PROJECT PROFILE
ON
ELECTRICAL MOTOR WINDING

PRODUCT CODE (ASICC)	:	97115
QUALITY STANDARDS	:	As per Customer's Specification
PRODUCTION CAPACITY	:	Qty. : 3,000 Nos. per annum Value : Rs. 21,10,000/-
YEAR OF PREPARATION	:	2006-07
PREPARED / UPDATED BY	:	MSME - Development Institute Ministry of MSME Govt. of India, Vikash Sadan, College Square, Cuttack-753003 (Orissa) Phone No.-0671-2648049, 2648077 Telefax-0671-2332307

1. INTRODUCTION

Motors are used as a prime mover for driving various machines and pump sets in industry, agriculture and domestic application. Electric motor has over riding advantages of easy starting and control, clean operation, easier maintenance and lesser space, The function of an electric motor is to convert electrical energy in to mechanical energy and consists of a stator housed in the body with a rotor mounted on shaft, which is free to rotate in bearings. When AC electric supply is applied to the starter, it causes the rotor to rotate due to electromagnetic induction. The rotation of the rotor causes the shaft to rotate, which is in turn coupled to, rotate the desired equipments. In electric motor, the winding is one of the main part of any motor. It gets damaged frequently due to wear and tear and needs rewinding.

2. MARKET POTENTIAL

Motors are widely used for various industrial agricultural and commercial and domestic appliances with the development of power generators, rural electrification, domestic usage etc. the demand for electric motor is growing rapidly, consequently the demand for motor servicing and repair activity which is one of the major repair activity in any motor repair shop, is in great demand, specially in the semi-urban and rural areas.

3. BASIS AND PRESUMPTIONS

i) Production capacity has been taken on single shift basis on 75% efficiency.

ii) Capacity utilization is 60% during first year, 80% during second year of operation. The Unit is expected to achieve full capacity utilization from the third years onward.

iii) The salaries and wages cost of raw material, utilities, rent of the shed etc. are based on the prevailing rates in and around Cuttack. These cost factors are likely to vary with time and location.

iv) Interest on term loan and capital loan has been taken at the rate of 16 % on an average. The rate may vary depending upon the policy of the financial institutions and agencies from time to time.

v) The cost of machinery and equipment refers to a particular make/model and the price is approximate.

vi) The project preparation cost etc. whenever required may be considered under the head of preoperative expenses.

vii) The Break Even Point indicated is of full capacity utilization.

viii) The essential production machinery and test equipment required for the project has been indicated. The unit may also utilize common testing facilities available at Electronics test & Development Centre (ETDCs) and Electronics Regional; Test Laboratories (ERTLs) and Regional Testing Centres (RTCs).

IMPLEMENTATION SCHEDULE:

The major activities in the implementation of the project have been listed and the average time for implementation of the project is estimated at 12 months

		Period (in months) (Suggestive)
1.	Preparation of Project Report	1
2.	Registration & Other Formalities	1
3.	Sanction of Loan by Financial Institutions	3
4.	Plant & Machinery a) Placement of orders b) Procurement c) Power connection / Electrification d) Installation / erection of Machinery/Test Equipment	 1 2 2 2
5.	Procurement of Raw Materials	2
6.	Recruitment of Technical Personnel etc.	2
7.	Trial Production	11
8.	Commercial Production	12

NOTE:

1) Many of the above activities shall be initiated concurrently.
2) Procurement of raw materials commences from the 8th month onwards.
3) When imported plant and machinery are required the implementation period of project may vary from 12 months to 15 months.

TECHNICAL ASPECTS

1. PROCESS OF MANUFACTURING

Winding refers to a system of insulated conductors forming the current carrying element of a machine, designed to produce a magnetic field, which influences a rotary movement.

An electric machine operates 'because of the magnetic flux setup in its magnetic circuit by magneto-motive forces arising from currents flowing in groups of winding suitably disposed on the stator and

rotor. The flux usually sets up an m.m.fs. in the winding due to the conductors of the winding cutting the flux, or turns of the winding being linked with a varying flux. The interaction of the motor of the m.m.f. stator and rotor windings sets up a torque.

In the motor, a current-carrying conductor in a magnetic field gets acted on by a force proportional to the current and the field strength. Thus the torque developed is proportional to the field winding. These windings are usually arranged in slots, provided in a laminated iron core. There are different types of winding according to winding coils. Mostly in 3 phase motors, the number of coils equal to the slots. The coils are connected such a way that three separate windings are formed which are called phase winding. Each coil in these winding should be same size and shape, coil per phase are 1/3 of the total coils. The windings are connected in star or delta.

METHOD OF REWINDING OF OLD MOTORS:

I) Dismantling of Motor:

(a) First remove the pulley from the shaft with the help of pulley puller after unscrewing the L.N. screw from the pulley. Do not hammer the pulley.

(b) Mark on both the end covers and body of the motor with the help of the center punch. Unscrew the covers and remove these with the help of mallet. Steel hammer, screwdriver or chisel should not be used.

(c) Draw the rotor from the stator carefully. It should not be rubbed with the winding. It is better to lengthen the shaft with the help of suitable pipe. The rotor will come out easily.

(d) Check the bearing for chick and play. Replace if faulty, do grease, if dry.

Data Sheet for Polyphase motor

Make.....

HP.....	R.P.M.....	Volts....	Amps....
Cycle....	Type.....	Frame....	Style....
Temp....	Model.....	S. No....	Phase....
No. of Coils....	No. of Solts....		Connections....
Size of Wire....	No. of Turns....		No. of Groups....
Coil Croups....	No. of Poles....		Pitch of Coils....

ii) Taking data of the Motor: Fill up first the above portion of the data sheet after clearing the dirt of the winding. This data will be available on the nameplate. Cut the winding from one end and pull from the other side. Keep the uncut coil in the end to take the size for the coil. Fill up the second portion of the data sheet before and after striping the coils.

If the winding in the motor is very tight and hard then beat it up by passing heavy current in the winding or blowlamp. (The core of the motor should not burn.)

iii) Rewinding of motor (Method of witiding): Insert the coils in the slots according to the data noted in the above sheet. Give proper insulation in slots. Afterwards connect and tape the winding nicely. Preheat impregnate, tape the winding.

iv) Baking and Varnishing. : When all the connections between poles of the winding have been completed and tested and the flexible leads to power line attached and tied, the stator should be placed in a baking oven at a temperature of approximately 250°F and preheated for a short period of time, approximately 1 hour. This removes moisture from the windings and increases the perpetration of the varnish. The stator is then dipped in to a container of insulation varnish compatible with the type of magnet wire used. It is important to remember that the varnish must be thin enough to penetrate the winding and thick enough to leave an adequate film when baked. The varnish may become thickened due to evaporation of the thinning fluid. If this happens, use a thinner recommended by the manufacturer.

After the winding the winding has soaked in the varnish for approximately one-half hour or until all bubbling has ceased, it is removed from the container and allowed to drip. After it has stopped dripping it is again placed into the baking oven and baked for several hours. In using any type of varnish, make certain the manufacturer's recommendations and directions are followed. When the stator is removed from the oven, the inner surface of the core should be scrapped to remove the adhering varnish, so that there will be sufficient space for the rotor to turn freely.

Dipping and baking bonds the entire winding in to a solid mass, which is, not subjects to movement. It seals the winding against moisture and foreign material and increases the mechanical and dielectric. strength of magnet wires.

There are other types of varnish that do not require baking and are called air-drying varnishes. Many shops use this varnish for fractional horsepower stators. Here again the manufacturer's recommendation should be followed.

Many shops use a solvent less polyester varnish that can be applied to windings in less than 20 minutes. These varnishes are completely solvent less and give the same protection that ordinary varnishes provide. The winding is heated first by applying approximately half voltage. The resin is then poured through the heated windings while the stator is kept in a horizontal position the resin is

permitted to trickle through the slots. After the pouring has been completed, the winding is kept heated by sending current through the coils for about five minutes. This permits the resin to cure and get quickly, the entire process should take less than one-half hour. The varnish is applied to three phase motor. The same method is used for single phase motors.

Thus, based on the above method the winding shop can undertake (a) Motor winding of electric fan, (b) Motor winding of mixture grinder, (c) Motor winding of AC motor (5 HP to 100 HP Motors), Different kinds and capacity of DC motors etc. After winding the following Test to be carried out to ascertain the serviceability the Motor:

a) Earth Test

b) Open Circuit:

c) And Short Circuit test, etc.

2. QUALITY STANDARDS

As per customer's specification

3. PRODUCTION CAPACITY PER ANNUM :

QUANTITY	:	3,000 Nos.
VALUE	:	Rs. 21,10,000/-

4. MOTIVE POWER : 5 KVA.

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.

Iridia having acceded to the Montreal Protocol in Sept., 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluore Carbon (CFCs), Carbon Tetrachloride, Halons and methyle 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, 2000.

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 phaseout 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 CPCs, 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 CPC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as trichloroethylene, per chloroethylene and methylene chloride have been used an 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:

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Govt. of India since 1980s. The energy conservation Act, 2001 has been enacted on 18th August, 2001, which provides for efficient use of energy, its conservation and capacity building of bureau energy efficiency created under the Act.

The following steps may help for conservation of electrical energy :

i) Adoption of energy conserving technologies, production aids and testing facilities.

ii) Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum energy conservation.

iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and de-soldering stations.

iv) Periodical maintenance of motors, compressors etc.

v) Use of power factor correction capacitors. Proper selection and layout of lighting system, timely switching On-Off of the lights; use of compact fluorescent lamps wherever possible etc.

FINANCIAL ASPECTS

(i) Land & Building

Built up area	1000 Sq. ft.
Office, Stores	300 Sq. ft.
Assembly & Testing	700 Sq. ft.
Rent Payable per annum	**Rs. 36,000/-**

(ii) Machinery and Equipment :

Sl.No	Description	Ind./Imp.	Qty.	Value(Rs.)
1.	Motorized winding machine	Ind.	1	30,000
2.	Manual winding machine	Ind.	1	7,000
3.	Table winding Machine	Ind.	1	7,000
4.	Oven	Ind.	1	28,000
5.	½ Inch Bench Drilling machine	Ind.	1	4,000
6.	Portable drilling machine	Ind.	1	3,000
7.	Bench Grinder 200 mm	-do-	1	4,000
8.	Soldering Machine	-do-	2	500
9.	2.5 KV Testlna Machine	-do-	1	7,500
10.	Panel board for testing	-do-	1	5,000
11.	3 ½ digit clamp meter	-do-	1	3,500
12.	Megger 500 volts DC	Ind	1	3,500
13.	Multimeter	-do-	2	1,000
14.	Leakage current Earth Leakage Tester	-do-	1	4,500
15.	Auto Transformer 10 Amps	-do-	1	4,000
16.	Ither misc. Instruments and meters	-do-	LS	5,000
			Total	**1,17,500**
Electrification Charges @ 10% of the Cost of Machinery & Equipment				Rs. 11,750
Office Equipments, Furniture & Working tables etc.				Rs. 20,000
Mould, die, tools, jigs and fixtures etc.				Rs. 5,000
Pre-Operative Expenses				Rs. 5,000
Total				**1,59,250**
Total fixed Capital				**1,59,250**

Working Capital Per Month :

(i) Staff & Labour

Sl. No.	Designation	Nos. of Persons	Salary/month (Rs.)	Total Salary/ month (Rs.)
1.	Service Engineer/Supervisor	1	3,500	3,500
2.	Skilled Worker & Electrician	2	2,500	5,000
3.	Unskilled worker	2	2,000	4,000
			Total	12,500
			Add 15% perquisites of above Total	1,875
			Total	**14,375**

(ii) Raw Material requirement per Month :

Sl.No	Description	Ind./Imp.	Qty.	Value(Rs.)
1.	Super Enameled Cooper of different gauges	-do-	200 kqs.	84,000
2.	Insulation paper	-do-	40 kqs.	10,000
3.	Cotton tape	-do-	15 kqs.	3,000
4.	Insulation varnish	-do-	1 00 litre	12,000
5.	Glass wire, Consumables stores, Cables, Accessories & Misc.	-do-	LS	10,000
			Total	**1,19,000**

(iii) Utilities Per Month

Power	Rs. 1,750
Water	Rs. 250
Total	**Rs. 2,000/-**

(iv) Other contingent Expenses per month

1.	Rent	3,000
2.	Postage and Stationery	500
3.	Telephone/Telex/Fax charges	500
4.	Repair & Maintenance	1,000
5.	Transport and conveyance Charges	1,000
6.	Publicity &Advertisement	500
7.	Insurance and Taxes	750
8.	Miscellaneous expenses	1,000
	Total	**8,250**

Total recurring expenditure per month (i + ii + iii + iv) = Rs. 1,43,625/-

Total Capital Investment :

	(Rs.)
Fixed Capital	1,59,250
Working Capital on 3 months basis	4,30,875
Total	**5,90,125**
Or Say	**5,90,125**

FINANCIAL ANALYSIS:

Cost of Production Per annum :

Total recurring expenditure per year	17,23,500
Depreciation on machinery and equipment @ 10%	11,750
Depreciation on tools, jigs and fixtures @ 25%	1,250
Depreciation on office equipment & furniture @ 20%	4,000
Interest on total investment @ 16%	94,420
Total	**18,34,920**
or Say	**18,34,920**

Turnover Per Annum :

Item	**Qty. (Nos.)**	**Rate/Unit (Rs.)**	**Total Sales (Rs.)**
Motor winding charges for electric fan	1400	300	4,20,000
Motor winding charges of electric mixture grinder	800	200	1,60,000
Motor winding charges:			
a. 0.5 HP to 2 HP	400	1,000	4,00,000
a. 2.5 HP to 5 HP	250	2,000	5,00,000
a. 5.5 HP to 10 HP	150	4,200	6,30,000
		Total	**21,10,000**

Profit Per Annum (Before Tax) = (Turnover per annum - cost of production per annum)
21,10,000 – 18,34,920
= **Rs. 2,75,080**

Profit Ratio = $\frac{\text{Profit per annum}}{\text{Sales per annum}}$ x 100 = $\frac{2,75,080}{21,10,000}$ x 100 = 13.03%

Rate of Return = $\frac{\text{Profit per annum}}{\text{Total Capital Investment}}$ x 100 = $\frac{2,75,080}{5,90,125}$ x 100 = 46.6%

BREAK EVEN POINT

Fixed Cost per annum

Rent	36,000
Depreciation on Machinery @ 10%	11,750
Depreciation on Tools & Equip. @ 25%	1,250
Depreciation on Office Equipment & furniture @ 20%	4,000
Interest on Total Capital Investment @ 16%	94,420
Insurance	9,000
40% of salary and wages	69,000
40% of contingent & utilities (Excluding rent and insurance)	31,200
Total	**2,56,620**
Or Say	**2,56,620**

Break even point (BEP) = $\frac{\text{Fixed cost}}{\text{Fixed cost + Profit}}$ x 100 = $\frac{2,56,620}{2,56,620+2,75,080}$ x 100

= 48.6%

Additional Information

a) The Project Profile may be modified to suit the individual entrepreneurship qualities/ capacity, production Programme and also to suit the locational characteristics, wherever applicable.

b) The Electronics Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology 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. It also extends to the process and environment 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 bank's discretion.

Name & Address of the Machinery & Testing Equipment manufacturer/Supplier:

1. M/s. Prabhat Electronics, OMP Square, Cuttack Baidyanath Electronics, Chandan Palia, Cuttack.
2. M/s. Bhairab Electronics, Mangalabag, Cuttack.
3. M/s. Badal Electronics, Mangalabag, Cuttack.
4. M/s. Indian Electrical Corporation, 106 & Ill, Chandaka Integrated Campus, Rasulgarh, Bhubaneswar.
5. M/s. H. P. Singh Machinery (Pvt.) Ltd., 75, Ganesh Chandra Avenue, Kolkata - 700013
6. M/s. Nandy & Co., 125 Belilious Road, Howrah-711101
7. M/s. Turnwell Machine Tools, 16, Ganesh Chandra Avenue, Kolkata- 700 013
8. M/s. Turner & Tools, 15, Ganesh Chandra Avenue, 2nd Floor, Kolkata - 700013
9. Pathak Machine Tools Pvt. Ltd. 116, G T. Road, Saikia, Howarh - 711106
10. M/s Patel & Company, Naupatna, Cuttack-l
11. Gollya Electricals Pvt. Ltd. Plot no. 64, GI.D.C. Estate, Phase I, OPP. Sunita Textiles, Vapi - 396195. Distt Bulsar, Gujarat.
12. Gollya Instrument Pvt. Ltd, 311, Bharat Industrial Estate, T. J. Road, Sewree, Mumbai-400015
13. Any dealer of L&T, SIEMENS, Havells, Crompton Greaves Ltd. etc. & local market.

Name & Addresses of Raw material Suppliers:

1. M/s. Lucky Electricals, Manisahu Chhak, Cuttack.
2. M/s. Prebhat Electronics, MP Square, Cuttack.
3. M/s. Utkal Electronics, 270-A, Saheed Nagar, Bhubaneswar.
4. M/s. Indian Electronics Corporation, 106 & 111, Chandakar Integrated Complex, Rasulgarh.
5. M/s. Mutual Insulated Cables and Conductors, Ltd., A-25 & 26, Phase-III, New IndustriaI estate, Jagatpur, Cuttack-21.
6. M/s. Bholenath Electricals, Buxi Bazar, Cuttack.
7. M/s. D.P. Electricals, Ranihat, Cuttack.

PROJECT PROFILE
ON
REPAIR & SERVICING OF ELECTRICAL APPLIANCES

PRODUCT CODE (ASICC)	:	97115
QUALITY STANDARDS	:	As per customer's Requirement
SERVICING CAPACITY	:	Qty : 4800 Nos. per annum Value : Rs. 10,00,000
YEAR OF PREPARATION	:	2006-07
PREPARED / UPDATED BY	:	MSME - Development Institute Ministry of MSME Govt. of India, Vikash Sadan, College Square, Cuttack-753003 (Orissa) Phone No.-0671-2648049, 2648077 Telefax-0671-2332307

1. INTRODUCTION:

To-day, the "Electrical Industry" has a pride place in "Indian Manufacturing Industry". It has advanced through technical collaborations, joint ventures and indigenous research and development, comprising of diverse products ranging from electric generators, transformers, to house hold electrical Appliances and gadgets, etc. The electrical appliances like mixer/ grinder, Geysers, water heater, fan, Iron, etc. are widely used in almost every household. The major manufacturers are Usha, Bajaj, Crompton, Onida, Videocone, LG etc. These electrical appliances do need periodic servicing, maintenance and repair actively. Though there are a number of authorized repair & servicing centers, provided by the authorized dealers network but still there is wide spread need of the repair & servicing centers to cater the need of repair and servicing activity for these appliances specially in semi-urban and rural areas.

2. MARKET POTENTIAL:

This will be a service-oriented industry to cater to the needs of the repair & servicing of Electrical Appliances. There is hardly any household which does not posses these items. In course of time, these items/ appliances need periodic servicing and repair requirement, therefore, there is a tremendous scope for the growth of these repair & servicing centers, specially in semi-urban and Rural Areas, which can be undertaken by the educated-unemployed youths of the area with a little skill development without much capital requirement.

3. Basis and Presumptions

i) The basis for calculation of Production capacity has been taken on single shift basis on 75% efficiency.

ii) The maximum Capacity utilization is 60% during first year, 80% during second year of operation. The unit is expected to achieve full capacity utilization from the third year onwards.

iii) The Salaries and wages cost of raw materials, utilities, rent of the shed etc. are based on the prevailing rates in and around Cuttack. These cost factors are likely to vary with time and with location.

iv) Interest on term loan and capital loan has been taken at the rate of 16% on an average. This rate may vary depending upon the policy of the financial institutions and agencies from time to time.

v) The cost of machinery and equipments refer to a particular make/model and the prices is approximate.

vi) The project preparation cost etc. whenever required may be considered under the head of pre-operative expenses.

vii) The Break Even Point indicated is of full capacity utilization.

viii) The essential production machinery and test equipment required for the project has been indicated. The unit may also utilize common testing facilities available at Electronics test & Development centres (ETDCs) and Electronies Regional Test Laboratories (ERTLs) and Regional Testing Centres (RTCs)

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The major activities in the implementation of the project have been listed and the average time for implementation of the project is estimated at 12 months

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NOTE:

1) Many of the above activities shall be initiated concurrently.
2) Procurement of raw materials commences from the 8th month onwards.
3) When imported plant and machinery are required the implementation period of project may vary from 12 months to 15 months.

TECHNICAL ASPECTS:

1. Process of Servicing

Basically the process of repairing and servicing of Electrical Appliances would be servicing in nature. The periodic servicing of the appliances can be carried out at a time interval as and when the customer brings the Appliances for servicing. The Appliances *i.e.* electric fans, mixer, Geysers, Iron etc. which is completely de-assembled after overhaulirig and replacing worn out parts, changes

of ball bearings, etc. and lubrication the appliance is re-assembled and tested, On the other hand, under repairing activity, after testing and fault diagnosing, the repair activity can be carried out by rectifications or replacement of worn out/defective item, etc. Apart from these, the winding of armature of the motorized appliances can also be carried out.

2. QUALITY STANDARDS

As per customer's requirement

3. PRODUCTION CAPACITY PER ANNUM :

QUANTITY	:	4,8,00 Nos. Repair & Serving per annum
VALUE	:	Rs. 10,00,000/-

4. MOTIVE POWER : 5 KVA.

5. POLLUTION CONTROL:

The Government 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 September, 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluoro Carbon (CFCs), 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, 2000.

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 CPCs, 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 CPC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as trichloroethylene, per chloroethylene and methylene chloride

have been used an 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:

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Govt. of India since 1980s. The Energy Conservation Act 2001 has been enacted on 18th August, 2001, which provides for efficient use of energy, its conservation & capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy.

i) Adoption of energy conserving technologies, production aids and testing facilities.

ii) Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum Energy Conservation.

iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and de-soldering stations.

vi) Periodical maintenance of motors compressors, etc.

v) Use of power factor correction capacitors. Proper selection and layout of lighting system, timely switching On-Off of the lights; use of compact fluorescent lamps wherever possible, etc.

FINANCIAL ASPECTS

(i) Land & Building

Built up area	1000 Sq. ft.
Office, Stores	300 Sq. ft.
Assembly & Testing	700 Sq. ft.
Rent Payable per annum	**Rs. 36,000/-**

(ii) Machinery and Equipment:

Sl.No	Description	Ind./Imp.	Qty. Nos.	Value(Rs.)
1.	Motorized winding machine	Ind.	1	30,000
2.	Manual winding machine	Ind.	1	7,000
3.	Table winding Machine	Ind.	1	7,000
4.	Oven	Ind.	1	28,000
5.	½ Inch Bench Drilling machine	-do-	1	4,000
6.	Portable drilling machine	-do-	1	3,000
7.	Bench Grinder 200 mm	-do-	1	4,000
8.	Soldering Machine	-do-	2	500
9.	2.5 KV Testing Machine	-do-	1	7,500
10.	Panel board for testing	-do-	1	5,000
11.	3 ½ digit clamp meter	-do-	1	3,500
12.	Megger 500 volts DC	Ind	1	3,500
13.	Multimeter	-do-	2	1,000
14.	Leakage current Earth Leakage Tester	-do-	1	4,500
15.	Auto Transformer 10 Amps	-do-	1	4,000
16.	Other misc. Instruments and meters	-do-	LS	5,000
			Total	**1,17,500**
Electrification Charges @ 10% of the Cost of Machinery & Equipment				Rs. 11,750
Office Equipment, Furniture & Working tables etc.				Rs. 20,000
Mould, die, tools, jigs and fixtures etc.				Rs. 5,000
Pre-operative Expenses				Rs. 5,000
Total				**1,59,250**
Total fixed Capital				**1,59,250**

Working Capital Per Month :

(i) Staff & Labour

Sl. No.	Designation	Nomber of Persons	Salary/month (Rs.)	Total Salary/ month (Rs.)
1.	Service Engineer/Supervisor	1	4,000	4,000
2.	Skilled Worker & Electrician	3	2,500	7,500
3.	Unskilled worker	2	2,000	4,000
			Total	15,500
			Add 15% perquisites of salary	2,325
			Total	**17,825**

(ii) Raw Material requirement per Month :

Sl.No	Description	Ind./Imp.	Qty.	Value(Rs.)
1.	Super Enameled Cooper	-do-	30 kqs.	11,850
2.	Ball Bearing	-do-	45 kqs.	5,000
3.	Coil of Iron	-do-	30 kqs.	2,250
4.	Geyser Coil	-do-	25 kqs.	4,000
5.	Shaft, Bush, Capacitor, Field Coil, Armature, Carbon etc.	-do-	LS	5,000
6.	Consumables stores & Cables, Paper Insulations	-do-	LS	3,000
7.	Mechanical & Electrical Accessories, Hardware & misc.	-do-	LS	4,000
			Total	**35,000/-**

(iii) Utilities Per Month

Power	Rs. 1,750
Water	Rs. 250
Total	**Rs. 2,000/-**

(iv) Other contingent Expenses per month

Rent	3,000
Postage and Stationery	500
Telephone/Telex/Fax charges	500
Repair & Maintenance	1,000
Transport and conveyance charges	1,000
Publicity &Advertisement	500
Insurance and Taxes	750
Miscellaneous Expenses	1,000
Total	**8,250**

Total recurring expenditure per month (i + ii + iii + iv) = Rs. 63,175/-

Total Capital Investment :

	(Rs.)
Fixed Capital	1,59,250
Working Capital on 3 months basis	1,89,525
Total	**3,48,775**

Financial Analysis:

Cost of Production Per annum :

1.	Total recurring expenditure per year	7,58,100
2.	Depreciation on machinery and equipment @ 10%	11,750
3.	Depreciation on tools, jigs and fixtures @ 25%	1,250
4.	Depreciation on office equipment & furniture @ 20%	4,000
5.	Interest on total investment @ 16%	55,804
	Total	**8,30,904**
	or Say	**8,30,900**

Turnover (Per Annum) :

Sl.No.	**Item**	**Qty. (Nos.)**	**Total Servicing (Rs.)**
1.	Repairing of fan, Grinder/ Mixer, Iron, Geysers	1,800	7,00,000
2.	Servicing of fan, Grinder/ Mixer, Iron, Geysers	3,000	3,00,000
		Total	**10,00,000**

Profit Per Annum (Before Tax) = (Turnover per annum - cost of production per annum)
= **Rs. 1,69,100**

Percentage of Profit on Sales:

$$= \frac{\text{Profit per Annum}}{\text{Sales per annum}} \times 100 = \frac{1,69,100}{10,00,000} \times 100 = 16.9\%$$

Rate of Return

$$= \frac{\text{Profit per annum}}{\text{Total Capital Investment}} \times 100 = \frac{1,69,100}{3,48,775} \times 100 = 48.4\%$$

BREAK EVEN POINT

Fixed Cost per annum:

Rent	36,000
Depreciation on Machinery @ 10%	11,750
Depreciation on Tools & Fixure @ 25%	1,250
Depreciation on Office Equipment & furniture @ 20%	4,000
Interest on Total Capital Investment @ 16%	55,804
Insurance	9,000
40% of salary and wages	85,000
40% of other contingent & utilities (Excluding rent and insurance)	34,200
Total	**2,37,004**
Or Say	**2,37,000**

$$\text{Break Even Point (BEP)} = \frac{\text{Fixed cost}}{\text{Fixed cost + Profit}} \times 100 = \frac{2,37,004}{2,37,004+1,69,100} \times 100$$

$$= 58.36\%$$

Additional Information

a) The Project Profile may be modified to suit the individual entrepreneurship qualities/ capacity, 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 the national and international technology 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. It also extends to the process and environment 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 bank's discretion.

NAME AND ADDRESS OF MACHINERY & TESTING EQUIPMENT SUPPLIERS:

Name & Address of the Machinery & Testing Equipment manufacturer/Supplier :

1. M/s. Prabhat Electronics, OMP Square, Cuttack Baidyanath Electronics, Chandan Palia, Cuttack.
2. M/s. Bhairab Electonics, Mangalabag, Cuttack.
3. M/s. Badal Electronics, Mangalabag, Cuttack.
3. M/s. Indian Electrical Corporation, 106 & 111, Chandaka Integrated Campus, Rasulgarh, Bhubaneswar.
5. M/s. H. P. Singh Machinery (Pvt.) Ltd., 75, Ganesh Chandra Avenue, Kolkata - 700013
6. M/s. Nandy & Co., 125 Belilious Road, Howrah- 711 101
7. M/s. Turnwell Machine Tools, 16, Ganesh Chandra Avenue, Kolkata - 700 013
8. M/s. Turner & Tools, 15, Ganesh Chandra Avenue, 2nd Floor, Kolkata - 700013
9. Pathak Machine Tools Pvt. Ltd. ,116, G. T. Road, Salkia, Howarh - 711 106
10. M/s. Patel & Company, Naupatna, Cuttack-1
11. Gollya Electricals Pvt. Ltd. Plot no. 64, G.I.D.C. Estate, Phase I, OPP. Sunita Textiles, Vapi - 396195. Distt Bulsar, Gujarat.
12. Gollya Instrument Pvt. Ltd., 311, Bharat Industrial Estate, T.J. Road, Sewree, Mumbai-400 015
13. Any dealer of L&T, SIEMENS, Havells, Crompton Greaves Ltd. etc. & local market.

Name and Address of Raw material Suppliers:

1. M/s Lucky Electricals, Manisahu Chhak, Cuttack.

2. Prabhat Electronics, OMP Square, Cuttack.

3. M/s. Utkal Electronics, 270-A, Saheed Nagar, Bhubaneswar.

4. M/s. Indian Electronics Corporation, 106 & 111, Chandakar Integrated Complex, Rasulgarh.

5. M/s. Mutual Insulated Cables and Conductors, Ltd., A-25 & 26, Phase-III, New Industrial Estate, Jagatpur, Cuttack-21.

6. M/s Bholenath Electricals, Buxi Bazar, Cuttack.

7. M/s D.P. Electricals, Ranihat, Cuttack.