PROJECT PROFILE ON TOUGHENED GLASS

PRODUCT CODE (ASICC)	:	94107
QUALITY AND STANDARDS	:	IS 2553:1971 IS 6180:1971 IS 6640:1972 and IS 2553 (Part 1) : 2018
Production Capacity (per annum)	:	Quantity: 3, 60,000 S.ft.
	:	Value : Rs. 4,21,20,000
MONTH AND YEAR OF PREPARATION	:	June 30, 2021
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I. Introduction:

Toughened glass acquires a degree of strength for excess of the strength of normal glass sheet or plate glass, which if broken shatters into small and comparatively harmless pieces. It is claimed that the resistance to mechanical stock of toughened plate glass is 4 to 5 times more than that of ordinary plate glass. A toughened glass has better resistance to the vibration, mechanical shock and abrasion.
Toughened Glass has to pass the following important tests:
i. Transfer strength test on sheets on simply supplied (Modules of rupture and electricity)
ii. Impact test: By following weight on sheets supported on two wooden battens
iii. Impact by falling weight on sheet evenly bedded (on putty)
iv. Impact by falling weight on edge of sheet
v. Repeated twisting tests
vi. Sand blast abrasion
vii. Thermal tests
Because of the strength and other specific physical properties mentioned above, it finds applications in the following fields:
i. Automobile: Cars, trucks,
Industry buses, tempos etc.
ii. Railways: Coaches
iii. Defence: Fleets, vehicles factory
iv. Commercial: Hotels, shops, complex
v. Air ports: Doors

II. Market Potential:

With increased transportation facilities the demand of the product is increasing at a steady pace especially in the automobile industry, railways, ships building both for production and replacement. Local market and advertisement has become very essential for the success of any business activity. As such it is found to have scope for starting new small scale units for the manufacture of Toughened glass to meet the growing demand.

III. Basis and Presumptions:

a) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
b) 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 onwards.
c) The salaries and wages, cost of raw materials, utilities, rents, etc. are based on the prevailing rates in and around Chennai. These cost factors are likely to vary with time and location.

d) Interest on term loan and working capital loan has been taken at the rate of 18 % on an average. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.
e) The cost of machinery and equipments refer to a particular make/model and prices are approximate.
f) The break-even point percentage indicated is of full capacity utilization.
g) The project preparation cost etc. whenever required could be considered under pre-operative expenses.

IV. Implementation Schedule:

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

S. No	Activity	Period (In Months)
1	Preparation of project report	1
2	Registration and other formalities	1
3	Sanction of loan by financial institutions	3
4	Plant and Machinery:	
	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

Notes
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.

V. Technical Aspects:

1) **Process of Manufacture:**

The glass plate is heated to a temperature above its softening point and then subjected to rapid cooling. The glass is suddenly chilled and in this process contracts towards the core. It stretches until it has solidified and is no longer able to contract further at this stage the core is still soft. It contracts against restrained exercise by the solidified upper layer of the glass. This compression is responsible for the strength of the glass sheet, which is limited to about 20,000 lb/sq.inch. Thus it is highly stressed and the resultant force is able to nullify the external impact.
The intensity of the stresses depends on the rate of cooling, co-efficient of expansion, thermal conductivity of the glass, its specific heat, elasticity, and certain other physical properties.
Toughening Process:

The raw plate glass sheet which is free from waviness, distortion etc., is cut to required size and shape and then all the edges are ground and polished as per end use of the product. This is called edge

grinding and polishing and is very important for toughening because it will lead to breakages during process. No glass sheet can be toughened without edge grinding and polishing.

Washing and Drying:

After the edge grinding and polishing the glass sheets are washed manually or by machine and then dried. The glass sheets are fed into the furnace (Electrically operated). The sheets are kept in the furnace above its softening point, which varies according to the composition of glass. After attaining required temperature the glass sheets are removed out of the furnace and placed in the air blowing quenching boxes for 20 to 25 seconds. After quenching glass sheet is toughened. For bend glass toughening, the glass sheets passes through a set of dies (as per shape) after furnace and then to the quenching boxes.

Testing:

After toughening all the sheet glasses are passed through the polariscope inspection.

2) Quality Control and Standards:

IS 2553:1971
IS 6180:1971
IS 6640:1972
IS 2553 (Part 1) : 2018

3) Production Capacity (per annum) :

Quantity: 3, 60,000 S.ft. &
Value: Rs. 4,21,20,000

4) Pollution Control:

The Government 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 Chlorofluoro Carbon (CFCs), Carbon Tetrachloride, Halons 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.

6) 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 Government 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 and 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 *Toughening Process & Washing and Drying* can be obtained by using efficient temperature controlled systems.
iv) Periodical maintenance of motors, compressors etc.

VI. Financial Aspects:

a) Fixed Capital:

(i) Land and Building :	(Rs.)
3000 sq.mtrs. @ Rs.2,000/- Per Sq. Mtr	**60,00,000**
Built up area : Work shed = 400 mtrs @ 3,500	14,00,000
workshop 100mtrs @ 4,000	4,00,000
Laboratory block 50 mtrs.@ Rs. 5,000	2,25,000
Water Tank & Boundary wall ..L.S.	3,00,000
Total	**83,25,000**

(ii) Machinery and Equipments:

Sl. No.	Description	Qty.	Price (Rs.)
1	Electric toughening furnace complete with refractory lining, heating elements, thermo-couples, recorders, operating panel board, oil circuit breaker, temperature controller etc. to heat the sheet glass at its softening point as per following specifications: Maximum kW: 185,Maximum temp. 800ºC No. of zone: 6,Maximum sheet glass size: 84" x 36" (7'x 3') Electric supply: 400/440V, 3 phase	1	50,00,000
2	Air quenching blower with motor dia 1450 mm, motor 175 HP to cool the heated glass	1	8,00,000
3	Super structure and ducting (Fabricated locally)	1	4,50,000
4	Hydraulic equipment for curved sheets	1	5,50,000
5	Blowing boxes and moulds for curved sheets	1 set	1,50,000
6	Edge working machine for edge arising with motor, starter, grinding wheel,	2 sets	2,50,000
7	water tough and V belt Vertical notching machine complete with motor starter, V belt etc., for edge working	1	1,00,000
8	Vertical grinding machine complete with motor, starter, V belt etc., for edge working	1	1,00,000
9	Vertical polishing machine with motor,starter, V belt etc.	1	90,000
10	Drilling machine for drilling holes in the sheet glass for shaping suitable drilling 1" bore with 3" x 2" cast iron table with 10"/12" drilling centre	1	1,20,000
11	Cutting machine with arm table, cutting rail and swivel cutting head for shaping	1	1,50,000

12	Drying and washing machine with blower, starter, heater conveyor, roller etc., for washing and drying the sheets	1	3,00,000
	Total		**80,60,000**
Testing equipments :			
13	Rectification machine to detect surface scratch	1	60,000
14	Polariscope inspection line with Polaroid sheet, light etc., for testing the strain/in the glass	1	65,000
15	Misc. tools	LS	50,000
***Maintenance and workshop machines**:*			
16	Lathe machine complete with accessories	1	2,00,000
17	Pillar drilling machine	1	25,000
18	Power saw machine 10"	1	25,000
19	Hand drill 25 mm size	1 set	15,000
20	Hand grinder 6" size	1	10,000
21	Tools for die making	L.S	15,000
22	Bench vice	2 sets	10,000
23	Compressor	1	50,000
24	Pumps for water supply	2	60,000
25	Misc. equipments such as trolleys, glass cutting tables etc.		85,000
26	Office equipment like typewriter, almirah, furniture, trolleys for carrying sheet glass etc.	LS	1,00,000
	Total		8,70,000
Electric Sub-station: LT panel Electricals like bus bar, distributionboard, main switch, cables etc.			15,00,000
Total			1,04,53,000
Installation and Electrification charges @ 10%			10,45300
Total Plant and Machinery			1,14,98,300
(iii) Pre operative expenses :			**1,00,000**
Total			**1,15,98,300**

. Working Capital:

i) Staff and Labour (per month): **(Rs.)**

1	Production-cum-Factory Manager	1	20000	20,000
2	Administrative officer cum-Accountant	1	15,000	15,000
3	Marketing executive	1	15,000	15,000
4	Production supervisor	1	15,000	15,000
5	Foreman	2	14,000	28,000
6	Furnace operator	1	12,000	12,000
7	Edge working operator	2	10,000	20,000
8	Glass cutter	2	10,000	24,000
9	Packing-cum-dispatch clerk	1	10,000	10,000
10	Fitters	1	12,000	12,000
11	Clerk Cum-typist	1	10,000	10,000
12	Skilled labour	2	10,000	20,000
13	Unskilled labour	2	8000	16,000
14	Peon	1	8,000	8,000
15	Security staff	2	9,000	18,000
	Perquisites @ 15% on Salaries			36,450
	Total			2,79,450

ii) Raw materials (per month):

Sheet glass 32,000 sq.ft. @ Rs.60 per sq.ft.	**19 20,000**
Packing materials LS	**9,00,000**
Total	**20,10,000**

(iii) Utilities (per month) :	**(Rs.)**
Power 50,000 kWH units @ Rs.7.00 per unit cost	3,50,000
Water L.S	10,000
Total	**3,60,000**

(iv)	**Other Contingent Expenditure (per month) :**	**(Rs.)**
1	Postage and Stationery	2,000
2	**Sales expenses**	2,000
3	Telephone Charges	2,000
4	Transport Charges	30,000
5	Insurances	15,000
6	Miscellaneous	5,000
	Total	**56,000**

(v) Working Expenditure (per month) :	
Staff and Labour	2,79,450
Raw Materials	20,10,000
Utilities	3,60,000
Other Contingent Expenditure	56,000
Total	**27,05,450**
(vi) Working Capital (for 3 Months) : 2705450 x 3 = 81,16,350	

C. Total Capital Investment:

(i) **Land and Building**	**83,25,000**
(ii) **Machinery and Equipments & preoperative expenses**	**1,15,98,300**
ii) Working Capital (for 3 months)	81,16,350
Total	**2,80,39,650**

Machinery Utilization: 75% utilization of machinery and manpower has been taken into consideration.

VII. Financial Analysis: 1375000

	Cost of Production (per year)	**Rs.**
1	Total recurring cost	3,24,65,400
	Depreciation on building @ 5%	116250
	Depreciation on Machinery and Equipment @ 10%	639830
2	Depreciation on furnace 20%	10,00,000
3	Depreciation on others & furniture @ 25%	25,000
5	Interest on Capital Investment @ 9.25 %	25,93,667
	Total	3,68,40,147

(ii) Turnover (per year):

	Rs.
For calculation purposes, it is assumed that the unit shall manufacture flat toughened glass of size 5 to 6 mm. the average prices of which has been taken at Rs.40 per sq.ft. total 3,84,000 sq.ft. (per year), after allowing rejection of 24,000 sq.ft., the saleable quantity will be 3,60,000 sq.ft., @ Rs.117/- per sq.ft.	4,21,20,000

(iii) Net Profit (per year):

Total Sales Turnover (-) Cost of production	4,21,20,000(-) 3,68,40,147	**52,79,853**

(iv) Net Profit Ratio:

Net profit × 100 Annual turnover	3,52,79,853 × 100 4,21,20,000	**12.53 %**

(v) Rate of Return :

Net profit × 100 Capital Investment	52,79,853× 100 2,80,39,650	= 18.82 **%**

(vi) Break-even Point:

Fixed Cost :

1	Total Depreciation	17,81,000
2	Interest on Total Capital Investment	25,93,667
3	40% of Salary and Wages	13,41,360
4	40% of Other Contingent expenses	19,24,800
5	100% of Insurance	1,80,000
	Total	**78,20,827**

B.E.P. :		
Fixed cost × 100 Fixed cost + Profit	**78,20,827 × 100** **1,31,00,680**	**59.69 %**

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.
d. The unit may therefore adopt these standards for global competition.
e. The margin money recommended is 25% of the working capital requirement at an average. However, the percentage of margin moneymay vary as per bank's discretion.
f. The raw materials and sales prices have been taken at the prevailing market and sales prices have been considered ex-factory

IX. Addresses of Machinery and Equipment Suppliers:

M/s. Wes make Industrial Products B-104, Mayapuri, Phase-I, New Delhi-64.	M/s. Wildbar Field (India) Ltd ,Mohur Street Building, 25-A, Dr. Annie Besant Road, Mumbai-18.
M/s. Mansfield Conveyors (P) Ltd, S-77, Baddi Indl. Estate,Delhi-42	M/s. Supertuf Industries ,3/93, DB Gupta Road, Paharganj, New Delhi.
M/s. Associated Erectors 14 A, S.N. Banerjee Road, Kolkata-700 013.	M/s. Andrew Yule and Co. Ltd. Yule House, B. Civil Row, Kolkata-700 001.
M/s. Punam Machine and Tools 10, Ganesh Chandra Avenue, Kolkata - 700 013.	M/s. Eastern Engineering Works 7, FancyLane, II Floor, 4 A, Courz in House Street, Kolkata - 700 001.

X. Addresses Raw Material Suppliers:	
M/S. Saint Gobin Glass Ltd, Sri Perumbattur, Tamilnadu	
M/s. Shree Vallabha Glass Works Vallabha Vildyanagar, Via Anand, Dist. Kaira, (Gujarat)	M/s. Hindustan Pilkington Glass Works Ltd. Assansol, (West Bengal)
M/s. Triveni Sheet Glass Works Ltd. Bhurpur, Allahabad (UP).	M/s. Indo Asahi Glass Works Ltd. Hazaribag, (Bihar)
M/s. Haryana Sheet Glass Works Ltd. 20th Mill Stone, P. S. Rai, Sonepat, (Haryana)	M/s. Saraikela Glass Works Ltd. Kandra, Singh bum, (Bihar)
M/s. Sri Jagadamba Plywoods, 33/1, BVK Iyengar Road, Bangalore-53	M/s. Dhariwal Glass,58, 2nd Floor, 21, Killari Road,Opp. T.V. Complex, Bangalore-53.
M/s. A.S. Glass and Plywoods, 8, Mysore Road, New Tharagupet, Bangalore-2	M/s. Mahaveer Glass House, 32, BVK Iyengar Road, Bangalore-53.
M/s. Rachana Enterprises, 69/1, 2nd Main, 8th Block, Jayanagar, Bangalore-82.	M/s. Deepak Enterprises, 39B, Mamulpet, Bangalore-53