
ADSORBENTS, CATALYSTS AND TOWER PACKING

Molecular sieve, activated alumina, silica gel, ceramic balls, catalysts, structured packing and tower packing

- Molecular sieves 3A / 4A / 5A / 13X / CaX / Li / CMS
- Activated alumina and silica gel
- Ceramic and alumina balls, catalyst media
- Structured and random tower packing
- Supply, technical selection and project support



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Technical data as per the manufacturing plants' documentation. Subject to change without notice.

About us

Batys Snab Systems supplies process materials to oil and gas, petrochemical, power, water treatment and manufacturing plants in Kazakhstan: adsorbents, catalysts and support media, inert ceramic media, structured and random tower packing. Materials are selected against the process medium, temperature, pressure, required selectivity, water capacity, mechanical strength, size and pressure drop, taking the installed equipment and the project requirements into account.

1. Selection

Material matched to the process conditions and to the vessel data.

2. Cross-reference

Equivalents matched to the incumbent brands and to the licensor's data.

3. Supply

Delivery from the manufacturing plants with quality certificates and shipping documents.

4. Service

Support on loading, changeout and disposal of spent material.

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Molecular sieves

Synthetic zeolite adsorbents for drying, purification and separation of gases and liquids, supplied as beads and pellets, plus activated powder and carbon molecular sieve for PSA nitrogen plants.

Molecular sieve powder

Activated powder produced by high-temperature calcination of molecular sieve raw powder with special additives. Used directly as a selective adsorbent in mixtures: it takes up moisture without changing the physical or chemical properties of the product, reduces bubbles and improves uniformity and strength of the material.



Typical applications

- Coatings, adhesives, sealants and polyurethane systems
- Removal of moisture and bubbles from compounds

Technical data

Parameter	Kalium based	Sodium based	Calcium based	Sodium X based	Ti-Si-Al	Modified
Model No.	XT310101	XT310201	XT310301	XT310401	XT310501	XT310302
Colour / shape	White powder	White powder	White powder	White powder	White powder	White powder
Particle size, µm	2-4	2-4	2-4	2-4	1.2-3.0	2-4
pH value	9-11	9-11	9-11	9-11	/	7-11
Bulk density, g/ml	≥0.45	≥0.45	≥0.45	≥0.35	≥0.55	≥0.5
Static H ₂ O adsorption, %	≥23.0	≥24.0	≥25.0	≥27.0	/	≥24.0
Sieve residual, % (325 mesh)	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2	≤0.2
Water content, %	≤0.5	≤0.5	≤0.5	≤0.5	/	≤0.5

Packing: carton box or big bag. Store in a cool, dry place.

3A molecular sieve

Potassium form of the A-type aluminosilicate lattice with a 3 Å pore. Adsorbs water and excludes any molecule larger than 3 Å, which makes it the standard desiccant for deep drying of unsaturated hydrocarbons and polar liquids without co-adsorption and without promoting polymerisation.



Typical applications

- Drying of cracked gas: ethylene, propylene, butadiene
- Drying of methanol, ethanol and other polar liquids
- Air drying
- Drying of natural gas and methane

Chemical formula: $0.4K_2O \cdot 0.6Na_2O \cdot Al_2O_3 \cdot 2SiO_2 \cdot 4.5H_2O$ ($SiO_2 : Al_2O_3 \approx 2$)

Technical data

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Colour / pore size	Light gray / 3 Å	Light gray / 3 Å	Light gray / 3 Å	Light gray / 3 Å
Bulk density, g/ml	≥0.70	≥0.70	≥0.68	≥0.68
Compressive strength, N/pc	≥35.0	≥100.0	≥35.0	≥50.0
Particle size pass rate, %	≥98.0	≥98.0	≥98.0	≥98.0

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Static water adsorption, %	≥21	≥21	≥21	≥21
Static ethylene adsorption, mg/g	≤3.0	≤3.0	≤3.0	≤3.0
Moisture content, %	≤1.5	≤1.5	≤1.5	≤1.5
Wear rate, %	≤0.2	≤0.2	≤0.2	≤0.2

Static water adsorption at (35±1) °C over saturated salt solution, 24 h. Moisture content after 1 h at (550±10) °C. Standard GB/T 10504-2017.

4A molecular sieve

Sodium form of the A-type lattice with a 4 Å pore. Adsorbs water, methanol, ethanol, ethylene, propylene, hydrogen sulphide, sulphur dioxide, carbon dioxide and ammonia, with the highest selectivity for water. Uniform pore distribution keeps the water capacity above that of conventional desiccants at high temperature or very low humidity.

Typical applications

- Deep drying of gases and liquids, refrigerants
- Static drying of medicines, electronics and perishable goods
- Dehydrating agent in paints and fuels
- Argon production



Chemical formula: $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 4.5\text{H}_2\text{O}$ ($\text{SiO}_2 : \text{Al}_2\text{O}_3 \approx 2$)

Technical data

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Colour / pore size	Light gray / 4 Å	Light gray / 4 Å	Light gray / 4 Å	Light gray / 4 Å
Bulk density, g/ml	≥0.70	≥0.70	≥0.66	≥0.66
Compressive strength, N/pc	≥35.0	≥100.0	≥40.0	≥80.0
Particle size pass rate, %	≥98.0	≥98.0	≥98.0	≥98.0
Static water adsorption, %	≥22	≥22	≥22	≥22
Static methanol adsorption, %	≥15.0	≥15.0	≥15.0	≥15.0
Moisture content, %	≤1.5	≤1.5	≤1.5	≤1.5
Wear rate, %	≤0.2	≤0.2	≤0.2	≤0.2

Static water adsorption at (35±1) °C over saturated salt solution, 24 h. Moisture content after 1 h at (550±10) °C.

5A molecular sieve

Calcium form of the A-type lattice with a 5 Å pore. In addition to everything adsorbed by 3A and 4A it takes up C3-C4 n-alkanes, ethyl chloride, ethyl bromide and butanol. High selectivity and fast adsorption kinetics make it the standard charge for pressure swing adsorption units.

Typical applications

- PSA production of oxygen, hydrogen and other gases
- Air purification and deep drying
- Natural gas drying and desulphurisation
- Separation of normal and iso-paraffins



Chemical formula: $0.7\text{CaO} \cdot 0.3\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 4.5\text{H}_2\text{O}$ ($\text{SiO}_2 : \text{Al}_2\text{O}_3 \approx 2$)

Technical data

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Colour / pore size	Light gray / 5 Å	Light gray / 5 Å	Light gray / 5 Å	Light gray / 5 Å
Bulk density, g/ml	≥0.68	≥0.68	≥0.66	≥0.66
Compressive strength, N/pc	≥30.0	≥80.0	≥30.0	≥50.0
Particle size pass rate, %	≥96.0	≥96.0	≥96.0	≥94.0
Wear rate, %	≤0.20	≤0.20	≤0.40	≤0.40
Static water adsorption, %	≥21.0	≥21.0	≥20.5	≥20.5
Static n-hexane adsorption, %	≥12.5	≥12.5	≥12.5	≥12.5
Moisture content, %	≤1.5	≤1.5	≤1.5	≤1.5

Static water adsorption at (35±1) °C over saturated salt solution, 24 h.

5A molecular sieve for hydrogen and oxygen service

Calcium-sodium aluminosilicate with a developed three-dimensional pore system and a crystal pore diameter of 0.5 nm, produced specifically for PSA hydrogen purification and PSA oxygen generation.

Typical applications

- PSA hydrogen purification
- PSA oxygen generation
- Separation of normal and iso-paraffins



Technical data

Parameter	Pellet 1.6-2.5 mm
Colour / pore size	Light gray / 5 Å
Bulk shape	Pellet
Compressive strength, N/pc	≥35.0
Particle size pass rate, %	≥97.0
Wear rate, %	≤0.30
Static water adsorption, %	≥25
Moisture content, %	≤1.5

Static water adsorption at 25 °C over saturated salt solution. Moisture content after 1 h at (550±10) °C.

13X molecular sieve

Sodium form of the X-type lattice with a 10 Å pore, adsorbing any molecule below 10 Å. Used as a catalyst carrier and for co-adsorption of water with carbon dioxide or hydrogen sulphide, mainly in air compression systems and in the pharmaceutical industry.

Typical applications

- Purification of raw gas: removal of water, CO₂ and H₂S
- Drying and desulphurisation of natural gas
- Deep drying of general gases
- Oxygen production



Chemical formula: Na₂O · Al₂O₃ · (2.8±0.2) SiO₂ · (6-7)H₂O (SiO₂ : Al₂O₃ ≈ 2.6-3.0)

Technical data

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Colour / pore size	Light gray / 10 Å	Light gray / 10 Å	Light gray / 10 Å	Light gray / 10 Å

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Bulk density, g/ml	≥0.64	≥0.64	≥0.61	≥0.61
Compressive strength, N/pc	≥30.0	≥85.0	≥30.0	≥50.0
Particle size pass rate, %	≥98.0	≥98.0	≥95.0	≥95.0
Wear rate, %	≤0.20	≤0.20	≤0.40	≤0.40
Static water adsorption, %	≥26.0	≥26.0	≥26.0	≥26.0
Static CO ₂ adsorption, %	≥18.5	≥18.5	≥17.5	≥17.5
Moisture content, %	≤1.5	≤1.5	≤1.5	≤1.5

Static water adsorption at (35±1) °C, RH 75 %, 24 h.

13X-APG molecular sieve

Aluminosilicate with a 10 Å pore developed for cryogenic air separation: raised carbon dioxide and water capacity prevents freeze-up of the column. Also removes trace acetylene and other hydrocarbons from the air.

Typical applications

- Cryogenic air separation units of any capacity
- Removal of CO₂ and water ahead of the cold box



Chemical formula: Na₂O · Al₂O₃ · 2.45SiO₂ · 6.0H₂O (SiO₂ : Al₂O₃ ≈ 2.6-3.0)

Technical data

Parameter	Sphere 1.6-2.5 mm	Sphere 3.0-5.0 mm	Pellet 1.5-1.7 mm	Pellet 3.0-3.3 mm
Colour / pore size	Light gray / 10 Å	Light gray / 10 Å	Light gray / 10 Å	Light gray / 10 Å
Bulk density, g/ml	≥0.64	≥0.64	≥0.61	≥0.61
Compressive strength, N/pc	≥25.0	≥80.0	≥25.0	≥45.0
Particle size pass rate, %	≥98.0	≥98.0	≥95.0	≥95.0
Static water adsorption, %	≥26.5	≥26.5	≥26.5	≥26.5
Static CO ₂ adsorption, %	≥18.5	≥18.5	≥18.5	≥18.5
Moisture content, %	≤1.5	≤1.5	≤1.5	≤1.5
Wear rate, %	≤0.20	≤0.20	≤0.40	≤0.40

Static water adsorption at (35±1) °C, RH 75 %, 24 h.

13X-HP molecular sieve

X-type sieve for oxygen generation. In a pressure swing cycle it retains nitrogen, carbon dioxide and other components of compressed air so that oxygen passes to the receiver. High nitrogen capacity and a high N₂/O₂ selectivity give high product purity and long service life in household and medical oxygen concentrators.

Typical applications

- PSA and VPSA oxygen generators
- Household and medical oxygen concentrators

Chemical formula: Na₂O · Al₂O₃ · 2.45SiO₂ · 6.0H₂O (SiO₂ : Al₂O₃ ≈ 2.6-3.0)

Technical data

Parameter	Pellet 0.4-0.8 mm	Pellet 1.6-2.5 mm
Colour / pore size	Light gray / 10 Å	Light gray / 10 Å



Parameter	Pellet 0.4-0.8 mm	Pellet 1.6-2.5 mm
Bulk density, g/ml	≥0.62	≥0.62
Compressive strength, N/pc	/	≥30.0
N ₂ capacity, ml/g	≥8.0	≥8.0
N ₂ /O ₂ selectivity	≥3.0	≥3.0
Particle size pass rate, %	≥95.0	≥97.0
Wear rate, %	≤0.20	≤0.20
Static water adsorption, %	≥30.0	≥30.0
Static CO ₂ capacity, wt % (250 mmHg, 25 °C)	≥19.8	≥19.8
Moisture content, %	≤1.0	≤1.0

Static water adsorption at (35±1) °C, RH 75 %, 24 h.

CaX molecular sieve

Calcium form of the X-type crystal. Its pores are considerably larger than those of the A-type lattice: molecules with a kinetic diameter below 9 Å are adsorbed, larger ones are excluded.

Typical applications

- PSA hydrogen purification
- Industrial oxygen generation
- Medical oxygen concentrators



Technical data

Parameter	Pellet 6 × 8
Colour / pore size	Light gray / 5 Å
Bulk density, g/ml	≥0.60
Compressive strength, N/pc	≥25.0
Wear rate, %	≤0.3
Nitrogen adsorption rate, % (760 mmHg, 25 °C)	≥18.0
Moisture content, %	≤1.5

Moisture content after 1 h at (550±10) °C.

Lithium molecular sieve (LiLSX)

Lithium low-silica X sieve for air separation. Against conventional calcium and sodium oxygen sieves it offers a higher adsorption capacity and separation efficiency at very low adsorption pressure, which cuts the energy demand of small VPSA oxygen units and raises their output purity.

Typical applications

- VPSA oxygen units
- Small and micro oxygen generating equipment
- Oxygen-enriched air production



Chemical formula: LiLSX: 0.99Li₂O · 0.01Na₂O · Al₂O₃ · 2SiO₂ · 6H₂O (Li₂O 15.9 %, Na₂O 1.7 %, Al₂O₃ 25.5 %, SiO₂ 30.0 %)

Technical data

Parameter	Sphere 0.4-0.8 mm	Sphere 1.3-1.7 mm
Colour / shape	Light gray / sphere	Light gray / sphere

Parameter	Sphere 0.4-0.8 mm	Sphere 1.3-1.7 mm
Bulk density, g/ml	0.63-0.67	0.61-0.65
Compressive strength, N/pc	/	≥15
N ₂ /O ₂ selectivity	≥6	≥6
Static N ₂ adsorption, ml/g	≥22	≥22
Moisture content, %	≤0.5	≤0.5
Wear rate, %	≤0.3	≤0.3

Carbon molecular sieve (CMS)

Black extruded pellets built almost entirely of elemental carbon with a dense system of micropores about 4 Å across. The micropores hold oxygen strongly, so in a pressure swing cycle nitrogen passes through: this is the working charge of PSA nitrogen generators. High nitrogen output, high recovery and long service life.



Typical applications

- PSA nitrogen generators
- Nitrogen for chemical, metallurgical, food and electronics production

Technical data

Type	Adsorption pressure, MPa	N ₂ purity, %	N ₂ output, Nm ³ /(h·t)	N ₂ /air recovery, %
CMS-220	0.75-0.8	95 / 96 / 97 / 98 / 99 / 99.5 / 99.9 / 99.99 / 99.999	420 / 380 / 340 / 300 / 260 / 220 / 145 / 100 / 55	2.0 / 2.1 / 2.2 / 2.3 / 2.4 / 2.6 / 3.7 / 4.8 / 6.8
CMS-240	0.75-0.8	95 / 96 / 97 / 98 / 99 / 99.5 / 99.9 / 99.99 / 99.999	440 / 400 / 360 / 320 / 280 / 240 / 160 / 110 / 65	1.8 / 2.0 / 2.1 / 2.2 / 2.3 / 2.5 / 3.5 / 4.6 / 6.6
CMS-260	0.75-0.8	95 / 96 / 97 / 98 / 99 / 99.5 / 99.9 / 99.99 / 99.999	470 / 430 / 390 / 350 / 320 / 260 / 175 / 120 / 75	1.7 / 1.9 / 2.0 / 2.1 / 2.2 / 2.3 / 3.4 / 4.6 / 6.5
CMS-280	0.75-0.8	95 / 96 / 97 / 98 / 99 / 99.5 / 99.9 / 99.99 / 99.999	500 / 455 / 410 / 365 / 335 / 280 / 190 / 135 / 90	1.6 / 1.8 / 2.0 / 2.1 / 2.2 / 2.3 / 3.4 / 4.5 / 6.4

Values in each cell correspond to the nitrogen purity listed in the same order. Appearance: black extruded pellet.

Activated alumina

Porous alumina spheres for drying, purification and specialised chemical adsorption duties, from standard desiccant grades to dechlorination, COS removal and catalyst carriers.

Activated alumina desiccant

Porous, highly dispersible white spheres with a large water capacity and a fast drying rate. The material does not swell, deform or crack after taking up water, so it does not damage the equipment.

Typical applications

- Drying and dehydration of compressed air and industrial gases



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ , wt %	≥93
SiO ₂ / Fe ₂ O ₃ / Na ₂ O, wt %	0.02 / 0.02 / 0.25
Bulk density, g/ml	0.70-0.80
Pore volume, ml/g	0.45-0.50
Specific surface area, m ² /g	≥300
Attrition loss, %	≤0.1
Loss on ignition, wt %	4-7
Crushing strength, N/pc: 1-2 / 2-3 / 3-5 / 4-6 mm	≥40 / ≥70 / ≥150 / ≥180
Crushing strength, N/pc: 5-7 / 6-8 / 8-10 / 12-14 mm	≥200 / ≥300 / ≥350 / ≥350

Activated alumina, fluorine and arsenic removal agent

Adsorbent with a large specific surface area for water treatment. At low raw-water pH the micropore count is high and the fluoride capacity rises. Removes arsenic, fluorine, copper, zinc, lead and phosphate, with potential for chromium, silicon, selenium and mercury.

Typical applications

- Water treatment plants: defluoridation and arsenic removal
- Used alone or together with filtration units



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ , wt %	≥93
SiO ₂ / Fe ₂ O ₃ / Na ₂ O, wt %	0.02 / 0.02 / 0.25
Bulk density, g/ml	0.70-0.80
Pore volume, ml/g	0.45-0.50
Specific surface area, m ² /g	≥330
Fluoride removal capacity, mg F/g	2.5-3.0
Attrition loss, %	≤0.1

Parameter	Value
Loss on ignition, wt %	4-7
Crushing strength, N/pc (2-3 mm)	≥50

Activated alumina for hydrogen peroxide production

White spheres, non-toxic and insoluble in water, esters, hydrocarbons and alcohols. The grade does not pulverise or soften in water or alkali and has a long service life; it is the dedicated adsorbent for the anthraquinone process.

Typical applications

- Regeneration of the working solution in anthraquinone hydrogen peroxide plants



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ , wt %	≥93
SiO ₂ / Fe ₂ O ₃ / Na ₂ O, wt %	0.02 / 0.02 / 0.35
Bulk density, g/ml	0.70-0.80
Pore volume, ml/g	0.45-0.50
Macropore > 750 Å, ml/g	0.14
Specific surface area, m ² /g	≥330
Attrition loss, %	≤0.1
Loss on ignition, wt %	4-7
Crushing strength, N/pc: 2-3 / 3-5 / 4-6 mm	≥50 / ≥100 / ≥150

Activated alumina catalyst carrier

Spheres with a large pore volume and specific surface area that take up the catalyst solution by impregnation; after the special impregnation process the carrier performs the function of the catalyst itself.

Typical applications

- Carrier for catalyst solutions, organic salts and other active components



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ , wt %	≥93
SiO ₂ / Fe ₂ O ₃ / Na ₂ O, wt %	0.02 / 0.02 / 0.25
Bulk density, g/ml	0.70-0.80
Pore volume, ml/g	0.45-0.50
Specific surface area, m ² /g	≥300
Attrition loss, wt %	≤0.1
Loss on ignition, wt %	4-7
Crushing strength, N/pc: 4-6 / 8-10 / 12-14 mm	≥120 / ≥280 / ≥350

Activated alumina for TBC removal

Smooth-surface spheres with high mechanical reliability, a low deactivation rate and resistance to adsorbed poisons, used to take the inhibitor out of monomer streams.

Typical applications

- Removal of TBC inhibitor and residual moisture from styrene and other monomers



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ / Na ₂ O, wt %	≥93 / 0.35
Bulk density, g/ml	0.70-0.80
Specific surface area, m ² /g	≥300
Pore volume, ml/g	0.45-0.50
Attrition loss, wt %	≤0.1
Loss on ignition, wt %	4-7
Static adsorption capacity, wt %: RH 20 / 60 / 95 %	10 / 20 / 40
Crushing strength, N/pc: 1.2-2.8 / 1.5-3.2 / 2.5-4.0 mm	≥50 / ≥80 / ≥100

Activated alumina dechlorination agent

Wide operating temperature range with uniform activity at low and high temperature, good water resistance and stable reaction products that do not migrate. Used to dechlorinate synthesis gas and to protect catalysts and adsorbents.

Typical applications

- Dechlorination of synthesis gas
- Protection of downstream catalysts and adsorbents
- Dechlorination in naphtha reforming



Technical data

Parameter	Value
Colour / shape	White / sphere
Al ₂ O ₃ , wt %	≥93
SiO ₂ / Fe ₂ O ₃ / Na ₂ O, wt %	0.02 / 0.02 / 0.30
Bulk density, g/ml	0.70-0.80
Pore volume, ml/g	0.45-0.50
Specific surface area, m ² /g	≥300
Attrition loss, wt %	≤0.1
Loss on ignition, wt %	4-7
Chlorine capacity at 50 °C / 350 °C, %	≥12 / ≥22
Crushing strength, N/pc (3-5 mm)	≥150

Sodium permanganate activated alumina

Deep-processed activated alumina impregnated with sodium permanganate. The strong oxidising action decomposes reducing harmful gases, so the material works as a chemical adsorbent for air purification.

Typical applications

- Removal of H₂S, SO₂, chlorine, formaldehyde and low-concentration harmful gases from air
- Air purification in control rooms and electronics production



Technical data

Parameter	2-3 mm	3-5 mm
Colour / shape	Purple / sphere	Purple / sphere
Al ₂ O ₃ , %	≥80	≥80
Na ₂ O, %	≤0.35	≤0.35
Fe ₂ O ₃ , %	≤0.04	≤0.04
NaMnO ₄ , %	≥8.0	≥8.0
Bulk density, g/ml	≥0.8	≥0.8
Pore volume, ml/g	≥0.38	≥0.38
Specific surface area, m ² /g	≥150	≥150
Crushing strength, N/pc	≥50	≥100
Water content, %	≤30	≤30

Activated alumina for COS removal

Composite adsorbent on an alumina carrier working by physical adsorption. Removes COS, H₂S, CS₂, CO₂ and water from the gas phase of hydrocarbon streams.

Typical applications

- Protection of downstream catalysts in polyolefin and petrochemical plants
- Selective adsorption of sulphur compounds from hydrocarbon gas



Technical data

Parameter	7 × 14 mesh (2-3 mm)	5 × 8 mesh (3-4 mm)
Colour	White	White
Bulk density, g/ml	0.75	0.75
Crushing strength, N/pc	35	80
Abrasion loss, %	0.1	0.1
Al ₂ O ₃ and auxiliary content, %	93	93
LOI (300-1000 °C), %	7	7

Packing: 25 kg bag or 800 kg big bag.

Activated alumina CD

Composite adsorbent on an alumina carrier for hydrocarbon streams: removes H₂O, SO₂, H₂S, COS, ethers and ammonia, and takes up oil and harmful by-products, preventing catalyst poisoning and extending the catalyst cycle.

Typical applications

- Removal of oxygenates and sulphur compounds from liquid and gaseous hydrocarbons
- Guard bed ahead of polyethylene and polypropylene catalysts



lication:

Technical data

Parameter	7 × 14 mesh (2-3 mm)	5 × 8 mesh (3-4 mm)
Colour	White	White
Bulk density, g/ml	0.65-0.7	0.65-0.7
Crushing strength, N/pc	35	75
Abrasion loss, %	0.1	0.1
Al ₂ O ₃ and auxiliary content, %	95	95
LOI (300-1000 °C), %	5	5

Packing: 800 kg or 1000 kg big bag.

Silica gel

Silica and silica-alumina gel adsorbents for drying, protection of downstream adsorbent beds and humidity indication, supplied as white, blue, orange and composite grades.

White silica gel

Transparent or translucent spherical particles of chemically inert silicon dioxide with an extremely fine pore mesh that binds water by physical attraction. Non-toxic, non-corrosive, mechanically strong, does not soften in water and can be regenerated after adsorbing water vapour or organic impurities.

Typical applications

- Drying of instruments, medicines, clothing and packaged goods
- Catalyst carrier

Technical data

Parameter	Value
Colour / shape	White / spherical glass particles
Average pore size, nm	2.0-3.0
SiO ₂ , %	≥98.5
Particle size qualification rate, %	≥90
Heating loss, %	≤1
Bulk density, g/l	784
Pore volume, ml/g	0.35-0.45
Specific surface area, m ² /g	650-800
Adsorption capacity, %: RH 20 / 50 / 90 %	≥11.2 / ≥29.2 / ≥37.6
Specific heat, kJ/(kg·°C)	0.92
pH	4
Size, mm	0.5-1.5; 0.5-1; 2-4; 2-5; 4-8

Packing: 25 kg woven bag or customised.



Blue silica gel (indicating)

Blue or light blue glassy spheres that change colour from blue to pink as they take up moisture and return to blue after high-temperature regeneration. Uniform particles, dry surface, stable chemistry, strong mechanically.

Typical applications

- Humidity indication in adsorbent beds and packaging
- Packaging of precision instruments and appliances

Technical data

Parameter	Blue gel indicator	Colour-changing gel	Blue silica gel	Conventional
Shape	Spherical glass particles	Spherical glass particles	Spherical glass particles	Spherical glass particles
Adsorption at RH 20 %, %	≥8	/	/	≥8.5



Parameter	Blue gel indicator	Colour-changing gel	Blue silica gel	Conventional
Adsorption at RH 35 %, %	≥13	/	/	≥13.6
Adsorption at RH 50 %, %	≥20	≥20	≥18	≥22.5
Adsorption at RH 90 %, %	/	/	≥28	≥31.4
Abrasion rate, %	≤10	≤10	≤10	≤0.5
Particle size qualification rate, %	≥96	≥90	≥90	≥97
Heating loss, %	≤5	≤5	≤5	≤0.9
Colour at RH 20 / 35 / 50 %	blue - purple-red - light red	light red at 50 %	purple-red or light red	/
Size, mm	1-3; 2-5; 4-8	1-3; 2-5; 4-8	1-3; 2-5; 4-8	1-3; 2-5; 4-8

Packing: 25 kg woven bag or customised.

Orange silica gel (cobalt free)

Cobalt-free colour-changing desiccant: orange-yellow transparent glassy spheres with strong hygroscopic capacity. The colour shifts from orange through light brown-green to dark green as saturation is reached, so the material acts as a humidity indicator without CoO.

Typical applications

- Humidity indication where cobalt salts are not permitted
- Packaging of precision instruments, appliances, petrochemical products



Technical data

Parameter	Value
Colour / shape	Orange-yellow transparent / spherical glass particles
Al ₂ O ₃ / SiO ₂ , %	≈97 / ≈3
Specific surface area, m ² /g	≈750
Adsorption capacity, %: RH 20 / 35 / 50 / 90 %	≥8.0 / ≥15.0 / ≥20.0 / ≥30.0
Bulk density, g/l	750-800
Pore volume, ml/g	0.4
Compressive strength, N/pc	≥200
Water content, %	≤3.0
Size, mm	2-5; 2-4; 3-5; 1-3

Packing: 25 kg woven bag or customised.

Silica-alumina gel, WS type

Waterproof porous adsorbent in white spherical form built from Al₂O₃ and SiO₂. It protects other adsorbents and catalysts where the water content is high, resists moisture and heat ageing, regenerates at low temperature and is hard and wear resistant.

Typical applications

- Dehydration and protective layer in gas drying units
- Air desiccant in drying air separation systems



Technical data

Parameter	Value
Colour / shape	White / spherical
SiO ₂ / Al ₂ O ₃ , %	≈90 / ≈10
Specific surface area, m ² /g	600
Adsorption capacity at 25 °C, %: RH 20 / 40 / 80 %	≥5.8 / ≥11.5 / ≥30
Water content, %	≤3.0
Bulk density, kg/l	0.7
Pore volume, ml/g	≈0.4
Compressive strength, N/pc	≥60
Liquid water defence	yes
Size, mm	1-3; 2-4; 2-5; 3-5

Packing: 25 kg woven bag or customised.

Silica-alumina gel, H type

Light yellow spheres of $m\text{SiO}_2 \cdot n\text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O}$. At high humidity the capacity is 6-10 % above that of fine-porous silica gel and the thermal stability is more than 150 °C higher, which suits high-temperature adsorbents and separation duties. No defence against liquid water.

Typical applications

- Separation duties in natural gas processing
- Protective layer and pressure swing adsorption service



Technical data

Parameter	Value
Colour / shape	Light yellow / spherical
SiO ₂ / Al ₂ O ₃ , %	≈97 / ≈3
Specific surface area, m ² /g	750
Adsorption capacity at 25 °C, %: RH 10 / 80 %	6.5 / 42
Abrasion rate, %	0.05
Bulk density, kg/l	0.8
Pore volume, cm ³ /g	0.4
Compressive strength, N/pc	200
Liquid water defence	no
Size, mm	2-5

Packing: 25 kg woven bag or customised.

Ceramic and alumina balls

Inert ceramic support media for reactor internals and grinding media, from 17-19 % ordinary porcelain balls up to 99 % pure alumina, corundum and zirconia.

17-19 % ceramic balls

Support and covering media made of chemical clay, used as tower packing and reactor internals. They buffer the impact of the incoming liquid and gas on the catalyst and improve its distribution across the bed.

Typical applications

- Covering and support layers over catalyst beds in refining and chemical plants



Technical data

Parameter	Min, %	Max, %	Typical, %
Al ₂ O ₃	17	19	18
SiO ₂	70	77	74.9
Al ₂ O ₃ + SiO ₂	90	94	93
Fe ₂ O ₃	/	1.0	0.5
TiO ₂ / CaO / MgO	/	0.5 / 0.5 / 0.5	0.46 / 0.42 / 0.38
Na ₂ O / K ₂ O	/	2 / 3.5	1.12 / 3.28
Water absorption, %	< 2.0	Acid resistance > 90 %	Alkali resistance > 85 %
Bulk density, g/cm ³ / specific gravity, kg/m ³	1.3-1.35	2300	Mohs > 6.5
Max. operating temperature, °C	1050	Thermal expansion 0.20 %	Thermal shock 10 cycles
Compressive strength, kN/pc: Ø3 / 6 / 10 / 13 mm	≥0.3	≥0.8 / ≥1.0	≥2.5
Compressive strength, kN/pc: Ø16 / 19 / 25 / 38 / 50 mm	≥3.2 / ≥7.4	≥8.3 / ≥9.3	≥15.4

Colour gray, ball shape. Apparent porosity ≤0.4 % (Ø≥10 mm), ≤1.0 % (Ø6 mm), ≤3.0 % (Ø3 mm); free iron ≤0.1 %.

23-26 % inert alumina ceramic balls

Support and covering media of high-quality chemical clay with high compressive strength, thermal shock resistance, chemical stability and low water absorption. They increase the number of gas and liquid distribution points and hold down catalysts of low strength.

Typical applications

- Support and hold-down layers in reactors in refining, chemicals, fertilizers, natural gas and environmental plants



Technical data

Parameter	Min, %	Max, %	Typical, %
Al ₂ O ₃	23	26	24.5
SiO ₂	64	75	68.5

Parameter	Min, %	Max, %	Typical, %
Al ₂ O ₃ + SiO ₂	90	96	93
Fe ₂ O ₃	/	1.0	0.9
TiO ₂ / CaO / MgO	/	0.5 / 0.5 / 0.5	0.46 / 0.42 / 0.38
Na ₂ O / K ₂ O	/	2 / 3.5	1.12 / 3.28
Water absorption, %	< 2.0	Acid resistance > 98 %	Alkali resistance > 85 %
Bulk density, g/cm ³ / specific gravity, kg/m ³	1.35-1.4	2300	Mohs > 6.5
Max. operating temperature, °C	1050	Thermal expansion 0.20 %	Thermal shock 10 cycles
Compressive strength, kN/pc: Ø3 / 6 / 10 / 13 mm	≥0.2	≥0.5 / ≥0.85	≥1.8
Compressive strength, kN/pc: Ø16 / 19 / 25 / 38 / 50 mm	≥2.3 / ≥4.3	≥6.2 / ≥7.0	≥7.2

Colour light gray, ball shape. Free iron ≤0.1 %.

Medium alumina ceramic balls

Balls pressed from ultrafine alumina powder and fired in a high-temperature tunnel kiln, supplied in 50, 70, 75 and 80 % alumina grades.

Typical applications

- Packing balls and catalyst support in refining and chemical reactors
- Bottom layer in chemical fibre, alkylation and hydro-reforming plants



Technical data

Parameter	50 packing balls	70 packing balls	75 packing balls	80 packing balls
Al ₂ O ₃ , %	≥50	≥70	≥75	≥80
Al ₂ O ₃ + SiO ₂ , %	≥90	≥90	≥90	≥90
Fe ₂ O ₃ , %	<0.3	<0.3	<0.3	<0.2
Specific gravity, g/cm ³	2.4-2.8	2.65-2.9	2.8-3.1	2.9-3.2
Bulk density, kg/m ³	1350-1450	1500-1650	1600-1750	1700-1850
Water absorption, %	<4	<4	<4	<4
Acid / alkali resistance, %	>98 / >85	>98 / >85	>98 / >85	>98 / >85
Heat resistance, °C	1100	1300	1300	1400
Resistance to sudden temperature change, °C	≥400	≥500	≥600	≥700
Compressive strength, kN/pc: Ø3 / Ø6 / Ø10	≥0.12 / ≥0.5 / ≥1.5	≥0.15 / ≥1.0 / ≥2.0	≥0.2 / ≥1.0 / ≥2.0	≥0.25 / ≥1.2 / ≥2.5
Compressive strength, kN/pc: Ø13 / Ø16 / Ø19	≥2.2 / ≥2.5 / ≥3.2	≥3.0 / ≥4.0 / ≥5.0	≥3.5 / ≥4.5 / ≥5.5	≥4.0 / ≥5.0 / ≥6.0
Compressive strength, kN/pc: Ø25 / Ø30 / Ø36 / Ø50	≥4.5 / ≥5.5 / ≥6.5 / ≥7.2	≥6.0 / ≥7.0 / ≥8.0 / ≥12.0	≥6.5 / ≥10.0 / ≥12.0 / ≥15.0	≥7.0 / ≥12.0 / ≥15.0 / ≥22.0

90-92 % high alumina balls

Balls of alumina with a very low silicon content and few impurities, giving better protection to the catalyst bed at high temperature.

Typical applications

- High-temperature and high-pressure service
- Proppant and protective layers in catalytic gas phase processes



Technical data

Parameter	Min, %	Max, %	Typical, %
Al ₂ O ₃	92	94	92.5
SiO ₂	/	2	1.5
Fe ₂ O ₃ / TiO ₂	/	0.3 / 0.1	0.02 / 0.02
CaO / MgO	/	4 / 0.1	1.50 / 0.05
Na ₂ O / K ₂ O	/	0.25 / 0.2	0.1 / 0.13
Free iron, %	≤0.01	Specific gravity, kg/m ³	3200
Apparent porosity, %	≤7.0	Mohs hardness	>8.0
Water absorption, %	<4.0	Thermal conductivity, W/(m·K)	0.7-0.8
Acid / alkali resistance, %	>98 / ≥85	Max. operating temperature, °C	1400
Bulk density, g/cm ³	1.8-2.0	Thermal expansion, %	0.10
Compressive strength, kN/pc: Ø3 / 6 / 10 / 13 / 16 mm	≥0.5 / ≥1.0	≥1.9 / ≥6.0	≥7.6
Compressive strength, kN/pc: Ø19 / 25 / 38 / 50 mm	≥10 / ≥12.0	≥17.9	≥20

Colour white gray, ball shape. Thermal shock stability 10 cycles (500 °C to cold water).

99 % pure alumina balls

Balls with very few impurities and a very low silicon content, free of components toxic to the catalyst, able to withstand the temperature swings of the process. They increase the number of distribution points and support low-strength catalysts.

Typical applications

- High-temperature covering and support media in refining, chemical, fertilizer and natural gas reactors



Technical data

Parameter	Min, %	Max, %	Typical, %
Al ₂ O ₃	99	99.6	99.3
SiO ₂ / Fe ₂ O ₃	/	0.2 / 0.2	0.18 / 0.02
TiO ₂ / CaO / MgO	/	0.55 / 0.1 / 0.1	0.02 / 0.2 / 0.05
Na ₂ O / K ₂ O	/	0.25 / 0.2	0.1 / 0.13
Free iron, %	≤0.01	Specific gravity, kg/m ³	3600
Apparent porosity, %	≤7.0	Mohs hardness	>8.0
Water absorption, %	<4.0	Thermal conductivity, W/(m·K)	0.7-0.8
Acid / alkali resistance, %	>98 / ≥85	Max. operating temperature, °C	1500
Bulk density, g/cm ³	2.0-2.2	Thermal expansion, %	0.10

Parameter	Min, %	Max, %	Typical, %
Compressive strength, kN/pc: Ø3 / 6 / 10 / 13 / 16 mm	≥0.5 / ≥1.0	≥1.9 / ≥6.0	≥7.6
Compressive strength, kN/pc: Ø19 / 25 / 38 / 50 mm	≥10 / ≥12.0	≥17.9	≥20

Colour white gray, ball shape. Thermal shock stability 10 cycles (500 °C to cold water).

Corundum grinding balls

Grinding media for ball mills, stirred mills, vibration mills and sand mills, produced by roll forming (Ø1-Ø50 mm) and by isostatic pressing (Ø40-Ø70 mm). High strength, high density, low wear.



Typical applications

- Grinding of ceramics, alumina, zirconium, kaolin and similar materials

Technical data

Parameter	XT-92	XT-95
Colour / shape	White gray / spherical	White gray / spherical
Al ₂ O ₃ , %	≥92	≥95
SiO ₂ , %	≤5	≤3
Fe ₂ O ₃ , %	≤0.2	≤0.15
Bulk density, g/cm ³	3.65	3.7
Wear rate, %	0.01	0.01
Water absorption, %	0.01	0.01
Mohs hardness	9	9.5
Compressive strength, MPa	2000	2200

High alumina grinding balls

Grinding media produced by isostatic pressing for ceramics, cement, paints, glazes, chemicals, pharmaceuticals, coatings and mining. High hardness, high density, low wear and regular shape shorten the grinding time.



Typical applications

- Grinding media for ceramics, cement, paints, coatings and chemical products

Technical data

Parameter	≥75 %	≥80 %	≥90 %	≥92 %	≥95 %
Colour	White gray	White	White	White	White
Al ₂ O ₃ , %	≥75	≥80	≥90	≥92	≥95
SiO ₂ , %	<20	<16	<7	<5	<3
Fe ₂ O ₃ , %	<0.4	<0.2	<0.15	<0.1	<0.1
Na ₂ O, %	<0.8	<0.5	<0.5	<0.4	<0.25
Bulk density, g/cm ³	3.15-3.25	≥3.30	≥3.50	≥3.60	≥3.68
Wear rate, %	<0.15	<0.12	<0.12	<0.10	<0.07
Mohs hardness	8	9	9	9	9
Water absorption, %	<0.02	<0.01	<0.01	<0.01	<0.01

Sizes Ø10 to Ø90 mm: Ø10 (10±1), Ø15 (15±1), Ø20 (20±1), Ø25 (25±1.5), Ø30 (30±1.5), Ø40 (40±2), Ø50 (50±2), Ø60 (60±2), Ø70 (70±3), Ø80 (80±3), Ø90 (90±3).

Zirconia balls

Highly wear-resistant zirconia grinding balls: high strength and hardness, PPM wear grade, high fracture toughness, large specific gravity, non-magnetic and electrically insulating. Strength and hardness are practically unchanged at 600 °C.

Typical applications

- Ultrafine grinding of metals, silicates and titanium dioxide



Typical Application:

Technical data

Parameter	Value
Colour / shape	White gray / spherical
ZrO ₂ , %	94.6
Y ₂ O ₃ , %	5.2
Crystal size, µm	≤0.5
Filling density, kg/l	3.5 (Ø5 mm)
Bulk density, g/cm ³	5.95-6.00
Hardness, GPa	>11
Elastic modulus, GPa	200
Thermal conductivity, W/(m·K)	3
Thermal expansion coefficient, 1/°C	9.6 × 10 ⁻⁶
Crushing strength, kN	≥20 (Ø7 mm)
Fracture toughness, MPa·m ^{0.5}	8

Structured packing

Corrugated sheet and wire mesh packing elements in metal, ceramic and plastic for distillation, absorption and biological treatment columns.

Metal corrugated plate packing

Perforated metal sheet rolled with fine grooves and large corrugations and assembled into blocks 50-200 mm high and over 1.5 m in diameter. The grooves subdivide the liquid film, improve wetting and raise mass transfer efficiency.

Typical applications

- Vacuum and atmospheric distillation in refining and petrochemicals
- Absorption, desorption and extraction columns



Technical data

Parameter	125Y	250Y	350Y	500Y	125X	250X	350X	500X
Weight, kg/m ³	53	108	125	180	53	108	125	180
Void ratio, %	98	97	94	92	98	97	94	92
Specific surface area, m ² /m ³	125	250	350	500	125	250	350	500
Inclination	45°	45°	45°	45°	30°	30°	30°	30°
Pressure drop, Pa	200	300	350	400	140	180	230	280
Theoretical stages, 1/m	1-1.2	2-2.5	3.5-4	4-4.5	0.8-0.9	1.6-2	2.3-2.8	2.8-3.2

Wire mesh corrugated packing

Disc-shaped element built from parallel corrugated wire mesh sheets stacked at 90° to each other. The capillary action of the mesh gives effective wetting, low pressure drop, low liquid hold-up and high separation efficiency.

Typical applications

- Precision distillation with a high number of theoretical stages
- Vacuum distillation down to 7 kPa, heat-sensitive products
- Separation of isotopic mixtures



Technical data

Parameter	250AX	500BX	700CY
Specific gravity, kg/m ³	125	90	120
Specific surface area, m ² /m ³	250	500	700
F factor, (m/s)·(kg/m ³) ^{0.5}	2.6	2.0-2.4	1.5-2.0
Number of theoretical stages	2-3	4-5	8-10
Peak height, mm	12	6.3	4.3
Theoretical plate height, mm	100	200	333-400
Inclination	30°	30°	45°
Void ratio, %	97	95	87

Ceramic structured packing

Corrugated ceramic elements stacked to a geometric pattern. The hydrophilic ceramic surface forms a thin turbulent liquid film in inclined channels, reduces stagnation and the risk of overheating, polymerisation and coking, and withstands acids and alkalis, especially H₂S and naphthenic acid.

Used in drying towers, absorption towers, cooling towers, scrubber regeneration towers, etc. in chemical industry, metallurgy, gas, oxygen production and other industries (such as the distillation of halogenated organic compounds; corrosive mixtures with strict requirements on pressure drop and number of theoretical plates) Distillation, absorption and other processes: sulfuric acid absorption, nitric acid concentration and fertilizer plant gas purification, etc. in towers with a large amount of natural media: vacuum operation with absolute pressure starting from 100Pa: used as heat exchangers, demisters or catalyst carriers, etc.).

Typical applications

- Drying, absorption and regeneration towers in chemical production
- Sulphuric acid and fertilizer gas purification
- Heat exchange service at vacuum down to 100 Pa

Technical data

Parameter	Value
Colour / shape	Gray / corrugated geometry
SiO ₂ , %	≥72
Al ₂ O ₃ , %	≥23
Fe ₂ O ₃ / CaO / MgO, %	≤0.5 / ≤0.5 / ≤1.0
Crushing strength, MPa	≥130
Mohs hardness	≥7
Acid resistance, %	≥99.5
Loss on ignition, wt %	≤5.0
Water absorption, %	≤0.5
Operating temperature, °C	800

Plastic structured packing

Corrugated plastic packing in PP, RPP, PE, PVC, CPVC or PVDF with a maximum service temperature of 160 °C. Resistant to strong hydrochloric acid and alkali, light, easy to install and a direct replacement for industrial ceramic corrugated packing.



Typical applications

- Gas purification and environmental treatment columns

Technical data

Type	Specific surface area, m ² /m ³	Void ratio, %	Pressure drop, MPa/m	Specific gravity, kg/m ³	Packing factor
SB-125Y	125	98	200	45	3
SB-250Y	250	97	300	60	2.6
SB-350Y	350	94	200	80	2
SB-500Y	500	92	300	130	1.8

Materials: PP, RPP, PE, PVC, CPVC, PVDF. Packing: ton bag per m³ or customised.

Bio-film packing

Packing used as a biofilm carrier in aeration tanks: waste water passes through the packing at a set flow rate after aeration and contacts the biofilm, which together with the suspended activated sludge purifies the water. Large buffer capacity, no secondary pollution, fully automatic operation.

treatment effect of the bio-film packing is very good, and it can meet the most stringent environmental protection requirements in various places in any season. Secondary pollution is produced. Microorganisms can grow on the organic matter in the bio-film packing without adding additional nutrients. Therefore, it has a fast start-up speed after shutdown. If it is shut down for weekends or restarted after 1 to 2 weeks of shutdown, it can achieve good treatment results immediately, and the best treatment effect can be achieved in a few hours. Stopping for 3 to 4 weeks and then starting again to have a good processing effect immediately, the best processing effect will be restored within a few days. Bio-film packing has a large buffer capacity, can automatically adjust the concentration to ensure that microorganisms always work normally, and has strong impact load capacity.

Typical applications

- Municipal and industrial waste water treatment: carbon oxidation, nitrification, denitrification

Technical data

Packing model	Board thickness, mm	Theoretical boards, 1/m ³	Specific surface area, m ² /m ³	Void ratio	Pressure drop, MPa/m	Stack weight, kg/m ³
SB-125Y	1.5-2.0	55	125	0.985	2×10^{-1}	125
SB-250Y	0.8-1.0	65	250	0.97	3×10^{-1}	250
SB-350Y	0.4-0.5	85	350	0.94	2×10^{-1}	350
SB-500Y	0.23-0.3	125	500	0.93	3×10^{-1}	500
SB-125X	1.5-2.0	45	125	0.985	1.4×10^{-1}	125
SB-250X	0.8-1.0	55	250	0.97	1.8×10^{-1}	250
SB-350X	0.4-0.5	75	350	0.94	1.3×10^{-1}	350
SB-500X	0.23-0.3	115	500	0.93	1.8×10^{-1}	500

Design loads: carbon oxidation filter 3.0-6.0 kg BOD₅/(m³·d), hydraulic load 2.0-10.0 m³/(m²·h), empty bed retention 40-60 min; nitrification filter 3.0-6.0 kg NH₃-N/(m³·d), 3.0-12.0 m³/(m²·h), 30-45 min; denitrification filter 3.0-6.0 kg NO₃-N/(m³·d), 6.0-12.0 m³/(m²·h), 20-30 min.

Ceramic random packing

Chemical porcelain random packing for drying, absorption, cooling, washing and regeneration towers, resistant to all inorganic and organic acids except hydrofluoric acid.

Ceramic Raschig ring

The earliest random packing: a simple ring with equal height and diameter. Excellent acid and heat resistance, suitable for high and low temperature service.

Typical applications

- Drying, absorption, cooling and washing towers in chemical and metallurgical plants
- Chlor-alkali and water treatment industry



Technical data

Parameter	16 mm	25 mm	38 mm	50 mm	80 mm	100 mm	150 mm
Wall thickness, mm	2	2.5	5	6	9.5	10	15
Specific gravity, kg/m ³	750	700	630	600	580	600	700
Stacked quantity, pcs/m ³	192 500	49 000	12 700	6 000	1 900	1 000	295
Specific surface area, m ² /m ³	305	190	126	93	90	70	50
Packing factor, 1/m	784	400	305	177	234	172	142
Void ratio, %	73	78	75	81	68	70	68

Material: chemical porcelain, gray. SiO₂ > 70 %, Al₂O₃ 17-23 %, water absorption < 0.5 %, acid resistance > 99.8 %, operating temperature > 1400 °C.

Ceramic Pall ring

Open ring with two rows of windows in the wall, each with an inward-curving tongue. The openings take about 30 % of the wall area, which improves gas-liquid distribution, makes use of the inner surface, raises capacity and lowers pressure drop against the Raschig ring.

Typical applications

- Drying and absorption towers in chemical, metallurgical and gas industries
- HNO₃ tail gas treatment



Technical data

Parameter	25 mm	38 mm	50 mm	80 mm
Wall thickness, mm	3	4	5	8
Specific gravity, kg/m ³	650	620	600	550
Stacked quantity, pcs/m ³	53 500	13 400	6 800	1 950
Specific surface area, m ² /m ³	210	150	120	75
Packing factor, 1/m	420	356	252	146
Void ratio, %	73	75	78	80

Material: chemical porcelain, gray, as for the Raschig ring.

Ceramic Intalox saddle

Grooved semicircular open shape between a ring and a saddle. Arc-shaped liquid channels in the bed lower the resistance to the gas and reduce radial diffusion of the descending liquid. Dense porcelain, strong resistance to acid and alkali, especially H_2SO_4 and HNO_3 .

Typical applications

- Drying and absorption towers with high flux and low pressure drop requirements



Technical data

Parameter	13 mm	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m^3	780	680	640	600	600
Specific surface area, m^2/m^3	623	253	164	115	92
Packing factor, $1/\text{m}$	200	85	50	37	24
Void ratio, %	71.7	73	75	77.4	75.5

Material: chemical porcelain, gray, as for the Raschig ring.

Ceramic super saddle

Improved rectangular saddle ring: the smooth arc of the Intalox saddle is replaced by a zigzag edge and an opening is added on the saddle back, which widens the contact gaps in the bed and improves the flow and diffusion of gas and liquid.

Typical applications

- Drying, absorption and regeneration towers in chemical and metallurgical industries



ication:

Technical data

Parameter	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m^3	620	600	580	550
Specific surface area, m^2/m^3	260	210	140	105
Packing factor, $1/\text{m}$	570	430	277	206
Void ratio, %	77	78	79	77

Material: chemical porcelain, gray, as for the Raschig ring.

Ceramic cross partition ring

A Raschig ring with a cross partition inside, which raises the specific surface area and the compressive strength, lowers the pressure drop and reduces channelling and wall flow. Sizes Ø80-150 mm serve as support material with a void ratio above 60 %.

Typical applications

- Support layers in drying, absorption and regeneration towers
- Bottom distribution layer under random packing



Location:

Technical data

Parameter	50 mm	80 mm	100 mm	120 mm	150 mm
Specific gravity, kg/m ³	680	820	850	860	750
Stacked quantity, pcs/m ³	6 400	1 950	1 000	370	216
Specific surface area, m ² /m ³	145	120	110	75	60
Packing factor, 1/m	565	356	252	146	110
Void ratio, %	50	56	53	55	58

Material: chemical porcelain, gray, as for the Raschig ring.

Ceramic cascade ring

A Raschig-type ring of reduced height with openings in the wall and a flange at one end, which raises the mechanical strength of the bed, promotes renewal of the liquid film and lowers the pressure drop and liquid hold-up against the Intalox saddle.

Typical applications

- Drying and absorption towers in chemical and metallurgical plants
- Synthetic ammonia and methacrylate refining towers



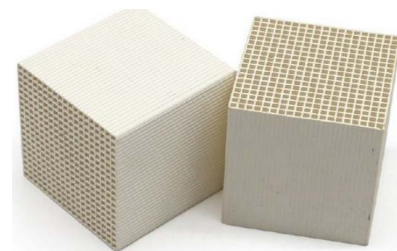
Technical data

Parameter	25×20×3 mm	38×30×4 mm	50×30×5 mm	76×45×7 mm
Specific gravity, kg/m ³	620	700	510	420
Stacked quantity, pcs/m ³	74 000	16 000	9 000	2 500
Specific surface area, m ² /m ³	270	192	108	63
Packing factor, 1/m	172	192	223	126
Void ratio, %	74	80	78.7	79.5

Material: chemical porcelain, gray, as for the Raschig ring.

Honeycomb ceramic for RTO

High-temperature combustion regenerator built as a honeycomb of equal channels, the core element of regenerative thermal oxidation: it recovers the heat of the flue gas, supports high-efficiency combustion and reduces NOx emissions.



Typical applications

- Regenerative thermal oxidisers (RTO) for VOC abatement
- Heat recovery in high-temperature combustion systems

Technical data

Size, mm	Cells, cpsi	Wall thickness, mm	Specific surface area, m ² /m ³	Porosity, %	Bulk density, kg/m ³
150×150×300	60×60	0.5	1315	70	680
150×150×300	50×50	0.7	1050	58	680
150×150×300	40×40	0.7	883	65	518
150×150×300	25×25	1.0	573	67	502

Composition: Al₂O₃ 31-34 %, SiO₂ 48-51 %, MgO 14-16 %. Cordierite volume density 1.9-2.0 g/cm³, thermal expansion < 2 × 10⁻⁶ 1/K (20-1000 °C), specific heat 830-900 kJ/kg, cycling temperature resistance 300 K, maximum operating temperature 1300 °C, heat resistance 800 °C, acid resistance > 99 %, alkali resistance > 85 %, water absorption 22±5 %. Packing: cartons or wooden boxes.

Metal random packing

Thin-wall stainless and carbon steel random packing with high void ratio and low pressure drop for distillation, absorption, washing and regeneration columns.

Metal Raschig ring

Open annular packing with equal height and diameter. The high opening rate lets gas and liquid pass freely, and the inner surface wets easily and is fully used. Bright, burr-free surface, thin wall and long service life.

Typical applications

- Drying, absorption, washing and regeneration towers in chemical and gas plants



Technical data

Parameter	16 mm	25 mm	38 mm	50 mm	76 mm	89 mm
Wall thickness, mm	0.3	0.5	0.8	0.8	1.0	1.0
Specific gravity, kg/m ³	345	357	387	315	237	206
Stacked quantity, pcs/m ³	201 000	51 000	15 000	6 500	1 830	1 160
Specific surface area, m ² /m ³	330	330	330	330	330	330
Void ratio, %	95.1	95.1	95.1	95.1	95.1	95.1

Packing: ton bag per m³ or customised.

Metal Pall ring

Ring punched from sheet metal with two rows of windows; each row has five inward-pointing tongues and the upper and lower windows are staggered. Gas-liquid distribution is much better than in the Raschig ring, the inner surface is fully used, capacity and operating flexibility are higher.

Typical applications

- Drying and absorption towers in chemical and metallurgical plants
- CO₂ degassing, vacuum distillation of heat-sensitive products



Technical data

Parameter	16 mm	25 mm	38 mm	50 mm	76 mm	90 mm
Wall thickness, mm	0.3	0.3	0.4	0.5	0.8	0.7
Specific gravity, kg/m ³	390	227	206	195	220	160
Stacked quantity, pcs/m ³	220 000	52 380	15 200	6 500	1 980	1 160
Specific surface area, m ² /m ³	346	212	145	106	69	62
Void ratio, %	95.5	96.2	96.7	97.5	97.4	97.1

Packing: ton bag per m³ or customised.

Metal Intalox saddle (MTP)

High-efficiency packing combining annular and saddle structures: annular ribs prevent nesting and give rigidity, and small claws are punched out to intensify gas-liquid agitation. Efficiency is 10-30 % higher and pressure drop 20-60 % lower than with conventional packing; a new column can be 35 % shorter and 30 % smaller in diameter.

Typical applications

- Distillation and vacuum service in refining and petrochemicals



Technical data

Parameter	16 mm	25 mm	38 mm	50 mm
Wall thickness, mm	0.3	0.3	0.4	0.4
Specific gravity, kg/m ³	300	198	168	128
Stacked quantity, pcs/m ³	330 000	100 000	52 000	15 500
Specific surface area, m ² /m ³	305	241	161	104
Packing factor, 1/m	167	135	79	59
Void ratio, %	96.5	96.8	97.1	98.1

Packing: ton bag per m³ or customised.

Metal super saddle

Saddle-type metal packing with staggered windows and inward tongues, giving good gas-liquid distribution, high capacity and operating flexibility with a thin wall and strong impact resistance.

Typical applications

- Random packing for washing and regeneration towers, oxygen production and similar duties
- Dewaxed oil refining and extraction



tion:
packing: it is used in driving towers :

Technical data

Parameter	16 mm	25 mm	38 mm	50 mm
Wall thickness, mm	0.3	0.3	0.4	0.4
Specific gravity, kg/m ³	300	198	168	128
Stacked quantity, pcs/m ³	330 000	100 000	52 000	15 500
Specific surface area, m ² /m ³	305	241	161	104
Packing factor, 1/m	167	135	79	59
Void ratio, %	96.5	96.8	97.1	98.1

Packing: ton bag per m³ or customised.

Metal cascade mini ring

Open-hole packing about half as high as it is wide, with a tapered flange on one side, windows in the wall and blades curved towards the centre. Large gaps along the gas-liquid path reduce pressure drop, the vertical orientation cuts the share of dry surface, and solids pass through the bed without fouling it.

Typical applications

- Absorption, stripping and washing towers in petrochemicals and fertilizers
- Synthetic ammonia desulphurisation, atmospheric and vacuum separation, organic acid separation



Technical data

Parameter	25 mm	38 mm	50 mm
Wall thickness, mm	0.3	0.3	0.4
Specific gravity, kg/m ³	215	155	154
Stacked quantity, pcs/m ³	98 120	30 040	12 340
Specific surface area, m ² /m ³	241	161	104
Void ratio, %	96.8	97.1	98.1

Packing: ton bag per m³ or customised.

Plastic random packing

Light, corrosion-resistant random packing in PP, RPP, PE, PVC, CPVC and PVDF for scrubbing, stripping and water treatment columns, operating temperature 60-150 °C depending on the medium.

Plastic Pall ring

Open-hole ring with equal height and diameter developed from the plastic Raschig ring. Gas flux is about 50 % higher and the pressure drop at the same gas velocity about half that of the Raschig ring of the same size.

Typical applications

- Scrubbing, stripping and separation towers in chemicals and environmental treatment
- CO₂ desulphurisation and denitrification reaction towers



Technical data

Parameter	16 mm	25 mm	38 mm	50 mm
Wall thickness, mm	1.1	1.2	1.4	1.5
Specific gravity, kg/m ³	72	56	54	45
Stacked quantity, pcs/m ³	179 000	53 500	15 800	6 500
Specific surface area, m ² /m ³	320	195	150	112
Void ratio, %	94	94	95	95

Materials: PP, RPP, PE, PVC, CPVC, PVDF. Packing: ton bag per m³ or customised.

Plastic Intalox saddle

Saddle-shaped packing with mainly arc-shaped liquid channels. The gaps in the bed are more continuous than in ring packing, so the gas flows along the arc channel: large flux, low pressure drop, high mass transfer efficiency, light and impact resistant.

Typical applications

- Absorption towers in refining, chemicals and environmental treatment



Technical data

Parameter	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m ³	90	67	57	75
Stacked quantity, pcs/m ³	128 400	55 500	1 100	5 500
Specific surface area, m ² /m ³	288	265	250	200
Void ratio, %	84.7	95	96	97
F factor, 1/m	473	405	332	289

Materials: PP, RPP, PE, PVC, CPVC, PVDF.

Plastic super saddle

Improvement on the Intalox saddle: the fan-shaped arc becomes a shell-shaped arc with a serrated edge and additional openings connect the inner and outer surfaces, which enlarges the free channel, improves liquid distribution and surface renewal and raises the throughput.

Typical Application:

• Widely used in petroleum, chemical, chlor-alkali, coal gas and environmental protection packed towers for dewaxing oil refining, demethanization, phthalic anhydride refining, etc.

Typical applications

- Packed towers in refining, chemicals and environmental treatment
- Phthalic anhydride refining

Technical data

Parameter	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m ³	77	70	60	60
Stacked quantity, pcs/m ³	51 200	45 000	6 300	3 700
Specific surface area, m ² /m ³	288	265	250	200
F factor, 1/m	473	405	332	289
Void ratio, %	167	95	96	97

Materials: PP, RPP, PE, PVC, CPVC, PVDF.

Plastic Tellerette rosette ring

A large flat sphere made of several small rings arranged radially. The wide gaps hold more liquid and lengthen its residence time in the tower, which increases the contact time between the phases and the mass transfer efficiency. Large porosity, low pressure drop, high flooding point, light weight.



Typical applications

- Packed towers in chemicals and environmental treatment
- Gas washing

Technical data

Parameter	25×9	47×19	51×19	59×19	73×28	95×37	145×48
Model	5	9	9	12	12	18	20
Wall thickness, mm	1.5-2	3	3	2	3-4	3-6	3-6
Specific gravity, kg/m ³	68	65	55	62	42	45	42
Stacked quantity, pcs/m ³	170 000	32 500	25 000	17 500	8 000	3 900	1 100
Specific surface area, m ² /m ³	195	185	180	150	127	94	65
Void ratio, %	82	88	89	92	89	90	95

Materials: PP, RPP, PE, PVC, CPVC, PVDF. Operating temperature 60-150 °C depending on the medium.

Plastic polyhedral hollow ball

Sphere formed from two hemispheres, each built of several fan-shaped blades staggered against each other. High gas velocity, many blades, low resistance, large specific surface area, wide operating range and full gas-liquid contact.

Typical Application:

The operating temperature in various media is 60-150°. It is widely used in petroleum, chemical, chlor-alkali, coal gas, smelting, environmental protection and other industries. It is used in spraying equipment, dust removal, degassing towers, demisters, denitrification, desulfurization, chlorine removal, oxygen removal, carbon dioxide removal absorption towers, spray purification towers, waste gas purification towers, acid mist purification towers, sewage treatment and other environmental protection equipment.

Typical applications

- Water treatment and CO₂ removal equipment in power plants
- Spraying and purification towers, chlorine removal, sewage treatment

Technical data

Parameter	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m ³	54	50	45	45
Stacked quantity, pcs/m ³	77 000	25 000	10 500	2 800
Specific surface area, m ² /m ³	460	325	236	150
Void ratio, %	84	87	90	92

Materials: PP, RPP, PE, PVC, CPVC, PVDF.

Plastic cascade mini ring

Ring with flanges on the side, which raises the mechanical strength, increases the probability of favourable orientation in the bed and turns line contact between elements into point contact. The larger gaps lower the resistance to the gas, raise the flux and promote renewal of the liquid film.

Typical Application:

Decarbonization and desulfurization systems in synthetic ammonia plant, crude oil separation and atmospheric and vacuum devices, etc. The operating temperature in various media is 60-150°C. As fillers, its widely used in absorption towers, washing towers, separation towers, etc. in petrochemical, chlor-alkali, coal gas, environmental protection and other industries.

Typical applications

- Decarbonisation and desulphurisation, crude oil separation and atmospheric service
- Absorption towers in petrochemicals, chlor-alkali and related industries

Technical data

Parameter	16 mm	25 mm	38 mm	50 mm	76 mm
Specific gravity, kg/m ³	90	54	54	38	40
Stacked quantity, pcs/m ³	299 136	81 500	27 200	10 740	3 420
Specific surface area, m ² /m ³	370	228	132.5	114.2	90
F factor, 1/m	602.6	312.8	175.8	143.1	112.3
Void ratio, %	85	90	97.5	97.4	97.1

Materials: PP, RPP, PE, PVC, CPVC, PVDF.

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