

# Engineering more efficient motors

Machinery-manufacturer ShinMaywa Industries, Ltd. is developing **DIRECT-DRIVE MOTORS THAT CAN POWER SPACECRAFT**, as well as technologies that impart special surface properties to materials

**As the aerospace and information technology industries grow**, so will the demand for direct-drive motors. With its roots in Japan's oldest aircraft manufacturer and a long history of making everything from thin-film-coating systems to garbage compactor trucks, ShinMaywa Industries, Ltd. is ideally positioned to meet this demand.

The company has developed a series of leading-edge, efficient synchronous direct-drive motors that are setting new industry standards. From machine tools to power-generation systems, the Built-In Direct-Drive series of alternating-current servomotors meets a wide range of application demands.

An example of ShinMaywa's innovation is its frameless motor. Compared to conventional drive systems, this motor features very low vibration and accurate rotational speed. The ability of ShinMaywa direct-drive motors to function on relatively low power with low loss is a crucial asset for operations in environments, such as space, where a continuous power supply is

**OUR DIRECT DRIVE MOTORS ARE IDEAL FOR SPACE-BASED APPLICATIONS DUE TO THEIR LOW WEIGHT AND HIGH EFFICIENCY**

not always available. The company is currently developing motors that are even more low loss and that can be used in various devices and machines for space missions.

"Our direct drive motors are ideal for space-based applications due to their low weight and high efficiency," says Fumihiko Shinoda, manager in the company's Automatic Machine Group. "They could be used to power vehicles or satellite antennas for planetary exploration."

ShinMaywa's direct-drive motors are the result of years of innovation and investment in cutting-edge engineering as well as materials science and technology. The company is developing technology for vacuum thin-film coating systems. These are used to impart special surface qualities to everyday products. ShinMaywa is also focusing on applications such as ion etching to remove polycrystalline diamond and physical vapor deposition from tool heads before recycling.

"In addition, we are developing nano-diamond technology that is suitable for realizing super lubrication, hardening materials and seeding diamond film growth on substrates," says Kensuke Uemura, chief executive officer



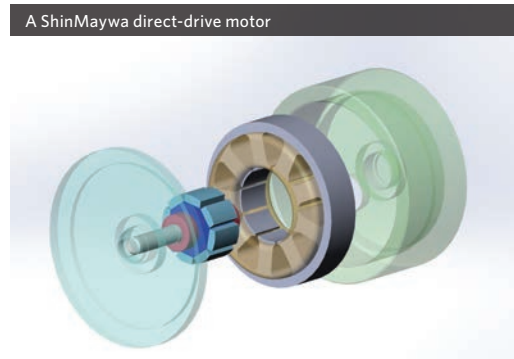
President and CEO Tatsuyuki Isogawa

of ITAC, LTD. part of the ShinMaywa group. "Meanwhile, our electron-beam technology can produce ultra-smooth surfaces such as dentures with titanium, replacing traditional hand polishing."

As it approaches its 70th anniversary in 2019, ShinMaywa will continue its tradition of innovation and craftsmanship while keeping its eyes fixed on the future. ■

**ShinMaywa**  
*Brighten Your Future*

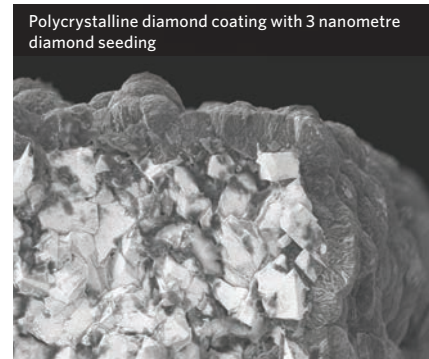
**ShinMaywa Industries, Ltd.**  
Wire Processing Systems Department,  
Industrial Machinery Systems Division  
3-2-43 Shitte, Tsurumi-ku, Yokohama,  
230-0003, Japan  
Phone: +81-45-584-1321  
Fax: +81-45-584-1320  
E-mail: dd.fa@shinmaywa.co.jp  
<http://www.shinmaywa.co.jp>



A ShinMaywa direct-drive motor



Dentures with an ultra-smooth surface



Polycrystalline diamond coating with 3 nanometre diamond seeding