

WINDTC™

Torsional Control *Retrofit for Wind Turbines*

Control your gearbox loads to control your gearbox life!

Extend the life of your gearbox! The WindTC™ is an innovative torsional control for wind turbines. The torque limiter offers standard forward torque limiting but has a reverse torque limiter that is significantly lower. This unique mechanical control reduces damaging loading in your drive train.

With the WindTC™ in your turbine, you get reduced magnitude spikes, shorter duration events, improved bearing alignment and increased gearbox life!

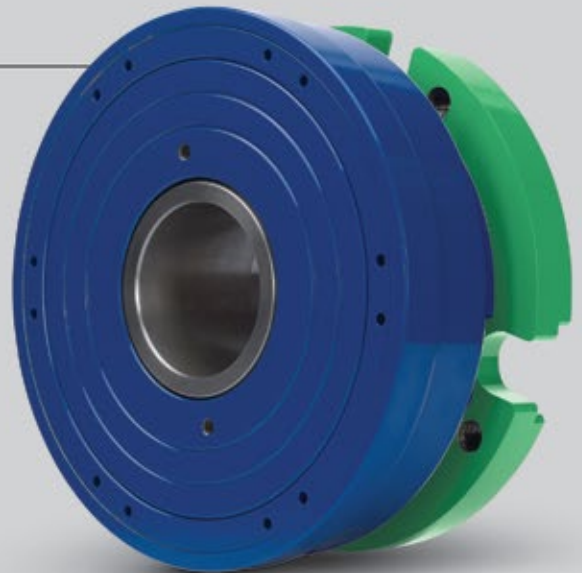
In all turbines, very large transient events occur in the drive train.

These events include:

- Grid loss
- Grid fault
- Pause events
- Braking
- Control malfunctions
- Wind gusts

Despite much progress by gearbox manufacturers and bearing suppliers, bearings and gearing continue to fail, costing up to \$250,000 to repair or replace the gearbox. All of the incremental improvements have not been able to address the dynamic loads that a wind turbine gearbox and its bearings will encounter.

Axial cracks and other damage in bearing raceways have become the major cause of premature gearbox failures in the latest generation of wind turbines, shortening life to as little as 1-2 years once it is initiated. Research and field application have shown that the torque reversals and impact loads are a leading cause of this damage. Only the WindTC addresses those loads.

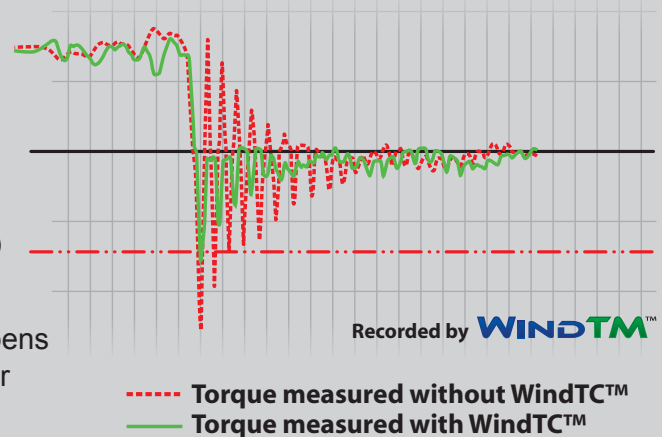


WINDTC™ Torsional Control Retrofit for Wind Turbines

The WindTC™ is effective in mitigating the damaging loads on the wind turbine gearbox from harsh negative torque. These loads are particularly bad for bearings in the case of sudden shocks as they do not allow time for the rollers to reposition as they accelerate into the load zone. Impact loading on the skewed rollers creates high stress and high strain rates just below the surface of the inner raceway. These impacts can create super hard white etch area (WEA) inclusions that will propagate axial cracks.

The WindTC reduces the magnitude of the events and dampens the system quickly." It acts as a mechanical "snubber" to your driveline, similar to an electrical snubber for voltage spikes.

Actual field results of WINDTC™



Features:

- Retrofits to existing turbine
- Adaptable to many coupling designs
- Designed to drop into current drive train spacing
- Mounts to the generator shaft

Benefits:

- Forward torque limiting
- Reverse limiting as low as 25% of nominal torque
- Extends gearbox life
- Reduces fatigue stresses in the entire drive system
- Dampens overall drive train vibration

