

# VOA

## Technical Data Sheet

### VOA (Environmentally Friendly Natural Iron Chelator)

Heartland Energy Group, Ltd. is pleased to offer an environmentally friendly iron complexing additive that will effectively prevent precipitation of iron compounds during well completions, workovers and intervention as well as the treatment of drilling fluids in oil, gas and water wells.

VOA is 100% natural and made with ingredients that are FDA GRAS approved. VOA is a unique blend of amino acids and vitamin derivatives that can be found at most natural food stores and as an ingredient to many of our everyday foods.

VOA is Non-DOT regulated, non-fuming, OSHA and EPA compliant and carries a triple zero hazardous materials index score. VOA qualifies as an EPA approved Designed for the Environment product.

#### TYPICAL PHYSICAL PROPERTIES:

Appearance and Color	Clear to light amber viscous liquid
Initial Freeze Point	N/A
Odor	Sweet odor
Solubility in water	100%
Initial Boiling Point	272 ± 5° F
Flashpoint	N/A
Specific Gravity	1.24±.005

#### FEATURES AND BENEFITS:

- Effective for stimulation treatments and workovers
- Can be used to treat or remove scale or weighting agents in reservoir drilling fluids
- Prevents precipitation of insoluble products that lead to formation damage
- Listed on the EPA's Cleangredient database and Dfe Program as approved formulating ingredients
- Chelating compound that effectively associates with ferric and ferrous iron to form soluble complexes
- A safer alternative to EDTA, acetic and citric acids
- Can be used effectively to temperatures that exceed 400° F

#### DIRECTIONS FOR USE:

Recommended Dilution Rates:

A .5% addition by volume will yield ~4500 ppm of iron control

Note: Oil Safe AR® concentrate contains VOA in the standard formula. However, small additions of VOA may be required if excessive amounts of iron are present in the piping system, tanks or formation.

Blending ratios may vary based on specific applications and recommendations from your consultants at Heartland Energy Group, Ltd.

#### STORAGE AND HANDLING:

VOA has a storage life of better than one year.

Keep container closed when not in use.

As with all chemical products and materials, take care as to where you store them.

Safety glasses are suggested for use when handling this product.

No special gloves or protective equipment are required when handling this product.

#### PACKAGING:

VOA is packaged in 5 gallon to 275 gallon containers.

Bulk quantities are available upon request.

Recommendations given in this data sheet are based on tests believed to be reliable. However, the use of the information is beyond the control of Heartland Energy Group, Ltd., and no guarantee, expressed or implied is made to the results obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage from the misuse of the product as such, or in combination with other materials. This bulletin is not to be taken as a license to operate under or recommendation to infringe any patent.