



30 ring frames upgraded by TeraSpin for improved productivity and quality

A vertically integrated textile mill in India, manufacturing blended yarns of man-made fibres, wool, and wool blends, was looking to improve its yarn spinning productivity and quality without entailing a heavy investment.

Challenge

The yarn spinning plant was set up in the 1980s when ring spinning machines of 1000+ spindles were still a rarity. Today their plant and machinery includes 1000+ spindle ring frames, but for producing small lots of dyed man-made fibres, which requires frequent changes in the ring frame settings and also thorough cleaning to avoid contamination. The older short ring frames of around 500 spindles are very useful to them.

With these old short ring frames, fitted with pneumatic drafting systems, the mill was facing issues related to yarn quality and productivity due to the following reasons:

1. Air leakages – hence, higher maintenance time and cost
2. Variation in top roller loading – ultimately resulting in poor and inconsistent yarn quality
3. Poor machine working and high yarn breakage rate – leading to less than optimum spindle speeds and increased waste generation.

Replacing these old machines with new machines would have entailed a major investment, which is always a difficult proposition in the competitive spinning industry.

Solution

This is when the mills got in touch with TeraSpin, experts in upgrading spinning machines.

After complete analysis and study of the existing pneumatic drafting, TeraSpin offered a very special and cost effective drafting up-gradation kit, consisting of standard drafting components and certain tailor-made drafting components.

To start with, two ring frames were upgraded with new TeraSpin PK 2035 drafting. Nothing else was changed on the machine.



PK 2035

Results

The results were almost immediate improvement in yarn quality. The “objectionable faults” and “drafting faults” as per the Classimat system of yarn defect categorisation came down drastically (see table below for actual values). In addition to the gain in quality, the mill could also increase spindle speed by 1000 rpm. The technical details and performance data are given in the table below.

Raw material details

| Fibres | Fibre length | Fineness | % in blend |
|------------------|--------------|------------|------------|
| Polyester (dyed) | 51 mm | 2 denier | 65% |
| Viscose (dyed) | 44 mm | 1.5 denier | 35% |

Yarn quality parameters

| Quality parameters | Before up-gradation | After up-gradation | % improvement |
|--|---------------------|--------------------|---------------|
| Yarn count | Ne 24s | Ne 24s | - |
| U% | 11.36 | 10.05 | 12% |
| Thin places (-50%) | 154 | 58 | 62% |
| Thick places (+50%) | 296 | 132 | 55% |
| Neps (+200%) | 433 | 386 | 11% |
| Total IPI | 883 | 576 | 35% |
| Classimat faults | | | |
| YF (yarn faults) | 124 | 66.4 | 46% |
| YJ (yarn joints) | 174.7 | 111.8 | 36% |
| Yarn cuts | 43 | 35.5 | 17% |
| N (neps) | 29.9 | 12.7 | 58% |
| S (short thick faults) | 73.6 | 48.2 | 35% |
| L (long thick faults) | 13.9 | 4.4 | 68% |
| T (thin faults) | 0.6 | 0 | 100% |
| Objectionable faults (A4+B4+C4+D4+C3+D3) | 54.6 | 22.1 | 60% |
| Drafting faults (C1+C2+C3+C4+D1+D2+D3+D4) | 623.9 | 356.5 | 43% |

Gain to the customer

1. Very significant improvement in all yarn quality parameters with TeraSpin drafting up-gradation kit
2. End breakage rate has been reduced by 50% with TeraSpin drafting
3. Improved machine working has also supported the increase in spindle speed by 1000 rpm

The remarkable improvements in quality and productivity achieved on the two upgraded ring spinning machines convinced the mill to upgrade their old machines instead of replacing them. Today the mill has a total of 30 ring spinning machines upgraded with the TeraSpin PK 2035 drafting system. The decision to upgrade existing machines instead of replacing them with new ones resulted in significant saving in the range of Rs 5000 (US\$ 80) per spindle.