



## TWISTACT: ENABLING MORE EFFICIENT LARGE-SCALE WIND TURBINES

*Twistact technology is a fundamentally new type of rotary electrical contact that eliminates the two physical degradation processes—sliding contact and electrical arcing—that limit the performance of traditional rotary electrical contacts.*

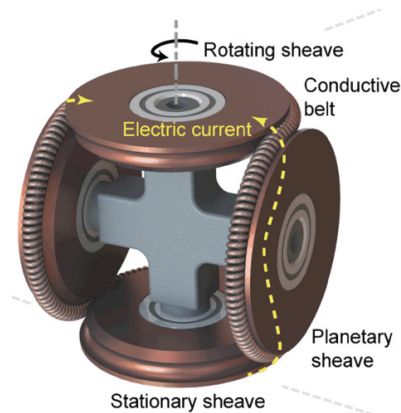
### OVERVIEW

Twistact technology comprises a pure-rolling-contact device that transmits electrical current between a stationary and rotating frame (or two rotating assemblies having different speeds and/or direction of rotation) along an ultra-low resistance path (e.g., 1 milliohm). Twistact devices accomplish this pure-rolling-contact galvanic connection using a flexible, electrically conductive belt and a matching set of epicyclic sheaves. Laboratory testing has proven that a single Twistact device will be capable of operating over the full 30-year service life of a multi-megawatt direct-drive wind turbine without maintenance or replacement. Having completed all of the milestones of its six-year R&D program on Twistact technology, Sandia National Laboratories is now ready to work with generator OEMs to assist with the transfer of Twistact technology into next-generation direct-drive wind turbines. Sandia is also open to partnering on the development of high-rpm Twistact technology for applications such as electric vehicles or doubly-fed induction generators.

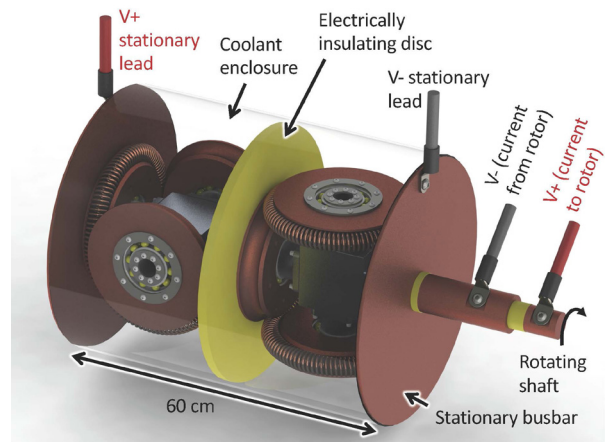
### APPLICATIONS

Sandia's Twistact technology has a wide variety of potential applications, but was initially motivated by the need to eliminate rare earth magnets in utility-scale direct-drive wind turbines.

- Wind turbines
- Synchronous motors and generators
- Doubly-fed induction generators
- Electrified railways
- Radar towers
- Grounding of rotating assemblies (e.g. lighting protection)
- Brush/slip ring replacement in existing applications



*Basic principle of Twistact operation.*



*A 2-channel Twistact device for a multi-megawatt direct-drive wind turbine application.*

### TECHNICAL BENEFITS:

- Eliminates reliance on rare earth magnets
- No maintenance or replacement costs

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