

# The hidden yet indispensable value of *monozukuri*

Working behind the scenes as the true purveyors of *monozukuri* craftsmanship, Japanese companies develop essential parts, components and machinery for the electronic devices and systems at the heart of Industry 4.0.

If there is one word that is synonymous with Japanese manufacturing, it is undoubtedly "quality". From cars and electronics, and onto high-tech engineered components and manufacturing machinery, Japanese manufacturers' painstaking attention to detail has ensured the long-standing reputation of the 'Made in Japan' brand across the globe.

This distinctive and unmistakable quality for which Japan is renowned can be mainly attributed to *monozukuri*, a long-standing philosophy held by Japanese manufacturers that focuses on pride, skill, dedication, high-quality production and the constant pursuit of innovation and perfection.

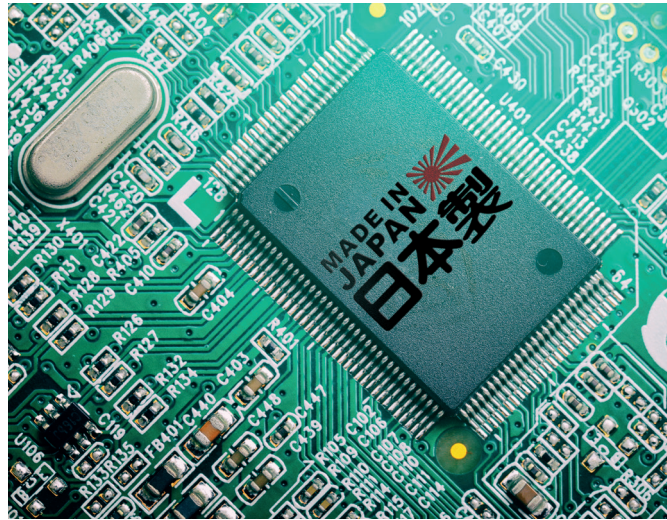
Toyota made the term become globally recognized in the world of business some years back. The automobile maker's reputed Toyota Production System is firmly based on the *monozukuri* philosophy, or what it calls an "all-encompassing approach to manufacturing."

"The essence of *monozukuri* is in the numerous components and materials essential to the manufacturing processes"

Motoshi Shinkai,  
President & CEO,  
Nippon Seisen Co., Ltd.

Toyota remains the global ambassador of *monozukuri* at the consumer level. But far from the eye of the end consumer, there are thousands of Nippon companies that work behind the scenes, building high-quality parts, components and machinery for top tier firms both at home and abroad. It is in this B2B segment that *monozukuri* really shines through, and that is particularly the case in the field of electronics manufacturing.

"When talking about *monozukuri*, our natural inclination is to focus our attention on the final products when in fact the essence of *monozukuri* is in the numerous



components and materials essential to the manufacturing processes," says Motoshi Shinkai, President and CEO of Nippon Seisen, a leader in the manufacture of stainless-steel wires, metal fibers and filters.

Nippon Seisen, for example, develops super fine wires that are essential to the manufacture of laminated capacitors found inside smart phones. "When producing laminated capacitors, electronic components manufacturers cannot build their circuit during screen printing without Nippon Seisen's Micro & Fine Technology 15µm stainless steel super fine wires," adds Mr. Shinkai.

## Industry 4.0

Amid the shift to Industry 4.0, Nippon Seisen sees huge potential in developing stainless steel wires for semiconductor manufacturing equipment related to 5G, IoT, CASE (Connected, Autonomous, Shared and Electric) vehicles, medical and renewable energy. And indeed, Industry 4.0 technologies are a priority focus for many Japanese companies involved in the electronics industry, particularly those that develop state-of-the-art machinery used to manufacture the latest semiconductors, such as Tokyo Electron (TEL).

"New technologies such as IoT, 5G, and AI have been drastically changing the semiconductor production process," says TEL president Toshiki Kawai.

"As a result, the semiconductor industry is undergoing rapid technological innovation and the market is changing rapidly."

In response to the rapidly changing market, TEL continues to invest heavily in R&D to develop the semiconductor manufacturing equipment for high-demanding clients looking to get ahead in the Industry 4.0 era. Indeed, as Mr. Kawai points out, working closely with clients to understand their needs is an essential part of the *monozukuri* process.

"*Monozukuri* is all about high-quality products built thoroughly and with precision"

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"*Monozukuri* requires many different steps, and communication is key in order to be able to respond clearly and effectively to each client's unique needs," he says. "*Monozukuri* is all about high-quality products built thoroughly and with precision. At Tokyo Electron, we are striving to adapt to the needs of our clients and their changing environments."

Another company bringing *monozukuri* to the forefront in the Industry 4.0 era is artron. Working as both a trading company and manufacturer, artron supplies industry-leading products and solutions for clients

across several industries – from cameras, sensors and radars for the latest automobiles, and LCD displays, touch panels and printed circuit boards for mobile devices; to factory automation equipment and state-of-the-art medical devices.

Already a leading international player, artron has taken *monozukuri* manufacturing global through its growing network of international production bases. "We have been realizing *monozukuri* all over the world since 2016," says president and CEO, Akio Shigeta.

"Currently we have fourteen facilities outside Japan to localize manufacturing and we are not looking to halt our expansion there. Areas could include Africa, South America or South East Asia—the sky is the limit!"

The advent of Industry 4.0 has also compelled Japanese companies involved in the ink manufacturing industry to adapt and diversify. In the case of Teikoku Printing Inks, which supplies high-quality inks for a wide range of industrial applications, the company's R&D is focusing on developing inks that are compatible with the latest sensor technologies.

"Our main focus is on sensors used in automatic driving or even vending machines, where an invisible lens detects the customer's age and gender information to offer purchase suggestions. Our R&D operates also with the basic principle that we are making products, especially inks, that are decorative but also functional and allow the latest sensor to penetrate," explains president, Nobunari Sawanobori, who stresses the importance of *monozukuri* in Teikoku's product development.

"*Monozukuri* is very important for Japan, and to us specifically because our elders worked extremely hard to build the economy and country back up after such a devastating war and *monozukuri* is how they did that. We believe their soul and character is within the practices of *monozukuri*."