

Product Bulletin

FR-500 FRICTION REDUCER ADDITIVE

GENERAL INFORMATION

Applied Chemical Technologies FR-500 is a synthetic high molecular weight polyelectrolyte based polyacrylamide. This product is a highly efficient friction reducer when used in water- based hydraulic fracturing fluids and is capable of reducing pressure losses due to friction by amounts in excess of 70%.

PHYSICAL PROPERTIES

Specific Gravity:	8.8lbs/gal – 1.05
Appearance:	Opaque, Off white Emulsion
Bulk Viscosity:	1000- 1200 cps
Storage Temperature:	32-95°F
Ionic Charge:	Anionic

CHEMICAL DESCRIPTION

FR-500 is useful in various industrial applications such as industrial water and waste water clarification, lubricant in drilling mud and thickening and as a friction reducer additive. Specifically optimized to be used in high temperatures as well as in freshwater and light or heavy brines; and is tolerant of brines which contain high concentration of divalent or multivalent ions.

RECOMMENDED USES

FR-500 use levels are 0.25-2.0gal/1000gal in water.

STORAGE

FR-500 should be stored between 32-95°F and protected from freezing. If freezing occurs the product should be warmed to 40-90°F and mixed well before use.

PACKAGING

FR-500 is furnished in 5-gallon pails, 55-gallon poly drums, or in bulk. It is not a DOT regulated material.

AVAILABILITY

FR-500 is conveniently warehoused on the Gulf Coast, in Broussard, LA for quick and easy pickup or delivery 24 hours/day 365 days/year.

APPLIED
CHEMICAL TECHNOLOGIES

FRICTION REDUCTION FLOW LOOP TESTING

Product	PSI IN	% Reduction	PSI OUT	% Reduction
Baseline (Fresh Water)	8.5		5	
FR-300 1GPT FW	7.5	11.76	4.5	10
FR-300 2GPT FW	7.25	14.7	4	20
FR-500 1GPTFW	7.5	11.76	4.5	10
FR-500 2GPT FW	7.5	11.76	4	20

Procedure: Placed 4000 mL of Fresh Water in the friction loop.

Read a Baseline PSI. Added proper amount of product. Obtain new PSI.

Product	PSI IN	% Reduction	PSI OUT	% Reduction
Baseline (2%KCl)	8.5		5	
FR-300 1GPT 2%KCl	7.5	11.76	4.5	10
FR-300 2GPT 2%KCl	7.5	11.76	4.25	15
FR-500 1GPT 2%KCl	8	5.88	4.5	10
FR-500 2GPT 2%KCl	7.5	11.76	4.5	10

Procedure: Placed 4000 mL of 2% KCl in the flow loop.

Read a Baseline PSI. Added proper amount of product. Obtain new PSI.

GEL SWEEP TEST

**Freshwater in oven @ 375°F
for 3hrs at 2% Loading**

<i>FR-300</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	48cP	9.5cP

<i>FR-500</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	70cP	11.3cP

<i>Competitor 1</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	66cP	7.0cP

<i>Competitor 2</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	57cP	10.9cP

**Freshwater in oven @ 275°F
for 1.75hrs at 2% Loading**

<i>FR-300</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	48cP	31cP

<i>FR-500</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	58cP	51cP

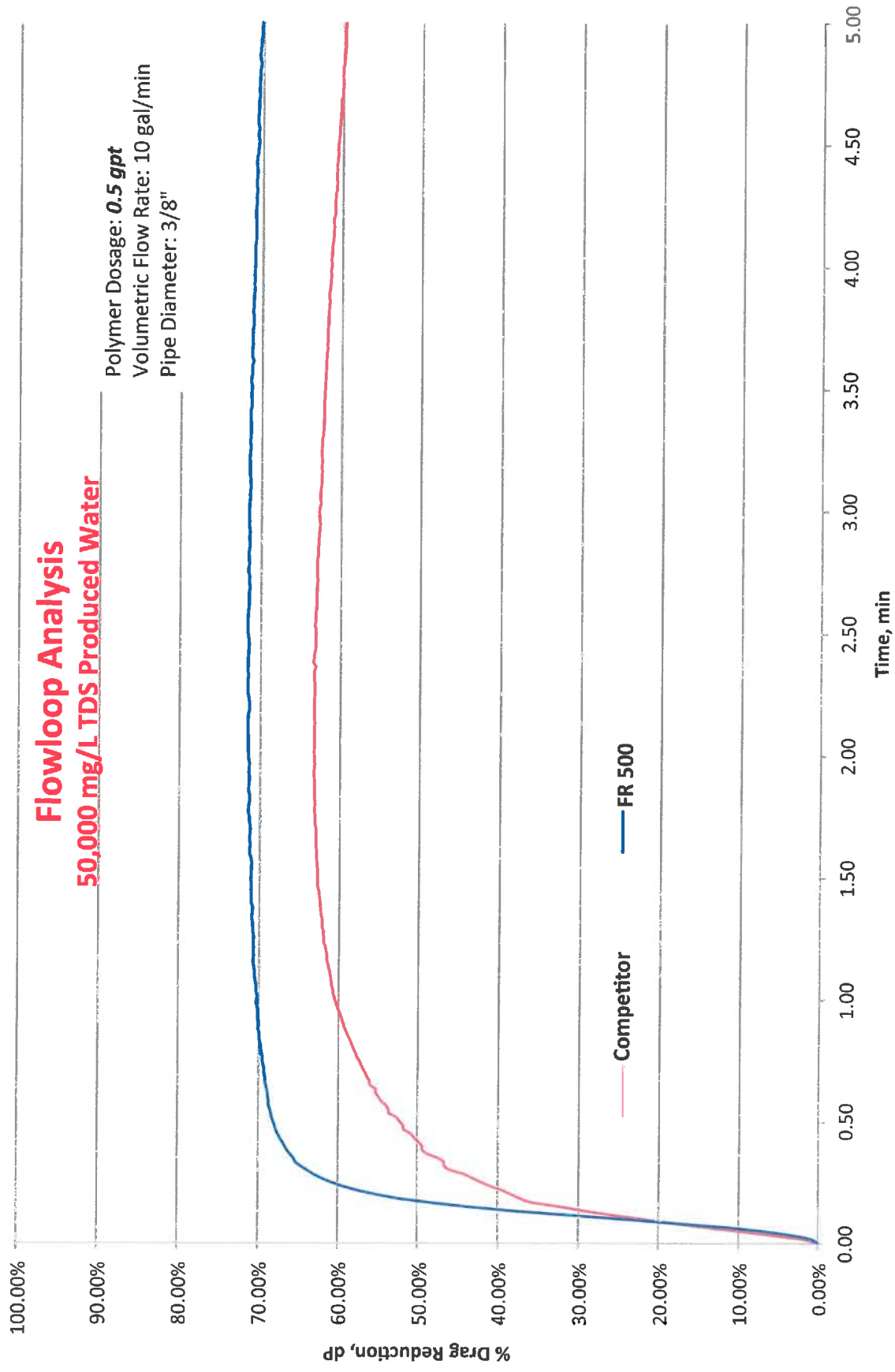
<i>Competitor 1</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	67cP	59cP

<i>Competitor 2</i>	<i>IN:</i>	<i>OUT:</i>
Freshwater	51cP	43cP

Flowloop Analysis

50,000 mg/L TDS Produced Water

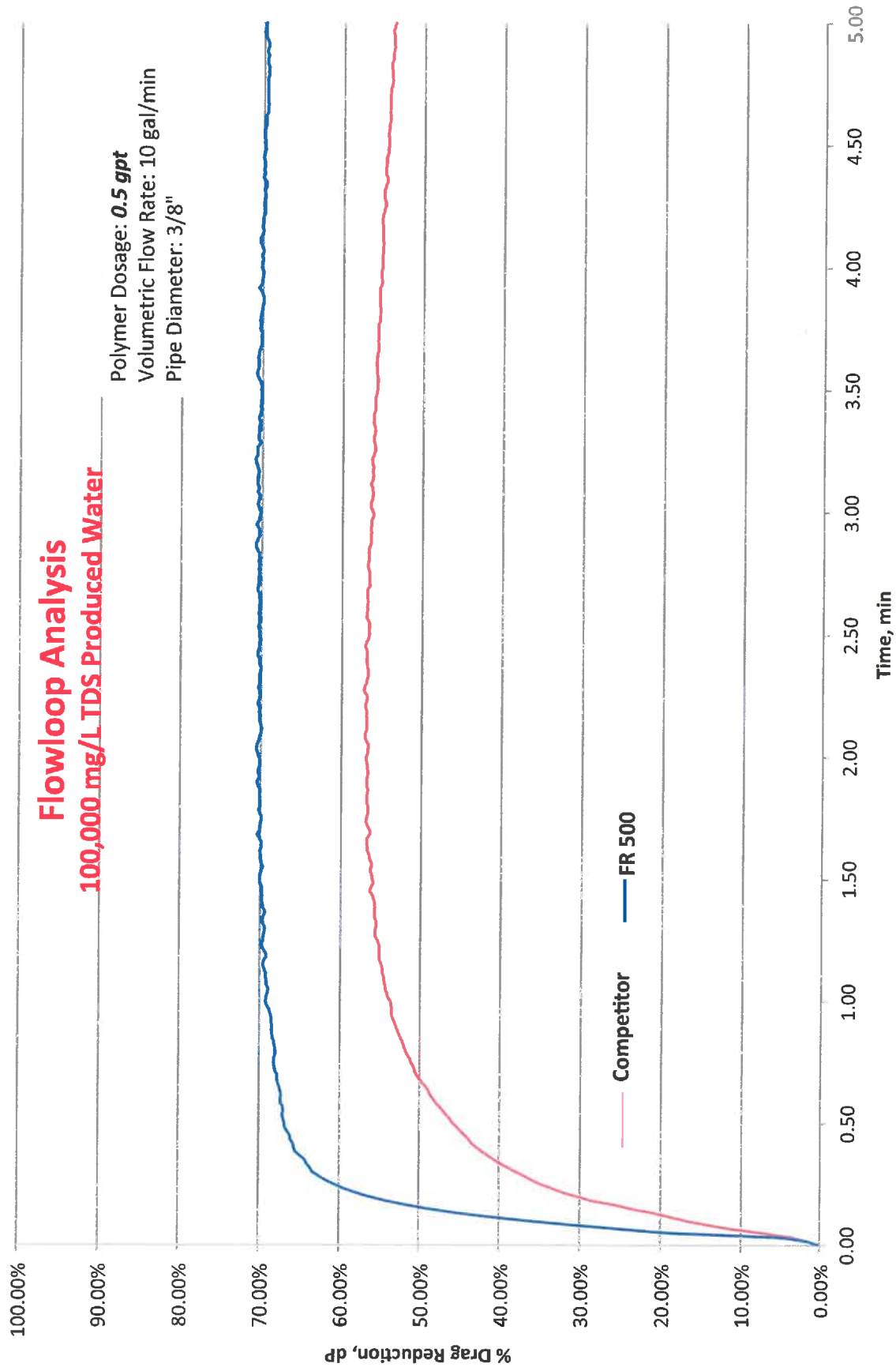
Polymer Dosage: 0.5 gpt
Volumetric Flow Rate: 10 gal/min
Pipe Diameter: 3/8"



Flowloop Analysis

100,000 mg/L TDS Produced Water

Polymer Dosage: 0.5 gpt
Volumetric Flow Rate: 10 gal/min
Pipe Diameter: 3/8"



Flowloop Analysis

100,000 mg/L TDS Produced Water

Polymer Dosage: 1.0 gpt
Volumetric Flow Rate: 10 gal/min
Pipe Diameter: 3/8"

