Project title: Researches on the achievement of ecologic technologies based on magnetostrictively induced vibrations with a view to reduce the energy consumptions having as effect the global warming

No. of phase: **3 Designing of magnetostrictive vibrator prototype**

Planned objectives:
- Final company standard - magnetostrictive vibrator
- Design of magnetostrictive vibrator prototype

Description of the activity:
Activity III.1 **Completion of the referential**

Within this activity the Company standard "Vibratory stress relief equipment with magnetostrictive vibrator" was drawn up.
The constructive and functional characteristics, the description and the operation, the technical quality conditions, the rules for quality verification which must be accomplished by the stress relief equipment were established.

The obtained results: Company standard – 1 pc.

The stage of accomplishment of planned objective / the finalizing form (of the activity within the phase):
The planned objective was accomplished and finalized as "Company standard – Vibratory stress relief equipment with magnetostrictive vibrator".

Activity III.2 Designing of magnetostrictive vibrator prototype

Within the activity a magnetostrictive actuator was studied and designed to generate mechanical vibrations on the frequency range 0 – 500 Hz, necessary to relieve the mechanical stresses from ferromagnetic materials.

The general structure of magnetostrictive actuator:
- the magnetostrictive core
- the magnetizing coil
- the permanent magnet with cylindrical coaxial geometry
- the elastic element to generate the pre-clamping force
- the case of the coil
- the case of the vibrator
- the plate of the vibrator
- the guiding segment
- the inertial mass
- the coupling disc

The functional characteristics of the designed magnetostrictive vibrator prototype:
- The maximum force: $1kN$.

- The maximum current: $4A$.
- The maximum supply voltage: in d.c.: $24V$.
  in a.c.: $100V$.
- The working frequency: $20 \div 500Hz$.
- The maximum power: $100W$ (d.c.), $500W$ (a.c.).
- The working service: continuous.
- Maximum linear displacement of the actuator (in d.c.): $0,5mm$.
- The medium over-temperature of the coil: $50^{\circ}C$.

The obtained results: Design – 1 pc.

The stage of accomplishment of planned objective / the finalizing form (of the activity within the phase):
The planned objective was accomplished and finalized as “Design of magnetostrictive vibrator prototype”.