

FibreTQS On-Line Monitoring

FibreTQS a unique On-Line Monitoring system provides total quality monitoring for all types of synthetic fibre processing equipment including, POY, FDY, T+I, BCF, DTY and ATY, providing the users clear benefits in downstream processing enhancing reputation and reducing costs.

FibreTQS System

Sensors are available to measure a range of parameters including; Spin Finish Level, Interlace, Broken Filaments, Slubs, Denier Variation, Denier Change, Tension and Crimp Modulus - The sensors recommended for each process are detailed in the individual process data sheets.



Electronics Distributed Electronics carry out all high-speed data acquisition and signal processing as well as providing a range of I/O functions

PC Software A simple intuitive user interface with a mimic display of the machine provides the current status of the machine at a glance. Details of this are shown under User Interface below

Plant Integration - Provides facilities for data export and control of multiple FibreTQS machines from a single PC.

FibreTQS Grading and Reporting

FibreTQS continuously monitors data from all measurements and grades packages in real time based on the limits and grading criteria defined in the Merge Setpoints. The key grading limits available in the merge setpoints are:

| Summary by Weight | | | | Summary by Grade | | | | | |
|--------------------------|-------|--------|-----------|------------------|--------|-------|--------|-----------|-------|
| No | % | Weight | % | Grade | No | % | Weight | % | |
| Full Packs | 18109 | 36.21 | 175024.02 | 45.48 | 1st | 60620 | 97.35 | 360444.38 | 93.66 |
| Break Packs | 1529 | 2.20 | 4006.51 | 1.04 | 2nd | 0 | 0.00 | 0.00 | 0.00 |
| All Packs | 68396 | 100.00 | 364942.11 | 100.00 | 3rd | 0 | 0.00 | 0.00 | 0.00 |
| Break Rate (per Kg) 0.00 | | | | | 4th | 2198 | 3.15 | 1436.15 | 0.39 |
| | | | | | Reject | 6028 | 8.69 | 22270.64 | 5.79 |

| Threadline | Pack ID | Doff No | Events | Doff Code | Grade | Reason | Build % | Weight (Kg) | Ended At | B. File |
|------------|---------|---------|--------|-----------|-------|--------|---------|-------------|---------------------|---------|
| 16.6 | 494 | 2569 | 7 | Doff | 4th | BF | 77.93 | 6.97 | 19/07/2006 14:55:00 | 40 |
| 16.6 | 497 | 2571 | 9 | Doff | 4th | BF | 77.89 | 6.97 | 19/07/2006 18:10:19 | 84 |
| 16.6 | 513 | 2603 | 8 | Doff | 4th | BF | 101.27 | 9.1 | 20/07/2006 16:58:43 | 80 |
| 16.6 | 609 | 2903 | 8 | Doff | 4th | BF | 48.96 | 4.30 | 20/07/2006 20:00:00 | 16 |
| 16.7 | 404 | 2402 | 8 | Cur | 4th | BF | 9.29 | 0.84 | 19/07/2006 16:47:58 | 118 |
| 16.7 | 406 | 2403 | 9 | Doff | 4th | BF | 76.95 | 6.88 | 19/07/2006 19:41:49 | 106 |
| 16.7 | 411 | 2407 | 8 | Doff | 4th | BF | 77.35 | 6.93 | 19/07/2006 04:49:25 | 60 |

Mean Variation - the minimum, maximum and CV values are checked against either mean data

Transient Faults – minimum and maximum limits are checked against each individual reading and in the case of a fault, a graph of the event is captured.

Slubs and Broken Filaments – grading is based on the number of Slub events, and/or the total number of Broken Filaments per package.

On the basis of the faults identified, **FibreTQS** automatically assigns a quality grade to the packages (Grade 1, 2, 3, 4 or reject) This quality grade is displayed at the machine PC and can be transmitted automatically to any automatic handling / packing system immediately when the package is doffed.

Flexible Reporting

A range of reports are available to summarise package quality and off quality events; by machine, merge group, winder, or threadline over flexible time periods. Full shift reporting facilities are included. These reports summarise the number and weight of packages in each grade and allow lists of packages in selected grades to be printed.

When viewing these reports on screen it is possible to view / print details of:

- Off quality events for any selected package
- Package summary data for each property
- Trend data for each property for the duration of the package

Monitoring Excellence

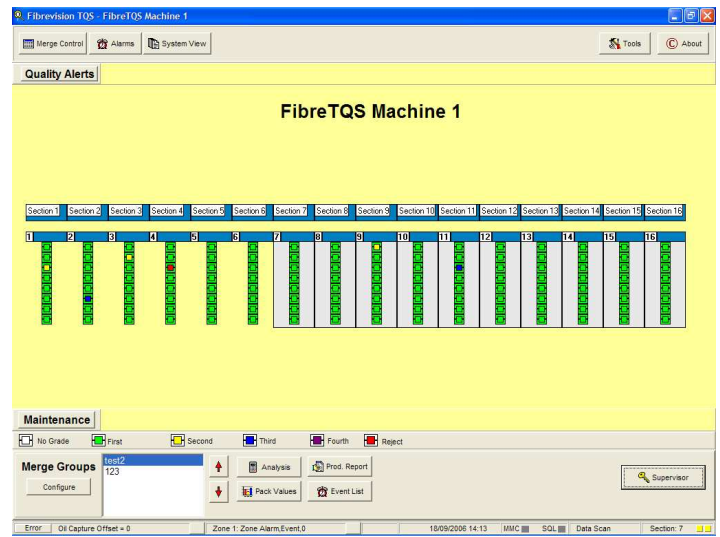


FibreTQS User Interface

FibreTQS provides a graphical display of the machine layout that indicates both threadline running status and quality grade by the colour of the package icons.

Clicking on a winder icon displays details of the current readings and clicking on individual threadlines provides:

- Current readings
- Summary data for the package to date
- Details of off quality events
- Real Time View graph
- Analysis tools to aid troubleshooting
- Quality reports from previous packages
- Access to historical trend data



FibreTQS Quality Improvement Tools

In Addition to Quality Grading functionality, **FibreTQS** is equipped with a powerful range of process improvement tools.

- Quality Alerts** this identifies threadlines with repeating faults/breaks or those approaching downgrade limits
- Pack Values** provides distributions based upon package average data of a selected period, allowing extreme threadlines to be easily identified.
- Extremes** provides views of the distribution and extremes of current real time data
- Historical Data** allows property trends to be assessed to optimise maintenance cycles.

FibreTQS Technical Data

| | Sensors | |
|---------------------------|---|---|
| | Optical | Spin Finish |
| Range | 20 to 1,500 denier 500 to 3500 denier | Up to 10,000 pS |
| Measurements | Interlace, Broken Filaments /Slubs Denier/Bulk Variation , Denier Change ATY Quality, Twist / Twist Balance | Spin Finish mean level and variation |
| Principle | Optical profile measurement with patented signal processing | Conductance measurement with conversion to Spin Finish level. |
| Calibration / Maintenance | Auto contamination compensation Maintenance alert if cleaning is required | Not required |

| SECTION INTERFACE UNITS | |
|-------------------------|------------------------------------|
| Threadlines | Up to 12 |
| Sensors | Up to 3 types per threadline |
| Inputs | Up to 14 user configurable Inputs |
| Outputs | Up to 14 user configurable Outputs |
| Power Supply | 28v DC +/- 10% |

| COMMUNICATIONS GATEWAY | |
|------------------------|---|
| LAN Length | Up to 70m per LAN |
| Sections | Up to 23 per LAN (2 LANs per Gateway) – Max 32 per machine |
| Inputs | Up to 2 user configurable Inputs |
| Outputs | Up to 2 user configurable Outputs |

| CUSTOMER SUPPLIED SERVICES | |
|----------------------------|--|
| PC | Minimum 2Ghz PC with 512mb RAM and 60Gb Disk with Windows 2000 Professional or XP Professional |
| Power Supply | 24v DC ± 10% to each section |
| Doff Inputs | Input(s) to indicate Yarn Doffing / Package Building |