Biotechnology for Cleaning Heating Systems and Thermal Equipment

General description of technology:

This technology, using bio composition BIZ-1 (hereinafter -BIZ-1), effectively and safely allows for the cleaning of equipment and systems from fouling deposits to practically return to their factory state.

The technology of sediment removal with the help of BIZ-1 was patented by Russian scientists in 2003 (patent No. 2213922 of 10.10.2003) and currently has no analogues in the world.

BIZ-1 is a product of highly-productive modified lactic acid bacteria and is intended for technical purposes. The bio-organic composition of BIZ-1 is a fermentation product and ferments pure cultures of lactic acid bacteria strains, which as a result of biochemical processes is hydrolyzed to monosaccharides, and generates more than 30 organic acids (formic, oxalic, citric, tartaric, butyric, lactic, propionic, succinic, malic and others). The resultant organic acids react with the layers of sediments and sludge, salts are converted from insoluble to soluble, and are rinsed off with water. The cleaning of surfaces from deposits is carried out under conditions of circulation of the working solution along a closed loop.

The innovative biotechnology of BIZ-1 makes it possible to solve the problems of efficient cleaning of equipment in oil refineries, oilfield infrastructure, raw heat exchangers, and pipelines. By applying various strains of bacteria, the BIZ-1 composition converts complex hydrocarbon chains from long to more simple, and heavy hydrocarbon fractions into light compounds. In this case, the product is obtained as a result of purification either for utilization or for further processing, depending on the task.

Advantages of using the BIZ-1 technology:

- ✓ High cleaning efficiency (plasticizes any kind of deposits, removing up to 98 -100% of sediments).
- ✓ Passivity to materials of the cleaned surfaces: metals, plastics, rubber.

- ✓ The possibility of cleaning hard-to-reach areas, the ability to clean branched pipelines and small-diameter pipelines.
- ✓ A closed scheme for cleaning pipelines and boilers (without mechanical analysis of equipment).
- ✓ Extends the service life of equipment and pipelines 2-3 times.
- ✓ Increases heat transfer through the heat exchange surface.
- ✓ Increases heat output (heat savings of 30-40% or more).
- ✓ Reduces thermal stresses in metals caused by overheating.
- ✓ Restores the capacity of pipelines and channels.
- ✓ Reduces operating costs associated with the operation of pumps (reducing electricity costs by up to 50%).
- ✓ Reduces the cost of fuel.
- ✓ Avoid overhauling the equipment.
- ✓ Environmentally friendly: does not harm the health of people and animals.
- ✓ The surface treated with bio-organic liquid is covered with a protective film that smooths out micro cracks, scratches, roughness, and shells in the metal, as a result of which the process of re-formation of scale and iron oxides is noticeably slowed down.
- ✓ Reduces the amount of greenhouse gas emissions into the atmosphere.
- ✓ Does not need special disposal, can be disposed of in a common sewage system without pre-treatment.

The scope of the technology is quite extensive, because it allows the cleaning of almost any heat and power equipment and technological systems from sludge, scale, and deposits of various origins:

- ✓ Equipment for boiler houses and thermal power plants of any capacity.
- ✓ Heat exchangers of any kind.
- ✓ Building heating systems.
- ✓ Hot water and cold water systems.
- ✓ Heating systems for trains on locomotive traction.
- ✓ Equipment of oil refineries.
- ✓ Equipment for the food and dairy industries.
- ✓ Evaporation plants.
- ✓ Equipment of sugar factories, etc.