

PROJECT PROFILE ON DISTRIBUTION TRANSFORMERS

- 1. Product:-** Distribution Transformers
- 2. NIC Code (1998):-** 360201008
- 3. Product Code (ASICC-2000):-** -
- 4. Production capacity:-** Qty. 1,000 Transformers of
100 KVA

(Value Rs 4,37,50,000)
- 5. Month & year of Preparation:-** Dec., 2010
- 6. Prepared by:-** MSME-Development Institute
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1. INTRODUCTION:

The Distribution Transformers are important links in the chain of power distribution systems. The power, which is transmitted at high voltage, stepped down to 430 volts with these distribution transformers. These are manufactured in a variety of capacities and voltage ranges.

2. MARKET POTENTIAL:

The demand for Distribution Transformers is basically related to power generation programme envisaged for the country and the rural electrification. The demand for these transformers is likely to increase considerably. At present about 100 units are in various part of the country.

3. BASIS & PRESUMPTIONS:

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During first year and second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onward.
- iii) The salaries and wages, cost of raw materials, utilities, rents etc. are based on the prevailing rates in and around Kanpur. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working 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/agencies from time to time.
- v) The cost of machinery and equipments refer to a particular make / model and prices are approximate.

- vi) The break-even point percentage indicated is of full capacity utilization.
- vii) The project preparation cost etc. whenever required could be considered under pre-operative expenses.
- viii) The essential production machinery and test equipment required for the project have been indicated. The unit may also utilize common test facilities available at Electronics Test & Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) and Regional Testing Centres (RTCs).

The following presumptions have been taken in to account –

- i) Voltage Range – 11/0.433 KV.
- ii) Capacity Range – 25 KVA to 250 KVA.
- iii) Basis of calculations – 100 KVA.

4. Implementation Schedule:

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

	Period (in months)
1. Preparation of project report	1
2. Registration and other formalities	1
3. Sanction of loan by financial institutions	3
4. <u>Plant & Machinery</u>	
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 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.

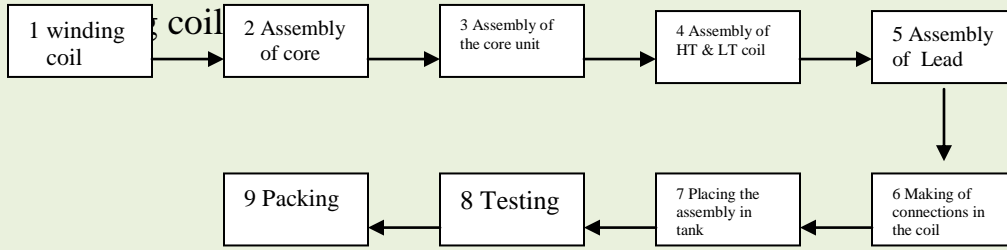
5. TECHNICAL ASPECTS:

I. PROCESS OF MANUFACTURE:

The manufacture of distribution Transformers can be sub-divided into following operations:

- (a) Assembly of the core unit H.T. & L.T. coils.
 - (b) Assembly of leads and making of connections in the coils.
 - (c) Placing the assembly in the tank.
 - (d) Testing.
- (i) **Ist Stage:** The H.T. & L.T. coils are wound on the coil winding machines and assembled on the core limbs out of silicon steel sheet.
 - (ii) **IInd Stage:** The connections of L.T. & H.T. coils are made and the assembly is put in a hot chamber of drying impregnation with insulating compound is carried out and the assembly is dried again.
 - (iii) **IIIrd Stage:** the fittings and accessories are mounted on the M.S. Tank fabricated in the factory. The core coil assembly is fitted in the Tank and the Tank is then filled with oil.
 - (iv) **IVth Stage:** The transformer is tested in the testing section as per relevant IS: Specifications.

Process Flow Chart:



II. QUALITY CONTROL & STANDARDS:

The Bureau of Indian Standard has laid down specifications:

1. IS: 2026 (Part-I) –1977 – Power Transformer General.
2. IS: 2026 (Part-II) –1977 – Power Transformers Temperature rise.
- (3) IS:2026(Part-III) - 1977–Power Transformers Insulation- Level & Dielectric.
- (4) IS: 1180 –1964 – Three Phase Distribution Transformers up to & Melding
100 KVA 11 KV outdoor type.
- (5) IS: 1885 (Part XXXVIII) Electro -technical Vocabulary

III. PRODUCTION CAPACITY PER ANNUM:

100 KVA Transformers.

Quantity	:	1,000 Nos. Per Annum
Value	:	Rs.4,37,50,000/-

IV. MOTIVE POWER : 50 K.W.

Water : 15 K.L./Monthly

V. 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 September, 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluore Carbon (CFCs), Carbon Tetrachloride, Halson 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 CFCs, 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, per chloroethylene and methylene chloride have been used an effective cleaner 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.

VI. 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.
- 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.

6. FINANCIAL ASPECTS

(A) Fixed Capital

(i) Land and Building

Built up Area - 750 Sq. Mtrs.
Rent (per month) @ Rs.20/- Per Sq. Mtr.

Office & Testing Area	– 150 Sq.	3,000/-
Mtrs.		
Manufacturing Area	– 400 Sq.	8,000/-

Mtrs.
Open Area – 200 Sq. 4,400/-
Mtrs
Rent payable / month/ annum
Total: - Rs. 15,000/-

(ii) MACHINERY AND EQUIPMENT:

S. No.	Particulars	HP/KW	Ind/Imp	Qty. (Nos.)	Value (Rs.)
(a)	<u>Production Unit</u>				
1.	Guillotine Shear Machine complete with motors and accessories	1KW	Ind	One	21,250/-
2.	Sheet Bending Press 150 Ton cap. Heavy Duty complete with motor	5 KW	Ind	One	55,250/-
3.	Welding Transformers 300 Amps	10 KW	Ind	One	13,600/-
4.	Welding Equipment Generator type 400 Amps	12 KW	Ind	One	12,750/-
5.	Tube bending Machine gear type bending size ½“ to 2’ X 16 SWG	1 KW	Ind	One	8,500/-
6.	Flexible shaft grinder 8” wheel dia	1	Ind	Two	7,650/-
7.	Gas Cutting Set			One	5,950/-
8.	Power Hacksaw	1	Ind	One	2,550/-
9	Drilling Machine Pillar Type Cap.1½”	1	Ind	One	5,440/-
10	Radial Drill Machine Bench Type ½“	3 KW	Ind	One	21,590/-

	Cap.				
11	Drilling Machine Bench type ½“Cap.	½“K W	Ind	Two	10,200/-
12	Portable Drill Heavy Duty ½“	½“ Cap	Ind	Two	5,100/-
13	Spray Painting Equipment Complete with Compressor, Spray Gun etc. Heavy Duty	1	Ind	One	12,750/-
14	HT Automatic Coil Winding Machine 14 Swz to 30 Swz. Complete with accessories	1 Cap.	Ind	Five	1,02,000/-
15	L.T. Coil Winding Machines, Heavy suitable for coil size up to 25’complete with counter	½	Ind	Three	76,500/-
16	Paper Cutting Machine	1	Ind	One	5,950/-
17	Electric Baking Oven temp. range up to 105C. Size 96”X72”x72”	10 KW	Ind	One	34,000/-
18	Vacuum Impregnation Plant with Tank size 45’X56”	2 KW	Ind	One	42,500/-
19	Oil Filtering Equipments 250 GPH		Ind	One	25,500/-
	Total:	52			4,69,030/-

(b)	Testing Equipment such as -				
1.	H.V. Testing Transformers with Penal 66 KV/230V. 10 KVA	10 KW	Ind.	One	54,400/-
2.	Double frequency Generator		Ind.	One	47,600/-
3.	Variable Transformer, 30 Amps 3 phase 50 HZ	5 KW	Ind.	One	37,400/-
4.	Turn Ratio Test Kit		Ind.	One	12,750/-
5.	Power Factor Meter		Ind.	One	4,250/-

6.	Oil Test Kit		Ind.	One	7,650/-
7.	Kelvin Bridge		Ind.	One	12,750/-
8.	Wheat Stone Bridge		Ind.	One	21,250/-
9.	Control Personnel with standard Voltmeter, Watt Meter, Ammeters, Current, Transformers, P.T. frequency Meter etc.		Ind.	One	12,750/-
10	Tong Tester		Ind.	One	4,250/-
11	AVO Meters		Ind.	Two	6,800/-
12	Meggar 500 V. 1000 Volts		Ind.	Two	6,800/-
13	Variac Single Phase 5 Amps		Ind.	Three	10,200/-
	Total:				2,38,850/-
(c) Maintenance Machinery					
1.	Lathe geared 6 ft	2 KW	Ind.	One	31,450/-
2.	Shaper 24" Stroke	2 KW	Ind.	One	25,500/-
3.	D.F. Grinder Wheel dia 12"	1 KW	Ind.	One	8,500/-
	Total:				65,450/-
(d) Other Fixed Assets:					
1.	Oil Storage Tank		Ind.	One	34,000/-
2.	Installation and Electrification charges @ 10%				80,750/-
3.	Hand Tools jigs, dies Fixtures etc.		Ind.		41,000/-
4.	Office furniture and Equipments, Work Benches, Rocks etc.		Ind.		2,85,160/-
	Total:				4,40,910/-

(e)	Pollution control Equipment, if required: Exhaust Fan				12,000/-
(f)	Energy Conservation Facilities/ Equipment, if used: Furnace should have heat resistant fire bricks to avoid wastage of heat energy CFT Tubes Fluorescent tubes with electronic chokes				12,000/-

(g)	Cost of Transformer & Electrification (If load more than 15KW)		30,000/-
	Total Cost of Machinery & Equipments (a+b+c+d+e+f+g)		12,68,240/-
(iii)	Pre-operative Expenses		11,000/-
	Total Fixed Capital(II + III):		12,79,240/-

WORKING CAPITAL (Per Month):

(i) Staff & Labour (Per Month)

S.No	Description	No.	Salary (Rs.)	Total (Rs.)
(a)	<u>Administrative & Supervisory</u>			
i.	Senior Engineer	1	6,000/-	6,000/-
ii.	Works Manager	1	6,000/-	6,000/-
iii.	Sales Officers	2	4,000/-	8,000/-
iv.	Administrative Officer	1	4,500/-	4,500/-
v.	Office Assistant	5	2,000/-	10,000/-
vi.	Stenographer/Typist	1	2,800/-	2,800/-
vii.	Store Officer	1	3,000/-	3,000/-
viii.	Peon/Office Boy	3	2,000/-	6,000/-
ix.	Chowkidar	3	2,000/-	6,000/-
			Total:	50,300/-
(b)	<u>Technical Skilled & Unskilled</u>			
i.	Skilled Worker	15	2,750/-	41,250/-
ii.	Semi-Skilled Worker	10	2,500/-	25,000/-
iii.	Unskilled Worker	10	2,200/-	22,000/-
			Total:	1,40,550/-
			+ Perquisites @ 15%	21,082/-
			Total:	1,61,032/-
			Say:	1,61,000/-

(ii) Raw Material (Per Month):

Sl. No	Description with Specification	Qty.	Rate (Rs.)	Value (Rs.)
1.	M.S.B.P. Sheet (8 to 16 SWG)	6 MT	@ 22,000/-	1,32,000/-
2.	CRGO Lamination (Transformer grade)	15 MT	@ 70,000/-	10,50,000/-
3.	DPC Aluminium Strip	2 MT	@ 1,10,000/-	2,20,000/-
4.	Super Enamelled DPC winding wire	3 MT	@ 3,20,000/-	9,60,000/-
5.	Transformer Oil	15500Ltrs	@ 28/-	4,34,000/-
6.	M.S. Channels 75X4mm to 100X50mm	3.4 MT	@ 19,000/-	64,600/-
7.	M.S. Flat (25X6mm to 75X12mm) MS Angles (35X35 to 75x75x7mm)	2 MT	@ 20,000/-	40,000/-
8.	Insulating Materials viz; Graft paper, PP paper, Press Board, Bamelite Sheet, PVC Cotton Tape etc.	2 MT	@ 20,000/-	40,000/-
9.	Hardware Materials, M.S. Nuts, Bolts, G.I. Pipe, Valve etc.	1 MT	@ 25,000/-	25,000/-
10.	HV/LV bushings (Set of 9 Nos.)	100 Sets	@ 600/-	60,000/-
11.	Paint/Varnish/Thinner etc.	300 Ltrs	@ 90/-	27,000/-
12.	Copper/Brass Fittings viz Nuts bolts	500 Sets	@ 30/-	15,000/-
13.	Radiator/Radiator tubes	200 Nos.		72,000/-
			Total:	30,07,600/-

(iii) Utilities Per Month:

Power 3000 units @ Rs.5.50 per unit	Rs.	16,500/-
Water	Rs.	1,500/-
Total:	Rs.	18,000/-

(iv) Other Contingent Expenses (Per Month):

Sl.No.	Particulars	Rs.	Total
1.	Rent	Rs.	15,000/-

2.	Postage & Stationery	Rs.	1,000/-
3.	Advertisement	Rs.	2,500/-
4.	Repair & Maintenance	Rs.	1,500/-
5.	Telephone	Rs.	1,000/-
6.	Transportation charges	Rs.	1,000/-
7.	Consumable Stores	Rs.	1,000/-
8.	Sales expenses	Rs.	5,000/-
9.	Insurance	Rs.	2,000/-
Total:		Rs.	30,000/-

TOTAL RECURRING EXPENDITURE (Per Month):

Sl.No.	Particulars	Rs.	Total
i	Personnel (Salary & Wages)	Rs.	1,61,000/-
ii	Raw Material	Rs.	30,07,600/-
iii	Utilities	Rs.	18,000/-
iv	Other Contingent Expenses	Rs.	30,000/-
Total:		Rs.	32,16,600/-

Working Capital for 3 months: Rs.32,16,600 X 3 = Rs. 96,49,800/-

TOTAL CAPITAL INVESTMENT:

Sl.No.	Particulars	Rs.	Total
i)	Fixed Capital	Rs.	12,79,240/-
ii).	Working Capital for 3 months	Rs.	96,49,800/-
Total:		Rs.	1,09,29,040/-
Say		Rs.	1,09,29,000/-

FINANCIAL ANALYSIS:

Cost of Production (Per Annum):

Sl.No.	Particulars	Rs.	Total
1.	Total Recurring Cost per year	Rs.	3,85,99,200/-
2.	Depreciation on Machinery & Equipments @ 10%	Rs.	94,208/-

3.	Depreciation on Jigs, Fixtures & Dies @ 25%	Rs.	10,250/-
4.	Depreciation on Office Furniture @ 20%	Rs.	57,032/-
5.	Interest on Total Capital Investment @ 16%	Rs.	17,48,640/-
Total:		Rs.	4,05,09,330/-
Say:		Rs.	4,05,09,300/-

TURN OVER (PER ANNUM):

<u>Item</u>	<u>Qty.</u>	<u>Rate/Unit</u>	<u>Total Sales</u>
	<u>(Nos.)</u>		
Distribution Transformers KVA	100 1000 Nos.	43,750/-	Rs. 4,37,50,000/-

PROFIT PER ANNUM (Before Taxes)

Profit	Annual Sales (-)	Cost of Production		
=				
	4,37,50,000/- (-)	4,05,09,300/-	=	Rs. 32,40,700/-

NET PROFIT RATIO:

<u>Net profit X 100</u>	<u>32,40,700/- X 100</u>		
Turn Over	4,37,50,000/-	=	7.4%

RATE OF RETURN:

<u>Net profit X 100</u>	<u>32,40,700/- X 100</u>		
Total Investment	1,09,29,000/-	=	29.65%

BREAK EVEN POINT:

Fixed Cost (Annual):

1	Rent of the Building	Rs.	1,80,000/-
2	Depreciation on Machinery & equipments @ 10%	Rs.	94,208/-
3	Depreciation on Jigs, Fixtures & Dies @ 25%	Rs.	10,250/-
4	Depreciation on Office Furniture @ 20%	Rs.	57,032/-
5	Interest on Total Capital Investment @ 16%	Rs.	17,48,640/-
6	40% of Salary & Wages	Rs.	7,72,800/-
7	40% Other Expenses	Rs.	62,400/-
8	Insurance	Rs.	24,000/-
	Total:	Rs.	29,49,330/-
		Say:	Rs. 29,49,300/-

Break Even Point:

$$\frac{\text{Fixed Cost X 100}}{\text{Fixed Cost + Profit}} = \frac{29,49,300 \text{ X } 100}{29,49,300 + 32,40,700} = 47.64\%$$

Additional Information:

- a. The Project Profile may be modified/tailored 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 alone. 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.

Addresses of Machinery Suppliers:

1. M/s Vacuum Plants & Instruments Mfg. Co. (P) Ltd.,
P.O. Mundhewa, Pune-411036. – Vacuum Plant.
2. M/s Batliboi & Company, 28, R. N. Mukherjee Road,
Kolkata-700001. – General Machinery.
3. M/s Agronic Instruments Pvt. Ltd.,
204, Shivshakti Indl. Estate, L.B.S. Marg, Ghatkopar (W), Mumbai. –
Instruments
4. M/s Delta Control Engg. Corpn., B-215/216 Shrayas Industrial Estate,
Adjacent Gurunanak Industrial Estate,
Western Expresso Highway Gorregaoon (E), Mumbai-63. – Instruments.
5. Oriental Scientific Apparatus Workshop,
Jawahar Lal Nehru Marg, Ambala Cantt-133001. – Kelvin Bridge.
6. M/s Prem Engg. Works, 22, Okhla Indl. Estate, New Delhi 110020.
7. M/s Mamckal & Sons, 115/116, Narayan Dharia Street, Mandvi, Mumbai.
8. M/s Anateep Machines Tools Pvt. Ltd., 14/7, Mathura Road, Faridabad.
9. M/s C.A. Willner & Co. Pvt. Ltd., 15, Richmond Road, Bangalore.
10. M/s Compressed machinery Corpn., Sunil Sadan, M.I. Road, Jaipur.
11. M/s Jaymes Engg. Co. Pvt. Ltd., M Block, Connaught Place, New Delhi.

12. M/s East Asiatic Inds. Pvt. Ltd., 113/1, Rash Behari road, Kolkata.
13. M/s Joshi Engg. Co. Ltd., India Palace, II Block, Connaught Place, New Delhi.
14. M/s Uday Raj & Sons, 36m, Ezra Street, Kolkata.
15. M/s Toshniwal Bros. (P) Ltd., M.G. Road, Ajmer.
16. M/s Automatic Electric Ltd., Rectifier House, P.B. No. 703, Mumbai.
17. M/s Zaran Trading Agency, P. B. No. 6657, Bandra, Mumbai.
18. M/s P.C. Ghosh & Co. Pvt. Ltd., 171/C, Lamin Sarani, Behind New Cinema, Kolkata.

Addresses of Raw Materials & Spares Suppliers:

1. M/s Gues Keen Williams Ltd., Shankey Division, Kolkata. – Stamping.
2. M/s Sanjay Electrical Stmping Ltd., Wakefield House, Sprott Road, Ballarad Estate, P.O. Box No. 121-A, Mumbai. – Stamping.
3. M/s G.K.W. Limited, Jiwan Vihar, 3, parliament Street, New Delhi.
4. M/s Devidayal Stainless Steel Stamping (P) Ltd., (Electrical Stmping Division) Box No. 6224, Darunkhana Road, Mumbai. – Stamping.
5. M/s System Stampings, B-16, Sarvodaya Nagar, Kanpur-208005.
6. M/s Senapathy White clay (P) Ltd., 14, Netaji Road, Bangalore.
7. M/s Indian Cable Co. Ltd., Industrial Assurance Building, Char Rasta, Gandhi Road, P.B. 33, Ahmedabad.
8. M/s National Insulated Cable Company of India Ltd., MCGO House, Hare Street, Kolkata.
