

## **OPHTHALMIC LENS GRINDING**

### **1. INTRODUCTION:**

The people of all age groups use sunglasses as an aid to protect eyes against glare or wind and also as a fashion wear. The present younger generations is using these glasses mainly as fashion in different colors and varieties. The sunglasses are mostly manufactured in plane without power in various sizes, colors and shades. Photo chromatic glasses are the latest introduction in the range of sunglasses in the country. These are special variety of glasses with the characteristics that when the sun light strikes on them the invisible micro-crystals of silver halides inside the glass automatically get darker and imparts color and shade to the glass and in normal indoor light, the glasses revert to its colorless clear transparency. These glasses also protect eyes from UV rays and are useful both as sunglasses and reading glasses.

### **2. PRODUCT & ITS APPLICATION:**

Ophthalmic lenses are manufactured out of ophthalmic rough glass blanks. There are different types of ophthalmic lenses such as purely spherical, cylindrical bifocal and fused bifocal as well as sunglasses etc. These spectacle lenses serve as an aid to precious human eyes for better and comfortable vision. They protect and restore the normal eyesight of persons. Sunglasses are used for protect of eyes against glare, second wind and also become a fashion wear. Fused bifocal lens serve dual purpose i.e. for distance and near vision in in one spectacle and thus convenient to wear. Fused bifocal lenses are not only scientifically perfect in having spherical center with reading segment but also advantageous to cut and fit into different shapes and sizes of spectacle frames.

### **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

Graduate in any discipline.

#### **4. INDUSTRY LOOK OUT AND TRENDS**

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#### **5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

There is wide spread use of sunglasses for eye care apart from the style and fashion. The need of powered glasses is felt after the age of forty. The demand for sunglasses/ophthalmic

Glasses is increasing day-by-day to produce ophthalmic lenses as per doctor's prescription. There is a good scope for setting up of new units with modern machinery in different parts of the country, particularly in the urban and semi-urban areas, where there is immediate demand for the product.

#### **6. RAW MATERIAL REQUIREMENTS:**

The major raw materials required for the project are Photochromic glass blanks, i.e. (photogrey, photogrey-extra, photobrown and photosun) of 60 mm to 65 mm diameter of 2.8 mm to 5 mm thickness. Colored glass blanks. Different shades i.e. SP2, SP4 and SP10 of 55 to 65 mm diameter and 3.00 mm to 5.00 mm thickness. Abrasive and polishing materials, compounds, blocking alloy and cleaning materials, chemical and other allied materials, packing materials.

#### **7. MANUFACTURING PROCESS:**

Glass blanks of particular diameter and thickness are selected on the basis of power to be given to a lens. Glass blanks are first blocked with the help of surface blocker which is latest attachment developed for blocking purposes. After blocking the surfaces are ground by means of Diamond Curve Generator. After grinding and smoothing, the

surface is polished with the help of fixing felt cloth and using polishing material (cerium oxide) on fully automatic machines. The polished glass blanks are then de-blocked in alloy reclaim tank that is a compact unit for de-blocking of lenses. The process is further repeated for grinding and polishing of the second surface of the blanks. Lenses are then cleaned and tested for accuracy and perfection. Though the process of grinding and polishing is simple, it is quite sophisticated in practice with rigid quality control measures at each stage of manufacture.

## 8. MANPOWER REQUIREMENT:

The enterprise requires 9 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	Machine Operators	12,000	12000	1	1	1	1	1
2	Helpers	8,000	24000	3	3	4	4	5
3	Production supervisor	15,000	15000	1	1	1	1	1
4	Accounts/Stores Asst	12,500	12500	1	1	1	1	1
5	Office Boy	9,000	9000	1	1	1	1	1
	<b>Total</b>		72500	7	7	8	8	9

## 9. IMPLEMENTATION SCHEDULE:

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

Sr. No.	Activity	Time Required (in months)
1	Acquisition of premises	1.00
2	Construction (if applicable)	0.00
3	Procurement & installation of Plant & Machinery	1.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (some activities shall run concurrently)	2.00

## 10. COST OF PROJECT:

The project shall cost ₹ 13.565 lacs as detailed below:

Sr. No.	Particulars	₹
1	Land	0
2	Building	0
3	Plant & Machinery	325000
4	Furniture, Electrical Installations	32500
5	Other Assets including Preliminary / Pre-operative expenses	39000
6	Working Capital	960000
	<b>Total</b>	<b>1356500</b>

## 11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	3.39125
2	Bank Finance	10.17375
	<b>Total</b>	<b>13.56500</b>

## 12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹ 4.80 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	320000	0.25	80000	240000
2	Receivables	320000	0.25	80000	240000
3	Overheads	320000	100%	320000	0
4	Creditors	-		0	0
	<b>Total</b>	<b>960000</b>		<b>480000</b>	<b>480000</b>

### 13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below: Power Requirement: 5 HP

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value (₹ in Lacs)
	<b>Plant &amp; Machinery / equipments</b>				
<b>a)</b>	<b>Main Machinery</b>				
i.	Spherical Diamond Curve	Nos	1	75000	0.75
ii.	Generator with motor and pump on three phase 440 volts, 1 HP on AC supply and switch	Nos	2	50000	1.00
iii.	Automatic two spindle spherical machine with feeding pump to each spindles for smoothing with switch and motors of 1 HP each and timer		5		0.50
<b>b)</b>	<b>Ancillary machinery</b>				
i.	Automatic two spindle spherical machine with feeding pump to each spindle for polishing with motor and 1 HP motor of each Surface blocker.	Nos	1.00		1.00
	<i>sub-total Plant &amp; Machinery</i>				<b>03.25</b>
	<b>Furniture / Electrical installations</b>				
a)	Office furniture	LS	1	20000	0.2
b)	Stores Almirah	LS	1	30,000	0.3
c)	Computer & Printer		L. S.	1,00,000	32499.5
	<i>sub total</i>				<b>32500</b>
	<b>Other Assets</b>				
a)	preliminary and preoperative				39000
	<i>sub-total Other Assets</i>				39000
	<b>Total</b>				<b>396500</b>

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:

- Kamdhenu Agro Machinery  
Plot No. 6, Near Power House,  
Wathoda Road, Wathoda  
Nagpur - 440035  
Maharashtra, India
  
- Future Industries Private Limited  
Shed No. 15, Ambica Estate,  
Corporation Municipal Plot,  
Opposite Sadvichar Hospital,  
Naroda, Ahmedabad - 382330,  
Gujarat, India
  
- The Global Pharma Equipments  
Star Industrial Estate,  
D-32, Naik Pada,  
Near Hanuman Mandir,  
Opposite Dwarka Industrial Estate,  
Vasai East, Vasai - 401208,  
Maharashtra, India

#### 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	2304000	2688000	3072000	3456000	3840000
3	Raw Materials & Other direct inputs	₹. In Lacs	1371600	1600200	1828800	2057400	2286000
4	Gross Margin	₹. In Lacs	932400	1087800	1243200	1398600	1554000
5	Overheads except interest	₹. In Lacs	767200	815150	911050	939820	959000
6	Interest	₹. In Lacs	101737.5	101737.5	67825	50868.75	40695
7	Depreciation	₹. In Lacs	227500	162500	113750	81250	73125
8	<b>Net Profit before tax</b>	₹. In Lacs	-164037.5	8412.5	150575	326661.25	481180

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 litre. 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 64.33 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	3840000
2	Variable costs	₹. In Lacs	2286000
3	Fixed costs incl. interest	₹. In Lacs	999695
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	64.33%

## 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 Static and Mobile Pressure Vessels (Unfired) Rules, 1981**

These (SMPV) Rules are notified under the Explosives Act, 1884. These rules regulate storage, handling and transport of compressed gases. These rules stipulate

requirements regarding construction and fittings, periodic testing, location, fire protection, loading and unloading facilities, transfer operations etc. in respect of pressure vessels whose water capacity exceeds one thousand litres. These rules are enforced by the Chief Controller of Explosives under the Ministry of Industry and Commerce, Govt. of India (PESO).

### **The Manufacture, Storage and Import of Hazardous Chemicals 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.

### **The Factories Act, 1948 and State Factories Rules**

The Factories Act, 1948 is very comprehensive legislation dealing with the matters of safety, health and welfare of workers in factories. The Act places duties on the occupier to ensure safety, health and welfare of workers at work. Some of the salient provisions of the Act include:

- Guarding of machinery
- Hoists and Lifts; Lifting Machines and Appliances
- Revolving Machinery
- Pressure Plant
- Excessive Weight
- Protection of Eyes
- Precautions against dangerous fumes, gases etc.
- Explosive or inflammable dust, gas etc.
- Precautions in case of fire
- Safety of buildings and machinery



- Permissible limits of exposure of chemical and toxic substances
- Entrepreneur may contact State Pollution Control Board where ever it is applicable.

## **17. BACKWARD AND FORWARD INTEGRATIONS**

Chemical companies often become integrated and undergo other activities outside the chemical industry. Increased competition prompts many companies to reduce supply chain costs by looking outside the chemical sector at suppliers and customers. While most companies within the chemicals sector primarily produce chemicals, some companies also conduct other manufacturing activities. The exact proportion of chemicals sector companies that are integrated with other sector activities is unknown, but many companies actively seek vertical integration. Many manufacturers pursue vertical integration to secure suppliers and customers for their products.

Mergers and acquisitions are a common way for companies to undertake new chemical ventures. By purchasing their chemical suppliers, some manufacturers secure future chemical feedstock for their products or other chemicals that they use in manufacturing. The company making the purchase obtains valuable expertise and equipment. Some mining and petrochemical production is more cost-effective when integrated within a chemical company.

Energy and feedstock costs are often a significant expense for chemical companies. Integrating chemical production with activities that secure supplies of chemical feedstock and energy is relatively common as chemical companies grow. Chemical companies are located near mines, oil fields, ammonia factories and water supplies. This reduces transportation costs and increases the reliability of supplies by reducing the distance between feedstock and the factory.

Some companies, such as Sino-Coking Coal and Coke Chemical Industries Incorporated, own their mines. BHP Billiton operates a broad range of mines and is primarily a mining company. It does, however, also produce petrochemical feedstock for the chemical industry and therefore operates within the chemical industry as well. These companies technically operate within both the chemical and mining industries in their normal business operations.

Integrating a chemical company with other activities provides several direct benefits for the company and is becoming increasingly common. High energy costs necessitate greater control of energy resources and minimal reliance on expensive transportation. Chemical companies experience volatile profitability due to fluctuations in feedstock and energy expenses. Some companies control this volatility through careful supply chain management and by charging supply surcharges. Actively researching and developing alternative feedstock and energy supplies helps the company reduce costs.

Vertical integration supports these activities by eliminating redundant activities at multiple companies and increasing efficiency. By consolidating activity among multiple, similar operations, chemical companies achieve cost savings that contribute to higher profitability. End products are often very profitable, and some chemical companies purchase their former customers to take advantage of the marked-up prices of products further along in the supply chain.

Integration may become more common for many chemical companies as competition strengthens and traditional feedstock becomes more expensive. Market demand for chemical feedstock increases as emerging market economies grow and result in increased consumer spending around the world.

## **18. TRAINING CENTERS AND COURSES**

There is no such training required to start this business but, basic chemical 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 specialised Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of chemical LD college of engineering  
No.120, Circular Road, University Area, Navrangpura,  
Opposite Gujarat University, Ahmedabad, Gujarat 380015

2. MIT College of chemical Engineering, Pune  
Gate.No.140, Raj Baugh Educational Complex,  
Pune Solapur Highway,  
Loni Kalbhor, Pune – 412201  
Maharashtra, India

Udyamimitra portal ( link : [www.udyamimitra.in](http://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.