



Premium Diaper SuperAbsorbent Polymers

For more than two decades, we have dedicated ourselves to the manufacture of superabsorbent polymers - and with great success. The fact that today's diapers have become much smaller and thinner - from more than 100 grams in the 1980s to only 45 grams today - is one of the achievements that have resulted from the progress we have made in the development of superabsorbents.



So effective, it's like magic

Just a few grams of superabsorbents are sufficient to store a baby's urine, making it "disappear." They can absorb up to 300 times their own weight in liquid, forming a gel that traps the liquid and won't release it, even under pressure. Our products are also used in feminine hygiene and adult incontinence products. In Europe, we manufacture superabsorbents primarily at our factory in Germany.

We have three production plants in the USA. In addition, we maintain laboratories for research, development and application technology in Germany, the U.S. and China.

Close cooperation with customers

The safety of our superabsorbents is our top priority. All raw materials and products are subjected to strict quality inspections. We also collaborate closely with our global and regional customers to development new technologies. This enables us to create unique products that fulfill the wishes and requirements of our customers.



Absorbent polymers work behind the scenes

In 1986, our company became the world's first large-scale manufacturer of absorbent polymers. Since then, thanks to ongoing innovation, we have retained a top position in the market for absorbent polymers.

Our research efforts center on the marketplace, our customers and product development. That means we work with our customers to find solutions to their problems and to improve their products, because each individual product requires its own specific type of absorbent polymers.

Network

Absorbent polymers consist of a network of hydrophilic polymer chains. Their primary characteristic is their ability to absorb liquids and keep them trapped, even under pressure. That means that unlike sponges, which hold water only briefly and release it when squeezed, absorbent polymers turn liquids into gels that trap and hold fluid. Depending on the type of liquid, the products can absorb 30 times their own volume. In the case of desalinated water, they can even hold 500 times their own volume. Our research department takes advantage of this basic principle to design special polymers for different uses. New products and applications are being called for all the time. Thanks to ongoing improvements by our researchers, absorbent polymers are now more effective than ever and can be found in many different hygiene articles.



Thinner, more lightweight diapers

Fifteen years ago, the absorbent cord in baby diapers was made of cellulose fibers. For example, a typical large-size baby diaper in the year 1987 contained 50 grams of cellulose and only two grams of absorbent polymers. Today, the ratio of the two "ingredients" is nearly 1:1. In 1999, a typical diaper contained 18 grams of cellulose and 15 grams of absorbent polymers. That means diapers have become thinner and more lightweight. It also means that the products have assumed the function previously fulfilled by cellulose. At the same time, thanks to the increased ratio of absorbent polymers, the total retention level - the diaper's ability to retain fluid - has increased fourfold, from 100 to more than 400 grams of liquid.

Optimal distribution of liquids



As generations of new absorbent polymers have been developed, our researchers have succeeded in continually improving their absorbent qualities. In 1986, the most important feature of these products was the amount of liquids they could hold. The next generation of absorbent polymers was not only capable of retaining fluid, it was also able to keep liquids trapped inside, even under pressure. In 1996, we succeeded in increasing the speed with absorbent polymers take on

liquids, which meant diapers could be made even thinner than before. In 1998 our researchers optimized the distribution of liquids within the diapers. Now the entire absorbent area of the diaper is used to the fullest, both in diapers for little girls and for little boys. In order to do so, we had to teach the polymers a new "trick": they had to "learn" to build a barrier against additional fluid by forming a solid gel structure. We were able to increase the permeability of the gel, so liquids can be spread out over larger areas of the diaper, which consists of a mixture of cellulose and absorbent polymers.

Responsible Care

Added success means added responsibility. For us, product quality also involves environmental quality.

We recognize that our leading position in the marketplace carries with it a high level of responsibility for conserving the environment. When we develop innovations and planning production and sales processes, we take ecological concerns into consideration. We comply with the Responsible Care initiative of the Chemical Industry Association. Our activities adhere to the principle of sustainable development, which for us involves designing our products and business methods in ways consistent with the responsibility we carry for generations to come - that means we respect the natural limits of the environment without sacrificing essential needs and comforts. Absorbent polymers fulfill both requirements of "sustainable development". They help reduce packaging and waste. And their use in hygiene articles contributes to consumers' health and the quality of their lives.



In order to make a detailed evaluation of the ecological effects of our absorbent polymers possible, we have conducted a "life cycle analysis" that provides much important information about the entire "life span" of our products. Of course, the safety of our absorbent polymers is our number one priority. We comply with legal safety requirements and we exceed them. We have set high safety standards for our products and laid them down in our Code of Practice that we adhere to from the moment we begin to develop a new product. All raw materials are subject to strict safety evaluations, and new products are subsequently evaluated using alternative toxicological tests.

Our production plants have been certified according to the international quality and environmental standards contained in DIN EN ISO 9001 and 14001.

Product Analysis - Premium Super Absorbent Polymer

SPECIFIC PARAMETER	SPECIFICATION LIMITS	
	RANGE	ACTUAL RESULTS
Particle Size Distribution:		
% on 20 mesh	0.0-2.0	1.0
% on 30 mesh	5.0-40.0	23.2
% on 50 mesh	40.0-75.0	48.3
% on 170 mesh	10.0-40.0	26.6
% on 325 mesh	0.0-3.0	0.8
% through 325 mesh	0.0-2.0	0.1
CRC, g/g, sieved	28.5-35.0	34.2
Absorbency Under Load 0.9psi, g/g, sieved	18.5 Minimum	21.0
Absorbency Under Load 0.9psi after Ball Mill, g/g, sieved	15 Minimum	16.0
pH	5.5 – 6.5	6.0
Bulk Density, g/cc	0.530-0.725	0.6
Moisture Content, %	0.0-2.0	0.5
Flowability, 10 mm:sec/100g	14 Maximum	12.0
Extractables, 16 hr	13 Maximum	9.0
SAP Appearance, Rd Units	80 Minimum	>85

Model		Aqua Sorb Premium
Chemical product name		Super Absorbent Polymer
CAS. No		9003-04-7
HS -code		3906.90.101000
Main element		Cross Linked Sodium Polyacrylate
Bulk size(mm)	Standard	0.1-0.850
	Others	
Free Absorbency (of Distilled Water) m/m		325-375
Free Absorbency (of 0.9%NaCl), m/m (≥)		40-50
Centrifugal Retention Capacity, g/g		28-35
Absorption Under Load, (0.3PSI) , g/g		23-28
Absorption Under Load, (0.7PSI) , g/g		Tested at 0.9 psi 15-20
Bulk Density(g/l)		0.650
PH		6.5-7.5
Moisture %		6-7
Particle size distribution	≥850μm	2-5%
	850-600μm	20-40%
	600-300μm	40-60%
	300-150μm	10-40%
	150-45μm	1-5%
	≤45μm	0-3%

Aqua Sorb® MSDS

Section 1a: Supplier Information

The ARK Enterprises, Inc.
PO Box 725
Peculiar, Missouri 64078
(816) 779-5741

Section 1b: Physical/Chemical Characteristics

Product Name: Aqua Sorb® Premium Diaper Polymer
Chemical Family: Superabsorbent

Section 2: Physical/Chemical Characteristics

Appearance & Odor: Off-White color, Granular Powder, Odorless
Boiling Point: N/A
Vapor Pressure & Vapor Density: N/A
Bulk Density: 25-31 lb/f3
Melting Point: N/A
Evaporation Rate: N/A
Solubility in Water: Slightly Soluble

Section 3: Hazardous Ingredients/Identity Information

Hazardous Components: OSHA PEL - ACGIH.TLV -
Other Components: Respirable particulate (dust)
Recommended Exposure Limit (dust) 0.05 mg/m³

Product Identification

Chemical Name	CAS No.	%
Sodium, Lightly Crosslinked	25608-12-2	92 to 98
Water	7732-18-5	2 to 8
Acrylic Acid	79-10-7	<0.08

NFPA/HMIS: Health 1 Reactivity 0
Fire 0 Specific Hazard 0
DOT Class: Not Regulated

Section 4: Fire & Explosion Hazard Data

Flash Point: Not available
Flammable Limits: Not available LEL - - UEL - -
Extinguishing Media: Carbon dioxide, water spray, foam or dry chemical
Special Fire Fighting Procedures: As with any fire, wear positive pressure, self contained breathing apparatus in any closed space when fighting fires along with full protective coating.
Unusual Fire/Explosion Hazards: Handle as a finely divided organic powder. Eliminate sources of ignition such as static discharge, open flames, etc. Maintain good housekeeping. Provide Adequate ventilation. Under certain confined conditions, a concentrated fine dust of this material in air may cause a dust explosion if ignited.
CAUTION: Material becomes very slippery when wet.

Section 5: Reactivity Data

Stability: Stable Incompatibility: Strong oxidizers
Hazardous Decomposition or Byproducts: Thermal decomposition releases CO, CO₂, Hydrocarbons
Hazardous Polymerization: Will not occur
Conditions to Avoid: Avoid contact with strong basic materials such as sodium, sodium hydroxides
Note: Store in cool, dry area and keep container closed to avoid moisture. Wash hands thoroughly after handling.

Section 6: Health Hazard Data (applies to unused product)

Route (s) of Entry: Inhalation, Skin, Eyes

Health Hazards: Contact with eyes, skin or clothing may cause irritation. Care must be taken to minimize exposure and prevent workplace inhalation of respirable dust. Respiratory protection is required for exposures above the recommended level of respirable dust.

Carcinogenicity: None known

Signs/Symptoms of Exposure: Slight irritant symptoms

Conditions generally aggravated by exposure: Respiratory Ailments

Emergency and First Aid Procedures:

Eyes: Hold eyelids open & flush with water for at least 15 minutes, consult physician

Skin: Wash with soap and water.

Inhalation: Remove to fresh air, consult physician

Ingestion: If large quantities are swallowed, seek medical attention.

Toxicity: Laboratory rats were exposed over their lifetimes to a highly respirable; less than 10 micron; sodium polyacrylate dust at the following concentrations: 0.8 mg/m³, 0.05 mg/m³. At the 0.8 mg/m³ concentration local chronic inflammation of lung tissue leading to tumors was seen in some animals. At 0.2 mg/m³ there was evidence of local inflammation of lung tissue but no tumorigenic response. There were no adverse effects.

Section 7: Control Measures

Respiratory Protection: If dust is created use NIOSH or MSHA approved respirator for nuisance dust of this type.

Ventilation: Local exhaust advisable if excessive dust is created.

Protective Gloves: Not normally necessary but suggested in cases of open wounds that are not appropriately protected.

Eye Protection: Safety goggles

Other Protective Clothing or Equipment: Normal work clothing.

Work Hygienic Practices: Open wounds should be kept clean and suitably protected.

Section: 8 Precautions for Safe Handling & Use

Respiratory Protection: Use NIOSH/MSHA approved or equivalent with high efficiency filter for particulate levels above 0.05 mg/m³.

Ventilation: As appropriate to control airborne dust levels below the applicable exposure limits.

Protective Gloves: Impervious/rubber

Eye Protection: Safety goggles

Other protective clothing or equipment: None

Work/Hygienic Practices: Good Housekeeping Practices

DISCLAIMER: These materials are made from natural products and contain naturally occurring microorganisms. Proper precautions are advised to prevent infection of open wounds, inhalation of excessive amounts of dust, and eye irritation. Normal and proper hygiene practices to prevent health hazards from any naturally occurring substance such as soil, bark, plant material, etc. should be employed. The information contained in all printed material is provided without warranty of any kind, express or implied. Information is provided solely for consideration, investigation, and verification by the recipients; users should consider this information only as a supplement to other information gathered by or made available to them. Users should make independent determinations of the suitability and completeness of all information from all sources to assure proper use and disposal of these materials for the safety and health of personnel and the environment, and for full regulatory compliance. The hazard information contained in the Material Safety Data Sheet ("MSDS") and elsewhere is not a substitute for risk assessment under actual conditions of use. Users have the responsibility to be and keep currently informed on chemical hazard information, to design and update their own programs, and to comply with all applicable international, federal, state and local laws and regulations regarding safety, occupational health, right to know, environmental protection, and any other related legislation.