**Z-DAMPER** is a breakthrough technology for vibration damping. This device developed by MAG SOAR is a magneto mechanism matching mechanical impedances and providing a multiplier effect to damp vibrations of both low and high frequency ranges more effectively.

- Motion multiplication of an input vibration by a contactless linear magnetic gear.
- For a gear ratio \( n \) the fast stage moves \( n \) times faster than the input/slow stage.
  - Highly effective even for low frequency and sub-millimetre amplitude.

Depending on the relation between the magnetic teeth, the “fast stage” moves up to 10 times faster than the “slow stage”. Simultaneously, the force exerted by the slow stage is up to 10 times larger than that of the fast stage.

\[
X_{\text{FAST}} = n \cdot X_{\text{SLOW}}
\]
Z-DAMPER
Z-Coupled Full System for Attenuation of Vibrations

Operational Temperature Range: -50°C to 250°C
Survival Temperature Range: -70°C to 300°C
Max. Damping Force at 25°C: 8 kN
Max. Input vibration amplitude: 5 mm
Gear ratio (n): 7:1
Natural Frequency (most efficient operational point): 12 Hz
Equivalent viscous damping coefficient (200°C, 12Hz): 35Ns/mm
Maximum dissipated power: 600 W
Envelope (DxL): 100 x 490 mm

Z-Damper is especially optimized for damping aircraft and aerospace mechanisms vibrations. Z-Damper is provided with a finned copper shell where heat is generated by eddy currents and released into the air.

APPLIED
AERONAUTICS & SPACE
INDUSTRY
ANTISEISMIC
LARGE STRUCTURES
DEFENCE

APPLICATIONS

Z-TVA
LIGHT ULTRA-EFFICIENT TUNED VIBRATION ABSORBER

Operational Temperature Range: -50°C to 80°C
Survival Temperature Range: -70°C to 300°C
Max. Damping Force at 25°C: 5 kN
Max. Input vibration amplitude: 5 mm
Gear ratio (n): 7:1
Natural Frequency (most efficient operational point): 19 Hz
Equivalent viscous damping coefficient (200°C, 12Hz): 2200N/mm
Maximum dissipated power: 60 g’s
Envelope (DxL): 80 x 490 mm
Weight: 9 Kg
Inertial mass: 3 kg
Potential Weight Saving (with regard to classic TVA): 90%

Z-TVA takes advantage of the impedance matching to increase the inertial mass acceleration proportionally to the amplification factor.

APPLIED
EARTHQUAKE PROTECTION
LARGE STRUCTURES
ENGINES
WIND POWER GENERATORS
SPACECRAFTS

APPLICATIONS

MagSoar is a company dedicated to providing advanced vibration control solutions for various industries and applications. For more information, visit www.magsoar.com or contact info@magsoar.com or sales@magsoar.com.

MagSoar: Leading the way in vibration control technology.
Related Papers

- **High-performance magnetic gears development for space applications**, ESMATS, 2017
- **Mechanical Impedance Matching Using a Magnetic Linear Gear**, Shock and Vibration, 2017

**Force relaxation and hysteresis in a frictionless superconducting magnetic bearing**, INTERNATIONAL JOURNAL OF SURFACE SCIENCE AND ENGINEERING, 2014


Videos

**Z-DAMPER - A breakthrough vibration damping technology**: https://www.youtube.com/watch?v=hswcmO7wiBA&t