M.S. And High Tensile Nuts And Bolts

PRODUCT CODE	:	343201011
QUALITY AND STANDARDS	:	IS 1363:1992 IS 1367:1994 IS 2389:1968 IS 4206:1987
PRODUCTION CAPACITY	:	Qty. : 360 M.T. (Per annum) Value : Rs. 115.5 Lakhs
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Introduction

An industrial fastener comprises a very wide range of items like nuts and bolts, washers, studs, nails etc. Nuts and bolts consist a major link in the family of industrial fasteners and are used by every industry. Bolt is a piece of metal rod, whose one end is upsettled and other end is threaded. Nut is the item which rolls on these threads. Nut and bolts are available in various shapes, designs and sizes.

Nuts and bolts are used for fastening purpose in industries where the replacement of pieces and the parts is necessary. There are many industries producing these nuts and bolts of various sizes, but the demand too is increasing as well as the raw material for the products is easily and indigenously available. The main raw material is mild steel wire coil/rod of required diameter. The composition of materials controls the quality of the bolts and nuts. The recommended composition for nuts and bolts raw material is given as under:

Carbon	0.22 to 0.23%
Phosphorus	0.40%
Manganese	0.39 to 0.60%
Sulphur	0.50%

Nuts and bolts are classified by two ways: i) Their uses, ii) Shape of head.

In terms of use, nuts and bolts are of several types:

Larger dia bolts, machine bolts, stand bolts, joint bolts, foundation bolts and nuts etc. in terms of shape, bolt and nuts are classified by head shape like hexagonal head, square head, round head, pan head, truss head etc.

Market Potential

The demand of nuts and bolts is influenced by the following factors:

a) Transportation industries, Railways, aircraft, wagon, bicycles, automobile, body builders, etc.

b) Electrical industries like manufacturing of transformer, electric motors, fans etc.

c) Building activities such as construction of bridges, fabrication of various steel structure etc.

d) Other heavy and light industries, steel and wooden furnitures, machine tools, agricultural machines and agricultural implements etc.

As various type of MS and HT nuts and bolts are used in above sectors, the market demand is directly proportionate to the development of these industrial segments.

Basis and Presumptions

1. Capacity Utilisation : 75% on single shift basis
2. Time period of 1 year : 300 days
3. Labour wages : Estimated on the minimum wages
4. Rate of interest : 16%
5. Margin money 25% varying from state to state
6. Operation period of project : 10 Years
7. Rental charges for land and building : 8,000 per month
8. Cost of machinery and equipment is approximate to that prevailing in the market.

Implementation Schedule

Sl.No.	Activity	Period In Weeks
1.	Selection of site	2
2.	Preparation of project report	4
3.	Provisional Registration	1
4.	Financial arrangement	8
5.	Procurement of machinery	8
6.	Installation, electrification and commissioning of machinery	6
7.	Selection and placement of staff	2
8.	Procurement of raw materials, tools etc.	2
	Total	33 weeks

Technical Aspects

Process of Manufacture

The raw material used for manufacture of bolt is M.S. Rounds. As some of the rounds available are rusty and not perfectly round and straight, it is necessary to make them round. The rounds are pickled in the acid tanks, washed and drawn in a drawing machine. The cleaned rod is fed into the cold heading machine. In the machine, one end of the rod is cut into the desired length with cutting stroke and simultaneously the head formation takes at other end. For the HT bolts, forging is done on hot forging press. The pins are then trimmed in the trimming machine. In quality bolts, the lower side of the head is also faced. Threading is done in the thread rolling machines.

While manufacturing nuts, the hexagonal rod of desired size is procured and the nuts are cut on the automatic nut-cutting machine. Cutted nuts blanks are drilled and tapped on the nut-tapping machine. Finally, these are deburred in the polishing barrel.

Process Flow Chart (M.S. Bolts)

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Mild steel rod

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Bolt cutting

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Head making

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Head trimming

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Thread rolling

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Polishing

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Store/despatch

Process Flow Chart (H.T. Bolts)

Mild steel rod

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Wire drawing

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Bolt cutting

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Forging

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Trimming

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Threading

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Heat treatment (800°C - 900°C)

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Tempering (400°C - 500°C)

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Plating/Coating

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Store/despatch

Quality Control and Standards

The Bureau of Indian Standards has laid down the following quality standards for M.S. and High tensile fasteners such as Bolts and Nuts:

IS 1363 : 1992

IS 1367 : 1994

IS 4206 : 1987

Production Capacity

Quantity	Value (In Rs.)
Nuts and Bolts of various sizes- 360 MT	1,15,50,000

Motive Power 85 HP.

Pollution Control

This industry involves pollution to some extent for which State Pollution Control Board has to be approached.

Energy Conservation

The unit is equipped with electric powered machinery. The energy conservation efforts need in unit is the creation of awareness among the workers.

Financial Aspects

A. Fixed Capital

(i) Land and Building	(Rs.)
Covered area 1600 sq. mtr.	8,000

(ii) Machinery and Equipment (per month)

Sl. No.	Description	Qty.	Total (In Rs.)
1.	Double stroke solid die cold head forging machine suitable for bolt dia 6 mm to 18 mm and length 20 mm to 150 mm with 15 HP electric motor	1No.	7,00,000
2.	Head trimming machine upto 18 mm dia bolt x 150 mm	1No.	4,70,000

Sl. No.	Description	Qty.	Total (In Rs.)
	length with 10 HP electric motor		
3.	Thread rolling machine suitable for upto 18 mm dia bolt x length 150 mm with 15 HP electric motor	1 No.	4,20,000
4.	Bull block wire drawing machine	1 No.	1,00,000
5.	Wire pointing machine with 1 HP motor	1 No.	15,000
6.	Steel polishing barrel with electric motor	1 No.	45,000
	Nut Making Section		
7.	Automatic nut forming plant, five station capacity 18 mm dia with 25 HP motor, lubricant and coolant pump	4 Nos.	12,50,000
8.	Nut tapping machine with 3 HP motor and stater	4 Nos.	2,20,000
9.	Semi muffle oil fired furnace	1 No.	1,55,000
10.	Tempering furnace H.T. air circulated type electrically heated temp. upto 500°C 3 KW rating	1 No.	75,000
11.	Die, tools guage and measuring instruments	L.S.	1,50,000
	Electrification and installation @ 10%		3,45,000
	Office equipment and furnitures		25,000
		Total	39,70,000

B. Working Capital (per month)

(i) Personnel

Sl. No.	Designation	No.	Salary (Rs.)	Total (In Rs.)
1.	Manager	1	6,000	6,000
2.	Office Assistant/clerk	1	3,200	3,200
3.	Skilled worker	6	3,200	19,200
4.	Semi-skilled Worker	2	2,500	5,000
5.	Un-skilled Worker	3	2,000	6,000
6.	Watchman-cum-Peon	1	2,000	2,000
		Total		41,400
	Perquisites @ 10%			4,140
		Total		45,540

(ii) Raw Material (Indigenous)

Sl. No.	Particulars	Qty.	Amount (In Rs.)
1.	M.S. Wire/rod 6mm - 18mm dia @ Rs.18,000/ MT	19.25 MT	3,46,500
2.	Hexagonal M.S. rod 6mm - 18mm dia @ Rs. 18,500 per MT	10.75 MT	1,98,875
3.	Packing/Polishing materials and consumables	L.S.	5,000
		Total	5,50,375
		Say	5,50,380

(iii) Utilities	(In Rs.)
i) Electricity and Water	19,200
ii) Furnace oil, 6,000 ltrs. @Rs. 13.50 per ltr.	81,000
iii) Lubricant oil etc.	1,650
Total	1,01,850

(iv) Other Contingent Expenses	(In Rs.)
1. Rent	8,000
2. Maintenance and repair	1,500
3. Postage, stationery and phone	2,500
4. Packing and transport	3,000
5. Travelling and conveyance	1,500
6. Insurance	500
7. Miscellaneous expenses	1,000
Total	18,000

(v) Total Recurring Expenditure
(i + ii + iii + iv)

= Rs. 45,540 + 5,50,380 + 1,01,850 + 18,000
= Rs. 7,15,770

(vi) Total Working Capital for 3 months Rs. 21,47,310

C. Total Capital Investment

(i) Fixed Capital	Rs. 39,70,000
(ii) Working Capital (for 3 months)	Rs. 21,47,310
Total	Rs. 61,17,310

Financial Analysis

(1) Cost of Production (per annum)	(In Rs.)
Total recurring cost	85,89,240
Depreciation on machines and equipments @ 10%	3,79,500
Depreciation on office and equipment @ 20%	5,000
Interest on total Capital Investment @ 16%	9,78,760
Total	99,52,500

(2) Total Sales (per annum)		(In Rs.)
(i) By sale of MS bolts @ Rs. 30 per kg.	120 MT	36,00,000
(ii) By sale of MS nuts @ Rs. 30 per kg.	60 MT	18,00,000
(iii) By sale of HT bolts @ Rs. 32 per kg.	115 MT	36,80,000
(iv) By sale of HT nuts @ Rs. 38 per kg.	65 MT	24,70,000
Total		1,15,50,000

(3) Profit (per year) Rs. 1,15,50,000 - 99,52,500
= Rs. 15,97,500

(4) Net Profit Ratio on Sale

$$= \frac{\text{Net profit} \times 100}{\text{Turnover}}$$

$$= \frac{15,97,500 \times 100}{1,15,50,000}$$

$$= 14\%$$

(5) Rate of Return

$$= \frac{\text{Net profit} \times 100}{\text{Total investment}}$$

$$= \frac{15,97,500 \times 100}{61,17,310}$$

$$= 26\%$$

(6) Break-even Point

Fixed Cost (per annum)		(In Rs.)
1.	Rent	96,000
2.	Depreciation on machinery and equipment	3,79,500
3.	Depreciation on office equipment	5,000
4.	Interest on total investment	9,78,760
5.	40% of salary and wages	2,18,590
6.	40% of other contingent expenses	86,400
	Total	17,64,250

B.E.P. $= \frac{17,64,250 \times 100}{17,64,250 + 15,97,500}$

$= 52\%$

Addresses of Machinery and Equipment Suppliers

1. M/s. Sohal Engineering Corporation
   61, Ganesh Chandra Avenue,
   Kolkata - 700013
2. M/s. Perfect Machine Tools Co. Pvt. Ltd.
   Bell Building,
   Sir P.M. Road,
   Fort, Mumbai
3. M/s. Manek Lal and Sons.
   23, Ganesh Chandra Avenue,
   Kolkata - 700 013
4. M/s. Industrial Machine Corporation
   F-36-C, Sainik Market,
   Main Road, Ranchi
5. M/s. S.S. Sabarwal and Sons
   664, Military Road,
   Anand Parbat Indl. Area,
   New Delhi-110005
6. M/s. Kalihar Machine Tools
   Plot No. 18696/1,
   K.M. Singh St. No. 7,
   Ludhiana
7. M/s. H. Mann Industries
   Ram Tirath Road,
   Amritsar - 143 001

Addresses of Raw Material Suppliers

1. M/s. Usha Martin Industries
   Tatisilwai,
   Ranchi
2. M/s. M. V. Wires Pvt. Ltd.
   Poddar Estate,
   Mahilong,
   Ranchi,
3. Local Market.