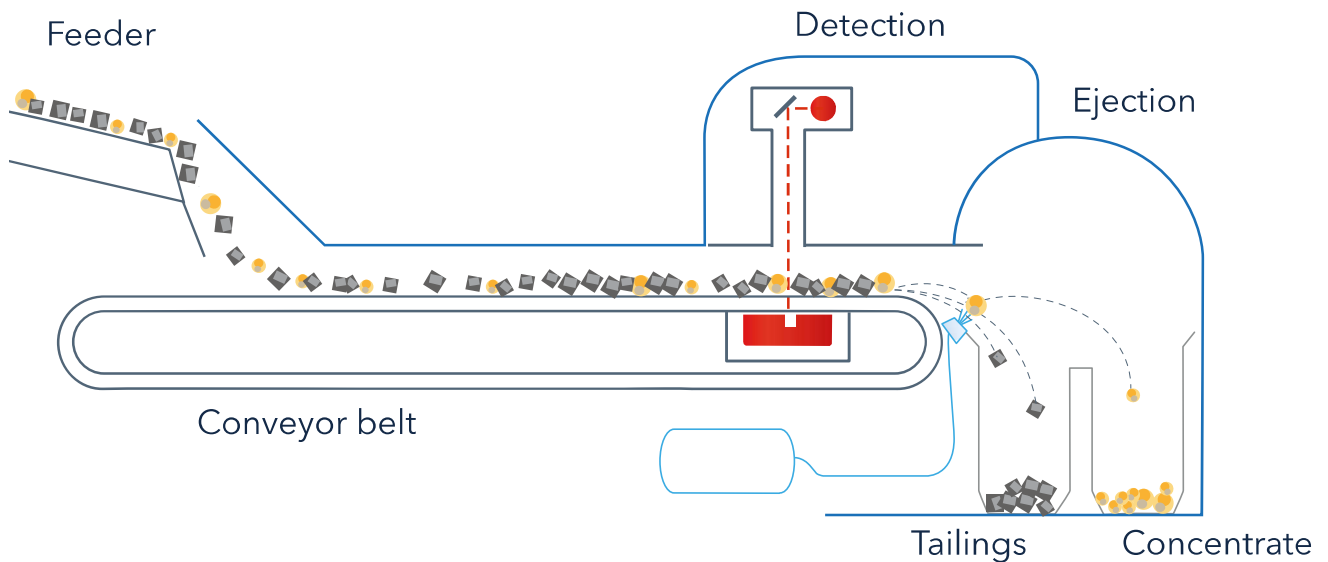


# Mineral ore sorting



























Bourestnik JSC has extensive experience in the design and manufacture of a wide range of sorters for mineral processing. Depending on the feed properties and the required final product specifications, a broad variety of sensor-based systems (or their combinations) can be utilized to ensure efficient sorting:



**Physical principles and detection technologies used in sorters manufactured by Bourestnik:**

<b>XRT</b>	X-ray transmission	X-ray transmission (XRT) sorting method based on the difference in X-ray absorption between valuable mineral and waste (raw material)
<b>XRL</b>	X-ray Luminescence	X-ray luminescence (XRL) sorting method based on the ability of certain minerals to luminesce in the visible spectrum under X-ray exposure
<b>XRF</b>	X-ray Fluorescence	X-ray fluorescence (XRF) sorting method based on the detection of secondary (fluorescent) X-rays emitted when minerals are irradiated with X-rays. The energy of this radiation is specific to each chemical element, allowing for the determination of the elemental composition of the raw material
<b>IR</b>	Thermography	Sorting method based on the difference in thermal properties (heat capacity, thermal conductivity, or emissivity) between valuable mineral particles and waste rock after preliminary heating
<b>VIS</b>	Visible range spectrometry	Sorting method based on the analysis of spectral characteristics of reflected or transmitted visible light from the surface of valuable mineral and waste rock particles

## Enrichment and sorting:

Gold-bearing ores  <b>Au</b> 	Silver-bearing ores  <b>Ag</b> 	Polymetallic Cu-Zn ores  <b>Cu-Zn</b> 
Tungsten-molybdenum ores  <b>W-Mo</b> 	Magnesite ores  <b>MgCO<sub>3</sub></b> 	Manganese ores  <b>Mn</b> 
Polymetallic Sn-Cu ores  <b>Sn-Cu</b> 	Tin ores  <b>Sn</b> 	Platinum ores  <b>Ru-Pb, Os</b> 
Mercury ores  <b>Hg</b> 	Lead ores  <b>Pb</b> 	Fluorite ores  <b>CaF<sub>2</sub></b> 

Bourestnik JSC carries out a comprehensive range of studies and evaluates the enrichment potential of various ores and mineral raw materials, including:

- Structure and chemical composition research;
- Modeling of lump sorting processes;
- Calculation of recovery rates and enrichment indicators;
- Technical and economic assessment of processing technology implementation.

We welcome opportunities for joint projects and cooperation!



# RGS-6A

Primary treatment

-100 +6 mm

New product



X-ray transmission (XRT) sorter RGS-6A is designed for enrichment of dry or damp mineral raw materials with size range -100 +6 mm. The operating principle of the sorter is based on the ability of materials to absorb X-rays. By studying the contrast between the enriched mineral and the accompanying ore, it allows for effective sorting and improvement of the yield quality. The sorter consists of a sorting machine (SM) and an automatic control rack (ACR).

### Main specification

Size fraction, mm	-100+50	-50+25	-25+12	-12+6
Throughput up to, t/h	до 186*	до 93*	до 47*	до 33*
Type of material	damp/dry*			

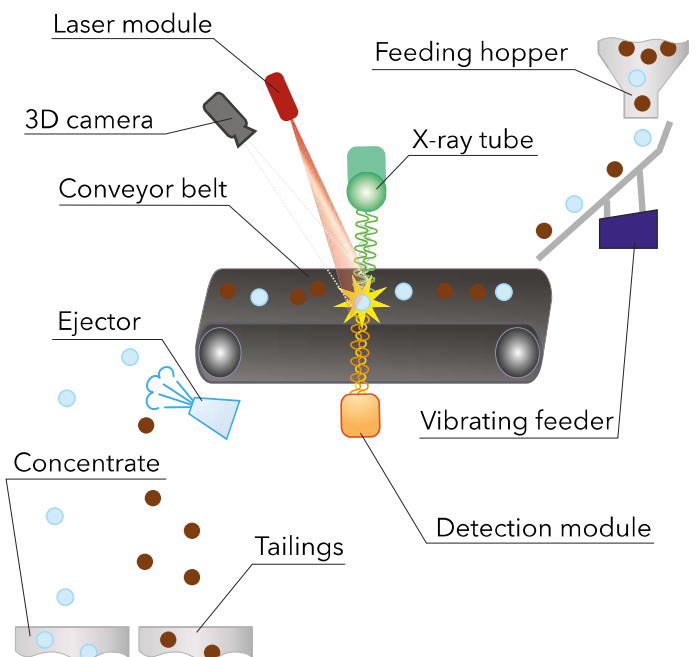
### Material feeding and detection system\*\*

Material feed	vibrating feeder and conveyor belt
Operational width, mm	1200
X-ray tube	1
Detection module	1
Laser sensor	1

### Sorter's supply

Electric power, kW*A	(1-phase network, 220V /50Hz); not less than β-phase network, 380V/50Hz).	11
Cooling water consumption, l/min,	not less than	4.5

	Dimensions, mm	Weight, kg
Sorting machine (SM), max	6180x2190x2480	4700*
Automatic control rack (ACR), max	1090x905x2055	335*



\*- Preliminary information

\*\* - Multi-channel pneumatic ejector system with local or group ejection

## Software interface:



Detection system interface

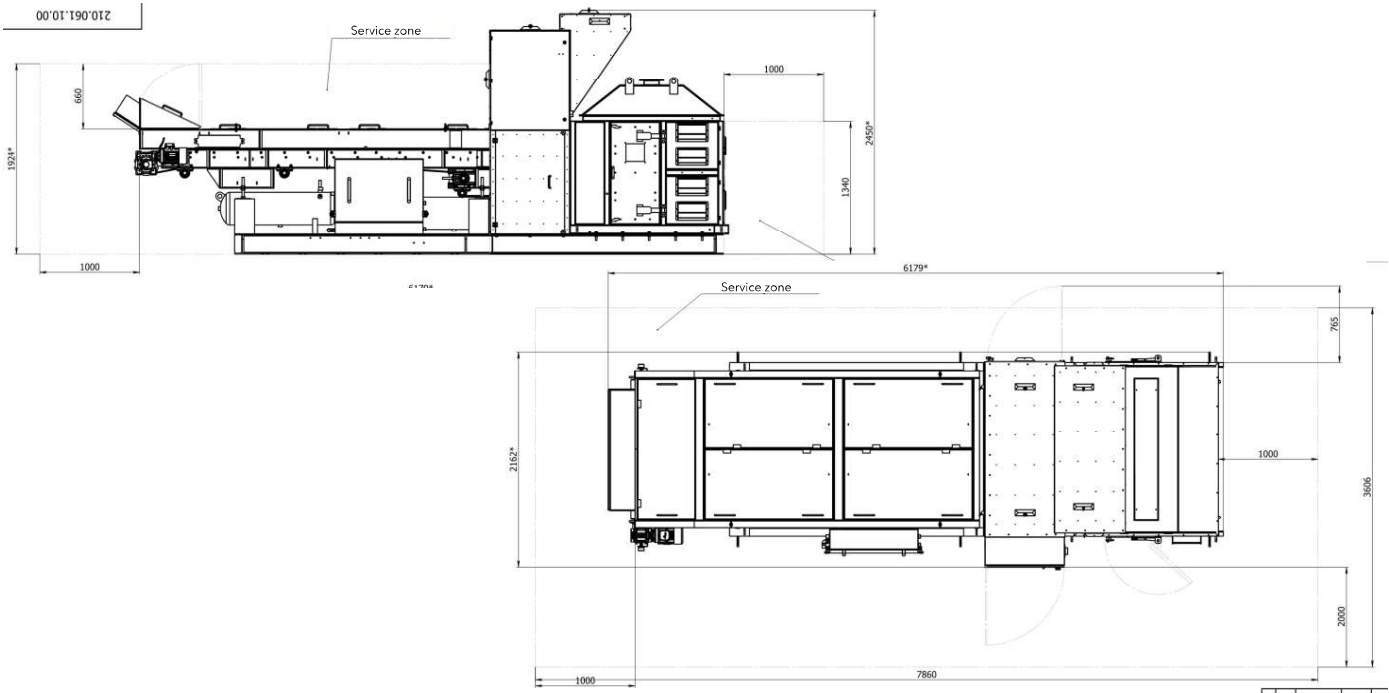


X-ray tube settings interface

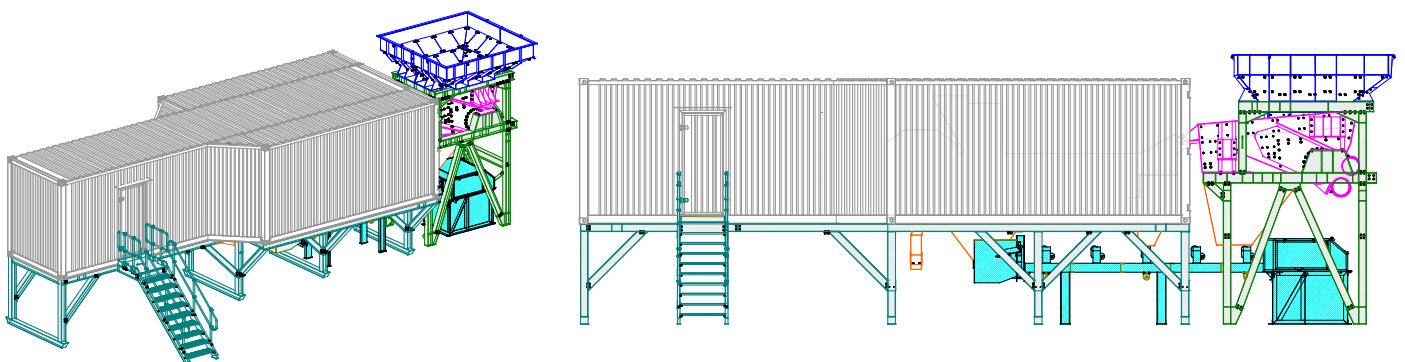


Ejector settings interface

## Installation dimensions:



## Containerized Unit:



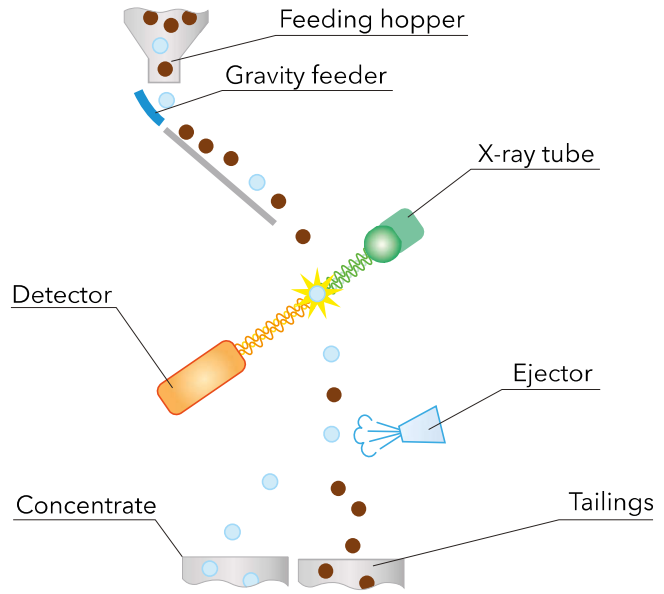
**RGS-5A** Primary sorting -50+10 mm New product

X-ray transmission (XRT) sorter RGS-5A is designed for primary sorting of dry or damp mineral raw materials with size range -50 +10 mm.

Main specification				
Size fraction, mm	-50+30	-30+20	-20+15	-15+10
Throughput, t/h	60	45	30	20
Yield per one ejection, kg	0.8	0.6	0.4	0.3
Type of material	dry or wet			

Material feeding and detection system	
Material feed	material feed
Material flow channel	1
X-ray tube	1
Detector	1

Sorter's supply	
Power consumption, kVA (single phase, 220V/50Hz)	5
Cooling water consumption, not less than, l/min	6
Consumption of compressed air	1.15
per 1 ejection, l	
at nominal capacity, l/min	30



	Dimensions, mm	Weight, kg
Sorting machine (SM)	2300x845x2300	1400
Automatic control rack (ACR)	881x603x1952	230

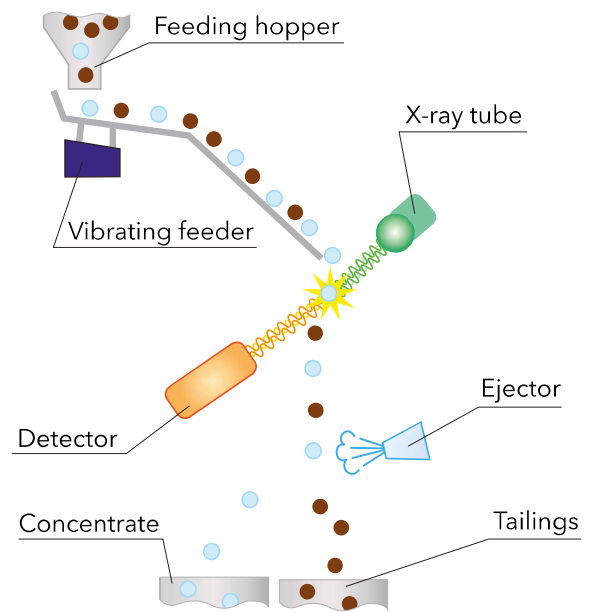
**RGS-OD-5A** Final concentrate retreatment -50 +10 mm New product

X-ray transmission (XRT) sorter RGS-OD-5A is designed for final treatment of dry or damp mineral materials with size range -50 +10 mm.

Main specification				
Size fraction, mm	-50+30	-30+20	-20+15	-15+10
Throughput, t/h	2500	2000	500	300
Yield per 10 ejections, grain	15	16	18	20
Type of material	dry or wet			

Material feeding and detection system	
Size fraction, mm	vibrating feeder
Material flow channel	2
X-ray tube	1
Detector	1

Sorter's supply	
Power consumption, kVA (single phase, 220V/50Hz)	6
Cooling water consumption, not less than, l/min	30
Water consumption, l/min	6
Consumption of compressed air	5
per 1 ejection, l	
at nominal capacity, l/min	50



	Dimensions, mm	Weight, kg
Sorting machine (SM)	2000x930x2135	1100
Automatic control rack (ACR)	881x603x1952	230

## QUESTIONNAIRE for the X-ray transmission (XRT) project

To customize an optimal solution, we ask you to provide the following information:

### 1. Contact details:

Company name: \_\_\_\_\_  
 Company contact person: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

### 2. Information about the deposit/processing plant:

Country: \_\_\_\_\_ Designation: \_\_\_\_\_  
 City: \_\_\_\_\_  
 Running plant  Design, construction  Feasibility assessment

### 3. Description of mineral processing objects (ore):

Type	Description
Feed material for processing (ore): description, mineralogical content, etc.	
Target enriched product (concentrate): description, mineralogical content, etc.	
Target waste product (tailings): description, mineralogical content, etc.	

### 4. Sieve characteristics of the enrichment object (ore):

#### EXAMPLE BELOW:

Size Fractions	Max., mm	Min., mm	% of all fractions	Throughput, t/h
Size Fractions 1				
Size Fractions 2				
Size Fractions 3				
Size Fractions 4				
Size Fractions 5				
Total:			100%	

Size Fractions	Max., mm	Min., mm	% of all fractions	Throughput, t/h
Size Fractions1	-50	+20	40%	40 t/h
Size Fractions2	-20	+10	60%	60 t/h
Total:			100%	100 t/h

### 5. Target recovery indicators:

Valuable material content in tailings (% / g/t)	
Waste product rate from the raw material (%)	

### 6. Your goals in making this request:

- Assessment of ore XRT sorting
- Requesting a technical and commercial proposal for XRT sorters
- Review of XRT sorting technology

### 7. Please note that Bourevestnik JSC reserves the right to use the result of the studies, including the format of publications.

Approval by the Customer is required

### 8. Are the remaining geological samples required to be returned upon completion of the research?

Yes  No

### 9. Additional information and comments:



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