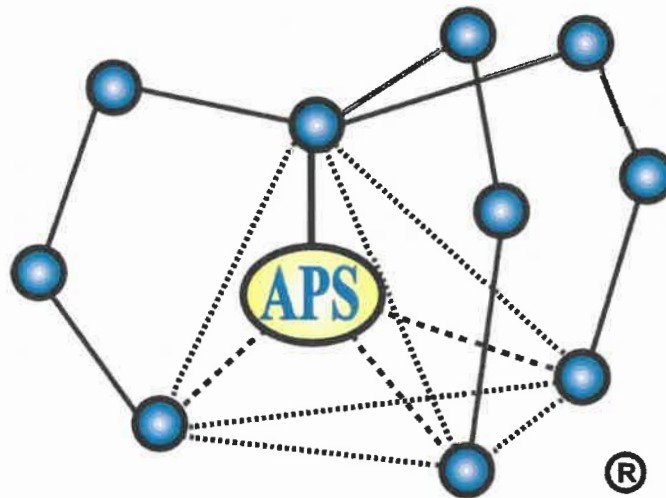




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Applied Polymer Systems, Inc. Product Guide



Technical Guidance for the Use of Polyacrylamides (PAM) and PAM-blends for Erosion Control and Storm Water Clarification

Practice Description

PAM used for erosion control is a water-soluble anionic polyacrylamide product used to minimize soil erosion caused by water and wind by binding soil particles, especially clays, to hold them on site. In addition, these types of materials may also be used as a water treatment additive to remove suspended particles from runoff. When PAM is used on construction sites it is typically applied with temporary seeding and or mulching on areas where the timely establishment of temporary erosion control is so critical that seeding and mulching need additional reinforcement. It may be used alone on sites where no disturbances will occur until site work is continued and channel erosion is not a significant potential problem. Permanent grassing applications can be better established using PAM as a tackifier and soil conditioner.

PAMs are manufactured in various forms to be used on specific soil types, and are generally applied at a rate of up to 50 pounds/acre for dry products or 2 ½ gallons/acre for emulsion-liquid products. Using the wrong form of a PAM on a soil will result in some degree of performance failure, and increase the potential for this material to enter surface waters. PAM used alone may not reduce NTU values enough resulting in noncompliance water quality discharges or poor soil binding conditions. Site specific soil-PAM testing must be performed. Exceeding the maximum application rates for this product does not increase the effectiveness of the product.

Toxicity

All vendors and suppliers of PAM, PAM mixes or blends shall present or supply a written toxicity report which verifies that the PAM, PAM mix or blend exhibits acceptable toxicity parameters which meet or exceed the requirements for the state and federal water quality standards.

Cationic forms of PAM are not allowed for use under this guideline due to their high levels of toxicity to aquatic organisms. Emulsions shall never be applied directly to stormwater runoff or riparian waters due to surfactant toxicity.

Performance

All vendors and suppliers of PAM, PAM mixes or blends shall supply written “site specific” testing results demonstrating a performance of 95% or greater reduction of NTU or TSS from stormwater discharges.

PAM Application

Emulsion batches shall be mixed following recommendations of a testing laboratory that determines the proper product and rate to meet site requirements. Application method shall insure uniform coverage to the target area. (Emulsions shall never be applied directly to stormwater runoff or riparian waters)

Dry form (powder) may be applied by hand spreader or a mechanical spreader. Mixing with dry sand or lime will aid in spreading. Pre-mixing of dry form PAM into fertilizer, seed or other soil amendments is allowed when specified in the design plan. Application method shall insure uniform coverage to the target area.

Block or Log forms shall be applied following site testing results to assure proper placement and performance and shall meet or exceed state and federal water quality requirements.

Common Problems

Consult with a registered design professional for assistance if any of the following occur:

- Problems with application equipment clogging.
- PAM alone may not meet testing requirements for NTU reduction and soil stabilization. Site specific “blends” may be needed to meet these requirements.
- Application specifications for PAM cannot be met; alternatives may be required. Unapproved application techniques could lead to failure.
- Visible erosion occurs after application.

Maintenance

An operation and maintenance plan must be prepared for use by the operator responsible for PAM application. Plan items should include the following items.

- Reapply PAM to disturbed or tilled areas that require continued erosion control.
- Maintain equipment to provide uniform application rates.
- Rinse all PAM mixing and application equipment thoroughly with water to avoid formation of PAM residues and discharge rinse water to soil areas where PAM stabilization may be helpful.
- Downstream sediment deposition from the use of PAM may require periodic sediment removal to maintain normal functions.

The Dirty Water Solution

Applied Polymer Systems, Inc.
700 Series Floc Logs®



APS 700 Series Floc Log®

Polyacrylamide Erosion Control & Water Clarification

The Applied Polymer Systems, Inc. 700 Series of Floc Logs® is a group of semi-hydrated polyacrylamide blended blocks that when placed within turbid water flows will remove fine particles and reduce NTU values. Each Floc Log® is formulated for the soil and water chemistry of the geographical area where the placement and usage are intended.

The Floc Log® is one of the most innovative approaches to using polyacrylamide blends in water applications. Not only is the Floc Log® non-toxic, but it also eliminates the need for machinery or other electrical devices for pumping or mixing when using liquid materials to treat turbid water. The Floc Log® contains materials that enhance its performance by reducing reaction times and decreasing NTU values. This enables the Floc Log® to out perform the results of PAM alone. The Floc Log® is for use wherever turbid water flows occur. As with all Applied Polymer Systems, Inc. products, proper soil or water sample analysis must be done to determine which Floc Log® type is correct for your soil.



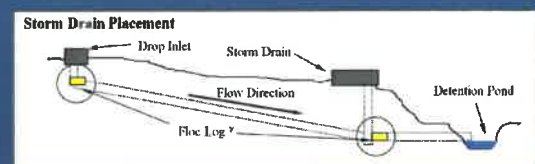
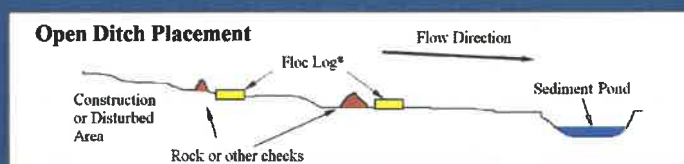
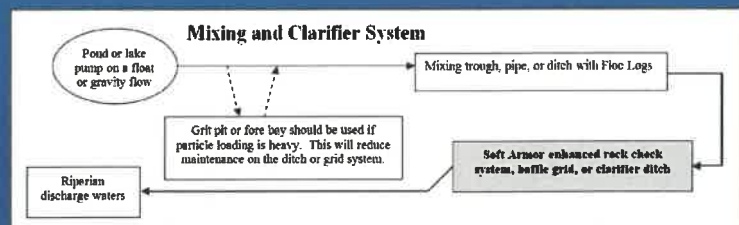
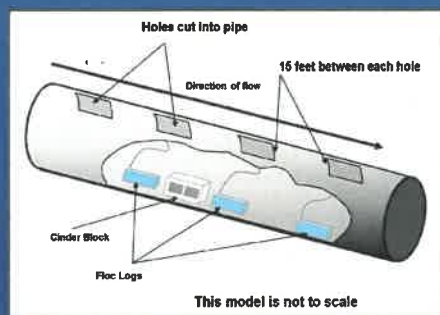
Floc Log® Specifications

- ANSI/NSF Standard 60 Drinking Water Treatment Chemical Additives
- EPA/600/4-90/027F 48 Hr. Acute Static Toxicity Test (Daphnia magna)
- EPA/600/4-91/002 7 Day Chronic Toxicity Test (Pimephales promelas)

APS, Inc. currently has over 50 types of Floc Logs®. Each Floc Log® is tailored for the specific requirement of water chemistry and soil within your geographical area.

The Floc Log® is available in two forms, clarifier and particle. Clarifier Floc Logs® are used for colloidal water and very fine suspended particles. Particle Floc Logs® are used for heavily particle laden water in areas before sediment traps and sediment ponds. (Floc Log® is available in boxes of 4)

Placement of the Floc Logs® should be as close to the source of the particle suspension and turbidity as possible. Finer particles and colloidal suspensions will require greater mixing times, usually never greater than 75 seconds, but typically 10 to 30 seconds. The mixing time is the time it takes for the water to flow through a ditch system or a pipe for a reaction to take place. Ideal performance will be attained when the Floc Log® is used in conjunction with the appropriate Best Management Practices. Rock checks, drop inlets, storm drains, retrofits and slope drains all greatly enhance the effectiveness of the Floc Log®. The Floc Log® is designed for a base flow rate of 40-80 GPM (gallons per minute) with a sediment load of less than 4%. A typical placement is shown in the diagrams below.



Case Study:

Polymer Enhanced Dewatering Ditch Application, Tennessee



A ditch is built, using straw or hay bales, running downhill. The bales are stacked down to hold them in place. The far end of the ditch is built wider; this is where



The ditch is lined with plastic sheeting to prevent erosion to the soil due to the high velocity flow expected



The site-specific Floc Logs are secured in the upper end of the treatment ditch. The logs are placed in a series running down the ditch, to ensure the required mixing is achieved.



The lower part of the ditch is where the particle collection will take place. This is built wider than the mixing portion, to allow the water to slow its velocity. Jute matting is secured in place, and is applied with the site-specific Silt Stop powder to aid in particle collection.



The pump is set up so that the feed is only pulling turbid water into the treatment ditch.



The pump was turned on, starting the flow down the treatment ditch.



The water as it flowed off the end of the jute field had a turbidity of 11 NTU.



The water flowed down a grassy swale and over a silt fence before exiting the site. The

The turbidity in the pond is about 700 NTU.

The flow rate was 650-700 GPM with a 6" 300 ft line with approx. 20-22 ft head.

Case Study:

Living Proof — No Aquatic Toxicity, Georgia



A testing device to put Floc Logs into solution. This device tested the longevity of the Floc Log and the efficiency in mixing. In late October of 2003 we placed seven 706b Floc Logs in the grid chamber where they sat through various weather events. The Floc Logs were frequently monitored through the course of the fall, winter and spring.

Amphibious larval stages have several qualities, which make them a useful indicator of harmful levels of pollutants in bioassay tests. Amphibian tadpoles show a variety of sub lethal responses such as changes in growth, development rates, pigmentation and expression of morphological deformities in a lesser time of exposure to the environmental pollutants. The recent malformations and declinations of amphibian populations unveils some aquatic organisms sensitivity to toxins. Today, because of these malformations and population declinations there is a major concern on the effects of aquatic toxins.

Frogs generally take between 13 and 15 weeks to complete their metamorphosis and become fully grown. Frog eggs generally hatch within 7 to 21 days and the metamorphosis from tadpole to frog takes roughly 12 weeks, but can take as long as a year depending on the environment they are living in.

We determined that our frogs were Hybrid "Gray" Treefrogs — (*Hyla chrysoscelis* X *Hyla avivoca*).

The tadpoles/frogs did not exhibit any changes in growth, development rates, pigmentation, and expression of morphological deformities. In due course (11 – 12 weeks) the frogs began leaving the water for limited periods of time, perching themselves on the coconut fiber skeletons of the Floc Logs. By the 13th week we noticed the frogs were venturing out of the grid. The tadpoles/frogs were thus unhindered by the Floc Log.



Case Study:

Restoration & Bank Stabilization Project at Poe Springs,

by Alachua County Florida Department of Environmental Protection

Poe Springs Park is a county owned park along the Santa Fe River, which is operated by the North Central Florida YMCA. This much used area near the spring and river was the focus of a recent restoration and bank stabilization project coordinated by the ACEPD. The scope, resources and funding were not available during the first restoration project, but now as the summer season approaches the need for the staircase is essential to prevent further erosion and to protect the efforts of the previous project. If this staircase to access the spring run is not provided the park visitors will continue to climb up and down the bank increasing erosion and trampling the recently planted vegetation intended to stabilize the banks.

This addition would complete the already outstanding example of shoreline management and riparian buffer restoration. The many visitors (over 26,000 last year) would also learn of the value of healthy, riparian ecosystems from the signage and brochures provided about the restoration and its benefits. This project, although small, is a critical part of several larger efforts. An issue of great importance to the state of Florida is the protection of its springs. The completed restoration and education aspects of this Poe Springs project will contribute to the Florida Springs Initiative.



Decorator Mulch installed several Filtrex socks to stabilize the toe of the slope and prevent further erosion and sedimentation into the spring run. A Filtrex sock is a plastic mesh tube in which a mixture of composted tree debris and sand is sprayed. The rest of the slope in the work area was covered in a jute fiber mat to prevent any further erosion of the bank.

Patton Construction installed the turbidity curtain and began the layout of the staircase. The PVC pilings were installed and the structural framing was begun. The structural framing was begun using ACQ treated wood.

The framing was attached to the PVC pilings. A turbidity curtain and silt fencing that was installed to prevent offsite runoff from eroding the bank during construction.

When the framing was completed and the decking installation was begun to include the building of the cantilever steps for the lower two steps. The decking installation was finished, aluminum handrails were installed, the adjacent bank was covered with jute fiber matting and herbaceous plants were installed.

The turbid water contained by the turbidity curtain was treated with a Floc-Log which contains a soil specific polymer that causes silt and clay to flocculate and prevents the colloidal solution from re-suspending. The Floc-Log is a registered product of Applied Polymer Systems, Inc. The turbidity behind the curtain was 93.4 NTU and the turbidity of the spring run was 0.25 NTU. After the initial treatment the turbidity dropped to 32.8 NTU, an additional treatment was necessary to reduce the turbidity to 15.5 NTU, which is an acceptable level for the removal of the turbidity curtain. The turbidity curtain was re-installed at the spring boil for the installation of the additional stairs.

The final project is a fan shaped staircase on the spring run at Poe Springs Park to facilitate the visitors' access to the water. The staircase is secured to the bank using concrete filled PVC pilings with ACQ treated structural beams with the landings. This structure will prevent further erosion of the bank and concentrate the foot traffic to one location instead of being dispersed throughout the riparian buffer as it has been historically.



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Floc-Log® is a federally registered trademark of Applied Polymer Systems, Inc.; unauthorized use of this trademark is strictly prohibited



APPLIED POLYMER SYSTEMS, INC.

700 SERIES FLOC LOGS

The Applied Polymer Systems, Inc. 700 Series Floc Logs® are a group of semi-hydrated polyacrylamide blended logs that when placed in the flow of turbid water remove fine particles and reduce turbidity, metals and nutrient values. Each Floc Log® is formulated for the soil and water chemistry of the geographical area where the placement and usage are intended.

Primary Applications

- Mine Tailings and Waste Pile ditches
- Newly cleared Construction or Building Sites drainage
- Road and Highway construction runoff ditches
- Ditch placement for all forms of highly turbid waters
- Dredging operations as a flocculator

Features and Benefits

- Removes solubilized soils and clay from water
- Prevents colloidal solutions in water within ditch systems
- Binds cationic metals within water, reducing solubilization
- Reduces pesticide and fertilizer loss during rain events from runoff
- Increases soil permeability and water penetration to shallow plants in ditches
- Reduces operational and cleanup costs
- Reduces environmental risk and helps meet compliance

Specifications / Compliances

- ANSI/NSF Standard 60 Drinking water treatment chemical additives
- 48h or 96h Acute Toxicity Tests (*D. magna* or *O. mykiss*)
- 7 Day Chronic Toxicity Tests (*P. promelas* or *C. dubia*)

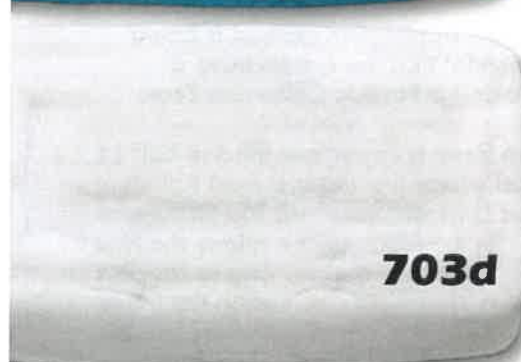
Floc Logs are packaged 4 per box.

144 Floc Logs (36 boxes) per skid, mixed skids are permitted

Item Number	Description	Wt.	Dimensions
703d	APS 703d Floc Log	~ 9 lbs	12" x 4" x 8"
703d#3	APS 703d#3 Floc Log	~ 9 lbs	12" x 4" x 8"
706b	APS 706b Floc Log	~ 9 lbs	12" x 4" x 8"
707a	APS 707a Floc Log	~ 9 lbs	12" x 4" x 8"
708x	APS 708x Floc Log	~ 9 lbs	12" x 4" x 8"
730b	APS 730b Floc Log	~ 9 lbs	12" x 4" x 8"



706b



703d



703d#3



730b



Build a channel from straw bales, line with plastic and matting; install Floc Logs



The last half to two-thirds of the channel should be wider to collect particles



Dirty water from the pond is pumped down the channel



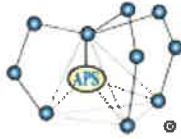
The dirty water passes over the logs, allowing flocculation to begin



The flocculated particles are captured on the matting



Clear water is discharged from the site



APPLIED POLYMER SYSTEMS, INC.

700 SERIES FLOC LOGS



Placement

Each Floc log is designed for placement within a ditch averaging three feet wide by two feet deep. Floc log placement is based on gallon per minute flow rates. Note: actual GPM or dosage will vary based on site criteria and soil/water testing. In general one Floc Log for every 50-70 GPM of flow rate.

Directions For Use

Mixing of water and Floc Log is most important

APS 700 Series Floc Log should be placed within the upper third to half of a ditch system or as close to the source of the turbid water possible. Simply anchor a stake onto the center of the ditch system as far up slope as possible. Place the attachment loop over the stake and lay the Floc Log into the center of the ditch.

APS 700 Series Floc Logs can easily be moved to different locations as site conditions change. The addition of soft armor covered ditch checks below the Floc Log will greatly improve water clarity.

Additional mixing can be necessary when dealing with low flow rates. Blocks, sand bags, wattles or rocks can be added to create additional mixing and turbulence.

Cleanup

Use soap and water to wash hands after handling. Plastic or rubber gloves are recommended during movement after usage.

Precautions / Limitations

- APS 700 Series Floc Logs will become extremely slippery when wet.
- Clean up spills quickly, Do Not use water unless necessary, extremely slippery conditions will result.
- APS Floc Log will remain viable for up to 1 year.
- APS 700 Series Floc Log has been specifically tailored to specific soil types. Soil types in varying geographical areas may require testing. If proper performance of this product is not satisfactory, contact Applied Polymer Systems.



Floc Logs can be used in a variety of different applications to include:

Split Pipes
Stormdrains
Dewatering ditches/channels
Tank Systems

No matter what application method is being used it is essential that the system have a Mixing Zone and a Particle Collection Zone.

The Mixing Zone is upper one third to half of the channel where the water is most turbulent and the Floc Logs are installed. The turbulence in the Mixing Zone allows the Floc

Log to dissolve releasing the blend of polymers into the water. The suspended particles are then bound together to make larger ones that can be captured or allowed to settle.



Mixing Zone

Particle Collection Zone

The Particle Collection Zone, is the remaining half to two-thirds of the system where the flocculated material is captured.

Optional: line the entire channel with a natural fiber matting (i.e. jute, hemp, burlap, coconut) and treat with 700 Silt Stop Powder to charge the system.

STOP *Erosion!*

Applied Polymer Systems, Inc.
700 & 600 Series Silt Stop®



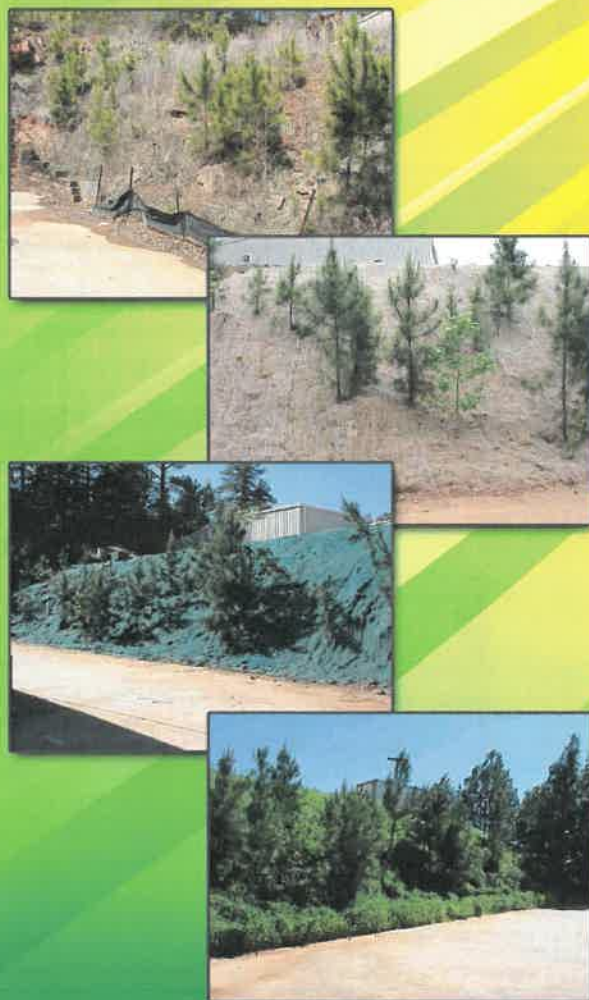
APS 700 Series Silt Stop® Powder & APS 600 Series Silt Stop® Emulsion

Polyacrylamide Erosion Control Powder & Emulsion

Sediment lost from construction sites can pollute streams and lakes, fill storm water treatment systems, cover and destroy fish spawning beds and reduce the overall quality of water for subsequent beneficial uses. Turbidity in storm water runoff is caused by organic and inorganic colloidal suspensions which cannot settle out by gravity separation alone. These fine particles are often a small percent of the endemic soil matrix, but they are the greatest contributor of turbidity problems.

Typical BMPs, such as detention basins, check dams and perimeter erosion controls, alone are generally ineffective for removal of colloidal suspension of turbidity from storm water runoff. USDA test data indicates that soil specific polyacrylamide has been a beneficial agent for soil erosion control. Reduced sediment, pesticide and nutrient loading to riparian areas can ultimately be expected when using polyacrylamide on construction projects.

Applied Polymer Systems, Inc. (APS) uses an innovative approach for the performance optimization of polyacrylamide applications. Unlike conventional techniques that tend to only "get close", APS precisely matches the correct polymer to the application site's lithology. This results in better performance at a reduced cost.



Silt Stop® is a family of co-polymer PAM blends, each formulated to work with specific soil lithologies and/or site water chemistries. Silt Stop® blends are available in powders and/or emulsions. The application of Silt Stop® to soil surfaces will reduce mass erosion, reduce or eliminate fine soil particle suspension, reduce or eliminate colloidal turbidity in runoff, increase soil infiltration rates, decrease runoff quantities and improve vegetation establishment. Silt Stop® provides superior tackifying characteristics.

Emulsion or powder Silt Stop® may be added to a hydroseeder as the final additive in the mixture. Powders may be applied using hydraulic seeder/mulchers, tow-behind or hand held spreaders or pneumatic blowing equipment. Each Silt Stop® type may react differently in regards to the soil type that is being targeted. Specific soil tests will determine the correct Silt Stop® that will need to be used.

Hydroseeding applications may be sprayed directly over the soft armor system as seen above. Areas of high water velocity will become extremely resistant to erosion without the high cost of expensive matting and blankets. After vegetation becomes established, the Silt Stop® and natural fiber matting will rapidly biodegrade leaving only the intended vegetation.

Application of the hydroseeding mix will vary with the viscosity of the solution. Different Silt Stop® types will create different viscosities. In most cases applicators may not see a difference in the mix solution. Conventional tackifiers need not be used when using Silt Stop® within your hydroseeding mix.

When high erosive stresses are anticipated [steep slopes, long slopes, ditches, swales, pavement edges, etc.], Silt Stop® assists in establishing vegetation by binding concurrently-applied seed and fertilizer to a previously placed organic reinforcing grid [burlap, jute, or coconut fiber]. This soft-armoring technique is effective regardless as to whether the Silt Stop®, seed and fertilizer are dry-applied or slurry-sprayed. The Silt Stop® binds the mulch, fiber, seed, fertilizer and soil into a strong, durable bonded fiber matrix.

Results are superior tackification or holding power, homogeneous vegetation, lesser volume of lime or soil conditioning requirements and substantial vegetative growth potential. Silt Stop® has outperformed all conventional agricultural PAMs and tackifiers currently available to date.

Case Study:

Highway 98 Restoration, Florida

On July 10, 2005 Hurricane Dennis raged through the Florida panhandle near Apalachicola and St. George's Island. It made landfall at 3 p.m. as a category 3 hurricane; with a maximum sustained wind near 140 mph and wave heights of 6 to 8 feet. US highway 98, a major tourism and transportation corridor that follows along the panhandle's coastline, felt the brunt of the hurricane's forces.

Damage was severe on approximately 14 miles of US highway 98, ranging from erosion of the shoulder to buckling and subsidence of the entire roadway. Immediately after the storm, the Florida Department of Transportation (FDOT) took action to reconstruct and open traffic on the stretch of damaged highway, awarding a construction contract to complete emergency repairs within 14 days. The travel lanes were quickly reconstructed and traffic soon resumed; however, within a month shoulder erosion was reoccurring, threatening to again encroach on travel lanes.



This 14 mile stretch of Highway 98 along the coast was the project area.



Above: The movement of the highly erosive beach sands caused the roadway to collapse, in some places across the entire width of the two lane road.

FDOT immediately sought to implement a short-term (1-2 years) cost-effective solution to protect the roadway and minimize sheet erosion of the front slopes and shoulders until a more permanent plan could be developed. Due to the proximity of the highway to the ocean and high exposure to saline-laden moisture and wind, the vegetation used had to be a salt-tolerant species. The design chosen had to allow for possible paving of the shoulders in the future.

Initially considered was a turf reinforced matting (TRM) design, but it did not fulfill the project requirements or specific site challenges. It was also a costly option, with an estimated cost of \$15 per square yard, or \$765,000 for the TRM material alone.

Josh Boan and Michael Shepard with FDOT consulted with Applied Polymer Systems and developed a soft armoring countermeasure that was cost-effective while meeting all of the design objectives. This application was also much more cost-effective, with a total project cost of \$744,650. The design consisted of the removal of the existing turf and regrading of the shoulders and front slopes, installation of a polymer enhanced soft armoring system with sod, and protection with temporary silt fence at the base of the front slope.

Once the shoulder area was regraded, two inches of nutrient-rich compost material was spread out. This compost layer provided the necessary nutrients to help establish and sustain the soil-stabilizing vegetation.

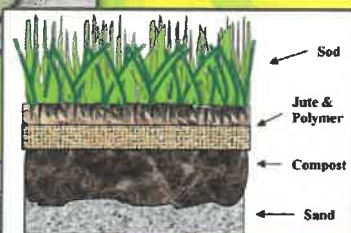
Over the layer of compost, open-weave jute matting and the correct soil-specific APS 705 Silt Stop powder was applied at a rate of 50 pounds per acre. Bermuda grass sod was laid over the jute matting. The jute matting provided an initial attachment surface for the polymer powder, which immediately bound to the surrounding soil and compost layers, instantly creating a highly erosion-resistant matrix that provided structural support while the vegetation was established.

Over one year later, in August 2006, the soft armoring technique is still performing well, requiring little maintenance and successfully mitigating coastal erosion. The application sustained two major storm events, a category 1 hurricane as well as a tropical depression, with total survival of the road. This single application had added savings to FDOT because it prevented the road from having to be rebuilt or repaired after these storms.

Over time, the jute blanket has biodegraded and the sod vegetation has continued to establish root structure into the underlying topsoil. The shoulder areas along US Highway 98 are so well stabilized that they can now be used as access to the waterfront without fear of erosion. The level of performance of this type of soft armor application far surpassed the expectations of FDOT.



Above & Left: A layer of compost material, covered with jute matting and Silt Stop powder, was applied before laying the sod.



Right: A cross-section diagram of the soft armor application.



Left: The shoulder of Highway 98, over 8 months after the application, is still stabilized and has held up to the extreme weather conditions of the Florida coast.

Case Study:

City of Bartlett Soft Armoring Performance Test, Tennessee

In September of 2006, the City of Bartlett used part of a subdivision development to test the performance of the soft armoring stabilization technique.

Soft Armoring uses soft pliable matting such as jute, coir, coconut, hemp or burlap and an application of the correct soil-specific polymer to stabilize the soil. The polymer binds the soil together with the matting, creating a highly erosion-resistant surface. It provides crucial stabilization while the vegetation establishes.

The test slope had previously been stabilized with sod, but a portion of it had been undercut, the sod had failed and washed away. Massive rills and gullies had formed in the exposed slope. After consulting with Jason Painter of Jen Hill, it was decided to try a Soft Armoring application to repair the slope.

Preparation work on the site involved re-grading the slope and filling in the rills. Since the area was very small, this was done by hand.



1) Grade Surface

Fill in any rills or gullies caused by erosion. This ensures that the surface of the work area is even and the matting will lay flush to the surface.



2) Apply matting

Install open-weave geotextile matting (coir, jute, or other natural fiber) flush to the soil surface and secure in place.

3) Apply Silt Stop powder, Seed & Fertilizer

The Silt Stop powder was added to the seed and fertilizer mix and applied as a dry spread with a hand seed/fertilizer spreader.



Just 3 days after installation of the jute matting and application of seed and soil-specific polymer powder, a large rainstorm dropped over two inches of rain on the site.

As shown in the photos to the left, even before the grass had germinated the slope is stabilized and showing no erosion or plumes of turbidity in the stormwater running through the silt fence and into the nearby stream.



Over four months after the application, the grass in the area of soft armoring was well-established and showed no signs of erosion. The areas of sod on either side of the soft armoring had dried out and died. The polymer allows for better water penetration and retention in the soil, helping to ensure healthy, lush vegetation.

Applied Polymer Systems, Inc

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APPLIED POLYMER SYSTEMS, INC.

700 SERIES SILT STOP POWDER



APS 700 Series Silt Stop is a group of soil specific tailored polyacrylamide co-polymer powders for erosion control. They reduce and prevent erosion of fine particles and colloidal clays from the soil into stormwater

Primary Applications:

- Mine Tailings and Waste Piles
- Newly Cleared Construction or Building Sites
- Road and Highway Construction
- Hydroseeding and Water Truck Application
- Hand Spreading and Ditch Placement

Features and Benefits:

- Removes Solubilized Soils and Clay from Water
- Prevents Colloidal Solutions in Water when Applied to the Soil Surface
- Will Reduce Soil Movement During Rain Event on Moderate Slopes
- Binds Cationic Metals within the Soil Matrix, Reducing Solubilization
- Reduces Wind Borne Dust Conditions
- Increases Soil Permeability and Water Penetration to Shallow Plants
- Reduces Operational and Cleanup Costs
- Reduces Environmental Risk and Compliance

Specifications / Compliances:

- ANSI/NSF Standard 60 Drinking water treatment chemicals
- 48 Hr. or 96 Hr. Acute Toxicity Tests (D. magna, P. promelas, or O. mykiss)
- 7 day Chronic Toxicity Tests (P. promelas or C. dubia)

Silt Stop Powder comes 30 bags per skid, mixed skids are permitted

Item Number	Description	Wt.
702	APS 702 Silt Stop Powder	50 lbs
705	APS 705 Silt Stop Powder	50 lbs
707	APS 707 Silt Stop Powder	50 lbs
712	APS 712 Silt Stop Powder	50 lbs
730	APS 730 Silt Stop Powder	50 lbs
740	APS 740 Silt Stop Powder	50 lbs
745	APS 745 Silt Stop Powder	50 lbs



Prep the site by filling in any low spots with extra soil.



Apply the powder to the group either dry or with a hydroseeder, cover with matting on steep slopes.



The powder holds the seed in place, giving it time to germinate.



Despite the steepness of the slope the seed was able to germinate and the soil is no longer bare. The erosion has been stopped.



APPLIED POLYMER SYSTEMS, INC.

700 SERIES SILT STOP POWDER



Application Rates

Soft Armoring application rate (per acre coverage): varies by soil content & grade of slope.

Gentle to Moderate slopes (0 to 4H:1V)

High Clay Content: 10-20 # powder

High Sand Content: 25-50 # powder

Steep slopes (3H:1V to 1H:1V)

High Clay Content: 20-35 # powder

High Sand Content: 45-50 # powder

Hydroseeding application rate (per acre coverage): varies by soil content & grade of slope.

Gentle to Moderate slopes (0 to 4H:1V)

High Clay Content: 10-20 # powder/3000 gallons/acre

High Sand Content: 25-50 # powder/3000 gallons/acre

Steep slopes (3H:1V to 1H:1V)

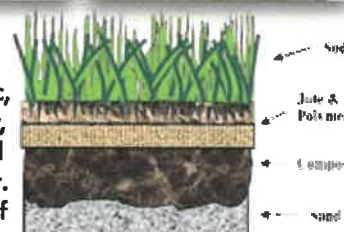
High Clay Content: 20-35 # powder/3000 gallons/acre

High Sand Content: 40-50 # powder/3000 gallons/acre



Directions for Use

Dry Form - APS Silt Stop® Powder may be applied by hand spreader, mechanical disc, or hand sowing. Slope or ditch application may require artificial support such as straw, or wood fiber mulch to reduce down slope movement. Areas of high water velocity will require benching or tier structuring to reduce velocity. Sheet flow applications are best. APS Silt Stop® Powder may be mixed with dry silica sand to aid in spreading. Ratios of sand to powder will vary in accordance with the type of spreading device used.



Liquid Form - APS Silt Stop® Powder may be applied with hydroseeders, water trucks or other spraying devices. All spraying devices must have a mechanical agitator or mixing apparatus or hydraulic recirculation. Caution - Do Not mix powder into a spraying device that does not contain a mixing apparatus.

Mixing - Sprinkle powder into the water with the mixing apparatus operating as the last material to be added to the mix. Three to Five minutes of mixing will be required after the powder is sprinkled into the water. ADD THE POWDER SLOWLY-adding the powder to fast will result in clumping resulting in poor performance.

****Longer mixing times will create high viscosity solutions possibly causing some types of spray equipment to undergo cavitations. When using more than 10 lbs./1000 gallons of water, do not let powder fully dissolve to prevent damage to the equipment.**

Clean-up

Spilled powder should be cleaned up dry as best as possible using broom or vacuum. Extreme slippery conditions will result. In event of skin contact, wash power from skin as soon as possible using soap and water.

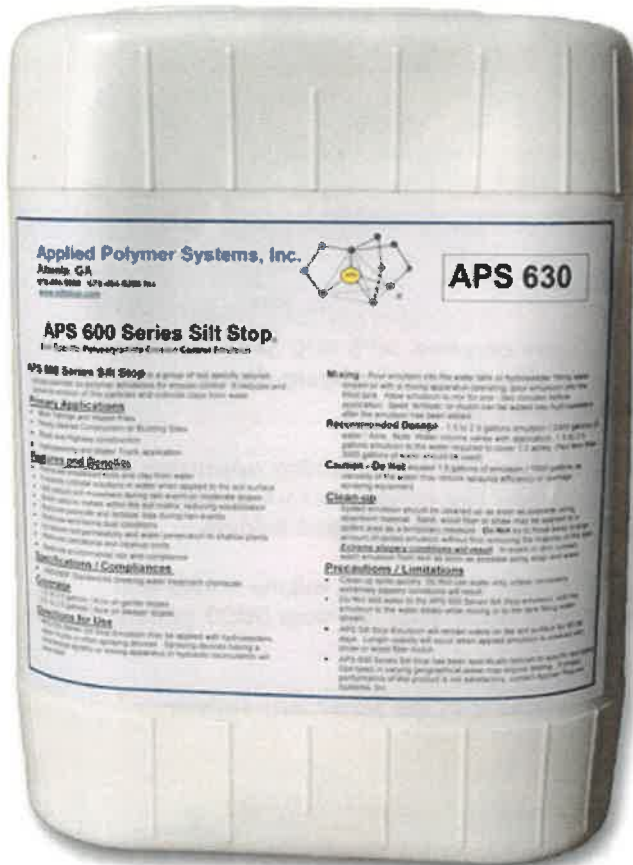
Precautions / Limitations

- Prevent inhalation of the powder, use adequate dust mask.
- Clean up spills quickly. Do not use water unless necessary, extremely slippery conditions will result.
- Do not add water to the APS Silt Stop® Powder; add the powder (sprinkle) to the water slowly.
- APS Silt Stop® Powder will remain viable on the soil surface for 60-90 days. Longer viability will occur when applied powder is covered with straw or wood fiber mulch.
- APS 700 Series Silt Stop® powders have been specifically tailored to specific soil types. Soil types in varying geographical areas may require testing. If proper performance of this product is not satisfactory, contact Applied Polymer Systems.



APPLIED POLYMER SYSTEMS, INC.

600 SERIES SILT STOP EMULSION



APS 600 Series Silt Stop is a group of soil specific tailored polyacrylamide co-polymer emulsions for erosion control. They reduce and prevent erosion of fine particles and colloidal clays from the soil into stormwater.

Primary Applications

- Mine Tailings and Waste Piles
- Newly cleared Construction or Building Sites
- Road and Highway construction
- Hydroseeding and Water Truck application

Features and Benefits

- Removes solubilized soils and clay from water
- Prevents colloidal solutions in water when applied to the soil surface
- Will reduce soil movement during rain event on moderate slopes
- Binds cationic metals within the soil matrix, reducing solubilization
- Reduces pesticide and fertilizer loss during rain events
- Reduces wind borne dust conditions
- Increases soil permeability and water penetration to shallow plants
- Reduces operational and cleanup costs
- Reduces environmental risk and compliance

Specifications / Compliances

- ANSI/NSF Standard 60 Drinking water treatment chemicals

Silt Stop Emulsion comes 32 pails per skid, mixed skids are permitted

Item Number	Description	Wt.	Volume
605	APS 605 Silt Stop Emulsion	45 lbs	5 gallon
630	APS 630 Silt Stop Emulsion	45 lbs	5 gallon
640	APS 640 Silt Stop Emulsion	45 lbs	5 gallon



Before spraying the Silt Stop Emulsion on the ground, fill in any rills or gullies and rate smooth.



For very steep slopes, a natural fiber matting needs to be installed for added protection against erosion.



Using the appropriate application rate for the steepness of slope, add the Emulsion as the last component of the mix.



By adding the Silt Stop Emulsion to the hydroseeding mix the seeds are allow to take root and establish vegetation.



APPLIED POLYMER SYSTEMS, INC.

600 SERIES SILT STOP EMULSION



Application Rates

Hydroseeding application rate (per acre coverage): varies by soil content and grade of slope.

Gentle to Moderate slopes (0 to 4H:1V)

High Clay Content: 1.0-2.0 gallons emulsion/ 3000 gallons/ acre

High Sand Content: 2.0-3.0 gallons emulsion/ 3000 gallons/ acre

Steep slopes (3H:1V to 1H:1V)

High Clay Content: 1.0-2.5 gallons emulsion/ 3000 gallons/ acre

High Sand Content: 2.5-3.0 gallons emulsion/ 3000 gallons/ acre



Directions for Use

Shake or mix the jug of emulsion before opening as separation may have occurred. APS 600 Series Silt Stop Emulsion may be applied with hydroseeders, water trucks or other spraying devices. Spraying devices having a mechanical agitator or mixing apparatus or hydraulic recirculation will work best.

Mixing - Pour emulsion into the water tank or hydroseeder filling water stream or with a mixing apparatus operating, pour emulsion into the filled tank. Allow emulsion to mix for one - two minutes before application. Seed, fertilizer, and mulch should be added into hydroseeders before the emulsion has been added.

Recommended Dosage - 1.0 - 2.5 gallons emulsion / 3000 gallons of water. Note: Water volume varies with applicators, 1.0 - 2.5 gallons emulsion to the water required to cover 1.0 acres. (Not less than 3000 gallons of water should be used)

CAUTION - Do Not exceed 2.5 gallons of emulsion / 3000 gallons as viscosity of the water may reduce spraying efficiency or damage spraying equipment.

Clean-up

Spilled emulsion should be cleaned up as soon as possible using absorbent material. Sand, wood fiber or straw may be applied to a spilled area as a temporary measure. Do Not try to hose away a large amount of spilled emulsion without first removing the majority of the spill. Extreme slippery conditions will result. In event of skin contact, wash emulsion from skin as soon as possible using soap and water.

Precautions / Limitations

- Clean up spills quickly, Do Not use water only unless necessary, extremely slippery conditions will result.
- Do Not add water to the APS 600 Series Silt Stop emulsion, add the emulsion to the water slowly while mixing or to the tank filling water stream.
- APS Silt Stop Emulsion will remain viable on the soil surface for 60-90 days. Longer viability will occur when applied emulsion is covered with straw or wood fiber mulch.
- APS 600 Series Silt Stop has been specifically tailored to specific soil types. Soil types in varying geographical areas may require testing. If proper performance of this product is not satisfactory, contact Applied Polymer Systems, Inc.





APPLIED POLYMER SYSTEMS, INC.

SOIL ZINGER



Soil Zinger™ solves every homeowner's dilemma of how to grow grass especially on tough areas like slopes. The unique blend of components that makes up Soil Zinger™ creates a sticky bond between the soil, grass seed, fertilizer and other soil amendments.

No longer will rain wash away seed, soil, fertilizer or other soil amendments.

A little bit of Soil Zinger™ goes a long way.

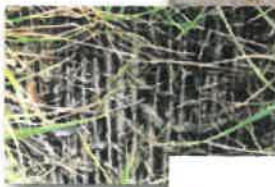
When applying the Soil Zinger™ alone, start with the lowest setting on the spreader and gradually work up until the spreader is broadcasting the powder at a moderate rate.

When applying with seed or fertilizer, set the spreader dial according to the seed and/or fertilizer manufacturer's recommendations.

The ground should NEVER be completely white.

For optimum performance, after the Soil Zinger™ is applied a layer of straw or natural fiber matting such as jute or burlap can be applied over the ground. This is especially helpful when the area where Soil Zinger™ is applied is a steep slope. Soil Zinger™ is activated by water, a light watering can be done after it is applied but is not necessary.

You will see Soil Zinger™ at work once the grass begins to germinate there will be no more patches of bare ground caused by rain washing the seed away.



Product	Wt.	Application on bare soil (with or without fertilizer)	Application with grass seed (with or without fertilizer)	SKU
Soil Zinger	1.25 lbs	1 bag treats 1200 sq ft	Use 0.25 lbs Soil Zinger with 1 lb of seed	7-93573-20906-1

Soil Zinger™ is easy to use. It can be put in any type of grass seed spreader. It can be applied alone or with seed and fertilizer.

Directions for use:

1. Fill in rills or gullies with soil. Rake to create a smooth surface.
2. Apply by hand or with a seed/fertilizer spreader. (Use gloves when applying by hand.) 100% coverage is required for best results.

THE GROUND SHOULD NOT BE WHITE!

A little goes a long way.

OPTIONAL:

- For maximum protection and increased staying power cover the treated area with straw, mulch or natural matting.
- Soil Zinger™ is activated by water. A light watering is recommended but not required.

Applied Polymer Systems, Inc
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