

**PROJECT PROFILE**  
**ON**  
**FORGING BLANKS FOR SPUR GEAR**

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|                       |   |   |
|-----------------------|---|---|
| Name of the Project   | : | Forging blanks for Spur Gear  |
| Capacity              | : | 300 MT/Anum   |
| Quality specification | : | As per market demand  |
| Year of Preparation   | : | 2012-13   |
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## 1. INTRODUCTION :

Forging blank for Spur gear are made of low carbon Alloy Steel. These blanks are used to make gear for any auto engine or gear boxes. These forging blanks are intermediary stage of auto gear, Sufficient machining tolerances are added in the dimension of the forging blanks of auto shafts.

## 2. MARKET :

The forging blanks are considered in the group of engineering items and can be widely used in automobile group of industries in our country. There are many such Clusters where auto parts are produced in India. The important automobile industries in India are: TELCO, Hind Motors HMT, Bangalore, Tractors Industries, Hind motor, Maruti Udyog, Defense vehicle industry etc. are widely using forging blanks of Gears for their product.

## 3. BASIS AND PRESUMPTION :

This project has been prepared on the basis of the following presumptions :

1. Working hour per day : 8 Hrs. per shift and 300 working days per year.
2. Time period for achieving full capacity utilization : 3 Yrs.
3. Labour wages : As per local market value or otherwise as per minimum wages act.
4. Margin money : 20% of the total investment.
5. Land cost & construction of sheds : Leased from IADA or on rent.
6. Cost of machines & equipments : Based on indigenous market price.
7. Grant from Central Governments : Based on govt. policy and schemes launched by the govt.

#### 4. IMPLEMENTATION SCHEDULE :

| SN | Activities                                | Period      |
|----|---|-------------|
| 1  | Calling quotations                        | 1 Month     |
| 2  | Preparation of DPR                        | 2 weeks     |
| 3  | provisional Regn. As SSI                  | 1 week      |
| 4  | Financial arrangement                     | 1 month     |
| 5  | Procurement of machine and equipment      | - 1 ½ Month |
| 6  | Erection, installment and electrification | 1.5 Month   |
| 7  | NOC from PCB                              | 1 week      |
| 8  | Recruitment of staff                      | 1 month     |
| 9  | Trial run                                 | 1 week      |
| 10 | Commercial production                     | 10 days     |
|    |   |             |

#### 5. TECHNICAL ASPECTS :

Forging Blank of Spur gear are made of low carbon alloy steel squares/Billets Bars or Squares are cut into size forged by hand forging technique or by Machine forging using open die or closed die depending upon demand or size of order. This forging blank can be produced using closed die with press forging Machine. It gives the product to a closer tolerance in form of forging Blanks.

#### 6. QUALITY SPECIFICATIONS :

The Material specification of the forging blanks are of different specifications depending upon its use or demand of mechanical properties need to be imparted in the shaft like wear resistant, toughness, tensile strength etc. the quality of the product can be controlled at three stage:

1. Selection of suitable material specification.

2. Dies used should be of closed dimensional tolerance Machining & Milling operations.
3. Controlled forging operations.

#### 7. PRODUCTION CAPACITY :

Quantity- 72000 pieces forging blanks per annum

( Average weight 1.0 Kg) Value- @ Rs.95x 72000 =Rs. 6840000/-

#### 8. POLLUTION CONTROL :

Forging industry has a share in the present environmental degradation. So it requires NOC from Pollution Control Board of the State. Heat treatment Industry depending on the character of the production is a great source of heat, toxic gases, dust and noise. It also produces a large quantity of wastes such as irreclaimable ashes and scales. It also produces a large quantity of wastes such as irreclaimable ashes and scales. These all elements have individual contributory affect on the environmental degradation and causes unhealthy and unsafe, conditions within the unit. The important consideration to prevent pollution is the right choice of appropriate technologies to be adopted and correct installation of instruments and machinery.

There are mainly two methods for control of pollution in a small Industrial units :

1. By Exploiting Metrological and Topographical Conditions :

For small unit, the exploitation of natural draughts and climate conditions are best cheapest methods for dispersion of chimney emissions. Use of equipment like gas scrubbers, ventilation fans, washers etc require considerable capital investment and also in value running expenses.

2. By using various equipments for cleaning and dispersion of gorging emissions :

Use of high stack chimney and operating the unit at a time of favorable natural draught through chimney, helps to successfully disperse the dust and gases emitted from the unit at zero or negligible cost. Proper treatment and handling of the raw material also reduces the emission contents, particularly dust. Use of simple measures like removal of dust from the furnace charge, use of oil of proper strength with appropriate air blast will also help to a great extent.

## 10. ENERGY CONSERVATION :

It has become essential these days that the energy conservation efforts are needed to be strengthened substantially. The energy audit is an integral part of an energy conservation project and is the key to a systematic approach for decision. Various factors which affect fuel economy in industrial furnaces may be stated as :

1. Complete combustion with minimum excess air;
2. Proper heat distribution;
3. Operating at the desired temperature;
4. Reducing heat losses from openings,
5. Minimizing wall losses;
6. Waste heat recovery from flue gases;

The principles of good combustion for the proper selection and maintenance of fuel oil burner is very important and it has the main role. So, standard and good quality burner should be used for better conservation of oil fuel.

10. FINANCIAL ASPECTS : (hot forged bolts & nuts)

1. Fixed Capital :

i) Land and building :

Total Covered area : 200 sqm. Rent Rs. 2500 p.m.

Build up area : 120 sqm.

ii) Machinery & Equipments (Indigenous) :

| Sl. No. | Description   | No. | Rate    | Amount (Rs.)   |
|---------|---|-----|---------|----------------|
| 1.      | Pneumatic Power Hammer (Capacity 500 Kg. with 33 HP Motor)  | 1   | 1250000 | 1250000        |
| 2.      | Solid frame type trimming power press 60 ton cap. With 5 HP motor   | 1   | 100000  | 100000         |
| 3.      | Oil fired pre-beating furnace with oil burners to be used for annealing. Normalizing etc. with 5 HP motor | 1   | 450000  | 450000         |
| 4.      | Normalizing furnace oil fired pit type (Size 3' dia x depth)  | 1   | 350000  | 350000         |
| 5.      | Shot blasting chambers with 7.5 HP motor  | 1   | 300000  | 300000         |
| 6.      | Power hacksaw 1.0 HP motor  | 1   | 46000   | 46000          |
| 7.      | Rockwell hardness tester  | 1   | 55000   | 55000          |
| 8.      | Double ended pedestal grinder with 2HP motor  | 1   | 16500   | 16500          |
| 9.      | Platform type weighing machine 500 Kgs. Cap   | 1   | 13500   | 13500          |
| 10.     | Forging dies tools & equipments   | LS  | 425000  | 425000         |
|         | Total (Rs.)   |     |         | 3006000        |
|         | Electrification & installation  |     | --      | 300600         |
|         | Pre operative expenditure   |     | --      | 50000          |
|         | <b>Total (Rs.)</b>  |     |         | <b>3356600</b> |

1. Personnel :

| Sl.No. | Designation            | No. | Salary (pm)    | Total (Rs.)  |
|--------|------------------------|-----|----------------|--------------|
| i      | Supervisor/Engineer    | 1   | 14500          | 14500        |
| ii     | Skilled workers        | 2   | 12500          | 25000        |
| iii    | Semi-Skilled Workers   | 2   | 8500           | 1700         |
| iv     | Maintenance worker     | 1   | 7500           | 7500         |
| v      | Store-keeper-cum-clerk | 1   | 8000           | 8000         |
| vi     | Watchman-peon          | 2   | 4500           | 9000         |
|        | <b>Total:</b>          |     |                | <b>65700</b> |
|        | Staff welfare@ 15%     |     |                | 9855         |
|        |                        |     | <b>Total :</b> | <b>75555</b> |

2. Raw Material (Per Month) :

| SN | Particulars                 | Qty.              | Rate          | Value         |
|----|-----------------------------|-------------------|---------------|---------------|
| 1. | Alloy steel billets/squares | 1.0 kg x 6000 pcs | @ Rs.45/kg    | 270000        |
| 2. | Furnace oil                 | 200 L             | @Rs.46/L      | 9200          |
|    |                             |                   | <b>Total:</b> | <b>279200</b> |

3. Utilities :

| SN | Particulars           | Qty.       | Rate          | Value        |
|----|-----------------------|------------|---------------|--------------|
| 1. | Electric Power 40 kva | 40x4x25KWH | x @ Rs.6/unit | 24000        |
| 2. | Water                 | --         | --            | 2500         |
|    |                       |            | <b>Total:</b> | <b>26500</b> |

4. Other Contingent expenses (Per Month) :

|    |                        |          |              |
|----|------------------------|----------|--------------|
| 1. | Rent                   | :        | 2500         |
| 2. | Postage & Stationary   | :        | 2000         |
| 3  | Consumable             | :        | 4500         |
| 4  | Repair & maintenance   | :        | 3500         |
| 5. | Transport & Conveyance | :        | 2500         |
| 6  | Unforeseen expenses    | :        | 3000         |
|    | <b>Total</b>           | <b>:</b> | <b>18000</b> |

5. Working Capital (Per Month) :

|  |                       |   |                |
|--|-----------------------|---|----------------|
| 1.   | Raw Material          | : | 279200         |
| 2.   | Personnel             | : | 75555          |
| 3  | Utilities             | : | 26500          |
| 4  | Other contingent exp. | : | 18000          |
|  | <b>Total</b>          | : | <b>399255</b>  |
| <b>Total Working Capital for three months = 399255 X 3</b> |                       |   | <b>1197765</b> |

6. COST OF THE PROJECT :

|            |   |   |                |
|------------|---|---|----------------|
| 1.         | Fixed investment on M/cs. & Equipments  | : | 3356600        |
| 2.         | 25 % of Working capital (1197765 x 25%) | : | 299441         |
|            | <b>Total</b>                            | : | <b>3656041</b> |
| <b>Say</b> |   |   | <b>3656000</b> |

11. MACHINERY UTILIZATION :

The scheme is on the basis of 75% efficiency on single shift basis, considering 25 working days in a month. This project is based on operations like material heating to forging temperature, forgings, trimming, normalizing & rough machining etc the break-even-point has come to 52% which will be achieved on giving care at different operational stage and full capacity utilization is needed for full achievement. The payback period has been calculated on the basis of five years.

12. FINANCIAL ANALYSIS :

1. Cost of Production (per year)

|    |   |                |
|----|---|----------------|
| 1. | Recurring cost (399255 x 12)                | 4991060        |
| 2. | Depreciation (15% x 3356600 )               | 503490         |
| 3. | Interest on investment @ Rs. 14% x 3656041= | 511848         |
|    | <b>Total:</b>                               | <b>6006398</b> |
|    | <b>or say</b>                               | <b>6006400</b> |

2. Turn Over (per year)

|    |  |                |
|----|--|----------------|
| 1. | Forging Blanks 72 MT x @ Rs.95000 / MT =       | 6840000        |
| 2. | Forging scrap & rejections 3.5MT x @30000/MT = | 105000         |
|    | <b>Total:</b>                                  | <b>6945000</b> |



3. Profit (per year) :

$$\begin{aligned} \text{Or Annual Sales} - \text{Cost of Production} &= \text{profit} \\ &= 6945000 - 6006400 = \text{Rs. } 938600/- \end{aligned}$$

4. Net Profit on sales (per year) :

$$\begin{aligned} \text{Net Profit} \times 100 / \text{Total Sale} \\ &= 938600 \times 100 / 6945000 = 13.5 \% \end{aligned}$$

5. Rate of Return :

$$\begin{aligned} \text{Net Profit} \times 100 / \text{Total Investment} \\ &= 938600 \times 100 / 3656000 = 25.6 \% \end{aligned}$$

6. Break Even Point :

Fixed Cost :

|    |  |                |
|----|--|----------------|
| 1. | 40% salary & wages                                   | 362664         |
| 2. | 40% utilities & other expenses                       | 213600         |
| 3. | Depreciation furnace Dies & Tools @ 15% x 3356600    | 503490         |
| 4. | Interest on total capital investment @ 14% x 3656000 | 511848         |
|    | <b>Total:</b>  | <b>1591602</b> |
|    | <b>or say</b>  | <b>1591600</b> |

BEP :

Fixed Cost x 100 / Fixed Cost + Profit

$$= 1591600 \times 100 / (1591600 + 938600) = 52 \%$$

$$\text{DSCR} = \frac{\text{Profit} + \text{Depreciation} + \text{Int on term Loan}}{\text{Int. on TL} + \text{Installment of TL}} \quad \text{or} \quad \frac{938600 + 503490 + 511848}{511848 + 731200} = \frac{1953938}{1243048} = 1.57:1$$

13. NAME & ADDRESS OF PLANT & MACHINERY:

1. M/s Westman Engg. (P) Ltd. Dumdum Road, Kolkata
2. M/s Macro Furnaces (P) Ltd, Faridabad (Haryana)
3. M/s Wellmake Engg. Corpn. Ltd., Mayapuri Phase – IB-104, New Delhi
4. M/s Patel Furnace & Forging (P) Ltd, A2/510, GIDC Estate Makarpura, Vadodra.
5. M/s Metatherm Furnace Pvt. Ltd.
6. M/s High-Temp. Furnace Pvt. Ltd. 1-C, II-Phase, Peenya Industrial Area, Post Box No. 5809, Bangalore – 560058.
7. M/s. Inspection Instruments Corpn.
8. Sherif Douj Street, Zakaria Bldg.,  
Mumbai-400 003
- 9 M/s. Fuel Instrument and Engineers Pvt. Ltd.  
Ichalkaranchi, (Maharashtra)
- 10 M/s. Blue Steel Engineers Pvt. Ltd.  
Blue Steel House, D-12 MIDC, Marol Ambhri (East),  
Mumbai-400 073