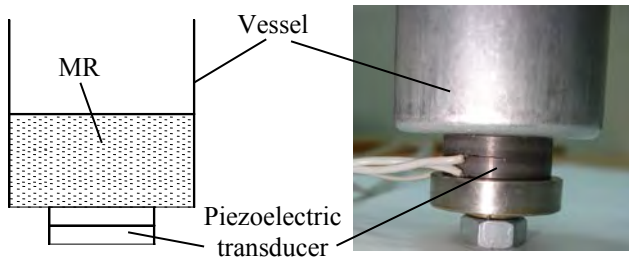


MECHATRONICS FOR PREVENT THE SEDIMENTATION OF THE MAGNETORHEOLOGICAL FLUID

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Introduction. Magneto-rheological fluids (MRF) consist of stable suspensions of micro-sized, ferromagnetic particles dispersed in a carrier medium such as silicon oil or water. When an external magnetic field is applied, the polarization induced in suspended particles results in the MR effect of the MRF. [1, 2].

MRF mixing systems. Magneto-rheological fluid MRF-140CG are very innovative material, which unfortunately sediment during approximately two weeks. Ferromagnetic particles are affected of gravitational force and gradually set on the bottom of vessel. As the result of this sedimentation phenomenon the working efficiency of MRF reducing. To ensure equipment's with MR operation, necessary to maintain the stability of fluid and following it stability of system. To solve this problem, we create several systems, witch supports rheological fluid homogeneity. Such designed systems are: a) MRF mixing using the multifunctional electromagnetic system (inside and outside of MR); b) MRF mixing creating running magnetic vortex field; c) MRF mixing using ultrasound (inside and outside of MRF). One of created systems with ultrasound transducer in presented in figure



1.

Figure 1 – MR fluid mixing, using ultrasound

Figure 2 – Model and real experimental stand

Experimental stand consist of test substance – MRF-140CG, vessel, piezoelectric transducer (figure 2). **Conclusion.** Such system is very appropriate for small volume mixing. After this experiment showed that the mixing structure is only partly right. During the experiment, measured the frequency and the change in the container by pouring the liquid Magneto-rheological and add gradually increasing the amount of liquid.

Literature

1. http://www.carbibles.com/suspension_bible.html
2. http://www.bose.com/learning/project_sound/bose_suspension.jsp