLICATIONS :

Track rollers, idlers, crane wheels, sprockets, wobblers, couplers, gears, pinions, tailbars, cement kiln tyres and trunnions etc.

#### WELD ALLOY PROPERTIES :

Hardness	28-33 HRC
----------	-----------

#### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	120-160	150-200



## LOW HEAT INPUT WELDING ALLOYS

### WEAR FACING ALLOYS

#### ASTRALOY 432

An economical, alloy steel type, all position AC/DC electrode for hard and abrasion resistant overlays on low, medium and high carbon, low alloy and austenitic manganese steels.

##### CHARACTERISTICS :

Easy arc strike and stable arc. Produces weld deposits of good finish and wash. Deposits are smooth, dense, hard and resistant to mild impact and high abrasion by minerals.

##### APPLICATIONS :

Bucket teeth, augers, oil expellers screws, conveyor screws, plough shares, harrow discs, charging chutes, mixer paddles, paper knives and cane knives etc.

##### WELD ALLOY PROPERTIES :

Hardness (3 layers)	55-58 HRC
---------------------	-----------

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	120-160	150-200

### WEAR FACING ALLOYS

#### ASTRALOY 440

An austenitic manganese steel type, AC/DC, all position electrode with controlled alloy content for high strength, crack free joining, building up and cushioning of austenitic manganese steels and joining with mild steels.

##### CHARACTERISTICS :

Smooth and stable arc producing smooth, dense welds with good wash. Deposits are extremely tough and work hardened in service offering excellent resistance to metal deformation under severe impact and gouging abrasion by minerals.

##### APPLICATIONS :

Bucket teeth, sprockets, crusher jaws, mantles, mill hammers and wear liner plates etc.

##### WELD ALLOY PROPERTIES :

UTS	80 Kgf/mm <sup>2</sup>
Elongation	35 %
Hardness as welded	180-220 BHN
Work Hardened	500-550 BHN

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	120-160	150-200

### WEAR FACING ALLOYS

#### ASTRALOY 444

A specially formulated high alloy AC/DC electrode for surfacing and build up on martensitic Stainless and carbon steels for corrosion, erosion and cavitation resistant deposits.

##### CHARACTERISTICS :

Soft and stable arc for smooth, dense and sound welds. Deposits are tough, machinable and corrosion/erosion resistant.

##### APPLICATIONS :

Refiner plugs and sockets, pump castings, impellers pump sleeves, hydro-turbine buckets and thrash plates in sugar mills etc.

##### WELD ALLOY PROPERTIES :

UTS	100 Kgf/mm <sup>2</sup> (Post weld heat treatment)
Elongation	14-16 %
Hardness	30-34 HRC

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	80-120	110-150	130-190

### WEAR FACING ALLOYS

#### ASTRALOY 445

A high efficiency, high alloy, austenitic manganese steel, AC/DC electrode, for surfacing, build up and cushioning of austenitic manganese, medium carbon and low steels for wear due to severe impact and gouging abrasion by minerals.

##### CHARACTERISTICS :

Stable and smooth arc produces weld deposits of good wash, shine and even finish. Ideal for multipass build up without cracking and spalling. Weld deposits are tough and work hardening and resistant to atmospheric corrosion.

##### APPLICATIONS :

Bucket teeth, mill hammers, crusher jaws, mantles, liners railway crossings in high traffic density and high speed traction etc.

##### WELD ALLOY PROPERTIES :

UTS	84 Kgf/mm <sup>2</sup>
Elongation	30 %
Hardness as welded	23-26 HRC
Work Hardened	45-50 HRC

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	120-160	150-200



## LOW HEAT INPUT WELDING ALLOYS

### WEAR FACING ALLOYS

#### ASTRALOY 446

A special high efficiency, chromium carbide depositing, AC/DC electrode for abrasion resistant overlays on low and medium carbon, low alloys and manganese steels.

##### CHARACTERISTICS :

Arc strike is easy. Smooth and stable arc produces weld with good finish and wash. Weld dilution is minimal and in most cases a single layer overlay is sufficient to achieve wear resistance.

##### APPLICATIONS :

Augers, pugmill screws, cane knives, conveyor screws, impellers casings, dozer corner bits, bucket teeth, crusher hammers, jaws, mantles, dredger buckets, sand slingers and scoop buckets etc.

##### WELD ALLOY PROPERTIES :

Hardness	57-60 HRC
----------	-----------

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	90-120	110-150	150-190

### WEAR FACING ALLOYS

#### ASTRALOY 447

An unique martensitic iron type with primary carbide depositing AC/DC electrode for extremely hard and abrasion resistant overlays on low and medium carbon, low alloy and manganese steels.

##### CHARACTERISTICS :

Soft and stable arc for smooth, dense and even weld deposits with minimal dilution for extremely hard and abrasion resistant overlays. Slag coverage is full, easy to detach and clean.

##### APPLICATIONS :

Bucket teeth, shredder hammers, crusher jaws, mantles, liners wear plates, charging chutes, impellers, conveyor screws, scraper blades, scoop buckets and sand slingers etc.

##### WELD ALLOY PROPERTIES :

Hardness	60-62 HRC
----------	-----------

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	110-150	140-190

### WEAR FACING ALLOYS

#### ASTRALOY 448

A hydrogen controlled, all position, AC/DC electrode typically designed for welding of high tensile low alloy steels.

##### CHARACTERISTICS :

Gives soft and stable arc and high deposition efficiency. The electrode has very good creep resistance properties and is highly resistant to corrosion.

##### APPLICATIONS :

Surfacing of parts subject to metal to metal wear with impact in service upto 538 Centigrade. Surfacing and repair of forging dies etc.

##### WELD ALLOY PROPERTIES :

Hardness	48-50 HRC
----------	-----------

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	120-160	150-200

### WEAR FACING ALLOYS

#### ASTRALOY 450

##### CHARACTERISTICS :

A heavy coated hardfacing electrode with excellent abrasion resistance at high temperatures & metal recovery of 240%. Gives soft & stable arc & weld deposits with excellent compressive strength. Slag is easy to detach.

##### APPLICATIONS :

Refractory press screws, cement press screws, boring bits, conveyor screws, blast furnace bells & hoppers, ore crushing rolls, gyratory crushers, dredging buckets etc.

##### WELDING ALLOY PROPERTIES :

Hardness	60-65 HRC
----------	-----------

##### WELDING DATA :

4.00 mm	140-200 Amp.
5.00 mm	220-300 Amp.
AC/DC +	



## LOW HEAT INPUT WELDING ALLOYS

### WEAR FACING ALLOYS

#### ASTRALOY 451

A hard surfacing electrode with 180% metal recovery and high abrasion resistance..

##### CHARACTERISTICS :

Electrode gives very high metal recovery. Weld metal has excellent abrasion resistance at normal temperature and easy arc control.

##### APPLICATIONS :

Suitable for hard surfacing of parts subject to heavy abrasion from metal to metal wear with moderate impact upto 500 Deg. C. Suitable for brick press screws, cement press screws, parts of crushers, conveyor screws, dredging bucket, knife, auger, boring bits, blast furnace bells and hoppers.

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps) AC/DC+	120-150	150-200	170-210

### GOUGING & CUTTING

#### ASTRALOY 101

A high efficiency AC/DC electrode for cutting and piercing carbon, stainless, manganese, alloy steels, copper alloy white metals.

##### CHARACTERISTICS :

Heat resistant exothermic coating for high speed and efficient thermal cutting of all metals without air or gas.

##### APPLICATIONS :

For air/gas less cutting of all metals, removal of damaged sections and piercing of metals before drilling etc.

##### WELDING DATA :

Size Dia (mm)	3.15	4.00	5.00
Welding Current (Amps)	200-250	250-300	300-350



### GOUGING & CUTTING

#### ASTRALOY 102

A air/gasless than chamfering and gouging AC/DC electrode for high speed removal of damaged materials without excessive heating of base metal.

##### CHARACTERISTICS :

A specially formulated coating with high arc energy and arc force for rapid removal of unwanted materials in steels, cast irons and stainless steels.

##### APPLICATIONS :

For chamfering groove and gouging out cracks, old rivet and bolt heads and deformed metal etc.

##### WELDING DATA :

Size Dia (mm)	4.00	5.00
Welding Current (Amps)	250-300	300-350







## STAINLESS STEEL TIG WIRE

### GRADE ER 308L

Stainless Steel filler wire suitable for welding 18/8 (304) austenitic stainless steels, providing good corrosion and wear resistance.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.03
Si	0.4
Mn	1.5
Cr	20
Ni	10

AWS	ER-308L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 309L

Stainless Steel filler wire containing higher Chromium & Nickel, suitable for joining materials of similar composition and also dissimilar stainless steels.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.03
Si	0.4
Mn	1.5
Cr	25
Ni	13

AWS	ER-309L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 309Mo

Stainless Steel filler wire suitable for welding dissimilar metals such as stainless steel containing Molybdenum to carbon steel, for welding ASTM 309 Mo steel. Also suitable for welding difficult to weld steels.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.09
Si	0.60
Mn	1.75
Cr	22
Ni	14
Mo	3

AWS	ER-309Mo
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 310

25/20 type Stainless Steel filler wire suitable for heat resistant, austenitic stainless steels, where application is subject to high temperatures.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.1
Si	0.4
Mn	1.5
Cr	26
Ni	21

AWS	ER-310
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel



## STAINLESS STEEL TIG WIRE

### GRADE ER 310H

25/20 type Stainless Steel filler wire suitable for welding high alloy castings for greater strength at elevated temperatures.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.15
Si	0.6
Mn	2.0
Cr	25
Ni	20

AWS	ER-310H
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 310L

25/20 type Stainless Steel filler wire with low carbon suitable for heat resistant, austenitic stainless steels, where application is subject to high temperatures.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.02
Si	0.4
Mn	1.5
Cr	26
Ni	21

AWS	ER-310L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 312

Stainless Steel filler wire suitable for welding cast alloys of similar composition, dissimilar steels and steels of unknown composition.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.1
Si	0.5
Mn	1.5
Cr	30
Ni	9

AWS	ER-312
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 316L

A molybdenum bearing Stainless Steel filler wire with low carbon content. It is corrosion resistant and suitable for welding molybdenum bearing stainless steels.

Typical applications for this acid resistant wire include the nuclear and chemical engineering industries.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.02
Si	0.4
Mn	1.5
Cr	19
Ni	12
Mo	2

AWS	ER-316L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm2
Hardness	180 BHN
Recommended Flux	Stainless Steel



## STAINLESS STEEL TIG WIRE

### GRADE ER 317L

Stainless Steel filler wire 18/13/3 type with low carbon suitable for joining stainless steel to lower alloy and carbon steels and welding when heat treatment after welding is not possible.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.03
Si	0.4
Mn	1.5
Cr	18
Ni	13
Mo	3

AWS	ER-317L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm <sup>2</sup>
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 318

Stainless Steel filler wire , Cg stabilized to prevent weld decay, giving excellent corrosion resistance, suitable for use on Cb or Ti stabilized 18/8 Mo steels such as 317 and 318 and when the weld is subjected to temperature more than 800°C.. Typical applications include bleaching, dyeing equipments and pickling plants :

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.06
Si	0.4
Mn	1.5
Cr	18
Ni	14
Mo	2.0
Cb	0.6

AWS	ER-318
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm <sup>2</sup>
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 318L

Stainless Steel filler wire with low carbon, columbium stabilized to prevent weld decay, giving excellent corrosion resistance, suitable for use on Niobium or Titanium stabilized 18/8/Mo steels such as 317 and 318 and where the weld is subjected to temperature more than 800°C. Typical applications include bleaching equipments, dyeing equipments and pickling plants.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.02
Si	0.4
Mn	1.5
Cr	18
Ni	14
Mo	2.0
Cb	0.6

AWS	ER-318L
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm <sup>2</sup>
Hardness	180 BHN
Recommended Flux	Stainless Steel

### GRADE ER 330

Stainless Steel filler wire suitable for welding castings and wrought alloys of similar composition.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.15
Si	0.50
Mn	1.75
Cr	16
Ni	35

AWS	ER-330
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm <sup>2</sup>
Hardness	180 BHN
Recommended Flux	Stainless Steel



## STAINLESS STEEL TIG WIRE

### GRADE ER 347

Stainless Steel filler wire, niobium stabilized to prevent weld decay, giving excellent corrosion resistance. Suitable for use on 18/8 type stainless steel, Nb and Ti stabilized, such as 304, 321 and where the weld is subjected to temperatures above 400°C.

Typical applications include aircraft fabrication, stainless steel pipelines, tanks, fittings and hospital equipment.

#### TYPICAL WELDMETAL COMPOSITION :

Element	Percent
C	0.07
Si	0.4
Mn	1.5
Cr	20
Ni	10
Nb	0.6

AWS	ER-347
Process	TIG & Gas
Melting Point	1440 °C.
Ultimate Tensile Strength	650N/mm <sup>2</sup>
Hardness	180 BHN
Recommended Flux	Stainless Steel

All wires are available in D 300 Plastic Spools 12.50 / 15.00 Kg each for diameter 0.8mm to 1.2mm and in cut lengths of 1000 mm in paper cartons of 5 Kg each for higher sizes duly embossed by grade for easy identification.



## TIG WELDING WIRE

### ASTRALOY 70S-2

Carbon Steel Filler Rods  
AWS A5.18 ER 70S-2

#### CHARACTERISTICS :

High quality carbon steel alloy for gas shielded arc welding. It gives a porosity free tough deposit.

#### TYPICAL MECHANICAL PROPERTIES :

UTS	70 Kgf/mm <sup>2</sup>
Elongation	22%
Impact Strength	27J@-29C





## PREMIER FLUX CORED WELDING WIRE

### CLASSIFICATION : AWSA/SFA 5.20 E 71 T1

#### CHARACTERISTICS :

A flux cored wire suitable for all position welding with higher deposition rate than solid wire. The wire produces high quality welds & gives stable arc with very low spatter & excellent slag detachability.

#### APPLICATIONS :

Welding of mild steels, carbon steels with UTS upto 50 kg/mm<sup>2</sup>, structural steels, ships, bridges, towers, vehicles, rolling stocks, chemical plant & machinery, wagons, steel frames etc.

Wel Metal Chemistry (%)	C	Si.	Mn	S	P
	0.12 max	0.90 max	1.75 max	0.030 max	0.030 max

Typical Mechanical Properties : of all Weld Metal	UTS Kg/mm <sup>2</sup>	YS Kg/mm <sup>2</sup>	% Elongation (L=4xd)	Charpy-V Impact Value at - 18 deg. C Kgfm
	58	50	24	4

Shielding Gas	: CO <sub>2</sub> or Ar/CO <sub>2</sub>	10-15 Lit./min.
Deposition Efficiency %	: ~90	

#### Welding Current and Packing Data :

Dia mm	1.2	1.6
Current Condition	DC+	
Current Amps	150-340	170-395
Welding Position	F, H, V-UP, OH	
Spool Size	300 mm ODx50.5 mm IDx103 mm Width	
Net Weight	15 kgs. Per Spool	



### CLASSIFICATION: AWSA/SFA 5.20 E 71 T5

#### CHARACTERISTICS :

A basic flux cored wire depositing sound radiographic quality weld metal. Deposits are highly crack-resistant and tough. Wire gives stable arc with easy deslagging.

#### APPLICATIONS :

Welding of structural and boiler-quality steels, with UTS upto 60 kg/mm<sup>2</sup>

Wel Metal Chemistry (%)	C	Si.	Mn	S	P
	0.12 max	0.60 max	1.75 max	0.030 max	0.030 max

Typical Mechanical Properties : of all Weld Metal	UTS Kg/mm <sup>2</sup>	YS Kg/mm <sup>2</sup>	% Elongation (L=4xd)	Charpy-V Impact Value at -20 deg. C Kgfm
	62	55	28	6

Shielding Gas	: CO <sub>2</sub> or Ar/CO <sub>2</sub>	10-15 Lit./min.
Deposition Efficiency %	: ~90	

#### Welding Current and Packing Data :

Dia mm	1.2	1.6
Current Condition	DC+	
Current Amps	150-340	170-395
Welding Position	F, H, V-UP, OH	
Spool Size	300 mm ODx50.5 mm IDx103 mm Width	
Net Weight	15 kgs. Per Spool	







The series of our Aluminium Alloy and Pure Aluminium Wires give high quality of welds.

## ER1050A

### Description

Aluminium wires and rods for welding alloys with mostly pure aluminium basis (maximum 0.5% of alloyed elements). Application in chemistry, electronics, construction and food industries.

### Chemical composition :

Si <0.30, Fe <0.40, Cu <0.05, Mn <0.05, Mg <0.05, Zn <0.07, Ti < 0.05, Al >99.50

### Minimal Values of the Mechanical Properties (Welded Metal)

Tensile strength	:	Rm : 65 N/mm <sup>2</sup>
Yield Strength	:	Rp 0,2 : 20 N/mm <sup>2</sup>
Elongation	:	L=5d 35%

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min

### Materials to be welded

Al. 99,0, AL. 99, 5  
AL. 99, 7, E-AL

### Description

Aluminium wires and rods for welding pure aluminium. Applications in the electronic, chemistry and food industries, in which a higher purity degree of deposit material is needed.

### Chemical composition :

Si <0.15, Fe <0.15, Cu <0.02, Mn <0.02, Mg <0.02, Zn <0.06, Ti < 0.02, Al >99.80

### Minimal Values of the Mechanical Properties (Welded Metal)

Tensile strength	:	Rm : 60 N/mm <sup>2</sup>
Yield Strength	:	Rp 1,0 : 22 N/mm <sup>2</sup>
Elongation	:	L=5d 40%

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min

### Materials to be welded

Al. 99, 8, AL. 99, 7  
AL. 99, 5, E-A1

## ER 1080A

### Description

Aluminium wires and rods for welding alloys with maximum 2% alloying elements and for aluminium alloys containing upto 7% of Si. Excellent flowability and penetration characteristics. Applications in the construction sector and in the automotive industry.

### Chemical composition :

Si 4.5 - 5.5, Fe <0.40, Cu <0.05, Mn <0.05, Mg <0.05, Zn <0.10, Ti < 0.15, Al remainder

### Minimal Values of the Mechanical Properties (Welded Metal)

Tensile strength	:	Rm: 120 N/mm <sup>2</sup>
Yield Strength	:	Rp 0, 2 : 40 N/mm <sup>2</sup>
Elongation	:	L=5d : 8%

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min

### Materials to be welded

Al Si 5, Al Mg Si 0, 5, Al Mg Si 0, 8  
Al Mg Si 1, Al Zn Mg, Al Cu Mg.  
(After anodizing welding will be of a dark grey colour)

## ER 4047

## ER 4043

### Description

Aluminium wires and rods for welding and brazing. Good mechanical characteristics, their excellent corrosion resistance and low melting point ensure a very low number of deformations in the origin metal. This material is generally used for brazing aluminium sheets, for extrusions and castings. (After anodizing the welding will be of a different colour)

### Chemical composition :

Si 11.0-13.0, Fe <0.50, Cu <0.05, Mn <0.15, Mg <0.05, Zn <0.10, Ti < 0.15, Al remainder

### Minimal Values of the Mechanical Properties (Welded Metal)

Tensile Strength	:	Rm : 130 N/mm <sup>2</sup>
Yield Strength	:	Rp 0, 2 : 60 N/mm <sup>2</sup>
Elongation	:	L=5d : 5%
Melting range	:	573-585 deg. C

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min

### Materials to be welded

G-Al Si 10 Mg, G-A1 Si 11, G-A1 Si 12 (Cu), G-A1 Si 7 Mg,  
G-A1 Si 6 Cu 4, Al Mg Si 0.8, Al Mg Si 1,  
(use flux when brazing oxyacetylene)

## ER 5356



### Description

Aluminium wires and rods for welding alloys with aluminium and magnesium basis, with maximum 5% Magnesium. High corrosion resistance. Applications in the construction of ships, storage tanks, railway and in the automotive industry.

### Chemical composition

Si <0.25, Fe <0.40, Cu <0.05, Mn 0.10-0.20, Mg 4.5-5.6, Cr 0.10-0.30, Zn <0.10, Ti 0.07-0.15, Al remainder

### Minimal Values of the Mechanical Properties (Welded Metal)

Tensile strength	:	Rm: 240 N/mm <sup>2</sup>
Yield strength	:	Rp 0, 2: 110 N/mm <sup>2</sup>
Elongation	:	L=5d : 17%

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min  
Ar 75% + He 25%  
Ar 50% + He 50%

### Materials to be welded

Al Mg 3, Al Mg 5, Al Mg Mn, Al Zn Mg 1, G-Al Mg 3 Si, G-Al Mg 5 Si, G-Al Mg 10, Al Mg 1 Si Cu, Al Mg Si 0, 7.

### Description

Welding wires and rods to be used when very high seawater corrosion resistance is needed. Applications in the construction of ships, offshore, cryogenic plants, railway and in the automotive industry.

### Chemical composition

Si <0.25, Fe <0.40, Cu <0.05, Mn 0.60-1.00, Mg 4.3-5.2, Cr 0.05-0.25, Zn <0.25, Ti 0.07-0.15, Al remainder

### Minimal values of the Mechanical Properties (Welded Metal)

Tensile Strength	:	Rm: 275 N/mm <sup>2</sup>
Yield Strength	:	Rp 0, 2 : 125 N/mm <sup>2</sup>
Elongation	:	L=5d : 17%

### Shielding Gases for GMAW/GTAW

Ar 99, 95% min  
Ar 75% + He 25%  
Ar 50% + He 50%

### Materials to be welded

Al Mg 4, 5 Mn, Al Mg 5, Al Mg 2 Mn 0, 8, Al Zn Mg 1, Al Zn Mg Cu 0, 5, Al Mg Si 0, 5, Al Mg Si 1, G-Al Mg 10, G-Al Mg 5, G-Al Mg 3 Si, G-Al Mg 5 Si.

## ER 5183

### AVAILABLE SIZES :

#### MIG 6-7 Kg in D 300 Spools

Diameter of the wire  
0,80mm 1,00mm 1,20mm 1,60mm 2,00mm  
2,40mm 3,20mm

#### TIG box of 5/10 Kg

Diameter of the rods (x 1000 mm length)  
1,60mm 2,00mm 2,40mm 3,20mm 4,00mm 5,00mm





## EL-8 : DESCRIPTION

EL-8 is a copper coated mild steel electrode for Submerged Arc Welding (SAW) of mild and medium carbon structural steels.

## EM-12 : DESCRIPTION

EM-12 is a medium manganese alloyed copper coated steel wire for submerged arc welding and electroslag welding of medium and high tensile steels.

## EH-14 : DESCRIPTION

EH-14 is a copper coated manganese alloyed semi-killed electrode for Submerged Arc Welding (SAW) of medium and high tensile steels.

## Chemical Composition of Wire (%) :

Standard	C	Mn	Si	Cr	Ni	S	P	Cu
AWS EL-8	0.10	0.30-0.60	0.03	0.20	0.030	0.030	0.030	0.20
AWS EM-12	0.10	0.80-1.10	0.07	0.20	0.030	0.030	0.030	0.20
AWS EH-14	0.12	1.50-1.90	0.07	0.20	0.030	0.035	0.035	0.20

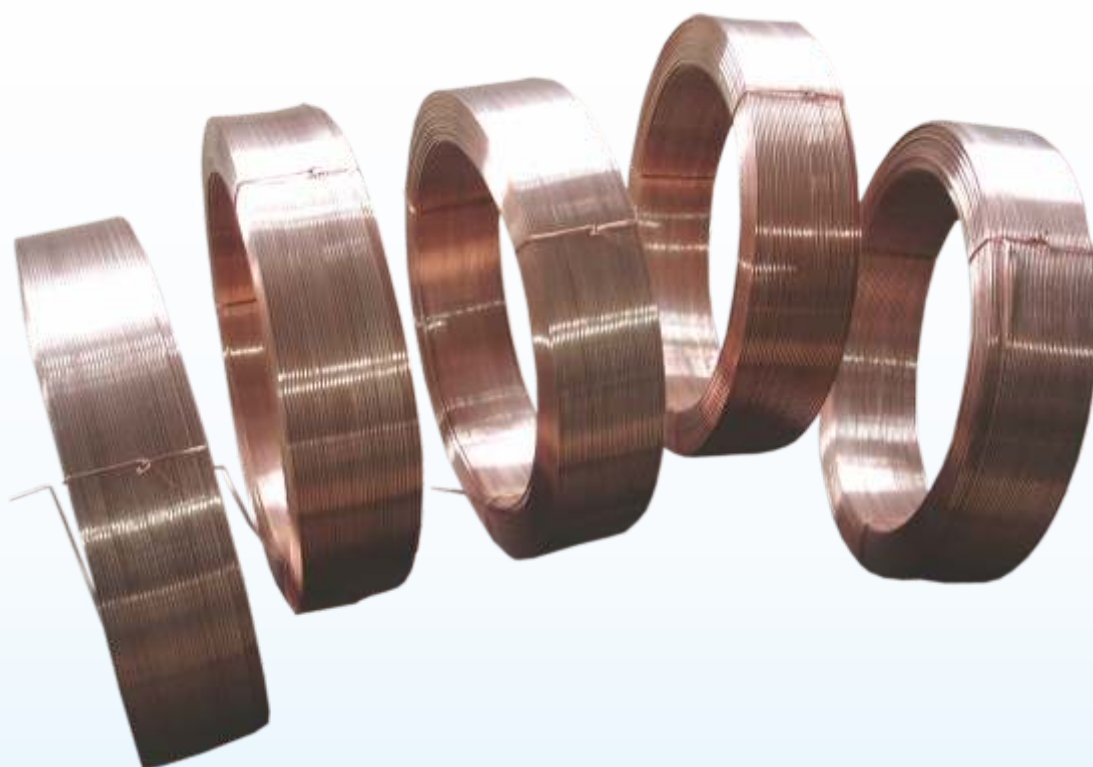
## Mechanical Properties of Weld Metal :

Standard	Yield point (MPa)	Tensile Strength (MPa)	Elongation (%)	Impact V-Notch J (0°C)
'0				
AWS EL-8	330	410-550	22	27
AWS EM-12	330	410-550	22	27
AWS EH-14	330	410-550	22	27

## Specification, Recommended Current Range and Package Weight :

Diameter (mm)	1.6	2.0	2.5	3.2	4.0	5.0
Current Range (A)	180-450	200-400	250-450	352-600	500-800	700-1000

25 Kg Coils with or without Paper / Metallic core.





## COPPER COATED SOLID WIRE FOR MIG/CO2 WELDING

### CHARACTERISTICS :

"Premier" MIG wires are copper coated solid Steel wires suitable for continuous welding for general purpose fabrication on low to medium carbon steels. These wires are manufactured by wet drawing and special coppering process ensuring longer shelf life, easy feed and current pick up. The Random/Layer Wound wire gives uniform and sound weld metal deposit.

### APPLICATION :

Mild and structural steels with Tensile Strength up to 55 kg/mm<sup>2</sup>

### CLASSIFICATION :

IS 6419-1996 Grade S4      AWS A5-18 : ER70S-6  
BS 2901 : A-18              DIN 8559 : SG2

### WIRE CHEMISTRY (%) :

C	SI	Mn	S	P
0.06-0.12	0.80 to 1.15	1.40 to 1.60	0.025 Max	0.025 Max

### MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Value at - 29 °C. Kgfm
Minimum Required Values:			
51	42.8	22	2.80
Typical Values:			
57.8	46.9	31	6.40

### WELDING CURRENT AND PACKING DATA :

Wire Dia. mm	0.8	1.0	1.2	1.6
Current Amps.	50-180	75-200	90-300	180-500
Welding Position	Downhand / Horizontal / Vertical			
Spool Size	300 mm OD X 50.5 mm ID x 103 mm Width			
Net Weight	12.50/15.00 kgs. per Spool.			



## COPPER COATED SOLID WIRE FOR MIG/CO2 WELDING (JUMBO PAC)

### CHARACTERISTICS :

"Premier" Jumbo Pac wires are copper coated solid steel wires particularly suitable for robotic welding. "Premier" wires are of unsurpassed quality & deposit excellent quality weld metal at high deposition rates. Labour and overhead are the most expensive factors in a welding operation, usually comprising more than 50% of the total cost. Welding with Jumbo Pac wires provides an immediate means of cost reduction without an exorbitant investment in equipment. Whether you are using wire on spools or bulk pack from other sources, it is easy to change to Jumbo Pac. The only accessories you will need are a wire conduit attachment, wire conduit & a quick connector. "Premier" Jumbo Pac wires are manufactured by special coppering process ensuring longer shelf life, easy feed & current pickup.

### APPLICATION :

Mild and structural steels with Tensile Strength up to 55 kg/mm<sup>2</sup>

### CLASSIFICATION :

IS 6419-1996 Grade S4      AWS A5-18 : ER70S-6  
BS 2901 : A-18              DIN 8559 : SG2

### TYPICAL MECHANICAL PROPERTIES OF ALL WELD METAL :

Ultimate Tensile Strength Kg/mm <sup>2</sup>	Yield Strength Kg/mm <sup>2</sup>	Elongation % (L=5d)	CVN Impact Value at - 29 °C. Kgfm
57	48	27	6.50

### TYPICAL WIRE CHEMISTRY (%) :

C	SI	Mn	S	P
0.07	0.95	1.52	0.017	0.020

### WELDING CURRENT AND PACKING DATA :

Wire Dia. mm	0.8	1.0	1.2	1.6
Current Amps.	50-180	75-200	90-300	180-500
Welding Position	Downhand / Horizontal / Vertical			
Drum Size	510 x Height 790 mm for 250 kg.			
Net Weight	100 kg and 250 kg drums.			









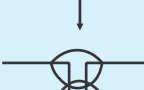
## DATA SHEETS / ELECTRODE CONSUMPTION

### Calculation of Electrode Consumption

In the tables, joint cross section, theoretical joint volume and kg weld metal per metre length of welded joint are given. The electrode consumption per metre of welded joint is obtained by dividing the number of kg of weld metal by N, where N is the kg of weld metal per kg of electrode.

### Square butt joints : Joint volumes and weld metal weights

Position	Plate thickness mm	Gap mm	Volume/length cc/cm3	Weight/length weldmetal kg/m
 Flat	1	0	2	0.02
	1.5	0.5	3	0.02
	2	1	4	0.03
	3	1.5	7	0.05
 Flat	4	2	17	0.13
	5	2	21	0.16
	6	2.5	27	0.21
	7	3	36	0.28
 Horizontal-Vertical	1	0	2.5	0.02
	1.5	0.5	4	0.03
	2	1	5	0.04
	3	1.5	9.5	0.07
 Horizontal-Vertical	4	2	22	0.17
	5	2.5	25	0.20
	6	3	32	0.25
	7	3	42	0.33

Position	Plate thickness mm	Gap mm	Volume/length cc/cm3	Weight/length weldmetal kg/m
 Overhead	4	2	9	0.07
	5	2	10.5	0.08
	6	2.5	13	0.10
	7	3	16	0.13
	4	2	10.5	0.08
	5	2	16	0.13
	6	2.5	18	0.14
	7	3	21	0.16

### Single V-joints : Joint volumes and weld metal weights





Plate thickness mm	Gap mm	 50° Flat			 60° Flat		
		1	2	3	1	2	3
4	1	11.5	11	0.09	13	12.5	0.10
5	1	16.5	16	0.13	19.5	19	0.15
6	1	23	21.5	0.17	27	25.5	0.20
7	1.5	33.5	32.5	0.26	39	38	0.30
8	1.5	42	40	0.31	49	46.5	0.37
9	1.5	51	48	0.38	60.5	56	0.44
10	2	66.5	62	0.49	77.5	72	0.57
11	2	78.5	71.5	0.56	92	83.5	0.66
12	2	91	83	0.65	107	97.5	0.77
14	2	120	110	0.86	141	130	1.02
15	2	135	123	0.97	160	146	1.15
16	2	151	132	1.04	180	157	1.23
18	2	189	170	1.33	223	204	1.60
20	2	227	208	1.63	271	247	1.94
25	2	341	313	2.46	411	375	2.94


Plate thickness mm	Gap mm	 70° Vertical			 80° Overhead		
		1	2	3	1	2	3
4	1	15	16.5	0.13	17.5	18	0.14
5	1	22.5	24.5	0.19	26	28	0.22
6	1	31	37	0.29	36	38.5	0.30
7	1.5	45	49	0.38	51.5	56	0.44
8	1.5	57	59.5	0.47	65.5	70	0.55
9	1.5	70	75.5	0.59	81.5	87.5	0.69
10	2	90	96.5	0.76	104	109	0.86
11	2	107	113	0.89	124	130	1.02
12	2	125	134	1.05	146	157	1.23
14	2	165	171	1.34	193	204	1.60
15	2	188	197	1.55	219	231	1.81
16	2	211	223	1.75	247	257	2.02
18	2	263	276	2.17	308	320	2.51
20	2	320	334	2.62	376	396	3.11
25	2	488	510	4.00	577	606	4.76





## Calculation of Electrode Consumption

### Single V-joints : Joint volumes and weld metal weights





Plate thickness mm	Gap mm	 Horizontal-Vertical		
		1	2	3
4	1	13	14.5	0.11
5	1	19.5	21	0.16
6	1	27	30	0.24
7	1.5	39	42	0.33
8	1.5	49	56	0.44
9	1.5	60.5	65	0.51
10	2	77.5	81	0.64
11	2	92	96.5	0.76
12	2	107	113	0.89
14	2	141	159	1.17
15	2	160	171	1.34
16	2	180	186	1.46
18	2	223	233	1.83
20	2	271	281	2.21
25	2	411	425	3.34

1 Theoretical volume cc/m; 2 Actual joint volume cc/m (taking account of transverse shrinkage); 3 Deposited weld metal kg/m





### The first run and backing run V-joints : Weld metal weights

Position	Plate thickness mm	Weight/length kg/m	Electrode diam mm
Flat	6- 12	0.10	3.25
Flat	> 12	0.15	4
Vertical	> 8	0.15	3.25
Horizontal-Vertical	> 8	0.15	3.25
Overhead	> 10	0.10	3.25

## Corner Welds : Joint Volumes and weld metal weights

Plate thickness mm	Section size mm2								
		cm3/m	kg/m	cm3/m	kg/m	cm3/m	kg/m	cm3/m	kg/m
2	2	3.5	0.03	3	0.02	3.5	0.03	3.5	0.03
3	4.5	7	0.05	7	0.05	7	0.05	7.5	0.06
4	8	9	0.07	9	0.07	9.5	0.07	10.5	0.08
5	12.5	13	0.10	13.5	0.11	14.5	0.11	16	0.13
6	18	18.5	0.15	19.5	0.15	21	0.16	22	0.17
7	24.5	22.5	0.20	26.5	0.21	27.5	0.22	31.5	0.25
8	32	33	0.26	34.5	0.27	36	0.28	40.5	0.32
9	40.5	41.5	0.33	43	0.34	45.5	0.36	51	0.40
10	50	51.5	0.40	53.5	0.42	56	0.44	64	0.50
11	60.5	63	0.49	67	0.53	72	0.57	78.5	0.62
12	72	74.5	0.58	79	0.62	84.5	0.66	93	0.73
15	113	1.16	0.91	123	0.97	132	1.04	141	1.11
18	162	167	0.31	174	1.37	190	1.49	204	1.60
20	200	206	1.62	206	1.62	227	1.78	252	1.98
22	242	248	1.95	255	2.00	275	2.16	294	2.39
25	323	329	2.58	331	2.60	370	2.90	405	3.18

## Fillet Welds : Joint Volumes and weld metal weights

Plate thickness mm	Section size mm2								
		cm3/m	kg/m	cm3/m	kg/m	cm3/m	kg/m	cm3/m	kg/m
2	4	5	0.04	6	0.05	5.5	0.04	5.5	0.04
2.5	6.5	7.5	0.06	8.5	0.07	8	0.06	8.5	0.07
3	9	10.5	0.08	12.5	0.10	11	0.09	12	0.09
3.5	12.5	14	0.11	16	0.13	15	0.12	16.5	0.13
4	16	18	0.14	21	0.16	19.5	0.15	22	0.17
4.5	20.5	22.5	0.18	26	0.20	24.5	0.19	26.5	0.21
5	25	27.5	0.22	31.5	0.25	30.5	0.24	33	0.26
5.5	30.5	33.5	0.26	37	0.29	36	0.28	40.5	0.32
6	36	40	0.31	42	0.33	43	0.34	47.5	0.37
6.5	42.5	46.5	0.37	49.5	0.39	51	0.40	56	0.44
7	49	54.5	0.43	57	0.45	56	0.44	65	0.51
7.5	56.5	60.5	0.47	65	0.51	64	0.50	73.5	0.58
8	64	70	0.55	73.5	0.58	76.5	0.60	82.5	0.65
9	81	88	0.69	94	0.74	95	0.75	109	0.86
10	100	108	0.85	114	0.89	116	0.91	130	1.02
11	121	131	1.03	138	1.08	143	1.12	157	1.23
12	144	155	1.22	162	1.27	169	1.33	188	1.48
13	169	179	1.41	190	1.49	195	1.53	220	1.73
14	196	207	1.62	224	1.76	227	1.78	257	2.02
15	225	237	1.86	248	1.95	264	2.07	294	2.31



### SOLD WIRE CLASSIFICATION FOR GTAW/GMAW

Indicates the minimum tensile strength of the weldmetal produced by the electrode in accordance with the specification

ER 70 S-X

Indicates a filler wire / rod

Indicates that the filler metal is solid

X	C	Mn	Si	S	P	Ti	Zr	Al
2	0.07	0.90 /1.40	0.40 0.70	0.035 /0.15	0.025	0.05 /0.12	0.02 /0.15	0.05
3	0.06 /0.15	0.90 /1.40	0.45 /0.75	0.035	0.025	---	---	---
4	0.07 /0.15	1.00 /1.50	0.65 /0.85	0.035	0.025	---	---	---
5	0.07 /0.15	1.00 /1.50	0.65 /0.85	0.035 /0.090	0.025	---	---	0.05
6	0.06 /0.15	1.40 /1.85	0.80 /1.15	0.035	0.025	---	---	---
7	0.07 /0.15	1.50 /2.00	0.50 /0.80	0.035	0.025	---	---	---
G	----- Not Specified -----							

## Helping you with Winning Solutions





Indicates the primary welding conditions for which the electrode is designed;  
0 - Flat and horizontal positions  
1 - All Positions

Designates an electrode

**EXXTX - X**

Indicates the minimum tensile strength (in units of 10 KSi) of the deposited weldmetal in accordance with specified welding conditions

Indicates the chemical composition of the weldmetal

#### Indicates usability and performance capabilities

1. Electrode classified for used with CO<sub>2</sub> or CO<sub>2</sub>+Ar mixture to improve usability especially for out of position welding. Designed for single and multi-pass welding characterized by spray transfer, low spatter loss and a moderate volume of slag. Generally are rutile based and operate on DC+
4. Self - shielded electrode for single and multi pass welding in the flat and horizontal vertical positions. Operates of DC+ and gives globular transfer.
5. Designed for use with CO<sub>2</sub> (Ar based gases may be used) for single and multi pass welding in the flat and horizontal positions. Electrodes of this group have a lime fluoride based slag and produce weldmetal having improved impact properties and crack resistance in comparison to rutile types.
8. Self shielded electrode operating on DC with negative polarity. Designed for all positions and provides a weldmetal with very good low temperature impact properties. Used for single and multi pass welding.

X	C	Mn	Ni	Cr	Mo	V	Al
Carbon - Molybdenum Steel Electrodes							
Al	0.12	1.25	—	—	0.40/0.65	—	—
Chromium - Molybdenum Steel Electrodes							
B1	0.12	1.25	—	0.40/0.60	0.40/0.65	—	—
B2L	0.05	1.25	—	1.0/1.5	0.40/0.65	—	—
B2	0.12	1.25	—	1.0/1.5	0.40/0.65	—	—
B2H	0.10/0.15	1.25	—	1.0/1.5	0.40/0.65	—	—
B3L	0.05	1.25	—	2.0/2.5	0.90/1.20	—	—
B3	0.12	1.25	—	2.0/2.5	0.90/1.20	—	—
B3H	0.10/0.15	1.25	—	2.0/2.5	0.90/1.20	—	—
Nickel Steel Electrodes							
Ni1	0.12	1.50	0.80/1.10	0.15	0.35	0.05	1.80
Ni2	0.12	1.50	1.75/2.75	—	—	—	1.80
Ni3	0.12	1.50	2.75/3.75	—	—	—	—
Manganese - Molybdenum Steel Electrodes							
D1	0.12	1.25/2.00	—	—	0.25/0.55	—	—
D2	0.15	1.65/2.25	—	—	0.25/0.55	—	—
D3	0.12	1.00/1.75	—	—	0.40/0.65	—	—
All other low alloyed Electrode							
K1	0.15	0.80/1.40	0.80/1.10	0.15	0.20/0.65	0.05	---
K2	0.15	0.50/1.75	1.00/2.00	0.15	0.35	0.05	1.80
K3	0.15	0.75/2.25	1.25/2.60	0.15	0.25/0.65	0.05	---
K4	0.15	1.20/2.25	1.75/2.60	0.20/0.60	0.30/0.55	0.05	---
K5	0.10/1.25	0.60/1.60	0.75/2.00	0.20/0.70	0.15/0.55	0.05	---
K6	0.15	0.50/1.50	0.40/1.10	0.15	0.15	0.05	1.80
K7	0.15	1.00/1.75	2.00/2.75	---	---	---	---



## SOLID WIRE VERSUS FLUX CORED WIRE-WHEN TO USE THEM AND WHY

### Comparing the Advantages of GMAW and FCAW

Gas metal arc welding (GMAW) and flux cored arc welding (FCAW) possess different characteristics that welding operators must evaluate when selecting them for welding applications. To achieve the best results, consider the following factors: thickness of the material, proper shielding gas, wire feed speed and voltage settings, location of the work site and weld appearance. There is no "one-size-fits-all" welding solution and all of the above variables will affect the operator's decision to use solid or flux cored wire. This article will help the novice or occasional welding operators such as farmers, ranchers, motorsports enthusiasts and home hobbyists, understand the basics of solid and flux cored wire and how to maximize the advantages of each.

### Solid Wire/MIG Basics

MIG power sources use a continuous solid wire electrode for filler metal and require a shielding gas delivered from a pressurized gas bottle. Mild steel solid wires are usually plated with copper to prevent oxidation, aid in electrical conductivity and help increase the life of the welding contact tip. The shielding gas protects the molten weld pool from contaminants present in the surrounding atmosphere. The most common shielding gas combination is 75 percent Argon and 25 percent CO<sub>2</sub>. While using solid wire outdoors, the operator should use caution and prevent any wind from blowing the shielding gas coverage away from the welding arc. Windshields may need to be used.

### Flux Cored Wire Basics

There are two types of flux cored wires: gas shielded

and self shielded. Gas shielded flux cored wires require external shielding gas and the slag is easy to remove.

The operator may want to consider using gas shielded flux cored wires when welding on thicker metals or in out-of-position applications. Gas shielded flux cored wires have a flux coating that solidifies more quickly than the molten weld material. As a result, it creates a "shelf" to hold the molten pool when welding overhead or vertically up. Self shielding flux cored wire does not require external shielding gas; the weld pool is protected by gas generated when flux from the wire is burned. As a result, self shielding flux cored wire is more portable because it does not require an external gas tank.

### What To Consider When Choosing Solid Or Flux Cored Wire

#### Appearance

Many welding operators believe that weld appearance is an important factor. When you are working on materials less than 3/16 inches down to thin sheet metal (24 ga.), solid wire will produce a clean looking weld. For example, a short circuit transfer with .030-inch solid wire set at 18-19 volts with 160-170 amps and using 75 percent Argon and 25 percent CO<sub>2</sub> shielding gas will usually produce little spatter, create a smaller heat affected area and reduce chances of burn-through. As a result, many automotive enthusiasts who specialize in bodywork or those who work with thinner applications prefer solid wire in their operations.

### Location

The welder must also consider the location of the work site when choosing between solid and flux cored wire. There are certain environments such as windy locations, where solid wire or gas shielded flux cored wire cannot be used; exposing the shielding gas to wind can compromise the weld integrity. Typically the loss of shielding gas will produce porosity visible in the weld bead.

On the other hand, self shielded flux cored wire is ideal for welding outdoors or in windy conditions. The operator does not have to set up windshields to protect the shielding gases from being blown away because the shielding gas is generated from the burning flux. Since self shielded flux cored wire does not require external shielding gas, it is also more portable than solid wire. This portability is ideal in agricultural applications where field equipment can break down far from the shop. If you are welding thicker metals (16 ga. and above), self shielded flux cored wire also provides excellent penetration.

### Thickness, Type of Application and Parameter Settings

Many novice operators attempt to use "a-one-size-fits-all" wire and shielding gas combination for multiple applications. The most common wire and gas combinations (for solid wire) are 1.20mm diameter wire used with a 75 percent Argon and 25 percent CO<sub>2</sub> shielding gas. When welding thicker material, however, consideration needs to be given to welding power source output, as well as welding wire diameter. If the 1.20mm wire is selected for thicker materials, and the power source is one that is plugged into a

230-volt circuit, the resulting amperage output may not be sufficient to make quality welds. The chance of "cold lap" or "lack of fusion" may increase.

Attempting to use too small of a solid wire for thicker applications (such as on A-frames of an automobile), increases the chance of lower penetration in the root, and could require more than one welding pass. Misapplication of the solid wire (even though strong enough) may also not provide adequate penetration on thicker material.

Although more expensive than solid wire, flux cored wire could help you gain productivity. Flux cored wire typically has the ability to handle the welding of dirtier materials that may have higher levels of rust, mill scale, or oil. Although cleaning is always the proper method of preparing the steel, flux cored wires contain de-oxidizing elements that trap these contaminants in the weld pool and hold them in the slag coverage typically preventing the associated weld problems found when welding "dirtier" steels. Flux cored wire also increases penetration on the side walls and offers the advantage of better deposition rates (the amount of weld metal deposited in a given time period, measured in pounds per hour) when compared to solid wire. Although the operator is initially spending more on materials for flux cored wire, the savings are realized in the decreased production time.

### Which is better, solid wire or flux cored wire?

Neither wire is superior over the other. They simply have different properties, which work better on certain applications. As far as performance is concerned, both types of wire produce sound welds with good weld bead



appearances when applied correctly and used within the proper parameter settings. Solid wire provides deep penetration in the root and usually has little spatter. Flux cored wire has a larger ball type transfer and produces low spatter levels. In addition, flux cored wire produces a rounder penetration profile with excellent sidewall fusion.

As far as user appeal, both solid wire and flux cored wire are relatively easy to use and are ideal for novice and occasional welders working in automotive, farming and home hobby applications. Operator appeal on solid wire may be better on thinner applications because there is no slag to remove; it is ready to paint; and the weld beads may be more aesthetically pleasing.

### Conclusion

The most important thing to remember is not to fall into the "one-size-fits-all" mindset. Solid wire, self shielded flux cored wire and gas shielded flux cored wire all work well provided they are applied correctly. The type of wire you choose will be contingent upon the location of the work site, thickness of the application, proper shielding gas combination and the type of equipment available. The operator should always clean the work piece prior to welding to ensure optimum weld quality and prevent impurities from becoming trapped in the weld bead. In order to achieve the best possible results, the operator must be willing to make adjustments based on the worksite variables and consider having both solid and flux cored wire available.

### Flux Cored Wire (FCAW)

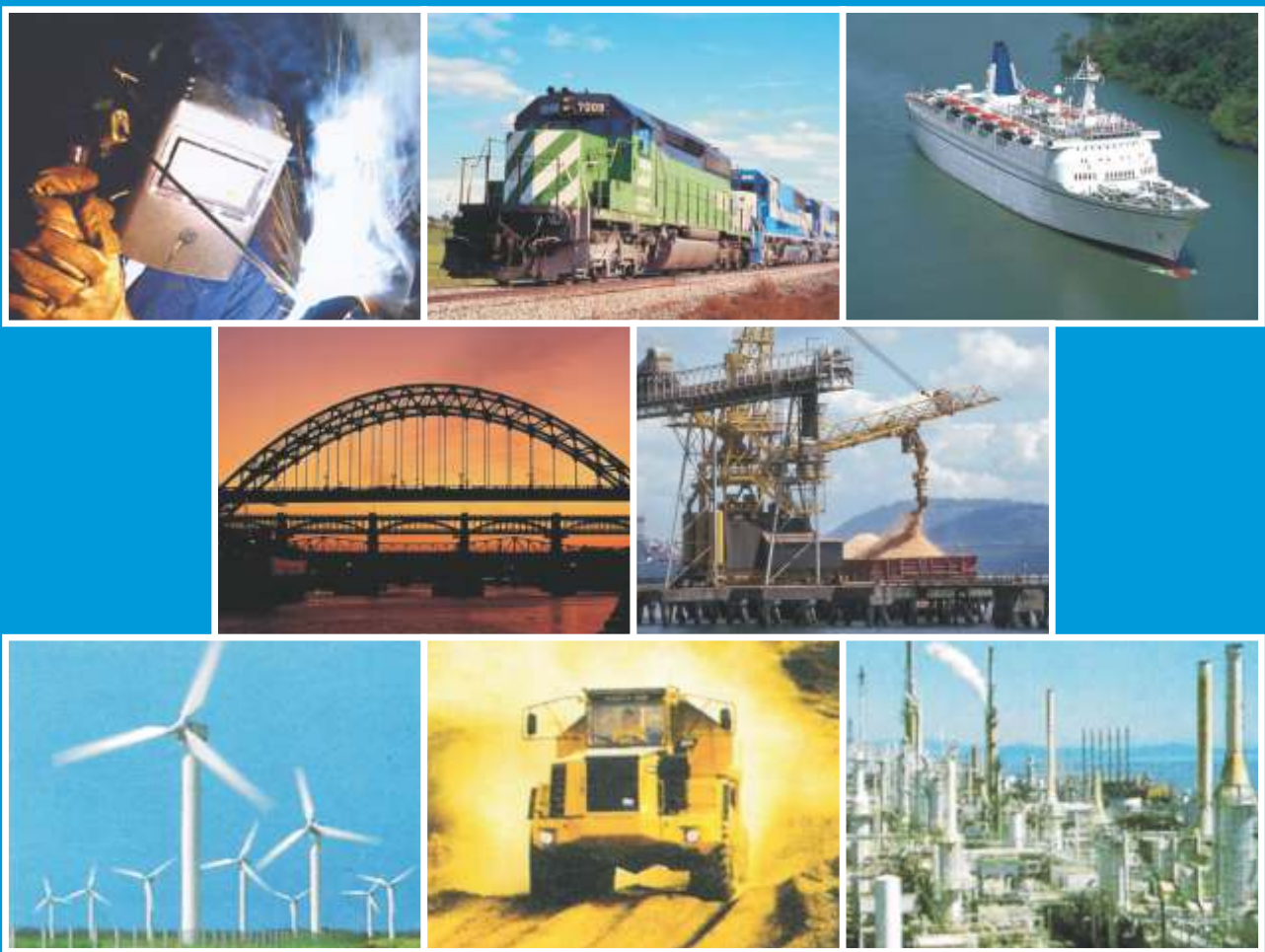


### Copper Coated Solid Wire (GMAW)





# "A PRODUCT FOR EVERY WELDING APPLICATION"



PREMIER RANGE OF WELDING CONSUMABLES



**Welding Wires and  
Electrodes that save  
you money Today,  
Tomorrow  
and  
Day After**





AN ISO 9001:2000 COMPANY

## **WELDING SPECIALITIES (INDIA) PVT. LTD.**

Regd. Office & Fact : D-50, M.I.D.C. Industrial Area,  
Ambad, Nashik - 422 010. Maharashtra. India

Tel : +91 - 253 - 2383813, 2380298 Fax : +91 - 253 - 2384017

E-mail : [info@wsipl.com](mailto:info@wsipl.com) Website : [www.wsipl.com](http://www.wsipl.com)

