A novel oil-agnostic, proprietary surfactant demulsifier which aggressively breaks the oil-water bond.

RAW's standard oil-agnostic demulsifier formulation works equally well with all types and blends of oil suspended in brine or fresh water. The proprietary nanotechnology design maximizes value while minimizing operating costs through the utilization of micelle.

Plant based fatty acids and oils accelerate separation through the strength of proprietary micelle formulas. Active ingredients measure from 1 – 5 nanometers and have both hydrophilic (*water loving*) head and hydrophobic (*oil loving*) tails. The result is that each micelle collects the oil and quickly rises to the surface for collection.

RAW colloidal solutions enable active ingredients to remain suspended and continue to actively seek out oil to bring to the surface without the need for mechanical separation or processes.

Benefits of the RAW Demulsifiers include:

- Formulation performs equally well in all oil types.
- Separated hydrocarbons easily re-enter the transportation system without a need for further separation. It will not harm or accelerate the deterioration of various oils already in the network.
- Works equally well in brine, salt or fresh water.
- Paraffins and asphaltenes are equally dispersed in the oil for re-entry into the transportation network.
- Does not require high temperatures to work effectively and efficiently.
- Cleaner produced water reduces handling and discharge costs.
- RAW demulsifiers are environmentally safe. Accidental spills require no special treatment and are non-hazardous.
- Minimized work safe procedures with no special handling required. Demulsifiers do not contain nonylphenols or any other endocrine disruptors or xenoestrogens which are typical to most other demulsifiers.

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

TECHNICAL DATA SHEET

Description

Readily biodegradable and formulated with domestically sourced plant-based ingredients, RAW's demulsifiers are built as a novel surfactant package for aiding in the separation of water and oil emulsions. Demulsifier comes with and without a Winterizing Agent and functions in fresh water or brines. Unlike petrochemical demulsifiers, RAW's do not contain nonylphenols or any other endocrine disruptors or xenoestrogens.

Physical State	Liquid
Colour	Light Yellow
Odour	Mild
pH	3 - 5
Base	Plant Extracts
Persistence & Degradability	Readily Biodegradable

Directions for Use

Demulsifiers are used in treating produced hydrocarbons during the water separation phase, separating and reclaiming hydrocarbons from cutting prior to disposal, and separating and reclaiming hydrocarbons during equipment cleaning operations, etc.

Dosing thresholds are critical. Too much demulsifier may stabilize emulsion. It is always better to use too little than use too much.

A bottle shake test will establish proper dosing. Pull several samples into small bottles and dose in intervals starting at 50 ppm, 100 ppm, 250 ppm, etc. Always keep one bottle untreated as a control.

Shake bottle well. Record the time it takes for emulsion to break in each bottle. Dosing generally starts at lower ppm for lower viscosity oils and increases for heavy crude oil.

If higher dosage seems appropriate, confirm this with a second round of bottle shake tests prior to beginning scaled up treatment.

Ultimately product should be injected into transfer line sufficiently prior to the emulsion settling tank to allow for adequate mixing and to enable shear force. Using RAW's Demulsifier appropriately will significantly decrease wait times for separation to occur in emulsion separation tanks.

In case of accidental overdosing, shut off demulsifier at the injection point and allow influx of fresh emulsion to bring dosage point back below threshold. Once emulsion begins to break, dosing can be resumed. As in all RAW chemicals, the addition of heat will accelerate the process. Ideal temperatures for this process will be 120^{0}F (48^{0}C).

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^{0}C – 80^{0}C. Product can be used in steam applications up to 490^{0}C (540^{0}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.