



TSK-SM – THE PRINCIPLE OF OPERATION, THE EFFECT, THE SAFETY ISSUES

The Russian Federation Patent No.2415176

TSK-SM is the material, which increases the durability and improves the antifriction quality of the metallic friction surfaces.

THE PRINCIPLE OF OPERATION

Normally, TSM-SM is put into a friction unit together with a regular lubricant*. Its particles are very small (ca. 3-20 micrometer) and the technology of its grinding makes them chemically active, as broken molecular bonds are many.

The combination of high temperatures and pressures in the contact spots creates a favourable environment for the particles of the material to enter into a physical-chemical reaction with the friction surface. As a result, a surface layer, which is several times harder than the original, is being formed in the locations of the maximum deterioration.

Surface defects are “healed” in a natural way of operation. Moreover, the particles of the material bind the active hydrogen in a friction zone, thus preventing from its destructing effect on metal (hydrogen deterioration).

The process of creation of the layer is self-regulated, therefore in problem areas the temperature reaches its maximum, and that creates optimum conditions for the particles in the lubricant to react with the metal surface.

The particles of the material practically have no abrasive properties, thus they do not affect friction surfaces as far as grinding is concerned hence the friction unit is not destroyed for a momentary effect or short-term gain.

THE EFFECT

The introduction of the material into the lubricating environment results in multiple increasing of the components’ lifetime, economies of their maintenance, repairs and replacements, which cannot be achieved otherwise. The offered technologies are of a “non-dismountable” sort whilst the bedding-in of the material is being made, as a rule, in regular operating modes of machines and equipment.

The antifriction characteristics of the surface layer being formed and the improvement of the geometry of the friction surfaces reduce the friction ratio**, particularly in the event where the lubricant are absent or imperfect. It is manifested completely when machines are started and stopped, as it prevents from creation of tears.

The decrease of the friction ratio, on the one hand, additionally prevents from the abrasion of metal and extends the lifetime of the unit, on the other side it economizes the energy paid for the friction. Other than economy on en energy carriers, which is very essential in most cases, the heating of the friction unit is decreased, and the vibration/noise is lowered.

The ratio of the cost of TSK-SM materials against the works of its introducing into a friction unit to the effect shown, makes it possible to assess the competitiveness, in the usage of various friction units problems solving, as the high one and even unique one.

THE SAFETY ISSUES

The technology used is absolutely safe for the equipment, as the material is not abrasive and it cannot change the properties of the lubricant environment, does not interfere with acting of additives contained herein and – as being activated only by triboprocess and in view of some peculiarities of the physicochemical process' behaviour – is not able to worsen the condition or the geometry of friction surfaces.

The material utilized as the base for the ore raw materials, is non-toxic, non-radioactive and non-inflammable. One need not special protective means in order to manipulate with the material, and the contact with a human skin is absolutely safe for a human being.

* putting of the material (forming of a layer) on the surface of elements without friction processes, including new ones, requires special equipment.

** the relative value of the decrease of the friction rate will depend on the condition of the unit and will reach its maximum on the units of the medium deterioration factor

© 2012 NESK Ltd., <http://nesk-tsk.ru>