

## RAW's Gel Fragment Emulsifier quickly reduces particle size in produced frack water and drives down disposal costs.



RAW's Gel Fragment Emulsifier eliminates costly mechanical gel fragment treatment methods and commensurate disposal costs.

### RAW Biochem Is

Readily Biodegradable  
Non-Reactive  
Non-Toxic  
Non-Corrosive  
Non-Hazardous  
Not Flammable  
Contain No VOC's

### RAW Biochem Products Do NOT Contain

Petroleum Distillates  
Glycol Ethers  
Caustics  
Ozone Depleting Agents  
Nonylphenols  
Endocrine disruptors

Significant costs are added to operations when flowback and produced water is heavily laden with gel fragments and hydrocarbons that are dispersed throughout the fluid matrix. Disposal costs are negatively influenced by the size and quantity of gel fragments contained in the fluids and may even require additional forms of separation or reduction. Often, the mechanical systems used are temporary in nature and will not fully alleviate disposal well operator concerns.

RAW Biochem's Gel Fragment Emulsifier is an ideal remedy for these issues. It is specifically designed to break the bond to guar gum, friction reducers, drilling fluids and hydrocarbons. Gel Fragment Emulsifier treated flowback and produced water that had been heavily saturated with gel fractions will only have a slight scum floating on the surface. This scum can be rinsed and is miscible with agitation. The amount of filtration necessary to prepare the brine for reuse or disposal is minimal and, in many cases, not required at all.

For brine reuse, RAW Biochem's Gel Fragment Emulsifier allows for easy rehydration with most friction reducers and thickening agents.

In 3rd party testing performed on low and high gravity solids; the following results were observed:

Sample Tank	% Below 25 um	% Below 50 um	% Below 100 um	LGS % by Volume	Maximum Particle Size um
Control Sample	64.02	70.66	77.34	31.53	409.163
<b>RAW Biochem Treatment</b>	<b>95.57</b>	<b>97.76</b>	<b>98.91</b>	<b>62.78</b>	<b>174.110</b>

Additional benefits:

- Reuse of produced or flowback water means reduced disposal fees and environmental charges.
- No special equipment or apparatus is required

## TECHNICAL DATA SHEET

## Description

RAW's Gel Fragment Emulsifier is a concentrated blend of readily biodegradable ingredients which break the bonds and emulsify guar gum, friction reducers, drilling fluids and hydrocarbons to enable frac water re-use or easy disposal.

The active ingredients are safe to use on all substrates and will not damage steel, glass, fiberglass or plastic.

## Physical State

Liquid

Colour	Light Amber
Odour	Mild
pH	4 - 6
Base	Plant Extracts
Persistence & Degradability	Readily Biodegradable

## C.H.A.T.

**Chemical:** Unlike typical petrochemicals, RAW formulations may not perform as well with higher concentrations of product than they would with higher dilution rates. In a new process or application, trials are strongly recommended to achieve the correct chemical concentration.

**Heat:** The optimum temperature ranges from 43°C – 80°C. Product can be used in steam applications up to 490°C (540°F).

**Agitation:** Where applicable, agitation aids in dislodging soils from surfaces so they can be rinsed away.

**Time:** Dwell time is dependant on the application, heat and chemistry but generally speaking, longer dwell times enable more satisfactory results.

## Directions for Use

Add 1-part Gel Fragment Emulsifier Concentrate to 750 – 4,000 parts flowback water. The exact dosage is contingent on the amount and extent of suspended particles believed to be inhibiting the fluid mechanics.

Use a pump with an adequate amount of shear or turbidity such as a Baker pump to roll the tank for approximately 20-30 minutes in order to allow GFE to fully interact with the fluid.

Following this treatment with Gel Fragment Emulsifier, use of a polymer type flocculent added to the frac tank will allow for easier removal of any large particle aggregates that remain.

Following treatment(s,) test fluid for hydration ability with a Friction Reducing product, and confirm proper mechanics with a field viscosity test.