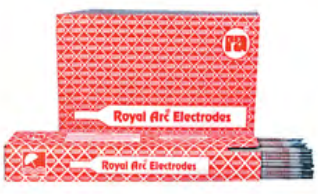
ROYAL ARC ELECTRODES LTD.

Advanced Technology.
Wide Range.

- Welding Electrodes (SMAW) • Copper Coated Solid Wires (GMAW)
- Stainless Steel Filler Wire (TIG Wire) • Flux Cored Wires (FCAW)
- Metal Cored Wires (MCAW) • Filler wires (MIG/TIG)
- Resin Bonded Abrasive Wheels for Grinding & Cutting

ISO 9001 REGISTERED FIRM
DNV Certification B.V. THE NETHERLAND



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ROYAL ARC PRODUCTS

(Click on category)

Main Category
WELDING ELECTRODES
FLUX CORED WIRE
COPPER COATED WIRES / MIG-TIG WIRES
ABRASSIVE WHEELS

TOP

WELDING ELECTRODES

Category	Main Category
MILD STEEL ELECTRODES	WELDING ELECTRODES
LOW HYDROGEN TYPE ELECTRODES	WELDING ELECTRODES
STAINLESS STEEL ELECTRODES	WELDING ELECTRODES
HARD FACING	WELDING ELECTRODES
CASTING ELECTRODES	WELDING ELECTRODES
CUTTING & GOUGING	WELDING ELECTRODES
LOW ALLOY HIGH TENSILE ELECTRODES	WELDING ELECTRODES

TOP

MILD STEEL ELECTRODES

Brand	AWS Code	Category
ROYAL - 6010	E 6010	MILD STEEL ELECTRODES
ROYAL - 6011	E 6011	MILD STEEL ELECTRODES
ROYAL SPEED	E 6012	MILD STEEL ELECTRODES
ROYAL BOND	E 6013	MILD STEEL ELECTRODES
ROYAL - S	E 6013	MILD STEEL ELECTRODES
ROYAL – SS	E 6013	MILD STEEL ELECTRODES

LOW HYDROGEN TYPE ELECTRODES

Brand	AWS Code	Category
ROYAL - 7015	E 7015	LOW HYDROGEN TYPE ELECTRODES
ROYAL - 7016	E 7016	LOW HYDROGEN TYPE ELECTRODES
ROYAL - 7016 (W)	E 7016	LOW HYDROGEN TYPE ELECTRODES
ROYAL - 724	E 7024	LOW HYDROGEN TYPE ELECTRODES
ROYAL THERM	E 7018	LOW HYDROGEN TYPE ELECTRODES
ROYAL THERM (SPL)	E 7018 -1	LOW HYDROGEN TYPE ELECTRODES
ROYAL THERM (2H) SPL	E 7018 (NACE)	LOW HYDROGEN TYPE ELECTRODES
ROYAL THERM H4R	E 7018 H4R	LOW HYDROGEN TYPE ELECTRODES
ROYAL THERM SPL H4R	E 7018-1 H4 R	LOW HYDROGEN TYPE ELECTRODES

TOP

STAINLESS STEEL ELECTRODES

Brand	AWS Code	Category
ROYAL - 1A	E 308 - 16	STAINLESS STEEL ELECTRODES
ROYAL - 1A H	E 308H - 16	STAINLESS STEEL ELECTRODES
ROYAL - 2A	E 316 - 16	STAINLESS STEEL ELECTRODES
ROYAL - 1B	E 347 - 16	STAINLESS STEEL ELECTRODES
ROYAL - 2B	E 318 - 16	STAINLESS STEEL ELECTRODES
ROYAL - 1C	E 308L - 16	STAINLESS STEEL ELECTRODES
ROYAL - 2C	E 316 L - 16	STAINLESS STEEL ELECTRODES
ROYAL - D2	E 309 - 16	STAINLESS STEEL ELECTRODES
ROYAL - D2L	E 309L - 16	STAINLESS STEEL ELECTRODES
ROYAL - D2 Mo	E 309 Mo - 16	STAINLESS STEEL ELECTRODES
ROYAL - D2 Mo L	E 309LMo - 16	STAINLESS STEEL ELECTRODES
ROYAL - CW	E 310 - 16	STAINLESS STEEL ELECTRODES
ROYAL – CW (SPL)	E 310 - 17	STAINLESS STEEL ELECTRODES
ROYAL - D2 (BASIC)	E 309 - 15	STAINLESS STEEL ELECTRODES
ROYAL - D2L (BASIC)	E 309L - 15	STAINLESS STEEL ELECTRODES
ROYAL – CW (BASIC)	E 310 - 15	STAINLESS STEEL ELECTRODES
ROYAL CHROME - 13	E 410 - 15	STAINLESS STEEL ELECTRODES
ROYAL CHROME - 13/4	E 410 – 15 NiMoX	STAINLESS STEEL ELECTRODES
ROYAL 18 / 8 / 5	E 18 : 8Mn R26	STAINLESS STEEL ELECTRODES
ROYAL - 307	E 307 - 15	STAINLESS STEEL ELECTRODES
ROYAL CHROME - 17	E 430 - 15	STAINLESS STEEL ELECTRODES
ROYAL – 309 Cb	E 309 cb - 16	STAINLESS STEEL ELECTRODES
ROYAL 312	E 312-16	STAINLESS STEEL ELECTRODES
ROYAL 385ZF	E 385 - 16	STAINLESS STEEL ELECTRODES
ROYAL 2209	E 2209 -16	STAINLESS STEEL ELECTRODES
ROYAL 2553	E 2553 -16	STAINLESS STEEL ELECTRODES
ROYAL - 317L	E 317L - 16	STAINLESS STEEL ELECTRODES
ROYAL 1B (BASIC)	E 347 - 15	STAINLESS STEEL ELECTRODES
ROYAL 1C (BASIC)	E 308L - 15	STAINLESS STEEL ELECTRODES
ROYAL 2C (BASIC)	E 316L - 15	STAINLESS STEEL ELECTRODES
ROYAL D2MoL SPL	E 309 L Mo - 17	STAINLESS STEEL ELECTRODES
ROYAL 309Cb (BASIC)	E 309 Cb - 15	STAINLESS STEEL ELECTRODES

TOP

HARD FACING

Brand	AWS Code	Category
ROYAL C – I	E Fe A	HARD FACING
ROYAL C – II		HARD FACING
ROYAL C - III	E Fe-1C	HARD FACING
ROYAL C - III (L H)		HARD FACING
ROYAL C - V		HARD FACING
ROYAL MANGAN	E Fe Mn A	HARD FACING
ROYAL - CHROMAX		HARD FACING
ROYAL - CHROMANG		HARD FACING

CASTING ELECTRODES

Brand	AWS Code	Category
ROYAL CAST	Est.	CASTING ELECTRODES
ROYAL CAST Fe Ni (36%)	E Ni Fe - Ci (Mod)	CASTING ELECTRODES
ROYAL CAST Fe Ni (55%)	E Ni Fe – Ci	CASTING ELECTRODES
ROYAL CAST - N	E Ni CI	CASTING ELECTRODES
ROYAL CAST - CN	E Ni Cu - B	CASTING ELECTRODES
ROYAL CAST Mo - 6	E Ni Cr Mo6	CASTING ELECTRODES
ROYAL CAST Mo - 3	E Ni Cr Mo3	CASTING ELECTRODES
ROYAL - MONEL	E Ni Cu - 7	CASTING ELECTRODES
ROYAL CAST - 3	E NiCrFe-3	CASTING ELECTRODES
ROYAL CAST Fe-2	E NiCrFe-2	CASTING ELECTRODES

CUTTING & GOUGING

Brand	AWS Code	Category
ROYAL BRONZE		CUTTING & GOUGING
ROYAL CUT		CUTTING & GOUGING

LOW ALLOY HIGH TENSILE ELECTRODES

Brand	AWS Code	Category
ROYAL THERM MOLY	E 7018 - A1	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL THERM (Ni) SPL	E 8018 G	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL CHROME – 1	E 8018 - B2	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL CHROME – 2	E 9018 B3	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 9018 B3L	E 9018 B3L	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL CHROME – 5	E 8018 B6	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL CHROME – 9	E 8018 B8	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL (Ni) CHROME	E 10016 G	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL THERM - 100M	E 10018M	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL THERM - 110M	E 11018M	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 7018 G	E 7018 G	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018 C1	E 8018 C1	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8016 C2 L	E 8016 C2L	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018 C2	E 8018 C2	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018 B1	E 8018-B1	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018 BL	E 8018 BL	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8015 B8	E 8015 B8	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8016 G	E 8016 G	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018 W	E 8018 W	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL MOLY THERM - SPL	E 8018 D3	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 9018 G	E 9018 G	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 9018 M	E 9018 M	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 9018 D	E 9018 - D1	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL THERM - 90D	E 9018 – D3	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL CHROME – 9 (SPL)	E 9015 B9	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8018C3		LOW ALLOY HIGH TENSILE ELECTRODES

TOP

Brand	AWS Code	Category
ROYAL 7018 B2	E 7018 B2	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 7018 C3L	E 7018 C3L	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 7015 B2L	AWS:SFA 5.5, E 7015 B2L	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 8016 B2	E 8016 B2	LOW ALLOY HIGH TENSILE ELECTRODES
ROYAL 7018 B2L	E 7018 B2L	LOW ALLOY HIGH TENSILE ELECTRODES

FLUX CORED WIRE

Category	Main Category
CARBON STEEL FLUX CORED WIRE	FLUX CORED WIRE
LOW ALLOY STEEL	FLUX CORED WIRE
STAINLESS STEEL	FLUX CORED WIRE
HARDFACING	FLUX CORED WIRE
METAL CORED WIRE	FLUX CORED WIRE

CARBON STEEL FLUX CORED WIRE

Brand	AWS Code	Category
ROYALFIL GS 11 R	E70T-1C	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS 12 R	E71T-1C	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS 12 ESR	E71T-12MJ	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS 12 H4R	E71T-1C H4	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS T9R	E71T-9C	CARBON STEEL FLUX CORED WIRE
ROYALFIL DUAL T9R	E71T-9C / E71T-9M	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS T12 R	E71T-12 C	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS 15 RB	E71T-5 C	CARBON STEEL FLUX CORED WIRE
ROYALFIL GS 31 RB	E70T-5 C	CARBON STEEL FLUX CORED WIRE

TOP

LOW ALLOY STEEL

Brand	AWS Code	Category
ROYALFIL GS 15B-A1	E71T5-A1 C	LOW ALLOY STEEL
ROYALFIL GS 16 R	E81T1-Ni1 C	LOW ALLOY STEEL
ROYALFIL GS 17 R	E81T1-Ni2-C	LOW ALLOY STEEL
ROYALFIL GS 18 R	E81T1-W2 C	LOW ALLOY STEEL
ROYALFIL GS 19 R	E91T1-Ni2 C	LOW ALLOY STEEL
ROYALFIL GS 36 B	E80T5-K1 C	LOW ALLOY STEEL
ROYALFIL GS 36 R	E80T1-K2 C	LOW ALLOY STEEL
ROYALFIL GS 38 R	E81T1-K2 C	LOW ALLOY STEEL
ROYALFIL GS 41 B	E90T5-K2 C	LOW ALLOY STEEL
ROYALFIL GS 41 B3	E90T5-B3 C	LOW ALLOY STEEL
ROYALFIL GS 41 R	E91T1-B3 C	LOW ALLOY STEEL
ROYALFIL GS 42 B	E110T5-K4 C	LOW ALLOY STEEL
ROYALFIL GS 42 R	E111T1-K4C	LOW ALLOY STEEL
ROYALFIL GS 43 R	E110T1-K4 C	LOW ALLOY STEEL
ROYALFIL GS 45 R	E120T1-G C	LOW ALLOY STEEL
ROYALFIL GS 80 RB	E80T5-B2 C	LOW ALLOY STEEL
ROYALFIL GS 80 B6	E80T1-B6 C	LOW ALLOY STEEL
ROYALFIL GS 81 B	E 81T1-G C	LOW ALLOY STEEL
ROYALFIL GS 81 RM	E81T1-B1 C	LOW ALLOY STEEL
ROYALFIL GS 81 R	E81T1-B2 C	LOW ALLOY STEEL
ROYALFIL GS 81 RB	E81T5-B2 C	LOW ALLOY STEEL
ROYALFIL GS 90 D2	E90T5-D2 C	LOW ALLOY STEEL
ROYALFIL GS 91 D	E91T1-D1 C	LOW ALLOY STEEL
ROYALFIL GS 91 R	E91T1-G C	LOW ALLOY STEEL

TOP

STAINLESS STEEL

Brand	AWS Code	Category
ROYALFIL GS 1B	E347T1-1	STAINLESS STEEL
ROYALFIL GS 1C	E308LT1-1	STAINLESS STEEL
ROYALFIL GS 1CH	E308HT1-1	STAINLESS STEEL
ROYALFIL GS 2C	E316LT1-1	STAINLESS STEEL
ROYALFIL GS D2	E309LT1-1	STAINLESS STEEL
ROYALFIL GS D2H	E309HT1-1	STAINLESS STEEL
ROYALFIL GS D2MOL	E309LMoT1-1	STAINLESS STEEL
ROYALFIL GS 209	E2209T0-1	STAINLESS STEEL
ROYALFIL GS 106	E312T1-1	STAINLESS STEEL
ROYALFIL GS 307	E307T1-1	STAINLESS STEEL
ROYALFIL GS 413	E410T0-1	STAINLESS STEEL
ROYALFIL OA 18.8.5		STAINLESS STEEL

HARDFACING

Brand	AWS Code	Category
ROYALFIL OA C II		HARDFACING
ROYALFIL OA C III		HARDFACING
ROYALFIL GS C IV		HARDFACING
ROYALFIL OA 435		HARDFACING
ROYALFIL OA 725		HARDFACING
ROYALFIL OA 730		HARDFACING
ROYALFIL OA 755		HARDFACING
ROYALFIL OA 760		HARDFACING
ROYALFIL OA 762		HARDFACING
ROYALFIL OA 765		HARDFACING
ROYALFIL OA TIC		HARDFACING

METAL CORED WIRE

Brand	AWS Code	Category
ROYALFIL GS 703 C	E70C-3MH4	METAL CORED WIRE
ROYALFIL GS 706 C	E70C-6M	METAL CORED WIRE
ROYALFIL GS 80 M	E80C-GM	METAL CORED WIRE

COPPER COATED WIRES / MIG-TIG WIRES

Category	Main Category
CO2 WIRES	COPPER COATED WIRES
Mig Tig Wires	MIG-TIG WIRES

CO2 WIRES

Brand	AWS Code	Category
ROYAL 70S-3	ER 70S-3	CO2 WIRES
ROYAL CO2 WIRE	ER 70S-6	CO2 WIRES

Mig Tig Wires

Brand	AWS Code	Category
ROYAL – Tig – T2	ER 70S-2	Mig Tig Wires
ROYAL – CUPRO NICKEL 70 - 30	ER Cu Ni	Mig Tig Wires
ROYAL – CUPRO NICKEL 90 - 10	SFA 5.7ER Cu Ni	Mig Tig Wires
ROYAL – ER 80 SB2	ER 80SB2	Mig Tig Wires
ROYAL – ER 80SB6	ER 80SB6.	Mig Tig Wires
ROYAL – ER 80SB8	ER 80SB8	Mig Tig Wires
ROYAL – ER 80SG	ER 80SG	Mig Tig Wires
ROYAL – ER 308	ER 308	Mig Tig Wires
ROYAL – ER 309	ER 309	Mig Tig Wires
ROYAL – ER316	ER 316	Mig Tig Wires
ROYAL – ER 309 Mo	ER 309 Mo	Mig Tig Wires
ROYAL – ER 309LMo	ER 309 L Mo	Mig Tig Wires
ROYAL - ER 410	ER 410	Mig Tig Wires
ROYAL – ER 308L	ER 308L	Mig Tig Wires
ROYAL – ER 309L	ER 309L	Mig Tig Wires
ROYAL – ER316L	ER 316L	Mig Tig Wires

ABRASSIVE WHEELS

Category	Main Category
ABRASSIVE WHEELS	ABRASSIVE WHEELS

ABRASSIVE WHEELS

Brand	AWS Code	Category
PLAIN GRINDING WHEELS		ABRASSIVE WHEELS
DEPRESSED CENTRE WHEELS		ABRASSIVE WHEELS
REINFORCED CUT OFF WHEELS		ABRASSIVE WHEELS
NON REINFORCED CUT OFF WHEELS		ABRASSIVE WHEELS
SWING FRAME / PEDESTAL WHEELS		ABRASSIVE WHEELS
CUP WHEELS		ABRASSIVE WHEELS
GLASS GRINDING WHEELS		ABRASSIVE WHEELS
SEGMENT		ABRASSIVE WHEELS

ROYAL - 6010 (E 6010)

AWS : A 5.1, E 6010
IS : 814 EC 4310 X

Applications

Used in joining of cross country steel pipelines, pressure pipelines, storage tanks, structural fabrication & field works where deep penetration is required.

Characteristics on Usage

It is a medium coated all position cellulosic electrode, provides a deep penetration forceful arc with readily removable thin friable slag and deposits a flat bead with high melting rate. It can be used in all position particularly on multi pass welding in vertical and overhead positions. gives 100% radiographic quality of welds.

Notes On Usage

- 1) Pay attention not to use currents exceeding the recommended currents.
- 2) As this electrode is proved to absorb moisture, store it with care.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.20 Max	1.20 Max	1.00 Max	0.03 Max	0.03 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
450 Min	370 Min	22.0 % Min	27 Joules Min

Approvals

KNPC

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60 – 90	DC (+)
3.20 X 350/450	5	20	11	44	80 – 140	
4.00 X 350/450	5	20	11	44	120 – 180	
5.00 X 350/450	5	20	11	44	180 – 240	

ROYAL - 6011 (E 6011)

AWS – E 6011

Applications

This includes general fabrication, ship building, galvanized steel, bridges, heavy equipments, rails, roads, cars etc.

Characteristics on Usage

This electrode is designed to take advantage of all positions with AC or DC reverse polarity (DC +) The cellulose base coating produces deeply penetrating spray arc. Bead is flat with thin brittle slag. Weld Metal has high tensile strength, ductility and is of X-Ray quality.

Notes On Usage

- 1) Pay Attention not to use currents exceeding the recommended currents.
- 2) As this electrode is proved to absorb moisture, store it with care.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.20 Max	1.20 Max	1.00 Max	0.030 Max	0.030 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
450 Min	350 Min	22 % Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	55-75	AC/ DC +ve
3.20 X 350/450	5	20	11	44	80-120	
4.00 X 350/450	5	20	11	44	120-160	
5.00 X 350/450	5	20	11	44	160-220	

ROYAL SPEED (E 6012)

AWS : SFA 5.1, E 6012
IS : 814 ER 4112

Applications

Used for welding rusty plates, structural fabrication. Used for tacking works, repairs, construction equipments, Steel furniture, Truck bodies & Storage tanks.

Characteristics on Usage

A general purpose, rutile coated electrode designed for welding application of structural fabrication and repair works. The electrode is running in all position and has medium penetration of welding characteristics, it can be used to weld rusty plates and poor joints fitup. It produces a flat evently rippled weld bead with easily removable slag.

Notes On Usage

- 1) Dry electrode at 70-100° C for 30-60 min. before use.
- 2) Pay attention not to exceed the range of proper current.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.20 Max	1.20 Max	1.00 Max	0.030 Max	0.030 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT +27° C (J)
450 Min	350 Min	17 % Min	50 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60 – 90	AC / DC (-)
3.20 X 350/450	5	20	11	44	100 - 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

ROYAL BOND (E 6013)

AWS : A 5.1, E 6013
IS : 814 ER 4222

Applications

Used in Structures & Building construction, Auto bodies and Railway wagons, Grills, General Fabrication, Vessels, Tanks, Pipelines, Bridges, Ships, Trailers.

Characteristics on Usage

A medium coated all position electrode for work of structural importance with medium penetration, soft arc and low spatter, easy to detach slag. It can be used in both AC & DC.

Notes On Usage

- 1) Dry electrode at 70-100° C for 30-60 min before use.
- 2) Pay attention not to exceed the range of proper current.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.20 Max	1.20 Max	1.0 Max	0.040 Max	0.040Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT 0° C
450 Min	350 Min	22 % Min	47 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (-)
3.20 X 350/450	5	20	11	44	100 - 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

TOP

ROYAL - S (E 6013)

AWS : A 5.1, E 6013
IS : 814 ER 4212 X

Applications

Used in Ship building, Storage tanks & Boilers, Pressure pipes Railway coaches.

Characteristics on Usage

A medium coated rutile type all position electrode with excellent welding characteristics for major structural works where finishing is important. Low spatter, smooth arc and easy slag removal, easy to operate in vertical upward position. Ideal where radiographic quality is required.

Notes On Usage

- 1) In case of varticle download welding manipulate the electrode, keeping its tip in contanct with base metal.
- 2) Dry the electrode at 70-100 °C for 30-60 min before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.12 Max	0.65 Max	0.40 Max	0.04 Max	0.04 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 5d)	IMPACT (CVN) AT 0° C	RADIOGRPHY TEST
460 - 560	370 – 480	22 % Min	47 Joules Min	Satisfactory as per IIW blue std

Approvals

L.R.S, B.V, D.N.V, A.B.S, K.N.P.C.,

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC 50 OCV / DC (-)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 190	
5.00 X 350/450	5	20	11	44	190 – 250	

TOP

ROYAL – SS (E 6013)

AWS: A 5.1, E 6013
IS: 814 ERR 4222X

Applications

Used for Bridges & Boilers, Compressors, Automobile parts, Fine steel furnitures, Railway coaches, Locomotive fireboxes &

Characteristics on Usage

A heavy coated all position electrode for major or minor structural work. The weld metal is radiographic quality, smooth arc, low spatter and medium penetration.

Notes On Usage

- 1) In case of varticle download welding manipulate the electrode keeping its tip in contanct with base metal.
- 2) Dry the electrode at 70-100 °C for 30-60 min. before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.12 Max	0.75 Max	0.50Max	0.030 Max	0.030 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 5d)	IMPACT (CVN) AT 0° C	RADIOGRPHY TEST
400 - 560 Min	330 Min	22 % Min	47 Joules Min	Satisfactory

Approvals

B.V.

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (-)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 190	
5.00 X 350/450	5	20	11	44	190 – 250	

TOP

ROYAL - 7015 (E 7015)

AWS : A 5.1, E 7015

Applications

For joining mild steel to cast iron, for welding on rail ends & railway class III steels, for fixing rails to mild steel girders for overhead cranes.

Characteristics on Usage

A medium heavy coated all position hydrogen controlled electrode for the welding of medium high tensile structural steel such as Carbon steel up to 0.4% C, Manganese steel up to 2.0% Mn, Silicon steel up to 0.5% Cr, Chrome Nickel steel and other heat treated steels where matching of base metal and weld metal is not necessary. Gives radiographic quality welding.

Notes On Usage

- 1) Dry the electrode at 350-400 °C for 60 min. before use.
- 2) Keep the arc as short as possible.
- 3) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.25 Max	0.90 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)	Hydrogen (Mercury method) in 100grm weld metal
490 Min	400 Min	22 % Min	50 - 80 Joules	5 ml (Max)

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60-95	DC +ve
3.20 X 350/450	5	20	11	44	90-120	
4.00 X 350/450	5	20	11	44	140-190	
5.00 X 350/450	5	20	11	44	190-250	
6.30 X 350/450	5	20	11	44	250-310	

TOP

ROYAL - 7016 (E 7016)

AWS : A 5.1, E 7016
IS : 814 EB 5426H3X

Applications

Used for joining mild steel to cast iron, for welding on rail ends & railway class III steels, for fixing rails to mild steel girders for overhead cranes.

Characteristics on Usage

A medium heavy coated all position hydrogen controlled electrode for welding of medium high tensile structural steel such as carbon steels upto 0.4% C, Manganese steel upto 2.0% Mn, Silicon steel upto 0.5% Cr, Chrome Nickel steels and other heat treated steels where matching of base metal and weld metal is not necessary.

Notes On Usage

- 1) Dry the electrode at 300-350 °C for 60 min. before use.
- 2) Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose to prevent blow hole at the arc starting.
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 5d)	IMPACT (CVN) AT - 30° C (J)	Hydrogen (Mercury method) in 100grm weld metal
490 Min	400 Min	22 Min	27 Joules Min	5 ml (Max)

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 - 95	AC (OCV 70) / DC (+)
3.20 X 350/450	5	20	11	44	90 - 120	
4.00 X 350/450	5	20	11	44	140 - 190	
5.00 X 350/450	5	20	11	44	190 - 250	
6.30 X 350/450	5	20	11	44	250 - 310	

TOP

ROYAL - 7016 (W) (E 7016)

AWS : SFA 5.1, E 7016
IS : 814 EB 5426 H3X

Applications

It is used for welding of high carbon steel to mild steel, high carbon steel parts, low alloy steel, armour plates, cast steels as well as unknown composition of steel.

Characteristics on Usage

It is medium coated, hydrogen controlled all position electrode. It gives a smooth clean weld deposit with least spatter due to having a special type of lime coating. The weld metal is highly resistant to cracking and gives radiographic quality. Dry the electrodes at 300 °C for hour for best result.

Notes On Usage

- 1) Dry the electrode at 300-350 °C for 60 min. before use.
- 2) Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose to prevent blow hole at the arc starting.
- 3) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.35 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)	Hydrogen content in 100 gm weld metal
520 Min	400 Min	22 Min	40 Joules Min	5 ml (Max)

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	190 – 250	

ROYAL - 724 (E 7024)

AWS : A 5.1, E 7024
IS : 814 ERR 5242XK

Applications

Welding of heavy structures & machinery parts. Crane, Bridge, Girders, Ship Building, Earthmoving equipments, Pressure Vessels &

Characteristics on Usage

A heavy coated iron powder type electrode with a deposition efficiency of approximately 140%. It is touch welding electrode with high deposition rate for flat and horizontal position. The electrode is easy to manipulate and gives smooth arc with radiographic quality of welds. It can be used at high current and gives high welding productivity.

Notes On Usage

- 1) Optimum speed ratio is 1-1.5%.
- 2) Usability degrades when moistened. In case of abosorbing moisture,it must be dried. [70-100°C for 30-60 min.]

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%
0.15 Max	1.25 Max	0.90 Max	0.035 Max	0.035 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT 0° C
490 Min	400 Min	22 % Min	47 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	80 – 120	AC/DC (±)
3.20 X 350/450	5	20	11	44	130 – 170	
4.00 X 350/450	5	20	11	44	180 – 240	
5.00 X 350/450	5	20	11	44	250 – 290	

ROYAL THERM (E 7018)

AWS : A 5.1, E 7018
IS : 814 EB 5426H3JX

Applications

Ship Building, Pipelines, Bridges, Boilers, Pressure Vessels, Restrained Joints, Penstocks, Blast Furnace Steel Work, Atomic Reactor Shell & Pipework.

Characteristics on Usage

This is a basic heavy coated low hydrogen iron powder type electrode with excellent weld characteristic. very smooth arc, medium penetration and low spatter, easy to remove slag. the weld metal is ductile and crack resistant and is of radiographic quality. it is easy to operate in all position and deposition efficiency is approximately 115%. (PLEASE KEEP DRY)

Notes On Usage

- 1) Dry the electrode a 300-350 °C for 60 Min- before use .
- 2) Keep the arc as short as possible.
- 3) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)	RADIOGRPHY TEST	Hydrogen (Mercury method) in 100grm weld metal
490 Min	400 Min	22 % Min	27 Joules Min	Satisfactory as per IIW blue std	5 ml (Max)

Approvals

L.R.S, B.V., ABS, DNV

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 - 95	AC 70 OCV/
3.20 X 350/450	5	20	11	44	90 - 120	DC+
4.00 X 350/450	5	20	11	44	140 - 190	
5.00 X 350/450	5	20	11	44	190 - 250	
6.30 X 350/450	5	20	11	44	250 - 310	

TOP

ROYAL THERM (SPL) (E 7018 -1)

AWS : SFA 5.1 E 7018 – 1
IS : 814 EB 5629 H3JX

Applications

Boilers, Pumps & Compressors, Blast Furnace steel work, Bridges, Rail wagons, Earth Moving Equipments, Roads Building Machinery, Tanks, Pressure Vessels, Penstocks, Atomic Reactor Shells.

Characteristics on Usage

This unique electrode is capable of yielding welds which are of Radiographic quality specially designed for high impact values down to 46°C and is crack resistant. This electrode has easy slag removal, excellent

Notes On Usage

- 1) Dry the electrode at 350-400 °C for 60 min. before use.
- 2) Keep the arc as short as possible and avoid large width of weaving.
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose to prevent blow hole at the arc starting.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 45° C (J)	Hydrogen content in 100 gm weld metal
490 Min	400 Min	22 % Min	47 Joules Min	5 ml Max

Approvals

L.R.S., B.V., ABS

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	80 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 135	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 250	
6.30 X 350/450	5	20	11	44	250 – 320	

ROYAL THERM (2H) SPL (E 7018 (NACE))

AWS : SFA 5.1, E 7018 NACE
IS : 814 E611514 HJ

Applications

Tanks and pressure vessels, Heavy Machinery, Bridges, Penstocks, Carbon steel & Low alloy steel fabrication with stand high temperature service condition and also for joining heavy parts of earthmoving equipments.

Characteristics on Usage

A heavy coated iron powder type all position electrode for welding of high tensile, heavy sections, structural steel and restrained joints in high tensile steels. It gives smooth arc, medium penetration and detach the slag easily in a Vee grove joint. The electrode is used for critical welding and gives excellent welding characteristics. The weld metal contains 1.20% Mn and controlled Sulphur as well as Hydrogen which is extremely resistant to cold and hot

Notes On Usage

- 1) Dry the electrode a 300-350 °C for 60 min. before use .
- 2) Keep the arc as short as possible.
- 3) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.10 Max	1.60 Max	0.50 Max	0.012 Max	0.015 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)	Hydrogen content in 100 gm weld metal
500 Min	400 Min	22 % Min	50 Joules Min	4 ml Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	80 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	
6.30 X 350/450	5	20	11	44	230 - 280	

ROYAL THERM H4R (E 7018 H4R)

AWS : SFA 5.1, E 7018 H4 R

Applications

All maintenance application including welding of all types of Carbon-manganese steel, high tensile steel, heavy structure, plant and equipments subject to static or dynamic loading. It can be used as a buffer layer before hardfacing.

Characteristics on Usage

The low hydrogen controlled, vacuum packed, basic coated electrodes which is welder friendly and is recommended for welding of mild steel, medium carbon, steel, high strength steel, cast steel and problematic steels. The electrodes is vacuum packed and hence does not require expensive redrying at 300°C for 2 hours or a higher temperature. The weld metal is clean and has lowest level of impurities with has much longer life than the weld metal usually deposited with other E 7016 or E 7018 class of electrodes. Deposited weld metal met X-ray radiographic quality standards.

Notes On Usage

- 1) Re baking is not necessary if the package is undamaged. If the package has been open more than 8 hrs, Re-bake at 300 °C for 2 hrs.
- 2) Hold the electrodes in portable oven at 100-150 °C during welding and re bake electrodes in mother oven/ holding oven at 300 °C for 2 hrs before use.
- 3) Keep the arc as short as possible.
- 4) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)	Hydrogen content in 100 gm weld metal
490 Min	400 Min	22 % Min	27 Joules Min	4 ml Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100-130	
4.00 X 350/450	5	20	11	44	140-190	
5.00 X 350/450	5	20	11	44	190-240	

TOP

ROYAL THERM SPL H4R (E 7018-1 H4 R)

AWS : SFA 5.1, E 7018-1 H4 R

Applications

All maintenance application including welding of all types of Carbon-manganese steel, high tensile steel, heavy structure, plant and equipments subject to static or dynamic loading. It can be used as a buffer layer before hardfacing.

Characteristics on Usage

Hydrogen controlled, vacuum packed, basic coated electrodes which is welder friendly and is recommended for welding of mild steel, medium carbon steel, high strength steel, cast steel and problematic steels. The electrodes is vacuum packed and hence does not require expensive redrying at 250°C for 2 hours or a higher temperature. The weld metal is clean and has lowest level of impurities with has much longer life than the weld metal usually deposited with other E 7016 or E 7018 class of electrodes. Deposited weld metal met X-ray radiographic quality standards. The

Notes On Usage

- 1) Dry the electrode a 300-350 °C for 60 min. before use.
- 2) Keep the arc as short as possible.
- 3) Use wind screen against strong wind.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.15 Max	1.60 Max	0.75 Max	0.035 Max	0.035 Max	0.20 Max	0.30 Max	0.30 Max	0.08 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 45° C (J)	Hydrogen content in 100 gm weld metal
490 Min	400 Min	22 % Min	27 Joules Min	4 ml Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100-130	
4.00 X 350/450	5	20	11	44	140-190	
5.00 X 350/450	5	20	11	44	190-240	

ROYAL - 1A (E 308 - 16)

AWS : SFA 5.4, E 308 - 16
IS : 5206 E 19.9R 26

Applications

welding stainless steels of AISI 301, 302, 304 & 308 composition. For welding of household articles, milk & soap industries. Hospital apparatus, apparatus for nitric acid, acetic acid.

Characteristics on Usage

This is a normal carbon 19/9 stainless steel electrode with a controlled ferrite content of 3 to 7 % for maximum resistance to cracking, corrosion and high temperatures upto 800 Degrees centigrade. The metal has excellent creep strength and is of radiographic quality.

Notes On Usage

- 1) Keep the arc as short as possible.
- 2) Remove dirts such as oil and dust from the groove.
- 3) Dry the electrode a 350°C for 60 Min- before use .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.080 Max	0.50- 2.50	1.00 Max	0.030 Max	0.040 Max	18.0 - 21.0	9.0 – 11.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 5d)	Reduction Area %	FERRITE %.
550 Min	35 % Min	50 – 70	3.0 – 8.0 %

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 85	AC 70 OCV / DC (+)
3.20 X 350	2	10	4.40	22.05	85 – 115	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL - 1A H (E 308H - 16)

AWS : SFA 5.4, E 308H - 16
IS : 5206 E 19.9R 26

Applications

For welding stainless steels of AISI 308H, 304H, type of base material fabrication works. Used for joining 18/8 stainless steel when the carbon is in the range of 0.04 – 0.08 %.

Characteristics on Usage

It is a rutile coated stainless steel electrode which deposits high carbon i.e. 0.04 to 0.080, 19Cr, and 10 Ni type of weld metal which gives high tensile and creep strength at elevated temperature. This electrode are used for welding AISI 304H type of base material. It is running with smooth arc with excellent weld bead finish and self lifting slag.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use .
- 2) Remove dirts such as oil and dust from the groove .
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %	Nitrogen
0.04 - 0.08	0.50 – 2.00	0.75 Max	0.020	0.030 Max	18.0 - 21.0	9.0 - 11.0	0.50 Max	0.050 Max	Absent

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	35.0 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 – 90	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 110	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum packing

ROYAL - 2A (E 316 - 16)

AWS : SFA 5.4, E 316 - 16
IS : 5206 E 19-11 - 2R 24

Applications

For welding all types of stainless steels. Tanks, coils & vats used in the pulp, paper & textile industry. Chemical mixers, paint, dye industries.

Characteristics on Usage

This is a rutile coated electrode, the weld metal has excellent creep strength and is of radiographic quality. It is capable of depositing 316 type of weld metal with normal content of carbon the electrode can be manipulated easily in all welding positions

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use .
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.080 Max	0.50 - 2.50	1.00 Max	0.03 Max	0.040 Max	17.0 - 20.0	11.0 - 14.0	2.0 - 3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %	FERRITE %.
520 Min	30 % Min	3 - 8 %

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 - 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 - 115	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL - 1B (E 347 - 16)

AWS : SFA 5.4, E 347 - 16
IS : 5206 E 19.9 Nb R26

Applications

AISI steels 321 and 347 generally on 18/8 steels stabilized by Titanium or Niobium in the manufacture of equipment for chemical , food & aircraft industries, also used for welding unstabilized stainless steels of AISI 301, 302, 304, & 308 types.

Characteristics on Usage

A lime titania all position electrode which is almost spatter free, has a smooth arc, with excellent weld bead finish and self lifting slag. A niobium stabilised stainless steel of 19 Cr - 10 Ni type weld metal has excellent creep strength and is of radiographic quality. Welding can be done on AC or DC (+) polarity, high degree of corrosion resistance in oxidising environment such as nitric acid.

Notes On Usage

- 1) Dry the electrode at 350°C for 60 Min- before use .
- 2) Keep the arc as short as possible.
- 3) Remove rust,water,oiland paint from the surface to be welded.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Nb (Cb)+ Ta %
0.080 Max	0.50 - 2.50	1.00 Max	0.03 Max	0.040 Max	18.0 - 21.0	9.0 - 11.0	0.50 - 0.90

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 80	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 – 120	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	140 - 180	

Packing

Vaccum pack

ROYAL - 2B (E 318 - 16)

AWS : SFA 5.4, E 318 - 16
IS : E 19-12 - 2 Nb – R26

Applications

For the fabrication of chemical plants. Paper mill equipments Pickling plant etc., Joining and surfacing of similar composition of stainless steel.

Characteristics on Usage

It is a stainless steel electrode it produces a columbium stabilized 19/12/Mo weld metal. It is a all position electrode having good resistant to corrosion and improved creep strength. It is idealy suited for joining for stainless steel of similar composition the weld metal has excellent creep strength upto 850 °C and is of radiographic quality, recommended for welding AISI 316, 317 & 318 type of stainless steel.

Notes On Usage

- 1) Dry the electrode at 350°C for 60 Min- before use .
- 2) Keep the arc as short as possible.
- 3) Remove rust,water,oiland paint from the surface to be welded.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cb%
0.080 Max	0.50 - 2.50	1.00 Max	0.030%	0.040%	17.0 - 20.0	11.0 - 14.0	2.0 - 2.50	0.50 - 1.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	25% Min

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 - 80	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80 - 100	
4.00 X 350	2	10	4.40	22.05	110 - 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL - 1C (E 308L - 16)

AWS : SFA 5.4, E 308L - 16
IS : E 19 - 9 LR - 16

Applications

Idealy suited for welding of stainless steel of AISI grade 301, 302, 304, 304L, 308, 308L composition. For welding of household articles, milk and soap industries Hospital apparatus, nuclear plant.

Characteristics on Usage

An extra low carbon lime titania all position 19 Cr - 10 Ni stainless steel electrode which is highly resistance. intergranular corrosion, cracking, oxidation and scaling very smooth running with extremely smooth removal of slag leaving a uniform and fine rippled bead characterized by excellent all round performance and weld metal properties upto 250° C.

Notes On Usage

- 1) It is mostly effective to protect with welding,keeping the arc as short as possible in flat position .
- 2) Remove dirts such as oil and dust from groove.
- 3) Dry the electrode a 350°C for 60 Min- before use .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.040 Max	0.50 - 2.0	0.75 Max	0.030 Max	0.040 Max	18.50 - 21.0	9.0 - 11.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520	35 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 - 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 - 115	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL - 2C (E 316 L - 16)

AWS : SFA 5.4, E 316 L - 16
IS : 5206 E 19 -12 - 2L R 26

Applications

Suitable of welding AISI 316L & 317L type of stainless steel Applications in chemical plants, paint, pulp paper and textile industries.

Characteristics on Usage

An extra low carbon lime titania all position 18 Cr, 13Ni, 2 Mo stainless steel electrode for welding AISI 316-L equivalent grades of stabilized steel and non stabilized chromium nickel steel which are resistant to atmospheric corrosion of the 316 type. It is very smooth running with extremely smooth removal of slag leaving a uniform and fine rippled bead characterized by excellent all round performance and weld metal properties.

Notes On Usage

- 1) Weaving width should be within two and half times of electrodes diameter.
- 2) Remove dirts such as oil and dust from groove.
- 3) Dry the electrode a 350°C for 60 Min- before use .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.04 Max	0.50 - 2.50	1.00 Max	0.03 Max	0.04 Max	17.0 - 20.0	11.0 - 14.0	2.0 - 3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
490	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 – 115	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

ROYAL - D2 (E 309 - 16)

AWS : SFA 5.4, E 309 - 16
IS : 5206 E 23, 12 R 26

Applications

Recommended for AISI 309 grade of stainless steel and straight chrome steel for joining clad steel, low alloy steel and carbon steel.

Characteristics on Usage

A medium heavy coated rutile type all position electrode yielding 25 Cr 12 Ni stainless steel weld deposit. This is characterized by excellent all round performance and metal properties including resistance to chemical corrosion. Temperatures upto 1100% suitable for steel containing 22 - 26 % Cr and 11 - 14 % Ni and also for joints between 18 Cr. 8 Ni stainless steel and mild steel or low alloy steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use .
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.15 Max	0.50 - 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550	30% Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 - 115	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05	135 - 180	

Packing

Vaccum pack

ROYAL - D2L (E 309L - 16)

AWS : SFA 5.4, E 309L - 16
IS : 5206 E 23, 12 R 26

Applications

Recommended for AISI 309 grade of stainless steel and straight chrome steel for joining clad steel, low alloy steel and carbon steel.

Characteristics on Usage

A medium heavy coated rutile type all position electrode yielding 25 Cr 12 Ni stainless steel weld deposit. This is characterized by excellent all round performance and metal properties including resistance to chemical corrosion. Temperatures upto 1100º C suitable for steel containing 22 - 26 % Cr and 11 - 14 % Ni and Also for joints between 18 Cr. 8 Ni stainless steel and mild steel or low alloy steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.040 Max	0.50 - 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
540	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 - 115	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05	135 – 180	

Packing

Vaccum pack

ROYAL - D2 Mo (E 309 Mo - 16)

AWS : SFA 5.4, E 309 Mo - 16
IS : 5206 E 309 E 23, 12.2 R 26

Applications

Suitable for welding steel containing 22 – 26% and 11 - 14 % Ni, 2 - 3 % Mo also for joints between 18 Cr - 8 Ni stainless steel and mild steel or low alloy steel.

Characteristics on Usage

A medium heavy coated rutile type all position electrode giving 25 Cr 12 Ni, 2 Mo stainless steel weld deposit, the addition of molybdenum improves tensile strength and resistance to chemical corrosion and heat, standing upto 1100º C temperature. It gives a stable arc, low spatter, smooth weld bead and easily detachable slag.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.
- 3) Use currents as low as possible to avoid excessive dilution.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.12 Max	0.50 – 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0	2.0 - 3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45 – 85	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	85 - 115	
4.00 X 350	2	10	4.40	22.05	100 - 145	
5.00 X 350	2	10	4.40	22.05	135 – 180	

Packing

Vaccum pack

ROYAL - D2 Mo L (E 309LMo - 16)

AWS : SFA 5.4, E 309LMo - 16
IS : 5206 E 309 E 23, 12.2 L R 26

Applications

Suitable for welding steel containing 22 - 26% Cr, 11 - 14 % Ni, 2 - 3% Mo, also for joints between 18 Cr, - 8 Ni, stainless steel and mild steel, or low alloy steel as well as clad steel.

Characteristics on Usage

A low carbon stainless steel electrode for welding heat resistant Cr and Cr - Ni alloyed steel. It is a medium heavy coated rutile type, all position electrode yielding 25 Cr, 12 Ni, 2 Mo stainless steel weld deposit. The ferritic austenitic weld metal is very crack resistant smooth weld with clean edges. Suitable for welding build up turbine runners made of ferritic chromium stainless steel specially designed for welding root run in clad steel as well as mild steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.
- 3) Use currents as low as possible to avoid excessive dilution.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.04 Max	0.50 – 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0	2.0 - 3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 x 350	2	10	4.40	22.05	45 – 85	AC / DC (+)
3.20 x 350	2	10	4.40	22.05	85 – 115	
4.00 x 350	2	10	4.40	22.05	100 – 145	
5.00 x 350	2	10	4.40	22.05	135 – 180	

Packing

Vaccum pack

ROYAL - CW (E 310 - 16)

AWS : SFA 5.4, E 310 - 16
IS : E25-20 R 26 X

Applications

Suitable for welding of AISI 310 type of stainless steel plates. German steel, Clad steel, straight chrome steel and dissimilar steel. Gas turbine combustion chamber parts, High temperature furnace parts, Annealing boxes etc.

Characteristics on Usage

A medium heavy coated rutile type all position stainless steel electrode with excellent welding characteristics. This unique electrode is manufactured by using 25 Cr, 20 Ni, type of core wire to give 25/20 weld deposit. The weld metal has excellent resistance to oxidation scaling up to 1200 ºC in continuous service. The weld metal is fully austenitic and is of radiographic quality.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.08 – 0.20	1.0 - 2.50	0.75 Max	0.030 Max	0.030 Max	25.0 – 28.0	20.0 – 22.50

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 75	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	110 – 140	
5.00 X 350	2	10	4.40	22.05	150 – 180	

Packing

Vaccum pack

ROYAL – CW (SPL) (E 310 - 17)

AWS : SFA 5.4, E 310 - 17

Applications

Suitable for welding of AISI 310 type of stainless steel plates. German steel, Clad steel, straight chrome steel and dissimilar steel. Gas turbine combustion chamber parts, High temperature furnace parts, Annealing boxes etc.

Characteristics on Usage

A medium heavy rutile coated all position stainless steel electrode with excellent welding characteristics. This unique electrode is manufactured by using 25 Cr, 20 Ni, type of core wire to give 25/20/ 5Mn weld deposit. The weld metal has excellent resistance to oxidation scaling up to 1200 ºC in continuous service. The weld metal is fully austenitic and is of radiographic quality.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.08 – 0.20	1.0 – 2.50	0.75 Max	0.030 Max	0.030 Max	25.0 – 28.0	20.0 – 22.50

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 75	AC/DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	110 – 140	
5.00 X 350	2	10	4.40	22.05	150 – 180	

Packing

Vaccum pack

ROYAL - D2 (BASIC) (E 309 - 15)

AWS : SFA 5.4, E 309 - 15

Applications

Recommended for AISI 309 grade of stainless steel and straight chrome steel for joining clad steel, low alloy steel and carbon steel.

Characteristics on Usage

A medium heavy coated Basic type all position electrode yielding 24 Cr 13 Ni stainless steel weld deposit. This is characterized by excellent all round performance and metal properties including resistance to chemical corrosion. Temperatures upto 1100 °C Suitable for steel containing 22 - 26 % Cr and 11 - 14 % Ni and also for joints between 18 Cr. 8 Ni stainless steel and mild steel or low alloy steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.15 Max	0.50- 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	DC (+)
3.20 X 350	2	10	4.40	22.05	85-115	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	135-180	

TOP

ROYAL - D2L (BASIC) (E 309L - 15)

AWS : SFA 5.4, E 309L - 15
IS : 5206 E 23, 12 LB 20

Applications

Recommended for AISI 309 grade of stainless steel and straight chrome steel for joining clad steel, low alloy steel and carbon steel.

Characteristics on Usage

A low carbon medium heavy coated basic type all position electrode yielding 25 Cr 12 Ni stainless steel weld deposit. This is characterized by excellent all round performance and metal properties including resistance to chemical corrosion. Temperatures upto 1100°C suitable for steel containing 22 - 26 % Cr and 11 - 14 % Ni and also for joints between 18 Cr. 8 Ni stainless steel and mild steel or low alloy steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.040 Max	0.50- 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0 - 14.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %
540 – 640	36 – 45 %

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	DC (+)
3.20 X 350	2	10	4.40	22.05	85-115	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	135-180	

ROYAL – CW (BASIC) (E 310 - 15)

AWS : SFA 5.4, E 310 - 15

Applications

Suitable for welding of AISI 310 type of stainless steel plates. German steel, Clad steel, straight chrome steel and dissimilar steel. Gas turbine combustion chamber parts, High temperature furnace parts, Annealing boxes etc.

Characteristics on Usage

A medium heavy Basic coated all position stainless steel electrode with excellent welding characteristics. This unique electrode is manufactured by using 25 Cr, 20 Ni, type of core wire to give 25/20/ 5Mn weld deposit. The weld metal has excellent resistance to oxidation scaling up to 1200 ºC in continuous service. The weld metal is fully austenitic and is of radiographic quality, the electrode is to be kept dry at 300º C for 1 hour before welding.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.08 – 0.20	1.0 – 2.50	0.75 Max	0.030 Max	0.030 Max	25.0 – 28.0	20.0 – 22.50

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON
2.50 x 350	2	10	4.40	22.05
3.20 x 350	2	10	4.40	22.05
4.00 x 350	2	10	4.40	22.05
5.00 x 350	2	10	4.40	22.05

ROYAL CHROME - 13 (E 410 - 15)

SFA 5.4 AWS E 410 - 15

Applications

Turbines, armature valves & pumps.

Characteristics on Usage

This electrode is used for welding and surfacing of 13% chromium steel. It is also recommended for using in turbines, armature valves and pumps. The weld metal is of radiographic quality, resistant to friction, corrosion and oxidation.

Notes On Usage

- 1) Preheat the job at 150-200° C & PWHT. at 730 - 760° C for one hour soaking.
- 2) keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from grove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.12 Max	1.00 Max	0.90 Max	0.03 Max	0.04 Max	11.0 - 13.5	0.70 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	470 Min	20% Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 - 80	DC (+)
3.20 X 350	2	10	4.40	22.05	80 - 100	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL CHROME - 13/4 (E 410 – 15 NiMoX)

SFA 5.4 AWS E 410 – 15 NiMoX

Applications

Welding and surfacing of Turbines, Armature, Valves, Pumps. Welding for similar composition of casting steel. Welding of martenistic / ferritic stainless steel of 13% Cr, 4% Ni.

Characteristics on Usage

It is a heavy coated basic type hydrogen controlled electrode, used for welding and surfacing of 13% Cr, 4% Ni type martensitic – ferritic chromium steel. It gives impact properties upto minus 29 °C, the weld metal has radiographic quality and easily removable slag.

Notes On Usage

- 1) Preheat the job at 150-200 °C & PWHT at 595 - 620 °C for one hour soaking.
- 2) keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from grove.
- 4) Dry the electrodes at 350 °C for 60 min. before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.06 Max	01.00 Max	0.90 Max	0.030 Max	0.040 Max	11.0 – 12.50	4.0 – 5.0	0.40 – 0.70

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
760	15

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 – 80	DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	110 – 160	
5.00 X 350	2	10	4.40	22.05	150 – 190	

Packing

Vaccum pack

ROYAL 18 / 8 / 5 (E 18 : 8Mn R26)

IS : 5206 E 18.8 Mn R 26

Applications

Suitable for joining ferritic to austenitic steels, Armour plates, heat resistant steels, dissimilar materials, buffer layers on difficult steels before hardfacing. Excellent for repairing cracks in austenitic manganese steel, castings for surfacing manganese steel.

Characteristics on Usage

It is a light-basic coated multi purpose stainless steel electrode with S.S. corewire, easy to operate in all position at low current. The weld metal has excellent crack resistance as well as heat resistance at 900° C. It is also corrosion resistant to atmosphere, marine water and weak acids. It gives 18% Cr, 8% Ni & 5% Mn type weld deposit, easily removable slag. It is to be dried at 250° C for 1 hour before welding.

Notes On Usage

- 1) Keep the arc as short as possble.
- 2) Remove dirts such as oil and dust from the groove.
- 3) Dry the electrode a 350° C for 60 min. before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.20 Max	5.0 - 8.0	0.90 Max	0.030 Max	0.040 Max	17.0 - 20.0	7.0 - 10.0	0.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 5d)
560 - 670	30 - 40

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 - 75	DC (+) / 70 OCV
3.20 X 350	2	10	4.40	22.05	80 - 110	
4.00 X 350	2	10	4.40	22.05	110 - 150	
5.00 X 350	2	10	4.40	22.05	150 - 200	

Packing

Vaccum pack

ROYAL - 307 (E 307 - 15)

AWS: SFA 5.4, E 307 - 15
DIN – 8556 E 18.8 Mn B 20

Applications

Ideally suitable for welding of dissimilar steel, 13% Mn steels, & carbon steel. Use for buffer layer prior to hard surfacing, railway linear, marine shaft building, bucket lips etc.

Characteristics on Usage

It is a rutile coated austenitic stainless steel electrode deposit 18% Cr, 8% Ni, and 6% Mn type of weld metal with 5% ferrite. The weld metal is excellent in crack resistance when welding with unknown steel, dissimilar steel etc. It is all position electrodes giving a very smooth, quite, stable arc with controllable slag. The weld is of radiographic quality.

Notes On Usage

- 1) Dry the electrodes at 350 °C for 60 min. before use.
- 2) Keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.040 - 0.14	3.30 – 4.75	1.00 Max	0.030 % Max	0.040 % Max	18 – 21	9.0 – 10.70	0.50-1.50

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
590	490	30

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 – 80	DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	120 – 160	
5.00 X 350	2	10	4.40	22.05	160 – 200	

Packing

Vaccum pack

ROYAL CHROME - 17 (E 430 - 15)

AWS/SFA 5.4, E 430 - 15
IS : 5206 E 17 St

Applications

Suitable for surfacing and welding of straight chrome steel such as AISI 430 Grade Automobile body moulding, Oil burner parts, equipments in the chemical & food industries.

Characteristics on Usage

It is a heavy coated basic type all position electrode depositing 17% Chrome type of weld metal. The weld metal has good resistance to corrosion, heat and is of radiographic quality.

Notes On Usage

- 1) Preheat the job at 150-200° C & PWHT. at 760 - 790° C for one hour soaking.
- 2) Remove rust, water, oil, paint etc. from groove.
- 3) keep the current as low as possible.
- 4) Dry the electrodes at 350° C for 60 min. before use.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.10 Max	1.00 Max	0.90 Max	0.030 Max	0.040 Max	15 – 18.00	0.60 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
540	470	20

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 – 90	DC (+)
3.20 X 350	2	10	4.40	22.05	90 - 130	
4.00 X 350	2	10	4.40	22.05	130 - 160	
5.00 X 350	2	10	4.40	22.05	170 - 200	

Packing

Vaccum pack

ROYAL – 309 Cb (E 309 cb - 16)

AWS : SFA 5.4, E 309 cb - 16,
IS : 5206. 23.12 Nb R 26

Applications

Suitable for joining columbium stabilized stainless steel to high alloy & unalloyed steels, for welding AISI 309 – cb type steels, straight chrome steels, Joining stainless steel to low alloy steel and carbon steel.

Characteristics on Usage

A medium heavy coated rutile type all position electrode yielding 25 Cr, 12 Ni Columbium stabilized weld deposit. The addition of columbium provides resistance to intergranular corrosion and high strength at elevated temp. service. The weld deposit withstand up to 1100° C in continuous service. It gives stable arc, low spatter, smooth weld bead with easily removable slag. Redry the electrode at 250° C for 1 hour for better result.

Notes On Usage

- 1) Dry the electrodes at 350° C for 60 min. before use.
- 2) keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cb%
0.12 Max	0.50 -2.50	1.00 Max	0.030 Max	0.040 Max	22.0 – 25.0	12.0 – 14.0	0.75 Max	0.70 – 1.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550	30

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 - 80	AC/DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 110	
4.00 X 350	2	10	4.40	22.05	110-140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL 312 (E 312-16)

AWS A/ SFA 5.4 E 312-16 ,
IS 5206 – 1983 E 29.9 R 16.

Applications

Suitable for welding of Heavy machinery parts, earth moving equipments, automobile spring, trumnions of cement mill and other allied components, parts subject to corrosion and impact. Joining and surfacing of High Carbon, low and high alloy steel, tool steel, spring steel, manganese steel, case hardening steel, high speed steel, cost steel etc

Characteristics on Usage

A medium heavy coated rutile type all position electrode giving 30 % Cr. And 10 % Nickel weld deposit. The electrode has very soft arc and gives smooth and defect free austeno ferritie weld metal. Almost no distortion and embrifflement of the base material. The weld metal is resistant to friction, heat and corrosion is work hardening and shockproof gives radiography weld deposit.

Notes On Usage

- 1) Dry the electrodes at 350° C for 60 min. before use.
- 2) Keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.15 Max	0.50 – 2.50	1.00Max	0.030 Max	0.040 Max	28.0 - 32.0	8.0 – 10.50	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
660	22

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 70	AC /DC + Ve
3.20 X 350	2	10	4.40	22.05	70 – 100	
4.00 X 350	2	10	4.40	22.05	100 – 130	
5.00 X 350	2	10	4.40	22.05	130 – 160	

Packing

Vaccum pack

ROYAL 385ZF (E 385 - 16)

AWS: SFA 5.4, E 385 - 16

Applications

These electrodes are used primarily for welding of type 904 L material for the handling of sulphuric acid and many chloride contain media. It is also used for HV – 9 A and HV-9 stainless steel and similar alloy for high temperature services in the jet aircraft industry

Characteristics on Usage

It is semi basic coated all position electrode giving a smooth arc, medium penetration & weld deposit of 20 % Cr, 25% Ni, 5 % Mo & 1.5 % Cu. Which possesses excellent corrosion and heat resistance up to 1200º C. Frequently encountered in fully austenitic weld metal leaving smooth bead having fine ripples with self lifting slag.

Notes On Usage

- 1) Dry the electrodes at 350° C for 60 min. before use.
- 2) keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.03 Max	1.0 - 2.5	0.90 Max	0.020 Max	0.030 Max	19.5 - 21.5	24.0 - 26.0	4.20 – 5.20	1.2 – 2.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550	30

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 70	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80-100	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL 2209 (E 2209 -16)

AWS / SFA 5.4 E 2209 -16

Applications

It is used for welding of duplex stainless steel material were the weld metal deposited combines increase tensile strength with improve resistance to pitting corrosive.

Characteristics on Usage

The normal composition (wt. %)of this weld metal is contain 22.2 %Cr, 9.5 % Ni& 0.15% N. Electrodes of this composition are used primarily to weld duplex stainless steels which contain approximately 22% of chromium.

Notes On Usage

- 1) Dry the electrodes at 350° C for 60 min. before use.
- 2) keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %	N%
0.040Max	0.50– 2.00	1.00 Max	0.030 Max	0.040 Max	22.5 – 23.5	8.5 – 10.5	2.5-3.50	0.75Max	0.08- 0.20

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
690	20-28

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 90	AC / DC + Ve
3.20 X 350	2	10	4.40	22.05	90 – 140	
4.00 X 350	2	10	4.40	22.05	120 – 170	
5.00 X 350	2	10	4.40	22.05	180 – 220	

Packing

Vaccum pack

ROYAL 2553 (E 2553 -16)

AWS / SFA 5.4 E 2553 -16

Applications

It is used for welding of duplex stainless steel such as SAF 2507,Zeron 100, ferralium 255 , UR47N , DP3 etc.

Characteristics on Usage

It is rutile base electrode specially designed for welding of Super duplex stainless steels. Which contain 25%Cr, 8 % Ni& 3% Mo. The deposited weld metal has a duplex microstructure consisting of an austenite ferrite matrix, with high ductility and improved resistance to pitting corrosive attack and to stress corrosion cracking. It gives excellent welding characteristic in all position with smooth and stable arc, self lifting slag .The weld bead is smooth, fine rippled and shiny.

Notes On Usage

- 1) Dry the electrodes at 350° C for 60 min. before use.
- 2) Keep the current as low as possible.
- 3) Remove rust, water, oil, paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %	N%
0.060Max	0.50– 1.50	1.00 Max	0.030 Max	0.040 Max	24.0 - 27.0	6.5 – 8.5	2.9-3.90	1.50-2.50	0.10- 0.25

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %
760	15.0

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 90	DC + Ve
3.20 X 350	2	10	4.40	22.05	90 – 140	
4.00 X 350	2	10	4.40	22.05	120 – 170	
5.00 X 350	2	10	4.40	22.05	180 – 220	

Packing

Vaccum pack

ROYAL - 317L (E 317L - 16)

AWS / SFA 5.4 E 317L-16
IS 5206 – E19.12.3LR 26

Applications

It is used for welding of AISI 317L type SS plates as well as 316L similar type of material. For joining of stainless steel to low alloy and carbon steel .for serve corrosion applications involving sulphuric acid and their salts.

Characteristics on Usage

A medium stainless steel electrode depositing an extra low carbon weld metal containing 19 Cr, 12 Ni, and 3 Mo. The weld metal is resistance to inter crystalline corrosion, stress corrosion cracking, hot cracking and chemical corrosion against sulphuric acid, phosphoric acid etc. The higher molybdenum content reduces the suspectibility to pitting; improve creep strength at elevated temp and practically eliminates cracking as the weld cools from molten stage to room temp. Redry electrodes at 300° C one hour for better results.

Notes On Usage

- 1) Keep the current as low as possible.
- 2) Dry the electrdes at 350° C for 60 min. before use.
- 3) Remove foreign substance such as oil, grease, dust or scale from the groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.040 Max	0.50 – 2.50	1.00Max	0.030 Max	0.040 Max	18.0 - 21.0	12.0 – 14.0	3.0 – 4.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520	30

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 – 80	AC /DC + Ve
3.20 X 350	2	10	4.40	22.05	80 – 110	
4.00 X 350	2	10	4.40	22.05	110 – 140	
5.00 X 350	2	10	4.40	22.05	140 – 180	

Packing

Vaccum pack

ROYAL 1B (BASIC) (E 347 - 15)

AWS : SFA 5.4, E 347-15

Applications

AISI steels 321 and 347 generally on 18/8 steels stabilized by Titanium or Niobium in the manufacture of equipment for chemical, food & aircraft industries, also used for welding unstabilized stainless steels of AISI 301, 302, 304 & 308 types.

Characteristics on Usage

A medium heavy coated basic type all position electrode which is almost spatter free, has a smooth arc, with excellent weld bead finish and self lifting slag. A niobium stabilised stainless steel of 19 Cr - 10 Ni type weld metal has excellent creep strength and is of radiographic quality. Welding can be done on DC(+) polirity, hiah degree of corrosion resistance in oxidising environment such as nitric acid.

Notes On Usage

- 1) Dry the electrode at 350°C for 60 Min. before use .
- 2) Keep the arc as short as possible.
- 3) Remove rust, water, oil and paint from the surface to be welded.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Nb (Cb)
0.08 Max	0.50-2.50	1.0 Max	0.030 Max	0.040 Max	18.0-21.0	9.0-11.0	0.50-0.90

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	DC (+)
3.20 X 350	2	10	4.40	22.05	85-120	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL 1C (BASIC) (E 308L - 15)

AWS : SFA 5.4, E 308L - 15

Applications

Idealy suited for welding of stainless steel grade 301, 302, 304, 304L, 308, 308L composition. For welding of household articles, milk and soap industries, Hospital apparatus, nuclear plant,

Characteristics on Usage

An extra low carbon lime titania all position 19 Cr - 10 Ni stainless steel electrode which is highly resistance. Intergranular corrosion, cracking, oxidation and scaling very smooth running with extremely smooth removal of slag leaving a uniform and fine rippled bead characterized by excellent all round performance and weld metal properties upto 250° C.

Notes On Usage

- 1) It is mostly effective to protect with welding,keeping the arc as short as possible in flat position .
- 2) Remove dirts such as oil and dust from groove.
- 3) Dry the electrode a 350° C for 60 Min. before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
0.040 Max	0.50-2.0	0.75 Max	0.030 Max	0.040 Max	18.50-21.0	9.0-11.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	35 Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	DC (+)
3.20 X 350	2	10	4.40	22.05	85-115	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL 2C (BASIC) (E 316L - 15)

AWS : SFA 5.4, E 316 L - 15

Applications

Suitable of welding AISI 316L & 317L type of stainless steel applications in chemical plants, paint, pulp paper and textile industries.

Characteristics on Usage

An extra low carbon basic coated all position 18Cr, 12 Ni, 2 Mo stainless steel electrode for welding AISI 316-L equivalent grades of stabilized steel and non stabilized chromium nickel steel which are resistant to atmospheric corrosion of the 316 type. It is very smooth running with extremely smooth removal of slag leaving a uniform and fine rippled bead characterized by excellent all round performance and weld metal properties.

Notes On Usage

- 1) Weaving width should be within two and half times of electrodes diameter.
- 2) Remove dirts such as oil and dust from groove.
- 3) Dry the electrode a 350°C for 60 Min. before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.040 Max	0.50-2.50	1.0 Max	0.030 Max	0.040 Max	17.0-20.0	11.0-14.0	2.0-3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
490 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	DC (+)
3.20 X 350	2	10	4.40	22.05	85-115	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL D2MoL SPL (E 309 L Mo - 17)

AWS : SFA 5.4, E 309 L Mo - 17

Applications

Suitable for welding steel containing 22 - 26% Cr, 11 - 14 % Ni, 2 - 3% Mo, also for joints between 18 Cr, - 8 Ni, stainless steel and mild steel, or low alloy steel as well as clad steel.

Characteristics on Usage

A low carbon stainless steel electrode for welding heat resistant Cr and Cr - Ni alloyed steel. It is a medium heavy coated rutile type, all position electrode yielding 25 Cr, 12 Ni, 2 Mo stainless steel weld deposit. The ferritic austenitic weld metal is very crack resistant smooth weld with clean edges. Suitable for welding build up turbine runners made of ferritic chromium stainless steel specially designed for welding root run in clad steel as well as mild steel.

Notes On Usage

- 1) Dry the electrode a 350°C for 60 Min- before use.
- 2) Keep the arc as short as possible.
- 3) Use currents as low as possible to avoid excessive dilution.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.040 Max	0.50-2.50	1.0 Max	0.030 Max	0.040 Max	22.0-25.0	12.0-14.0	2.0-3.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	45-85	AC/DC (+)
3.20 X 350	2	10	4.40	22.05	85-115	
4.00 X 350	2	10	4.40	22.05	100-140	
5.00 X 350	2	10	4.40	22.05	135-180	

Packing

Vaccun pack

ROYAL 309Cb (BASIC) (E 309 Cb - 15)

AWS : SFA 5.4, E 309 Cb - 15

Applications

Suitable for joining columbium stabilized stainless steel to high alloy & unalloyed steels, for welding AISI 309 – cb type steels, straight chrome steels, Joining stainless steel to low alloy steel and carbon steel.

Characteristics on Usage

A medium heavy coated rutile type all position electrode yielding 25 Cr, 12 Ni Columbium stabilized weld deposit. The addition of columbium provides resistance to intergranular corrosion and high strength at elevated temp service. The weld deposit withstand up to 1100º C in continuous service. It gives stable arc, low spatter, smooth weld bead with easily removable slag. Redry the electrode at 250 ºC for 1 hour for better result

Notes On Usage

- 1) Dry the electrodes at 350ºC for 60 minute before use
- 2) Keep the arc as short as possible.
- 3) Remove rust.water,oil,paint etc. from groove.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cb%
0.12 Max	0.50-2.50	1.0 Max	0.030 Max	0.040 Max	22.0-25.0	12.0-14.0	0.75 Max	0.70-1.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50-80	AC/DC (+)
3.20 X 350	2	10	4.40	22.05	80 - 110	
4.00 X 350	2	10	4.40	22.05	110 - 140	
5.00 X 350	2	10	4.40	22.05	140-180	

Packing

Vaccum pack

ROYAL C – I (E Fe A)

IS: 7303. 1974 Class – E Fe A

Applications

Suitable for Gears, Shafts, Axles, Hammers, Pinion teeth, Pulleys, Couplings, Spindles.

Characteristics on Usage

A medium heavy coated rutile type all position hard surfacing electrode. It deposits a tough air hardening type of weld metal approximately 250 BHN hardness. The weld metal is machinable and recommended for hard surfacing on hard base material. The electrodes give low smoke and negligible spatter with smooth arc characteristics.

Notes On Usage

- 1) Dry the electrodes at 70-100 ºC for 60 minutes before use.
- 2) Hard facing large size cast steel and forging low alloy steel and high carbon steel requires preheating at 150ºC and more than that in general.

Welding Positions

1G 2F 3G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.16 Max	0.15 – 0.40	0.25 Max	0.030 Max	0.030 Max	0.4 – 0.75	1.00 – 1.50

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	100 - 140	AC / DC (+)
3.20 X 450	5	20	11	44	140 - 180	
4.00 X 450	5	20	11	44	180 - 220	
5.00 X 450	5	20	11	44		

ROYAL C – II ()

Applications

Suitable for Shear's blades and croppers. Bamboo Chipper knives, coupling, Conveyer parts, Roller, Tractor wheels, Steel casting, Shafts, Axles.

Characteristics on Usage

A medium heavy coated rutile type good running hardfacing electrode, deposit a tough air hardening type of weld metal of approximately 350 BHN hardness. The weld metal is machinable and recommended for application involving maximum hardness as required.

Notes On Usage

- 1) Dry the electrodes at 70-100ºC for 60 minutes before use.
- 2) In case of hardfacing on large size cast steel, low alloy steel and high carbon steel preheat at 150ºC and more than that in general.

Welding Positions

1G 2F 3G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %
0.30 Max	0.40 – 0.70	0.20 -0.40	0.030 Max	0.030 Max	2.50 – 3.50

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 - 100	AC / DC (+)
3.20 X 450	5	20	11	44	100 - 140	
4.00 X 450	5	20	11	44	140 - 180	
5.00 X 450	5	20	11	44	180 - 220	

ROYAL C - III (E Fe-1C)

IS: 7303- 1974 Class – E Fe-1C

Applications

Mine Rails & Crane wheels. Hot & Cold punching dies, metal cutting & forming tools. Crush hammers & caterpillars treads. Drilling bits, crane wheels, conveyor buckets.

Characteristics on Usage

A medium heavy coated Rutile type electrode, air hardening type of weld metal where approximately 600 Brinell hardness is required. Weld is non machineable and finished by grinding. The electrode is recommended for hard facing applications on mild steel, carbon steels & low alloy steels where severe conditions of abrasion, friction, accompanied by moderate impact exist. suitable for couplings, conveyor buckets, shears blades, steel castings, etc.

Notes On Usage

- 1) Dry the electrodes at 150ºC for 60 minutes before use
- 2) Preheat the job at 150-200ºC more than that in general.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %	V %
0.40 – 0.70	0.20 – 0.40	0.2- 0.45	0.030 Max	0.030 Max	6.0– 7.8	0.50 – 0.80	0.4 – 0.7

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 - 100	AC / DC (+)
3.20 X 450	5	20	11	44	100 - 140	
4.00 X 450	5	20	11	44	140 - 180	
5.00 X 450	5	20	11	44	180 - 230	

ROYAL C - III (L H) ()

Applications

Earth moving equipment, Conveyor buckets Oil expeller worms, Punching dies, Mine Rails Disintegrator hammers, shears blades, caterpillar treads Drill bits, Muller ploughs, Dipper teeth impellers

Characteristics on Usage

This is medium heavy coated low hydrogen, air hardening type iron powder electrode. The weld deposit is extremely hard, sound and non-machinable. The low hydrogen enables the electrode to be used on high carbon and high sulphur steel without inducing under bead cracking or porosity. The electrode is recommended for hardfacing where severe conditions of abrasion and friction accompanied by moderate impact exist the weld deposit is finished by grinding.

Notes On Usage

- 1) Dry the electrodes at 350-400ºC for 60 minutess before use
- 2) Preheat at 150ºC and more than that in general

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %	V %
0.40 – 0.75	0.50 – 0.70	0.60- 1.0	0.030 Max	0.030 Max	6.50– 7.80	0.70 –1.10	0.40 – 0.80

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	100 - 140	AC / DC (+)
3.20 X 450	5	20	11	44	140 - 180	
4.00 X 450	5	20	11	44	180 - 230	
5.00 X 450	5	20	11	44		

ROYAL C - V ()

Applications

Concrete mixer blades. Excavator teeth plough shares. Bucket lips, scraper blades. Cement die, rings.

Characteristics on Usage

This is a medium coated Rutile type hard facing electrode depositing on air hardening, weld metal is of approximately 600 BHN hardness. The weld metal resistant to severe abrasion and moderate impact, suitable for hardfacing applications like Dredger bucket lips, plough shares, excavator, conveyor buckets etc.,

Notes On Usage

- 1) Dry the electrodes at 70-100º C for 60 minute before use.
- 2) Preheat at 150º C or more than that in general.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %
2.20 – 2.80	0.80 – 1.25	2.50- 3.50	0.030 Max	0.030 Max	3.0– 4.0

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 - 90	AC / DC (+)
3.20 X 450	5	20	11	44	100 - 140	
4.00 X 450	5	20	11	44	140 - 180	
5.00 X 450	5	20	11	44	180 - 210	

ROYAL MANGAN (E Fe Mn A)

AWS / SFA 5.13 E Fe Mn A.

Applications

Rock crushing jaws & crusher mantles. Manganese steel rail points and crossings Dredger bucket teeth & cement grinder teeth Bulldozer teeth, manganese steel casting etc.

Characteristics on Usage

This is a medium heavy coated low hydrogen electrode for hard facing applications on austenitic manganese steel parts. The weld metal is tough and the work hardness to more than 500 BHN in service under severe impact. The weld deposit consists of 12% Mn composition, when used on mild steel or low alloy steel parts it gives a buffer layer of stainless steel.

Notes On Usage

1) Dry the electrodes at 350-400ºC for 60 minute before use

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Mo %
0.50 – 1.00	12.0 – 16.0	1.30 Max	0.030 Max	0.030 Max	0.50 – 1.50

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	100 – 140	AC / DC (+)
3.20 X 450	5	20	11	44	140 – 180	
4.00 X 450	5	20	11	44	180 – 220	
5.00 X 450	5	20	11	44		

ROYAL - CHROMAX ()

Applications

Suitable for rock crushers, Coal Mining cutters, charging rams, Dipper teeth, Shovel tracks, Tractor grousers, Pump housing, Conveyor rolls, Conveyor buckets, Crusher mantles, dredger cutter teeth Ignot lifting tongs etc.

Characteristics on Usage

A heavy – Coated electrode depositing semi austenitic weld metal which gives hardness approx 250 BHN in as welded condition. It is used for hard overlays on Mild Steel, Carbon Steel, low alloy steels and Austenitic Manganese Steel where resistance to combined effect of abrasion, impact and corrosion is necessary.

Notes On Usage

1) Dry the electrodes at 150-200ºC for 60 minute before use

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %
0.25 Max	2.50 – 3.50	0.20 – 0.50	0.03 Max	0.03 Max	17 – 20	4 - 5

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 - 90	AC/DC (+)
3.20 X 350	5	20	11	44	90 - 120	
4.00 X 350	5	20	11	44	130 - 180	
5.00 X 350	5	20	11	44	180 - 220	

ROYAL - CHROMANG ()

Applications

It is idealy suitable for Dipper teeth, Charging rams, Tractor grousers, Dipper lips, Pump housing, Conveyor rolls, Conveyor buckets, Mill hammer, Scraper blades, Pulverizes plows, and pump impeller's.

Characteristics on Usage

It is a heavy coated hard surfacing electrode with pleasing performance for overlays on Mild Steel. Carbon steel, low Alloy steels, and austenitic Manganese steels. The weld deposit gives hardness up to 200 BHN approx and work hardness approx 500 BHN. The weld metal is excellent resistance to combined effect of impact, abrasion and corrosions.

Notes On Usage

1) Dry the electrodes at 350-400ºC for 60 minute before use

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %
0.25 Max	5.50 Max	0.50 Max	0.030 Max	0.030 Max	16.5 Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
3.20 X 350	5	20	11	44	90 - 120	AC/DC (+)
4.00 X 350	5	20	11	44	130 - 160	
5.00 X 350	5	20	11	44	180 - 220	

ROYAL CAST (Est.)

AWS A/SFA 5.15, Est.

Applications

It is used for welding Gears, Cracked motor or generators housing. It is used for repair works of cast iron, carbon steels, mild steels parts.

Characteristics on Usage

A medium heavy coated low hydrogen type electrode for all types of cast iron where machinabiliity is not essential for welding basis on cast iron. It gives high strength where a strong and rigid joints is required in between two cast iron parts. Suitable for joining of cast iron to carbon and low alloy steels.

Notes On Usage

- 1) Preheat temprature vary in accordance with shape and size of base metal
- 2) Preheat at 200-350° C gradual Cooling recommended after welding.

Welding Positions

1G 2F

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 - 80	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	100 – 140	
4.00 X 350	2	10	4.40	22.05	140 – 180	
5.00 X 350	2	10	4.40	22.05	180 – 230	

ROYAL CAST Fe Ni (36%) (E Ni Fe - Ci (Mod))

AWS / SFA :5.15 E Ni Fe – Ci (Mod)
IS: 5511-1991 E Ni Fe (Mod)

Applications

Ideally suited for joining various types of cast iron such as grey cast iron, nodular cast iron, malleable cast iron. Rectification of defective casting in cast iron foundry, engine heads, pumps, casing impellers, rope drums, ingot moulds. Repairing of various types of cast iron parts.

Characteristics on Usage

It is a medium coated Nickel-Iron alloy type electrode, specially designed for welding cast iron parts. It produces high strength ductile and machinable weld with match parent metal. It is running in flat position with soft and smooth arc low spatters and smoke and the weld metal is crack resistant and has good machinability. Suitable for repair and joining components of various type of cast iron, including grey and nodular cast iron parts.

Notes On Usage

- 1) Use currents as low as possible .
- 2) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat.
- 3) The preheat temprature vary in accordance with size and shape of the base metal 100 - 200 °C is appropriate in general.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Cu %
1.0 – 2.0	0.50 – 1.0	4.0 Max	0.03 Max	0.030 Max	35	2.0 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	HARDNESS
33-44	140 - 190 BHN

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 - 80	AC / DC (+)
3.20X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	150 – 190	

ROYAL CAST Fe Ni (55%) (E Ni Fe – Ci)

AWS / SFA: 5.15 E Ni Fe – Ci
IS: 5511-1991 E Ni Fe

Applications

Ideally suited for joining various types of cast iron such as grey cast iron, nodular cast iron, malleable cast iron. Rectification of defective casting in cast iron foundry, engine heads, pumps, casing impellers, rope drums, ingot moulds. Repairing of various types of cast iron parts.

Characteristics on Usage

It is a medium coated Nickel-Iron alloy type electrode, specially designed for welding cast iron parts. It produces high strength ductile and machinable weld with match parent metal. It is running in flat position with soft and smooth arc low spatters and smoke and the weld metal is crack resistant and has good machinability. Suitable for repair and joining components of various type of cast iron, including grey and nodular cast iron parts.

Notes On Usage

- 1) Use currents as low as possible .
- 2) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat.
- 3) The preheat temprature vary in accordance with size and shape of the base metal 100 - 200 °C is appropriate in general.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	Ni %	Cu %	Fe%
2.0 Max	2.50 Max	4.0 Max	0.03 Max	45-60	2.50 Max	Balance

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	HARDNESS
330-440	110 - 130 BHN

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	50 - 80	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 120	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05	150 – 190	

ROYAL CAST - N (E Ni CI)

AWS / SFA 5.15 E Ni CI

Applications

It is suitable for welding of variety of cast iron like grey, S.G. iron components. Suitable for cold welding for engine components, Blocks, Pump casing, Impellers gears, Sprockets, Valve bodies, Cast iron machine base, filling in sand pockets and drill holes as well as surfacing.

Characteristics on Usage

ROYAL CAST – N is an outstanding electrode depositing pure Nickel for machinable welding of cast iron. The weld deposit is soft and has good resistance to cracking. It is used for welding of cast iron to produce machinable weld deposits. It is an all position electrode gives excellent bonding of weld metal with cast iron or dissimilar metal parts.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with size and shape of the base metal 150°C is appropriate in general .

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Fe%
2.00 Max	2.50 Max	4.00 Max	0.030 Max	Traces	85.00 Min	8.00 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	HARDNESS
300 – 400	150 VPN

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	40 - 60	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	80 – 110	
4.00 X 350	2	10	4.40	22.05	90 – 130	
5.00 X 350	2	10	4.40	22.05	140 – 180	

ROYAL CAST - CN (E Ni Cu - B)

AWS : E Ni Cu - B
IS : EM Ni Cu 2/2 14

Applications

Repair of cast iron & engine blocks re-building worn surfaces joining cast iron to steel.

Characteristics on Usage

This is a light coated graphite based electrode for welding cast iron without preheating and for getting machinable weld on cast iron. The electrode gives a nickel copper (Monel) deposit.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with size and shape of the base metal 150°C is appropriate in general .

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Cu %	Fe%
0.70-1.30	0.60 Min	0.60 Max	0.030 Max	0.030 Max	64.0-70.0	Bal.	2.0-4.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	HARDNESS
300-400	150 BHN

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 - 70	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	70 - 100	
4.00 X 350	2	10	4.40	22.05	100 – 140	
5.00 X 350	2	10	4.40	22.05		

ROYAL CAST Mo - 6 (E Ni Cr Mo6)

AWS: SFA 5.11, E NiCrMo-6

Applications

Electrodes of this classification are used for welding 9% Nickel steel base metal are ASTM A333, A334, A353, A522, and A553 etc.

Characteristics on Usage

This type of electrode is used for welding of 9% nickel- chromium and molybdenum Alloys Steel. For surfacing steel with nickel – chromium molybdenum weld metal deposit 65% Ni, 14.5%Cr, 7%Fe, 7%Mo, 3%Mn, 1.5%W, and 1.5%Nb plus Ta electrode having diameter 3.15 for welding in all position and 4.0, 5.0 diameters for flat horizontal position with easily slag removal and good bead finish.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with the size and shape of the base metal 150°C is appropriate in general .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cb%
0.10 Max	2.0 – 4.0	1.00 Max	0.020 Max	0.030 Max	12.0 - 17.0	55.0 Min	5.0-9.0	0.5 - 2.0

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %	BEND TEST
620 Min	20 % Min	Satisfactory

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	80 -100	AC/ DC (+)
3.20 X 350	2	10	4.40	22.05	100 - 140	
4.00 X 350	2	10	4.40	22.05	140 - 180	
5.00 X 350	2	10	4.40	22.05	180-230	

ROYAL CAST Mo - 3 (E Ni Cr Mo3)

AWS / SFA 5.11 E NiCrMo – 3

Applications

Joining of Alloy 625 alloy 825 and other similar material, dissimilar Material. Austenitic stainless steel to Ni-Cr-Mo grade steel of the 9 % Ni type for cryogenic services. Overlay welding of carbon and

Characteristics on Usage

This type of electrode is used for welding of nickel – chromium & molybdenum Alloys Steel. For surfacing steel with nickel – chromium molybdenum weld metal. These electrodes also can be used for welding nickel base inconel 625 alloys steel where the temp. ranges from cryogenic to 9800° C for optimum resistance to pitting corrosion stress corrosion

Notes On Usage

- 1) Chip off base metal completely at the repairing part.
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temperature vary in accordance with the size and shape of the base metal 150° C is appropriate in general.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cb%
0.10 Max	1.0 Max	0.75 Max	0.02 Max	0.03 Max	20 – 23	55 Min.	8-10	3.15 -4.15

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION
550 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	80 – 100	AC / DC (+)
3.20 X 350	2	10	4.40	22.05	100 – 140	
4.00 X 350	2	10	4.40	22.05	140 – 180	
5.00 X 350	2	10	4.40	22.05	180 – 230	

ROYAL - MONEL (E Ni Cu - 7)

AWS : A / SFA 5.11, E Ni Cu - 7

Applications

It is used for welding the clab side of joints in steel clad with a Nickel – Copper alloy and for surfacing steel with Nickel – Copper alloy weld metal to obtain a corrosion resistant surface. It is also used for fabrication and welding for the Nickel – Copper base material like ASTM – B127, B 163, B 164, and B 165 all of which have UNS No. 4400.

Characteristics on Usage

It is a medium coated basic type Monel electrode, it gives stable arc with medium penetration and easily removable slag. The weld deposit contain Ni – Cu alloys elements, and gives Radiographic quality.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with size and shape of the base metal 150° C is appropriate in general .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Cu %	Fe%
0.15 Max	4.00 Max	1.50 Max	0.015 Max	0.020 Max	62 - 69	Balance	2.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION
480 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	60 - 80	DC (+)
3.20 X 350	2	10	4.40	22.05	80 - 110	
4.00 X 350	2	10	4.40	22.05	110 - 140	
5.00 X 350	2	10	4.40	22.05	140 – 190	

ROYAL CAST - 3 (E NiCrFe-3)

AWS: SFA 5.11, E NiCrFe-3

Applications

This is the versatile electrode for all position welding of nickel, inconel,monel ,nickel-chromium –iron alloys HK alloys, stainless And heat resisting steels. Also for welding dissimilar metals such as carbon steels, stainless steels, nickel and nickel alloys to each other .for use on equipment and components made of pure nickel, for fabrication of corrosion resistant tank and containers, heat exchangers, furnace components, boiler, fittings etc.

Characteristics on Usage

The Electrode gives soft stable arc on low current. Deposits are cold tough and have excellent resistance to scaling at high temperatures and corrosion resistance at both normal and elevated temperatures. Also possesses good thermal shock resistance.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with size and shape of the base metal 150°C is appropriate in general .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
0.10 Max	5.0 – 9.50	1.00 Max	0.015 Max	0.030 Max	13.0 - 17.0	59.0 Min	0.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	40 - 60	DC (+)
3.20 X 350	2	10	4.40	22.05	60 - 80	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05		

TOP

ROYAL CAST Fe-2 (E NiCrFe-2)

AWS: SFA 5.11, E NiCrFe-2

Applications

Electrode for all position welding of nickel, inconel,monel ,nickel-iron– chromium alloys HK alloys, stainless And heat resisting steels. For use on equipment and components made of pure nickel, for fabrication of corrosion resistant tank and containers, heat exchangers, furnace components etc.

Characteristics on Usage

The Electrode gives soft stable arc on low currents. Deposits have excellent resistance to scaling at high temperatures and corrosion resistance at both normal and elevated temperatures.

Notes On Usage

- 1) Chip off base metal completely at the repairing part .
- 2) There is possiblity that cracks spreads or makes holes at both ends of repairing part .
- 3) Keep the weld metal length less than 50 mm (2 inch) to disperse welding heat- adopt back steping stone or symmetry method by turns.
- 4) The preheat temprature vary in accordance with size and shape of the base metal 150° C is appropriate in general .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.10 Max	1.0 – 3.50	0.75 Max	0.020 Max	0.030 Max	13.0 - 17.0	62.0 Min	0.5 -2.50	0.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	30 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	2	10	4.40	22.05	40 - 60	DC (+)
3.20 X 350	2	10	4.40	22.05	60 - 80	
4.00 X 350	2	10	4.40	22.05	100 - 140	
5.00 X 350	2	10	4.40	22.05		

ROYAL BRONZE ()

AWS / SFA 5.6 E Cu Sn - A

Applications

Suitable for welding copper and bronze to cast iron steel where colour matching is not essential, bearing bushings, impeller blades valve section.

Characteristics on Usage

It is a 94% copper contain light coated electrode, specially develop for the welding of Copper and Bronze. The weld metal gives 93% copper 6% tin and 0.20% phosphorous for complete deoxidation. Maintain preheat and inter pass temperature from 250 °C to 350 °C during the welding operation on heavy section.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

P%	Cu %
0.35 Max	92.0 – 96.0

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/ 450	2	10	4.40	22.05	50 - 80	DC (+)
3.20 X 350/ 450	2	10	4.40	22.05	80 – 110	
4.00 X 350/ 450	2	10	4.40	22.05	110 – 160	
5.00 X 350/ 450	2	10	4.40	22.05	160 - 200	

ROYAL CUT ()

Applications

For cutting mild steel, austhentic steel, cast iron and alloys.

Characteristics on Usage

This is an extruded coated electrode used for cutting. it is suitable for all positions. no gas cylinders are required.

Welding Positions

1G 2F 3G 4G

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
3.20 X 350/ 450	2	10	11	44	160 - 180	AC/DC (+)
4.00 X 350/ 450	2	10	11	44	200 - 240	
5.00 X 350/ 450	2	10	11	44	260 - 300	

ROYAL THERM MOLY (E 7018 - A1)

AWS : SFA 5.5, E 7018 - A1
IS : E 49 B Al-2-6-Fe

Applications

Suitable for Boilers welding, Pressure Vessels Pipe and Tubes, High Temp. Application upto 525° C

Characteristics on Usage

A low hydrogen, low alloy iron powder type basic coated all position electrode yielding a weld deposit containing 0.50%Mo. The weld metal is of radiographic quality and can withstand service temperature upto 525° C . smooth and weld ripled beads possessing excellent mechanical properties at room and at elevated temperature.

Notes On Usage

- 1) Dry the electrode a 350-400 °C for 60 Min- before use .
- 2) Preheat at 100 - 200 °C & post heat at 620 -680 °C
- 3) Keep the arc as short as possble.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Mo %
0.12 Max	0.90 Max	0.80 Max	0.030 Max	0.030 Max	0.40 - 0.65

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT R. Temp.(27 ± 2)
490 Min	390 Min	22 % Min	50 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 130	
4.00 X 350/450	5	20	11	44	140 – 190	
5.00 X 350/450	5	20	11	44	190 – 240	

ROYAL THERM (Ni) SPL (E 8018 G)

AWS : SFA 5.5, E 8018 G
IS : 1395E 55 BG1Ni26

Applications

Welding of high strength steel, heavy duty structural fabrication, fine grained, Q & T steel, pressure vessels, tanks, Penstocks.

Characteristics on Usage

A basic coated low hydrogen iron powder type electrode. It is used for welding heavy section of fine grained, high strength steel. It's running very smooth and easy slag removable, yielding a weld deposit containing 1.50%Mn and 0.7%Ni. It gives radiographic quality and low temperature service down to minus 60ºC.

Notes On Usage

- 1) Dry the electrodes at 350 -400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because arc stricking on the base metal is in danger of initating cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %	Cu %
0.10 Max	1.00 Min	0.80 Min	0.030 Max	0.030 Max	0.30 Min	0.50 Min	0.20 Min	0.10 Min	0.20 Min

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)	Hydrogen (Mercury method) in 100grm weld metal	Reduction Area %
550 Min	460 Min	19 % Min	40 Joules Min	5 ml (Max)	50 - 80

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	90 – 120	
4.00 X 350/450	5	20	11	44	110 – 150	
5.00 X 350/450	5	20	11	44	150 – 200	

TOP

ROYAL CHROME – 1 (E 8018 - B2)

AWS : SFA 5.5, E 8018-B2
IS : 814E 55 BB226Fe

Applications

Joining of crack resistant steels, low alloy steels. Welding on equipment of Oil refineries, pipeline & high temperature synthetic chemical industries. Electric power plant.

Characteristics on Usage

It is a hydrogen controlled basic iron powder type all position electrode running with smooth & stable arc with easily detachable slag. It is designed for welds of radiographic quality and used in joining creep resistant steel and low alloy steel. The weld metal possess excellent mechanical properties and resistance to cracking caused by heavy stresses or hydrogen . Redry the electrode at 200°C – 250°C for one hr. before welding.

Notes On Usage

- 1) Preheat at 150 - 250 °C and post heat at 690 ± 15 °C.
- 2) Dry the electrode a 350-400 °C for 60 Min- before use .
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.05 - 0.12	0.90 Max	0.80 Max	0.03 Max	0.03 Max	1.0 - 1.50	0.40 - 0.65

Mechanical Properties Of Weld Metal

(After PWHT at 691 ± 14ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Hydrogen (Mercury method) in 100grm weld metal
550 Min	460 Min	19 % Min	5ml Max

Approvals

K.N.P.C.

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-100	AC/DC (+)
3.20X 350/450	5	20	11	44	100-140	
4.00X 350/450	5	20	11	44	140-180	
5.00X 350/450	5	20	11	44	180-230	

ROYAL CHROME – 2 (E 9018 B3)

AWS:SFA 5.5, E 9018 B3
IS : 814E 53 B-B3-26 Fe

Applications

Suitable for welding 2.25% Cr, 1% Mo steels. Low alloy steel boilers and pipeline operation, Repair of high tensile steel castings. Pipelines for oil refinery, power plant at service temperature up to 600 ºC.

Characteristics on Usage

A medium heavy coated low hydrogen iron powder type electrode, welding in all positions. used for welding of similar Cr-Mo steel. Its deposition efficiency is 106% approximately, the weld metal is of radiographic quality and has creep resistance up to 600 ºC. The weld metal gives 2.25% Cr and 1.0% Mo having excellent welding characteristics. Dry the electrode at 300 ºC for obtaining best results.

Notes On Usage

- 1) Preheat at 150 - 250 °C and postheat at 690 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.05- 0.12	0.90 Max	0.80 Max	0.030 Max	0.030 Max	2.0 – 2.50	0.90 – 1.20

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Hydrogen (Mercury method) in 100grm weld metal
620 Min	530 Min	17 % Min	5ml Max

Approvals

K.N.P.C

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-130	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	190-230	

TOP

ROYAL 9018 B3L (E 9018 B3L)

AWS : SFA 5.5, E 9018 B3L
IS : 814E 53 B-B3-26 Fe

Applications

Suitable for welding 2.25% Cr, 1% Mo steels. Low alloy steel boilers and pipeline operation, Repair of high tensile steel castings. Pipelines for oil refinery, power plant at service ,

Characteristics on Usage

A medium heavy coated controlled Carbon, low Hydrogen Iron powder type electrode, welding in all positions. used for welding of similar Cr-Mo steel. Its deposition efficiency is 106% approximately, the weld metal is of radiographic quality and has creep resistance up to 600 ºC. The weld metal gives 2.25% Cr and 1.0% Mo having excellent welding characteristics. Dry the electrode at 300 ºC for obtaining best results.

Notes On Usage

- 1) Preheat at 150 - 250 °C and postheat at 690 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.050 Max	0.90 Max	0.80 Max	0.030 Max	0.030 Max	2.0 – 2.50	0.90 – 1.20

Mechanical Properties Of Weld Metal

(After S.R. at 690 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Creep strength AT 550 ºC	1% offset in 10000 Hrs AT 575 ºC
620 Min	530 Min	17 %	12 Kg/mm2	9.0 Kg/mm2

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 130	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	190 – 230	

TOP

ROYAL CHROME – 5 (E 8018 B6)

AWS : SFA 5.5, E 8018 B6
IS : E41 BB626 Fe

Applications

It is used for welding of 5% Cr, 0.5% Mo steel for high temp application in oil refineries. Power plants, Petrochemical plants. Fertilizer Industries.

Characteristics on Usage

A low hydrogen iron powder type basic coated all position electrode. It gives weld deposit which has contain 5% Cr, 0.5% Mo for the welding of similar Cr-Mo steel. The weld metal is of radiographic quality and has creep resistance upto 650 ºC. Dry the electrode at 300 ºC for obtaining best results.

Notes On Usage

- 1) Preheat at 150 - 250 °C and postheat at 690 ± 14 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.05 – 0.09	0.50 – 0.90	0.25 – 0.50	0.030 Max	0.030 Max	4.0 – 6.0	0.45 – 0.65

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	460 Min	19 % Min

Approvals

K.N.P.C.

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60-90	DC (+)
3.20 X 450	5	20	11	44	100-140	
4.00 X 450	5	20	11	44	140-180	
5.00 X 450	5	20	11	44	190-240	

ROYAL CHROME – 9 (E 8018 B8)

AWS : SFA 5.5, E 8018 B8

Applications

It is used for welding of 9% Cr, plates, pipes, tubes It is also used for welding of 7 to 10% Cr, 1% Mo steels , for general corrosion and heat resistance application, Surfacing of turbine Blades, Valve, Seats, Pump parts etc.,

Characteristics on Usage

A heavy coated low hydrogen electrode specially developed for welding of Ferritic, Martensitic chrome steels. It gives weld deposit which has contain 9% Cr, 1% Mo having excellent creep strength upto 625 ºC and resistance to oxidising atmosphere upto 700 ºC. Proper preheating and post heating is required for welds made with these electrodes. The weld deposit gives radiographic quality of welds. Dry the electrode at 300 ºC before welding to obtain best results.

Notes On Usage

- 1) Preheat at 150 - 250 °C and postheat at 740 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.05 – 0.10	1.0 Max	0.90 Max	0.030 Max	0.030 Max	8.0 – 10.50	0.40 Max	0.85 – 1.20

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	460 Min	19 % Min

Approvals

K.N.P.C.

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

Packing

Vaccum Pack

ROYAL (Ni) CHROME (E 10016 G)

AWS : SFA 5.5, E 10016 G
IS : E 68BG126

Applications

It is used for welding earth moving equipment's. Steam turbine, rotors of chemical plants. Heavy machinery parts made of high tensile steel. Automotive parts and armour steel of Ni-Cr-Mo based.

Characteristics on Usage

It is a hydrogen controlled medium heavy coated all position electrode. It has better creep resistance properties as well as corrosion resistance properties. It gives weld deposit which contain 1% of Cr & 2.5% of Ni. The weld metal is of radiographic quality and possess excellent strength combined with good toughness. This electrode is used for welding of high tensile, low alloy steels, which contains Ni-Cr-Mo types. Therefore, it is used in Chemical plants, especially for the welding of steam turbine, rotors etc. Redry the electrodes at 300 °C about an hour for better results

Notes On Usage

- 1) Dry the electrode at 350-400 °C for 60 Min- before use.
- 2) Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose.
- 3) Preheat at 100 - 150 °C The temp. varies in accordance with plate thikness and kind of steel.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.10 Max	1.00 Min	0.20 – 0.50	0.030 Max	0.030 Max	0.8 – 1.20	2.20 – 2.80	0.60– 0.90

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT R. Temp.(27 ± 2)
690 Min	600 Min	16 % Min	50 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100– 130	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

TOP

ROYAL THERM - 100M (E 10018M)

SFA 5.5 AWS E 10018M
IS : E68BM229Fe

Applications

Welding of high tensile steel such as USS – T - 1. Welding of Penstocks, Earth moving equipment's. Heavy duty structural steel, fabrication for High Tensile Steel.

Characteristics on Usage

It is a medium heavy basic coated low hydrogen, low alloy iron powder type electrode, used for welding high tensile fully killed fine grained steel. The electrode has excellent welding characteristics and operates in all position. It gives radiographic quality of welds with easily removable slag and has good notch toughness down to minus 50 °C. It's deposition efficiency is approximately 112%, dry the electrode at 350 °C for 2 hours to obtain good results.

Notes On Usage

- 1) Dry the electrode at 350-450 °C for 60 Min- before use.
- 2) Preheat at 200 - 300 °C
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.10 Max	0.75 – 1.70	0.60 Max	0.03 Max	0.03 Max	0.35 Max	1.40 – 2.10	0.25 – 0.50	0.05 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 ° C (J)
690 Min	600 Min	16 % Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	80 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 - 230	

TOP

ROYAL THERM - 110M (E 11018M)

SFA 5.5 AWS E 11018M
IS : 814E 76BM329Fe

Applications

Welding of Penstocks, Earth moving equipments, Heavy duty structure made from high tensile steel. Petrochemicals Tanks & Vessels.

Characteristics on Usage

A basic coated low hydrogen iron powder type electrode used for welding high strength steel. the electrode is operating in all position and has excellent welding characteristics. the weld metal is of radiographic quality and possesses high strength combined with excellent toughness at sub Zero temperature. it is used for welding high tensile fine grained steel.

Notes On Usage

- 1) Dry the electrodes t 350 -400ºC for 60 minutes befor use
- 2) Preheat at 150 - 200 ºC
- 3) Keep toe are as short as possible

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.10 Max	1.30 -1.80	0.60 Max	0.030 Max	0.030 Max	0.40 Max	1.25 - 250	0.25 – 0.50	0.050 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
760 Min	680 Min	20 % Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	
6.30 X 350/450	5	20	11	44	230 – 280	

TOP

ROYAL 7018 G (E 7018 G)

AWS : SFA 5.5, E 7018 G

Applications

Welding of high strength steel, heavy duty structural fabrication, fine grained, Q & T steel, pressure vessels, tanks, Penstocks.

Characteristics on Usage

A basic coated low hydrogen iron powder type electrode. it is used for welding heavy section of fine grained, high strength steel. It's running very smooth and easy slag removable, yielding a weld deposit containing 1.50%Mn and 0.7%Ni. it gives radiographic quality and low temperature service down to minus 60ºC.

Notes On Usage

- 1) Dry the electrodes at 350 -400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because ar stricking o the base metal is in danger of initing cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %
0.090 Max	1.60 Max	0.30 Max	0.030 Max	0.030 Max	1.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)	Hydrogen (Mercury method) in 100grm weld metal
520 Mn	450 Min	22 % MIn	40 Joules Min	5 ml (Max)

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/400	5	20	11	44	70 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	90 – 120	
4.00 X 350/450	5	20	11	44	110 – 150	
5.00 X 350/450	5	20	11	44	150 – 200	

ROYAL 8018 C1 (E 8018 C1)

AWS : SFA 5.5, E 8018-C 1

Applications

It is used for welding of nickel alloy piping, System valves and tanks. Used for welding low temperature service for Locomotive main frames, Refineries, Pipelines.

Characteristics on Usage

A medium heavy coated low hydrogen iron powder type electrodes, the weld metal deposits 2.5% Ni in the weld metal. It is specially designed for welding fine grained steel, nickel alloy steel . It gives high ductility, toughness and resistance to the service temperature at minus 59 C. The electrode gives smooth arc with medium penetration and negligible spatter. It is all position electrodes with Radiographic quality of weld deposit. Dry the electrode at 250 C for 1 hour before using.

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C
- 2) Preheat at 80 - 100°C
- 3) Keep the arc as short as possible .

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %
0.12 Max	1.25 Max	0.80 Max	0.030 Max	0.030 Max	2.0 - 2.75

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (C.V.N.) AT - 60 °C (J)
550 Min	460 Min	20 % Min	27 Joules Min

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-250	

ROYAL 8016 C2 L (E 8016 C2L)

AWS : SFA 5.5, E 8016-C2L

Applications

It is used for welding of nickel alloy equipments. Fabrication of pressure vessels, piping system, valves and tanks. Used for welding low temperature service for Locomotive main frames, Refineries, Pipe lines.

Characteristics on Usage

A medium heavy coated low hydrogen type electrode, the weld metal deposits 3.5%Ni in the weld metal. It is specially designed for welding fine grained steel, nickel steel and nickel alloy steel. It gives high ductility, toughness and resistance to the service temperature at minus 80° C. The electrode gives smooth arc with medium penetration and negligible spatter. It is all position electrode with radiographic quality of weld deposit. Dry the electrode at 250° C for 1 hour before using.

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C
- 2) Keep the arc as short as possible

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %
0.050 Max	1.25 Max	0.60 Max	0.030 Max	0.030 Max	3.0 - 3.75

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (C.V.N) AT - 75 °C (J)
560 Min	470 Min	20 % Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 250	

ROYAL 8018 C2 (E 8018 C2)

AWS : SFA 5.5, E 8018-C2
IS : 814E 55 BC22gFe

Applications

It is used for welding of nickel alloy equipments. Fabrication of pressure vessels, piping system, valves and tanks. Used for welding low temperature service for

Characteristics on Usage

A medium heavy coated low hydrogen iron powder type electrode, the weld metal deposits 3.5%Ni in the weld metal. It is specially designed for welding fine grained steel, nickel steel and nickel alloy steel. It gives high ductility, toughness and resistance to the service temperature at minus 80° C. The electrode gives smooth arc with medium penetration and negligible spatter. It is all position electrode with radiographic quality of weld deposit. Dry the electrode at 250° C for 1 hour before using.

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because ar stricking o the base metal is in danger of initing cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %
0.12 Max	1.25 Max	0.80 Max	0.030 Max	0.030 Max	3.0 - 3.75

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (C.V.N) AT - 75 °C (J)
550 Min	460 Min	19% Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 250	

ROYAL 8018 B1 (E 8018-B1)

AWS : SFA 5.5, E 8018-B1

Applications

Joining of crack resistant steels, low alloy steels. Welding on equipment of Oil refineries, pipeline & high temperature synthetic chemical industries. Electric power plant.

Characteristics on Usage

It is a hydrogen controlled basic iron powder type all position electrode running with smooth & stable arc with easily detachable slag. It is designed for welds of radiographic quality and used in joining creep resistant steel and low alloy steel. The weld metal possess excellent mechanical properties and resistance to cracking caused by heavy stresses or hydrogen .

Notes On Usage

- 1) Preheat at 150 - 300 °C and post heat at 690 ± 15 °C.
- 2) Dry the electrode a 350-400 °C for 60 Min- before use .
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.05 - 0.12	0.90 Max	0.80 Max	0.03 Max	0.03 Max	0.40 – 0.65	0.40 - 0.65

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Hydrogen content in 100 gm weld metal
550 Min	460 Min	19 % Min	5ml Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

TOP

ROYAL 8018 BL (E 8018 BL)

AWS : SFA 5.5, E 8018 BL
IS : 1395E 55 B-B3-26 Fe

Applications

Suitable for welding 2.25% Cr, 1% Mo steels. Low alloy steel boiler and pipelines operation Repair of high tensile steel castings. Pipelines for oil refinery, power plant at service

Characteristics on Usage

A medium heavy coated controlled Carbon, low Hydrogen Iron powder type electrodes, welding in all position used for welding of similar Cr-Mo steel. Its deposition efficiency is 106% approximately, the weld metal is of radiographic quality and has creep resistance up to 600°C The weld metal gives 2.25% Cr and 1.0% Mo having excellent welding characteristics. Dry the

Notes On Usage

- 1) Preheat at 200 - 350 °C and postheat at 690 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.050Max	0.90 Max	0.80 Max	0.030 Max	0.030 Max	2.0-2.50	0.90-1.20

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Creep strength AT 550 ºC	1% offset in 10000 Hrs AT 575 ºC
550 Min	460 Min	17 % Min	12 Kg/mm2	9.0Kg/mm2

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-130	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	190-230	

ROYAL 8015 B8 (E 8015 B8)

AWS : SFA 5.5, E 8015 B8

Applications

It is used for welding of 9% Cr, plates, pipe, tubes. It is also used for welding of 7 to 10% Cr, 1% Mo steel for general corrosion and heat resistance application. Surfacing of turbine Blades, Valve, Seats

Characteristics on Usage

A basic coated medium alloy low hydrogen electrode specially developed for welding of Ferritic, Martensitic chrome steels. It gives weld deposit which has contain 9% Cr, 1% Mo having excellent creep strength upto 625°C and resistance to oxidizing atmosphere upto 700°C. Proper preheating and post heating is required for weld made with these electrodes. The weld deposit gives radiographic quality of welds. Dry the electrodes at 300°C before welding to obtain best results.

Notes On Usage

- 1) Preheat at 200 - 350 °C and postheat at 740 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.05 -0.10	1.00 Max	0.90 Max	0.030 Max	0.030 Max	8.0 – 10.50	0.40 Max	0.85 – 1.20

Mechanical Properties Of Weld Metal

(After PWHT at 740 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
550 Min	460 Min	19 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60 – 90	DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

Packing

Vaccum packing

ROYAL 8016 G (E 8016 G)

AWS : SFA 5.5, E 8016 G

Applications

Welding of high strength steel, heavy duty structural fabrication, fine grained, Q & T steel, pressure vessels, tanks, Penstocks.

Characteristics on Usage

A basic coated low hydrogen type electrode. it is used for welding heavy section of fine grained, high strength steel. It's running very smooth and easy slag removable, yielding a weld deposit containing 1.50%Mn and 0.7%Ni. it gives radiographic quality and low temperature service down to minus 60ºC.

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because ar stricking o the base metal is in danger of initing cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %
0.090 Max	1.60 Max	0.30 Max	0.030 Max	0.030 Max	1.0 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)	Hydrogen (Mercury method) in 100grm weld metal
570 Min	470 Min	19 % Min	40 Joules Min	5 ml (Max)

Approvals

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	90 – 120	
4.00 X 350/450	5	20	11	44	110 – 150	
5.00 X 350/450	5	20	11	44	150 – 200	

ROYAL 8018 W (E 8018 W)

AWS : A/SFA 5.5, E 8018 W

Applications

Ideal for welding high tensile steel. Specially recommended for weathering steel like CORTEN A and B and their equivalents used in Chemical, Petrochemical, Railway, Industries to resist atmospheric corrosion.

Characteristics on Usage

It is basic coated hydrogen controlled low alloy high tensile type electrode gives weld deposit of approx 0.6% Cr, 0.70% Ni and 0.50% Cu. which is highly resistance of atmospheric Corrosion. It gives a smooth arc medium penetration with easily removable slag. Easy to operate in all positions. Redry electrode at 250°C 2 hour for better results.

Notes On Usage

- 1) Dry the electrode a 250-350 °C for 60 Min- before use .
- 2) Keep the arc as short as possible.
-

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
0.12 Max	0.50-1.30	0.35-0.80	0.030 Max	0.030 Max	0.45-0.70	0.40-0.80	0.30-0.75

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Weld deposit Hardness as welded condition	Diffusible Hydrogen contain in 100-grm weld metal deposit	CVN IMPACT AT - 20°C (J)
550 Min	460 Min	19 % Min	190 – 200 HV	5 ml Max	47 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	60 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 250	
6.30 X 350/450	5	20	11	44	250 - 300	

ROYAL MOLY THERM - SPL (E 8018 D3)

AWS : SFA 5.5, E 8018 D3

Applications

For welding 0.9% N & 0.5 Mo steel boiler tubes & boiler Plates etc.

Suitable for welding of manganese molly steel. Low alloy high tensile

Characteristics on Usage

It is a medium heavy coated Hydrogen Controlled iron powder type all position electrodes deposit low alloy steel weld metal having 0.90% Ni & 0.50% Mo. Gives smooth arc, little spatter & easily removable slag. Specially suitable for the welding of Manganese molly steel and similar composition. The weld is of radiographic quality. Redry electrodes at 250o C for one hour for better result.

Notes On Usage

- 1) Dry the electrode a 350-400 °C for 60 Min- before use .
- 2) Preheat at 100 - 200 °C & post heat at 620 ± 15 °C
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Mo %
0.12 Max	1.0-1.75	0.80	0.030 Max	0.030 Max	0.90 Max	0.25-0.45

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 ° C (J)
560 – 660	460 – 570	19 %	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 90	AC / DC (+)
3.20 X 350/450	5	20	11	44	90 – 130	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 220	

ROYAL 9018 G (E 9018 G)

AWS : SFA 5.5, E 9018 G
IS : 1395E 63 BG 129 Fe

Applications

Welding of grain refined steels. Q&T steel, HSLA steel, structural fabrication, Penstocks, Tanks, pressure vessels.

Characteristics on Usage

A heavy coated low hydrogen iron powder type electrode. welding in all positions. used for welding steel having high tensile strength upto 70 Kg/mm2 as well as low alloy structural steel. the weld metal is of radiographic quality having excellent welding characteristics like crack resistant with good toughness down to minus 50ºC.

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because arc stricking on the base metal is in danger of ininting cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Mo %
0.070 Max	1.70 Max	0.80 Max	0.030 Max	0.030 Max	1.40 Max	0.50

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 51 °C (J)
620 Min	530 Min	20 % Min	40 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-100	AC/DC (+)
3.20X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-230	

TOP

ROYAL 9018 M (E 9018 M)

AWS : SFA 5.5, E 9018M
IS : 1395E 63 BG129Fe

Applications

Welding of grain refined steels. Q&T steel, HSLA steel, and ASTM A615 Grade 60 steel, structural fabrication, Penstocks, Tanks, pressure vessels.

Characteristics on Usage

A heavy coated low hydrogen iron powder type electrodes , welding in all positions used for welding steel having high tensile strength upto 70 Kg/mm2 as well as low alloy structural steel. The weld is of radiographic like quality having excellent welding characteristics like crack

Notes On Usage

- 1) Dry the electrodes at 350 - 400°C for 60 min before use.
- 2) Keep the arc as short as possible .
- 3) Adopt back step method or strike the arc on a small plate prepared for this particular purpose because arc stricking on the base metal is in danger of initing cracking.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.10 Max	0.60-1.25	0.80 Max	0.030 Max	0.030 Max	0.15 max	1.40-1.80	0.35

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 ° C (J)	HARDNESS
620 Min	540 Min	24 % Min	27 Joules Min	200 BHN Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-100	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-230	

ROYAL 9018 D (E 9018 - D1)

AWS: SFA 5.5, E 9018 -D1
IS: 1395: E 63BD 1241

Applications

Welding of grain refined steels. Q&T steel, HSLA steel, structural fabrication, Penstocks, Tanks, pressure vessels.

Characteristics on Usage

A heavy coated low hydrogen iron powder type electrode. welding in all positions. Used for welding steel having high tensile strength upto 70 Kg/mm2 as well as low alloy structural steel. the weld metal is of radiographic quality having excellent welding characteristics like crack resistant with good toughness down to minus 50ºC.

Notes On Usage

- 1) Dry the electrode at 350-400 °C for 60 Min- before use .
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Mo %
0.12 Max	1.0- 1.75	0.80 Max	0.030 Max	0.030 Max	0.90 Max	0.25 – 0.45

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
620 Min	530 Min	22 % Min	50 Joules

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

ROYAL THERM - 90D (E 9018 – D3)

AWS: SFA 5.5, E 9018 –D3
IS: 1395: E 63BD 1241

Applications

Welding of grain refined steels. Q&T steel, HSLA steel, structural fabrication, Penstocks, Tanks, pressure vessels.

Characteristics on Usage

A heavy coated low hydrogen iron powder type electrode. Welding in all positions. Used for welding steel having high tensile strength upto 70 Kg/mm2 as well as low alloy structural steel. The weld metal is of radiographic quality having excellent welding characteristics like crack resistant with good toughness down to minus 50ºC.

Notes On Usage

- 1) Dry the electrode a 350-400 °C for 60 Min- before use .
- 2) Preheat at 100 - 200 °C & post heat at 620 ± 15°C
- 3) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Ni %	Mo %
0.12 Max	1.0- 1.80	0.80 Max	0.030 Max	0.030 Max	0.90 Max	0.40 – 0.65

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
620 Min	530 Min	22 % Min	50 Joules

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70 – 100	AC / DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

ROYAL CHROME – 9 (SPL) (E 9015 B9)

AWS : SFA 5.5, E 9015 B9

Applications

It is used for welding of 9% Cr, plates, pipes, tubes. It is also used for welding of 7 to 10% Cr, 1% Mo steel for general corrosion and heat resistance application. Surfacing of turbine Blades, Valve, Seats, Pump parts etc. A 213- T9 Tube , A335- P9 Pipe , P11&,A387

Characteristics on Usage

A heavy coated low hydrogen electrode specially developed for welding of Ferritic, Martensitic chrome steels. It gives weld deposit which has contain 9% Cr, 1% Mo modified Nb/ V to provide improved creep strength, toughness, fatigue life & oxidation , orrosion resistance at elevated temperature. Proper preheating and post heating is required for weld made with these electrodes. The weld deposit gives radiographic quality of welds.Dry the electrodes at 300°C before welding to obtain best results.

Notes On Usage

- 1) Preheat at 150 - 250 °C and postheat at 740 ± 15 °C.
- 2) Dry the electrode at 350-400 °C for 60 Min- before use.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.080 – 0.13	1.20 Max	0.30 Max	0.030 Max	0.030 Max	8.0 – 10.50	0.80 Max	0.85 – 1.20

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
620 Min	530 Min	17 % Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60 – 90	DC (+)
3.20 X 350/450	5	20	11	44	100 – 140	
4.00 X 350/450	5	20	11	44	140 – 180	
5.00 X 350/450	5	20	11	44	180 – 230	

Packing

Vaccum pack

ROYAL 8018C3 ()

AWS : SFA 5.5, E 8018-C 3

Applications

It is used for welding of nickel alloy equipments. Fabrication of pressure vessels, piping system, valves and tanks. Used for welding low temperature service for Locomotive main frames, Refineries, Pipe lines.

Characteristics on Usage

A medium heavy coated low hydrogen iron powder type electrodes, the weld metal deposits 1.0% Ni in the weld metal. It is specially designed for welding fine grained steel, nickel steel and nickel alloy steel . It gives high ductility, toughness and resistance to the service temperature at minus 40 C. The electrode gives smooth arc with medium penetration and negligible spatter. It is all position electrodes with Radiographic quality of weld deposit.

Notes On Usage

- 1) Dry the electrode at 250 C for 1 hour before using.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.12 Max	0.40 - 1.25	0.80 Max	0.030 Max	0.030 Max	0.15 Max	0.80 - 1.10	0.35 Max	0.05 Max.

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
550 Min	470 Min	24 % Min	27 Joules Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350/450	5	20	11	44	60-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-250	

ROYAL 7018 B2 (E 7018 B2)

AWS : SFA 5.5, E 7018 B2

Applications

Suitable for joining of crack resistant steel, Low alloy steel. It is used for welding of pipelines in oil refineries, high temp. synthetic chemical industries, Electric power plant, Steam pipes of boiler tubes super heaters etc.

Characteristics on Usage

It is a low carbon hydrogen controlled basic coated iron powder type electrode operates in all position. It gives smooth and stable arc with easily removable slag. It gives low carbon content 1.20% Cr adn 0.50% Mo type weld deposit with radiographic quality. The weld metal possesses excellent mechanicla properties and resistance to cracking caused by heavy stresses of hydrogen.

Notes On Usage

- 1) Redry electrode at 250 °C for 2 hours.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.12 Max	0.90 Max	0.80 Max	0.030 Max	0.030 Max	1.0 - 1.50	0.40 - 0.65

Mechanical Properties Of Weld Metal

(After P.W.H.T. at 690 ± 15ºC for 1 Hr soaking period)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
520 Min	390 Min	19 Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-230	

ROYAL 7018 C3L (E 7018 C3L)

AWS : SFA 5.5, E 7018 C3L

Applications

It is used for welding of nickel alloy piping, system valves and tanks. Used for welding low temperature service for Locomotive main frames, Refineries, Pipelines, Equipments, fabrication of pressure vessels.

Characteristics on Usage

A medium heavy coated low hydrogen iron powder type electrodes. the weld metal deposits 1.0 % Ni in the weld metal. It is specially designed for welding fine grained steel, nickel alloy steel. It gives high ductility, toughness and resistance to the service temperature at minus 50 °C

Notes On Usage

- 1) Dry the electrode at 250 °C for 60 Min- before use .
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %
0.08 Max	0.40 - 1.40	0.50 Max	0.030 Max	0.030 Max	0.15 Max	0.80 - 1.10	0.35 Max	0.05 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
490 Min	390 Min	22 Min	27 Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50X350	5	20	11	44	60-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-250	

ROYAL 7015 B2L (AWS:SFA 5.5, E 7015 B2L)

AWS : SFA 5.5, E 7015 B2L

Applications

Suitable for joining of crack resistant steel, Low alloy steel. It is used for welding of pipelines in oil refineries, high temp. synthetic chemical industries, Electric power plant, Steam pipes of boiler tubes super heaters etc.

Characteristics on Usage

It is a low carbon hydrogen controlled basic coated iron powder type electrode operates in all position. It gives smooth and stable arc with easily removable slag. It gives low carbon content 1.20% Cr adn 0.50% Mo type weld deposit with radiographic quality. the weld metal possesses excellent mechanicla properties and resistance to cracking caused by heavy stresses of hydrogen.

Notes On Usage

- 1) Redry electrode at 250 °C for 2 hours.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.050 Max	0.90 Max	1.0 Max	0.030 Max	0.030 Max	1.0 - 1.50	0.40 - 0.65

Mechanical Properties Of Weld Metal

(After P.W.H.T. at 690 ± 15ºC for 1 Hr soaking period)

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
520 Min	390 Min	19 Min

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-90	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-230	

ROYAL 8016 B2 (E 8016 B2)

AWS : SFA 5.5, E 8016 B2

Applications

Suitable for joining of crack resistant steel, Low alloy steel. Welding on equipment of Oil Refineries, pipeline & high temperature synthetic chemical industries, Electric power plant , Steam pipes of Boilers, Tubes, Super heaters.

Characteristics on Usage

It is hydrogen controlled basic iron powder type all position electrode running with smooth & stable arc with easily detachable slag. It is designed for welds of radiographic quality and used in joining creep resistant steel and low alloy steel. The weld metal possess excellent mechanical properties and resistance to cracking caused by heavy stresses or hydrogen.

Notes On Usage

- 1) Redry electrode at 200-250 °C for one hours before welding.
- 2) Keep the arc as short as possible.

Welding Positions

1G 2F 3G 4G 5G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Mo %
0.05-0.12	0.90 Max	0.80 Max	0.030 Max	0.030 Max	1.0-1.50	0.40-0.65

Mechanical Properties Of Weld Metal

(After P.W.H.T. at 690 ± 15ºC for 1 Hr soaking period)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	Hydrogen (Mercury method) in 100grm weld metal
550 Min	460 Min	19 Min	5 ml Max

Packing and Welding Current

SIZE (mm)	KG PER PACKET	KG PER CARTON	LBS PER PACKET	LBS PER CARTON	In Amps	Current (Amps)
2.50 X 350	5	20	11	44	70-100	AC/DC (+)
3.20 X 350/450	5	20	11	44	100-140	
4.00 X 350/450	5	20	11	44	140-180	
5.00 X 350/450	5	20	11	44	180-230	

ROYAL 7018 B2L (E 7018 B2L)

ROYALFIL GS 11 R (E70T-1C)

AWS A / SFA 5.20 E70T-1C

Applications

Royalfil GS-11R is for mass production in a wide range in mild and low alloy steels. Suitable for joining steels conforming to ASTM SA-36/SA-36M and A, B, C, D grades of SA-283 / SA-283M. Examples:- Fabrication in chemical plant machinery structures & Steel frames in ship building, heavy bridges & towers.

Characteristics on Usage

Royalfil GS-11R is Rutile flux cored wire designed for optimum performance in flat and horizontal positions when using CO2 shielding. The slag coverage is complete and designed for easy removal with fewer fumes, minimal spatter in flat and horizontal positions. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%
Typical Values	0.05	1.25	0.38	0.010	0.018
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	550	470	26	60
Spec. Reqd.	490 - 670	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. Vaccum Packed Plastic Spool.

ROYALFIL GS 12 R (E71T-1C)

AWS A / SFA 5.20 E71T-1C

Applications

Royalfil GS-12R is designed for all position single and multipass welding of low and medium carbon steels. Suitable for joining steels conforming to ASTM SA-36 /SA-36M and A,B,C,D grades of SA-283 / SA-283M & SA-414 / SA-414M.(P.No.1) e.g. Fabrication in chemical plant machinery structures & Steel frames in ship building, heavy bridges & towers.

Characteristics on Usage

Royalfil GS-12R is an all position Rutile flux cored wire designed for optimum performance when using CO2 shielding. The smooth metal transfer facilitates easy deposition of vertical-up stringer beads. The slag coverage is complete and designed for easy removal. Weld metal is consistently free of inclusions and porosity for X-ray soundness. This wire is formulated to produce fewer fumes, minimal spatter.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%
Typical Values	0.05	1.25	0.38	0.010	0.018
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	550	470	26	60
Spec. Reqd.	490-670	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

ABS/ DNV/ GL

Packing

15 kgs. Vaccum Packed Plastic Spool.

ROYALFIL GS 12 ESR (E71T-12MJ)

AWS A / SFA 5.20 E71T-12 MJ

Applications

It is used for all position single and multipass welding of tank, pressure vessels where stress relieving is necessary. This wire is especially useful in welding of nozzle neck of carbon steel, pressure vessel, where low temp. service is required.

Characteristics on Usage

Royalfil GS-12ESR is a Titania base all position flux core welding wire designed for optimum performance when using 80% Ar + 20% CO2 shield. It gives smooth metal transfer with excellent flat bead, least spatter and easy slag removal. The weld deposits content 0.5 % Ni while retaining excellent impact properties at low temp. service even after stress relieving. Weld metal is of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
As Welded*	0.052	1.38	0.48	0.006	0.015	0.42
StressRelieved* (620±10° C for 3Hrs.)	0.048	1.42	0.48	0.007	0.014	0.44
StressRelieved (620±10° C for 8 Hrs.)	0.046	1.34	0.46	0.009	0.016	0.42
Spec Reqd.	0.12 Max	1.60 Max	0.90 Max	0.030 Max	0.030 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
As welded*	590	520	26	70
Stress relieved*(620 ± 10°C for 3 Hrs.)	560	470	30	75
Stress relieved(620 ± 10°C for 8 Hrs.)	520	420	28	65
Spec.Reqd.	490-620	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

TOP

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 12 H4R (E71T-1C H4)

AWS A / SFA 5.20 E71T-1C H4

Applications

Royalfil GS -12H4R is designed for all position single and multipass welding of low and medium carbon steels. Suitable for joining steels conforming to ASTM SA-36 /SA-36M and A,B,C,D grades of SA-283 / SA-283M & SA-414 / SA-414M.(P.No.1) e.g. Fabrication in chemical plant machinery structures & Steel frames in ship building, heavy bridges & towers.

Characteristics on Usage

Royalfil GS-12H4R is low hydrogen all position Rutile flux cored wire designed for optimum performance when using CO2 shield. The smooth metal transfer facilitates easy deposition of vertical-up stringer beads. The slag coverage is complete and designed for easy removal. Weld metal is consistently free of inclusions and porosity for X-ray soundness. This wire is formulated to produce fewer fumes, minimal spatter.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%
Typical Values	0.05	1.25	0.38	0.010	0.018
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	550	470	27	60
Spec. Reqd.	490-670	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS T9R (E71T-9C)

AWS A /SFA 5.20 E71T-9C

Applications

Used for fabrication in chemical plant machinery structures & steel fabrication in ship building, heavy bridges, towers. earth moving equipments etc

Characteristics on Usage

Royalfil GS-T9R is all position Rutile flux cored wire having ability to produce higher deposition rates using CO2 shielding. Weld metal is consistently free of inclusions, porosity & is of radiographic quality. The wire is formulated to produce less fumes & minimum spatters. Slag coverage is complete & gets removed very easily. Designed for single pass & multiple pass welding of low & medium carbon steels with improved impact properties. Meets the new AWS A 5.20 'D' designation requirements.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.045	1.25	0.40	0.010	0.018	0.40
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.5 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	580	490	26	60
Spec. Reqd.	490-670	390 min	22 min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL DUAL T9R (E71T-9C / E71T-9M)

AWS A / SFA 5.20 E71T-9C / E 71T-9M

Applications

Used for fabrication in chemical plant machinery structures & steel fabrication in ship building, heavy bridges, towers. earth moving equipments etc.

Characteristics on Usage

RoyalFil Dual T9R is all position flux cored wire having ability to produce higher deposition rates using CO2 or Ar+CO2 shielding. Weld metal is consistently free of inclusions, porosity & is of radiographic quality. The wire is formulated to produce less fumes & minimum spatters. Slag coverage is complete & gets removed very easily. Designed for single pass & multiple pass welding of low & medium carbon steels with improved impact properties. Meets the new AWS A 5.20 'D' designation requirements.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values *	0.045	1.25	0.40	0.010	0.018	0.40
Spec. Reqd. *	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.50 Max
Typical Values **	0.055	1.55	0.50	0.010	0.018	0.40
Spec. Reqd.**	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.50 Max

Mechanical Properties Of Weld Metal

Typical Values * Under CO2 Shield; ** 80% Argon + 20% CO2 Shield

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values*	580	490	26	60
Spec. Reqd.*	490- 670	390 Min	22 Min	27 Min
TypicalValues **	600	515	26	80
Spec. Reqd.**	490-670	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. plastic spool.

TOP

ROYALFIL GS T12 R (E71T-12 C)

AWS A / SFA 5.20 E71T-12 C

Applications

RoyalFil GS- T12 R is suitable for single and multipass welding of oil and gas constructions, pipe and offshore constructions where low temperature service is required.

Characteristics on Usage

RoyalFil GS-T12R is Rutile base flux cored wire for all position optimum performance when using with CO2 shielding. Metal transfer is smooth, slag coverage is complete and easy removal. Weld metal is consistently free from inclusions and porosity for X ray soundness. Weld deposit is with 0.5 % Ni toimprove impact toughness at low temperature service down to – 30 °C even after stress is relieving . The wire is formulated to produce fewer fumes, minimum spatter. Weld metal with 0.5 % Ni. Max and 1.60 % Mn. Max. conforms to the A- no.1 analysis group in the ASME boiler and pressure vessel code, section IX

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.05	1.25	0.40	0.010	0.018	0.40
Spec. Reqd.	0.12 Max	1.60 Max	0.90 Max	0.030 Max	0.030 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	550	470	26	60
Spec. Reqd.	490-620	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 15 RB (E71T-5 C)

AWS A / SFA 5.20 E71T - 5C

Applications

Royalfil GS-15RB is designed for all position single and multipass welding of low and medium carbon steels. Suitable for joining steels conforming to ASTM SA-525-70, and C grades of SA-285, IS: 2002-2A & 2B IS2062, IS226 & DIN 17155 HIV e.g. Construction of bridges, Pressure vessel & Offshore structures.

Characteristics on Usage

Royalfil GS-15RB is an all position basic type flux cored wire-having stable and smooth arc with good slag detachability using CO_2 shield. The slag coverage is complete and easy to remove. Weld metal is consistently free of inclusions and porosity for radiography soundness. This wire is formulated to have high resistance to cracking with fewer fumes & minimal spatter.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.050	1.25	0.45	0.010	0.018	0.40
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	550	470	26	60
Spec. Reqd.	490-670	390 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

IBR

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 31 RB (E70T-5 C)

AWS A / SFA 5.20 E70T-5 C

Applications

Royalfil GS-31RB is designed for single and multipass welding of low and medium carbon steels. Suitable for joining steels conforming to ASTM Grade C,D,E OF SA-414 /SA-414M, (P.No.1) Typical application includes steel plant equipments, heavy machinery etc.

Characteristics on Usage

Royalfil GS-31RB is basic type flux cored wire for flat & horizontal welding with CO2 shielding. The slag coverage is complete and easy to remove. Weld metal is consistently free of inclusions and porosity for X-ray soundness. This wire is formulated to produce fewer fumes, minimal spatter.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.05	1.41	0.40	0.010	0.018	0.30
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	550	470	26	60
Spec. Reqd.	480 Min	400 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 15B-A1 (E71T5-A1 C)

AWS A / SFA 5.29 E71T5 - A1 C

Applications

Suitable for single & multiple pass welding using DCEP polarity. It is used for welding of similar composition of MO steels & other creep resistant steels with Co2 shielding .Commonly used in steam power plants, marine, chemical plants & refineries.

Characteristics on Usage

RoyalFil GS 15B - A1 is Basic type low alloy steel all position welding wire with less spatter, smooth & stable arc, with good penetration & easily removable thin slag. Weld metal is of radiographic quality with low temp. toughness as down to -30°C.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Mo %
Typical Values	0.050	1.00	0.45	0.010	0.018	0.50
Spec. Reqd.	0.12 Max	1.25 Max	0.80 Max	0.030 Max	0.030 Max	0.4 –0.65

Mechanical Properties Of Weld Metal

(After PWHT at 620ºC for 1 Hr)

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	550	460	25	50
Spec. Reqd.	490 - 620	400 Min	20 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 16 R (E81T1-Ni1 C)

AWS A / SFA 5.29 E81T1-Ni1 C

Applications

Royalfil-GS-16R fcw wire have been designed to produce weld metal with increase strength (without being air hardenable) & with increase notch toughness at low temperature. This Nickel steel weld metal can be used without PWHT.Often used in structural applications where excellent toughness is required. For e.g. Construction machineries, Structural bridges & storage tanks. Ideal for welding quenched & tempered steels of HY 80 type.

Characteristics on Usage

Royalfil GS-16 R is Rutile base gas shielded flux cored wire welding for all position welding with Co2 shielding gas depositing radiographic quality metal. Arc is smooth & stable with low spatter and good bead appearance. Slag coverage is complete and easy removal.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %	Mo %
Typical Values	0.045	1.40	0.55	0.007	0.017	1.00	0.28
Spec. Reqd.	0.12 Max	1.50 Max	0.80 Max	0.030 Max	0.030 Max	0.80 -1.10	0.35 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	620	520	24	80
Spec. Reqd.	550-690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 17 R (E81T1-Ni2-C)

AWS A / SFA 5.29 E81T1-Ni2 C

Applications

Royalfil-GS-17R fcw wire have been designed to produce weld metal with increase strength (without being air hardenable) & with increase notch toughness at low temperature. This Nickel steel weld metal can be used without PWHT.Often used in structural applications where excellent toughness is required. For e.g. Construction machineries, Structural bridges & storage tanks.Ideal for welding quenched & tempered steels of HY 80 type. Suitable for welding of 560 N/mm2 high tensile steel

Characteristics on Usage

Royalfil GS-17 R is Rutile base gas shielded flux cored wire welding for all position welding with Co2 shield gas depositing radiographic quality metal. Arc is smooth & stable with low spatter and good bead appearance.Slag coverage is complete and easy removal.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.045	1.20	0.50	0.007	0.017	2.00
Spec. Reqd.	0.12 Max	1.50 Max	0.80 Max	0.030 Max	0.030 Max	1.75-2.75

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
Typical Values	620	530	24	70
Spec. Reqd.	550-690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 18 R (E81T1-W2 C)

AWS A / SFA 5.29 E81T1-W2 C

Applications

Royalfil-18R is designed for welding atmospheric corrosion resistant steel as Resco, corton & ITACOR. Suitable for joining weathering grade steels conforming to ASTM SA-588, SA-242 etc.

Characteristics on Usage

Royalfil GS-18R is Rutile base all position flux cored wire for welding of low alloy. This wire is having stable and smooth arc with good slag detachability & excellent bead appearance with CO2 shield. This wire is designed for welding CORTON grade weather resistance steels.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
Typical Values	0.05	0.97	0.45	0.01	0.018	0.62	0.65	0.40
Spec. Reqd.	0.12 Max	0.50 -1.30	0.35 -0.80	0.03 Max	0.03 Max	0.45- 0.70	0.40-0.80	0.30-0.75

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	600	510	25	50
Spec. Reqd.	550-690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

RDSO-IRS CLASS IV

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 19 R (E91T1-Ni2 C)

AWS A / SFA 5.29 E91T1-Ni2 C

Applications

Royalfil-GS-19 R fcw wire has been designed to produce weld metal with increase strength (without being air hardenable) & with increase notch toughness at low temperature. This Nickel steel weld metal can be used without PWHT.Often used in structural applications where excellent toughness is required. For e.g. Construction machineries, Structural bridges & storage tanks. Ideal for welding quenched & tempered steels of HY 80 type.

Characteristics on Usage

Royalfil GS-19 R is Rutile base gas shielded flux cored wire welding for all position welding with Co2 shielding gas depositing radiographic quality metal. Arc is smooth & stable with low spatter and good bead appearance. Slag coverage is complete and easy removal.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.060	1.30	0.50	0.007	0.017	2.50
Spec. Reqd.	0.12 Max	1.50 Max	0.80 Max	0.030 Max	0.030 Max	1.75 -2.75

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
Typical Values	680	590	21	70
Spec. Reqd.	620-760	540 Min	17 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 36 B (E80T5-K1 C)

AWS A / SFA 5.29 E80 T5- K1 C

Applications

This flux cored wire primarily intended for as welded applications. It can also be used long for long term stress relieved applications for welding of low alloy high strength steels in particular 1% nickel steels. Recommended for pressure vessels or fabrication of thicker section which require subzero impact properties.

Characteristics on Usage

It is low hydrogen type flux cored wire with highly basic slag having stable & smooth arc, good slag detachability. Weld metal is of radiographic quality. It is used for flat & horizontal position welding with CO2 shielding.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %	Mo %
Typical Values	0.045	1.00	0.50	0.010	0.015	1.00	0.45
Spec. reqd.	0.15 Max	0.80-1.40	0.80 Max	0.030 Max	0.030 Max	0.80-1.10	0.20-0.65

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
Typical Values	620	530	23	50
Spec. reqd.	550-690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 36 R (E80T1-K2 C)

AWS A/ SFA 5.29 E80T1-K2 C

Applications

Royalfil-GS-36R is welding wire for welding of high tensile steel used in machinery, structures bridges etc. Steels welded are Hy80, Hy100. ASTM A 710, ASTM A 514 and similar high strength steels.

Characteristics on Usage

Royalfil GS-36R is a low alloy rutile base flux cored wire depositing approximately 1.0-2.0% Ni & 0.20% Mo weld metal. The slag coverage is complete and designed for easy removal. Weld metal is consistently free of inclusions and porosity with very good mechanical strength. It is used for flat & horizontal welding with CO2 shield. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.05	1.20	0.40	0.010	0.018	0.10	1.50	0.20
Spec. Reqd.	0.15 Max	0.50- 1.75	0.80 Max	0.03 Max	0.03 Max	0.15 Max	1.00 -2.00	0.35 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	620	530	24	60
Spec. Reqd.	550 - 690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 38 R (E81T1-K2 C)

AWS A / SFA 5.29 E81T1-K2C

Applications

Royalfil-GS-38R is all position welding wire suitable for single & multiple pass welding of high tensile steel used in machinery, structures bridges, low temperature service steel in the construction of LPG,LNG storage tanks etc. Steels welded are Hy80, Hy100. ASTM A 710, ASTM A 514 and similar high strength steels.

Characteristics on Usage

Royalfil GS-38R is a all position low alloy rutile base flux cored wire depositing approximately 1.0-2.0% Ni & 0.20%Mo weld metal with CO2 shielding. The slag coverage is complete and easy to remove. Weld metal is consistently free of inclusions and porosity with very good mechanical strength & is of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.050	1.20	0.40	0.010	0.018	0.10	1.50	0.20
Spec. Reqd.	0.15 Max	0.50 -1.75	0.80 Max	0.03 Max	0.03 Max	0.15 Max	1.00 -2.00	0.35 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	620	530	24	60
Spec Reqd.	550 - 690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 41 B (E90T5-K2 C)

AWS A / SFA 5.29 E90T5-K2 C

Applications

Royalfil GS-41B is suitable for welding of many HSLA steels like HY-80, Naxtra 56, 63, LA60 etc. Suitable for joining steels conforming to ASTM Grade 60, Grade 65 steel of SA-515/ SA-515M Grade 55,Grade 60, Grade 65 steels of SA-516/SA-516M, all thickness range of SA- 455/SA-455M etc.

Characteristics on Usage

Royalfil GS-41B is basic flux cored wire having stable and smooth arc with good slag detachability. It is used for flat & horizontal welding with CO2 shield. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.05	1.45	0.45	0.01	0.018	0.15	1.80	0.30
Spec. Reqd	0.15 Max	0.50- 1.75	0.80 Max	0.03 Max	0.03 Max	0.15 Max	1.00 -2.00	0.35 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
Typical Values	705	590	20	50
Spec. Reqd	620-760	540 Min	17 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 41 B3 (E90T5-B3 C)

AWS A / SFA 5.29 E90T5-B3 C

Applications

Royalfil GS-41B3 is designed for welding of creep-resisting 2.25% Cr & 1% Mo steel in flat and horizontal position. It is used for welding of high temperature, creep resistant Cr-Mo alloy boiler plates, pressure pipes and other pressure vessel applications. Suitable for joining steels conforming to ASTM Grade F22 of SA-182/ SA-182M & SA-336/ SA-336M,Grade T4,T22 of SA-199 / SA-1995M,Grade P22 of SA-335/SA-335M etc.

Characteristics on Usage

Royalfil GS-41B3 is basic flux cored wire having stable and smooth arc with good slag detachability. This wire is designed for welding of creep-resisting 2.25% Cr & 1% Mo steels. It is used for flat & horizontal welding with CO2 shield. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.05	1.05	0.35	0.01	0.018	2.25	1.00
Spec. Reqd	0.05 -0.12	1.25 Max	0.80 Max	0.03 Max	0.03 Max	2.00-2.50	0.90-1.20

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	675	605	20
Spec. Reqd.	620-760	540 Min	17.0 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 41 R (E91T1-B3 C)

AWS A / SFA 5.29 E91T1-B3 C

Applications

Royalfil GS-41R is used for welding of similar composition of Cr-Mo steels and other creep resistant steels. It is also used for welding of high temperature & pipe steels for oil industry and for welding of steel casting (DIN 7245:GS-18CR Mo9-10) Suitable for joining steels conforming to ASTM Grade F22 of SA-182/ SA-182M & SA-336/ SA-336M,Grade T4,T22 of SA- 199 / SA-1995M,Grade P22 of SA-335/SA-335M etc.

Characteristics on Usage

Royalfil GS-41R is an all position low alloy rutile base flux cored wire depositing approximately 2.25% Cr & 1.0%Mo weld metal with CO2 shielding. The slag coverage is complete and designed for easy removal. Weld metal is consistently free of inclusions and porosity for radiography soundness

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical values	0.06	0.50	0.40	0.010	0.018	2.25	1.0
Spec. Reqd.	0.05-0.12	1.25 Max	0.80 Max	0.03 Max	0.03 Max	2.00- 2.50	0.90-1.20

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical values	705	585	20
Spec. Reqd.	620-760	540 Min	17 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	120-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 42 B (E110T5-K4 C)

AWS A / SFA 5.29 E110T5-K4 C

Applications

Royalfil GS-42B is designed for welding of high strength, fine grained quenched & tempered steel like N-A-XTRA 70, USS T1,T1B etc. to meet low temperature toughness as well as down to - 50ºC. It is also used for fabrication of earthmoving equipments, steel construction, crane plates and other similar application suitable for joining steels conforming to ASTM Grade C,D of SA-225/SA-225M, Grade A,B,C of SA-738/SA738M, all thickness range OF SA-612/612m ETC.

Characteristics on Usage

Royalfil GS-42B is low alloy basic flux cored wire depositing 2% Ni, 0.25% Cr & 0.5% Mo weld metal. The weld deposit is of radiographic quality with very low diffusible hydrogen and stable and smooth arc with good slag detachability. It is used for flat & horizontal welding with CO2 shield

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	P%	Cr %	Ni %	Mo %
Typical Values	0.05	1.75	0.45	0.018	0.25	2.00	0.50
Spec. Reqd.	0.15 Max	1.20-2.25	0.80 Max	0.030 Max	0.20-0.60	1.75 -2.60	0.20-0.65

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
Typical Values	820	730	20	50
Spec. Reqd.	760-900	680 Min	15 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 42 R (E111T1-K4C)

AWS A/ SFA 5.29 E111T 1- K4C

Applications

It is primarily intended for as welded applications for welding wire low alloy high strength steels. Addition of approximately 0.50Cr provides higher strength for many applications needing in excess of 830 N/ mm² tensile strength such as “armour” plate. Typical applications include welding of Hy100 and ASTM A 514 steels.

Characteristics on Usage

RoyalFil GS 42 R is rutile base low hydrogen type all position flux cored wire design for single and multiple pass welding with Co2 shield gas. Weld metal is of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.050	1.50	0.50	0.010	0.015	0.50	2.00	0.40
Spec. Reqd.	0.15 Max	1.20 -2.25	0.80 Max	0.030 Max	0.030 Max	0.20-0.65	1.75-2.60	0.20-0.65

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	840	740	20	60
Spec. Reqd.	760-900	680 Min	15 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 43 R (E110T1-K4 C)

AWS A /SFA 5.29 E110T1- K4 C

Applications

It is primarily intended for as welded applications for welding wire low alloy high strength steels. Addition of approximately 0.50Cr provides higher strength for many applications needing in excess of 830 N/ mm² tensile strength such as “armour” plate. Typical applications include welding of Hy 100 and ASTM A 514 steels.

Characteristics on Usage

RoyalFil GS 43R is Rutile base low hydrogen type flux cored wire designed for single and multiple pass welding in flat and horizontal positions with CO2 shielding. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.050	1.40	0.50	0.010	0.015	0.50	2.00	0.30
Spec. reqd.	0.15 Max	1.20-2.25	0.80 Max	0.030 Max	0.030 Max	0.20-0.65	1.75-2.60	0.20-0.65

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	830	740	20	60
Spec. reqd.	760-900	680 Min	15 Min	27Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 45 R (E120T1-G C)

AWS A / SFA 5.29 E120T1- G C

Applications

For welding of high strength fine grain structured steel having yield strength around 750 N/mm2

Characteristics on Usage

RoyalFil GS - 45R is Rutile base flux cored wire for flat & horizontal position welding. It gives stable arc easily detachable slag, uniform bead & less spatters with Co2 shield. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.050	1.70	0.45	0.010	0.015	1.00	2.20	0.50
Spec. Reqd.	0.12 Max	1.50-1.80	0.80 Max	0.030 Max	0.030 max	0.80-1.30	2.00-2.50	0.40-0.65

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	900	810	18	50
Spec.Reqd.	830 Min	745 Min	14 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 80 RB (E80T5-B2 C)

AWS A / SFA 5.29 E80 T5 - B2 C

Applications

Since all Cr-Mo electrodes produce weld metal which will harden in still air, both preheat & post weld heat treatment are required for most applications. Specially design for Cr-Mo Steels with high temp & pressure service condition in steam pipes of boilers.

Characteristics on Usage

RoyalFil GS 80 RB is low hydrogen type flux cored wire with highly basic slag having stable & smooth arc, good slag detachability. Weld metal is of radiographic quality. It is used for flat & horizontal position welding with CO2 shielding.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.060	0.70	0.40	0.010	0.015	1.25	0.50
Spec. reqd.	0.05 –0.12	1.25 Max	0.80 Max	0.030 Max	0.030 Max	1.00-1.50	0.40-0.65

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	600	545	24.50
Spec. reqd.	550-690	470 Min	19 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26 -30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 80 B6 (E80T1-B6 C)

AWS A / SFA 5.29 E 80T1-B6 C

Applications

Royalfil GS-80B6 is used for welding of similar composition of Cr – Mo steel and other creep resistance steel. It is also used for welding of high temp. & Pipe steel for oil refineries, power plant, chemicals plant, fertilizers Industries, fabrication of SA 387 Grade 5 plates & pipes.

Characteristics on Usage

Royalfil GS-80B6 is flat and horizontal position low alloy Rutile base flux cored wire depositing approx 5% Cr, 0.50% Mo weld metal with CO2 shielding. The slag coverage is complete easily removable. The weld metal is radiographic quality and has creep resistance up to 650oC

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.064	0.84	0.64	0.010	0.018	5.0	0.28	0.50	0.12
Spec. reqd.	0.05-0.12	1.25 Max	1.00 Max	0.030 Max	0.040 Max	4.0-6.0	0.40 Max	0.40 -0.65	0.50 Max

Mechanical Properties Of Weld Metal

(After PWHT at 745 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	624	512	24
Spec. reqd.	550-690	470 Min	19 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 81 B (E 81T1-G C)

AWS A / SFA 5.29 E 81T1- G C

Applications

RoyalFil GS-81B is designed for all position single and multipass welding of ship-building steels etc.

Characteristics on Usage

RoyalFil GS-81B is a semi-automatic type gas shielded flux-cored wire, whereby CO2 shield is applicable. The weld metal is of radiographic quality with excellent impact strength at sub-zero temperatures up to minus 20°C. The slag coverage is complete and designed for easy removal. The wire is specially designed for welding of ship building steels, etc

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %
Typical Values	0.06	1.50	0.70	0.010	0.015	0.75
Spec. Reqd.	0.12 Max	1.75 Max	0.90 Max	0.03 Max	0.03 Max	0.50 Min

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typial Values	635	560	25	60
Spec.Reqd.	550-690	470 Min	19 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

IRS

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 81 RM (E81T1-B1 C)

AWS A /SFA 5.29 E81T1-B1 C

Applications

RoyalFil GS- 81R-M is Suitable for single & multiple pass welding using DCEP polarity. It is used for welding of similar composition of Cr-MO steels & other creep resistant steels with CO2 shielding. Commonly used in steam power plants, ships, chemical plants & refineries.

Characteristics on Usage

RoyalFil GS- 81R-M is an all position rutile based low alloy steel wire depositing Approx 0.5%Cr & 0.5%Mo weld metal. It is characterized by spray transfer, less spatter, smooth & stable arc with good penetration & moderate volume of slag which completely covers the weld bead. Weld metal is of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.060	0.70	0.60	0.010	0.018	0.50	0.50
Spec. Reqd.	0.05-0.12	1.25 Max	0.80 Max	0.030 Max	0.030 Max	0.4 -0.65	0.4 -0.65

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	610	520	24
Spec. Reqd.	550 - 690	470 Min	19 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 81 R (E81T1-B2 C)

AWS A / SFA 5.29 E 81T1-B2 C

Applications

Royalfil GS-81R is used for welding of similar composition of Cr-Mo steels and other resistant steels. It is also used for welding of high temperature & pipe steels for oil industry.

Characteristics on Usage

Royalfil GS-81R is an all position low alloy rutile base flux cored wire depositing approximately 1.20% Cr & 0.50%Mo weld metal with CO2 shielding. The slag coverage is complete and designed for easy removal. Weld metal is consistently free of inclusions and porosity for radiography soundness.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.06	0.70	0.60	0.010	0.015	1.20	0.50
Spec. Reqd.	0.05-0.12	1.25 Max	0.80 Max	0.03 Max	0.03 Max	1.00-1.50	0.40-0.65

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	600	545	24.50
Spec. Reqd.	550-690	470 Min	19 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

IBR

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 81 RB (E81T5-B2 C)

AWS A / SFA 5.29 E81 T5 - B2 C

Applications

Since all Cr-Mo electrodes produce weld metal which will harden in still air, both preheat & postweld heat treatment are required for most applications. Specially design for Cr-MO Steels with high temp & pressure service condition in steam pipes of boilers. It is used for welding of Iron / 0.5 Mo, 0.5 Cr/0.5 Mo & similar creep resistance steels. Eg. ASTM A 335 – P11' pipe, ASTM A 387 Gr. II plate.

Characteristics on Usage

It is low hydrogen low alloy all position type flux cored wire with highly basic slag having stable & smooth arc, good slag detachability. Weld metal is of radiographic quality. It is used for all position welding with CO2 shielding.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.060	0.70	0.40	0.010	0.015	1.25	0.50
Spec. Reqd.	0.05-0.12	1.25 Max	0.80 Max	0.030 Max	0.030 Max	1.00-1.50	0.40 -0.65

Mechanical Properties Of Weld Metal

(After PWHT at 690 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
Typical Values	600	545	24.50
Spec.Reqd.	550-690	470 Min	19 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 90 D2 (E90T5-D2 C)

AWS A / SFA 5.29 E 90T5-D2 C

Applications

Royalfil GS- 90 D2 is designed for welding of high strength, low alloy pressure vessels steel is such as A302 Gr. B, HSLA steels and Manganese- Molybdenum castings, such as ASTM A 49, A 291 and A 735 etc. to meet low temperature toughness as well as down to – 500 c.

Characteristics on Usage

Royalfil GS-90 D2 is low alloy basic flux cored wire depositing 2.0 % Mn, 0.4 % Mo weld metal with CO2 shielding. The weld deposit is of radiographic quality with very low diffusible hydrogen and stable and smooth arc with good slag detachability. However, the weld metal from these Mn-Mo steel electrodes is quite air-hardenable and usually requires preheat and PWHT.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Mo %
Typical Values	0.045	2.0	0.50	0.01	0.018	0.40
Spec. Reqd.	0.15 Max	1.65-2.25	0.80 Max	0.03 Max	0.03 Max	0.25-0.55

Mechanical Properties Of Weld Metal

(After PWHT at 620 ± 15ºC for 1 Hr)

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT – 50 º C (J)
Typical Values	700	610	22	50
Spec. Reqd.	620-760	540 Min	17 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 91 D (E91T1-D1 C)

AWS A / SFA 5.29 E 91T1-D1 C

Applications

Royalfil-GS-91D is used for welding steel to IS 8500-91 grade 540B and 590B, IS 2002-92 grade III, IS:1875-92 class III A or other equivalent steel.

Characteristics on Usage

Royalfil GS-91 D is all position flux cored wire for welding of low alloy steel, Carbon – Moly steel. It gives stable and smooth arc with good slag detachability & excellent bead finish with radiographic quality with CO2 shielding.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Mo %	Cu %
Typical Values	0.050	1.67	0.60	0.010	0.018	0.50	0.31
Spec. Reqd.	0.12 Max	1.25- 2.00	0.80 Max	0.030 Max	0.030 Max	0.25 - 0.55	0.20 -0.40

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT -40 °C (J)
Typical Values	670	580	24.0	50
Spec. Reqd.	620 - 760	570 Min	17 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Approvals

RDSO, IRS CLASS III

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 91 R (E91T1-G C)

AWS A / SFA 5.29 E91T1- G C

Applications

Royalfil-GS-91R fcw wire is used for high tensile, fine grain structural steel, creep resistant fine grain structural steels, heat treated fine grain structural steel.

Characteristics on Usage

Royalfil GS-91 R is Rutile base gas shielded flux cored wire welding for all position welding with Co2 shielding depositing radiographic quality metal. Arc is smooth & stable with low spatter and good bead appearance.Slag.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Ni %	Mo %
Typical Values	0.065	1.40	0.35	0.008	0.018	1.20	0.40
Spec. Reqd.	0.05 - 0.08	1.20-1.60	0.25-0.40	0.03 Max	0.03 Max	1.0-1.40	0.3-0.50

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	670	590	22	80
Spec. Reqd.	620 Min.	540 Min.	17 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-210	26-30	150-210	22-26	180-210	26-30
1.60	210-250	26-30	180-250	21-27	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool.

ROYALFIL GS 1B (E347T1-1)

AWS A / SFA 5.22 E347T1 - 1

Applications

Used to weld type 321, 347 & 348 stainless steel for joining & cladding application on Niobium and Titanium stabilized stainless steel.

Characteristics on Usage

A lime titania all position stainless steel flux cored wire gives 19.% Cr, 10% Ni, & 0.35% Columbium weld deposit with Co2 gas shield. The weld metal is excellent resistance to intergranular corrosion, stable arc with improved weld pool control for weldabillity, bright finely rippled weld bead, reduces chromium carbide precipitation etc. Weld metal is of radiographic quality with easy slag removal and low spatters.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	Mn%	S%	P%	Cr %	Ni %	Mo %	Cu %	Cb%
Typical Values	1.50	0.010	0.030	19.50	10.2	0.015	0.105	0.40
Spec.Reqd.	0.5-2.50	0.030	0.040 Max	18.0-21.0	9.0-11.0	0.50 Max	0.50 Max	1.0 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	590	35
Spec. Reqd.	520 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 1C (E308LT1-1)

AWS A / SFA 5.22 E308 LT1-1

Applications

Royalfil GS-1C is used for welding of 18%Cr, 9% Nickel Steel for joining Austenitic Steels such as 304, 304 L, 321, CF-8, CF-3

Characteristics on Usage

Royalfil GS-1C is an extra low carbon Lime Titania all position 19% Cr-10 % Ni stainless steel gas shield flux cored wire. The weld deposit is highly resistance intergranular corrosion, cracking, oxidation and scaling. It gives uniform and fine rippled bead characterized by excellent all around performance and mechanical properties. Weld metal is of radiographic quality with easy slag removal and low spatters

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.50	0.60	0.010	0.030	19.80	9.50	0.050	0.10
Spec. Reqd.	0.040	0.5-2.50	0.010 Max	0.030 Max	0.040 Max	18-21 Max	9.0-11.0 Max	0.50 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	580	40
Spec. Reqd.	520 min	35 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Approvals

RDSO - IRS M 46 CLASS VI ,DNV

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 1CH (E308HT1-1)

AWS A / SFA 5.22 E308 HT1-1

Applications

Royalfil GS-1CH is used for welding of 304H, 308H type base metal.

Characteristics on Usage

Royalfil GS-1CH is a all position 19Cr-10 Ni stainless steel gas shield flux core wire. It gives uniform and fine rippled bead characterized by excellent all around performance and mechanical properties. Carbon percentage is in the range of 0.04 – 0.08 %, which provides higher tensile and creep strength at elevated temperatures. Weld metal is of radiographic quality with easy slag removal & low spatters.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.055	1.50	0.60	0.010	0.030	19.80	9.70	0.050	0.10
Spec. Reqd.	0.04 –0.08	0.5-2.50	1.0 Max	0.03 Max	0.04 Max	18.0-21.0	9.0-11.0	0.50 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Valuesd	605	39
Spec. Reqd.	550 Min	35 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 2C (E316LT1-1)

AWS A / SFA 5.22 E 316LT1-1

Applications

It is used for welding of 18% Cr, 12% Ni & 2.50% Mo steel also use for welding of AISE 316L & 317L type of stainless steel in chemical plant, paint, pulp paper & textile industries,CF-8M,CF-3M

Characteristics on Usage

Royalfil GS – 2C is an extra low carbon rutile coated all position stainless steel flux core welding wire with CO2 gas shielding. It gives the weld deposit of 18% Cr, 12% Ni & 2% Mo etc. It runs smoothly & gives uniform weld metal deposit with easily slag removal. The weld metal is highly resistance to intergranular corrosion . Weld metal is of radiographic quality with easy slag removal and low spatters.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.50	0.70	0.030	18.50	12.05	2.50	0.1
Spec. Reqd.	0.040 Max	0.50-2.50	1.0 Max	0.040 Max	17-20	11-14	2.0-3.0	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	580	38
Spec. Reqd.	485 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS D2 (E309LT1-1)

E309LT1-1

Applications

Royalfil-GS-D2 is suitable for the welding of dissimilar metals such as stainless steel and carbon steel or stainless steel and low alloy steel.

Characteristics on Usage

Royalfil GS-D2 is a stainless steel flux core welding wire for all position welding with co2 gas shielding. It gives the 23% Cr and 12% Ni weld deposit with excellent all around performance and resistance to chemical corrosion. Weld metal is of radiographic quality with easy slag removal and low spatters.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.60	0.65	0.010	0.030	23.20	12.75	0.05	0.10
Spec. Reqd.	0.04 Max	0.5 – 2.50	1.00 Max	0.030 Max	0.040 Max	22.0 - 25.0	12.0-14.0	0.5 Max	0.5 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	600	36
Spec. Reqd.	520 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Approvals

RDSO:IRS M46 CLASS VII,DNV

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS D2H (E309HT1-1)

Applications

Royalfil-GS-D2H is suitable for the welding of dissimilar metals such as stainless steel and carbon steel or stainless steel and low alloy steel. Ferrite content is about 6 -7 FN which makes this welding wire suitable for welding of 23 Cr – 12.5 Ni wrought & cast steels designed for corrosion and oxidation resistance.

Characteristics on Usage

Royalfil GS-D2H is a stainless steel flux core welding wire for all position welding with co2 shielding gases. It gives the 23% Cr and 12% Ni weld deposit with excellent all around performance and resistance to chemical corrosion. Carbon restriction helps to provide higher tensile strength & creep strength at elevated temp.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.055	1.60	0.65	0.010	0.030	23.20	12.50	0.050	0.10
Spec. Reqd.	0.04-0.10	0.5-2.50	1.00 Max	0.03 Max	0.040 Max	22.0-25.0	12.0-14.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	610	35
Spec. Reqd.	550 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS D2MOL (E309LMoT1-1)

AWS A / SFA 5.22 E309LMoT1-1

Applications

Dissimilar joint welds of and between high strength mild steel & low alloy quenched & tempered steel stainless steel. Ferrite Cr. & Austenitic – Cr/Ni steel. Cladding for first layer of corrosion resistant weld cladding on ferrite steels.

Characteristics on Usage

Royalfil GS-D2MO is a stainless steel flux core welding wire for all position welding with co2 shielding gas. It gives the 23% Cr and 12% Ni & 2% Mo weld deposit. It is suitable for the welding of similar composition of steel.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.60	0.65	0.010	0.020	23.20	12.75	2.50	0.10
Spec. Reqd.	0.04 Max	0.5-2.50	1.0 Max	0.030 Max	0.040 Max	21.0-25.0	12.0-16.0	2.0-3.0	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	620	32
Spec. Reqd.	520 Min	25 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 209 (E2209T0-1)

AWS A / SFA 5.22 E2209T0-1

Applications

Royalfil-GS 209 used for welding of Duplex stainless steel which contain approximately 22% Chromium. Also used for joining of Duplex steels to mild steels, cladding of Duplex stainless steel weld metal on Carbon steel/low alloy steel. Used for piping in gas & oil industry, off-shore platforms, welding of duplex stainless steels 1.4417, 1.4460, 1.4462

Characteristics on Usage

Royalfil GS- 209 is a Duplex stainless steel flux core welding wire for welding with Co2 shielding gas. The nominal composition of the weld metal is 22 % Cr., 9 % Ni., 3 % Moly.,& 0.15 % N. The microstructure of the weld deposit consists of a mixture of Austenite & Ferrite. Because of the two phase microstructure, this alloy is one of the family of duplex stainless steel alloys. The alloy has high tensile strength & has good resistance to stress corrosion cracking & pitting corrosion Welding of Duplex steels should be made with low heat input. Weld metal is of radiographic quality.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.50	0.50	0.006	0.030	22.5	9.00	3.0	0.12
Spec. Reqd.	0.04 Max	0.5-2.0	1.0 Max	0.03 Max	0.04 Max	21-24	7.5-10	2.5-4.0	0.5 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	780	25
Spec. Reqd.	690 Min	20 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	160-210	26-30
1.60	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 106 (E312T1-1)

AWS A / SFA 5.22 E312T1-1

Applications

Royalfil-GS-106 is suitable for the welding of difficult to weld steel like spring steels. Cast steels, tool steels,high speed steels, case hardening steels, manganese steels, steels of unknown chemical composition, dissimilar joints between stainless steel & high carbon steel, to weld cast alloys of similar composition. Also used for laying buffer before hardfacing .

Characteristics on Usage

Royalfil GS-106 a stainless steel flux core welding wire for all position welding with CO2 gas shielding. It gives the 30% Cr and 9% Ni weld deposit which has excellent oxidation resistance. The weld metal has a two phase structure with substantial amount of ferrite in austenitic matrix. Deposited weld metal is highly resistance to cracks & fissures. Weld metal is of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.030	1.60	0.65	0.008	0.030	28.5	9.0	0.070	0.090
Spec. Reqd.	0.15 Max	0.5-2.5	1.0 Max	0.030 Max	0.040 Max	28.0-32.0	8.0-10.5	0.5 Max	0.5 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	750	24
Spec. Reqd.	660 Min	22 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 307 (E307T1-1)

AWS A/ SFA 5.22 E307 T1-1

Applications

For joining Manganese steel to dissimilar steels like stainless steel, Carbon steel, Alloy steel, difficult to weld steels & high alloys like Armour plates. Very good for repairing cracks in austenitic manganese steel casting, for laying buffer before hardfacing, surfacing manganese steel rails etc.

Characteristics on Usage

Royalfil GS – 307 is a Gas Shielded Steel flux cored wire for all position welding with Co2 shielding gas depositing radiographic quality weld metal with 19% Cr.,9.7% Ni.,4.0 Mn, 1 Mo composition. Weld metal has excellent crack resistance, corrosion resistance, easily machinable.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.040	4.00	0.60	0.010	0.030	19.0	9.75	0.90	0.10
Spec. Reqd.ues	0.13 Max	3.0-4.75	1.0 Max	0.03 Max	0.04 Max	18-20.5	9-10.5	0.5-1.5	0.75 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	650	36
Spec. Reqd.	590 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	160-210	26-30	120-210	22-26	160-210	26-30
1.60	190-250	26-30	160-250	21-27	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL GS 413 (E410T0-1)

AWS A /SFA 5.22 E 410T0-1

Applications

Welding of martensite stainless alloys of 13 % Cr type. It is used for surfacing of seraling faces of valves for gas, water & steam piping. Hard surfacing of continuous casting roll of steel plants, valves etc.

Characteristics on Usage

Royal Fil GS - 413 is a martensitic type Gas Shielded flux cored welding wire with 100% Co2 which are commonly used for hard surfacing of steel mill rolls, valve component of similar alloys. The weld metal is resist to corrosion, erosion or abrasion & resist to high temperature microstructure stability, thermal fatigue & cracking, eliminate ferrite in the microstructure.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
Typical Values	0.045	0.55	0.35	0.009	0.020	11.75	0.55	0.010	0.040
Spec. Reqd.	0.12 Max	1.20 Max	1.00 Max	0.030 Max	0.04 Max	11.00-13.50	0.60 Max	0.50 Max	0.50 Max

Mechanical Properties Of Weld Metal

(After PWHT at 732-760ºC for 1 Hr), Hardness on 2nd layer is 28-32 HRC.

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical Values	575	24.5
Spec. Reqd.	520 Min	20 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	160-210	26-30
1.60	190-250	26-30

Packing

12.5 kgs. vaccum packed plastic spool.

ROYALFIL OA 18.8.5 ()

Applications

Highly recommended for welding of difficult steels such as armour plates, welding of austenitic manganese steels to low / medium carbon steels, low alloy high tensile steels, for laying buffer before hardfacing , surfacing manganese steel rails, repairing cracks in austenitic manganese steel castings

Characteristics on Usage

Royalfil OA 18.8.5 is a self shielded Stainless Steel flux cord wire depositing low hydrogen type weld metal with 18Cr, 8Ni, 5Mn composition. Weld metal has excellent crack resistance, corrosion resistance, easily machinable & has excellent heat resisting properties up to 900 °C

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %
Typical Values	0.050	5.5	0.50	0.010	0.020	19.0	9.0
Spec. Reqd.	0.10 Max	5.0-7.0	1.0 Max	0.030 Max	0.040 Max	17.0-20.0	8.0-10.0

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
Typical values	620	38
Spec Reqd.	590 Min	30 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.0	200-250	28-32
2.40	250-300	28-32
2.80	300-350	28-32

Packing

10kgs. vaccum packed plastic spool.

ROYALFIL OA C II ()

Applications

It is for rebuilding of worn machinery parts, deposit surfaces are suitable for metal to metal rolling and sliding contact of low / high speed gear teeth shaft rail links rollers, wheel etc.in Mining & Civil Engineering industries.

Characteristics on Usage

A low alloyed flux core wire designed for building up crack free weld deposit and are machinable with carbide tipped tools. Deposited weld metal gives the hardness 30 – 40HRC.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Mo %	V %
Spec. Reqd.	0.10-0.30	0.50-2.0	1.0 max	1.80-3.80	1.0 max	0.35 max

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
30 – 40 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20-1.60	200-250	26-32
2.00-2.40	250-350	26-32

Packing

1) 15 kgs.vaccum packed plastic spool for 1.20/1.60 mm 2) 10 Kgs.vaccum packed plastic spool for 2.00/2.40 mm

ROYALFIL OA C III ()

Applications

Suitable for surfacing of minerals craine wheels hot & cold punching dies metal cutting & forming tools, crush hammer & catter pillers trades, crane wheels, conveyer buckets. Self tempering deposit for hard facing applications in Mining & Civil Engineering industries.

Characteristics on Usage

A high carbon& high chrome flux core wire depositing a weld metal having excellent resistant of abrasion friction and moderate impact. A deposited weld metal gives Hardness 55 to 60 HRC.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Mo %	V %
Spec. Reqd.	0.50-0.80	0.50-1.50	1.0 Max	4.0-8.0	1.0 Max	0.75 Max

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
55 – 60 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
1.20-1.60	200-250	26-32
2.00-2.40	250-350	26-32

Packing

1) 15 kgs.vaccum packed plastic spool for 1.20/1.60mm 2) 10 Kgs.vaccum packed plastic spool for 2.00/2.40mm

ROYALFIL GS C IV ()

Applications

Suitable for hard facing of loading machines, road machines, mixers, mixing rollers, digging tools, road machines, shovel teeth, different tools and wear parts etc

Characteristics on Usage

RoyalFil GS C IV is a gas shielded hard facing flux cored wire with high chromium content, about 9% Cr. Weld metal shows relatively good resistance to general corrosion and is highly wear resistant. Weld metal is also resistant to softening up to about 550 °C.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %
Typical Values	0.50	0.50	3.0	9.0

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
54 – 59 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
1.20	180-210	26-30
1.60	210-250	26-30

Packing

15 kgs. vaccum packed plastic spool

ROYALFIL OA 435 ()

Applications

Hard surfacing of continuous casting roll of steel plants, valves, Hardfacing of different kinds of shaft subjected to wear & corrosion of high temperature etc.

Characteristics on Usage

Royal Fil OA - 435 is a martensitic type open Arc Flux Core Welding Wire which are commonly used for hard surfacing of steel mill rolls, valve component of similar alloys. The weld metal is resistant to corrosion, erosion or abrasion & resistant to high temperature microstructure stability, thermal fatigue & cracking, eliminate ferrite in the microstructure.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Ni %	Mo %
Typical Values	0.080	1.00	0.60	13.50	4.00	0.50

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
42 – 48 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 - 2.80	250-400	26-32

Packing

10 Kgs. vaccum packed plastic spool

ROYALFIL OA 725 ()

Applications

It is used for railway, rails & crossover rebuilding, shafts, rollers, wheels & in Mining & Civil Engineering Industries.

Characteristics on Usage

Royal Fil OA - 725 is a self shielded chromium alloyed wire gives chromium, Moly & Manganese type weld deposit.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %
Typical Values	0.40	16.00	0.50	14.00

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER	Work To Hardness
22-24 HRC	44-48 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250-400	26-32

Packing

10 Kgs. vaccum packed plastic spool

ROYALFIL OA 730 ()

Applications

Rebuilding & reclamation of chain guide rolls, wheels, worn out parts of bulldozers, shaft rollers in mining & civil engineering industries.

Characteristics on Usage

RoyalFil OA - 730 is a low alloy air hardening type self shielded FCW wire designed for rebuilding & reclamation of chain guide rolls, wheels, worn out parts of bulldozers, shaft rollers in Mining & Civil Engineering Industries.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %
Typical Values	0.15	1.50	0.80	1.50

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
25-35 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250-400	26-32

Packing

10 Kgs. vaccum packed plastic spool .

ROYALFIL OA 755 ()

Applications

Mining & civil engineering industries, hard facing of bucket teeth & blades, slides, conveyor, screws etc.

Characteristics on Usage

Royalfil-OA 755 is self shielded high chromium, carbon & manganese alloyed wire which is excellent resistance to service abrasion & impact.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %
Typical Values	0.50	1.50	2.50	8.50

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
55 – 58 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250-400	26-32

Packing

10 Kgs.vaccum packed plastic spool

ROYALFIL OA 760 ()

Applications

Hardfacing excavator parts, bucket, cutting edges grabteeth, crusher jaws & cones, table liner high chrome crusher rolls in cement plants, catalyst pipes and bends heavy load earth moving equipments etc.

Characteristics on Usage

Royal Fil 760 hard facing self shielded (Open Arc) flux core wire deposits high chromium high carbon weld metal subjected to hard facing of component for extreme abrasion / erosion under moderate / heavy impact load. The weld deposit is nonmachinable and grinding is possible.

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %
Typical Values	5.0	1.20	1.0	24-26

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
56 – 62 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40	250 - 400	26-32
2.80	250 - 400	26-32

Packing

10 Kgs. vaccum packed plastic spool

ROYALFIL OA 762 ()

Applications

Vertical crushers armoring of conveyers for coal, clinker & glass. Alloy recommended for application involving silver high stress abrasion combined with low impact at temp. up to 4500 C.

Characteristics on Usage

Royal Fil OA 762 is a self shielded wire for wear protection of carbon steel, low or high alloy steel & manganese steel depositing extra hard material in a tough matrix gives very good wear resistance to fine abrasive particles of high hardness

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Nb (Cb)
Typical Values	5.0	0.50	1.00	22.00	7.00

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
60 – 65 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250-400	26-32

Packing

10 Kgs. vaccum packed plastic spool

ROYALFIL OA 765 ()

Applications

Blast furnace hoppers, extractor fans, crushers jaws mixer blades, sinter brakers, ventilator blades.

Characteristics on Usage

Royal Fil GS - 765 is a self shielded Flux cored wire with high alloyed Chromium cast iron with a high concentration of complex carbide weld deposit. It gives abrasive wear resistance upto 600oC

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Mo %	V %	W%	Nb (Cb)
Typical Values	5.50	0.50	1.50	22.00	5.50	1.00	2.00	6.00

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
63 – 65 HRC

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250-400	26-32

Packing

10 Kgs.vaccum packed plastic spool

ROYALFIL OA TIC ()

Applications

It is used for rebuilding of cement, crusher, roll, pulveriser rolls and hammer.

Characteristics on Usage

Royal Fil OA - TIC is a self shielded hardfacing flux core wire gives chromium carbide type weld deposit which is expose to high abrasive wear & impact stress

Welding Positions

1G

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	Cr %	Mo %	Ti %
Typical Values	2.00	1.50	1.00	7.00	1.40	5.00

Mechanical Properties Of Weld Metal

HARDNESS ON III rd LAYER
56 – 58 HRC.

Welding Parameters (DC + VE)

Diameter (mm)	Flat (A)	Flat (V)
2.40 – 2.80 mm	250 - 400	26 - 32

Packing

10 Kgs. vaccum packed plastic spool

ROYALFIL GS 703 C (E70C-3MH4)

AWS A / SFA 5.18 E70C - 3MH4

Applications

It is used for welding of medium & high tensile steel with mixed gas 80%Ar+ 20% Co2 shielding in ship building, machineries, structural fabrication and bridge constructions.

Characteristics on Usage

Royalfil GS 703-C is a low hydrogen type “Metal Cored” arc welding wire. It gives good penetration, high resistance to porosity with controlled hydrogen. Intended for both semi automatic, automatic single & multiple welding with 80%Ar + 20% Co2 shielding. Characterized by a spray arc, excellent bead wash characteristics and no slag covering. Elimination of slag removal is especially beneficial in hard to reach areas.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
Typical Values	0.045	1.50	0.55	0.010	0.016	0.10	0.40	0.30
Specific reqd.	0.12 Max	1.75 Max	0.90 Max	0.030 Max	0.030 Max	0.20 Max	0.5 Max	0.50 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
Typical Values	585	490	26	75
Specific reqd.	480 Min	400 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	160-210	26-30
1.60	180-250	26-30

Packing

15 kgs.vaccum packed plastic spool.

ROYALFIL GS 706 C (E70C-6M)

AWS-SFA A 5.18 E70C- 6MH4

Applications

It is used for welding of medium & high tensile steel with mixed gas 80%Ar + 20% Co2 shielding in ship building, machineries, structural fabrication and bridge constructions.

Characteristics on Usage

Royalfil GS 706-C is a metal Cored arc welding wire. It gives good penetration high resistance to porosity with controlled hydrogen. Intended for both semi automatic, automatic single & multiple welding with 80%Ar + 20% Co2 shielding. Characterized by a spray arc, excellent bead wash characteristics and no slag covering. Elimination of slag removal is especially beneficial in hard to reach areas.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Cu %
Typical Values	0.45	1.50	0.55	0.010	0.016	0.10	0.40	0.30
Specific reqd.	0.12 Max	1.75 Max	0.90 Max	0.030 Max	0.030 Max	0.20 Max	0.5 Max	0.5 Max

Mechanical Properties Of Weld Metal

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
Typical Values	585	490	26	60
Specific reqd.	480 Min	400 Min	22 Min	27 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	160-210	180-250
1.60	26-30	26-30

Packing

15 kgs.vaccum packed plastic spool.

ROYALFIL GS 80 M (E80C-GM)

AWS A / SFA 5.28 E80C-GM

Applications

Intended for single & multiple pass applications. Used for welding of medium & high tensile low alloy steel with (80 %Ar - 20% CO2).It can be used on 1.25 Cr. & 0.5 Mo steels. Recommended for welding of steam boiler plates and high temperature steels.

Characteristics on Usage

ROYALFIL GS-80M is a low alloy steel metal cored welding wire. It gives low spatter, higher deposition rate, and good penetration & generates less fumes. Faster travel speeds are achievable than with solid wire, thus increasing productivity.

Welding Positions

1G 2F

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Mo %
Typical Values	0.045	1.20	0.50	0.007	0.017	1.25	0.5
Spec. Reqd.	0.10 Max	1.00-1.50	0.3-0.6	0.030 Max	0.030 Max	1.0-1.50	0.4-0.65

Mechanical Properties Of Weld Metal

(After PWHT at 620ºC for 1 Hr)

Property	U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT 0° C
Typical Values	630	540	24	90
Specific reqd.	550 Min	470 Min	19 Min	47 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)
1.20	160-210	26-30
1.60	180-250	26-30

Packing

15 Kgs. vaccum packed plastic spool.

ROYAL 70S-3 (ER 70S-3)

AWS : A 5.1 8 ER 70S-3
IS – 6419

Applications

Suitable for welding of structural steel with tensile strength up to 540N/mm2, welding of automobile bodies, bridges ship containers railway rolling stock, bogies, storage tanks and general structural fabrication works.

Characteristics on Usage

Royal – 70S-3 wire is a copper coated solid wire for Co2 welding for general engineering and structural application. It gives spatter free welding with Co2 gas and Ar+Co2 gas mixtures The weld deposit is free from porosities with smooth and uniform weld bead.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cu %
0.06 – 0.15	0.90 – 1.40	0.40 – 0.75	0.035 Max	0.025 Max	0.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
490	400	22	27

Packing and Welding Current

SIZE (mm)	In Amps	In Volts	GAS FLOW L/M	Current (Amps)
0.80	50 - 160	18 - 25	10 - 25	DC (+)
1.00	80 – 200	20 – 26	12 – 20	
1.20	110 – 250	22 – 36	15 – 25	
1.60	200 - 400	24 - 38	16 - 28	

Packing

Standard plastic spool of 300 mm dia and weight 12.5/15kg sealed in an air tight polythene bag and then packed in a corrugated box. Silica gel drying agent provided inside to prevent moisture pick up and increase shelf life.

ROYAL CO2 WIRE (ER 70S-6)

AWS : A 5.18 ER 70S-6
IS – 6419 EN – 440 G 46 3 M G4 Si 1

Applications

Suitable for welding of structural steel, with tensile strength up to 540N/mm2 Butt and fillet welding of automobile bodies, bridges, ships, containers, railway rolling stock, bogies, storage tanks and general structural fabrications.

Characteristics on Usage

Royal Arc-Co2 Wire is a copper coated solid wire for Ar/CO2 welding for general engineering and structural application. It gives spatter free welding with Co2 gas and Ar+Co2 gas mixtures. The weld deposit are free from porosities with very smooth and uniform weld bead.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cu %
0.06- 0.15	1.40 – 1.85	0.80 – 1.15	0.035 Max	0.025 Max	0.50 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
490	400	22	27

Packing and Welding Current

SIZE (mm)	In Amps	In Volts	GAS FLOW L/M	Current (Amps)
0.80	50 - 180	18 - 25	10 – 25	DC (+)
1.00	80 – 200	20 – 26	12 – 20	
1.20	130 – 300	22 – 36	15 – 25	
1.60	200 - 400	24 - 38	16 – 28	

Packing

Standard plastic spool of 300 mm dia and weight 12.5/15kg sealed in an air tight polythene bag and then packed in a corrugated box. Silica gel drying agent provided inside to prevent moisture pick up and increase shelf life.

ROYAL – Tig – T2 (ER 70S-2)

AWS A/ SFA 5.18 Class ER 70S-2

Applications

Structural pressure vessels and boiler involving unalloyed and micro alloyed structural steel with specific tensile strength upto 520 N/M2 to meet sub zero impact requirements at minus 51°C

Characteristics on Usage

Triple deoxidized mild steel wire smooth flow, stable arc and minimum spatter under optimum welding conditions. Gives radiography quality welds

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Zr%
0.07 Max	0.90 – 1.40	0.40 – 0.70	0.035- Max	0.025 Max	0.15 Max	0.15 Max	0.02-0.12

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	Y.S. (N/mm^2)	ELONGATION (L = 4d) %	IMPACT (CVN) AT - 30° C (J)
480	400	22	27

Packing and Welding Current

SIZE (mm)	KG PER PACKET
1.20 x 1000	5
1.60 x 1000	5
2.00 x 1000	5
2.50 x 1000	5

ROYAL – CUPRO NICKEL 70 - 30 (ER Cu Ni)

AWS / SFA 5.7ER Cu Ni

Applications

It is used for welding of Copper - Nickel Alloys

Characteristics on Usage

Royal Cupro Nickel alloys solid filler Wire Rods deposit 70% Cu, 30% Ni Weld Metal. the nickel strengthens the weld metal & improves the corrosion resistance against Sea Water, solt water

Chemical Composition Of Weld Metal

C%	Mn%	Si%	P%	Ni %	Cu %	Fe%	Ti %
0.05 max	1.00 max	0.25 max	0.020 max	29.00 – 32.00	Bal.	0.40 – 0.75	0.20 – 0.50

Mechanical Properties Of Weld Metal

U.T.S (Mpa)
345

Packing

Each pcks. Contents 5 kg. of wire Rods. Special packing will be supply on request.

ROYAL – CUPRO NICKEL 90 - 10 (SFA 5.7ER Cu Ni)

AWS / SFA 5.7ER Cu Ni

Applications

It is used for welding of Copper - Nickel Alloys

Characteristics on Usage

Royal Cupro Nickel alloys solid filler Wire Rods deposit 90% Cu, 10% Ni Weld Metal. the nickel strengthens the weld metal & improves the corrosion resistance against Sea Water, solt water

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	P%	Ni %	Cu %	Fe%	Ti %
0.05 max	1.00 max	0.25 max	0.020 max	10.00	Bal.	0.40 – 0.75	0.20 – 0.50

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)
345

Packing

Each pcks. Contents 5 kg. of wire Rods. Special packing will be supply on request.

ROYAL – ER 80 SB2 (ER 80SB2)

AWS /SFA A 5.28 ER 80SB2

Applications

It is used for joining of dissimilar combination of Cr-Mo and carbon steel or used similar component of tube, pipe welding.

Characteristics on Usage

It gives about 1.50 % Chromium and 0.50 % Molybdemum type weld deposit. The alloy is an air hardening material and therefore when welding with this filler wire rod ,preheat and post weld heat treatment are required

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
0.07 -0.12	0.40 – 0.70	0.40 – 0.70	0.025Max	0.025Max	1.20 – 1.50	0.20 Max	0.40- 0.65

Mechanical Properties Of Weld Metal

(After PWHT at 620 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
550	470	19

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000mm.

ROYAL – ER 80SB6 (ER 80SB6.)

AWS/ SFA 5.28 ER 80SB6.

Applications

It is used for welding material of similar composition .Usually in the form of pipe or tubing.

Characteristics on Usage

It gives about 4.50 to 6.0% Chromium and 0.50 % Molybdemum type weld deposit. The alloy is an air hardening material and therefore when welding with this filler wire rod, preheat and post weld heat treatment are required

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	V %	Cu %
0.10 Max	0.40 – 0.70	0.50 Max	0.025 Max	0.025 Max	4.50 – 6.00	0.60 Max	0.45- 0.65	0.030 Max	0.35 Max

Mechanical Properties Of Weld Metal

(After PWHT at 745 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
550	470	19

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm,1000mm

ROYAL – ER 80SB8 (ER 80SB8)

AWS/ SFA 5.28 ER 80SB8

Applications

It is used for welding base material of similar composition Usually in the form of pipe or tubing.

Characteristics on Usage

It gives about 8.0 to 10.5% Chromium and 1.0 % Molybdemum type weld deposit. The alloy is an air hardening material and therefore when welding with this filler wire rod, preheat and post weld heat treatment are required

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.10Max	0.40 – 0.70	0.50 Max	0.025 Max	0.025 Max	8.0 – 10.50	0.50 Max	0.85- 1.20	0.35 Max

Mechanical Properties Of Weld Metal

(After PWHT at 745 ± 15ºC for 1 Hr soaking)

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %
550	470	17

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000 mm.

ROYAL – ER 80SG (ER 80SG)

AWS –SFA A 5.18 ER 80SG

Applications

In general classification of metal requirements for welding of steel structures, pipe lines, construction of machinery, pressure vessels, where required strength 550 N/mm2 min.

Characteristics on Usage

Royal 80SG is a solid wire for flat and horizontal fillet welding position. As the deposition rate very high, gives smooth flow, shiny weld beads of radiographic quality.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Mo %	Cu %
0.08	1.35	0.50	0.020	0.020	0.30	0.35

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	Y.S. (N/mm²)	ELONGATION (L = 4d) %	CVN IMPACT AT - 20°C (J)
550	460	22	30

Packing

Each Packets content 5 kg of Wire Rods having length 1000 mm.

ROYAL – ER 308 (ER 308)

AWS –SFA A 5.9 ER 308

Applications

It is used for welding AISI, ASTM 308, 304 type Stainless Steel plate, Sheets, Pipes, Tubes etc. Fabricating Equipments for dairy, Chemical & Fertilizer Industries, Oil refineries, Specially use for root run.

Characteristics on Usage

This wire rods confirms to AWS – SFA 5.9 ER 308 class. The weld metal is very good resistant to inter granular corrosion with free from porosity & molten pool, and controlled ferrite.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.08 Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	19.5 – 22.0	9.0 – 11.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
520	35	Tip color yellow

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000mm.

ROYAL – ER 309 (ER 309)

AWS- SFA A 5.9 ER 309

Applications

Suitable for welding of dissimilar steel combination such as AISI 304 to carbon manganese steel and carbon steel used in fabrication barrier layer prior to surfacing & clad restoration specially used for root run.

Characteristics on Usage

This wire rods confirms to AWS – SFA 5.9 ER 309 class. The weld metal is free from porosity with good finish.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.12Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	23.0 – 25.0	12.0– 14.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
520	30	Tip color Green

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm,1000mm

ROYAL – ER316 (ER 316)

AWS- SFA A 5.9 ER 316

Applications

It is used for welding AISI 316, ASTM 316 type of Stainless Steel plate, Sheets, Pipes, Tubes etc. Used in fabricating Equipments for dairy, Pharmacetical ,Chemical & Fertilizer Industries, Oil refineries, Specially use for root run.

Characteristics on Usage

This wire rods confirms to AWS – SFA 5.9 ER 316 class. The weld metal is very good resistant to inter granular corrosion free from porosity & moltan pool. The weld metal is of controlled ferrite & with stand working temp up to 300°C Scale resistant up to 800°C.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.080Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	18.0 – 20.0	11.0– 14.0	2.0-3.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
490	30	Tip color Blue

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000 mm.

ROYAL – ER 309 Mo (ER 309 Mo)

AWS / SFA 5.9 ER 309 Mo

Applications

This wire rod is suitable for welding of dissimilar steel combination, such as AISI 304, 316, clad steel or the overlay of carbon steel. The weld metal reduces inter granular corrosion where severe corrosion condition exist requiring high alloy weld metal.

Characteristics on Usage

The composition of this rod is the same that deposited by E309Mo electrodes except for the addition of Molybdenum and a small reduction in the Carbon limit. The weld metal is free from porosity and any welding defects. It is used for welding 316 clad steel or for the overlay of Carbon steels.

Welding Positions

1G 2F 3G 4G

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.12Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	23.0 – 25.0	12.0– 14.0	2.0 – 3.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
550	30

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm. 1000mm

ROYAL – ER 309LMo (ER 309 L Mo)

AWS / SFA 5.9 ER 309 L Mo

Applications

This wire rod is suitable for welding of dissimilar steel combination, such as AISI 304, 316, clad steel or the overlay of carbon steel. The weld metal reduces inter granular corrosion where severe corrosion condition exist requiring high alloy weld metal.

Characteristics on Usage

The composition of this rod is the same that deposited by E309 L Mo electrodes except for the addition of Molybdenum and a small reduction in the Carbon limit. The weld metal is free from porosity and any welding defects. It is used for welding 316L clad steel or for the overlay of Carbon steels.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.030 Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	23.0 – 25.0	12.0– 14.0	2.0 – 3.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm^2)	ELONGATION (L = 4d) %
520	30

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm. 1000mm

ROYAL - ER 410 (ER 410)

AWS / SFA 5.9 ER 410

Applications

It is used for welding and surfacing of 13% Chromium steel, turbines, Armature valves and pumps.

Characteristics on Usage

Royal ER410 stainless steel solid filler wire rod deposit 12%Cr alloy is an Air hardening steel, pre heat and post weld heat treatments are required to achive welds of adequate ductility for many engineering purpose.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.12 Max	0.60 Max	0.50 Min	0.030 max	0.030	11.5 – 13.5	0.60 max	0.75 max	0.75 Max

Mechanical Properties Of Weld Metal

ELONGATION	U.T.S (Mpa)
20 min	520 min

Packing

Each pcks. Contents 5 kg. of wire Rods.special packing will be supply on request

ROYAL – ER 308L (ER 308L)

AWS –SFA A 5.9 ER 308L

Applications

It is used for welding AISI, ASTM 308, 304, 304L type Stainless Steel plate, Sheets, Pipes, Tubes etc. Fabricating Equipments for dairy, Chemical & Fertilizer Industries, Oil refineries, Specially use for root run.

Characteristics on Usage

This wire rods with low carbon content confirms to AWS – SFA 5.9 ER 308L class. The weld metal is very good resistant to inter granular corrosion with free from porosity & molten pool, and controlled ferrite

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.03 Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	19.5 – 22.0	9.0 – 11.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
520	35 % Min	Tip colour yellow

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000mm.

ROYAL – ER 309L (ER 309L)

AWS- SFA A 5.9 ER 309L

Applications

Suitable for welding of dissimilar steel combination such as AISI 304 to carbon manganese steel and carbon steel used in fabrication barrier layer prior to surfacing & clad resteration specially used for root run.

Characteristics on Usage

This wire rods with low carbon content confirms to AWS – SFA 5.9 ER 309L class. The weld metal is free from porosity with good finish.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.030Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	23.0 – 25.0	12.0– 14.0	0.75 Max	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
520	30 % Min	Tip colour Green

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm,1000mm

ROYAL – ER316L (ER 316L)

AWS- SFA A 5.9 ER 316L

Applications

It is used for welding of AISI 316 , ASME 316L type of plate sheet, pipes tubes used in fabricating equipments for chemical, pharmaceutical, Dairy & fertilizer, Industries, Oil Refineries, Specially used for root run .

Characteristics on Usage

This wire rods with low carbon content confirms to AWS – SFA 5.9 ER 316L class. The weld metal is very good resistant to inter granular corrosion free from porosity & moltan pool.The weld metal is of controlled ferrite & with stand working temp up to 300°C Scale resistant up to 800°C.

Chemical Composition Of Weld Metal

C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %	Cu %
0.030Max	1.00 – 2.50	0.30 – 0.65	0.03 Max	0.03 Max	18.0 – 20.0	11.0– 14.0	2.0-3.0	0.75 Max

Mechanical Properties Of Weld Metal

U.T.S. (N/mm²)	ELONGATION (L = 4d) %	Identification Mark
490	30 % Min	Tip colour Blue

Packing

Each Packets content 5 kg of Wire Rods having length 500 mm.,1000 mm.

PLAIN GRINDING WHEELS ()

Applications

Plain Grinding wheels are used in welding shops, metal, steel mills, automobile industries and foundries for heavy stock removal.

Characteristics on Usage

These plain grinding wheels are best suited for off-hand grinding operations such as snagging and fettling which are used on portable or fixed grinding machines or flexible shaft grinders.

DEPRESSED CENTRE WHEELS ()

Applications

Depressed center wheels are ideally suited for grinding, cleaning metal surface, cutting of gates, risers and finishing surfaces.

Characteristics on Usage

Depressed center wheels we provide are normally used on portable and grinder machines. These wheels are glass fiber which are strengthen for extra safety.

REINFORCED CUT OFF WHEELS ()

Applications

Fiber glass reinforced cut-off wheels support various qualities and is designed for easy performance, safety and easy availability, which can be wide range of ferrous and non-ferrous metal cutting usage like bar stock, structural steel, tubing, sheet metal etc.

Characteristics on Usage

Reinforced cut off grinding wheels produced by us are made to resist breaking caused by severely cross bending. Its application can be noticed in all the cutting operations where the work piece or the wheel is controlled by handcrafted machines such as portable grinder, circular saws, chop saws, g-saws or fixed cut-off machines. This wheel can be operated at maximum speed of l00M/s, as this the strength of the wheel.

NON REINFORCED CUT OFF WHEELS ()

Applications

Easy performance, safety, low cost and readily availability of Plain Cut-off wheels, making them versatile for wide range of applications like metal cutting and parting where side pressure applied on the wheel is quite low. Notching on hardened nozzles, collets and cutting small diameter stainless steel rods are also some of its applications.

Characteristics on Usage

These are non reinforced cut-off wheels offered by us are designed and are used in fixed base type of machines where work is secure clamped, guarded. It is also used in the machines where the wheel operates on controlled cutting plain without any twisting or lateral stresses.

SWING FRAME / PEDESTAL WHEELS ()

Applications

Swing Frame /Pedestal Wheels are ideally suited in steel industry for surface correction of billets & also used in foundries for gates & risers removal.

Characteristics on Usage

Swing Frame /Pedestal Wheels should be mounted on swing frame grinding machines.

CUP WHEELS ()

Applications

The noticeable cup wheels are generally used for large flat stock removal.

Characteristics on Usage

Cup wheels are used on both rotary as well as reciprocating table surface grinding machines.

GLASS GRINDING WHEELS ()

Characteristics on Usage

Glass grinding wheels, we provide are made using silicon carbide grits and grinding, chamfering of glass and engraving designs on glass and giving different shapes are the application of these wheels. Royal Arc Abrasives have discovered special types of wheels which are used for rough grinding, medium grinding and finishing operations. "C40". "C60", and "C80" are the different markings on the wheels.

SEGMENT ()

Applications

Segment are used in various rotary table surface grinding operation and also in vertical spindle reciprocating table surface grinding machines which are used for large material removal or precision surface finish.

Characteristics on Usage

Royal Arc Abrasives make segments which can be availed in different sizes and shapes and it can be customized according to requirement of various types of machines and customers demands.