

ENERGY SAVING CHOKE/LED LIGHTS

1. INTRODUCTION:

LED is semiconductor Technology that emits light at the junction of oppositely charged materials when voltage forces electron movement? Led based lighting systems are devices consisting of many LEDs chips embedded on the LED fixtures base and fitted with rectifier circuit that provides regulated current output at the low voltage that makes them to be operated on AC Circuit because LEDs requires DC to operate. The whole PCB circuit board is fitted inside a plastic enclosure along with the metallic cap and Smoky reflector. Electronic high-frequency ballasts is a device which controls the starting voltage and the operating currents of lighting devices built on the principle of electrical gas discharge. Electronic ballasts operate lamps using electronic switching power supply circuits. Electronic ballasts take incoming 50 Hz power (220 volts) and convert it to high-frequency AC (usually 20 to 40 kHz)

2. PRODUCT & ITS APPLICATION:

A choke is one of the vital components of a fluorescent lamp. It creates high voltage storage across the lamp electrodes during starting to initiate discharge through the low pressure gaseous medium between the electrodes. It also limits the current, during normal operation after the discharge has been established. In the beginning conventional coil wound choke were in use but with the change in technology this have been started replacing with electronic chokes. These chokes save about 35 to 40% of energy as compared to conventional chokes giving better luminescence. Beside this they ensure instant flicker free starting and high resistance to switching transient. They can even glow at lower voltage compared to conventional coil wound choke.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate in any discipline.

4. INDUSTRY LOOK OUT AND TRENDS

Global LED lighting market is likely to reach a size of \$70,240 million by 2023, growing at a CAGR of 12.6% during the forecast period. Light Emitting Diode (LED) symbolizes a semiconductor device that emits light when electric current passes through it. LED illumination is being utilized to offer radiance for a number of imaging or optical applications including indoor, outdoor, architectural, automotive and horticultural. The growing adoption of energy-efficient lighting solutions across the globe is a primary factor attributing to the growth of LED lighting market. The increased investment in infrastructure enhancement, along with continuous price erosion of LED lighting solutions is driving the demand of the LED lighting market. Increasing demand of LED lighting solutions for various applications of general lighting has also benefited the penetration of LEDs in recent years. However, development of alternative technologies and lack of awareness regarding installation costs and payback periods are some of the key factors hindering the growth of LED lighting market across the globe.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Conventional lighting systems represent mainly incandescent light bulbs and compact fluorescent lights (CFLs). LED lighting system provides advantages over conventional lighting systems in terms of better energy efficiency, better energy costs, longer lifetime, less temp. Sensitive, higher light output. This leads them to be better Lighting substitute and good market prospect. Therefore the market prospect for LED based Lighting system is good and booming. The market for electronic choke is increasing day by day and in future it seems it would completely replace the conventional coil wound choke because of its features like tremendous energy saving, instant flicker free starting and finally can glow at low voltage.

6. RAW MATERIAL REQUIREMENTS:

The raw materials required are Diodes (IN4007, IN4148 etc.) 2 High Voltage Switching Power Transistor 3 Resistors 4 Capacitors (Different types) 5 Printed Circuit Board (PCB) 6 Ferrite Cores 7 Copper winding wires 8 Enclosure, Screws, connector , Flexible wire etc.

7. MANUFACTURING PROCESS:

The whole manufacturing process can be categorized into the following steps

- PCB assembly
- Unit wiring and mounting in the cabinet.
- Testing for its performance.
- Quality control
- Finishing and packaging.

All the tested electronic components are mounted on the PCB as per the layout diagram/ B.O.M and then soldered. A visual check is carried to ensure that the orientation and position of the component is as per the layout diagram and there are no dry solders. The soldered side of the PCB is then cleaned using solvents to remove solder flux. In next step the assembled unit is suitably neatly wired to avoid any loose connection and then mounted in the cabinet. Functional checks are performed to ensure that the basic functions of choke are working correctly. The choke is again tested for the quality and the units having the required quality are ultimately sealed, packed and dispatched.

2. Quality Specifications As per B.I.S. specification

8. MANPOWER REQUIREMENT:

The enterprise requires 4 employees as detailed below:

Sr. No.	Designation Of Employees	Salary Per Person	Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
1	Operators	12000	24000	2	2	2	2	2
2	Helpers	10000	10000	1	1	1	1	1
3	Admin Manager	15000	15000	1	1	1	1	1
	Total		49000	4	4	4	4	4

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 2 months' time as detailed below

Sr. No.	Activity	Time Required(<i>in months</i>)
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (<i>some activities shall run concurrently</i>)	2.00

10. COST OF PROJECT:

The project shall cost ₹ **7.37**lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land on rent	0.00
2	Building	0.00
3	Plant & Machinery	2.00
4	Furniture, Electrical Installations	1.00
5	Other Assets including Preliminary / Pre-operative expenses	0.20
6	Working Capital	4.17
	Total	7.37

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets.

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	1.84
2	Bank Finance	5.53
	Total	7.37

12. WORKING CAPITAL CALCULATION:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	2.08	0.25	0.52	1.56
2	Receivables	1.04	0.25	0.26	0.78
3	Overheads	1.04	100%	1.04	0.00
4	Creditors	-		0.00	0.00
	Total	4.17		1.82	2.34

13. LIST OF MACHINERY REQUIRED:

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value
					(₹ in Lacs)
	Plant & Machinery / equipments				
a)	Main Machinery				
1	Oscilloscope	NO	1	0.50	0.50
2	Digital Multimeter	NO	1	0.25	0.25
3	Coil winding machine	NO	1	0.20	0.20
4	LCR & Q Meter	L.S.	1	0.30	0.30
5	Analog Dial Amps- Volts- Ohms meter Watt-meter Rheostat Small drilling machine	NO	1	0.50	0.50
6	Installation, Electrification, taxes and transportation.	L.S.	1	0.25	0.25
	<i>sub-total Plant & Machinery</i>				2.00
	Furniture / Electrical installations				
a)	Office furniture	LS	1	50000	0.50
b)	Stores CUPBOARDS	LS	1	0	0.00
c)	COMPUTER PRINTER	L. S.	5	50000	0.50
	<i>sub total</i>				1.00
	Other Assets				
a)	preliminary and preoperative				0.20
	<i>sub-total Other Assets</i>				0.20
	Total				3.20

All the machines and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Hifine Machine

5, New India Estate, Inside Relief Hotel,
Sanand Char Rasta, Sarkhej, Ahmedabad-382210, Gujarat
Phone: 079 26891274, 079 26890274

2. Sagar Engineering Works

A-129, Road No. 9 D,
V. K. I. Area, Jaipur - 302013,
Rajasthan, India
Phone: +91-9829024358, +91-141-4064876

3. Meter Centre

No. 1778/6, Ground Floor, Gandhi Main Road,
Near HDFC Bank, Ahmedabad, Gujarat 380001
Phone: 098257 01297

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	15.00	17.50	20.00	22.50	25.00
3	Raw Materials & Other direct inputs	₹. In Lacs	10.28	11.99	13.70	15.42	17.13
4	Gross Margin	₹. In Lacs	4.72	5.51	6.30	7.08	7.87
5	Overheads except interest	₹. In Lacs	1.84	1.96	2.19	2.25	2.30
6	Interest	₹. In Lacs	0.55	0.55	0.37	0.28	0.22
7	Depreciation	₹. In Lacs	1.40	1.00	0.70	0.50	0.45
8	Net Profit before tax	₹. In Lacs	0.93	2.00	3.04	4.05	4.90

The basis of profitability calculation:

The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study; it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per liter. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 32.03 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	25.00
2	Variable costs	₹. In Lacs	17.13
3	Fixed costs incl. interest	₹. In Lacs	2.52
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	32.03%

16. STATUTORY / GOVERNMENT APPROVALS

As per the allocation of business rules under the Constitution, labour is in the concurrent list of subjects. It is dealt with by the MOLE at the Central and Departments of Labour under State Governments in respective States / UTs. The MOLE has enacted workplace safety and health statutes concerning workers in the manufacturing sector, mines, ports and docks and in construction sectors.

Further, other Ministries of the Government of India have also enacted certain statutes relating to safety aspects of substances, equipment, operations etc. Some of the statutes applicable in the manufacturing sector are discussed below:

The Manufacture, Storage and Import of Hazardous Electronic Rules (MSIHC), 1989

These MSIHC Rules are notified under the Environment (Protection) Act, 1986. These rules are aimed at regulating and handling of certain specified hazardous chemicals. The rules stipulate requirements regarding notification of site, identification of major hazards, taking necessary steps to control major accident, notification of major accident, preparation of safety report and on-site emergency plan; prevention and control of major accident, dissemination of information etc. These rules are notified by the Ministry of Environment and Forests (MOEF) but enforced by the Inspectorates of Factories of respective States / UTs in the manufacturing sector. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATIONS

Both forward and backward integration for any Electrical Industry are strategies to gain better control over the supply chain, reduce dependency on the suppliers and increase their competitiveness. The two strategies can help companies reduce their dependency on suppliers and increase their influence over the customers. The benefits of these strategies can be big. Both impact the bottom line directly. Integration happens if a company moves upward or downward in its supply chain. Starting from the suppliers from whom the raw materials are obtained, the chain moves downstream towards the distributors and the retailers. If the suppliers' power is very high, it can create financial burdens for the company. Suppose the number of suppliers of a company is low, then the control in their hands would be low. The burden in that case will fall upon company's shoulders. Its expenditure on raw materials will be high.

18. TRAINING CENTERS AND COURSES

There is no such training required to start this business but, basic Electrical or IC bachelor's degree is plus point for enterpriser. Promoter may train their employees in such specialized

institutions to grow up the business. There are few specialized Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of Electrical LD College of engineering
No.120, Circular Road, University Area, Navrangpura,
Opposite Gujarat University, Ahmedabad, Gujarat 380015
2. MIT College of Engineering, Pune
Gate.No.140, Raj Baugh Educational Complex,
Pune Solapur Highway,
LoniKalbhor, Pune – 412201
Maharashtra, India

Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.