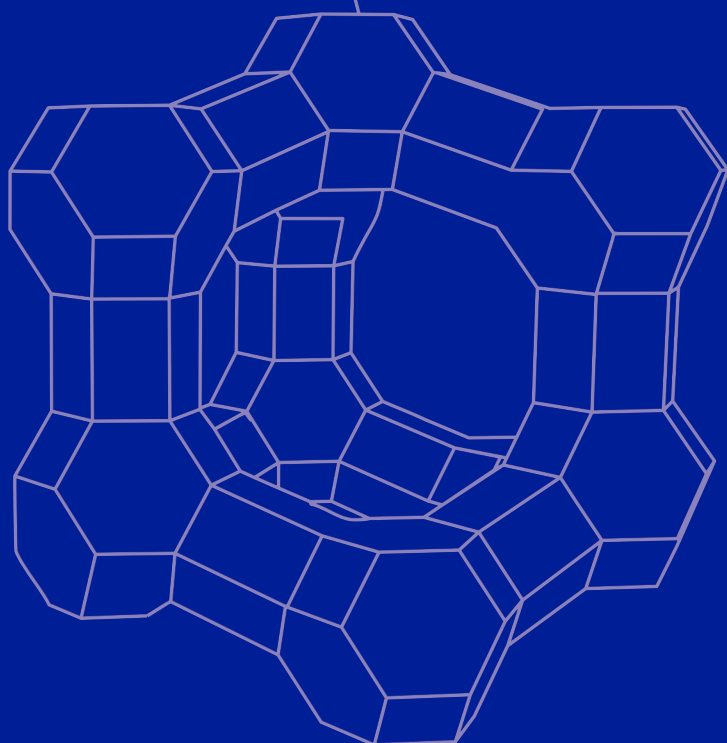




KNT *group*

production of sorbents and catalysts

ADVANCED TECHNOLOGIES
ПРОГРЕССИВНЫЕ ТЕХНОЛОГИИ



Sorbents
Сорбенты

KNT group is the largest manufacturer of synthetic zeolites (molecular sieves) and adsorbents in Russia

- Zeolite KA-U (improved)
molecular sieve 3A
- Zeolite NaA-U (improved)
molecular sieve 4A
- Waterproof zeolite NaA-U,
brand VST
molecular sieve 4A
- Zeolite CaA-U (improved)
molecular sieve 5A



Activated alumina -
gas adsorbent and catalyst carrier



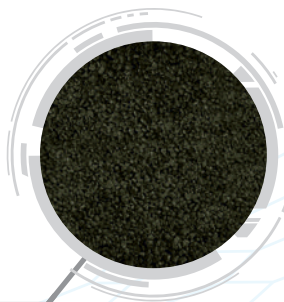
- Zeolite NaX
molecular sieve 13X
- Zeolite NaX-K (oxygen)
molecular sieve (for air
separation units)
- Zeolite NaX GDO
molecular sieve 13X-GDO



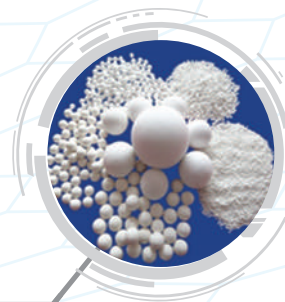
**Hydrogen Chloride Adsorbent
KNT-HCA-02M** - purification of
gases from hydrogen chloride
impurities



Adsorbent A-4M - purification of
aromatic hydrocarbons

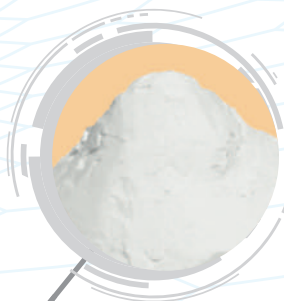


«Porcelain (ceramic) balls»
flow distribution, protection
of adsorbents and catalysts.



Catalyst components:

- Ultra stable zeolite Y type
- Pseudoboehmite
- Pentasilic zeolite type ZSM-5



Adsorbent KNT-COS - fine
purification of gas and liquid
streams from
COS, H₂S, CS₂, CO₂, H₂O molecules.



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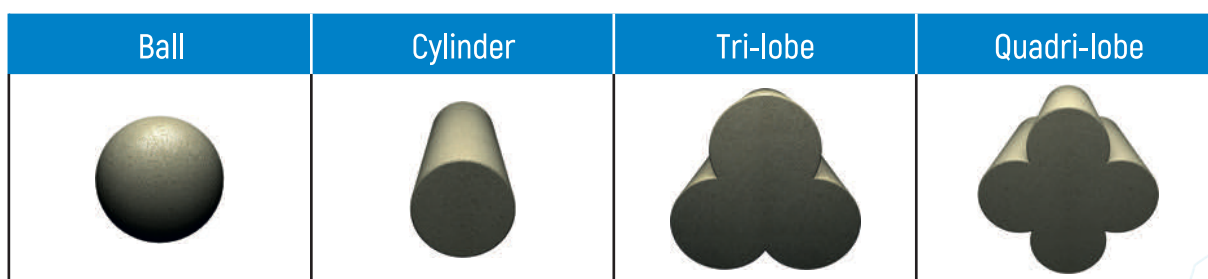


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The main types of molecular sieve pellets

KNT group company produces all main types of molecular sieve pellets:

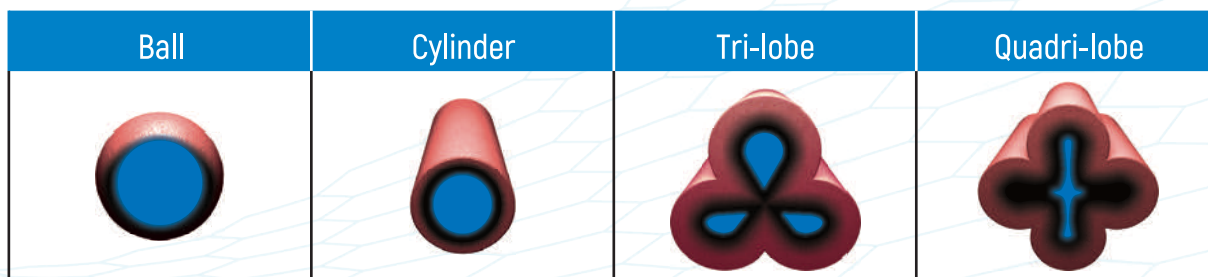
1. Spherical granules (ball)
2. Cylindrical granules (extrudate).
3. Complex pellets forms :
 - 3.1. The extrudate – tri-lobe;
 - 3.2. The extrudate – quadri-lobe (quatrefoil).



Features of standard pellets forms:

1. Spherical granules (the ball):
 - Easy loading and unloading from the adsorber;
 - Excessive bed mobility and as a result high attrition of pellets;
 - High specific pressure of pellets to each other at contact points.
2. Extrudates (cylinder, tri-lobe, quadri-lobe):
 - The minimum mobility of the adsorbed bed;
 - The ability to use the technology of uniform load;
 - Pellets minimal pressure on each other in contact along the generatrix.
- 2.1 For the tri-lobe and quadri-lobe pellet-types:
 - Greater availability of internal volume, high saturation limit of pellets;
 - Diffusion of hydrocarbons through the adsorbent bed takes place easier, the pressure does not increase;
 - The dynamic capacity for removing a component (H₂O, H₂S, etc.) is higher for 15% than that of other types of granules.

The saturation limit for different zeolite types.



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Molecular Sieve 3A



Principal applications:

- drying of easily polymerized hydrocarbon streams, in particular, drying of pyrogas, EEF, PPF, propylene;
- concentrating of alcohol solutions;
- natural and oil gas dehydration;
- organic gases and liquids dehydration.

Manufactured according to Technical Specification 2163-006-15285215-2006

Parameters	Brand A		Brand T		Brand Q	
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters
Appearance	Extrudate		Tri-lobe		Quadri-lobe	
Bulk density, g/cm ³	0,72 ≤	0,75±0,85	0,7 ≤	0,75±0,85	0,7 ≤	0,75±0,85
Granules size, mm	Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2		Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2		Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2	
Crushing strength, kg/mm ² , For granules, mm	Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2	1,5 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤	1,5±2,5 1,8±3,0 1,8±3,0 1,8±3,0 1,8±3,0	1,5 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤	1,5±2,5 1,8±3,0 1,8±3,0 1,8±3,0 1,8±3,0	1,5 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤
Dynamic water capacity, mg/cm ³ For granules, mm	Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2	125 ≤ 135 ≤ 140 ≤ 150 ≤ 155 ≤	125±140 135±155 140±160 150±170 155±180	127 ≤ 137 ≤ 142 ≤ 152 ≤ 157 ≤	127±140 137±155 142±160 152±170 157±180	130 ≤ 140 ≤ 145 ≤ 155 ≤ 160 ≤
Dynamic CO ₂ capacity, mg/cm ³ For granules, mm	Ø4,5±0,5 Ø3,6±0,4 Ø2,9±0,3 Ø2,2±0,2 Ø1,6±0,2	0,40 ≥ 0,45 ≥ 0,55 ≥ 0,60 ≥ 0,65 ≥	0,01±0,3 0,01±0,3 0,01±0,3 0,01±0,4 0,01±0,4	0,40 ≥ 0,45 ≥ 0,55 ≥ 0,60 ≥ 0,65 ≥	0,01±0,3 0,01±0,3 0,01±0,3 0,01±0,4 0,01±0,4	0,40 ≥ 0,45 ≥ 0,55 ≥ 0,60 ≥ 0,65 ≥
Mass fraction of water resistance, %	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9
Ignition loss, %	not more than 4,3					

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Molecular Sieve 4A

Formula $\text{Na}_2\text{O} \times \text{Al}_2\text{O}_3 \times 2\text{SiO}_2 \times \text{H}_2\text{O}$

Principal applications:

- drying of natural and oil gases;
- drying of process and instrumentation air;
- drying of reforming and cracking gas;
- drying and regeneration of transformer oil;
- drying and recovery of freon-oil cooling agents for refrigerating plants (NaA-2KT is produced upon the request of a Customer);
- as the filter for drying and recovery of motor oils, diesel and gasoline type fuels;
- etc.

Manufactured according to Technical Specifications 2163-003-15285215-2006

It is recommended by the All-Russian Power-Engineering Scientific Research Institute of «RAO UES Russia» to use at the power enterprises for drying «crude transformer oils».

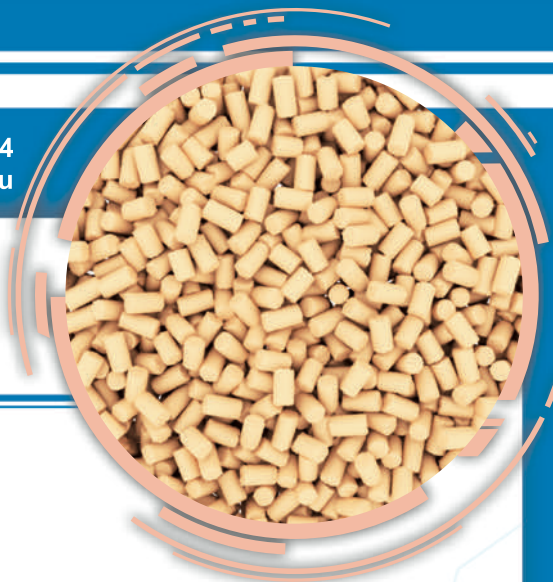
Parameters	Brand A		Brand T		Brand Q		
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	
Appearance	Extrudate		Tri-lobe		Quadri-lobe		
Bulk density, g/cm ³	0,66 ≤	0,75±0,85	0,66 ≤	0,70±0,85	0,66 ≤	0,70±0,85	
Granules size, mm	4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		
Crushing strength, kg/mm ²	Ø 4,5 ± 0,5 Ø 3,6 ± 0,4 Ø 2,9 ± 0,3 Ø 2,4 ± 0,2 Ø 2,0 ± 0,2 Ø 1,6 ± 0,2	1,8 ≤ 1,8 ≤ 2,0 ≤ 2,0 ≤ 2,0 ≤ 2,0 ≤ 2,0 ± 3,0	1,5 ≤ 1,5 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤	1,8 ± 2,8	1,5 ≤ 1,5 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤ 1,8 ≤	1,8 ± 2,8	
Dynamic water capacity, mg/cm ³ For granules, mm	Ø 4,5±0,5 Ø 3,6±0,4 Ø 2,9±0,3 Ø 2,4±0,2 Ø 2,0±0,2 Ø 1,6±0,2	125 ≤ 135 ≤ 140 ≤ 145 ≤ 150 ≤ 155 ≤	125±140 135±145 140±160 145±165 150±170 155±180	130 ≤ 137 ≤ 145 ≤ 150 ≤ 155 ≤ 160 ≤	130±145 137±150 145±165 150±165 155±175 160±185	132 ≤ 140 ≤ 147 ≤ 152 ≤ 157 ≤ 162 ≤	132±145 140±150 147±165 152±170 157±175 162±185
Mass fraction of water resistance, %	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9	
Ignition loss, %	Not more than 5						

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Synthetic zeolite NaA-U, brand VST (water-resistant)



Principle application:

- as a protective front bed resistant to effect of condensed moisture;
- dehydration of natural and associated petroleum gas;
- etc.

Manufactured according to Technical Specifications 2163-003-15285215-2006

Parameters	Standards acc. to TS	Actual parameters
Appearance	Extrudate of cylindrical shape	
Bulk density, g/cm ³	0,66 ≤	0,75÷0,88
Granules size, mm	4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2	
Crushing strength, kg/mm ²	1,8 ≤	2,0÷3,0
Dynamic water capacity, mg/cm ³ For granules, mm	Ø 4,5±0,5 Ø 3,6±0,4 Ø 2,9±0,3 Ø 2,4±0,2 Ø 2,0±0,2 Ø 1,6±0,2	120±140 126±150 135±155 140±160 150±165 155±175
Mass fraction of water resistance, %	99,0 ≤	99,0-99,9
Ignition loss,	Not more than 5	
Destruction level (% of damaged granules after 600 cycles of water supply at t=120 0C), %, not more than	2,0 ≥	0,01 – 1,5

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Molecular Sieve 5A

Formula $m\text{CaO} \times n\text{Na}_2\text{O} \times \text{Al}_2\text{O}_3 \times 2\text{SiO}_2 \times \text{H}_2\text{O}$

Principal application:

- drying and purification of natural and petroleum gas from hydrogen sulfide, carbon dioxide, methanol and some mercaptans;
- isolation and purification of normal paraffin hydrocarbons from a mixture with branched and cyclic hydrocarbons;
- etc.

Manufactured according to Technical Specifications 2163-004-05766557-97

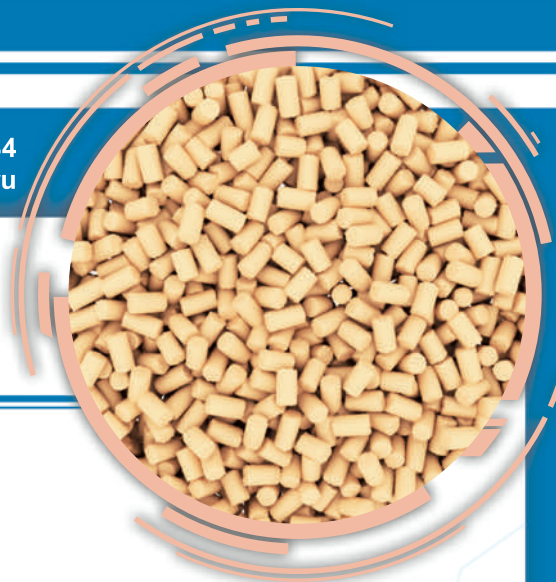
Parameters	Brand A		Brand T		Brand Q	
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters
Appearance	Extrudate		Tri-lobe		Quadri-lobe	
Bulk density, g/cm ³	0,68 ≤	0,68±0,85	0,68 ≤	0,68±0,85	0,68 ≤	0,68±0,85
Granules size, mm	3,6±0,4 2,9±0,3 1,6±0,2		3,6±0,4 2,9±0,3 1,6±0,2		3,6±0,4 2,9±0,3 1,6±0,2	
Mechanical crushing strength, kg/mm ² , for granules, mm	Ø3,6±0,4 Ø2,9±0,3 Ø1,6±0,2	1,8 ≤ 2,0 ≤ 2,0 ≤	2,0±3,0	1,8 ≤ 2,0 ≤ 2,0 ≤	2,0±3,0	1,8 ≤ 2,0 ≤ 2,0 ≤
Dynamic water capacity, mg/cm ³ For granules, mm	Ø3,6±0,4 Ø2,9±0,3 Ø1,6±0,2	115 ≤ 120 ≤ 130 ≤	115±125 125±145 135±160	120 ≤ 125 ≤ 127 ≤	120±140 130±150 140±165	122 ≤ 127 ≤ 137 ≤
Dynamic n-Heptane capacity, mg/cm ³ For granules, mm	Ø3,6±0,4 Ø2,9±0,3 Ø1,6±0,2	50 ≤ 60 ≤ 65 ≤	50±60 60±70 65±75	50 ≤ 60 ≤ 65 ≤	50±60 60±70 65±75	50 ≤ 60 ≤ 65 ≤
Mass fraction of water resistance, %, not less than	99,0 ≤	99,0±99,9	99,0 ≤	99,0±99,9	99,0 ≤	99,0±99,9
Ignition loss, %	Not more than 5					

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Molecular Sieve 13X

Formula $\text{Na}_2\text{O} \times \text{Al}_2\text{O}_3 \times 2,5\text{SiO}_2 \times \text{H}_2\text{O}$



Principal applications:

- purification of air and nitrogen from hydrocarbons, oxides and oils;
- purification of natural and associated petroleum gas from water, sulfur compounds and mercaptans;
- removal of radionuclides from liquid waste from nuclear power units;
- drying and purification of hydrogen-containing gas.
- etc.

Manufactured according to Technical Specifications 38.10281-88.

Parameters	Brand A		Brand T		Brand Q	
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters
Appearance	Extrudate		Tri-lobe		Quadri-lobe	
Bulk density, g/cm ³	0,6 ≤	0,6±0,8	0,6 ≤	0,6±0,8	0,6 ≤	0,6±0,8
Granules size, mm	4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2	
Crushing strength, kg/mm ²	1,0 ≤	1,1±2,0	1,0 ≤	1,1±2,0	1,0 ≤	1,1±2,0
Dynamic water capacity, mg/cm ³ For granules, mm						
Ø 4,5±0,5	115 ≤	115±130	130 ≤	130±140	132 ≤	132±142
Ø 3,6±0,4	120 ≤	120±135	135 ≤	135±150	137 ≤	137±152
Ø 2,9±0,3	125 ≤	125±145	145 ≤	145±155	147 ≤	150±165
Ø 2,4±0,2	130 ≤	130±150	147 ≤	147±157	149 ≤	149±164
Ø 2,0±0,2	135 ≤	135±160	148 ≤	148±163	150 ≤	150±165
Ø 1,6±0,2	140 ≤	140±170	150 ≤	150±165	152 ≤	152±167
Dynamic Benzole capacity, mg/cm ³ For granules, mm						
Ø 4,5±0,5	53 ≤	53±59	55 ≤	55±65	57 ≤	57±67
Ø 3,6±0,4	66 ≤	66±70	68 ≤	68±72	70 ≤	70±75
Ø 2,9±0,3	67 ≤	67±71	69 ≤	69±73	71 ≤	71±76
Ø 2,4±0,2	68 ≤	68±73	70 ≤	70±75	72 ≤	72±77
Ø 2,0±0,2	69 ≤	69±75	71 ≤	71±77	73 ≤	73±78
Ø 1,6±0,2	80 ≤	80±85	81 ≤	81±87	82 ≤	82±88
Mass fraction of water resistance, %	99,0 ≤	99,0 – 99,9	99,0 ≤	99,0 – 99,9	99,0 ≤	99,0 – 99,9
Ignition loss, %	Not more than 5					

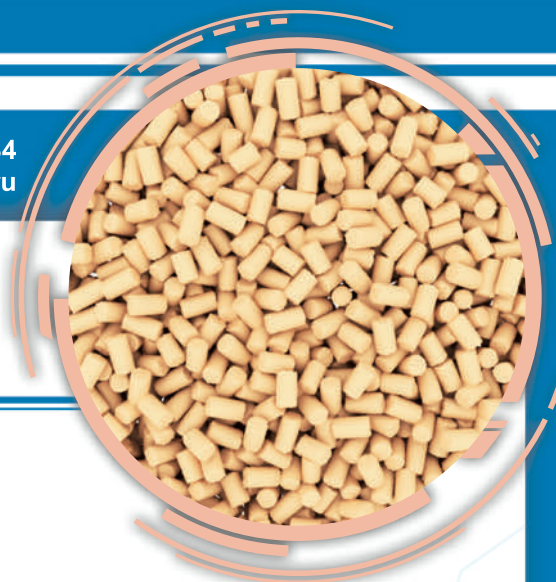
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Molecular Sieve NaX-GDO (13X)

Formula $\text{Na}_2\text{O} \times \text{Al}_2\text{O}_3 \times 2,5\text{SiO}_2 \times \text{H}_2\text{O}$



Principal applications:

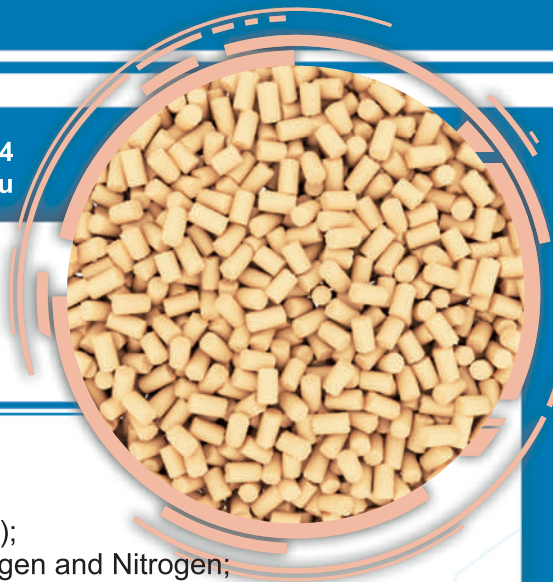
- fine gas and liquids purification from hydrogen sulfide, mercaptans and other sulfur compounds as well as deep dehydration and fine purification from carbon dioxide
- etc..

Manufactured according to Technical Specifications 2163-017-94262278-2011
Molecular sieve 13X - GDO has an extended mercaptan adsorption dynamic capacity.

Parameters	Brand A		Brand T		Brand Q		
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	
Appearance	Extrudate		Tri-lobe		Quadri-lobe		
Bulk density, g/cm ³	0,60 ≤	0,65±0,85	0,60 ≤	0,65±0,85	0,60 ≤	0,65±0,85	
Granules size, mm	4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		
Crushing strength, kg/mm ²	1,3 ≤	1,5-2,5	1,3 ≤	1,5-2,5	1,3 ≤	1,5-2,5	
Dynamic water capacity, mg/cm ³ For granules, mm	∅ 4,5±0,5 ∅ 3,6±0,4 ∅ 2,9±0,3 ∅ 2,4±0,2 ∅ 2,0±0,2 ∅ 1,6±0,2	140 ≤ 145 ≤ 150 ≤ 152 ≤ 154 ≤ 158 ≤	140±150 145±155 150±160 152±162 154±165 158±170	140 ≤ 145 ≤ 150 ≤ 152 ≤ 154 ≤ 158 ≤	140±150 145±155 150±160 152±162 154±165 158±170	140 ≤ 145 ≤ 150 ≤ 152 ≤ 154 ≤ 158 ≤	
Dynamic Benzole capacity, mg/cm ³ For granules, mm	∅ 4,5±0,5 ∅ 3,6±0,4 ∅ 2,9±0,3 ∅ 2,4±0,2 ∅ 2,0±0,2 ∅ 1,6±0,2	70 ≤ 75 ≤ 80 ≤ 81 ≤ 83 ≤ 87 ≤	70±75 75±80 80±85 81±86 83±88 87±92	70 ≤ 75 ≤ 80 ≤ 81 ≤ 83 ≤ 87 ≤	70±75 75±80 80±85 81±86 83±88 87±92	70 ≤ 75 ≤ 80 ≤ 81 ≤ 83 ≤ 87 ≤	
Mercaptan dynamic capacity, mg/cm ³ For granules, mm		105 ≤	105±115	110 ≤	110±125	115 ≤	115±130
Mass fraction of water resistance, %, not less than	98,0 ≤	99,0 – 99,9	98,0 ≤	99,0 – 99,9	98,0 ≤	99,0 – 99,9	
Ignition loss, %	Not more than 5						

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Molecular Sieve 13X-K

Formula $\text{Na}_2\text{O} \times \text{Al}_2\text{O}_3 \times 2,5\text{SiO}_2 \times \text{H}_2\text{O}$

Principle applications:

- purification of air from water, Carbon Dioxide, Acetylene in oxygen installations, fractionation;
- air drying in compressors (condensate removing at low temperatures);
- purification of air from Carbon Dioxide prior to its separation into Oxygen and Nitrogen;
- production of Oxygen from air by a short-cycle adsorption technique.

Manufactured according to Technical Specifications 2163-009-05766557-2000

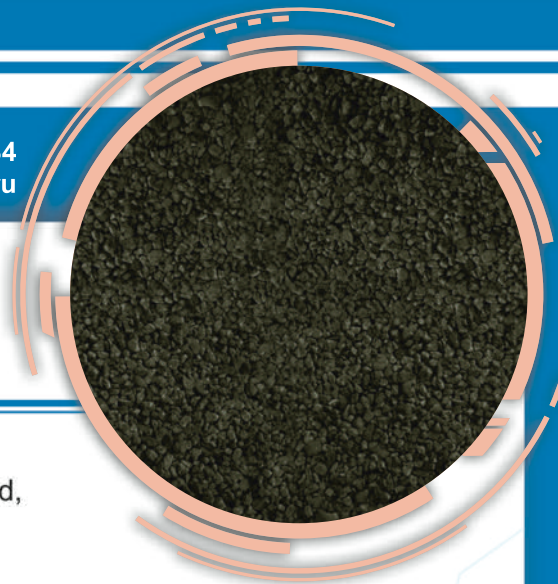
Molecular sieve 13X-K has a high dynamic Carbon Dioxide capacity and is specially produced for air-separation units.

Parameters	Brand D		Brand T		Brand Q	
	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters	Standards acc. to TS	Actual parameters
Appearance	Extrudate		Tri-lobe		Quadri-lobe	
Bulk density, g/cm ³	0,65 ≤	0,65±0,8	0,6 ≤	0,6±0,8	0,6 ≤	0,6±0,8
Granules size, mm	4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2		4,5±0,5 3,6±0,4 2,9±0,3 2,4±0,2 2,0±0,2 1,6±0,2	
Crushing strength, kg/mm ²	1,0 ≤	1,3±2,0	1,0 ≤	1,3±2,0	1,0 ≤	1,3±2,0
Dynamic water capacity, mg/cm ³ For granules, mm						
Ø 4,5±0,5	120 ≤	120+130	130 ≤	130+145	132 ≤	132+147
Ø 3,6±0,4	125 ≤	125+135	135 ≤	135+150	137 ≤	137+152
Ø 2,9±0,3	135 ≤	135+145	145 ≤	145+160	147 ≤	147+162
Ø 2,4±0,2	140 ≤	140+150	147 ≤	147+162	149 ≤	149+164
Ø 2,0±0,2	142 ≤	142+160	148 ≤	148+163	150 ≤	150+165
Ø 1,6±0,2	145 ≤	145+170	150 ≤	150+165	152 ≤	152+167
Dynamic Benzole capacity, mg/cm ³ For granules, mm						
Ø 4,5±0,5	50 ≤	50+60	52 ≤	52+62	54 ≤	54+64
Ø 3,6±0,4	58 ≤	58+70	60 ≤	60+72	62 ≤	62+74
Ø 2,9±0,3	66 ≤	66+75	70 ≤	70+80	72 ≤	72+82
Ø 2,4±0,2	67 ≤	67+77	72 ≤	72+82	74 ≤	74+84
Ø 2,0±0,2	69 ≤	69+80	75 ≤	75+85	77 ≤	77+87
Ø 1,6±0,2	70 ≤	70+82	77 ≤	77+87	79 ≤	79+89
Dynamic CO ₂ capacity, mg/cm ³	45 ≤	45+60	47 ≤	47+65	49 ≤	49+67
Mass fraction of water resistance, %	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9	99,0 ≤	99,0-99,9
Ignition loss, %	Not more than 5					

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Adsorbent A-4M (microspherical) Bleaching clay



Principal applications:

- purification of aromatic and paraffin hydrocarbons from unsaturated, resinous and coloring compounds.

Manufactured according to Technical Specifications 2163-002-05766557-95

Parameters	Standards acc. to TS	Actual parameters
Bulk density, g/cm ³	0,5 – 1,0	0,8 -1,0
Fractional content, % Mass fraction within 0,2-1,2 mm Mass fraction within 0,2-0,315 mm		not less 95 not more 28
Specific surface, m ² /g	125	130 - 160
Specific quantity of the purified aromatic feed, g/g, not less than	10	15-30
Water content, %, not less than	15	5-10

Note: at the request of the consumer, adsorbent A-4M can be supplied in the form of extrudates of cylindrical shape of the desired diameter.

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Hydrogen chloride adsorbent KHT-AXB-02M

Principal application:

Designed for drying and purification of hydrogen-containing gases, as well as other hydrocarbon streams from impurities of hydrogen chloride and other hydrogen halides in reforming, isomerization, hydrogenation processes.

Manufactured according to TS 2163-003-73770384-2010

Parameters	Standard	
	Brand P	Actual parameters
Appearance	Extrudate of cylindrical shape	
Zinc oxide mass fraction (expressed as Zn, at 550 °C), %	42 - 50	42 - 50
Sodium oxide mass fraction Na ₂ O, %, not more than	0,15	0,05 – 0,15
Bulk density, gr/cm ³	0,8-1,2	0,8 – 1,0
Diameter, mm	1,0-2,5 2,5-3,5 3,5-5,0	1,0-2,5 2,5-3,5 3,5-5,0
L.O.I. at 550°C, %, not more than	3,0	1,0 – 3,0
Mechanical crushing strength, kg/mm ² , not less than	1,1	1,1 - 1,8
Mass fraction of particles less than 1 mm in size, %, not more than	0,3	0,05 – 0,3
Surface area, m ² /gr, not less than	80	85 - 115
Chlorine capacity, wt %, not less than	29	35 - 45

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Activated Alumina - gas dryer

Principal application:

- grades A1 and B are used for drying and cleaning gases and liquids
- grades A2, T and Q are used as catalysts carriers

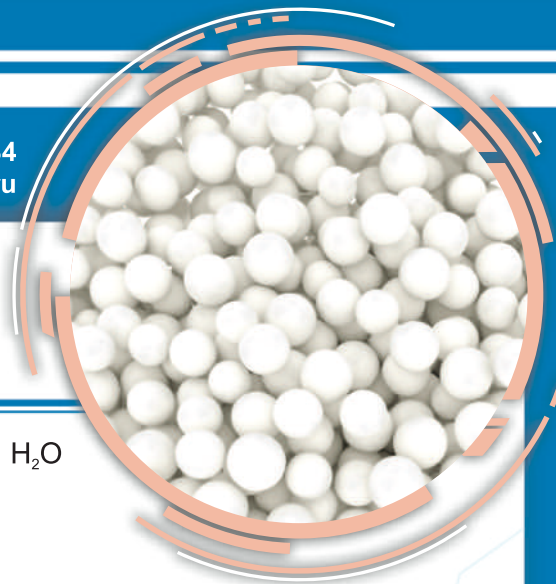
Produced according to TU 2163-015-94262278-2009

Parameters	Standards				
	Grade A1	Grade A2	Grade T	Grade Q	Grade B
Appearance	White, cream or pink cylindrical extrudates		White, cream or pink extrudate in a form of tri-lobe	White, cream or pink extrudate in a form of quadri-lobe	Spherical granules of white, cream or pink color
Bulk density, g/cm ³	0,40 - 0,70	0,40 - 0,70	0,40 - 0,70	0,40 - 0,70	0,70-0,80
Granules size, mm:	1,3±0,8 3,0±1,0 5,0±1,0	1,3±0,8 3,0±1,0 5,0±1,0	1,3±0,8 3,0±1,0 5,0±1,0	1,3±0,8 3,0±1,0 5,0±1,0	1,5 – 3,0 3,0 - 5,0 4,0 – 6,0 6,0 - 8,0 2,8 – 8,0
The size of the granules in length, mm, not more than	18	18	18	18	-
LOI, % not more than	5,0	5,0	5,0	5,0	7,0
Attrition index, %, not less than	65,0	65,0	65,0	65,0	95,0
Dust and fines mass fraction, %, not more than	0,5	0,5	0,5	0,5	0,5
Surface area, m ² /g, not less than	200	200	200	200	200
Total pore volume, cm ³ /g, not less than	0,65	0,65	0,65	0,65	0,50
Static activity on adsorption of water vapor from air at (20-25)°C, g of water per 100 g of desiccant, not less:					
- at relative humidity of 10%	3,0	-	-	-	4,5
- at relative humidity of 60%	9,0	-	-	-	14,0
Sodium mass fraction, %, not more than	-	0,03	0,05	0,05	-
Iron mass fraction, %, not more than	-	0,03	0,05	0,05	-

OUR CUSTOMERS



Adsorbent KNT- COS



Designed to remove gas and liquid streams from COS, H₂S, CS₂, CO₂, H₂O molecules from the composition.

It is used to clean easily polymerized hydrocarbon streams at petrochemical plants, for the treatment of LPG, etc.

It is an active alumina promoted by special additives.

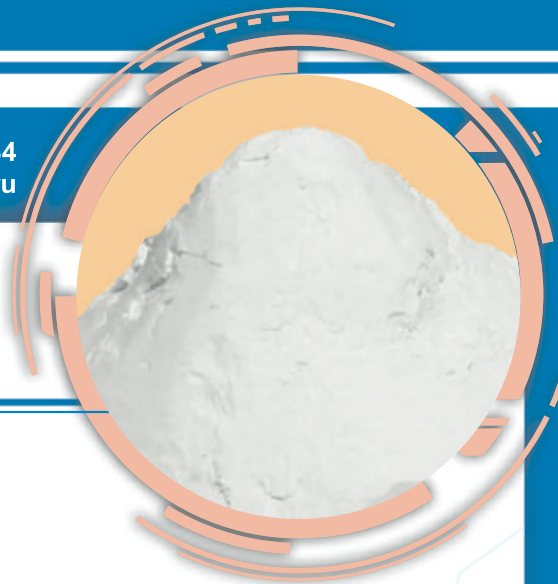
Produced according to TS 2163-025-94262278-2014

Parameters	Value	
Appearance	White spherical granules	
Granule size, mm	2,0 ± 0,5	3,2 ± 0,8
Specific surface, m ² /g not less than	280	270
Total pore volume, cm ³ /g not less than	0,5	0,5
Crushing strength kg/granule	4	14
Bulk density, kg/m ³ , not less than	650	650
Chemical composition:		
Al ₂ O ₃ + promoted additive, wt %	93,1	
SiO ₂ (wt %)	0,02	
Fe ₂ O ₃ (wt%)	0,02	
Na ₂ O (wt %)	0,30	
Ignition loss - LOI (250 - 1200°C) (wt%)	6,0	

OUR CUSTOMERS



ИРКУТСКАЯ
НЕФТЯНАЯ
КОМПАНИЯ



Ultra Stable Zeolite type Y

Principal application:

- component of the catalyst for FCC and hydrocracking.

Type	SiO ₂ /Al ₂ O ₃ mole ratio	Unit cell size, Å	Nominal cation form	Surface area m ² /g
FAU	5,1-6,2	24,24-24,65	Na, H, NH ₄	600-900

Pseudoboehmite, powder

Principal application:

- component of the catalyst.

Na ₂ O ≤	Al ₂ O ₃ ≥	Al ₂ O ₃ · 3H ₂ O ≤	Surface area, BET m ² /g ≥	Crystal size, Å
0,03	70	3	til 400	45-120

Pentasilic zeolites type ZSM-5

Principal application:

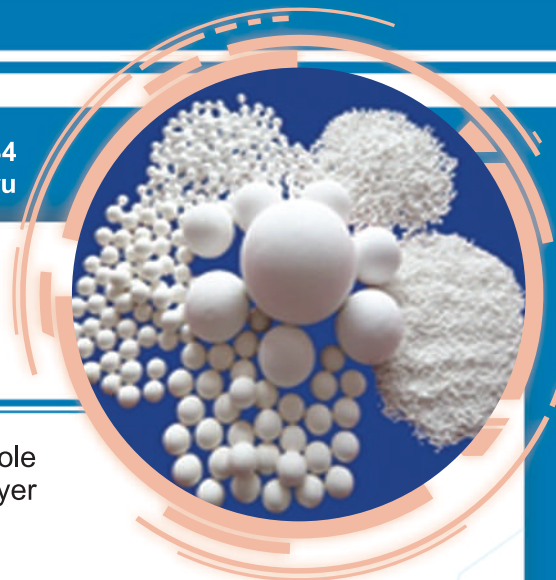
- a component of catalysts for catalytic cracking, hydrocracking, isomerization, alkylation, dewaxing, etc.

General formula: Na_n [Al_nSi_{96-n}O₁₉₂]_n · 16H₂O, where (0 < n < 27)

SiO ₂ /Al ₂ O ₃ mole ratio	Cationic form	Specific surface area m ² /g	Na ₂ O content, %
30 - 300	Ammonium	Not less than 400	Not more than 0,05

OUR CUSTOMERS





Porcelain (ceramic) balls

Principal application: filling the reaction apparatus - performing the role of a distributor of reagents and coolant, protection of the adsorption layer from temperature overheating.

Manufactured in accordance with TS 4328-004-73770384-2010

Parameters	Actual parameters
Balls diameter, mm	3, 4, 5, 6, 8, 10, 12, 13, 15, 16, 18, 19 20, 24, 25, 30, 35, 38, 40, 50, 70
Bulk density, MT/m ³	1,01 – 1,48 (depending on the diameter)
The number of heat cycles at a temperature difference of 700 ± 10 °C to 20 ± 2 °C	8 – 30 (depending on the diameter)
Compressive strength, Mpa	6 – 38 (depending on the diameter)
Temperature resistance, °C, not less than	1300
Acid resistance, %, not less than	99,0
Abrasion index, %/h, not more than	0,02
Water absorption, %, not more than	0,5
Mass fraction of defective products, % not more than	5

OUR CUSTOMERS



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