

## RISE TO THE CHALLENGE: SPEEDFACTORY



'The Future of Manufacturing', adidas' Speedfactory project, is using the specialist know-how of German robotics and textile engineers to produce a novel framework for making shoes.

# The robots are coming

Customised athletic shoes are not a new idea but, with an average lead time of between four and six weeks, not particularly convenient either. Adidas is looking to change that through the Speedfactory project – a collaboration with four German companies, partly funded by the German government, to “strike out on a new path” in terms of how products are made. The aim is to create new production technologies and efficiencies while looking into consumer needs, speed, flexibility and sustainability.

“It is important to us to be at the forefront of innovation and technology across all categories, to continue to provide our consumers with disruptive products and features in a sustainable manner,” a spokesperson for adidas tells us.

Adidas' focus will start with footwear, while its partners bring varied know-how and ambitions. Automotive supplier Johnson Controls is looking at textiles for car seats; KSL Keilmann Sondermaschinen, a specialist in 3D robotic stitching, hopes to create machines that can stitch

faster and more intelligently; Fortiss, part of the TUM Technical University Munich, is researching robotics and embedded systems; while ITA RWTH Aachen, Aachen University's textile institute, is focusing on textile handling systems.

“The future of manufacturing might be about different materials or product features and functions which we have not considered yet,” says Gerd Manz, senior innovation director at adidas. “It could also be about new production technologies and new ways of engaging with our consumers and their needs. We are asking ourselves lots of questions, such as: How can we be faster and more flexible, and what environmental footprint can we possibly leave?”

The adidas-initiated project began last October and will continue until September 2016, during which time representatives will “interact constantly” to share findings, and meet every quarter to chart progress.

### Process innovation

“Process innovations for Johnson Controls is as important as product innovation,” says Dr

*Adidas is hoping to make its manufacturing processes faster and more flexible.*



Andreas Eppinger, vice-president of technology in the group's automotive seating division. "Sewing covers for vehicle seats is largely by hand. Increased automation is very complex. Nevertheless, we are convinced it is feasible."

Disruptive products by their nature have the ability to change the prevailing structure of an industry. Speedfactory aims to combine the capabilities of humans and machines to not only optimise the cutting and sewing, but also the entire handling of textiles. Fabrics will be laid out in a new way, positioned next to each other and then joined together in a quicker manner.

"At the project's conclusion, the prototype of a system should be in place, in which humans and robots work together to produce textile products," says Ulrich Andree, director of global communications at Johnson Controls. "Our ultimate goal is to increase automation."

Johnson Controls and adidas say they are hoping to develop products with 'intelligent' technologies and which can be made in a 'flexible manner'. "This will enable both companies to produce closer to our customers and to fulfil their demand for customised products quickly," adds Mr Andree.

The ability to customise is a big driver for adidas, which sees this as something consumers will increasingly desire. Increased automation also raises the possibility of near-shoring: as cost savings made by locating manufacturing in Asia diminish due to rising wages, companies are looking to offset them by bringing factories closer to home. If fewer workers are needed, labour costs become less relevant, and reducing transport costs and carbon footprint might become more important stipulations.

### Government support

This is one reason why the German government is backing the project. Its High Tech Strategy, launched in 2006, comprises climate and energy, health and nutrition, mobility, security and communication. The Autonomic for Industry 4.0 programme is focused on combining state-of-the-art information and communication technologies (ICT) with industrial production, innovative products and skill-intensive electronic services with the aim of securing wealth and jobs. "The objective is to push the development of autonomic systems to establish Germany as a leading industrial base for new and forward-looking internet-based technologies," say the companies.

Johnson Controls believes advances in ICT will revolutionise industrial production over the coming decades. "It is crucial to set the course early on," says Mr Andree. "The High-Tech Strategy 2020, with Speedfactory feeding into this, will strengthen the competitiveness of the German industry and its job market."

Expected outcomes include a reduction in the amount of energy needed, more environmentally-friendly processes and greater efficiency in relation to material wear.

### Machine interaction

Munich-based Fortiss is focusing on two research areas: process modelling and human-machine interaction. In terms of cognitive process modelling, the institute is developing concepts for modularising production processes. Production is divided into steps that can be executed by machines or humans. "The goal is to quickly get from the design to the final product," says a spokesperson for the group. "In terms of human-machine interaction, Fortiss is focusing on the development of concepts to support human operations. The interaction has to be intuitive, safe, and at the same time ergonomic and adaptive to human needs. The goal is to reduce the workload on the human and to keep it as low as possible.

"Within Speedfactory, existing approaches will be evaluated regarding their suitability for the textile and sporting goods industry," she adds. "New concepts will be developed, as well."

ITA will look at the automatic production and handling of fabrics by robots and develop new handling systems. This includes the chain from the production area and joining processes.

### Future thinking

"In the sporting goods industry, the way products are manufactured has changed significantly over the past decades: from small and family-run businesses – operating locally and manually – to global players with (partly) automated production lines and a global consumer base," says Jan Hill, a senior development engineer at adidas.

"For a long time, the company has realised that innovation will decide future success and that only innovation will ensure the group's competitiveness. This is why the group invests in initiatives like DryDye or the Manufacturing Excellence Programme and now into Speedfactory."

When Nike and adidas launched knitted running shoes in summer 2012, it was clear the companies were looking at cost savings associated with reduced labour; in fact, Nike has spoken recently of "engineering labour out of the product" and its own "manufacturing revolution" being undertaken by its supplier factories.

The big brands are moving towards increased efficiencies to reduce labour, waste and impact – and ultimately, to drive profit. "New technologies always unlock new opportunities," concludes the adidas spokesperson. "We are convinced that new ways of manufacturing will offer additional solutions and strengthen the production portfolio of the adidas group to generate competitive advantage." 



*Dr Andreas Eppinger,  
vice-president of  
technology in Johnson's  
seating division.*

 Johnson Controls  
Automotive Experience