MILD STEEL WELDING ELECTRODES

QUALITY & STANDARDS	**:**	**IS: 814:1991**
PRODUCTION CAPACITY	**:**	**1200 MT per year**
MONTH AND YEAR OF PREPARATION	**:**	**March,2011**
PREPARED BY	**:**	**MSME DEVELOPMENT INSTITUTE, (*METALLURGY DIVISION)* C.G.O. Complex, Block"C", Seminary Hills, Nagpur – 6.**

1. INTRODUCTION:

The proposed project is to manufacture welding electrodes required for arc welding purposes. The electrode is coated with flux. Although, electrodes are produced in different sizes viz. dia.2.5, 3.15, 4.00, 5.00mm & length 350 to 450mm, the assumption in the project has been made for production of electrodes of 4mm dia. core rods. The electrodes are used for fabrication work for joining of steel & alloy steel and cast iron parts for hard facing of jobs etc.

2. MARKET POTENTIAL:

Previously, this item was manufactured only in the medium & large scale sectors. But, now –a –days, this item is manufactured in the small scale sector as quality product with competitive prices. Though there is a good no. of units in the small scale sector manufacturing this product, but due to large gap between demand & supply, there is a very good potential market for this item in context of fast growing field of fabrication work, heavy construction works & large units coming up in the region.

3. BASIS AND PRESUMPTIONS:

Working hours per shift	8 Hours.
No. of shift per day	1 shift
Working days	300 days
Total number of working hours	2400
Working efficiency	75%
Time period for achieving maximum capacity Utilization.	3rd year from the date on which production is started
Labour charges	As per minimum Wages Act of State Govt.
Rate of bank interest	14%
Operative period of the project	10 years.

Total wastage loss has been estimated at 8-10%.

4. IMPLEMENTATION SCHEDULE:

Project implementation will take a period of 8 months from the date of approval of the project. Break-up of activities with time-period for each activity is shown below.

Sl.No.	Nature of activities (estimated)	Time period in months
1.	Scheme preparation and approval	0-1
2.	SSI provisional registration	1-2 day
3.	Sanction of loan	2-5
4.	Clearance from Pollution control Board	3-4
5.	Placement of order for delivery of machinery	4-5
6.	Installation of machines	6-7
7.	Power connection	6-7
8.	Trial run	7-8
9.	Commencement of production	9 months

5. TECHNICAL ASPECTS:

A. Production details and Process of Manufacture:

Electrodes are manufactured in various sizes & types. The drawn electrode quality wire (core wire) procured as raw material of required diameter, is first straightened on wire straightening machine & simultaneously cut to required length & stored. The flux in desired composition is prepared (normally flux constitutes 50% Rutile & 10% ferro-alloys & 40% other ingredients)in the dry blender & wet mixer as a slug in cylindrical form in automatic slug press. The slug is then placed in the extrusion press. The straight cut
wires are placed in the wire feeder hopper attached to the extrusion press. Simultaneously, the wires are fed through the press block at a higher speed & through the coating die/nozzle, the flux is also fed forming coating of flux of desired thickness on the wire. The coated wire is then passed through gauges & brushes where electrodes are randomly checked for desired thickness of flux coating & concentricity. These flux coated rods are then sent to baking / drying oven & are kept for specific time cycle at specific temperature.

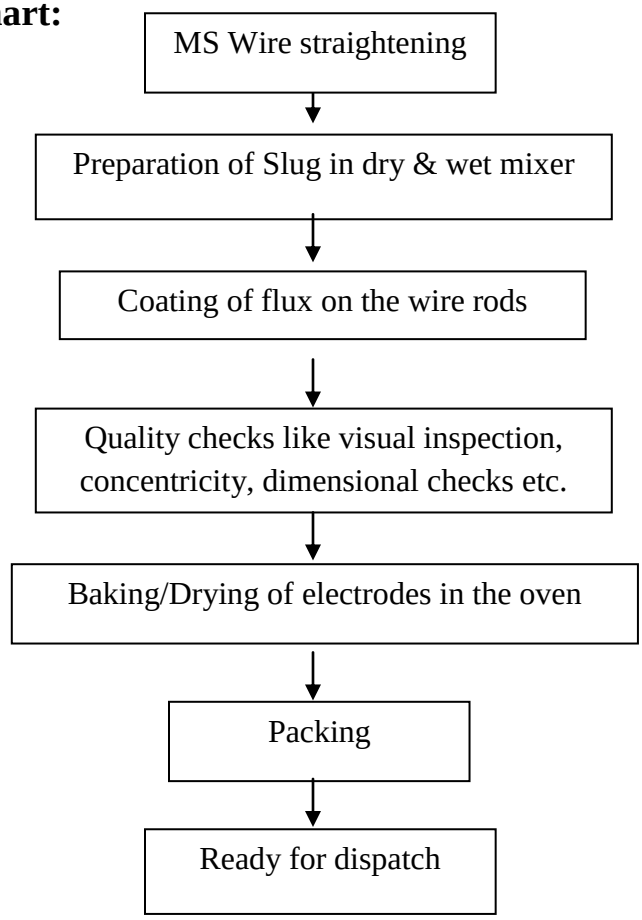
The electrodes thus produced are then packed & are ready for dispatch.

B. Quality Specification:

MS Welding electrodes are manufactured as per IS:814:1991, & Wire rod requirements are as per IS:2879:1983. Generally, the chemical analysis of all weld deposits is as follows: C – 0.05 to 0.10 %, Mn – 0.35 to 0.50%, Si – 0.3 max., & P – 0.03 max. & the mechanical properties of all weld

metal are UTS: 410-510 N/mm^2, YS:330 N/mm^2 min., Elongation: 22% min. & Impact Strength, in Joules, 47min. at 0^0C.

6. **Process Flow Chart:**



7. Production Capacity:

Quantity : 1200 tones per annum.

Value : Rs. 5,10,00,000/-

8. Motive power: 10 HP.

9. Pollution Control Measures:

The unit has to take into consideration the anti-pollution measures for disposal of chemicals/acid and alkaline solution so as to make then neutral. Digging pit for storage and neutralization and the shed should be well ventilated and provided with exhaust fan.

10. Energy Conservation:

These days energy conservation efforts are needed to be strengthened Substantially. The potential for conservation however, is must large and all efforts needed to be made the individuals to realize it to the extent possible.

The energy audit is an integral part of an energy conservation project and is the key to a systematic approach for decision.

11. Financial Aspects:

A. Fixed Capital

i) Land & Building, 7000 Sq. Ft. (rented) per month 10000

ii) Machinery & Equipments:

S.No.	Description of Machines	Quantity	Price (Rs)
1	Automatic Slug Press, 90 MT capacity	1	325000
2	Wet Mixer	1	80000
3	Steel Hopper for Storage	1	27000
4	Dry Blender, 1 MT capacity	1	100000
5	Chemical container for blended flux	1	20000
6	Sieving Vibrating machine	1	25000
7	Weighing machine for discharged flux	1	12000
8	Weighing machine for blending, Silicate etc.	1	12000
9	Lifting tackles, bogies, containers	L.S.	60000
	Extrusion & Drying Department		
1	Extrusion Press with electric meter for testing rods, 150 MT capacity with wire feeder for feeding length upto 9" to 12"	1	800000
2	Conveyor system with finishing unit	1	150000
3	Electrically heated Drying Oven	1	175000
4	Wire straightening & cutting machine	2	100000
5	Dry trays, trollies	L.S.	50000

6	Wire recovery plant with flux stripper, washing equipment & dryers	1	75000
7	Arber Press	1	75000
8	Lathe, 6"	1	100000
9	Drilling Machine, 1" capacity	1	15000
10	Pedestial Grinder	1	10000
11	Gas Welding equipment	1	25000
12	Storage bins, racks, fitter tools etc.	L.S.	50000
	Testing Laboratory & Quality Control Department		
1	Carbon Sulphur determination apparatus	1	35000
2	Moisture Determination equipment	1	12000
3	Arc Welding Transformer, 400 amp	1	20000
4	Small Electrically heated bath	1	7000
5	Rockwell Hardness Tester	1	35000
6	Microscope	1	75000
7	Izod Impact Testing Machine	1	40000
8	Universal Tensile Testing Machine, 5 MT capacity	1	150000
9	Miscellaneous equipments	L.S.	25000
		TOTAL	**2685000**

10	Electrification & installation @ 10% of above cost		268500
11	Office equipments like furniture, fan, typewriter etc.	L.S.	40000
12	Pre-operative expenses		40000
		TOTAL	**3033500**

12. Working capital (Per month):

A: Staff & Labour:

S.No.	Description	Nos.	Salary	Total
1	Technical Manager	1	8000	8000
2	Metallurgist	1	7000	7000
3	Production Engrr.	1	7000	7000
4	Foreman	2	6000	12000
5	Chief Chemist	1	5000	5000
6	Supervisor	2	5000	10000
7	Melter	1	4500	4500
8	Accountant/Clerk	1	4000	4000
9	Skilled Worker	4	3000	12000
10	Semi-Skilled Worker	4	2500	10000
11	Unskilled worker	6	2200	13200
12	Peon	1	2000	2000
13	Watchman	1	2000	2000
			Total	**96700**
14	Add perquisite @15% of salary			14505
			Total	**111205**

B. Raw Material (Per month)

S.No.	Particulars	Qty.(MT)	Rate(Rs.)	Value
1	Enveloping compound- Sodium silicate, Ferro Silicon, Rugeon Chalk, Chloride soda, Starch powder, Dolomite, Titanic oxide, Potash Mica, FeMn, Destrine, Limnite, Iron Powder, Rutile etc.	17	27000	459000
2	4mm MS Wire	93	34000	3162000

		Total	**3621000**

C. Utilities (Per month)

1	Electricity		15000
2	Water		1000
		Total	**16000**

D. Other Contingent Expenses (Per month)

1	Rent		10000
2	Postage & Telephone		3000
3	Packing		25000
4	Insurance		7000
5	Repairs & maintenance		5000
6	Consumable Stores		5000
7	Advertisement & Publicity		5000
8	Misc. Expenses		5000
9	Transport allowances		5000
		Total	**70000**

13. Total Working Capital (Per month) 3818205

14. Total Capital Investment

i)	Fixed Capital		3033500
ii)	Working Capital		11454615
		Total	**14488115**

15. Financial Analysis

a. Cost of Production (Per Year)

i)	Total recurring cost		45818460
ii)	Depn. on m/cry & equipment @ 10%		250300
iii)	Depn. on furnaces @ 20%		36400
iv)	Depn. On office equipments @ 20%		8000
v)	Interest on Total investment @12.5%		1811014
		Total	**47924174**

b. Turnover (Per Annum)

Welding Electrodes(4mm), @42500 per MT	1200MT	**51000000**

c. Net Profit per year

Turnover per year - Cost of production = **3075826**

d. Net Profit Ratio

(Net profit per year/ Turnover per year) X 100 = **6.03%**

e. Rate of Return

(Net profit per year/ Total investment) X 100 = **21.23%**

f. Break-even Point

Fixed Cost

i)	Rent	120000	
ii)	Depn. on machinery & equipment @ 10%		250300
iii)	Depn. on furnaces @ 20%	36400	
iv)	Depn. On office equipments @ 20%	8000	
v)	Interest on Total capital investment @12.5%		1811014
vi)	Insurance	84000	
vii)	40% of salary & wages	533784	
viii)	40% of other contingent expenses excluding rent & insurance	230400	
	Total	**3073898**	

Break- Even Point (B.E.P.)

[Fixed Cost/ (Fixed cost + Profit)] X 100 = **49.98%**

NAMES & ADDRESSES OF MACHINERY AND EQUIPMENT SUPPLIERS :

1) M/s. Hannu Metallurgical,
   B-22, Indsutrial Estate, Mahakali Caves Road,
   Andheri (East), Mumbai – 93.
2) M/s. Mahavir Engineering Corpn.,
   1, Ambica Estate, B/h. Agarwal I.E.,
   off S.V. Road, Jogeshwari West,
   Mumbai – 102.
3) M/s. Divecha Electrticals,
   Balaji Indl. Complex,
   Gala No. ½, Navaghar , Bhayandar (E),
   Distt. Thane.
4) M/s. Nisha Engrs. & Consultants
   Nisha Enclave, Plot No. 95,
   Sector 23, Cidco Indl. Area,
   Turbhe, Distt. Thane.
5) M/s. Combustion Equipments & Instruments,
   Jer Mahal, Dhobi Talaw, 1st Floor,
   Mumbai –2.
6) M/s. AIMIL Ltd.,
   Malhotra House, Opp. G.P.O.,
   Walchand Hirachand Marg,
   Mumbai – 1.
7) M/s. Electroil Super Thermal Engineers,
   151, Small Factory Area, Lakadganj,
   Nagpur – 8.

NAMES & ADDRESSES OF RAW MATERIAL SUPPLIERS :

SAIL, TISCO or Local Metal Traders or Dealers for Alloy Steel.

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