



## EXPLORE THE POWER OF POLYACRYLAMIDE

### ➤ What is “polyacrylamide”?

Polyacrylamide is a synthetic (man-made), potassium-based, long-chain polymer (same molecule repeating itself many times) designed to attract either positively charged particles (organic materials, such as carbon or human waste) or negatively charged particles (inert materials, such as sand or clay).

Polymers may be purchased in dry, emulsion, liquid and tablet form. These chemical compounds are used to flocculate and coagulate suspended solids in water, wastewater, and soil. They assist in management of the Earth's soil and water.

According to “Agricultural Research Magazine” July 2002, the new frontier of scientific technology called “materials science technology” is the source for development of new usages for polymers, among other materials, including ceramics and plastics.

**Hydrosorb, inc.’s™** polyacrylamides are sold under our trade names, **Hydrosorb®** and **Soilfloc®**.

### ➤ Is there more than one type of polyacrylamide? An emphatic YES! There are three.

#### **Anionic** polyacrylamide:

This type of polymer has molecules that carry negative charge. They pick up positively charged particles (clay, sand), much like a magnet picks up nails and other metal objects. There are over 100 varieties of this type of polymer. Anionic polyacrylamide has no aquatic toxicity. It is recommended for use in furrow irrigation, dust control, crop dusting, treating wholesale nursery & stormwater runoff, hydroseeding, animal waste treatment, construction projects, sports fields, landscaping, turf & sod, drilling mud, mining, and water & soil conservation.

#### **Cationic** polyacrylamide:

This type of polymer has molecules that carry positive charge. They pick up negatively charged particles (organic materials like carbon or human waste). There are over 1000 varieties of this type of polymer. It is recommended for use in wastewater plants, animal waste treatment, water clarification, drinking water, and many industrial applications, such as mining and paper processing. Many hours of testing are often required in these applications to determine the correct polymer choice.

#### **Non-ionic** polyacrylamide:

This type of polymer has molecules with no charge. They are used in very rare instances and special circumstances only. This polymer is used mostly in mining.

### ➤ What is “PAM”?

“PAM” is an acronym for polyacrylamide. The acronym is often used in such a way as to imply that “PAM” is a single chemical product. As described above, there are innumerable varieties of “PAM”, not just one. They were created to bring materials together to coagulate or flocculate suspended solids in order to extract them from water and wastewater or to reduce soil movement (erosion). They keep water cleaner, save soils, and keep certain nutrients, pathogens, and pesticides from field and feed lot runoff.

Every soil or water body has a “**chemical footprint**” that has to be matched to a specific polymer in order for the polymer to do its most effective job. The various polymers are differentiated by type, molecular weight, and charge density. Be sure to work with a reputable company in order to ensure that the broadest choice of products is available to do the most effective and efficient job.



Polyacrylamide was first used during World War II by the US military for stabilization of newly built runways. This practical, proven, scientifically based technology made its way into the private sector, where it was further refined and developed for commercial use over the 30 year course of the Clean Water Act (**CWA**). The CWA was passed by Congress in 1972. PAM was first used commercially in irrigated agriculture in the US in 1995. By 2001, over two million acres of farmland were being treated with PAM.

#### ➤ **Application of Polyacrylamide**

These products have very specific application methods and rates. They **must** be applied as recommended. **Do not over-apply**. In some instances, over application may actually decrease the performance of the product. When applied properly, PAMs are extremely efficient and very cost-effective.

#### ➤ **“PAMs” and National Conservation Standards**

The National Resources Conservation Service (**NRCS**) of the United States Department of Agriculture finalized a National Conservation Practice Standard for the use of Anionic Polyacrylamide in Irrigated Agriculture July, 2000.

An interim standard for furrow irrigation was established in California, July 2002. The state of Wisconsin has established a state standard for PAM use in construction projects.

Check with your state to see what Conservation Standard Practices are recommended and use them!

Check to see what practices will qualify for the **EQIP** cost-share/incentive program, Farm Bill 2002 in your state.

#### ➤ **Licensed and Registered Products**

“Polyacrylamides” (PAMs) are classified as “soil amendments” or “soil stabilizers”. Many states license companies selling them and register each product in the company’s “soil amendments” product line.

Check to see if your state licenses companies that sell “PAMs” or registers their products. Be sure to do business with reputable organizations.

#### ➤ **Safety and Health Issues**

Public perception is often that all chemicals are harmful. They are not – chemicals are the building blocks of all living things.

Acrylamide is a naturally occurring chemical found in a wide variety of foods, such as potatoes. There is a current controversy being debated in the media about “free acrylamide” causing cancer. It is being alleged that when the acrylamide component of a food product is heated to an **extremely high** temperature in the cooking process, its chemical structure is altered and in some instances acts as a cancer causing agent (e.g., deep-fried french fries).

Does this same claim apply to polyacrylamide? **No, it does not.**

Polyacrylamide, while using acrylamide as one of the raw materials in the chemical formula, is a man-made potassium-based chemical compound that has been tested and retested by numerous governmental agencies and found environmentally safe for use in drinking water treatment and agricultural production. It is not used in applications where extremely high heat is recommended. It’s like comparing apples and oranges - there is no correlation between the two.

Anionic polyacrylamide is a “non-toxic” chemical compound. Quality anionic polymers are:



1. Environmentally benign (safe)
2. Harmless to fish and aquatic organisms, wildlife, and plants
3. Non-combustible
4. Biodegradable

Be sure they are: manufactured to contain less than 0.05% free acrylamide monomer by weight as established by FDA, EPA and NSF Drinking Water Standards.

Request an MSDS and TDS sheet to confirm your products meet these standards.

When working with a dry anionic polymer where the concentration of total dust is more than 10 mg/m<sup>3</sup>, remember to use the same common sense precautions you would use with any ultra-fine soil, sand or other material.

### ➤ **Company Profile**

**Hydrosorb, inc.™**, a division of **Aqua Ben Corporation**, a 25+-year-old specialty chemical company, was founded in 1999 to respond to the polymer needs of municipalities and the horticulture, agriculture, viticulture, and construction industries. We provide technology-based solutions and products for water & soil conservation, erosion control, soil structure improvement, and stormwater treatment to meet state and federal requirements for runoff BMPs & management measures. As a company, we pride ourselves on product quality, dependable service, and customer satisfaction.

**Hydrosorb, inc.™** is involved in ongoing testing with the University of California, Riverside's Cooperative Extension, as well as several commercial growers and businesses.

\*Research, test information, MSDS and TDS, and complete product application guides available upon request.

*"Erosion, from the Latin word erodere, 'to gnaw', aptly describes the slow, steady pace of the natural phenomenon. Accelerated erosion – the kind we cause – is more like devouring than gnawing: a fast, violent rending of the land,"* (Erosion Control Magazine, Editorial Comment March/April 2001).

"The United States' market (for PAM) is expected to continue to grow as water quality improvements are mandated by new Federal legislation and court action, and since PAM use is one of the most effective, economical and least intrusive management approaches recently identified that can meet the needed water quality improvement."  
Source: USDA Research Service, Northwest Irrigation Soils Research Lab Research Paper, Kimberly, Idaho 2002

**Hydrosorb, inc.'s™ products, Soilfloc® and Hydrosorb®, meet NRCS Conservation Practice Standards criteria and FDA, EPA and NSF requirements for potable water!**