

EDS-ER™

Electron Donor Solution- Extended Release

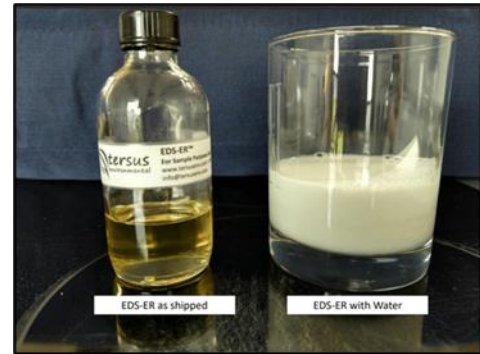


A Safe and Proven Long-Lasting Carbon Source

In 2011, Tersus pioneered *EDS-ER™* the first water-mixable vegetable oil based organic substrate to provide a lasting source of carbon and hydrogen for enhanced reductive dechlorination and other bioremediation processes. It is delivered as a 100% fermentable substrate concentrate, fostering anaerobic remediation conditions within aquifers. *EDS-ER™* comprises refined, bleached, and deodorized soybean oil along with surfactants. These surfactants play a crucial role in reducing the interfacial energy ($\gamma_{o/w}$) required to increase the surface area, thereby promoting oil droplet dispersion, and ensuring thermodynamic stability when combined with water. When mixed with water, *EDS-ER™* spontaneously becomes an emulsified vegetable oil (EVO) as demonstrated in the video at tersusenv.com/EDS-ER-emulsifying.mp4.

Advantages

1. **High-Quality Emulsion Formation:** It spontaneously forms a high-quality, low-droplet size oil-in-water emulsion that evenly disperses throughout the aquifer.
2. **Ease of Mixing:** *EDS-ER™* easily mixes with water, simplifying field operations.
3. **100% Fermentable:** It contains no water and is 100% fermentable.
4. **Long-Lasting:** *EDS-ER™* is a slowly fermenting product that can provide electrons for up to five years.
5. **Food-Grade Ingredients:** It contains refined, bleached, and deodorized (RBD) food-grade soybean oil.
6. **Preservative-Free:** *EDS-ER™* contains no preservatives.
7. **Extended Shelf Life:** It has a long shelf life allowing for long periods of storage.
8. **Reduced Transportation Costs:** Compared to other EVO (Emulsified Vegetable Oil) products, *EDS-ER™* offers lower transportation costs.
9. **Fewer Containers:** It requires up to 50% less packaging material when compared to other EVO products, reducing its carbon footprint.
10. **USDA Certified Biobased Product:** *EDS-ER™* is certified as a USDA Biobased Product.
11. **Versatile Injection Methods:** It can be injected into existing wells or via direct push methods.
12. **Improved Efficiency:** *EDS-ER™* reduces the number of necessary injection points for low-permeability structures, enhancing remediation efficiency.



Field Application Design

Field application designs for *EDS-ER™* can be tailored to meet the specific needs of your site. Typical configurations include grid and barrier patterns, as well as applications in excavations or trenches. The product's low viscosity facilitates subsurface distribution through multiple methods, including direct-push injection points, hollow-stem augers, or pumping through existing wells. This adaptability allows you to effectively address site-specific conditions and remediation goals.

Achieving uniform distribution of an electron donor is essential for the successful enhancement of anaerobic bioremediation. *EDS-ER™*, once mixed with water, maintains its emulsified state, even at low concentrations. The

resulting diluted emulsion has a viscosity nearly identical to that of water. Therefore, we recommend injecting a relatively dilute emulsion in a single step, as the oil droplets move along with the injected water. These oil droplets may remain suspended in the water for a few days to a few weeks after injection until they are absorbed into soil surfaces, providing a sustained source of electron donor.

The convenience of on-site dilution is a key feature of *EDS-ER™*. To achieve the desired concentration, simply add the necessary amount of product to a mixing tank and then incorporate water. This flexibility makes it easy to adapt to specific project requirements and ensure efficient anaerobic bioremediation.

Product Content

Chemical Name	Concentration (%)	CAS Number
Soybean Oil	90 – 93	8001-22-7
Emulsifiers	7 – 10	Proprietary

Product Characteristics

Parameter	Specification
Physical State	Liquid
Appearance	Yellowish Translucent Oil
Flash Point	Greater than 282°C (540°F)
Density	0.92 to 0.925 g/cm3
Water Solubility	Miscible

Packaging Options

EDS-ER™ is available for shipping in either 55-gallon poly drums or 275-gallon IBC containers, providing flexibility in packaging options to meet your needs.

Safety Observations

It is recommended to always use personal protective equipment (PPE) that matches the specific task when working with any type of chemicals.

**Tersus Provides Site-Specific Remediation Programs
and Performance Monitoring Plans
To Meet Your Budget**

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