

PROJECT PROFILE ON MACHINE VICE

PREPARED BY: BRANCH M.S.M.E-D.I, BHIWANI

(Action Plan 2010-11)

MACHINE VICES

Introduction:

Vices are used as holding device on machines like lathes, milling machine, drilling machine etc. and also by tool makers for holding jobs. Designwise three types of vices are very common in use namely plain vice, swivel vice and tool makers vice which is commonly known as bench vice.

A. Plain Vices

Plain vices bolted directly on the Milling machine table, is the most common type of machine vice used for milling operations. The vice may be fastened to the table with the jaws set either parallel or at right angles to the table T-slots. Work piece is clamped between the fixed and movable jaws.

B. Swivel Vice

The swivel vice is used to mill an angular surface in relation to a straight surface without moving the work piece from the vice. In construction it may be considered as plain vice which is mounted on a particular base graduated in degrees. The base is clamped on the table with the help of T.bolts.

C. Universal Vice

The universal vice can be swivelled in a horizontal plane like swivel vice and can also be tilted in any vertical position for angular cuts. The vice not being rigid in construction is mainly used in tool room work and hence is called as tool makers universal vice.

Market Potential:

The plain swivel vices are commonly used for all machining work on milling machine and also for drilling holes on jobs on drilling machines. These milling machines are essential in any workshops where the milling and drilling machines are installed. The number of work shops where milling and drilling machines are used are increasing due to rapid developments in industrial sectors. All the machine tool manufacturers get the vices made in small scale industries as a sub contracting work as standard equipments. Small Scale Industries also purchase the vices in the open market through dealers. With wide usage of milling and drilling machines the market for machine vices is increasing day by day. This shows that there is a good market for this item due to its usefulness.

Basis and Presumptions:

- (i) The efficiency of the unit is considered 75% i.e. six hours working per shift of eight hours with 25 working days per month and 300 working days per year for full capacity utilization
- (ii) The unit is envisaged to achieve 75% capacity in 1st year, 80% in 2nd year, 90% in 3rd year and 100% in the 4th year of production
- (iii) Labour wages are taken as per those prevailing under the Minimum Wages Act.
- (iv) Interest rate for capital is taken @ 16% per annum.
- (v) Margin Money Depends on the norms of financing institute
- (vi) Pay back period of the project is considered to be six years.

Implementation Schedule:

S.No.	ACTIVITY	PERIOD
1.	Preparation of project report	30 days
2.	Selection of site	30 days
3.	Registration of SSI	1 week
4.	Availability of finance/loan	90 days
5.	Procurement, erection, commissioning and Trial run of machinery.	30 days
6.	Recruitment of labour	2 months

Some of the activities can be taken simultaneously.

Technical Aspects

Process of Manufacture:

The main raw material required will be casting (body) and EN. 8 rods for screws and carbon steel plates for jaws etc.

Plain Vice:

It consists of the following items:

- (a) Base,
- (b) Fixed jaws
- (c) Jaw plates
- (d) Movable jaws
- (e) Screw and nut
- (f) Guides
- (g) Grid
- (h) Handle

The base with a fixed jaw forms one piece of casting and it is milled on milling machine. Firstly the base is milled as a reference and then all other portions are machined with reference to base after milling operation it goes for scraping.

Jaw plates are machined drilled and tapped in-group to the required size. Movable jaw is also milled first on vertical milling machine and its sides are drilled and tapped for fixing jibs.

The nuts and bolts are machined on lathe as per design specifications and inspected for their interchangeability. The guides are integral parts of base machine scraped (for dove tail). The jibs are machined, drilled, tapped and ground to suit the dovetail. The components manufactured are inspected and sent or assembly.

The process flow is as under:

Milling

Drilling

Tapping

Grinding/ Machining (screws and nuts)

Milling square on shanks

Inspection

Assembly

Swivel Vice:

Following parts are required for assembly of swivel vice

- (a) Circular base
- (b) Fixed jaw
- (c) Movable jaw
- (d) Jaw plates
- (e) Screw and nuts
- (f) Guides
- (g) Jibs

The Circular base is made up of cast iron (special grade grey cast iron) & machined on milling machine. Firstly the base is machined and then all other parts are machined with reference to base. Secondly the circular T-slots are made for housing main body of vice over it. After these operations it is machined in degrees.

The body consisting of fixed jaws and guides is made of cast iron (special grade grey cast iron). This will be machined on all the required surfaces and then sent for scrapping / grinding. The movable jaw is machined; sides are drilled, tapped and screened to suit the jibs. The screws and nuts are machined on lathe and square shank on screw is machined on milling machine. As stated earlier the jibs which is integral part of body is also machined and scrapped.

The process flow is as under:

Milling – Scrapping – Milling – Tapping – Grinding – Machining – Milling Shank I Inspection – Assembly.

Quality Control and Standards:

Indian standards institution have formulated the specifications oh machine vices (machine tool) and its No. IS: 4502-1968. This specification covers interchangeability, dimensions, general requirement and permissible errors of punch and pulls type vices with fixed or swivel base.

Production Capacity:

There are three sizes of vices commonly used and they are 125mm, 160mm & 200mm both plane and swivel types. The market rates for these vices are as under:

S.NO	SIZE	QUANTITY	
		SWIVEL	PLAIN
1.	125mm.	20	20
2.	160mm.	30	30
3.	200mm.	30	30

The details of production & sales are as under :

(a) 125mm plain 20 nos.	@Rs. 3500 per pc.	Rs. 70000
(b) 160mm plain 30 nos.	@ Rs. 4500 per pc.	Rs. 135000
(c) 200mm plain 30 nos.	@ Rs.6000 per pc.	RS. 180000
(d) 125mm swivel 20 nos.	@ Rs. 4000per pc.	Rs. 80000
(e) 160mm swivel 30 nos.	@ Rs.5500per pc.	Rs. 165000
(f) 200mm swivel 30 nos.	@ Rs. 7000per pc	Rs. 210000
Total		Rs.840000

Pollution Control:

Not required

Energy Conservation:

All measures to save power and use of energy efficient equipments are suggested.

Financial Aspects:

Fixed Capital:

1. Land and Building (Built up area-800 Sq. mtrs. Open area-500Sq,mtrs)	Rs.50,00,000
2. Machinery and Equipments:	
A) .Lathe (40 mm spindle,6 ft bed)complete	Rs.325000
B) .Vertical Milling Machine (With Standard Accessories)	Rs.650000
C) .Surface Grinder (1000mmx240mm)	Rs. 140000
D) .Universal Tool Cutter Grinder	Rs. 350000
E) .Column drilling m/c (50 mm capacity)	Rs. 250000
F) .Universal Band saw	Rs. 80000
G) .Double ended Pedestal Grinder (6 in)	Rs. 40000
H) .Measuring Instruments	Rs. 50000
I) .Jigs and Fixtures	Rs. 80000
J) .Office Equipments	Rs. 75000
TOTAL	Rs. 2040000
Installation & Erection @10%	Rs. 204000
TOTAL	Rs.2244000

Working Capital:

1. Personnel	SALARIES
A. Manager	Rs.15000
B. Accountant	Rs.7000
C. Steno/Typist	Rs.5000
D. Technical supervisors	Rs.7000
E. Inspector	Rs. 5000
F. Skilled Worker (4Nos @4000)	Rs.16000
G. Semiskilled Worker (4 nos@3000)	Rs.12000
TOTAL	Rs.67000
Perquisites @15%	Rs.10050
TOTAL	Rs.77050

Raw Materials:

1. C.I. Castings 4T @Rs.40/Kg.)	Rs. 160000
---------------------------------	------------

2. EN-8 Rods37mmDia (1.00MT@Rs.125/Kg)	Rs.125000
3. T Nuts, Bolts & Screws	Rs.25000
4. Carbon Steel Plates	Rs.40000

Utilities:

Electricity consumption	Rs.40000
-------------------------	----------

Other Contingent Expenses (per month):

1. Postage & Stationary	Rs.2000
2. Telephone	Rs.1000
3. Consumable Stores	Rs.5000
4. Transport	Rs.10000
5. Insurance	Rs.6000
6. Misc. Expenses	Rs.10000

Total **Rs.34000**

Total Recurring Expenses: Rs.501050

Total Working Capital (3 months) Rs.1503150

Total Capital Investment:

Fixed Capital	Rs.7244000
Working Capital (3 months)	Rs.1503150
Total	Rs.8747150

Financial Analysis:

Cost of Production (per year)

1. Total Recurring Expenditure	Rs.6012600
2. Depreciation on Building @ 5%	Rs. 250000
3. Depreciation on machinery @10%	Rs. 204000
4. Depreciation on tools @25%	Rs. 20000
5. Depreciation on Office Equipment 20%	Rs. 12000
6. Interest on Fixed Capital @16%	Rs.1159040
7. Interest on Working Capital@16%	Rs. 240504

Total Rs.7898144

Net Profit (per year):

Turn Over –Cost of Production (=10080000-7898144) Rs.2181856

Net Profit Ratio:

$$\begin{aligned} &= \frac{\text{Net Profit} \times 100}{\text{Turn Over(per year)}} = \frac{2181856 \times 100}{10080000} \\ &= 21.6\% \end{aligned}$$

Rate of Return:

$$\begin{aligned} &= \frac{\text{Net Profit} \times 100}{\text{Total Investment}} = \frac{1460344 \times 100}{8747150} \\ &= 24.5\% \end{aligned}$$

Break- Even Point:

Fixed Cost:

1. Depreciation	Rs. 486000
2. Interest on Total Investment	Rs. 1399544
3. Insurance	Rs. 72000
4. 40% of salaries	Rs. 369840
5. 40% of other contingent expenses	Rs. 134400
Total	Rs.2461784

B.E.P

$$\begin{aligned} &= \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Profit}} = \frac{2461784 \times 100}{2461784 + 2181856} \\ &= \frac{2461784}{4643640} \times 100 = 53\% \end{aligned}$$

Addresses of Machinery Suppliers:

1. M/s.Sant Machine Tools Corporation
2nd Street, Kalsi Nagar
G.t.Road, Ludhiana.
2. M/s.Basant Mechanical Works
720-722,Industrial Area-B
Ludhiana.
- 3 .M/s Birdi Mechanical Works
G.T.Road,Miller Ganj
Ludhiana
4. M/s Katbro Machine Tools
G.T.Road,Miller Ganj
Ludhiana
5. M/s Sargodha Machinery Corporation
Near Manju Cinema,G.T.Road
Ludhiana
6. M/s Pal Mechanical Works
Street No 2,Partap Nagar
Ludhiana

Raw Material Suppliers:

Raw material required in the manufacturing is available in all industrial towns of the country.