PROJECT PROFILE

PRODUCT: INDUSTRIAL/MEDICAL OXYGEN GAS

PRODUCTION CAPACITY(P.A): 48,000 cylinders of 7 cum with 130- 150kgf pressure

Total Capital Investment : Rs. 2,32,80,760/-

MONTH AND YEAR OF PREPARATION: **MAY-2021**

PREPARED BY:

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PREPARED FOR:

INTRODUCTION:

Oxygen is very vital gas for living being used in respiration. In nature, the plants during the process of photosynthesis produce oxygen. The oxygen that is taped from the air by liquefaction followed by separation of other gases and then by distillation . This oxygen is called as industrial oxygen, which has 90 to 95% purity. It has wide applications in Industry and other activities. It provides support for combustion of acetylene gas in producing hot flame capable of cutting metal and welding of metals in fabrication/engineering workshops. It is also used in furnaces in manufacture of steel, burning of explosives in mines. When purity lies between 95 to 99%,it is mostly used for medical purposes i.e for artificial respiration purpose in hospitals, high altitude climbing, aeropleanes, jetpleans etc.Helium mixed with industrial oxygen is used for respiration of scuba drivers. The demand all types of oxygen gas is increasing with industrialization, and treatment of pulmonary disorder patients, mostly in covid virus affected cases.

Two types of plants are used for manufacture of oxygen viz. industrial oxygen plant and tonnage oxygen plants. Oxygen produced by first method is of high purity up to 99% and the bulk of it is in the form of liquid which is distributed in tankers or cylinders to customers for re-evaporation at their site. Tonnage oxygen plants are used to produce large quantity of oxygen and usually low purity 90-95% gaseous oxygen for direct supply to industries through pipe line in surrounding areas.

MARKET POTENTIAL:

Industrial oxygen is mainly used in supporting the combustion of acetylene gas cutting of metal in fabrication industry, in hospitals and mines for artificial respiration, etc. Its demand is increasing with vast industrialization and for medical purposes particularly in covid-19 pandemic situation. In Orissa few oxygen manufacturing and liquid oxygen storing and distribution plants situated at industrial estate Jagatpur(Cuttack),Angul, Bhubaneswar, Rourkela, Balasore, Kalinga Nagar, Dhenkanal, Choudwar. Still there exist very good scope for setting up some more units at different parts of our state observing the medical usage in recent covid virus pandemic in 1st and 2nd pase.

BASIS OF PRESUMPTION:

1. 60% efficiency at full capacity utilization and single shift working hours, 300 working days per annum have been considered in the preparation of the scheme.
2. The cost of machinery,plant and cylinders are taken as per quotations of M/s Sanghi Oxygen plant suppliers,Mumbai.
3. Minimum wages have been considered in preparation of scheme.
4. Interest rate of 10% has been considered in preparation of scheme.
5. A jumbo oxygen cylinder of volume 7 cubic meter with pressure 130-150 kgf per square cm takes 45 minutes for filling and testing before dispatch. Normally 20 head distribution line for filling 20 cylinders at a time is used in factory site for filling oxygen in jumbo cylinders. Smaller volume capacity or low pressure oxygen cylinders are also available in market but in this project jumbo cylinder filling has been taken into account.
6. An empty jumbo cylinder with fitting accessories cost has been taken as rupees 10,000 each which will be charged as caution money while distributing to caustomers.
7. 160 cylinders with 7 cum cap and 150 kgf pressure will be filled per day and in 25 days(per month), 4000 cylinders will be filled up
8. 160 cylinders will be filled up in 8 batches (20 in each batch) which will take around 6 hours. The unit will operate 8 to 10 hours every day. As per machine quotation 300 jumbo cylinders can be filled per day. Hence the capacity utilization is below 60%,which can be enhanced in subsequent years either by purchasing new cylinders or by increasing rotational cycle.

IMPLEMENTATION SCHEDULE:

1.	Preparation of project report,DPR & regn with different govt. offices	1 month
2.	Arrangement of finance	1 months
4.	Construction activities	1 months
5.	Procurement of machinery and installation	1month
	Total	4 months

E. TECHNICAL ASPECTS:

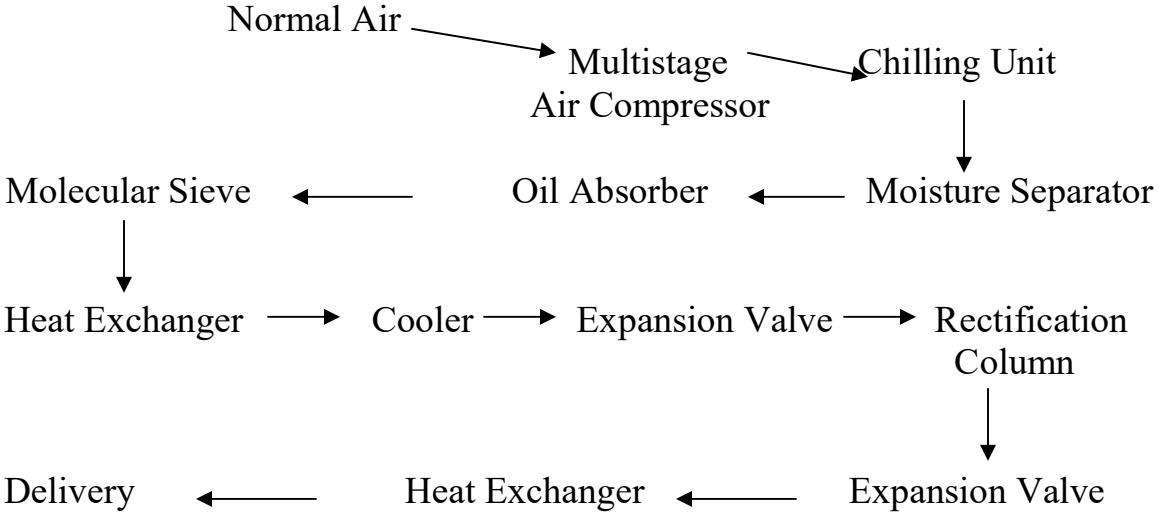
1. Process of Manufacture:

The oxygen plant employs a medium pressure operating cycle of 50 kgf/cm^2 with a highly efficient expansion engine. Oxygen gas with a purity of above 99.6% and pressure up to 200 kgf/cm^2 can be directly filled into cylinders by a variable speed liquor arrangement of this plant which ensures higher safety and lower power consumption.

A multistage air compressor draws air through an intake filter to remove dust particles. The compressed air passes through a chilling unit and then through a moisture separator and oil absorber in series. The air now enters the molecular sieve battery where moisture and carbon dioxide are removed.Then that air enters through heat exchanger where it is cooled down by the outgoing oxygen and out run waste nitrogen. A main heat exchanger and an expansion engine further cool this processed air. A part of the air stream passes via an expansion valve and the rest through the expansion engine. But these streams enter the bottom of a rectification column where it liquefies. The rich liquid from the bottom column is expanded through an expansion to the upper column. Similarly the poor liquid is throttled through another valve to the upper column. Liquid oxygen is pumped by a liquid oxygen pump and is delivered through the heat exchanger into the oxygen manifold for filling in cylinders.

Nitrogen gas can be collected as the by-product of oxygen gas. but in this project, the provision of collection of Nitrogen gas is not given.

The flow chart of manufacture of Oxygen Gas is given below.



2. Quality specification:

The Bureau of Indian Standard has formulated following specification for oxygen gas.IS: 309/1974 – Compressed oxygen gas.

3. Pollution control:

There is not much pollution in oxygen plant. However, necessary precautions are required to be taken for proper safety ventilation and storing of finished products to avoid explosion, PCA approved refrigerant should be used in chilling plant.

4. Energy conservation:

There is not much scope for energy conservation. However, care should be taken for optimal utilization of man, machinery and power to avoid unwanted wastage.

FINANCIAL ASPECTS:

Land and Building

Land: 25,000 sq.ft-own	own
Shed: 8000 sq. ft. @ 500 per sq.ft.	Rs.40,00,000
Water boring with 2 H.P submersible pump	Rs. 1,50,000
overhead tank & pipeline for circulation	
Boundary ,Vechile parking area development	
& watchman shed 100 sq ft	Rs. 2,50,000
	Rs.43,00,000

PLANT AND MACHINERY(300 jumbo cylinder of 7 cum with 150kgf pressure cap per day):

1 Air Filter
2 Air compressor
3 After cooler with tank
4 Nitrogen cooler
5 Purger
6 Oil absorber
7 Freon unit

8	Molecular sieve battery	
9	Air separation consisting of	
	Outer sheet casing	
	Main heat exchanger	
	Liquifier	
	Bottom column	
	Top column	
	Condenser	
	Sub-cooler	
	Liquid oxygen & nitrogen filter	
	Instrumentation	
	Cold pipe lines	
	Insulation materials	
10	Expansion engine	
11	Liquid oxygen pump	
12	Dust filter	
13	Defrosting heater	
14	Filling manifold(20 head) for filling oxygen gas	
15	Purity testing apparatus	
16	Gas/air lines	
17	Set water lines	
18	Water pump	
19	Cooling tower	
20	Water softener	
21	Electrical panel board	
	Total (Each one set amount in Rs.)	58,00,000/-
	G.S.T-18%	10,44,000
	Transportation,Installation,Electrification@10%	5,80,000
		74,24,000

PRE-OPERATIVE EXPENSES

1.	Electrification, pole erection with transformer150KVA	10,00,000
2.	Consultancy charges	20,000
3.	Cost for D.P.R.	10,000
4.	Legal fees, etc.	5,000
5.	Office furniture with one computer set	50,000
6.	Empty Cylinders 1000 no 7cum cap @10,000/cylinder	1,00,00,000
7.	Publicity,Stationary,misc exp	15,000
		1,11,00,000

FIXED CAPITAL INVESTMENT

43,00,000 + 74,24,000 + 1,11,00,000 = Rs.2,28,24,000/-

WORKING CAPITAL (Per month):

A. Personnel (Per Month):

1.	Manager	1	Rs.25, 000
2.	Technician	1	Rs.15,000
2.	Salesman	1	Rs.15, 000
3.	Skilled Labour	6	Rs.60, 000
4.	Un-skilled labour	6	Rs.48, 000
5.	Accountant	1	Rs.13, 000
6.	Watchman	3	Rs.24, 000
			Rs.2,00,000/-

B. **Raw materials (Per Month):**
(To fill 4000 cylinder of 7cum with 150kgf pressure capacity)

Main raw material required for the manufacture of oxygen is air, which is available freely. Water will be collected from own sources.

1.	Refrigerant	L.S	Rs.10,000
2.	Lubricant	10 litre @400/lt	Rs. 4000/-
3.	Coolant,salt etc	5 litre @ 200/LT	Rs.1000
			Rs.15,000

C. Utilities (Per Month):

1)	Air compressor	180HP
2)	Freon unit	7.5 HP
3)	Molecular sieve battery	20 H.P
4)	Expansion engine	10 HP
5)	Cooling Tower	5 HP
6)	Water pump	5 HP
7)	Liquid oxygen pump	5HP
	TOTAL	232.5HP/ 174KW

MOTIVATION POWER LOAD:176 KW.

Electricity 31680 KWH @RS.7.00/unit(average rate) Rs.2,21,760
(176 KWX 12 hr X 25days X 60%=31,680KWH)

D. Other expenses (Per Month):

1.	Traveling and transport	15,000
2.	Maintenance	5,000
3.	Publicity	2,000
4.	Insurance	2,000
5.	Other misc.	1,000
		20,000

Working capital per month = 2,00,000 + 15,000 + 2,21,760 + 20,000 = Rs.4,56,760/-

TOTAL CAPITAL INVESTMENT:

1.	Fixed capital	2, 28,24,000/-
2.	Working capital	4,56,760/-
		2,32,80,760/-

Means Of Finance

Promotors Contribution	@25%	Rs.58,20,190
Bank Loan	@ 75%	Rs1,74,60,570
		Rs.2,32,80,760

FINANCIAL ANALYSIS:

Cost of production:

1.	Total recurring expenses	54,81,120
2.	Depreciation on plant and machinery,transformer @ 10%	6,80,000
3.	Depreciation on office furniture @ 20%	10,000
4.	Depreciation on civil const. @ 5%	2,20,000
5.	Depreciation on cylinders @1%	1,00,000
6.	Interest on total Invt. @ 10%	17,46,057
		Total Rs.60,09,180

Turnover (Per annum):

Refilling of 48,000 no of Oxygen gas cylinders of 7 cum with 130-150 kgf pressure @ Rs.292/ per cylinder Rs1,40,16,000

Profit per annum:

Turnover – cost of production
Rs1,40,16,000- Rs 60,09,180 = Rs.80,06,820/-

Net Profit Ratio:

$$\frac{\text{Net profit x 100}}{\text{Turnover}} = 57\%$$

Rate of Return on Investment:

$$\frac{\text{Net profit x 100}}{\text{Total investment}} = 34\%$$

Break Even analysis:

Fixed cost:

1.	Total Depreciation	10,10,000
2.	Interest on total investment @ 12%	17,46,057
3.	Insurance	24,000
4.	40% Annual salary	9,60,000
5.	40% of other expenses	86,400
		38,26,457/-

BREAK EVEN POINT:

$$= \frac{\text{Fixed cost x 100}}{\text{FC + profit}} = 32\%$$

ADDRESS OF MACHINERY SUPPLIERS:

1) M/s. Universal Industrial Plants Mfg. Co., R-19, Hauz Khas Enclave, New Delhi-110016, Tel-26854168/26854421, Fax:011-26965762.
2) M/s. Sanghi Oxygen(Bombay) Pvt. Ltd., Mani Mahal, 11/12, Mathew Road, Behind Opera House, Mumbai-400004, Tel-022-23634852/23634853, Fax-022-23631559, Website-www.sanghioxygen.com