



# Analyzer of phosphorus ore AGP-F

Based on Tagged Neutron Method

## Main features

- The analyzer of phosphoric ores AGP-F is constructed for the express determination of the elemental composition of phosphorus ores in the field conditions.
- No preliminary sample preparation is required.
- Sample size: -100 mm
- Sample weight: 3–10 kg.
- Permissible mass fraction of water in samples – up to 7%.

## Operating principle

- Irradiation of samples with a flux of 14 MeV fast tagged neutrons and detection of gamma rays from inelastic scattering reactions.
- The source of fast neutrons is a portable neutron generator. Gamma rays are recorded by BGO crystal scintillation detectors.

## Composition

- The AGP-F consists of a neutron module, an electronics rack and an operator's workplace.
- For use in the field conditions, the installation is placed in a container with climate control.

Neutron module and electronics rack.



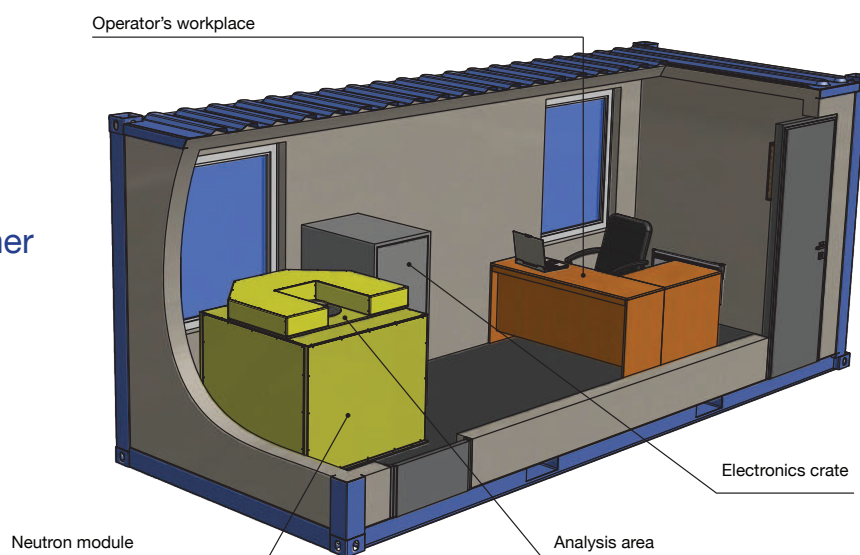
## Application area

- Range of concentration of P<sub>2</sub>O<sub>5</sub> – 2–38%
- Precision in measuring the concentration of P<sub>2</sub>O<sub>5</sub> – relative standard deviation is less than 5%.
- Simultaneously with the concentration of P<sub>2</sub>O<sub>5</sub>, the contents of SiO<sub>2</sub>, MgO, Fe<sub>2</sub>O<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, CaO, CO<sub>2</sub>, TiO<sub>2</sub>, Na<sub>2</sub>O, K<sub>2</sub>O are determined.

## Specifications

<b>Neutron source</b>	ING-27 portable neutron generator with alpha detector
<b>Neutron energy</b>	14 MeV
<b>Neutron beam intensity</b>	5 x 10 <sup>7</sup> n/s
<b>Number of tagged neutron beams</b>	9
<b>Gamma rays detection system</b>	12 gamma-detectors based on BGO crystal
<b>Power requirements</b>	Three-phase 380 V +/- 10%
<b>Power consumption of the measuring unit</b>	Not more than 300 W

## General view of AGP-F in a container



## Approbation

- AGP-F analyzer were tested in the field conditions at the mines of Apatit JSC and Kovdorsky GOK JSC.
- There is an expert conclusion of the Institute of the Earth's Crust of the SB RAS.
- There is an expert conclusion of Rospotrebnadzor stated the absence of activation above the background level of both controlled and environmental objects during the analysis.

## Interior view of the container

