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## Molecular Sieve type 4A

### Introduction

Molecular Sieve type 4A is an alkali alumino silicate; it is the sodium form of the Type A crystal structure. 4A molecular sieve has an effective pore opening of about 4 angstroms (0.4nm). Type 4A molecular sieve will adsorb most molecules with a kinetic diameter of less than 4 angstroms and exclude those larger. Such adsorbable molecules include simple gas molecules such as oxygen, nitrogen, carbon dioxide and straight chain hydrocarbons. Branched chain hydrocarbons and aromatics are excluded.

### ■ Typical 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 Parameter

Item	Unit	Technical data			
		Pellet		Sphere	
Shape					
Diameter	mm	1.5-1.7	3.0-3.3	1.7-2.5	3.0-5.0
Size ratio up to grade	%	≥98	≥98	≥96	≥96
Bulk density	g/ml	≥0.66	≥0.66	≥0.66	≥0.66
Wear ratio	%	≤0.20	≤0.40	≤0.20	≤0.20
Crushing strength	N	≥30/cm	≥45/cm	≥30/piece	≥70/piece
Static water adsorption	%	≥20.5	≥20.5	≥21	≥21
Static methanol adsorption	%	≥15	≥15	≥15	≥15
Water content, as shipped	%	≤1.5	≤1.5	≤1.5	≤1.5

### ■ Application

■ Drying and removing of CO<sub>2</sub> from natural gas, LPG, air, inert and atmospheric gases, etc.

■ Removal of hydrocarbons, ammonia and methanol from gas streams

(ammonia syn gas treating)

■ Special types are used in the air break units of buses, trucks and locomotives.

■ Packed in small bags, it may be used simply as a packaging desiccant.

■ **Regeneration** Molecular sieve Type 4A can be regenerated by either heating in the case of thermal swing processes; or by lowering the pressure in the case of pressure swing processes.

To remove moisture from a 4A molecular sieve, a temperature of 250-280°C is required. A properly regenerated molecular sieve can give moisture dew points below -100°C.



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The outlet concentrations on a pressure swing process will depend on the gas present, and on the conditions of the process

■ **Size**

4A - Zeolites are available in beads of 1-2 mm, (10x18 mesh) 2-3 mm, (8x12 mesh) , 2.5-5 mm, (4x8 mesh) and as powder, and in pellet 1.6", 3.2".

■ **Attention**

■ To avoid damp and pre-adsorption of organic before running, or must to be reactivated.

