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FRICTION EXPANSIONS AND ANTI-FRICTION MATERIALS IN FRICTION

Abstract: This article describes the types and significance of friction and antifriction materials used in our cars from friction and wear.

Key words: friction, friction, antifriction, mechanism, transmission.

ФРИКЦИОННЫЕ РАСШИРЕНИЯ И АНТИФРИКЦЫОННЫЕ МАТЕРИАЛЫ В ТРЕНИИ.

Аннотация: *В данной статье описываются типы и значение фрикционных и антифрикционных материалов, используемых в наших автомобилях, от трения и износа.*

Ключевые слова: *трение, трение, антифрикция, механизм, трансмиссия.*

One of the main parameters in the transfer of friction is the coefficient of friction. In this case, the coefficient of friction should be high. Otherwise, the movement cannot be extended or stopped. Due to the high coefficient of friction in the mechanisms of friction, the temperature in the friction zone is very high. Therefore, one of the following requirements for friction materials should be the main heat resistance. Friction mechanisms use mainly heat-resistant fiber-based material. Such materials include asbestos, fiberglass, and mixtures thereof with rubber.

Anti-friction materials are materials with a low coefficient of friction. The main parameters of antifriction materials are the coefficient of friction and the wear rate. Anti-friction materials have the following requirements:

- low coefficient of friction;
- thermal conductivity;

- electrically conductive;

- has high mechanical properties;

- very hard and plastic;

- The structure should be small.

As anti-friction materials: we use all types of metals and their alloys, ceramic materials, polymeric materials and composite materials based on metals from polymers.

Regarding the use of steel and cast iron in friction parts, high-carbon, chromium, low-carbon alloy steels and alloys resistant to corrosion and high temperatures are used for rolling bearings. The most commonly used materials for rolling bearings are the high-carbon chrome ball bearings 111X15 and SHX15ST. Corrosion-resistant grades are used for bearings operating in aggressive environments.

During thermal and chemical treatment, the thermal structure of capillaries must be obtained, the hardness of which is NV 148-207 for SHX15 and SHX15ST and NV 217 for 18XGT.

Among other types of materials, cast iron is the cheapest and most widely used as antifriction materials. Cast iron is generally much better, more resistant to corrosion and widely used in sliding parts. Grades of anti-friction cast iron:

- a plate cast graphite gray cast iron ASF;

- high-strength AVCh with glabular graphite;

- a pig-iron hammer with cotton graphite ACHK;

- such as anti-friction cast iron CHM.

Cast iron bearings are used with shafts of high rigidity (above NKS 55). Softer anti-friction cast irons (A4SZ, A4V2, A4K2) are used for softer shafts.

As for the disadvantages, due to its fragility and high stiffness, it makes sliding by itself difficult and works with high demands on the deformation of the shaft axis. The materials used for plain bearings can be divided into conditionally fragile (2NV50), soft (NV 50-100) and hard (INV 100) materials.

Anti-friction non-ferrous metals and alloys include brittle babbits, lead bronze, aluminum alloys and silver. Anti-friction softeners include tin bronzes and tin-lead-zinc bronzes. Solid anti-friction materials include aluminum-iron bronze and anti-friction cast iron. High-speed, high-speed bearings often operate under fluid hydrodynamic lubrication and typically use flexible materials. Recently, these materials have been coated with tapes for the production of fast and mostly interchangeable parts.

Babbits are alloys based on soft materials (tin, lead, zinc, aluminum, etc.), which have solid additives on a brittle basis, which ensures their wear resistance.

As antifriction materials, more lead bronze is used than bronze. They contain copper and lead, a small amount of tin, zinc, nickel and silver, and bronze is harder and more durable than babbits.

Silver is used in demanding heavy duty vehicles.

Iron graphites (97 ... 98% iron powder, 2-3% graphite powder and a small amount of copper and lead) have the best characteristics.

Polymer-based materials are used in semi-fluid lubrication with low speeds, low loads and periodic lubrication during operation. They can be used in one-time periodic lubrication or in oil-free conditions. Can be lubricated with non-working water. Plastic bearings can be made of phenolic (textemite), polycarbonite (diflan), paliamide (nylon, nylon), fluoroplastic (teflon).

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