

Oil reclamation systems



The purpose of transformer oil reclamation is extracting moisture, acids, mechanical dirt and undesirable components such as unsaturated hydrocarbons, asphalt-resinous substances, sulfur and nitrogen compounds. For the reclamation of waste oils used various technological operations, based on the physical, physico-chemical and chemical processes.

There are several chemical methods of deep oil reclamation, the main of which is an acid-alkaline-earth. This method of oil cleaning is based on treating with sulfuric acid, which compacts and binds all the unstable compounds into acid sludge oil. Tar is removed by settling and the remains of sulfuric acid and organic acids are neutralized by an alkali treating oil. Then the oil is washed with distilled water, dried and treated for complete neutralization by the bleaching earth. And after final filtration, the oil becomes recovered.

Methods of reclamation of transformer oil

- Mechanical - for removal from oil free water and solid contaminants (filtration, centrifugation, sludge);
- Thermophysical - evaporation, vacuum distillation;
- Physico-chemical - coagulation, adsorption;
- Chemical – if three methods are not enough, this method involves the usage of much more difficult and costly equipment.

Physical methods of reclamation of transformer oil

The physical method of transformer oil reclamation is usually referred to purification from mechanical impurities and water, i.e. drying.

Transformer oils (fresh, regenerated and operational), contaminated by mechanical impurities, and watered, but with no changing in its chemical properties and other the significant changes, can be corrected in most cases by one of the following cleaning methods. Products that deteriorates the initial properties of the oil, can be dissolved and undissolved in it. Thanks to mechanical cleaning you can remove products from oil, that exist in it in undissolved state, such as water, sludge, coal and other mechanical impurities.

Oils drying

The most advanced and economically effective method of oil drying is its spraying under vacuum at a low temperature is because the solution of the oil and water is sprayed with nozzle water in a tank in which underpressure is created. Thus the free and dissolved moisture, and the dissolved air, are removed from oil. When the oil is thin dispersed it quickly gives up its moisture. Dry oil, as droplets, fall to the bottom of the vacuum tank.

The efficiency and speed of drying rate is increased by heating the oil, as the evaporation of moisture increases. Wherein, oil loss from evaporation is insignificant. The rate of water evaporation from oil also

depends on the difference between the pressure of saturated steam at a given temperature and the residual pressure in the vacuum tank.

Reclamation with using water solutions of alkaline reagents

Alkaline cleaning may be the final stage of the sulfuric acid cleaning, the initial phase of alkaline earth metal cleaning, as well as an independent process with the regeneration of used transformer oils. Wherein, in the process of purifying acidic aging products, which contain in the processed oil, are converted into readily water-soluble sodium salt (soap) and during the water washing are transferred to the aqueous phase.