



"RUS-RESOTEK"

## STANDARD ORGANIZATIONS

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WTO 81329147.01-2008

### POLYMER ADDITIVE

«Nano Earth Soil»

Specifications

Official edition

Moscow 2008

**WTO 01393728-011-2008**

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**Specifications**

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## Foreword

### About the standard

**1 DEVELOPED** by LLC "Rus-Rezotec" with the participation of ANO "NII MK NT" and LLC «CMiS»

**2 INTRODUCED** by Rus-Rezotec LLC

**3 APPROVED AND PUT INTO EFFECT** by the order of the General Director of LLC "Rus-Rezotek" No. 18 of 08.08.2008

**4 INTRODUCED FOR THE FIRST TIME**

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## STANDARD ORGANIZATIONS

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### POLYMER ADDITIVE "Nano Terra Soil" Specifications

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Date of introduction 08.08.2008

#### 1 area of use

This standard applies to the additive polymer "Nano Terra Soil" -

NTS (hereinafter referred to as additive), intended for stabilization (strengthening) of soils w

using cement and water used in accordance with the design

solutions for construction, reconstruction and repair:

- highways and structures on them;
- airfields;
- areas for various purposes;
- temporary roads and sites during construction and installation works.

The requirements of this standard shall be observed in the development of the design and

technological documentation for the manufacture and use of the additive.

#### 2 Normative references

This standard uses references to the following standards:

GOST 12.3.002-75 Occupational safety standards system. Processes  
production. General safety requirements

GOST 12.4.011-89 System of labor safety standards. Means of protection  
working. General requirements and classification

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**GOST 12.4.103-83 Occupational safety standards system. Special clothing protective, means of individual protection of legs and hands. Classification**  
**GOST 11503-74 Petroleum bitumen. Method for determining the relative viscosity**  
**GOST 14192-96 Marking of goods**  
**GOST 18481-81 Hydrometers and glass cylinders. General Specifications**  
**GOST 23558-94 Crushed stone-gravel-sand mixtures and treated soils inorganic binders, for road and airfield construction. Specifications**  
**GOST 30108-94 Construction materials and products. Definition of specific effective activity of natural radionuclides**

### **3 Technical requirements**

**3.1 The additive is manufactured by Resotec Int. according to technological manufacturer's documentation and complies with the requirements of this standard.**

**The additive consists of polymers: a mixture of latex and cellulose dissolved in water, a is environmentally neutral and non-toxic additive for use in the process of earthworks for improvement, strengthening and stabilizing the soil with hydraulic binders.**

### 3.2 Features

In terms of its appearance and physical and mechanical properties, the additive should meet the requirements given in table 1.

Table 1

Designation indicator	Indicator value	Method of determination, paragraph of this STO 1.
Appearance	White viscous liquid	p. 8.1 Weak specific p. 8.2 2. Smell 3.
11.0 to	Density, g / cm	from 1.00 to 1.02 p .
12.5 p. 8.4 5.	Viscosity <sup>3</sup> at 25 0C,	from 1200-2000 p. 8.5

4 Labeling requirements 4.1

**Labeling must be applied to consumer and shipping containers directly or as a label in accordance with GOST 14192.**

4.2 Marking must be done with a printing press or other

**in a manner that ensures the safety and readability of the marking during storage and transportation to consumer use.**

**4.3 The additive must have a quality document.**

The manufacturer must apply a label to the packaging unit, which should contain the following data:

- product name (symbol);
- name of the manufacturer;
- trademark and address of the manufacturer;
- batch number and date of manufacture;
- net or gross weight, depending on the agreed terms of delivery;
- shelf life;
- brief instructions for use;
- the designation of this service station.

If necessary, the marking may contain additional data, providing complete identification of the additive.

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5 Packing requirements

**5.1 The additive is packed (poured) into sealed plastic containers 1000 liters.**

**By agreement between the manufacturer and the consumer (customer) under the conditions of delivery, other rules and methods of packaging the additive may be established, taking into account the conditions and methods of its transportation.**

## **6 Safety and environmental requirements**

**6.1 The additive must meet the sanitary and radiation-hygienic requirements.**

**Specific effective activity of natural radionuclides  $A_{eff}$  of raw materials used for the preparation of the additive should not exceed limit values, Bq/kg (according to GOST 30108), depending on its area applications.**

**6.2 In the production, application and testing of the additive, the general safety regulations, norms rules and requirements of GOST 12.3.002.**

**Electrical safety, fire safety, impact safety chemicals and pollutants at work sites and workplaces should be provided in accordance with the requirements of [1] and [2].**

**6.3 Persons associated with the use of the material must be provided with special clothing and personal protective equipment in accordance with GOST 12.4.011 and GUEST 12.4.103.**

**6.4 The additive refers to non-combustible materials.**

**6.5 Production and use of the additive may generate waste.**

**The procedure for accumulation, transportation, neutralization and burial or waste disposal is established in accordance with the requirements of [3].**

**Soil and sand are used to clean up the spilled additive. It is forbidden to drain the additive and its waste into the drainage system and water bodies.**



## **7 Acceptance rules**

**7.1 The additive is accepted by the technical control of the manufacturer.**

**7.2 The additive is accepted in batches. For the party take the amount of additive, documented in one quality document. Lot size for submission to control is taken in the amount of shift production or by agreement between manufacturer and consumer, but not more than daily output.**

**7.3 The quality of the additive in each batch is checked for all indicators, established in clause 3.2 of this standard, by conducting acceptance tests tests.**

**7.4 When accepting each batch of additive, at least 1% of the packages are selected, in each from which a point sample weighing at least 100 g each is taken.**

**After sampling, point samples are combined into a general sample, the mass of which should be sufficient to determine all controlled quality indicators supplements.**

**7.5 Upon receipt of unsatisfactory test results for at least one of the indicators, a second test is carried out for this indicator, for which again take twice the number of samples.**

**If the retest results do not meet the requirements of this standard, then the entire batch of the additive is not subject to acceptance.**

**7.6 The radiation-hygienic assessment of the additive is carried out according to the documents quality issued by the manufacturer.**

**In the absence of data on the content of natural radionuclides, once a year determine the specific effective activity of natural radionuclides  $A_{eff}$  materials according to GOST 30108.**

**7.7 The consumer has the right to carry out a control check of the quality of the additive in accordance with the requirements of this standard.**

## **8 Control methods**

**8.1 Appearance is checked by visual inspection.**

**8.2 The smell is evaluated organoleptically.**

**8.3 The density of the additive is determined using glass hydrometers according to GUEST 18481.**

The polymer additive is carefully, avoiding the formation of foam bubbles, poured into cylinder. Before immersion in the hydrometer cylinder, from the surface of the additive clean bubbles are removed with filter paper.

If the test is carried out at a temperature above or below  $(20 \pm 0.5) ^\circ\text{C}$ , use water bath at the specified temperature.

When immersing the hydrometer, do not allow the hydrometer rod to get wet above the level its immersion in the additive, since the layer of polymer additive on the rod underestimates measurement results.

After immersion, the hydrometer is manually sunk approximately two divisions into additive, then release and wait for the complete stop of the hydrometer.

The hydrometer readings are taken at the point of intersection of the hydrometer scale with additive surface.

**8.4 Determination of the hydrogen index (pH) of the additive is carried out with a pH meter of any models, according to his instructions.**

**8.5 The viscosity of the additive is determined using a VUB-1 viscometer according to GOST 11503.**

The viscometer is mounted horizontally with set screws.

The inner surface of the cylinder of the apparatus, as well as the shutter, are thoroughly washed benzene or other solvent and air dry. drain hole

The working cylinder is closed with a shutter and a measuring cylinder is substituted under it.

The test is carried out at a temperature of  $(25\pm 10)$  °C. To determine the conditional viscosity, the sample is poured into the working cylinder of the apparatus with the shutter closed u shutter level.

The sample is poured so that air bubbles do not form, then well stir with a thermometer.

At a test temperature with an error of not more than 0.5 ° C from the working cylinder apparatus, take out the thermometer and quickly raise the shutter. When draining, the product does n should be sprayed on the walls of the measuring cylinder.

At the moment when the additive level reaches the 25 cm mark in the measuring cylinder turn on the stopwatch. When the product level reaches the 75 cm mark <sup>3</sup>, a stopwatch stop and calculate the test time.

#### Method Convergence

Two determination results obtained by one executor are recognized reliable (with 95% confidence) if the discrepancy between they do not exceed 10% of the arithmetic mean.

#### Method reproducibility

Two test results from two different laboratories are recognized reliable (with 95% confidence) if the discrepancy between they do not exceed 40% of the arithmetic mean result.

## 9 Transport and storage

### 9.1 Transport

9.1.1 The methods used to transport the additive must exclude it losses, getting into the package with the addition of atmospheric precipitation and fore impurities.

9.1.2 The packaged additive is transported by road, rail and other modes of transport in accordance with the rules of transportation and fastening cargo operating on this mode of transport.

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## **9.2 Storage**

**9.2.1 Storage of the additive should be carried out on pallets in the manufacturer's container or hermetically sealed containers, in a dry, cool, dark place, under conditions ensuring the safety of the packaging.**

**9.2.2 The shelf life of the additive is 24 months from the date of preparation.**

**The use of the additive after the expiration of the permissible storage period is possible with the permission of the manufacturer, subject to positive results of the verification of the batch of additive to all the requirements of this standard.**

## **10 Instructions for use**

**10.1 Stabilization (strengthening) of soils using additives is necessary to be performed according to the work plan, in accordance with the project and technological regulations.**

**10.2 Before starting work, the laboratory selects the composition of the mixture (stabilized (reinforced) soil) in accordance with GOST 23558. Consumption of additives and cement depends on the type and physical and mechanical characteristics of the soil. The approximate consumption of the additive is 0.8-1.0% of the weight of the soil.**

**10.3 Preparation of a mixture of stabilized (reinforced) soil is carried out manually or with the help of Bertoli ECOTECH 150 soil mixing plants with its subsequent export to the road, or by mixing on the road with the use of cutters, profilers, recyclers.**

**10.4 Organization of work on the preparation and transportation of the mixture, device, compaction and care of the base layer (coating) from the mixture is carried out in accordance with the manuals to [4] and [5].**

## 11 Manufacturer's warranties

11.1 The manufacturer warrants that the additive meets the requirements of this standard, subject to the conditions of transportation and storage.

11.2 Guaranteed shelf life of the additive is two years from the date of manufacture.

## Bibliography

- [1] SNiP 12-03-2001 Labor safety in construction. Part 1.  
General requirements
- [2] SNiP 12-04-2002 Labor safety in construction. Part 2.  
Construction production
- [3] SanPiN 2.1.7.1322-03 [Hygienic requirements for placement and disposal of production waste and consumption](#)
- [4] SNiP 3.06.03-85 Car roads
- [5] SNiP 3.06.06-88 Airfields

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ОКС

ОКП

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