

ACTIVE MAGNETIC BEARINGS

A. G. Khalizeva – Sumy State University, group KM – 91
L.A. Denisova – EL Adviser

Magnetism is a class of physical phenomena that includes forces exerted by magnets on other magnets. It has its origin in electric currents and the fundamental magnetic moments of elementary particles. A bearing is a machine element that constrains relative motion between moving parts to only the desired motion.

There are two types of magnetic bearings: active and passive magnetic bearings. The most popular is the active magnetic bearings (AMB). This type of bearing operates with an alternative magnetic field. This field includes a core and a coil. The main principle of work is the levitation of shaft in a magnetic field. The main components of active magnetic system are: a radial bearing, a thrust bearing, supporting bearings and logic controller.

The most popular fields of applications of magnetic bearings are: high-power generators, precision measuring instruments, gyroscopes, test stands, high-tech equipment for the physical laboratories, machine tools with working rotating speed not higher than 100 000 r / min, cryogenics, gas generators, pump stations.

The main advantages of active magnetic bearings are: use in specific conditions as vacuum, sterile; high speed of rotating; contact is not available (the ability to work without mechanical friction and lubrication); work without seals (wide operating temperature range, the work in technical gas).

The main disadvantages of AMB are: they need safety-bearings, internal instability of the magnetic field; high temperature windings of bearing and the risk of occurrence of the phenomenon of saturation.

In a world of rapidly evolving technology magnetic bearings can be widely used, particularly in areas inaccessible to common bearings.

New Technology and Modern World: матеріали VII науково-практичної студентської конференції лінгвістичного науково-методичного центру кафедри іноземних мов, м. Суми, 22 травня 2013 р. / Відп. за вип. Г.І. Литвиненко. - Суми: СумДУ, 2013