3 Key Trends for the Future of Medical Device Automation

By Raghu Vadlamudi
Chief Research and Technology Director

SPECTRUM
PLASTICS GROUP
A DuPont Business

3 Key Trends for the Future of Medical Device Automation

By Raghu Vadlamudi
Chief Research and Technology Director

TREND 1: Robotic technologies are taking over repetitive manufacturing tasks, helping fill labor shortages while giving humans more satisfying job opportunities.

The manufacturing industry has long faced a shortage of workers to design, control and maintain automation processes and equipment. Thanks to technology advances and market expansion, collaborative robots (cobots) are now a more affordable commodity for manufacturers of all sizes.

With growing production volumes and improved quality requirements for products, manufacturers, especially those specializing in medical devices, increasingly are turning to these technologies to fill the labor gaps. Because cobots can work safely alongside humans and be programmed to perform a variety of actions, they offer a precise and cost-effective way to complete repetitive tasks, such as loading metal inserts and unloading molded plastic. That means, human workers can be reserved and focused on manufacturing roles that require cognitive abilities. Win-win!

Even with the cobots helping out, however, manufacturers will continue to face skilled worker shortages. With this in mind, expect to see more journeyman programs popping up to attract, train and retain new graduates to take on robotic programming and maintenance roles.

TREND 2: Data collection and analysis will become a competitive must-have, not a nice-to-have, for manufacturers.

The faster and more precisely a medical device manufacturer can reliably produce Class I, II or III devices and components, the more competitive the manufacturer is likely to be in the market. For years already, innovators and early adopters have enjoyed the ability to connect smart devices on their plant floors all the way up to the enterprise and beyond to enable decision-making. Still, many manufacturers have been reluctant to invest the resources to get up to speed and implement even rudimentary IoT capabilities.

Manufacturers that continue to make do with outdated equipment and processes are running out of competitive time. As a result, more and more manufacturers will invest in the smart technologies to connect their automation systems, with medical device makers leveraging them to predict and control the stability of a manufacturing process for consistency.

This shift also will signal a greater need within the industry for experienced manufacturing data analysis specialists.

TREND 3: Breakthroughs in 3D printing will change the game for manufacturing micro components.

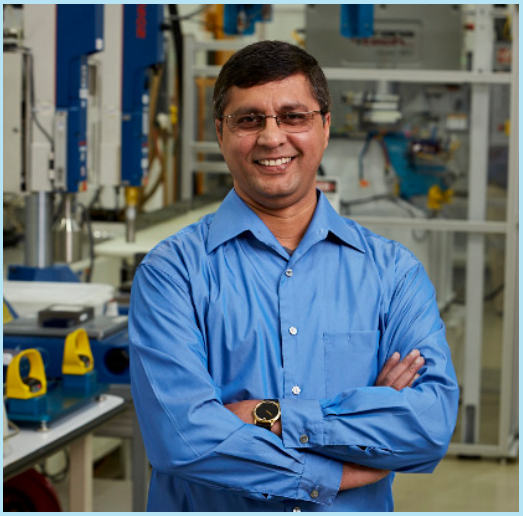
Additive manufacturing, also known as 3D printing, is changing so fast, and getting much better. Just within the past year, the technology evolved so much that it's now possible to print microparts with microfeatures – down to 40 microns! For reference, that's nearly half as small as the width of the average human hair. This breakthrough opens up a lot of future avenues for medical device designers.

For reference, microparts with microfeatures currently are most commonly seen in implantable medical devices and microelectronics. For these tiny parts, manufacturers generally use metal or high-temperature plastic materials, but are limited as far as the processes they can use to produce them. For example, injection molding, stamping and machining processes are not conducive to make parts with microfeatures, because molds cannot be built reliably and cutting tools do not exist to machine such fine features.

While this is exciting news for the medical device industry, the technology is still in the early stages. Before it becomes widely adopted and cost-effectively so, more comprehensive evidence proving its design for manufacturability, safety and efficacy will be required. That said, look for innovative manufacturers to get a head start on developing the technology and working with regulators to define approval processes and international standards.

3 Key Trends for the Future of Medical Device Automation

By Raghu Vadlamudi
Chief Research and Technology Director



About the author

Raghu Vadlamudi is our Chief Research and Technology Director. He has more than 25 years of experience in the medical device manufacturing industry managing process development groups, directing and coordinating process validation activities utilizing knowledge-based manufacturing practices. Raghu is an ASQ certified Medical Device Auditor, Certified Metal Cutting Professional, Certified Medical Device Compliance Professional, and a Certified Process Validation Professional.

About Spectrum Plastics Group.

We make products that enhance – and save – lives. We manufacture complex medical devices and components for low- and high-volume needs. That's all we do. And we do it with the utmost precision, consistency, and rigor, because for you – and your customers – **quality is essential. Reliability is a must. And delivering on what's promised is vital.**

Learn more about how we can help bring your medical devices to market – with confidence.

Contact +1.651.633.4200
Visit spectrumplastics.com

SPECTRUM PLASTICS GROUP
A DuPont Business