



Advanced Green Expertise

*BREATHING
NEW LIFE
INTO
MACHINES*

*TECHNOLOGY OF
ENERGY RESOURCE
CONSERVATION*

Adgex is in the business of developing innovative projects in the fields of machinery, infrastructure, mining, industrial and energy sectors including design & eco-friendly transportation solutions.

Our business principles are creation of opportunities and realization of highly-effective solutions in design, acquisition, development and promotion of our products & services globally.

KEY CUSTOMER BENEFITS

- Improved efficiency
- Improved performance (mechanical and hydraulic)
- Increased Mean Time Between Repairs (MTBR)
- Reduced operating and maintenance costs (fuel & energy)
- Management of wear and tear dynamics
- Guaranteed Results

Technology of Energy Resource Conservation (ERC Technology) is an innovative creation technology of brand new polycrystalline friction surfaces. ERC is designed for restorative repair and maintenance of machines and mechanisms at standard operation by means of origination of wear resistance layer on the surface of friction pairs. Application is feasible at any serviceable mechanism.

Our Company produces special mixtures under the ERC technology and consequently forms (reconstructs) new friction surfaces with unique features.

GLOBAL ENVIRONMENTAL ISSUE

Reduction of damage caused by friction forces and expressed by untimely obsolescence and complete functional loss of equipment, overestimated consumption of energy resources and environment pollution form global issue of the widest scale.

Traditional technological ways of friction decrease and conservation of equipment operational life are quality improvement of surfaces treatment and application of intermediate layer (lubricants). But lubricant itself has never been sufficiently effective third matter, splitting friction surfaces at machines and mechanisms operation.

At present, technologies related to treatment of friction assemblies during operation in purpose to change tribotechnical features of friction surfaces stimulate a great interest. Application methods of wear resistance surfaces, creating basis for both restoration of operative engine parameters and essential improvement of operational properties are strongly developed.

Machinery is fundamental to the function of industrial operations. Having high functioning equipment which is regularly maintained is a large factor in the smooth running of a project and increasing productivity. However, many companies are using old machinery which is usually a ticking time bomb with a history of glitches and failures. Not only is this unsafe, but the breakdowns mean downtime while equipment is getting repaired and time means money, so the result is revenue loss.

Breakdowns in drivers are a regular occurrence on the mine site and can cost the business thousands of dollars. For example, hydraulic power and belt drive failures cause up to 47% of downtime at mining operations.

We offer our technology and material to the companies, willing to reduce expenses relating to manufacturing of any types of products, equipment repair, increase service life machinery and non-failure operation of technical equipment, reduce the energy & fuel consumption and improve ecological safety.

Adgex's technology modifies the universal, motor, transmission, hydraulic oils and consistent lubricants, which restore operational parameters of machines and mechanisms, estimated to give significantly better service life. This outcome considerably simplifies application of ERC technology at medium to large companies in any fields of operations.

The basis for renovation of friction metal surfaces at micro-level is the process of forming polycrystalline layer from elements of surface metal layer and components of ERC-composition.

The origination process of a new friction surface is conducted in several stages:

- Supplementary particles crushing of ERC-composition at friction of parts
- Release of temperature
- Creation of conditions for a new surface forming.

Protrusions of micro-relief supplementary break down particles of ERC-composition.

In contact spots of protruded micro-roughness on friction surfaces, short-term local increase of temperature, necessary for generation reaction of a new polycrystalline surface, arises.

Micro-relief cleansing and hardening of ERC particles in surface hollows.

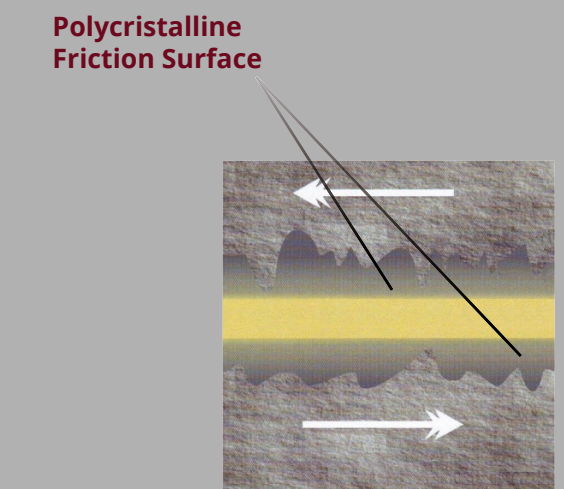
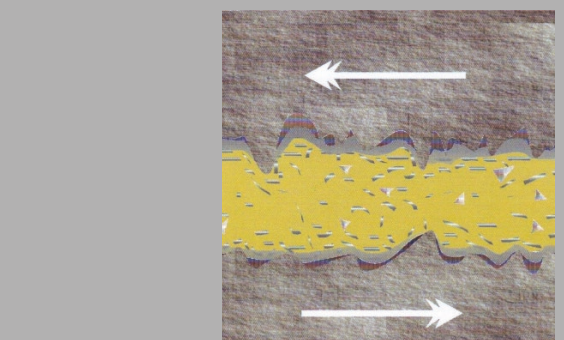
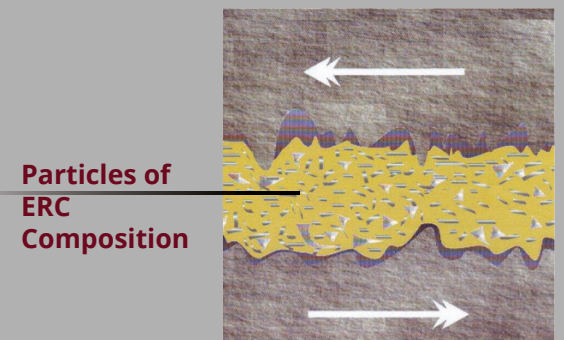
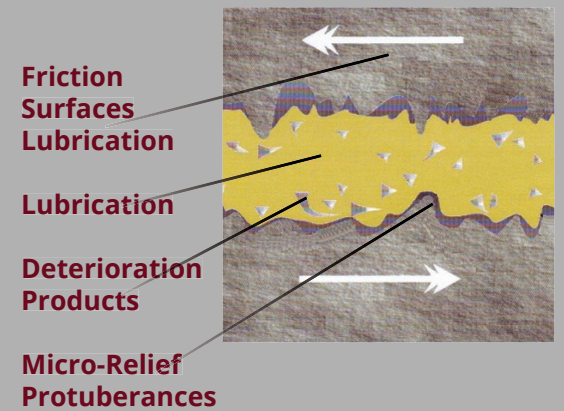
Particles of ERC-composition, available in lubricant layer, cleanse hollows of micro-relief as a result of chemical and physical processes.

Straightening and origination of a new polycrystalline surface.

Protrusions of micro-relief supplementary break down particles of ERC-composition.

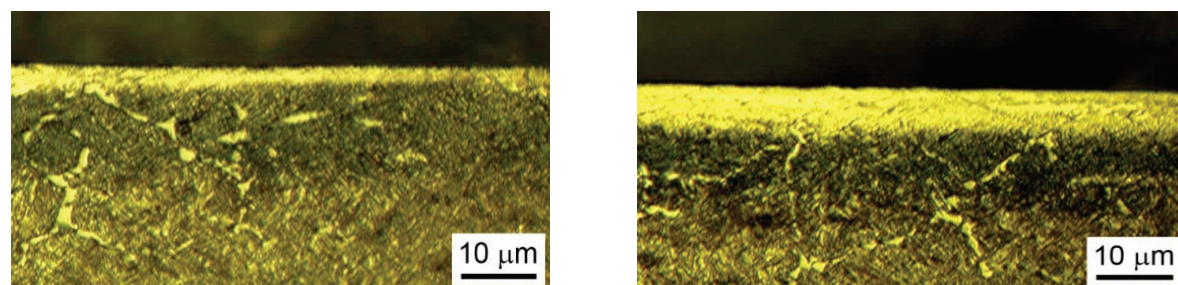
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ADGEX RESEARCH RESULTS



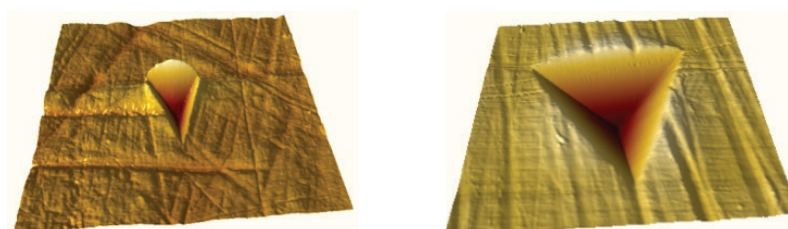
IMPROVEMENT OF PHYSICAL AND MECHANICAL FEATURES OF FRICTION SURFACES

VISUALIZATION OF SURFACE LAYER



Picture magnification of new surface, formed on the surface of cast-iron leverage of the Opel Corsa valve, revealed by selective chemical etching, Optical microscopy.

CHANGING OF MICRO-HARDNESS

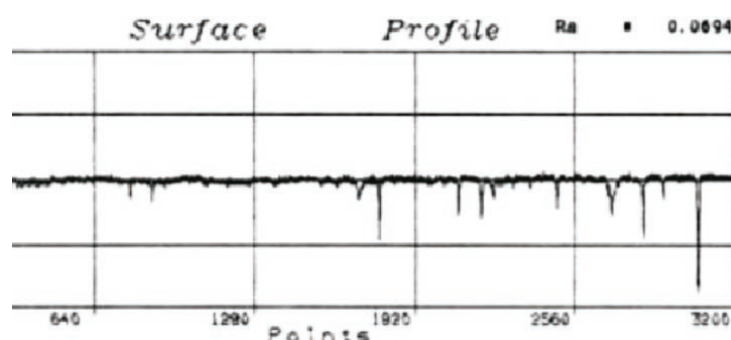
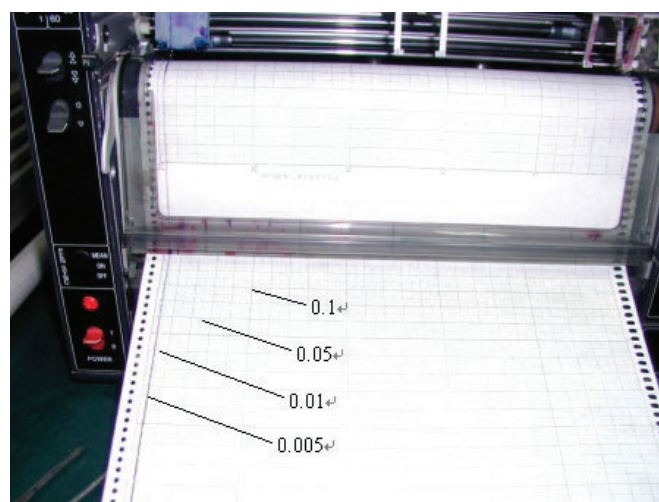


Typical pictures of nanoindenter prints, obtained in contact mode of atomic force microscopy,
a) Main metal, relief height 790 nm;
b) layer, formed on the friction surface, relief height 270nm.
Scan dimensions 9x9µm². Force 30mN.

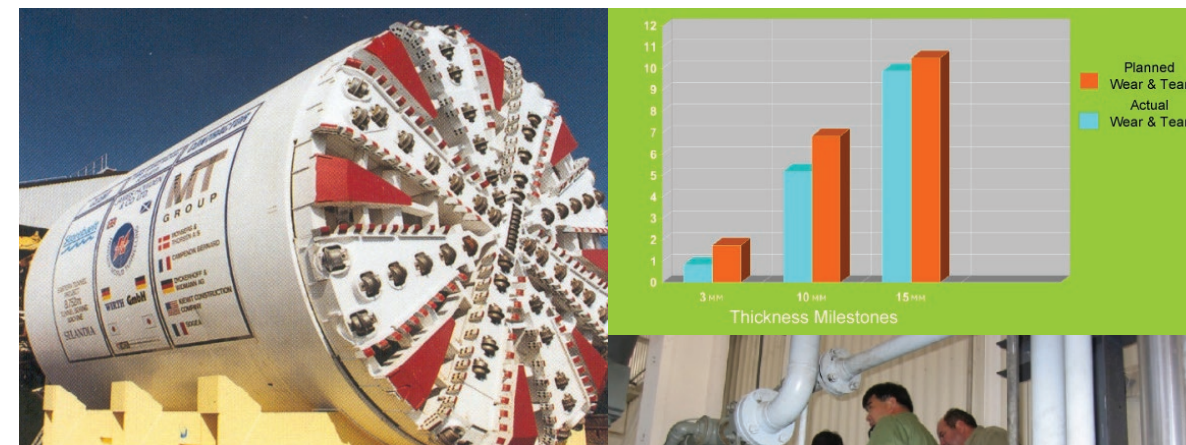
TEST OF COMPOSITION AT FRICTION MACHINE "FALEX"

Anomalously low friction coefficient.

$R_a = 0,0694!$
Extremely high surface smoothness!



OBJECTS OF SUCCESSFUL IMPLEMENTATION OF ERC TECHNOLOGY



The following data is acquired in virtue of obtained results for intensiveness on deterioration of teeth for 100 meters of driving with ERC reconstructors:

- Growth reduction of wear and tear intensiveness for teeth height of drive gear for tunneling complex "VIRT" approximately by 5.6 times.
- Teeth material augmentation along the drive gear width of tunneling complex "VIRT" for 0.11-0.17mm. Total growth reduction of wear and tear intensiveness for drive gear of tunneling complex "VIRT"



Gas Compressor treatment of «Ajax» Company, USA

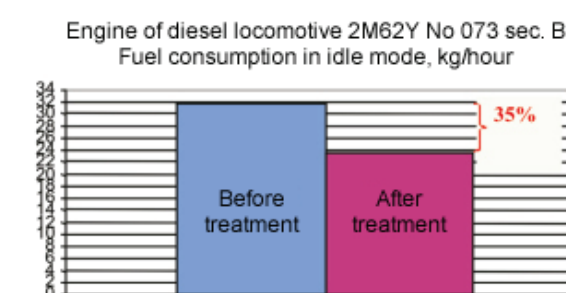


Gas pressure before treatment by ERC compositions

Main engine Skoda 6-27, 5A2L No 07820110
Fuel consumption kg/hour



Engine of diesel locomotive 2M62Y No 073 sec. B
Fuel consumption in idle mode, kg/hour



Gas pressure after treatment by ERC compositions

OBJECTS OF SUCCESSFUL IMPLEMENTATION OF ERC TECHNOLOGY



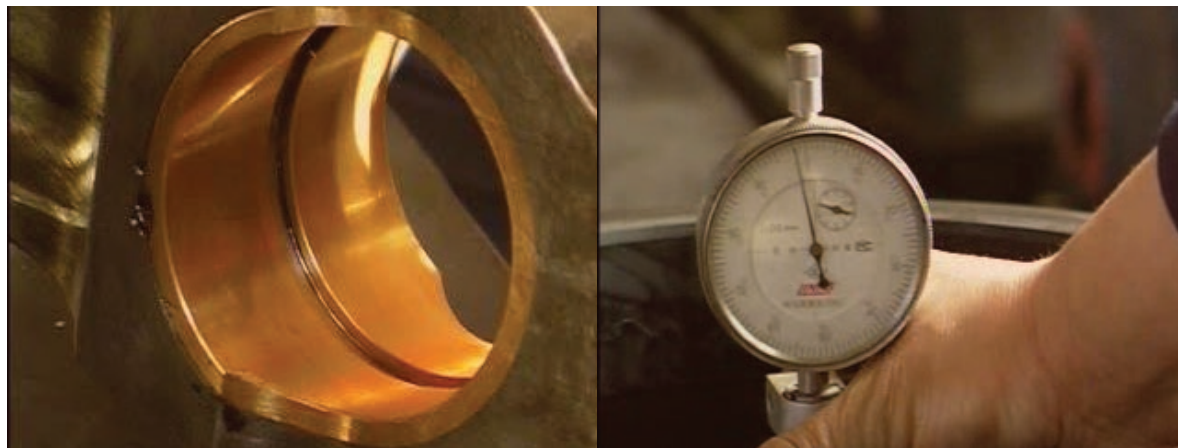
Large hauler HITACHI
2-stroke engine 1800 hp

TEST RESULTS

Once reconstructions under the ERC technology had been applied to the internal combustion engine, the hauler operated 1392 hours without OIL REPLACEMENT in engine. (Regular oil replacement – each 320 operation hours)

Drawing size of cylinder sleeve – 146 (+0.08 +0.019)mm. Internal size of cylinder sleeve before treatment – 146 (+0.10 +0.15)mm.

Internal size of the sleeve after 1392 operating hours of standard operation is 146 (+0.08).



NIL DETERIORATION!

These photographs illustrate parts condition of one chosen diesel locomotive internal combustion engine after its treatment by reconstructions under the ERC technology and total service life 660 thousand km. Parts dimension are fixed within the limits of a NEW engine dimensions.

In 2002, in Beijing division of China railroad, 100 of diesel locomotive engines were treated under the ERC technology.

By the end of 2008, their service life was approaching to 1,200,000 km. without engine overhaul (regular overhaul – each 300,000km.). Therefore, service life of engine oil is increased by at least 2 times. Fuel consumption in average equals to 10-12%.

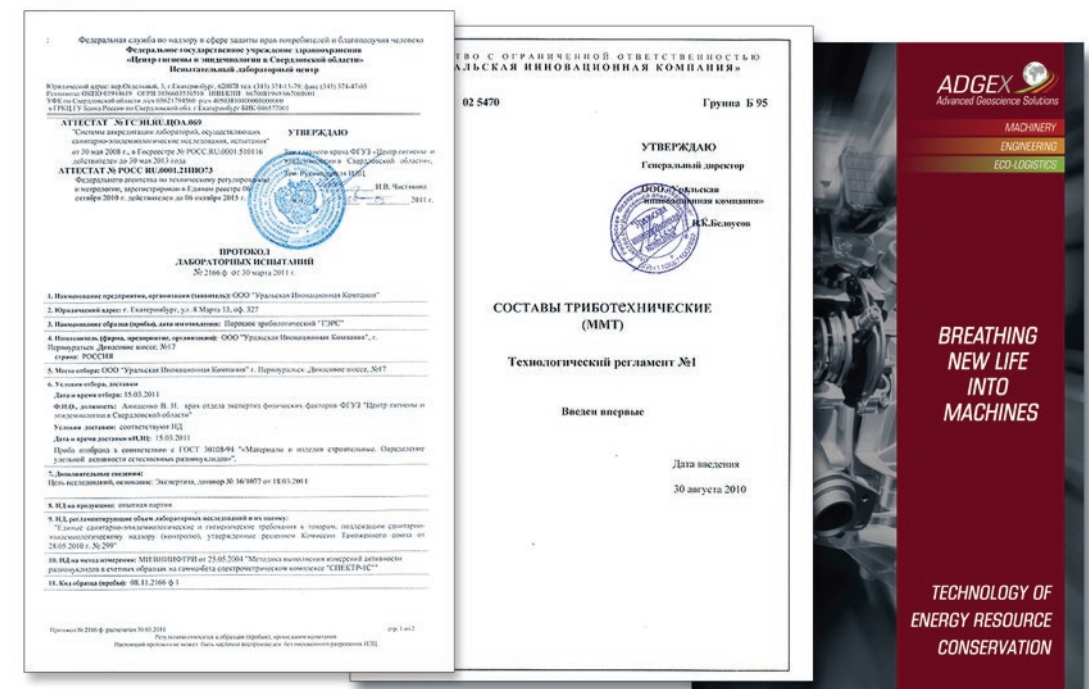
ECONOMIC EFFICIENCY OF ERC TECHNOLOGY APPLICATION

Opportunities provided by ERC Technology:

- Restore operating parameters of deteriorated machines, assemblies and mechanisms in regime of standard operation;
- Maintain restored operated parameters during the all course of technical equipment operation;
- Cutting OPEX;
- Estimated to extend engine oil service life by at least 2 times;
- Estimated to extend transmission oil service life by at least 4 times;
- Estimated to reduce engine fuel consumption by at least 8-12%;
- Estimated to reduce power consumption by 8-15%;
- Estimated to reduce exhaust gases toxicity of automobiles.

Based on extensive research and practical experience in application of energy and resource conservation technology ERC, Adgex offers to businesses in industry, energy and transport, to apply ERC compositions in terms of “manual” treatment of different mechanisms, or en masse via purchasing of oil and lubricants, already containing ERC compositions.

Adgex carries out follow-on supervision for correctness of products usage on technical equipment.



Adgex has its own manufacturing of ERC compositions and ready-for-service oils and lubricants with content of ERC compositions. Compositions are produced under our own technological schedule.

Adgex guarantees quality of production and effect of treatment for the first year operation of equipment and 1 year operation of automobile without limitation of mileage.

Compositions are environmentally friendly.



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