



CHALLENGE

To ensure consistent manufacturing quality where even a .001-inch discrepancy can harm product performance.

SOLUTION

Use JMP to monitor processes, conduct capability and variability studies, and present results to employees and customers.

RESULTS

Specialty Silicone Fabricators delivers exceptional quality and is recognized as one of the world's top-tier silicone product manufacturers.

MORE INFORMATION

www.jmp.com
www.ssfab.com



Small Things Count

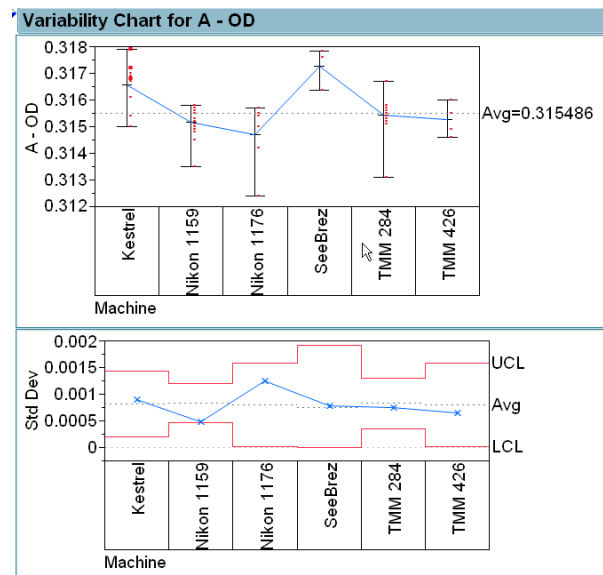
JMP® allows Specialty Silicone Fabricators to deliver medical device components of exceptional quality

Take it from Spiro Atieh. In a business where a .001-inch discrepancy might just as well be a mile, it's critical that your measurement systems are very finely honed.

That's the case at Specialty Silicone Fabricators (SSF), where precision in the design of a length of tubing inserted into the body for diagnostic purposes, for example, can ultimately be a lifesaving proposition. SSF, based

in Paso Robles, CA, is recognized as one of the world's top-tier manufacturers of silicone products, offering full product design and manufacturing services – from prototyping and testing to production, assembly and packaging.

Fine-tuning measurement systems to ensure the quality of manufacturing processes is Atieh's job. JMP statistical discovery software from SAS is a tool that's seldom far from his fingertips.



The SSF team studied the variability in the outer diameter (OD) of Part A by examining measurements taken using different inspection machines and by a variety of inspectors. In the top graph, inspectors' measurements are shown as red dots. The bottom graph shows the variability between the inspectors' measurements on each machine. The variance components table shows that 59% of the variance was due to machines and 41% to inspectors.

Component	Var Component	% of Total
Machine	7.8537e-7	59.1
Within	5.4384e-7	40.9
Total	1.32921e-6	100.0

**STATISTICAL
DISCOVERY.™
FROM SAS.**

“The statistics field is continually changing, updating and getting better. JMP stays at the forefront of using these new statistical methods and is always exploring the best solutions.”

Spiro Atieh
Quality Engineer
Specialty Silicone Fabricators

Not only does JMP allow him to better monitor the company's processes, but to do so in an interactive fashion with machine operators and inspectors. He can also use JMP to exhibit his data interactively to customers, who contract with the company to design and manufacture products.

Perfecting the process

SSF employs a process called extrusion to produce instruments such as surgical drains, catheter systems, intravenous drug delivery devices and pacemaker leads. The company's patented extrusion process (Geo-Trans®) makes it possible to vary inside diameters and/or outside diameters to meet precise specifications and to vary the shape, size, quantity and location of multiple lumens without joints, connectors, seams, adhesives or couplings. SSF is also able to switch silicone materials during the extrusion process in order to vary the hardness of a product over its length – as with a catheter, which requires a rigid proximal end and a flexible tip.

Atieh's job is to help ensure that a top-quality product is sent out the door consistently, seeing to it that the company's measurement systems are functioning as they must and that the processes are repeatable across the board, from one machine operator to the next. He also conducts variability studies, testing different parameters to improve output.

Atieh began using JMP almost five years ago – about two weeks after he

began work at SSF – when he was introduced to it by a colleague while doing a capability study.

In testing a product designed for a particular customer, the data that comes out of the process is fed into JMP, analyzed and displayed.

“We can then go back to the customer with the charts and say, ‘With our current measuring variability and process variability, here's what our capability looks like right now, so we're going to expect this percentage of fallout unless you change your specs to these,’” Atieh says.

“Just seeing how easily and well JMP accommodates those capability studies helped us identify other needs that can be met with JMP,” Atieh says. “I began using it in repeatability and reproducibility studies, and went on from there to do more.”

Atieh had little statistical background when he arrived at SSF and says that one of the really nice things about JMP is that if there was something he didn't quite understand, JMP could generally provide an answer.

What he learned enticed him to learn more.

“I remember going down to the library to read more about, for instance, tolerance intervals,” he recalls. “I'd read about some interesting things JMP had done with tolerance-interval calculations. That's really one of JMP's strengths – that the developers keep

adapting it using the latest proven statistical methods. The statistics field is continually changing, updating and getting better. JMP stays at the forefront of using these new statistical methods and is always exploring the best solutions.”

Profiling

Another area in which JMP has played a key role is in the gauge repeatability and reproducibility analyses Atieh has conducted with SSF inspectors, through which they've been able to better stabilize measurement variability.

“We found that we were needlessly adjusting our processes,” Atieh says. “It was something that we were able to figure out with JMP that otherwise would have eluded us.

“Something I've gotten to use a lot lately – and I think it's going to become even more prominent now with JMP 8 – is the profiler tool. Let's say we have a molding machine and it has different parameters that need to be set – for example, for length and width. Previously, there would be a lot of trial and error. We'd conduct some experiments on it and look at what particular parameters were producing.”

With the JMP profiler, Atieh can carry a laptop out to the machine operator, pull up that data and discuss proper settings while looking at a visual representation.

First and foremost: The visuals

Atieh says he's always learning something new with JMP. The September 2008 JMP Innovators' Summit was certainly a prime occasion for that.

"The fact that JMP puts on an information-packed event like that just overwhelms me," he says. "It's just an awesome way of exchanging and exploring different ideas and different techniques to better understand your data.

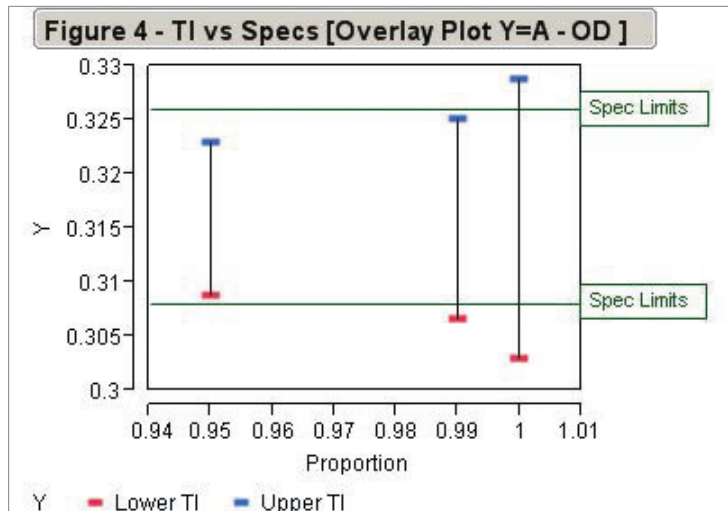
"And I think that's a big part of what's been missing in manufacturing – not enough understanding of data and the interpretation of data. So just going to that Summit was a real boost."

Atieh says he gained some general knowledge that he's incorporated into his work.

"There was a lot of great information about visualization of data – bringing more warmth to the data so that it's more appealing to read, more aesthetically pleasing and synthesizing data into maybe just a few interactive charts rather than putting out reams of reports."

In summing up what he likes best about JMP, this ongoing exchange of ideas among developers, industry experts and users ranks right up there.

The depth of JMP software's data-exploration capabilities is another major attraction.



This overlay plot displays tolerance interval calculations that show SSF's customer the specifications needed to manufacture (left to right respectively) 95%, 99% and 99.97% of their product within specifications 95% of the time.

At work ... at play

Spiro Atieh is unable to leave JMP at the office. It's a part of his home and recreational life as well.

Atieh coaches a teenage-girls' soccer team. "A lot of soccer up to that age is just boot the ball, boot the ball and get it as far away from the goal as possible," he says. "I'm trying to show them that is not the way to play; you've got to make crisp passes to build the offense."

Atieh collected data from the World Cup Web site on how many short and long passes were made each game by each team, fed it into JMP and was able to clearly demonstrate to his players the effect short passes had in winning games.

"The three worst teams had the most long passes per game," he says. "My players were wowed by this! It definitely helped them understand how important short passes are."

He also pulls information from his cell phone and, using JMP, splits it, stacks it, builds data sets and then makes tree maps based on how many minutes he's talked with individual friends. He then posts it on Facebook with his Top 10 list of friends he's talked to the most in the past year.

"People get a kick out of it, saying 'Hey, I made the Top 10,' or, 'Spiro, what happened? We need to get better at communicating. I don't want to ever fall out of the Top 10 again.'"

“JMP is definitely very fun to use and we learn so much from it. Sometimes I might find myself digging into data, just trying to figure out correlations between different features and different parts of the tool, trying to come up with what might have the most effect so that I can help improve our processes.

“And sometimes we find some gold in there, using multivariate analysis, MANOVA, different things – there are just so many different ways with JMP to discover what might correlate with what.”

Visualization capabilities are definitely at the top of Atieh’s list of reasons for using JMP.

“First and foremost for me is definitely the ease of communication with customers and colleagues that’s facilitated with JMP’s graphical tools and the different chart options. You can easily get an overview picture of all kinds of things versus having to rummage through a lot of data and carefully read through the statistics.

“A picture is worth a thousand words, and that’s definitely true with JMP and my job. You can just go through four or five charts and understand exactly what’s going on. And for our business, where tiny variations are critical, that’s no small thing.”



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