

## **TMEIC Develops World's First Mica Insulating Tape Using Nanocomposite Technology**

**— Enables Smaller Rotating Machinery as well as Reduces Losses and Improves Efficiency**

TMEIC Corporation (President & CEO Akira Kawaguchi; hereinafter, "TMEIC" or "the Company") has developed the world's first<sup>\*1</sup>, nanocomposite mica insulating tape using nanocomposite technology<sup>\*2</sup>. By incorporating this tape into the insulation systems of high-voltage rotating machinery, TMEIC enables more compact, higher-efficiency motors and generators.

TMEIC has independently developed<sup>\*3</sup> a technology to uniformly disperse the small nanoparticles embedded in mica insulating tape throughout the insulation system. Applying this technology, the Company has created nanocomposite mica insulating tape with a reduced insulation-layer thickness compared to conventional mica insulating tape.

The benefits of using this tape in rotating machinery are as follows.

### 1. Compact, higher-efficiency rotating machinery

- (1) By embedding nanoparticles, the insulation layer is reduced in thickness, enabling more compact rotating machines.
- (2) Reducing the insulation-layer thickness increases the copper fill factor in the stator coils, suppresses copper loss and improves machine efficiency.
- (3) Applying this tape, a synchronous generator (800 kVA – 6.6 kV – 1000 min<sup>-1</sup>) developed in September 2025 achieved approximately a 10% size reduction, 20% reduction in copper loss and 0.2% efficiency improvement compared with conventional models.

### 2. Efficiency improvement for existing machinery

- (1) By applying nanocomposite mica insulating tape during stator coil replacement of existing machines, the benefits described in 1- (2) above can be achieved.
- (2) Moreover, the tape developed by TMEIC is easy to handle and transport, allowing maintenance and repair to be carried out at local service facilities.

Comments by Executive Officer and Vice President Hideki Iwanaga, Rotating Machinery Systems Division:  
"TMEIC has developed the first synchronous generator to practically apply nanocomposite technology, which is attracting attention across various fields. We aim to extend this technology broadly across our rotating machinery lineup, delivering high-energy-density, high-efficiency products to our customers and contributing to the realization of a carbon-neutral society."



Figure 1. Synchronous generator (800 kVA – 6.6 kV – 1000 min<sup>-1</sup>) developed by TMEIC

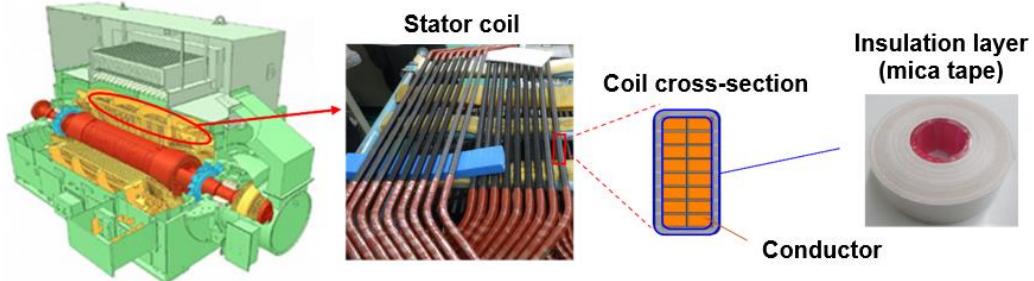


Figure 2. Application areas of nanocomposite mica insulating tape

Notes:

1. Based on TMEIC research, December 2025.
1. Nanocomposite technology involves mixing extremely fine particles (approximately 1–100 nm) into another material. Compared with mixing conventional micron-sized particles, this technology can significantly enhance mechanical strength, electrical insulation, heat resistance and durability.
3. Patented by TMEIC.

**Media inquiries:**

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In order to respond to the needs of manufacturing sites that serve as a foundation for supporting society, TMEIC always sets its eyes on the future of industry, society and the environment as an industrial systems integrator striking a balance between the sustainable development of society and the global environment. TMEIC will contribute to manufacturing and environmental management through leading-edge technologies based on its core technologies of rotating machinery, power electronics and engineering.