

RESEARCH OF MAGNETORHEOLOGICAL FLUID DAMPER BANDWIDTH

D. Mažeika (KTU PhD Student), E. Dragašius (KTU Researcher dr.).

Introduction. In researching process of MR fluid damper bandwidth, was used dynamic experimental setup where we can measuring damper dynamics characteristics (Fig.1 (a)). At the researching process, at first power supply was set to the maximum permissible current of the induction coil ($I = 1,5A$) and after that the induction coil have been connected and disconnected to power supply. The same at this researching process oscillations frequency was unchangeable and was set: $f = 1Hz$. So MR fluid damper was vibrating and when characteristic became unchangeable the induction coil was connected to power supply. After that we must wait till damping characteristic will be the same and recurrent then before. At this moment we disconnect power supply from induction coil and will be waiting till characteristic became unchangeable. After that we have been record by digital oscilloscope this characteristic (Fig.1 (b)) for the analysis. In this characteristic we were set the time t_1 and t_2 . Where t_1 is MR fluid particles connection time when the fluid was affected by magnetic field (induction coil was connected to the power supply), and t_2 is MR fluid particles mixing time when the fluid was not affected by magnetic field (induction coil was disconnected from power supply). At this analysis was found that $t_1 < t_2$ so it means that the MR fluid particles will be connected to magnetic lines in very short time ($t_1 = 5ms$), but when the magnetic field was terminated needs more time to stabilize damping characteristic, as it was prior when induction coil was excited ($t_2 = 25ms$). However these times are too short that MR fluid damper would be inappropriate for practical use.

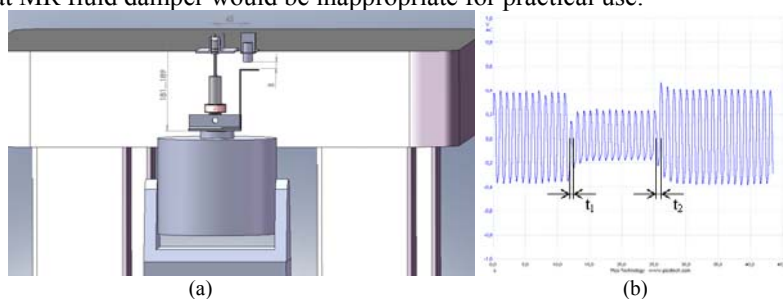


Fig.1 a) MR damper dynamic experimental setup, b) MR damper bandwidth result, when it was affected by 1Hz frequency oscillations.

Conclusion. Measured times are too short that MR fluid damper would be inappropriate for practical use.

Literature.

Pranas Žiliukas ir Rimantas Barauskas „Mechaniniai Virpesiai“, Kaunas „Technologija“ 2001m.