

**Commissioner of Industries  
Hyderabad  
Andhra Pradesh**

**Chemical Light Stick**

**1. Nature of the Product and Its Applications**

Chemical light stick is a simple device for instantaneous production of light as a result of chemical reaction. The device can be effectively used in distress signalling at night in mines and for decorative lighting. The light stick consists of a sealed plastic container having the relevant ingredients. It is activated by bending the tube whereby a thin-walled glass ampoule in the container breaks and the reactants are mixed. The tube has to be shaken for 30 - 50 seconds for homogenous mixing and glow. Light is produced instantaneously. The device works in the temperature range 20 degree C - 60 degree C. The following are the specifications of the indigenously developed product

System	Compact single unit containing five Components
Working light	3 hours (approx)
Marking light	8 hours (approx)
Visibility	About 2.5 kms in a moonless clear night.
Colour of Light	Greenish white. It is however, Possible to formulate compositions emitting other colours such as blue, orange or red. The production of light in the system is based on peroxyoxalate chemiluminescence.

**2. Market Potential**

The chemical light stick has advantages over other conventional emergency lighting devices. It can be used as an emergency light useful for reading, working, signalling, etc., in dark and even in moonless night. The light stick can work for a reasonably long time and its light could be seen from long distances. It can also be operated in wind, rain and under water and also in explosive regions, mines, etc. Besides, the defence sector, the product may find application in mountaineering and underwater fishing. There is a good demand for light sticks indigenously as well as in the export market.

**3. Installed Capacity**

A plant capacity of 50,000 candles per annum is being considered on the following basis:

No. of shifts	1
Production capacity	170 candles/day
Working days in a year	300
Assumed capacity utilisation	80% (in 3rd year)
Annual production (Assumed in 3rd year)	40,000 candles

**4. Raw Materials**

The raw materials required for manufacturing of chemical light stick are hydrogen peroxide, organic chemical (Oxalate), polythene tube (6" x 12" dia), glass ampoules, wrapper (polythene/aluminium). The above raw materials are available with agents/dealers in most of the state capitals and major cities.

## 5. Technology/Manufacturing Process

A glass ampoule is filled with one of the liquid reactants (hydrogen peroxide or oxalate) and sealed. The ampoules is placed in a polythene tube of 6" length and 1/2" diameter in which the second reactant is filled. The tube is then sealed and placed in polyester/aluminium wrapper. Before setting up the unit, clearance from State Pollution Control Board would be required.

## 6. Plant And Machinery

**6.1 Major Equipments** The major plant and machinery required for the unit includes vacuum pump, deep freezer, flash evaporator, sealing machine, etc.

### 6.2 Suppliers of Equipments

- i. Chem Project Engineers  
Plot B.35, BHEL-AIE, R C Puram  
Hyderabad 500032
- ii. Paramount Chem-plas Equipment (P) Ltd  
Tilak Road, Hyderabad 500001
- iii. Enfab  
C-2, IInd Floor, Shanti Niwas  
Mettuguda, Secunderabad 500017
- iv. Hiranya Chem-Elec Equipment (P) Ltd  
D-64, P-123, Ph-V IDA, Jeedimetla 500 055

## 7. Location

Nearer to market, availability of the raw materials, skilled & cheap labour and infrastructure facilities shall be the main consideration for the location of the proposed unit.

## 8. Infrastructure

Manpower : 8 Nos  
Power : 7 HP  
Water : 4 KL/day

## 9. Cost of the Project and Means of Finance Cost of the Project

	Particulars	Rs. Lakhs
a.	Land and land development (200 sq mt)	0.80
b.	Building and civil construction (100 sq mt)	2.60
c.	Plant and machinery	2.86
d.	Miscellaneous fixed assets	1.00
e.	Preliminary and preoperative expenses	0.43

Total fixed capital	7.69
Working capital margin	0.79
Total project cost	8.48

Working capital required in 1st year 1.90

#### Means of Finance

- Promoter's contribution :	3.48
- Term loan :	5.00

#### 10. Annual Operating Expenses

Assumed operating capacity in 3rd year = 80% of installed capacity.

	Particulars	Rs. Lakhs
a.	Raw material	6.64
b.	Packaging material and consumables	0.58
c.	Utilities	0.26
d.	Salaries and wages - Prdn	1.46
e.	Factory overheads	0.17
f.	Admn. & Management expenses	0.50
g.	Financial expenses	0.57
	Interest on term loan	0.27
	Interest on working capital	
h.	Depreciation	0.46
i.	Selling expenses	0.29
	Total	11.20

Net sales realisation :	14.33
Pre-tax profit :	3.13
a. Break even point @ 80% capacity utilisation :	36.73%
b. Rate of return on investment before taxes :	36.91%

**11. Any Other Special Features** This product has wide applications and can be operated in difficult conditions of rain, wind, under water, etc.