

VAN AIR SYSTEMS



Adsorbent Desiccants

Van Air Systems is the leading source of desiccants
used for drying compressed air and gas.

Activated Alumina

Silica Gel

Molecular Sieve

Cost Saving Solutions for Compressed Air Systems

Activated Alumina

Activated alumina is a porous form of aluminum oxide. It has a high surface area which adsorbs vapors without any change in form. Activated aluminas will not soften or disintegrate easily when immersed in water.

Dew points to -40°F and lower may be achieved with activated alumina depending on dryer design and operating conditions.

The 1/8" (2-5mm) bead is the size most frequently used in regenerative dryers.

The 3/16" (4-8mm) bead is used when pressure drop and surface area requirements fall between 1/8" and 1/4" material. It is suitable for most systems.

The 1/4" (5-10mm) bead alumina is used both as a pre-bed material to support large desiccant beds or as a buffer for silica gel beads. Pressure drop is slightly lower than 1/8" (2-5mm) material.

If size is not known or specified, the 1/8" (2-5mm) size is usually satisfactory. However, if activated alumina is used in a regenerative dryer and the desiccant retaining screens cannot be measured, the 1/4" (5-10mm) size should be used as a bed support (6" layer). If at all possible, obtain a sample and measure it before ordering.



Activated Alumina 1/8"



Activated Alumina 3/16"



Activated Alumina 1/4"

Product Benefits

- High adsorption capacity.** With high surface area and excellent pore distribution, activated alumina has a high water adsorption capacity. This reduces initial cost, energy consumption and operating costs through smaller bed sizes and/or longer operating cycles.
- Low abrasion.** Insures less dusting during tower depressurization or loading. Low abrasion means low pressure drop and a reduced chance of plugging the afterfilter.
- Resists liquid water.** Water slugging due to upstream failure of aftercooler, separators or drain traps will not fracture the alumina beads. The adsorption capacity of the desiccant can be restored after complete regeneration.
- High crush strength.** High crush strength, which limits dusting, is important during loading of desiccant towers. High crush strength makes alumina effective as a prebed material when used with other types of desiccants.
- Uniform bead sizes.** Activated alumina is a uniformly sized bead. It provides low pressure drop to minimize channeling and ensures utilization of the full bed column section.

Physical Properties

	1/8" (2-5mm)	3/16"(4-8mm)	1/4" (5-10mm)
Color and form	White bead	White bead	White bead
Bulk density	48 lbs/Ft ³	48 lbs/Ft ³	48 lbs/Ft ³
Crush strength	17-30 lbs	45-60 lbs	50-70 lbs
Surface area	1.74 x 10 ⁶ sq ft/lb	1.65 x 10 ⁶ sq ft/lb	1.59 x 10 ⁶ sq ft/lb
Static adsorption			
<i>Humidity</i>			
100% RH	42.0%	40.0%	36.0%
90% RH	37.5%	35.0%	32.0%
60% RH	21.0%	21.0%	17.5%
10% RH	7.5%	7.0%	6.0%

Activated Alumina Package Sizes

1/8" (2-5mm)		3/16" (4-8mm)		1/4" (5-10mm)	
33-0237	25 lb pail	33-0370	25 lb pail	33-0240	25 lb pail
33-0238	50 lb bag	33-0367	50 lb bag	33-0241	50 lb bag
33-0320	375 lb steel drum	33-0371	350 lb steel drum	33-0321	375 lb steel drum
33-0266	2000 lb bulk bag	33-0372	2000 lb bulk bag	33-0267	2000 lb bulk bag

Silica Gel

Silica gel is a spherical bead consisting of 97-100% silica. It is available in two types: indicating, a translucent bead impregnated with blue or yellow color and non-indicating white translucent color.

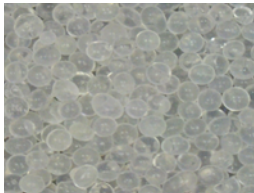
Sorbead™ R is an alumina-silicate, although it is listed in the Silica Gel section it is not truly a Silica Gel. Sorbead™ R is designed to perform in difficult environments and provide a higher service life than white Silica Gel. It is sometimes referred to as brown Silica Gel.

Since silica gel fractures in the presence of liquid water. It must be protected by a 10% to 15% (by weight) layer of activated alumina as a water buffer on the inlet side of the desiccant bed.

Dew points of -40°F and lower may be achieved with silica gel depending on dryer design and operating conditions.

Product Benefits

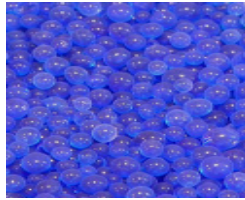
- High moisture retention capacity under dynamic conditions.** Used in some heated type regenerative dryers. Under dynamic conditions, a higher design capacity rating and lower regeneration temperature can be used.
- Uniform bead shape.** This shape provides lower pressure drop and less abrasion than granular types. Smooth beads also pack uniformly to minimize channeling.
- Provides visual check of desiccant condition (indicating type only).** Beads are impregnated with a moisture indicator. The color changes from blue to pink or yellow to green as moisture is adsorbed.



Non-Indicating White Silica Gel



Non-Indicating Sorbead™ R Silica Gel



Indicating Blue Silica Gel



Indicating Yellow Silica Gel

Physical Properties

Color and form	Non-Indicating		Indicating	
	White Bead	Sorbead	Blue bead	Yellow bead
Size	2-5 mm (1/8")	3-5 mm (1/8")	3-5 mm (1/8")	2-5 mm (1/8")
Bulk density	45 lbs/ft ³	50 lbs/ft ³	45 lbs/ft ³	45 lbs/ft ³

Silica Gel Package Sizes

White Non-Indicating		Sorbead™ R Non-Indicating		Blue Indicating		Yellow Non-Indicating	
33-0381	5 lb pail	33-0315	5 lb pail	33-0316	5 lb pail	33-0385	5 lb pail
33-0382	25 lb pail	33-0243	25 lb pail	33-0246	25 lb pail	33-0386	25 lb pail
33-0383	55 lb bag	33-0244	50 lb bag	33-0247	50 lb bag	33-0387	55 lb fiber drum
		33-0245	330 lb steel drum	33-0248	330 lb steel drum		

Molecular Sieve

Molecular sieve is a sodium aluminosilicate. It has a fixed pore size according to the material specified, 4 Angstrom being the most common.

(1 Angstrom = 3.94×10^{-9} inches)

Because of its higher cost, it is normally used for special process applications. Pressure dew points to -100°F may be achieved with molecular sieve depending on the dryer design and operating conditions.



Molecular Sieve

Product Benefits

- 1. Uniform retention capacity.** Moisture retention (pounds of water adsorbed per pound of desiccant) does not change appreciably if the air or gas is not saturated. It also keeps its moisture retention properties over a wider range of operating temperatures.
- 2. Round bead shape.** Spheres have high abrasion resistance and results in lower pressure drop than extruded molecular sieve.

Physical Properties

Color and form	Off white / tan bead
Size	3-5 mm (1/8")
Bulk density	40 lbs/ft ³ (+/- 10%)
Surface area	3.67 x 10 ⁶ sq ft/lb
Static adsorption	
<i>Humidity</i>	
100% RH	23.0%
90% RH	22.0%
60% RH	21.0%
10% RH	19.0%

Molecular Sieve Package Sizes

33-0317	5 lb pail
33-0249	25 lb pail
33-0265	50 lb bag
33-0250	330 lb steel drum

With an on-site, dedicated facility for desiccant development, you get the best desiccant on the market today.

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