

***PROJECT PROFILE***  
***ON***  
***ELECTRIC POWER CABLE***

**PRODUCTION CODE (NIC)** : 361008007

**QUALITY STANDARD** : IS : 694-1990  
PVC Insulated Cables for Voltage up to  
and including 1100 Volts.

**PRODUCTION CAPACITY** : 4mm<sup>2</sup> Al. Con. 1 core, 18000 Coils  
4mm<sup>2</sup> Al. Con. 1 core, 18000 Coils

**MONTH AND YEAR OF  
PREPARATION** : 2006-07

**PREPARED BY** : MSME-Development Institute  
Udyog Vihar,  
Chorhata, Rewa (M.P.) - 486006

## **1. INTRODUCTION:**

Cables and wires are major equipment for transmission & distribution of electrical power. They are suitable for use in substations, distribution systems, Industrial installations, house wiring, street lighting. PVC insulated wires and cables are the ultimate medium for distribution of electricity.

This project profile envisages manufacturing of PVC 4mm<sup>2</sup> 6mm<sup>2</sup> aluminum conductors extensively used in house wiring service connections, Railways, permanent & temporary connections of electrical power from overhead lines to customers previous/machines.

## **2. MARKET POTENTIALS:**

Demand of this product will increase day by day due Electrification, colonization, exclusively some of the bulk purchaser's of this product are –

- (i) Coal fields & colleries,
- (ii) Electricity Boards,
- (iii) Railways,
- (iv) All types of Power Stations,
- (v) Housing Boards/Colonisers.

Major scope of market for this product is in new installation/fitting & replacement 75 : 25 Entrepreneurs are advised to have close vision on both aspects.

To avoid unhealthy competition between the entrepreneur's itself. Strict quality norms as per standards specification are the main factors and to be followed strictly.

ETDC, ER TL, R TC, Electrical Research & Development Association, Vadodara is the major development & testing centers for this product. Entrepreneurs venturing in field of manufacturing of this product are advised to seek any help for testing of their products. However, in area where cluster of such industry are present testing centers can be set-up under Govt. directives.

## **3. BASIS & PRESUMPTIONS:**

1. Land & building is proposed on rental basis.
2. Labour wages mentioned are prevailing in the state of Madhya Pradesh.
3. Margin Money requirement may differ on the type of financial institutions/Entrepreneur.

4. Cost of machinery, Raw material, Test Equipments may vary from place to place cost given is approximate & may vary.
5. Minimum one year is required for full capacity utilization.
6. Break even point is calculated on full capacity utilization.
7. Total capital investment has been calculated by taking 3 months working capital in to account.
8. Rate of interest has been taken is 20% may differ depending on type of financial institution one to another.
9. The basis for calculation of production capacity is on single shift basis working of 25 days/ 300 days in per month/year respectively.

#### **4. IMPLEMENTATION SCHEDULE:**

The major activities in the implementation of the project has been tested and the average time for implementation of the project is estimated at 12 months.

		<b>Period (in months)</b>
1.	Preparation of project report.	1
2.	Registration and other formalities.	1
3.	Sanction of loan by financial institutions	3
4.	Plant & machinery:	
	a. Placement of orders.	1
	b. Procurement.	2
	c. Power connection/Electrification.	2
	d. Installation/ Erection of machinery/Test Equipment.	2
5.	Procurement of raw materials.	2
6.	Recruitment of technical personnel	2
7.	Trial production	11
8.	Commercial production	12

## **TECHNICAL ASPECTS:**

### **1. Process of Manufacture**

- (i) EC grade aluminum wire is feed in to extruder. As Wire passes through die in extruder uniform coating of PVC is obtained all around the wire.
- (ii) Then wire to be passed through cold water for cooling.
- (iii) After this High Voltage testing to be carried out by High Voltage tester to check up the insulation strength.
- (iv) Name of manufacturer/Brand name is printed on cable after emergence from extruder and before cooling.
- (v) Wire is cooled in to lengths of 100 metres on the take off system and tested. As per IS specification for following tests-
  - (i) Tensile Test,
  - (ii) Ageing Test,
  - (iii) Insulation Test,
  - (iv) Resistance Test.

### **2. QUALITY STANDARDS**

IS : 694 - 1977

### **3. PRODUCTION CAPACITY PER ANNUM:**

1. 18000 coils of 91.4 meters each of 4mm<sup>2</sup> cable.
2. 18000 coils of 91.4 meters each of 6mm<sup>2</sup> cable.

### **4. MOTIVE POWER :**

Approximate 3000 KWH is power requirement per month for this unit. In full capacity utilization 120 KWH is per day requirement of power.

### **5. POLLUTION CONTROL:**

The Govt. accords utmost importance to control environmental pollution. The small-scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in Sept. 1992, the production and use of Ozone Depleting Substances(ODS) like Chlorofluoro Carbon(CFC), Carbon Tetrachloride, Halons

and Methyl Chloroform etc. need to be phased out immediately with alternative chemicals/solvents. A notification for detailed Rules to regulate ODS phase out under the Environment Protection Act., 1986 have been put in place with effect from 19th July, 200.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

- i) In electronic industry fumes and gases are released during hand soldering/wave soldering/ Dip soldering, which are harmful to people as well as environment and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2-10% solids as opposed to the traditional 15-35% solids.
- ii) Electronic industry uses CFC, Carbon Tetrachloride and Methyl Chloroform for cleaning of printed circuit boards after assembly to remove flux residues left after soldering and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as Trichloroethylene, Perchloroethylene and Methylene Chloride have been used as effective cleaners in electronics industry for many years. Other organic solvents such as Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

## **6. ENERGY CONSERVATION:**

The following steps may be taken for the conservation of energy.

1. Machinery & Equipment's parts, which are revolving and reciprocating should be properly, lubricated from time to time with suitable lubricant oil.
2. Layout of the unit should be in such a way in that no back tracking of material is there.
3. All electric switches may be kept off, when not required.
4. The entire transmission belt will be tightened before starting the work is wherever applicable.
5. Fluorescent tube with electronic Chokes may be used for energy saving. Further recently developed compact fluorescent tubes called (CRT) of 10, 15, watts Philips/Glaux made may be used for energy saving and decoration. These self-ballasted fluorescent lamps are high efficiency replacements for ordinary bulbs. For same light output, CFLEBs consume about one-fifth the power consumed by ordinary bulbs, thereby saving a lot of energy. The savings get further multiplied when CLEBs are used in air conditioned areas, since the

saving of energy by using CLEBs also corresponds to less heat dissipation reducing load on air conditioners. The life of CFLEBs is about 8000/10000 hours i.e. about 10 times that of ordinary bulb.

The typical payback period in terms of savings of energy bills and cost of ordinary lamps is about 6 months operation. Unlike ordinary bulbs, these CFLEBs provide choice of three colours designated A, B & C, to suit individual requirements.

Electronic Ballast, with protection against high voltage spikes, along with high quality CFLs make these composite CFLEI3s (or self ballasted CFLs) Slim, lightweight, efficient and reliable units.

6. As far as possible Solar Energy and day light will be used keeping all the other lights off.
7. As far as possible inductive load of motor will be reduced and high power factor will be used with the aid of capacitors of appropriate sizes.

## **FINANCIAL ASPECTS**

### **(I) LAND & BUILDING:**

It is proposed to have rental shed at the cost of Rs. 5000/- per month.

### **(II) MACHINERY & EQUIPMENT:**

		Ind/Imp.	Qty.	Price
1.	PVC extruder 65mm with cooling through take off & take up system.	Ind.	01	20,00,000
2.	Wire straightening eqpt.	”	01	10,000
3.	Embossing roll for Embossing name of manufacturer.	”	01	10,000
4.	Coil winding & length measuring machines.	”	01	30,000
5.	Extrusion dies & nozzles	”	LS	20,000
				20,70,000

**(III) TESTING EQUIPMENTS:**

		Qty.	Price
1.	Continuous Spark Tester	01	15,000
2.	Kelvin Bauble Bridge	01	15,000
3.	Tensile Testing Machine 50, 1000, 500 Kg.	01	50,000
4.	Mugger 500v DC	01	2,000
5.	High Voltage Test Set 0-10 KV AC	01	15,000
6.	High Voltage Test Set 0-2 KV DC	01	6,000
7.	Ageing Test Apparatus	01	25,000
8.	Fire resistance testing apparatus	01	15,000
9.	Hot Water Bath	01	7,000
10.	Traveling microscope	01	3,000
11.	Micrometer 0-25mm	01	2,000
12.	HV Test Set AC 0-10 KV with misc. equipment calipers etc.	01	20,000
			1,77,000
<b>(IV) OTHER FIXED ASSETS:</b>			
Electrification & Installation			22,470
Furniture & Office Equipments			30,000
Fire Extinguisher (CTC)			10,000
			62,000

**(e) TOTAL FIXED CAPITAL**

II + III + IV

20,70,000 + 1,77,000 + 62,470 = 23,09,470

Rs. 23,09,470.00

## WORKING CAPITAL PER MONTH

### (i) STAFF & LABOUR

(1)	Manager	1	5,000
(2)	Skilled worker	10	15,000
(3)	Unskilled worker	10	10,000
(4)	Clerk/ Accountant	01	10,000
(5)	Watchman/Peon	2	2,000
			33,000

### (ii) RAW MATERIAL PER MONTH:

	Description	Qty.	Rate	Value
1.	EC Grade AI. wire	2 Mtr.	20000/mtr.	40,000
2.	PVC Compound (Cable grade)	3 Mtr.	60000/mtr.	1,80,000
3.	Packaging material	-	-	30,000
4.	Misc. item (Bobbin for 100 meters coils)	-	-	20,000
				2,70,000

### (iii) UTILITIES (Per month)

Electricity	5,000
Water	1,500
Advertisement/Packing	1,000
Transportation	3,000
Miscellaneous	3,000
	13,500



**Total Recurring Expenditure per month:**

(i + ii + iii)

$$33,000 + 2,70,000 + 13,500 = 3,16,500.00$$

**IV. TOTAL CAPITAL INVESTMENT:**

Fixed Capital	23,09,470
Working Capital for 3 months	9,49,500
	32,58,970
<b>COST OF PRODUCTION (per Annum) :</b>	
Rent	60,000
Staff & Labour	3,96,000
Raw Material	32,40,000
Depreciation on plant & machinery @ 10%	2,30,947
Interest on total capital investment @ 20%	4,71,794
Say Rs.	43,98,741
	43,98,000
<b>TURN OVER (Per Annum) :</b>	
By sales of 18000 coils of 4mm <sup>2</sup> cable (91.4 meters each) @ 150/- each	27,00,000
By sales of 18000 coils of 6mm <sup>2</sup> cable (91.4 meters each) @ 200/- each.	36,00,000
	63,00,000

**PROFITABILITY (Per Annum) :**

$$63,00,000 - 43,98,000 = 19,02,000.00$$

**NET PROFIT RATIO:**

$$\frac{1902000}{4398000} \times 100 = 43.24\%$$

**RATE OF RETURN:**

$$\frac{1902000}{3258970} \times 100 = 58.36\%$$

**BREAK EVEN ANALYSIS:**

a. FIXED COST:	
Rent	60,000
Interest on total capital investment.	4,71,794
Depreciation on plant & machineries @ 10%	2,30,947
40% of salary & wages	1,58,400
40% of contingent utilities	64,800
	9,85,941

**BREAK EVEN POINT:**

$$\frac{FC \times 100}{FC + Profit} = \frac{985941 \times 100}{985941 + 190200} = \frac{98594100}{2887941}$$

$$= 34.13\% \qquad \qquad \qquad = 34.13\%$$

**ADDITIONAL INFORMATION:**

- (a) Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacities, production programme and also to suit the locational characteristics wherever applicable.
- (b) The Electrical technology is undergoing rapid strides of change and there is need for regular monitoring of national and international scenario. The unit may therefore keep abreast with the new technologies in order to keep them in pace with the developments for global competition.
- (c) Quality today is not only confined to the product or service alone. It also extends to the process and environments in which they are generated. The ISO-9000 defines standards for Quality Management Systems and ISO-14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.
- (d) The margin money recommended is 25% of the working capital requirement at an average. However the percentage of margin money may vary as per banks discretion.

**NAME & ADDRESSES OF MACHINERY & EQUIPMENT SUPPLIERS:**

1. M/s. Shiman Engg. Works  
2535, Prem Narayan St.  
Churiwalan, Delhi- 110 006
2. M/s. MSIC Ltd. (Marketing Divn.)  
Near Okhla Indl. Estate,  
New Delhi
3. M/s. Prince Plastic Machinery Co. Ltd.  
Plot No. 55, Indl. Estate,  
Kandivili, Bombay
4. M/s. Boolani Engg. Corpn.  
Prabha Devi Indl. Estate,  
402, Veer Savarkar Marg,  
Bombay-400 025.
5. M/s. Toshinwal Bros. (P) Ltd.  
M.G. Road, Ajmer.
6. M/s. BPL India Ltd.  
304, Ashok Bhavan,  
Nehru Place, New Delhi-110 024
7. M/s. Rectifiers & Electronics  
WH-49, Mayapuri Indl. Estate,  
Phase-I, New Delhi.
8. M/s. Automatic Electric Co. Ltd.  
Rectifier House 570,  
Nigam Cross Road,  
Ph. No. 7103, Bombay
9. M/s. Naran Trading Agency  
Box. 6657, Bandra, Bombay-50
10. M/s. Blue Star Ltd.  
Bhandari House, 91, Nehru Place,  
New Delhi

11. M/s. Precision Scientific  
Equipment Works,  
26, Patel Road, SP Nagar,  
New Delhi- 110 002
12. M/s. Oriental Scientific  
Apparatus Workshop,  
J.L. Nehru Marg,  
Ambala Cantt. 133 001.

**ADDRESSES OF RAW MATERIAL SUPPLIERS:**

1. M/s. National Organic Chemical  
Industries Ltd.  
Bank of Baroda Building,  
Parliament Street, New Delhi.
2. M/s. Shri Ram Industries Ltd.  
Shri Ram Nagar, Kota, Rajasthan
3. M/s Indian Aluminium Co. Ltd.  
United Commercial Bank Building,  
Parliament Street, New Delhi.