Anago case study

anago
ensure optimum sharpness

Scalpel Manufacturer

"The value of the SST greatly extends the capability of the QA department. Because we can visualise the entire blade length, accumulated data allows us to equate sharpness data to all aspects of our processing in a much more complete and meaningful way."[1]

Case study:	CASE150
Product:	SST Auto
Customer:	Scalpel manufacturer
Country:	China
Product tested:	Scalpel blades
Industry:	Medical
Year:	2017

THE CUSTOMER

As one of the largest manufacturers of surgical blades, scalpels and handles in China, the company prides itself on its continuous efforts to develop innovative, safety-engineered medical products.

Prior to implementing the Anago SST into their testing processes, the company's quality control practices consisted of:

- Batch verification of blades using visual inspection of grinding and honing marks and edge formation microscopy
- Metrology (overall tolerance control and grind angle measurement)
- Simple sharpness tests: string-cut tests and plunge tests

The company commented: "While our simple string-cut test provides a consistent baseline, only a discrete position on the blade is tested and trends of overall sharpness or consistency across the entire grind length are cumbersome to achieve. Furthermore, accurate comparisons of 'average sharpness' between blade types or blade manufacturers is difficult to achieve."

THE GOAL

The manufacturer wanted to be able to better compare blades and measure any long-term improvements in their manufacturing quality, both internally and against competitors' products. Moreover, they wanted to be able to better link sharpness testing to process control – this would mean that sharpness testing could be coupled to process factors more efficiently and would enable changes to be evaluated in a timely fashion.

THE DRIVERS

Sharpness was being used as a marketing metric and the company needed a more effective and meaningful way to compare their blades to the rest of the market. In addition, they wanted to capture the maximum amount of data possible to objectively show the effects of constant improvements in their manufacturing processes.

[1] All direct quotes in this case study are the scalpel manufacturer's responses to an Anago questionnaire from 2017

THE SOLUTION

"The SST provides a feedback loop from QA testing which not only verifies that established performance baselines are maintained, but also simultaneously enables rapid-spot sharpness review and process performance review due to the SST's extensive data collection along the entire length of the blade."

HOW THE ANAGO SST WORKS:

The SST incorporates Anago's proven technology in the sharpness testing industry. A customised blade clamp (Figure 1) moves the scalpel blade through a woven test media (Figure 2) whilst recording the force required to cut each strand. The recorded force corresponds to a force measurement and from this, a sharpness measurement is calculated (Figure 3). Multiple points along the length of the blade are recorded.

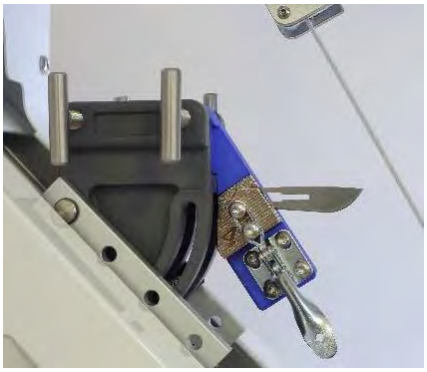

Figure 1. Standard no. 4 blade clamp

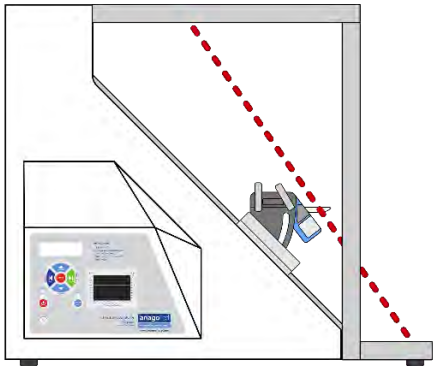

Figure 2. The test media orientation allows the capture of 50 data points along a scalpel of just 20mm length (i.e. 2.5 measurements per mm)

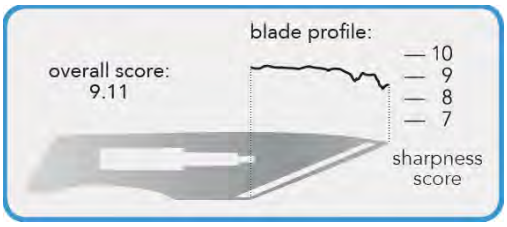

Figure 3. The output to PC includes an average (overall) score, as well as a profile along the length of the blade, clearly identifying dull and sharp areas

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THE BENEFITS

Complete and thorough findings

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Shows how process conditions affect data

For example, "[during wear testing] a finely honed (and very smooth) blade edge yields a different initial and worn cutting force pattern to a poorly ground (serrated) blade edge. The results can immediately appear anomalous, in that a serrated edge can appear to get 'sharper' over wear cycles, although inspection reveals that the knocking down of edge serrations correlates with the force measurements. Using the SST, these effects can be visualised along the whole blade length and we do not need to rely on testing of the exact same edge point in order to achieve a result."

More realistic

"The Anago SST test generally uses a slicing action, rather than a 'plunge' (normal to the edge). Although blade curvature means that portions of the blade experience different angles of attack to the media, we believe this represents a more realistic test. This aspect of the SST has allowed our engineering team to equate the blade and SST geometry (angle of attack) to the data, and judge the relative effect of the plunge versus slice action."

Fast and easy to use

"The testing is fast and data is easily captured and manipulated for reporting and analysis."

Enhanced fault analysis

"Fault analysis capability is greatly enhanced, since variation in sharpness results can be detected at any point along the blade, whereas a string or silicone plunge test may simply 'miss the spot' of the process fault, such as a grinding nick or other edge feature."