Alcoa World Chemicals

ACTIVATED ALUMINAS

F-220

PRODUCT DATA

Superior capacity and hydrothermal stability for drying gases and liquids

Product Information

F-220 is a smooth sphere of activated alumina produced by Alcoa's unique manufacturing process, and is available in a variety of sizes. It is optimized for maximum adsorption capacity and hydrothermal stability.

F-220 is an excellent desiccant for drying a wide variety of liquids and gases. Although all molecules are adsorbed to some extent on F-220, those molecules having the highest polarity are preferentially adsorbed. Stream conditions such as pressure, concentration and molecular weight of the molecules, temperature, and site competing molecules affect the efficiency of adsorption.

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 F-220 prevents adsorbent segregation during pneumatic loading, thus minimizing channeling and yielding more efficient use of the entire desiccant tower.

2. High crush strength. F-220 has a 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. F-220 activated alumina is highly resistant to amine attack. Furthermore, F-220's high crush strength enables it to dehydrate acid containing gases and liquids, such as CO_2, for a longer operating life.

3. Low abrasion. The low abrasion of F-220 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. F-220's high surface area and tailored pore distribution provide a high dynamic H_2O adsorption capacity. With proper tower design and effective regeneration, F-220 can achieve an ultra low H_2O effluent specification (i.e. dew point). F-220 also has excellent cyclic stability that yields a long life.

Applications

1. Drying. Nearly all gases and liquids can be dried with F-220. Water removal is often necessary for efficient processing, storage, and transportation of fluids.

The 3/16" size is normally recommend for vapor phase dehydration applications where pressure drop minimization yet high H_2O adsorption capacity is desirable. The 1/4" size provides the lowest pressure drop characteristics in vapor phase service but does not have as high an H_2O adsorption capacity as do smaller diameter sizes of F-220.

The 1/8" and 7 x 14 Tyler mesh size are recommended for use in liquid dehydration and other mass transfer limited adsorption applications.

F-220 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. F-220 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 noncorrosive product.

3. Process stream purification. F-220 is excellent for removal of highly polar compounds such as TBC, alcohols, ethers, etc. It also readily adsorbs 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.

Typical Properties of F-220 Activated Alumina

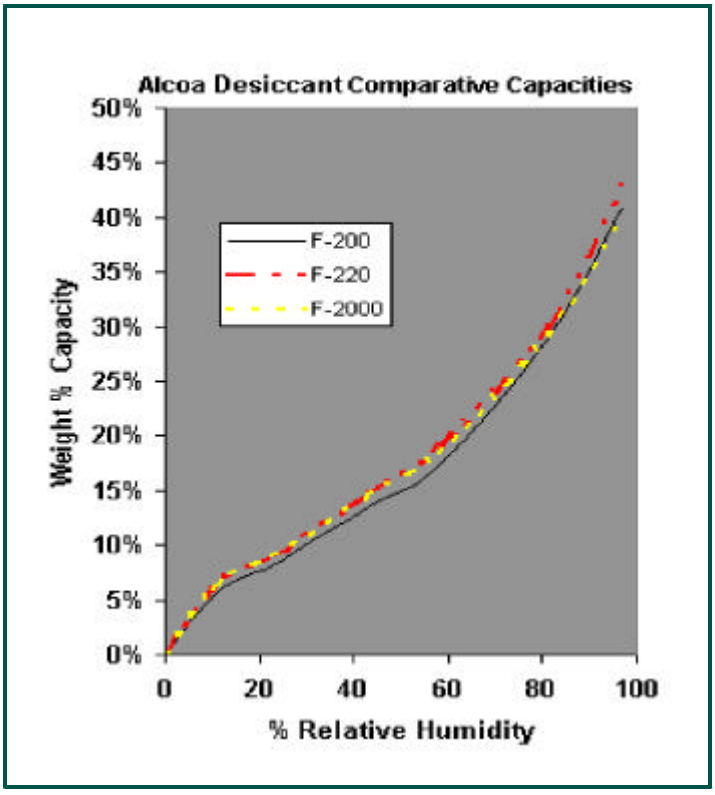
Physical

	7x14 Tyler mesh (2.0 mm)	1/8 inch (3.2 mm)	3/16 inch (4.8 mm)	1/4 inch (6.4 mm)
Surface area, m^2/g	360	355	340	325
Total pore volume, cc/g	0.5	0.5	0.5	0.5
Packed Bulk Density, lbs/ft^3 (kg/m^3)	49 (785)	49 (785)	49 (785)	49 (785)
Crush Strength lbs, (kgs)	12 (5.4)	33 (15)	60 (27)	75 (32)
Abrasion loss, wt%	0.1	0.1	0.1	0.1

Water Adsorption Data

Static sorption @ 11% RH	9	9	8	8
Static sorption @ 58% RH	23	23	22	20
Static sorption @ 97% RH	43	43	41	39

Chemical	wt%
Al_2O_3	93.1
SiO_2	0.02
Fe_2O_3	0.02
Na_2O	0.30
LOI (250 - 1100°C)	6



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