

Alumina

Activated Alumina for Liquid and Gas Drying

Alumina is a smooth sphere of activated alumina produced by a unique manufacturing process. Alumina is an excellent desiccant for drying a wide variety of liquids and gases. Although all molecules are adsorbed to some extent on activated alumina, those molecules having the highest polarity are preferentially absorbed. Stream conditions such as pressure, concentration and molecular weight of the molecules, temperature and site competing molecules affect the efficiency of adsorption. Alumina is available in nominal sizes of 1/16", 1/8", 3/16" and 1/4" spheres.

Product Benefits

1. Uniform ball size

This property is especially useful in high pressure gas dehydration where minimizing pressure drop is important. The uniform size and sphericity of Alumina prevents adsorbent segregation during pneumatic loading, thus minimizing channeling and yielding more efficient use of the entire desiccant tower.

2. High crush strength

Alumina has high crush strength which allows rapid pneumatic loading of towers. The high crush strength also allows use of taller towers that make more efficient use of the desiccant. The activated alumina is highly resistant to amine attack. Furthermore, Aluminas high crush strength enables it to dehydrate acid containing gases and liquids, such as CO₂, for a longer operating life.

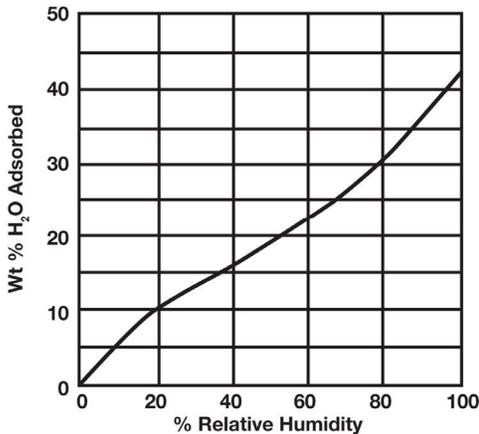
3. Low abrasion

The low abrasion of Aluminas ensures less dusting during transport, loading, and service life which reduces pressure drop and minimizes downstream valve and filter plugging, common with dustier products.

4. High adsorptive capacity

Aluminas high surface area and tailored pore distribution provide a high dynamic H₂O adsorption capacity. With proper tower design and effective regeneration, Alumina can achieve an ultra low H₂O effluent specification (i.e. dew point). Alumina also has excellent cyclic stability that yields a long life.

Typical Physical Properties	7X14 Tyler Mesh (2.0 mm)	1/8" (3.2 mm)	3/16" (4.7 mm)	1/4" (6.4 mm)
Surface Area, m ² /g	360	350	340	320
Total Pore Volume, cc/g	0.5	0.5	0.5	0.5
Packed Bulk Density, lbs/ft ³ (kg/m ³)	48 (769)	48 (769)	48 (769)	48 (769)
Crush Strength, lbs (kg)	11 (5)	30 (14)	55 (25)	70 (32)
Abrasion Loss, wt %	0.1	0.1	0.1	0.1



Typical Chemical Composition (wt %)

Al ₂ O ₃	92.7
SiO ₂	0.02
Fe ₂ O ₃	0.02
Na ₂ O	0.30
LOI (250-1100° C)	7.0

Product Applications

1. Drying

Nearly all gases and liquids can be dried with Alumina. Water removal is often necessary for efficient processing, storage, and transportation of fluids. The 3/16" size is normally recommended for vapor phase dehydration applications where pressure drop minimization yet high H₂O adsorptive capacity is desired. The 1/8" and 7 x 14 Tyler mesh sizes are recommended for use in liquid dehydration and other mass transfer limited adsorption applications.

The activated alumina is rapidly becoming the industry standard for drying compressed air. Providing long service life with performance at or below dew point specifications, Alumina is a 'peace of mind' product for both large and small dryers. Alumina is appropriate for use in dehydrating gases in both thermally regenerative (350 to 600°F) and pressure swing (PSA) modes.

2. Acid removal

Transformer oils, lubricating oils, and refrigerants form degradation acids upon use. Alumina will remove these acids during use. In the manufacture of chlorinated and/or fluorinated hydrocarbons, removal of these residual halides and water is essential for a non-corrosive product.

3. Process stream purification

Alumina is excellent for removal of highly polar compounds such as water and alcohol. It also readily adsorbs TBC and heavy metal ions from hydrocarbons.

4. Hydrocarbon adsorption

Under proper operating conditions, the pore size distributions and surface chemistry of activated aluminas are conducive to the adsorption of hydrocarbons.

Available Packaging

- 50 lb bags
- 375 lbs steel drums
- 2000 lb super sacks