



## ELECTRIFIED AIRCRAFT PROPULSION (EAP)

# Filling a Need for Efficient Electrical Insulation

To meet the needs of electrified aircraft, lightweight electrical insulation can help transport heat more effectively and improve aircraft safety at high altitudes.

## The Challenge

As electrical currents run through wires and cables, buildup of heat can negatively impact performance and safety. Current state-of-the-art insulation does not effectively remove excess heat or prevent electrical arcing, which occurs when an electrical current flows through the air between two conductors. This creates a potential safety hazard, especially as electric aircraft operate at high altitudes with high-voltage electricity.



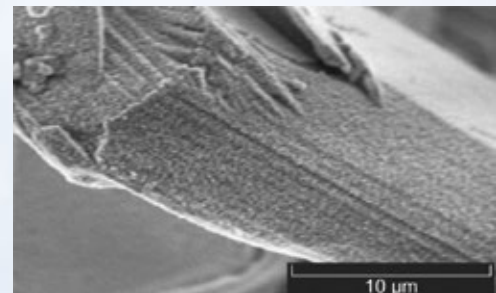
*New electrical insulation will help meet the needs of high-performance electric machines powering electric aircraft. Pictured: Illustration of NASA's EAP advanced subsonic aircraft.*

## BENEFITS OF NEW INSULATION:

- ✓ Increased aircraft efficiency
- ✓ Thinner and lightweight
- ✓ Improved high-altitude safety
- ✓ More efficient heat transfer

## New Design Technologies

New electrical insulation development explores the use of fillers, such as boron nitride, to help make insulation thinner and more lightweight. These fillers offer high thermal conductivity, enabling better transfer of heat, and are electrically insulating to prevent electrical arcing events. Research and development will play a key role in improving safety measures and ensuring optimal performance as electric aircraft take flight.



*Coated hexagonal boron nitride platelet used in new electrical insulation development.*

To learn more, visit <https://go.nasa.gov/3rZkiwy>.