

Polymer Emulsions Testing and Screening Procedure

Polyacrylamide Blend Erosion Control and Water Clarification Emulsions (Instructions for testing polymer emulsions)

1. BACKGROUND:

Polymer emulsions are water and soil specific for each application. There are many variables that can and will change the performance and application of the polymer emulsions. Testing of soils at each site must be done to assure that correct performance will occur when correct application has been done. Failure to perform these tests may result in poor performance or no results at all.

2. DEFINITIONS:

2.1 Polyacrylamide: A white, water-soluble polymer made up of repeating acrylamide units. It may be used as a thickening agent, a flocculent, an absorbent, and to separate macromolecules of different molecular weights. Polyacrylamide is used in food packaging, coatings, secondary oil recovery, water treatment..., adhesives, paper manufacturing, and to reduce soil erosion.

3. PURPOSE: *To test soil sample from site for specific polymer emulsion that will work on it.*

4. MATERIALS NEEDED:

4.1 Stock solution/slurry:

- 5 grams site specific soil
- (2) Clear/transparent container that can hold at least 8 oz of water
- 2 oz de-ionized water or site water
- .5 grams of polymer powder
- pH meter
- Pipette (15 mL transferring pipette)
- Turbidity (NTU) meter
- Water quality test strips for total hardness testing (optional)

5. PROCEDURE:

5.1. Stock solution/slurry:

- 5.1.1 Take 5 grams of soil and place it into a clear container that can hold approx. 8 oz of water.
- 5.1.2 Add two ounces of water into the cup and mix until the clay content is in solution.
- 5.1.3 Allow this mix to settle for 30-40 seconds
- 5.1.4 Carefully pour the muddy water into a second clear/transparent container taking care to not allow the sand and bulk of the heavier sediment to enter the second container.
- 5.1.5 Use a pipette to transfer the slurry water into a NTU meter. Make sure NTU jar is clear of films and fingerprints by wiping exterior with a clean towel. Record this as

initial NTU value or NTU_i. (See step 3 below for EPA Standard Methods turbidity testing.)

- 5.1.6 Test for the pH. Dip a pH stick or pH probe into the 2 ounces of slurry water or use a pH meter to test the pH of the water. Record the value.
- 5.1.7 Add approximately .5-2 oz of the polymer powder to the muddy slurry water.
- 5.1.8 Moderately swirl the container until particulate is formed. After the particulate is formed, compare the clarity of the water for each of the samples tested.
- 5.1.9 Take a final NTU reading of the sample. Record as NTU_f.

REPEAT THIS ENTIRE PROCESS FOR EACH POWDER TESTED

-The clarity of water needs to be good enough to meet any state or federal water quality requirement.

6. REPORTING RESULTS

Test report should include the following information:

- 6.1 All details necessary to determine which Floc Log will fit the specific soil or water type (pH, NTU_i, NTU_f, total hardness, Powder used, etc).
- 6.2 Test results are to be recorded in a similar to format to Table 1.

Table 1- Recommended Data Record Template for soil sample and water samples. Not all information may be needed or used. This is only a basic template used for emulsion testing.

Company: _____ Date: _____

Sample Type: Water Soil

pH: _____ Phosphate (PO₄): _____

Hardness (CaCO₃): _____ NTU_i _____

Floc Log	Time	NTU _f

Soil Stabilizer: _____

7. CLEAN UP METHODS and CAUTIONS:

7.1 Polymer Emulsions-

- 7.1.1 Anionic polymer emulsions are non-hazardous and non-toxic.

- 7.1.2 Must require an EPA certified aquatic toxicity report.
- 7.1.3 Emulsions will cause extremely slippery conditions.
- 7.1.4 Avoid contact with eyes, skin and mouth.
- 7.1.5 Wear safety glasses and gloves when handling polymer emulsions.
- 7.1.6 When spilled, DO NOT flush polymer emulsions with water.
- 7.1.7 Soak up any spilled polymer emulsions with absorbent material. Clean up Polymer emulsions with a shovel or a vacuum. Place in a container for Disposal. Polymer emulsions must be non toxic and non-hazardous and can Be disposed of in any commercial landfill.
- 7.1.8 Ammoniated solvent can be used to break up emulsion viscosity with agitation or power spray.