



# PRODUCT CATALOG (SORBENTS and ACTIVE CARBONS)

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«ООО «Sorbents of Kuzbass», LLC

KEMEROVO, RUSSIA, 2019



## About Us

The company "Sorbents of Kuzbass" was founded in 2010 to arrange the production of carbon sorbents. The company performed research and development and design and development work at the request of Rosnano Group of Companies, the Foundation for the Promotion of Small Industrial Enterprises in the Scientific and Technical Sphere, Skolkovo Foundation, Kuzbass Technopark.

"Sorbents of Kuzbass" is a resident of Innovation Center Skolkovo, a member of the Technological Platform "Technologies of production and processing of hydrocarbons", and is part of the Coal Chemistry Cluster of Kemerovo region.

The company has the advanced scientific and production potential for the development and production of high-performance adsorbents, activated carbons and gas absorbers, and has its own certified testing laboratory. The developed technologies of synthesis of carbon sorbents from coal raw materials and the use of unique equipment allow to ensure the production of products of high quality.

Sales and/or deliveries for testing of carbon adsorbents for separation and purification of gases have been realized to the following companies: SDS-Azot, NIOST (SIBUR holding), Gazprom dobycha Kuznetsk, Gazprom dobycha Orenburg, Mari oil-refining plant, Anzhersky oil refinery, AO "L. I. Karpov Institute of physical chemistry" (Rosatom Group of companies), AO "AECC" ("TVEL" Group of companies), Plant of electrochemical converters (Rosatom Group of companies), Sintez-Polimer, NIIT, TsNIISM, CYKLOGAS, Renfors Novye Tehnologii, Himtehpolimer, OOO Eliteh, Hromatek, NPP BAKS, Ioffe Physical-Technical Institute RAS, Institute of Physical Chemistry and Institute of Chemistry of Solids and Mechanical Chemistry SB RAS.

Services on sorption properties research and materials analysis have been provided to Sibirskiy Antracyt, SUEK, Kuzbassenergo, RNPk (Rosneft), Vtorpolimer, PROMINTEH, VALKOM-PM, SUEK-Specialty Minerals, SUEK-AG.

## Intended use of products

Carbon molecular sieve sorbents (granular and powder activated carbons) are intended for the use in engineering, oil and gas, chemical, energy, metallurgical, coal, nuclear, mining, transport, medical, food and other industries, including environmental and human protection.



Carbon sorbents (activated carbons) are used in adsorption filter units (filters) for cleaning storm and industrial water run-offs, in short-cycle non-heating adsorption plants for separation and purification of gas mixtures (separation and purification of hydrogen from synthesis gas, coke oven gas, coal gasification products), air purification, petrochemical waste gases, natural gas and associated petroleum gas, solvent vapor capture, flue gases of CHP and TPP, drying, purification, concentration and storage of natural gas. Moreover, they are used as absorbers of harmful gases when manufacturing personal protective equipment for the respiratory system and installations of gas and air purification (removal of carbon dioxide, hydrogen sulfide, nitrogen oxides, etc.), as well as carriers of catalysts and electrode material of supercapacitors and lithium-ion batteries.

## **Product Description**

The proposed sorbents are cylindrical granules or powder of black or dark gray color, non-toxic, non-combustible and not dangerous in the supplied form. The sorbents can be easily disposed of by incineration. Depending on the technical requirements of the Customer, on the basis of the carbon sorbents produced by OOO "Kuzbass Sorbent", it is possible to produce modified carbon sorbents (activated carbons) and compositions of various adsorbents for a comprehensive solution of the Customer's tasks. The ability to adjust the processes of obtaining and modifying of produced adsorbents allows to effectively purify the air and waste gases (APG, flue gases) from a wide range of contaminants.

Individual approach and replacement of imported sorbents with high-quality and cheaper domestic analog will save the Customer's money on filter elements and adsorption systems of gas and water purification.

Depending on the technology of production and intended use, the company "Kuzbass Sorbent" produces and supplies carbon molecular sieve sorbents of the following types, which in 2013-2017 successfully passed certification and comparative tests in accredited laboratories with analogues from China, Germany, the USA, Belgium and Russia.

Product Type	Application
<b>CMS KS-H</b>	<ol style="list-style-type: none"> <li>1. Separation of hydrogen from hydrogen-containing gases (synthesis gas, coke oven gas, coal gasification products, methane conversion and other gases with a hydrogen content of more than 30%)</li> <li>2. Drying and purification of hydrogen to a high purity (99.9999%) from carbon monoxide, carbon dioxide, HCl, water for the use in petroleum chemistry, metallurgy, fuel cells and other industries</li> <li>3. Separation of helium from natural gas and its purification</li> <li>4. Separation of argon and neon from gas mixtures and their purification from impurities</li> </ol>
<b>CMS KS-O and CMS-KS-M</b>	<ol style="list-style-type: none"> <li>1. Purification of air, flue gases of thermal power plants and internal combustion engines, ventilation emissions and industrial waste gases from carbon dioxide, methane, nitrogen oxides, sulfur oxides, hydrogen sulfide, mercury, chlorine, toluene, ammonia, formaldehyde and a number of other compounds</li> <li>2. Purification of coke oven gas, fuel gas, natural gas and associated petroleum gas (APG) from carbon dioxide, water, sulfur oxides, hydrogen sulfide, heavy hydrocarbons (C3+)</li> <li>3. Concentration of methane from the waste spaces of coal mines (methane-air gas mixture) for further use in the production of electricity, heat and gas engine fuel</li> <li>4. Drying of air and gases in gas treatment units</li> </ol>
<b>Sorbent CMS KS-K (powder)</b>	Use as electrode material for supercapacitors (ionistors), lithium-ion batteries
<b>Activated carbons SK-AG-3 (granules), SK-OU-A and SK-OU-B</b>	Use in adsorption filter blocks (filters) and installations for treatment of storm, mine and industrial water run-offs, including organic run-offs of chemical, textile, coke, oil and gas, metallurgical and other industrial enterprises (improved analogue of AG-3, AR-V, OU-A, Carbotech, SGL, Causorb, etc.)
<b>Chemical sorbent (absorber of CO<sub>2</sub>, H<sub>2</sub>O and hydrocarbons)</b>	Use to absorb carbon dioxide, water vapor, hydrogen sulfide, remove hydrocarbon vapor from ventilation emissions, disposal of oil spills, oils and fuels.



## Technical characteristics of carbon molecular sieve sorbents

Carbon molecular sieve sorbents are produced in accordance with specifications 216210-001-67691232-2015, registered by the company "Kuzbass Sorbent" in the state register of 2015.

Product Type	Technical Parameters					
	The abrasion resistance, %	The gas separation factor	Ash content, %	BET surface area, m <sup>2</sup> /g	Pore size, nm	Pore volume by water, cm <sup>3</sup> /g
Carbon sorbents CMS KS-H	From 75 to 93	30-70	Not more than 7	320-850	0.3-0.6, 0.8-0.9	Not less than 0.2 (up to 0.8)
Carbon sorbents CMS KS-O	From 75 to 98	5-15	Not more than 7	320-1300	0.65-2.5	Not less than 0.3 (up to 0.8)
Carbon sorbents CMS KS-K	From 65 to 98	-	Not more than 7	400-800	0,65-1,9	Not less than 0.3 (up to 0.8)
Activated carbons (granules/powder)	From 75 to 96	-	Not more than 7	600-1500	0.65-2.5	Not less than 0.35 (up to 0.8)
Chemical sorbent (absorber H <sub>2</sub> O, CO <sub>2</sub> and HC)	From 65 to 98	-	Not more than 7	400-1000	0.65-2.5	Not less than 0.3 (up to 0.8)

Other technical characteristics of carbon sorbents:

- Granules' size: diameter 1-1.5 mm, length 1.2-3.5 mm;
- Shelf life: not less than 1 year from the date of manufacture;
- Service life: from 1 to 7 years (depending on operating conditions);
- Dew point: about -55°C;
- Porosity (space between granules) - 35-40%;
- Bulk density-0.43-0.65 g/ml;
- Adsorption capacity for methane - 20-70 ml/g, CO<sub>2</sub>-85-330 ml/g;
- Iodine number from 700 to 1000
- Activity of methylene blue from 110 to 210
- Mass fraction of water - not more than 5.5 %;
- Volatile content - not more than 6 %;



Temperature of the sorbents' use in oxidizing atmosphere - not more than 130 °C, in inert atmosphere - not more than 350 °C.

## Packaging and Delivery

Carbon molecular sieve sorbents shall be packed in metal drums which are tightly closed and which do not allow entering of water and atmospheric air, according to GOST 5044-79, in polyethylene barrels, cans, metal barrels, vacuum special packaging, activated carbon shall be packed in polypropylene bags of 50-100 liters, polyethylene containers or big bags.

The sorbents resist water and do not require pre-purification of the gas mixture during commissioning.

Carbon sorbents are delivered on the territory of Russia, CIS countries, Asia and Europe, for which the company "Kuzbass Sorbent" has received the necessary certificates for products and rejection letters for submission to the customs authorities.

## Certification

The company has been certified according to ISO QMS standards: 9001, 14001, OHSAS 18001, has GOST R and FMBA certificates for products and services.





**We will be happy to cooperate with your company!**

You can discuss in detail the possibility of cooperation and selection of adsorbents, activated carbons, absorbers and equipment for the effective solution of your production tasks with the Director of the company "Kuzbass Sorbent" Berveno Alexander Viktorovich.

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