

TERALOOP

euspen Talent Programme Challenge

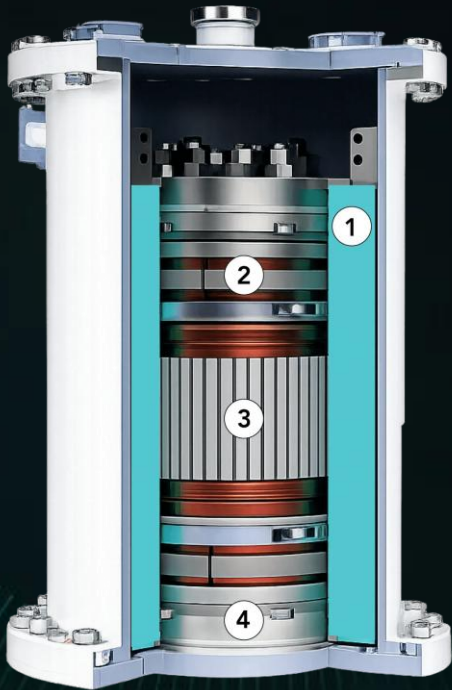
Backup bearing design for a shaftless magnetically levitated high-speed flywheel.

30th September 2026

ABOUT TERALOOP

Manufacturer of Kinetic Energy Storage Systems

Finnish engineering for the energy transition



Teraloop 250 kW flywheel.

1. Rotor 2. Active Magnetic Bearing (AMB) 3. Electric motor 4. Backup bearings

Technology

- *Based on traditional flywheel*
- *AMB levitated*
- *Vacuum environment*
- *High speed*
- *High power*

Typical applications

- *Power dense applications*
- *High energy throughput*
- *Grid quality*
 - *Frequency control*
 - *UPS*
 - *Voltage sag*
 - *Power balancing*



CHALLENGE

Backup bearing design for a shaftless magnetically levitated high-speed flywheel

Problem background

There is a chance that AMB levitation fails and therefore AMB systems are equipped with backup bearings.

In the Teraloop case, the flywheel is shaftless “outer runner” type of a rotor. This leads to a problem that commercial off-the-shelf product are not available, and backup bearings must be custom-made.

Problem description

In this challenge, teams will design new concept for flywheel backup bearings to tackle problems related to rotor stability during coast down and aiming to maximize safety and minimizing the damage in a flywheel unit.

