

PROJECT PROFILE

WELDING ELECTRODES

PREPARED BY



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1.1 INTRODUCTION

Welding electrodes are used in welding various metals in the fabrication of equipment for chemical & Allied industries, construction of steel structures such as bridges, factory sheds, in the manufacture of ships, Vehicles and engineering equipment. Mild steel is welded by electrodes to a maximum among all the metals & Alloys. Therefore M.S. Welding Electrode is the most widely used core wire. Besides this, special grade electrodes are being developed for specific applications.

Welding electrodes comprise basically of steel core wire and coating ingredients or flux mild steel core wires are used in majority of unalloyed steel electrodes. Besides mild steel, nickel, Nickel-copper, Nickel irons are also used in MIG & TIG welding. Stainless steel wires are also used for welding in fertilizer, chemical & surgical instrument making industry. Coating ingredients are basically rutile, potassium silicate, sodium silicate and minerals like quartz, calcite and mica. Ferro-alloys are also used in the formulations of fluxes.

The bulk users of welding electrodes are the manufacturers detailed as under:

- Welded Tubes & Pipes
- Structural fabrication & Construction
- Ship & Ship ancillaries
- Industrial machinery tools & equipment; and
- Misc. users including repairs and maintenance

Welding electrodes are used in different industries viz.

- Thermal, hydel & nuclear power plants
- Petrochemical Industry
- Industrial machinery
- Heavy engineering
- Transportation
- Fertilizers and

- Oil & water pipe lines

1.2 TECHNOLOGY AND PROCESS

Wires of different chemical compositions and sizes are obtained from different steel manufacturers. In electrode making plant, they are chemically cleaned, cut to different lengths (30 the selling prices of welding electrodes vary according to length of the electrodes and the raw material used.

There are two methods of applying Flux coating on the core wire, (a) by dipping, (b) by extrusion. Extrusion method is very fast and economical; produces strong uniform and concentric coatings and has largely replaced the dipping process.

(a) **Dipping method.** Number of core wires cut to definite length is clamped vertically in a fixture and are dipped in a bath of molten flux. When a suitable thickness of the flux gets adhered to the core wire, the fixture is raised and the flux is allowed to dry.

(b) **Extrusion process.** Coating ingredients as discussed earlier are mixed up in desired quantities, binder (often sodium silicate) is added and the resultant mass is brought in the form of a thick, viscous, stiff paste. This paste is shaped in the form of a cylinder which is fed into the extrusion press. Core wire and thick paste of flux simultaneously under pressure pass through a die, thus attaching the flux coating on the core wire. The coating thickness depends upon the die opening and can be varied. As a next step the flux from the gripping end of the electrode is removed by an electrically rotated wire brush; after which the electrodes are fed to ovens where they are dried and baked to remove excess moisture.

The electrodes are thereafter sorted, wrapped in polythene paper, put into packets, and bulk is boxed into wooden cases. Packets and boxes generally have information about: electrode coding, electrode size, nature of current and polarity, batch number, name of manufacturer, date of manufacture, etc.

Plant and Machinery

The machinery required for manufacturing of welding electrodes are extrusion press, dry mixer, wire drawing machine and wire cutting machine. Some of the machinery suppliers are:

1. Multirods Limited – India
2. Excel Alloys & Equipments – India
3. Eureka Systems & Electrodes Pvt. Ltd – India

Raw Material

The raw material used in the process of manufacturing of Welding Electrodes is Mild Steel Wire and Borax.

Manpower

The manpower required for the operation of the plant are 19 production staff and 8 administrative staff.

1.3 INVESTMENT

The project calls for an investment of Rs. 140.00 Lakhs to set up a unit to manufacture 8 MT per day of welding electrode with one shift of operations. The plant and machinery required for the project are indigenously available.

Table 1: Project Cost (Rs. Lakhs)

Description	Amount
1. Land & Land Development	6.00
2. Buildings & Civil works	40.00
3. Plant & Machinery	24.00
4. Misc. Fixed Assets	8.00
6. Contingencies	4.00
7. Deposits	5.00
8. Preliminary & Pre-operative Expenses	24.00

9. Margin Money for Working capital	29.00
Total	140.00

Suggested means of finance is tabulated below.

Table 2: Means of finance

(Rs. Lakhs)

Description	Amount
1. Equity from Promoters	50.00
2. Term Loan	90.00
Total	140.00

The debt equity is considered as 1.80:1 with 12% as interest on term loan.
 The product mix and the sales prices are as follows

The finished products can be sold at Rs. 65 per Kg.

1.4 RETURNS

The returns from the project are adequate enough to repay the term loan in 5 years time from the date of commercial operations. One shifts of operations have been taken into consideration. The key financial indicators of the project are tabulated below.

Table 3: Key Financial Indicators

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Total Income	936.00	975.00	1014.00	1053.00	1092.00	1131.00	1170.00	1209.00
Total Variable Costs	799.67	833.01	866.38	899.78	933.21	966.67	1000.17	1033.70
Total Fixed Costs	77.84	80.60	83.39	86.20	83.04	76.13	78.63	81.16
Total Expenditure	877.51	913.61	949.77	985.98	1016.25	1042.80	1078.80	1114.86
PBIDT	58.49	61.39	64.23	67.02	75.75	88.20	91.20	94.14
Profit After Tax (PAT)	22.49	25.60	28.68	31.72	38.65	47.41	49.17	50.88
Cash Accruals	29.03	32.14	35.22	38.26	45.19	53.95	55.71	57.42
Term Loan Repayment	18.00	18.00	18.00	18.00	18.00	0.00	0.00	0.00
Closing Balance	16.87	35.80	57.80	82.85	108.87	161.67	216.16	272.37
BEP (Op Capacity)	73.42%	70.95%	68.69%	66.64%	60.78%	53.51%	53.35%	53.22%
Gross DSCR	1.61	1.79	1.99	2.24	2.42	-	-	-
Average Gross DSCR	1.97							
Net DSCR	1.95	2.12	2.29	2.46	2.51	-	-	-
Average Net DSCR	2.26							
IRR	33%							