Tumbler Locks

PRODUCT CODE	:	343301008
QUALITY AND STANDARDS	:	IS 4230:1967
PRODUCTION CAPACITY	:	Qty. : 1.20 Lakh Nos. (per annum) Value : Rs. 41.1 Lakhs
MONTH AND YEAR OF PREPARATION	:	April, 2003
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Introduction

As is revealed from the name itself, Tumbler Locks are used for locking of doors, shutters of houses/shops. Tumbler locks are a kind of pad locks. The body of the tumbler lock is pressure die casted from Aluminium or Zinc alloy. The tumbler locks are available in different shapes and sizes, among them the most common are 20, 25, 30, 35 and 46 mm. These locks are opened with the help of a key made from either brass, mild steel or die casted non ferrous metal, To operate the lock, the key is inserted in the key hole provided at the bottom of the lock, opposite side to shackle. These locks are used to lock windows, Almirah, trunks etc.

The alloy used to manufacture such locks is known as "Mazak" Alloy. Mazak alloy is an alloy having Zinc as the base material. The composition of other elements in Mazak alloy used for this purpose is as follows:

Aluminium : 4%

Copper : 2.7%

Magnesium : 0.1 to 0.3%

The alloy having the above composition is hard and strong and can be easily die-casted. Pressure die-casting has been widely used to produce sound and strong castings of accurate dimensions as they need no final machining to size. The surface is smooth and good.

Market Potential

Since Lock is an essential household item, its demand is ever increasing.

Tumbler lock being a stout lock is considered to be a good quality lock.

Basis and Presumptions

It is considered that the unit is run 300 days in a year with 8 hours per day. The rates for raw material, labour, machinery etc. have been taken as prevailing at the time of preparation of project scheme. Margin money requirement, terms of loan, interest rates may vary from time to time and institution to institution providing finance, which may be verified. In this project profile, the rate of interest has been considered as 16% per annum.

Implementation Schedule

It is estimated that it may take 4-5 months from conception to commercial production including preparation of project report, finalization of loan from financial institutions, procurement of machinery, erection and commissioning, recruitment of staff and labour, registration and clearance from authorities.

Technical Aspects

Process of Manufacture

Tumbler lock consists of the following main components: (a) body (b) cylinder (c) levers and its mechanisms (d) shackle and (e) Tumbler key.

(a) *Body:* Housing of lock mechanism, which contains all the parts except key and shackle is known as body of the tumbler lock. However, one end of the shackle is also fitted in the body. The body of the lock is pressure die casted from Aluminium or Zinc alloy called Mazak Alloy. After pressure die casting, the burrs and sharp edges are removed and polished. Body can also be painted or plated depending upon the requirement.

(b) *Cylinder:* Cylinder is also pressure die casted part from Aluminium or Zinc Alloy. It is the housing for lever tumbler mechanism. It is fitted inside the body of lock during assembly.

(c) *Lever and Lever Mechanism:* Levers are mostly press cut from brass or mild steel sheets. These levers along with springs are fitted inside the cylinder which rotates inside the body to keep open or close the lock with the help of key.

(d) *Shackle:* It is that part of the lock which passes through the staple loop on the door and is engaged to lock bolt when pushed inside the lock and key is turned lock. Shackle are made from mild steel rods, cut to size, notched and bent to the shape. These are generally nickel plated.

(e) *Key:* The key is an important member of lock and key arrangement. It is made of brass or mild steel. It is flat, has long bit or blade with V groves made on one or both edges according to the lever mechanism.

All these components are manufactured in various sizes and shapes of the lock. Manufactured components are then assembled and movement of lever cylinder, shackle fixed in position with the help of a pin. The tumbler locks are painted or nickel plated before packing for despatch.

Quality Control and Standards

Tumbler locks are to be manufactured as per IS 4230 :1967.

Since the locks are directly related to the safety of house–hold the manufacturer must ensure the following in addition to IS specification:

(a) All the components must be in accordance with the dimensional accuracy. Manufacturing defects in no case be allowed. The raw material must conform to the specifications.

(b) Strength of cylinder and shackle must be ensured and it should not lead to failure/break on jerks.

(c) The components, particularly levers and keys should be non-interchangeable.

(d) Smooth function of the lock must be ensured.

Production Capacity (per annum)

Item	Qty.	Total (In Rs.)
Tumbler Lock Size 20 and 25 mm	48,000 Nos.	12,00,000
Tumbler Lock Size 30 and 35 mm	60,000 Nos.	22,50,000
Tumbler Lock Size 40 mm	12,000 Nos.	6,60,000
Total	1,20,000 Nos.	41,10,000

Motive Power 10 KW.

Pollution Control

No special arrangements are suggested for pollution control. However, proper disposal of electroplating waste must be ensured.

Energy Conservation

No special energy conservation measures are to be taken. However, energy efficient machines have been suggested.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building	(In Rs.)
Covered Area 300 sq.mtr. @ Rs. 5,000 p.m.	5,000

(ii) Machinery and Equipment

Sl. No.	Description	Ind./ Imp.	Qty.	Toal (In Rs.)
Production Unit				
1.	Hand operated Hot chamber Pneumatic pressure die casting Machine upto 400 gm.capacity with double Toggle Adjustable all steel made ejector and high speed diesel burner and electricals etc.	Ind.	5	4,25,000
2.	Power Press 10MT capacity with 1HP motor and electricals	Ind.	2	1,30,000
3.	Air compressors 150 to 200 lbs Sq. inch capacity with 1 HP motor suitable for Pressure die casting machine above at S.No. (1).	Ind.	5	75,000
4.	Bench Drilling machine 10 mm drill dia capacity with 1/2 HP motor and electricals.	Ind.	2	25,000
5.	Bench Grinder 200 mm dia wheel and 3/4 HP motor	Ind.	1	5,500
6.	Lathe 1500 mm bed with 2 HP motor and electricals floor model	Ind.	1	75,000
7.	Electroplating plant/painting equipments	Ind.	L.s.	1,00,000
		Total		8,35,500
	Erection and Commissioning @ 10% of the cost of the machinery			83,550

Cost of Dies, Tools and Measuring instruments	1,00,000
Cost of Office equipment and furniture	50,000
Total	10,6950
(iii) Pre-operative Expenses	50,000
Total Fixed Capital (i+ii+iii)	11,19,050
Say	11,20,000

B. Working Capital (per month)

(i) Personnel

Sl. No.	Particulars	Nos.	Salary (Rs.)	Amount (In Rs.)
1.	Foreman	1	4000	4,000
2.	Skilled workers	5	2500	12,500
3.	Semi-skilled workers	8	2000	16,000
4.	Clerk-cum-Typist	1	2500	2,500
5.	Watchman/Peon	1	2000	2,000
	Total			37,000
	Add: Perquisites @ 15%			5,500
	Total			42,500

(ii) Raw Material

Sl. No.	Particulars	Ind./ Imp.	Qty.	Rate (Rs.)	Amount (In Rs.)
1.	Mazak Alloy	Ind.	1.50MT	70000 per MT	1,05,000
2.	Springs	Ind.	100Kg	25/ Kg.	2,500
3.	MS Sheet 24 SWG	Ind.	500 Kg	20/Kg.	10,000
4.	Misc. items such as electroplating salt, paint, oil, diesel etc.	Ind.	LS	-	75,000
	Total				1,92,500

(iii) Utilities	(In Rs.)
Power 2000 kWH units @ Rs. 4/unit	8,000
Water	500
Total	8,500

(iv) Other Contingent Expenses	(In Rs.)
(1) Rent	5,000
(2) Postage and Stationery	1,000
(3) Transportation	3,000

(iv) Other Contingent Expenses	(In Rs.)
(4) Telephone	1,000
(5) Maintenance and Repair	500
(6) Packing	2,500
(7) Insurance	500
(8) Misc. Expenses	1,500
Total	15,000

(v) Total Recurring Expenditure (per month)
(i + ii + iii + iv) Rs. 2,58,500

(vi) Working Capital for 1½ months
2,58,500 x 1½ = Rs. 3,87,750

Say Rs. 3,88,000

C. Total Capital Investment

(i) Fixed Capital	Rs. 11,20,000
(ii) Working Capital for 1½ months	Rs. 3,88,000
Total	Rs. 15,08,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)	(In Rs.)
Total recurring cost	31,04,000
Depreciation on Machinery @ 10%	83,550
Depreciation on Dies and Tools @25%	25,000
Depreciation on Furnitures @ 20%	10,000
Interest on Capital Investment @ 16%	2,40,000
Total	34,62,550
Say	34,62,000

(2) Turnover (per year)

Item	Qty. Nos.	Rate (Rs.)	Total (In Rs.)
Tumbler Lock Size 20 and 25 mm	48,000	25	1200,000
Tumbler Lock Size 30 and 35 mm	60,000	37.50	22,50,000
Tumbler Lock Size 40 mm	12,000	55	6,60,000
Total			41,10,000

(3) Profit (per year)

Rs. 41,10,000 – 34,62,000 = Rs. 6,48,000

(4) Percentage Profit on Sales (Net Profit Ratio)

$$= \frac{\text{Net Profit (per year)} \times 100}{\text{Turnover}}$$

$$= \frac{648000 \times 100}{3462000}$$

$$= 18.72\%$$

(5) Rate of Return

$$= \frac{\text{Net Profit} \times 100}{\text{Capital Investment}}$$

$$= \frac{648000 \times 100}{1508000}$$

$$= 43.0\%$$

(6) Break-even Point

(i) Fixed Cost	(In Rs.)
Total Depreciation	1,18,550.00
Interest on investment	2,40,000.00
Insurance	6,000.00
Rent	60,000.00
40% of Salary and Wages	2,04,000.00
40% of Other Contingent Expenses *(excluding Rent and Insurance)*	86,400.00
Total	7,14,950.00

(ii) Profit Rs. 6,48,000.00

B.E.P.

$$= \frac{\text{Fixed Capital} \times 100}{\text{Fixed Capital + Profit}}$$

$$= \frac{7,14,950 \times 100}{714950 + 648000}$$

$$= 52.5\%$$

Addresses of Raw Material Suppliers

1. M/s. Basant Industries Corpn.
   Industrial Area 'B',
   Ludhiana
2. M/s. Hind Engg. Works,
   Opp. D.S. College,
   Aligarh
3. M/s. Singhal Engg. Works
   Subhash Road,
   Aligarh
4. M/s. Daulat Industries Corporation
   Civil Lines,
   Ludhiana
5. M/s. Bhag Sons,
   Indl. Area 'B',
   Ludhiana
6. M/s. Kalsi Machinery Mfg. Pvt. Ltd.
   G. T. Road,
   Ludhiana
7. M/s. P. K. Engg. Works
   Opp. D.S. College,
   Aligarh
8. M/s. Prakash Engg. Works
   Agra Road,
   Aligarh
9. M/s. James Engg. Works
   31, Thembur Chetty Street,
   Chennai
10. M/s. Atlas Engg. Works
    G.T. Road,
    Batala
11. M/s. Perfect Machine Tools Co.
    123-Mount Road,
    Chennai
12. M/s. Hindustan Metal and Engg.Co.
    B–10, End. Carpenter Street,
    Mumbai
13. M/s. Komal Industries Corporation
    51-Biggan Street,
    Mumbai
14. M/s. Non-Ferrous Metal Corpn.
    174, Sardar Vallabh Bhai Patel
    Road, Mumbai
15. M/s. Bombay Metal Syndicate,
    106-Kila Street,
    Mumbai-4
16. M/s. Essential Machine Tools Pvt.
    Ltd.
    5-Nyaymurthi,
    G.N. Vaidya Marg,
    Bank Street,
    P.O. Box No. 2,
    Behind State Bank, Fort,
    Mumbai - 400001.