

## Quality certification—the information technology solution

**Business Development Manager with process quality software specialist QISoft, Tim Perris, presents a case study illustrating how specialist nonwovens producer Technical Fibre Products uses information technology systems to improve its efficiency and its service to customers.**

**M**aterial quality, consistency and certified conformance are vital ingredients for the technical textile industry. By accepting the challenge presented by automating data-capture, producers can achieve genuine process benefits and secure a significant competitive advantage.

Take the example of Technical Fibre Products (TFP), which develops and produces advanced materials using paraaramids (Kevlar), carbon fibres, ceramics, titanium and other materials for demanding applications such as automotive, aerospace and fire engineering. (The company is in the same group as, and shares a site with, specialist paper producers James Cropper plc.)

Certifying conformance is complicated because the possible range of source materials, blends, thicknesses and weights is huge. In addition, different monitoring criteria are required by a varied set of end-users. These clients often demand exceptionally close conformity to specification and timely production of data to ensure the integrity of their own production. TFP decided that a solution based on information technology (IT), centred on QIS software from QISoft, provided the most efficient answer.

### Ensuring efficient data capture

Prior to adopting the IT solution, TFP used a manual process for data gathering and interpretation. For each client and each production batch, it recorded a different set of process parameters, some manually and some automatically. It then collated the data with information from off-line testing in the laboratory to allow conformance certificates to be produced individually and despatched with the material. This procedure involved a substantial commitment of skilled manpower to a tedious and unrewarding task. Moreover, from a quality standpoint there were several issues with such an approach:

- the gathering of process data was essentially driven by the requirements of certification;



*Technical Fibre Products produces its advanced materials from a wide range of mineral, man-made, metallic and composite fibres. Crucially, from the perspective of quality control, the exact form of each product depends on the specific application.*

- the need to capture data from several disparate plant and laboratory sources, and to re-key, analyse and interpret it introduced potential sources for error and inaccuracy;
- a lack of transparency meant that data was not accessible to all team members and so the scope for more active intervention was limited;
- accumulated quality data in the paper log could not easily be accessed, analysed and used to support management and quality initiatives.

### Common problems, common solutions

Both TFP and James Cropper use similar technologies to achieve a wet-laid web for post-production converting and finishing. Where James Cropper uses wood pulp, occasionally supplemented with other natural fibres as the basis of its product, all the products from TFP are based on minerals—metals or man-made fibres.



Left: Technical Fibre Products advanced materials are produced in a continuous process. The wet laid web formation is similar to the paper production process but no fibres of plant origin are used.

Below: The QIS process system enables the properties of each reel of material to be precisely monitored. As reels are converted the company can therefore provide total assurance of quality for each subsequent batch of material.



It emerged that similar issues arose in the paper mill and so it was decided to seek a software vendor who could address quality issues in both plants. A common statement of requirements was therefore produced and invitations were issued to software vendors to offer a suitable solution.

A structured and objective approach was essential. The statement of requirements weighted software features in terms of importance: essential needs were weighted higher than others that were merely nice to have. The IT department ranked presentations from several vendors according to compliance to the statement and produced a short-list for more detailed evaluation.

Following the first screening stage the systems were demonstrated to the key stakeholders: the management, the quality assurance (QA) team and operators. By using this method consensus was achieved and agreement reached that the QIS system did meet immediate needs and offered scope to keep pace with future developments.

### **Real-time benefits**

The installation of the QIS system has brought TFP tangible benefits. Now, a comprehensive range of data is gathered around the plant and correlated with that from laboratory tests. The QIS system interfaces directly to the Measurex process control system through QIS ProcessLink, a dedicated interface management module. As each reel is completed, critical product and process data downloads automatically to the QIS data bank.

Data can also be collected automatically from test instrumentation and gauges via the LabLink interface module. As a result, information from instruments (such as weight balances, tensile testers and burst testers) is visible and acces-

sible to everyone around the plant. Variations are quickly and precisely located, non-conforming material is identified and waste eliminated.

Monitor displays around the plant enable operators and management to access and process laboratory data. This is presented in graphical as well as tabular format. The system stores the recipes and specifications for each class of product. Colour screens provide an immediate visual indication when a given process parameter is green (within specification), yellow (giving cause for concern) or red (outside specification).

Correlation of data and analysis is rapid. Certificates of conformance, in the many variations demanded by different manufacturers, are now produced in half the time. The company also has greater confidence in their accuracy and can easily show their derivation should a quality audit be required.

### Maintaining the momentum

TFP has become a beta-test site for the latest QIS version 5. The new software improves the speed, quality and depth of data delivered. The principal benefits that QIS has brought are improved real-time process control data, rapid analysis and wide availability. This has shortened the control loop—making it possible to respond promptly to changes and actively manipulate the process to achieve the desired quality.

A further bonus from QIS 5 is that improved communication and presentation facilities have streamlined the production of essential documentation. TFP's Quality Coordinator Philip Latham says "Many customers require real-time quality data in highly specific formats. This means we hold special stationery for each client and print and post individual certificates with each batch. QIS 5 enables us to hold bitmap images of client logos and certificate layouts. We now have the ability to fax or e-mail this data, in precisely the format demanded by the client, so that they have quality information to hand, in the documentary form they need, as soon as material is shipped."

An extensive library of associated documents may be accessed from within the program at any time:

- reference product data;
- bills of materials (BOM's);
- QA standards;
- health and safety standards;
- ISO 9000 procedures;
- critical control-point data for hazard analysis;
- environmental specifications.

Universal changes are now easy to implement. Critical parameters, such as moisture content or weight can be standardized over a complete range of products, without the need to call up and change each individual specification. Formula changes where one parameter changes as a proportion of another can also be pre-set.

Similarly, variations to BOM's can be made and stored as versions of an existing document. For QA purposes all such variations are fully documented with details of who made the change, when and who approved the amendment. The system can be told to recognize and block unauthorized changes. Likewise changes can be set for implementation at a specified time.

When fully implemented, QIS 5 will also enable TFP to share even more data, in rich and relevant formats, with clients. Quality information data in graphical format can be stored as bitmaps and e-mailed to clients as supplementary reports to the main certificates.

The software will also contribute to improving production quality systems. A vast, readily accessible and easily interrogated archive of quality data is now available. This will enable exercises in cost- and capability analysis, that were hugely time consuming with the old paper log, to be more easily undertaken. Understanding the process, taking ownership and collective responsibility for quality issues, and implementation of improvements now becomes easier.

For manufacturers of technical textiles, quality is an issue in every phase of the process. Validation of quality adds value to the product, but can also add to cost and create masses of documentation that are difficult to unravel. TFP has learnt about the benefits arising from automating this process and how reams of paper can become useful streams of data. Service to the customers has also been improved.



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