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The Ramco Group Limited is a conglomerate of over 40 companies operating within East Africa, with a key focus on six key sectors; building materials, print and packaging, hardware and trading, manufacturing, office supplies, and service and properties.

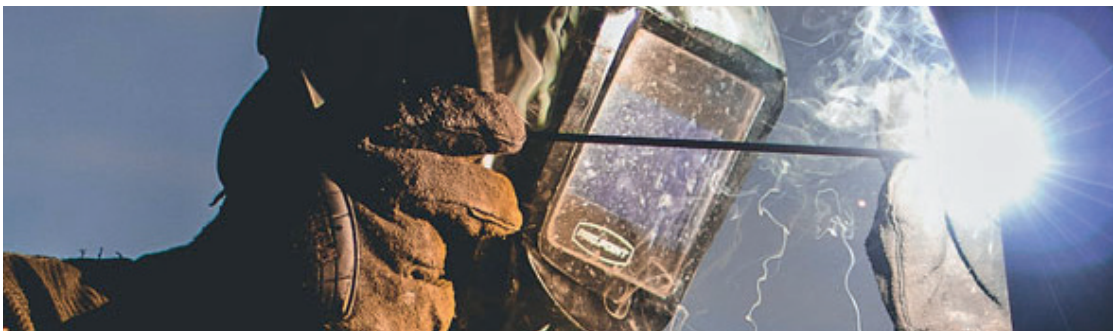
The group has a heritage of providing innovative products and solutions across different industries.



**ASL Limited** – Industrial Division is a leading manufacturer of Welding electrodes & other industrial products based in Industrial area, Lusaka road, Nairobi – Kenya.

Among its unique core products are ideal diverse welding electrodes; used for structural & construction works, maintenance work, welding of thin & heavy sheets and industrial use. Our products are available in the the Eastern Africa

# MARUTHI WELDING ELETTRODES



market under the brand name MARUTHI Welding Electrodes, of which are of superior quality and have been engineered with high expertise to meet the local and international standards, enabling us to deliver a high customer satisfaction and top notch welding solutions.

**ASL's MARUTHI** products guide conforms to the standards required by today's welding industry. We emphasize on quality & backed by an extensive range of products to cater for the diverse welding industry applications; comprising of mild steels, Stainless steels, cast irons, hard facing & other specialized electrodes.

**ASL MARUTHI** Electrodes thrives on a Quality Management System with the support of its well-equipped state of the art testing & analyzing

Mechanical & Chemical Laboratories, delivers conforming products to the quality requirements of Kenya Bureau of Standards (KEBS) as well as ensuring that the production processes from conversion of raw materials to the finished products is achieved under intensively controlled environment consistently.

We strive to remain a market leader in supplying most preferred quality welding products to our most valuable customers, meeting all their welding solutions with utmost satisfaction.

# PRODUCTS



## APPLICATION:

**MARUTHI E6013** is used for welding low & medium carbon structural steels machinery fabrications, bridge constructions, boiler vessels, automotive bodies, steel furniture, metal plate works & general repairs. Redrying at 100°C for 1 Hr. is recommended.

## MECHANICAL PROPERTIES

Yield Strength	≥500N/MM <sup>2</sup>
Tensile Strength	≥420N/MM <sup>2</sup>
Elongation (L=5d)	25%
Impact	60 J (0°)

## WELDING PARAMETERS AC/DC(±):

Φ (MM)	Current (Amps)
2.50	60 - 90
3.20	80 - 130
4.00	130 - 200
5.00	180 - 320
OCV >50V	

# MARUTHI E6013

MILD STEEL WELDING ELECTRODE (AWS A5.1:E6013)

**MARUTHI E6013** is a medium heavy coated, rutile type all positions electrode positing radiographic quality welds. Has very easy slug detachability, low spatter, and smooth and shining weld beads. Weld metal has high resistance to cracking.







#### APPLICATION:

**MARUTHI E7018's** typical applications include storage tanks, ship building, coaches, bridges, wagons, Quarry equipment, penstocks, earthmoving machines, etc. Re- dry the electrodes at 250-300°C for 1hr.

#### MECHANICAL PROPERTIES

Yield Strength	460N/MM <sup>2</sup>
Tensile Strength	530 N/MM <sup>2</sup>
Elongation (L=5d)	28%
Impact (ISO-V/-50°C)	Min 47J

#### WELDING PARAMETERS AC/DC(±):

φ (MM)	Current (Amps)
2.50	70 - 100
3.20	100 - 150
4.00	150 - 190
5.00	200 - 250

## MARUTHI E7018

### LOW HYDROGEN ELECTRODE(AWS A5.1: E7018)

**MARUTHI E7018** is a heavy coated low hydrogen, iron powder type electrode ideally suited for Producing welds of radiographic quality in boilers, pressure vessels and heave structures subjected to dynamic loading.





#### APPLICATION:

**MARUTHI E308L-16** is used in the welding of niobium or titanium stabilized austenitic stainless steels. Welding of vapor and pressure fittings, storage tanks & equipment used in milk & other food industries-i.e. S.S or S.S plated steels operating under chemical attacks, joining of S.S parts of similar composition with cast pieces.

#### MECHANICAL PROPERTIES

Yield Strength 4	20 N/MM <sup>2</sup>
Tensile Strength	570 N/MM <sup>2</sup>
Elongation (L=5d)	45 %
Impact (ISO-V)	80 J (+20° C)

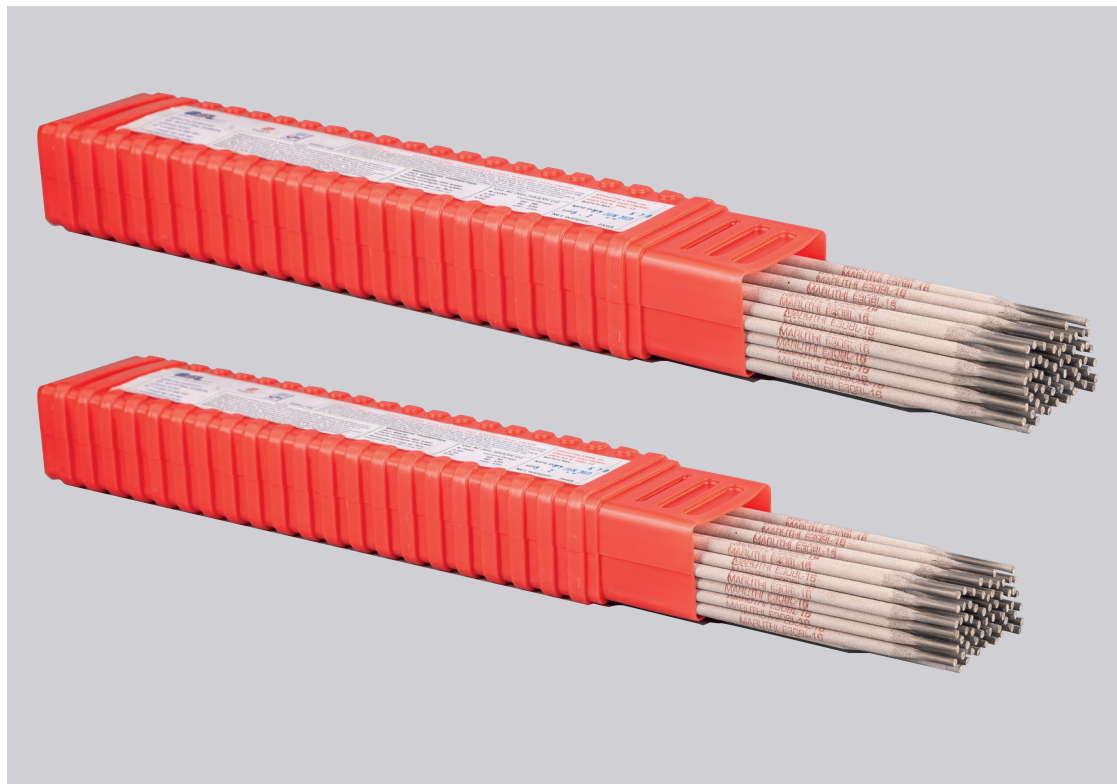
#### WELDING PARAMETERS AC (Min 50V)/DC (+):

φ (MM)		Current (Amps)
2.50		60 - 90
3.20	9	0 - 120
4.00		110 - 150

## MARUTHI E308L-16

STAINLESS STEEL WELDING ELECTRODE. (AWS A5.4:E308L-16.)

**MARUTHI E308L-16** is an extra Low carbon rutile coated electrode giving a filler metal of the Cr-Ni type. Has perfect quality smooth weld beads which are highly resistant to acids, intergranular corrosion at operating temp up to 350°C & to oxidation up to 800°C Easy slug removal and stable arc. Ideal for welding of steels corresponding to AISI 301,302,304,304L, 308 & 308L.







#### APPLICATION:

**MARUTHI E309L-16** is an ideal electrode especially designed for welding pipes, plates & tanks that are used in chemical, petro-chemical, food and paper industries; forged & cast pieces & industrial furnaces that are exposed to high temperatures.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Yield Strength	460 N/MM <sup>2</sup>
Tensile Strength	590 N/MM <sup>2</sup>
Elongation (L=5d)	40 %
Impact (ISO-V)	70 J (+20° C) / 35 J (-80 °C)

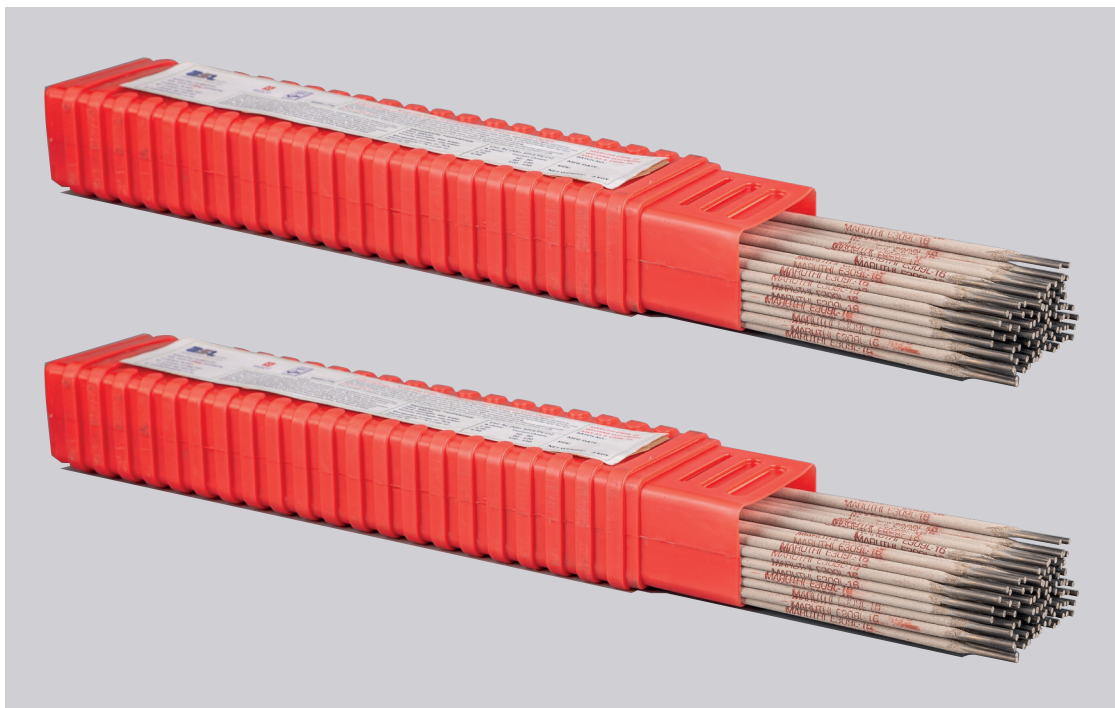
#### WELDING PARAMETERS AC (Min 50V)/DC (+):

ø (MM)	Current (Amps)
2.50	50 - 80
3.20	80 - 120
4.00	120 - 150

## MARUTHI E309L-16

STAINLESSSTEELWELDINGELECTRODE. (AWSA5.4: E309L-16.)

**MARUTHI E309L-16** is a low carbon rutile coated electrode of the filler metal of Cr-Ni type. Weld beads are highly resistant to oxidation at operating temperatures up to 1000°. Commonly used for joining stainless steels with low & medium alloyed steels and for root pass applications before welding of surface plated steels. It can also be used for cladding of mild steels and to form buffer layer for hard facing before welding with E308L-16. It can be used in all positions & weld metal has high resistance to cracking. Ferrite content = 12%.





#### APPLICATION:

**MARUTHI E309L-16** is an ideal electrode especially designed for welding pipes, plates & tanks that are used in chemical, petro-chemical, food and paper industries; forged & cast pieces & industrial furnaces that are exposed to high temperatures.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Yield Strength	625 - 650 N/MM <sup>2</sup>
Tensile Strength	780 - 845 N/MM <sup>2</sup>
Elongation (L=5d)	20 - 25 %
Hardness	220 - 260 HB

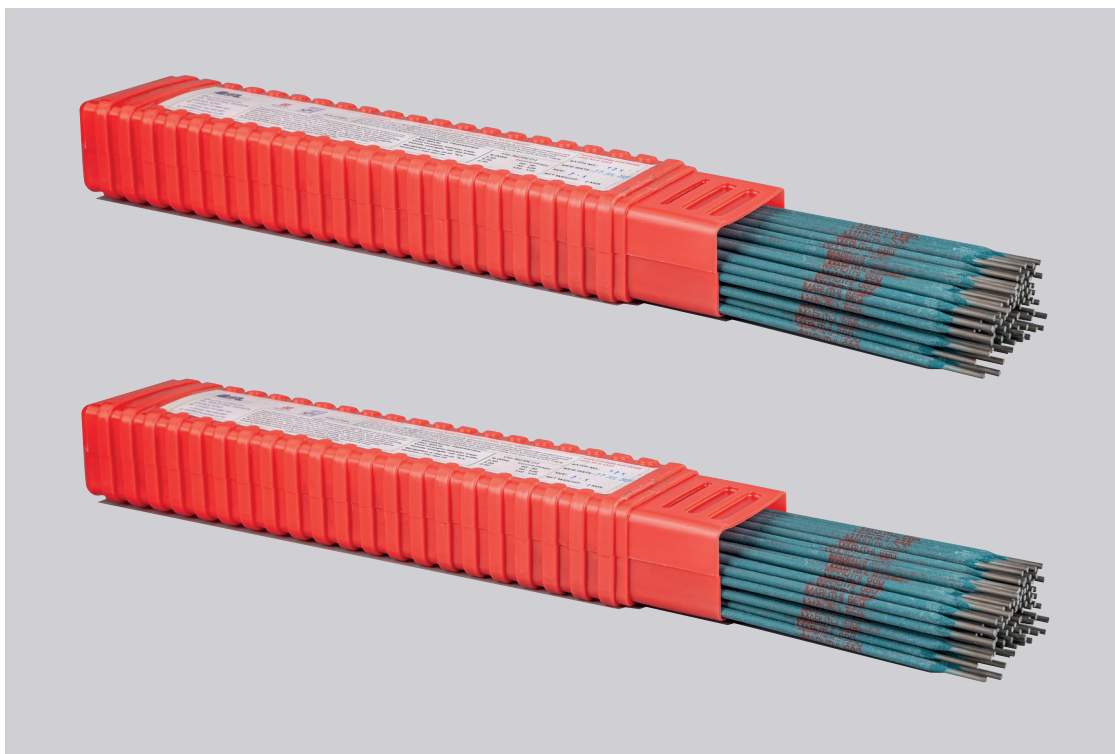
#### WELDING PARAMETERS AC/DC(+):

ø (MM)	Current (Amps)
2.50	60 - 90
3.20	90 - 120
4.00	110 - 150

## MARUTHI E680

STAINLESS STEEL WELDING ELECTRODE. (AWS A5.4: E312-16.)

**MARUTHI E680** is a highly alloyed manual metal arc electrode with good deposition qualities & extremely high strength and crack resistant for the welding of air hardening steels, cementation steels, High carbon steel V-Mo spring steels, dissimilar steels, manganese steels. Also ideal for buffering of higher carbon steels & alloy steels prior to hard overlays including 12-14 % austenitic manganese steels. Gives work hardenable weld metal and the arc is stable and spatter free.











#### APPLICATION:

**MARUTHI E316L-16** is ideal for welding of pipes, tanks & vessels that are used in chemical, paint & paper industries. Cr-Ni-Mo steels, steel cast parts & pipes that are used for acid, gas & vapor transmission can also be welded with this electrode. Can also be used in buildup welding of leak-proof surfaces.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Yield Strength	490 N/MM <sup>2</sup>
Tensile Strength	600 N/MM <sup>2</sup>
Elongation (L=5d)	35 %
Impact (ISO-V)	60 J (+20° C)

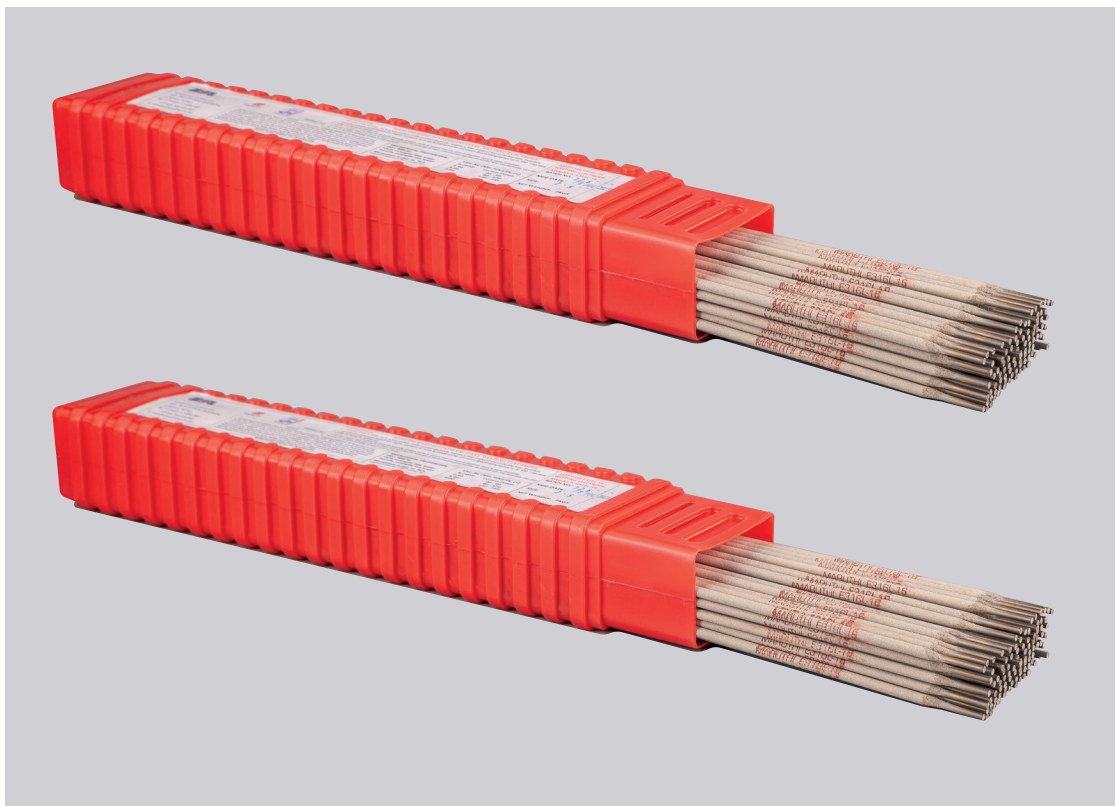
#### WELDING PARAMETERS AC (Min 50V)/DC (+):

Ø (MM)	Current (Amps)
2.50	40 - 60
3.20	80 - 120
4.00	120 - 145

## MARUTHI E316L-16

### STAINLESSSTEELWELDINGELECTRODE.(AWSA5.4: E316L-16.)

**MARUTHI E316L-16** is a low carbon rutile coated electrode. It gives a filler metal of the Cr-Ni-Mo type. Excellent quality smooth weld beads are highly resistant to acids & intergranular corrosion operating temps up to 350°. It has easy slug removal & a stable arc.







**NB:** When welding cast iron without preheat, smallest possible electrode diameter & lowest possible welding current should be used to limit the width of heat affected zone that might occur due to excess heating. When welding thick pieces, a preheating to 150-200 °C & slow cooling is recommended.

#### APPLICATION:

**MARUTHI FN-55** used for the joining & build up welding of gray cast iron, nodular cast iron & malleable cast iron parts, welding parts exposed to dynamic forces-found in heavy machinery base & body. It is an ideal electrode for the joining of cast iron pieces to stainless steel or steel parts. It can also be used to fill up cavities in castings, or cavities that might form after machining.

## MARUTHI FN-55

CAST IRON WELDING ELECTRODE. (AWS A5.15: ENiFe- CI.)

**MARUTHI FN-55** is a nickel cored electrode used for the welding of all types of cast irons and particularly for the joining of austenitic alloyed cast irons; called Ni-resist. It gives a very stable arc and negligible amount of easily removable slag. Weld metal can easily be machined and has same color with that of the cast iron. It has excellent mechanical properties and it is very resistant to cracking.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Yield Strength	320 - 360 N/MM <sup>2</sup>
Tensile Strength	430 - 470 N/MM <sup>2</sup>
Elongation (L=5d)	10 %
Hardness	160 - 200 HB

#### WELDING PARAMETERS AC (Min 50V)/DC (+):

φ (MM)	Current (Amps)
2.50	45 - 80
3.20	60 - 120
4.00	90 - 140





#### APPLICATION:

**MARUTHI HF-350** is used for hardfacing of alloyed and unalloyed steels, worn surfaces of rails & rail surfaces, crane and conveyor wheels, cast steel valve seats, pinions, track rollers and links of earth moving equipment can be hard-faced with MARUTHI HF-350; recommended for in multipass applications. Preheating & interpass temperature of min 200°C.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Yield Strength	70 - 80 Kg/mm <sup>2</sup>
Tensile Strength	90 - 110 Kg/mm <sup>2</sup>
Elongation (L=5d)	10 - 15 %
Hardness	38 - 40 HRC
Impact (ISO-V)	24 J (+20° C)

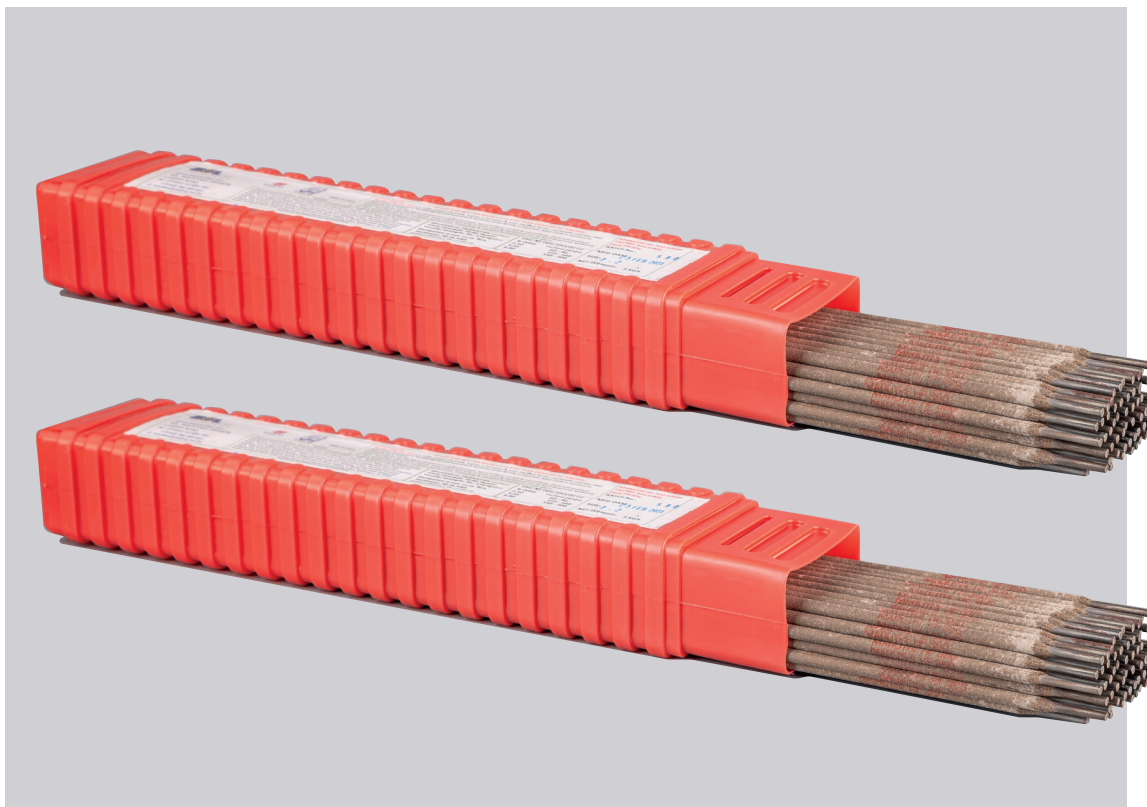
#### WELDING PARAMETERS AC (Min 50V)/DC (+):

ø (MM)	Current (Amps)
2.50	60 - 90
3.20	110 - 160
4.00	140 - 200

## MARUTHI HF-350

### HARD-FACING WELDING ELECTRODE

**MARUTHI HF-350** is a rutile coated electrode. It gives a corrosion & wear resistant ferritic-martensitic stainless steel weld metal. It is used in hardfacing applications where hardness of 42-46 HRC is required. Weld metal is resistant to softening up to 500°C.







#### APPLICATION:

**MARUTHI HF-500** is commonly used for hardfacing of alloyed & unalloyed steels. Worn surfaces of crushing tools in the mining industry, conveyor screws, excavator & bulldozers blades, mixer parts, screws of cement pumps & cutting edges of cold worked tool steel can be hard-faced with this electrode.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Hardness	52 - 56 HRC
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#### WELDING PARAMETERS AC (Min 50V)/DC (+):

ø (MM)	Current (Amps)
2.50	60 - 100
3.20	110 - 140
4.00	150 - 190

## MARUTHI HF-500

### HARD-FACING WELDING ELECTRODE

**MARUTHI HF-500** is a basic coated electrode. Wear resistant weld metal & has a high toughness value & exhibits a high resistance to cracking at operating conditions with high impact. Highest wear resistance is obtained after three passes. 10% Cr content increases the wear resistance of the weld metal to the simpler forms of corrosive attacks. Weld metal is resistant to softening up to 500°C. Can be machined by grinding.











#### APPLICATION:

**MARUTHI HF-600** is used for hardfacing of alloyed and unalloyed steels. Protective lining of worn surfaces of machines used in mines, bulldozers blades, excavator teeth, crushing jaws, conveyors, agricultural & forestry machines that are exposed to wear can be hard- faced with this electrode.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

Hardness	57 - 62 HRC
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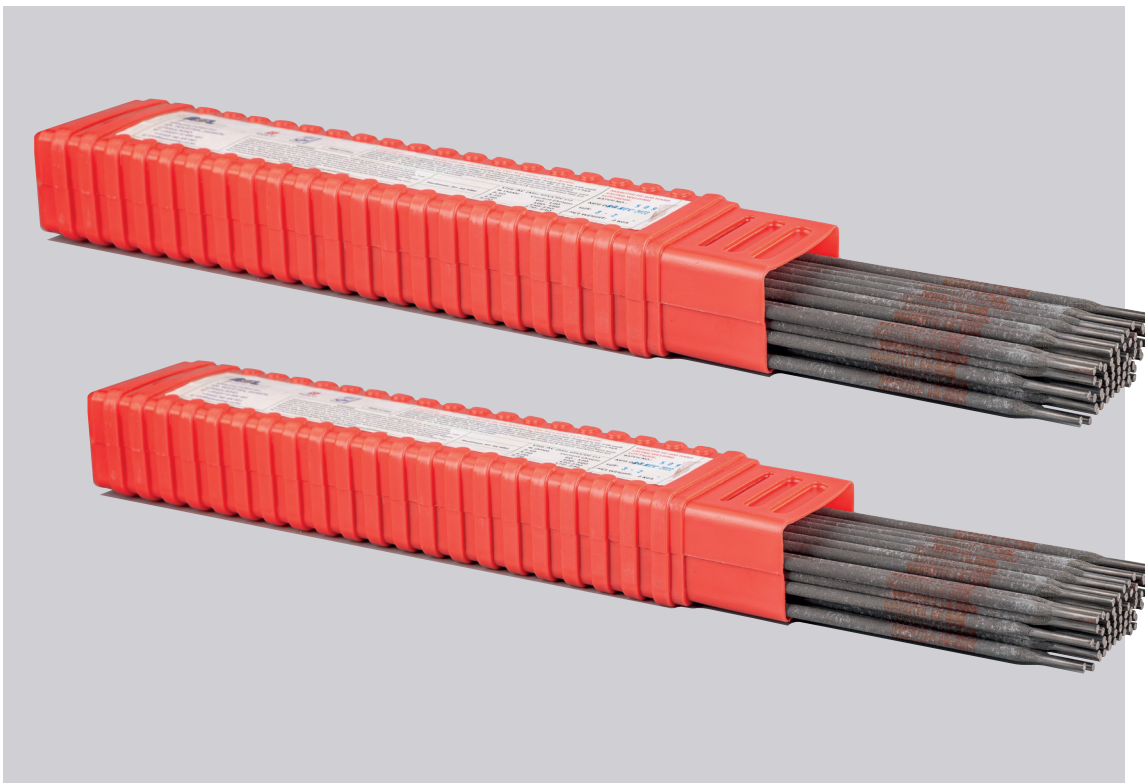
#### WELDING PARAMETERS AC (Min 65V)/DC (+):

ø (MM)	Current (Amps)
2.50	60 - 120
3.20	100 - 160
4.00	130 - 190
5.00	170 - 240

## MARUTHI HF-600

### HARD FACING WELDING ELECTRODE

**MARUTHI HF-600** is a general purpose, rutile coated hardfacing electrode especially designed to use with small transformers having a relatively low open circuit voltage. It is resistant to softening up to 500°C. It gives a high abrasion resistant martensitic type weld metal with medium toughness .Weld metal cannot be machined.







#### APPLICATION:

**MARUTHI NM** is ideal for joining and repair welding of cast iron. Welding machine bases, gears, cams, cracked motor & generator housings. Foundry defects can be rectified perfectly with the electrode.

#### MECHANICAL PROPERTIES (WELD ALL METAL)

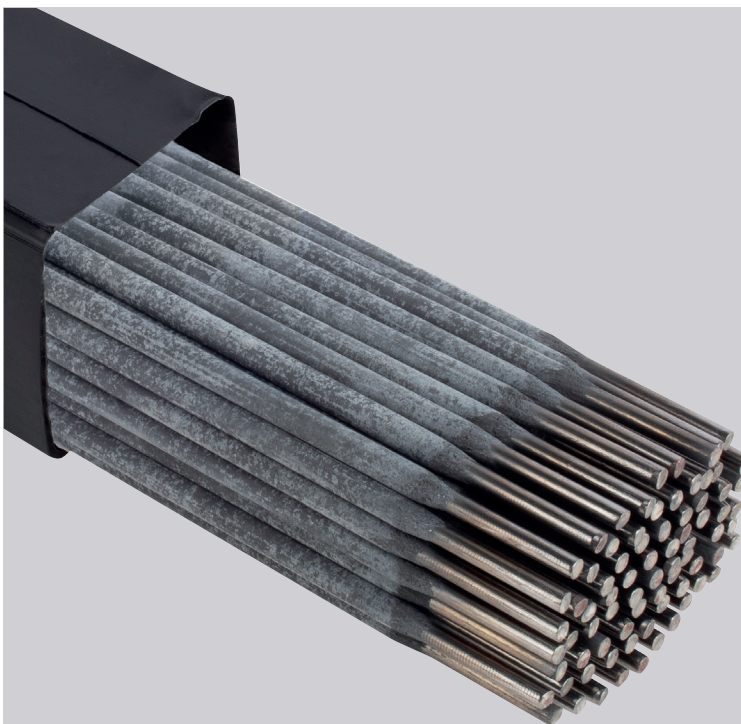
Tensile Strength	41.368 KN/MM <sup>2</sup>
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#### WELDING PARAMETERS AC/DC (+):

φ(MM)	Current (Amps)
3.20	60 - 90
4.00	90 - 150

## MARUTHI - NM NONMACHINABLE CAST IRON WELDING ELECTRODE

**MARUTHI NM** is an unmachinable electrode producing smooth, dense, high strength & porosity free deposits even on old and dirty cast iron materials. The welds have good bond strength & slag detachability. Can be used in all positions, with deposits closely matching cast iron in color. Preheating is not necessary but, preheating to about 175 °C helps to reduce stresses and permits use of low amperage to reduce distortion.





## MARUTHI E82

### CUTTING ELECTRODE

**MARUTHI E82** is suitable for cutting, chamfering and piercing all types of steel, cast iron and non-ferrous metal. It strikes easily and achieves clean cuts even on thicker materials owing to its high current carrying capacity.

#### APPLICATION:

It is used for beveling, weld preparation of cracks and for gouging of armour steels, air hardenable steels, stainless steels, cast irons, hard metals, work hardenable and difficult to machine materials. The surface is clean and doesn't require further dressing. Metal removal speed depends on the electrode diameter, amperage selected and to the thickness of the piece. It is recommended to work with a quality power source for best results.

Instructions: set up the workpiece so that the molten metal can run off easily. It is advisable to execute an up-and-down sawing movement, pushing the molten metal away with the electrode. Depending on the electrode diameter and material thickness, vary the amperage respectively.





#### APPLICATION:

Site welding of pipe and pipelines carrying natural gas, crude petroleum or alike; ship building; storage tanks, boiler and pressure vessel manufacturing, steel and bridge constructions are among its application areas. Also ideal for applications requiring high penetration, for root and deposition pass and also for pipe connections of 5lx46 grade line pipes.

## MARUTHI E6010

### CUTTING ELECTRODE

**MARUTHI E6010** is an easy to strike cellulosic coated electrode. Excellent molten pool control due to easily removable, low volume slag and gaseous arc shielding eliminates porosity problems in weld beads. In all positions, it enables weld beads of high penetration and it minimizes problems that frequently occur in the welding of rusty or oily steels.







## MARUTHI MIG WELDING WIRE (AWS: ER70S-6)

**MARUTHI MIG Welding wire (AWS: ER70S-6)** is a copper coated gas metal arc welding wire in 15 kg spools. Ideally designed for semiautomatic and full automatic GMAW applications. Working temperature can range between -50 to 450° C. CO<sub>2</sub> or 80% Ar-20 % CO<sub>2</sub> are used for gas shielding.

### MECHANICAL PROPERTIES (All Weld Metal):

Yield Strength	440 N/MM <sup>2</sup>
Tensile Strength	540 N/MM <sup>2</sup>
Elongation (L=5d)	30 %
Impact (ISO-V)	60 J (-30°C)

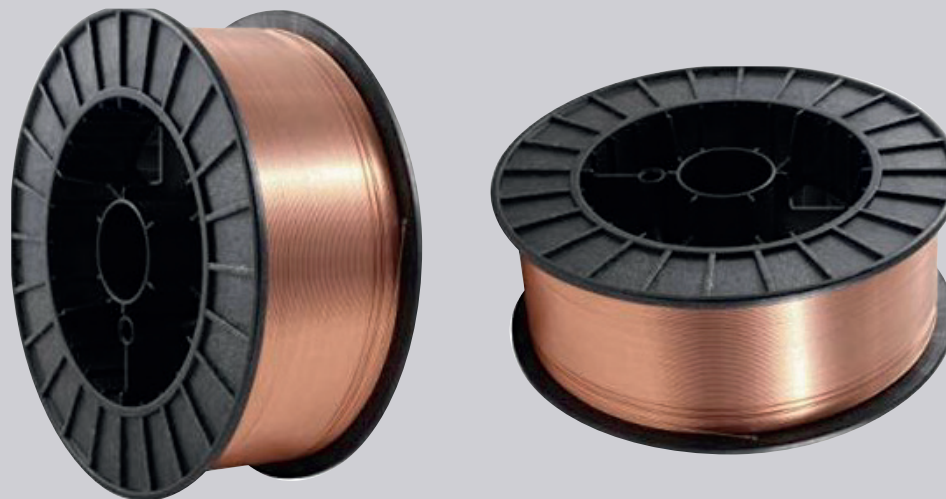
### CURRENT TYPE & POLARITY DC (+):

Arc type	φ (MM)	Current (Amps)	Voltage
Short Arc	0.8	60 – 140	18-22
Short Arc	1.0	80 – 175	18-24
Short Arc	1.2	120 – 200	18-27
Sprey Arc	1.2	150 -280	25-40

### Chemical Composition (w %), Typical, wire.

C	0.08
	0.06*
Si	0.85
	0.55*
Mn	1.50
	1.10*

(\*)Typical weld metal composition (CO<sub>2</sub> GAS shielding)





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