

# Saving potential of small diameter spindle wharves

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Survival of a company and market success is proportional to the confidence and satisfaction of the customer who has the right to demand quality. Quality is timely compliance to defined requirements.

Accordingly, the spinning mills perform the task of manufacturing yarn conforming to the quality and performance criteria of the end-user at a commercially competitive and industrially profitable output rate.

In order to manufacture yarn at competitive price, the spinning mills must control the product cost. In fact the component of the product cost over which the spinning mills exercise effective control is the conversion cost.

The details of the conversion cost of a typical spinning mill comprising of 19200 spindles are given in Annexure-1.

It should be noted that the cost of utilities, i.e. electric power is the highest at 41.17% as compared to other components. Savings in the cost of electric power can be achieved by the use of small diameter spindle wharves as calculated below:

## 1. Saving in Electric Power Cost

| Particulars                          | Large Diameter Wharve  | Small Diameter Wharve  |
|--------------------------------------|--|--|
| Count, Twist Factor, Turns per Inch  | 20 Ne, 4.25, 19  | 20 Ne, 4.25, 19  |
| Number of Spindles per machine       | 480  | 480  |
| Total connected Load                 | 25 KW  | 25KW   |
| Drive Pulley Diameter Wharve Dia     | 10 inch / 24 m.m (0.945 inch)  | 10 inch / 19 mm (0.748 inch)   |
| Main Motor RPM                       | 1450   | 1450   |
| Spindle RPM                          | 15,344   | 19,385   |
| Machine Efficiency                   | 92%  | 93%  |
| Production per machine per day (LBS) | $\frac{15344 \times 60 \times 24 \times 480 \times 0.92}{19 \times 36 \times 20 \times 840}$ | $\frac{19385 \times 60 \times 24 \times 480 \times 0.93}{19 \times 36 \times 20 \times 840}$ |
|                                      | 849.11   | 1084.4   |



## Practical Hints

Electric Power consumed per day machines =  
 $25 \times 24 \times 0.80 \times 0.85 = 408 \text{ KWH}$

Assuming Power Tariff @ Rs 11.0 / KWH

Cost of Electric power consumed per machine per day:  
 $408 \times 11 = \text{Rs} = 4488$

Electricity Expenses incurred per L.B of yarn =  $\frac{4488}{849.11} = \text{Rs} 5.29$

$\frac{4488}{1084.4} = \text{Rs} 4.14$

Saving in Electric Power cost per LB. of yarn = Rs 1.15

Saving per 40 machines (19,200 spindles) / day:  
 $1.15 \times 1084.4 \times 40 = \text{Rs} 49,882.40$

### Saving in conversion cost

On account of higher spindle achieved with small diameter spindle wharve, the machine production also increases resulting in saving of the conversion cost as calculated below:

| Particulars                                       | Large Diameter wharve                          | Small Diameter wharve                                |
|---|--|--|
| Production in ozs per spindle shift (OPS)         | $\frac{849.11 \times 16}{480 \times 3} = 9.44$ | $\frac{1084.4 \times 16}{480 \times 3} = 12.05$      |
| The Conversion cost as calculated in Annexure-1   | Rs 28.78 Million                               | Rs 28.78 Million                                     |
| Cost per spindle shift (CPS)                      | Rs 16.60                                       | Rs 16.60   |
| Conversion cost per LB. of yarn =                 | Rs 28.14                                       | Rs 22.04   |
| Saving in Conversion cost per LB of yarn          |  | Rs 6.10  |
| Saving in Conversion cost per 40 machines per day |  | $6.1 \times 1084.4 \times 40 = \text{Rs} 264,593.60$ |

### Summary

Saving in electric power cost / day = Rs 49,882.40

Saving in conversion cost / day = Rs 264,593.60

Total savings per day = Rs 314,476

Total savings per annum / 300 working day = Rs 94,342,800.

In conclusion, it may also be mentioned that the thin walls of the small diameter wharve are not a disadvantage. The manufacturers use high and adequate quality steel for maintaining durability and prevention of wear by spindle tapes.

### Conversion Cost

Approximate total project cost of a typical spinning mill comprising of 19,200 spindles is assumed at Rs 700 million.

Financial Plan at debt / Equity ratio of 60/40 works out as follows:

Debt = Rs 420 million

Equity = Rs 280 million

Supplier Credit = Rs 300 million

Sponsors Contribution = Rs 140 million

LMM loan = Rs 50 million

Bridge loan = Rs 140 million

LT-TFC = Rs 70 million. ♦

| Break -Up of conversion Cost |   |                              |                          |
|------------------------------|---|------------------------------|--------------------------|
| S. No                        | Description   | Cost per Month Rs in Million | Percentage of total cost |
| <b>1</b>                     | <b>Mark- up on Loans</b>  |                              |                          |
|                              | Bridge Loan, Supplier Credit and LT-TFC= Rs 510 million @16 %   | 6.8                          |                          |
|                              | LMM Loan = Rs 50 Million @13 %  | 0.54                         |                          |
| <b>2</b>                     | <b>Mark-up on Cotton Finance</b>  |                              |                          |
|                              | Consumption 3000 bales / month @ Rs 9500 per maund, per Kg = Rs 254.52  | <u>1.73</u>                  | 31.52%                   |
|                              | Total cost = Rs 129.81 million, Financing @ 80% @ 16% mark-up   | <u>9.07</u>                  |                          |
| <b>3</b>                     | <b>Utilities</b>  |                              |                          |
|                              | Connected load = 2200 KWH, Running Load @80%, p.f = 0.85<br>Units consumed per month = 10,77,120 @ Rs 11.0/ KWH | 11.85                        | 41.17%                   |
| <b>4</b>                     | <b>Salaries, Wages and overheads</b>  |                              |                          |
|                              | Salaries, wages and overheads at the factory and Head office  | <u>5.0</u><br><u>16.85</u>   | 17.37%                   |
| <b>5</b>                     | <b>Insurance</b>  |                              |                          |
|                              | Insurance of plant and machinery, stock-in-process, vehicles buildings, cash – in transit etc.                  | 2.0                          |                          |
| <b>6</b>                     | Cotton cess @ Rs 20/- per bale, monthly consumption 3000 bales  | 0.06                         |                          |
| <b>7</b>                     | Loading and unloading contractor  | 0.2                          |                          |
| <b>8</b>                     | Packing Contractor  | 0.2                          |                          |
| <b>9</b>                     | Stores, spares and lubricants   | 0.2                          |                          |
| <b>10</b>                    | Unforeseen Expenses   | <u>0.2</u><br><u>2.86</u>    | 9.94%                    |
| <b>11</b>                    | <b>Total</b>  | Rs. 28.78                    |                          |