



ROSENERGOATOM

**TERMOXID**

**Industrial production of ion  
selective inorganic sorbents  
for water purification and  
solving environmental issues**

Clean water – Safe World

# Termoxid today:



- Subsidiary of JSC "Concern Rosenergoatom"
- Founded in 1994

## Activities:

- Manufacture of the Termoxid-brand ion selective inorganic sorbents
- Development of the new types of sorbents based on zirconium, titanium, and tin compounds as well as their production technologies.

## Termoxid sorbents application area:

- Decontamination of the process water from the nuclear power plants and other nuclear facilities:
- Liquid radioactive wastes processing.
- Drinking water additional treatment.
- Alcohol and alcohol-containing products treatment.
- Emergency situations consequences elimination
- Industrial waste water decontamination.



# Basic characteristics of the sorbents

- High chemical and thermal stability
- High radiation resistance
- High selectivity to radionuclides and polyvalent anions
- Low hydrodynamic resistance of bulk layers
- Long service life
  
- By chemical composition they are modified by various compounds, hydroxides, and zirconium phosphates.
- They are mechanically strong glassy spherical pellets, white, yellow and green.

## **The use of the Thermoxid sorbents in the water purification facilities ensures high efficiency of the purification from:**

- cesium and strontium radionuclides;
- polyvalent anions of silicon, arsenic, molybdenum, chromium, selenium, phosphorus, etc.
- iron, manganese, aluminum, amines, toxic and heavy metals, hydrogen sulfide, ammonia and active chlorine.



# Product range



Sorbent name	Basic properties	Main purpose
<b>Termoxid-35</b>	<p>It is a composite material and a mixed crystalline hexacyanoferrate (ferrocyanide) of nickel by the chemical composition, distributed on an inorganic carrier - zirconium hydroxide.</p> <p>It has an increased selectivity to cesium ions. Its inorganic nature and sol-gel manufacturing technology guarantees the operating properties of the sorbent such as: Radiation resistance of not less than 100 MGy; low hydrodynamic resistance of bulk layers; preservation of sorbent properties in radiation fields for 30 years</p>	<p>Purification of the process water from the NPPs and other nuclear facilities with different degrees of mineralization from cesium radionuclides.</p>
<b>Termoxid-3K</b>	<p>By the chemical composition it is a modified hydrated zirconia dioxide. It has an increased selectivity to ions of alkaline-earth elements in weakly alkaline and alkaline solutions</p>	<p>It is used in bulk filters for the selective purification of the alkaline earth elements and liquid radioactive waste from strontium radionuclides in the pH range from 8.5 to 12.</p>

# Product range



Sorbent name	Basic properties	Main purpose
<b>Termoxid-3</b>	It is an inorganic polymeric material with an amorphous structure, zirconium hydroxide $Zr(OH)_4 \cdot nH_2O$ , which has increased selectivity to polyvalent anions (silicon, arsenic, molybdenum, chromium, selenium, phosphorus, etc.), as well as to strontium radionuclides in a slightly alkaline area pH 8 , 5-12.	It is used as a filtering load component in the local facilities for additional purification of the drinking water from anions.
<b>Termoxid-3A</b>	It is an inorganic polymer material with a semicrystalline structure - zirconium phosphate. The main form of the sorbent is hydrogen - $Zr(HPO_4)_2 \cdot nH_2O$ . At the customer's request, the sorbent can be supplied in salt form (sodium, potassium or ammonium) form $Zr(RPO_4) \cdot nH_2O$ , where R is a modifying sodium, potassium or ammonium cation.	Purification of the waters of the SNF cooling and storage ponds from cesium radionuclides (incl. cobalt, manganese, etc.) in the pH range from 6.0 to 8.5. It is also used in a mixture with the Termoxid-3 sorbent at the local facilities for additional purification of the drinking water from heavy metals.

Many years of experience in the use of the "Termoxid"-brand sorbents in Russia and abroad have shown their high efficiency in the decontamination of the process water from nuclear power plants and other nuclear facilities, as well as in the purification of various aqueous media of other industries, as evidenced by the reports on the practical application of the sorbents in process systems and equipment.

# Sorbents usage in water purification plants



Thermoxid sorbents are used as a component of filtering loading in local water purification plants.

- Pellets size – 0.4-1.0
- Bulk density– 1.0-1.05
- Mechanical crushing resistance - above 10 MPa
- Moisture, wt: - 35-45%

Depending on the source water composition and the required quality after its purification, the water purification plants may consist of several filter elements and materials, for example such as:

- Quartz sand - for mechanical purification.
- Activated carbon - to remove organic matter.
- Mixture of the Thermoxid sorbents - to remove radionuclides, polyvalent anions, heavy metals, ammonia, active chlorine, etc.
- Bactericidal facilities - for disinfection.



Depending on the water purification plants capacity and the required amount of filter loading, the Thermoxid sorbents are supplied in different containers of different capacity. 50 liters plastic barrels are used most often.





# Key customers



## Nuclear industry enterprises:



## Production enterprises:



## Foreign customers:



Food industry enterprises, producers of alcoholic beverages, etc.



ROSENERGOATOM  
**TERMOXID**

PO Box 94, Zarechniy, Sverdlovsk region,  
624250, Russia  
Beloyarsk NPP Industrial site

Tel.: +7 (34377) 3-60-90  
Cell phone: +7 (982) 634-85-72  
e-mail: [es@termoxid.com](mailto:es@termoxid.com)

e-mail: [kyrchanov-aa@rosenergoatom.ru](mailto:kyrchanov-aa@rosenergoatom.ru)  
Cell phone: +7 (917) 575-16-04