

# TersOx™ Nutrients



- Nutrient blend for bioremediation
- Blends of nitrogen, phosphorous and microbial growth enhancers
- Soluble or long-lasting versions for water or subsurface environments
- Compatible with Tersus' bioremediation products
- Site-specific optimized blends with urea, phosphorous buffer and iron

## Nutrient Blends for Biodegradation and Bioremediation Programs

### Ex-situ Bioremediation



### Laboratory Validation



Nutrient quality control ensures increased microbial plate counts, respirometer tests and biodegradation rates.

### Packaging



## Principle

Both in-situ and ex-situ bioremediation of organic contaminants in aquifers, soils or sludges provide a low-cost, easy route to the removal of constituents of concern. Contaminated matrices are usually deficient in nitrogen and phosphorus content, key elements in biological activities during microbial destruction of organic contaminant destruction. Using TersOx™ Nutrients provides limiting nutrients in a mixture of environmentally compatible salts and biodegradation rates are maximized.

TersOx™ Nutrients is a specialty blend of nitrogen, phosphorus and microbial growth enhancers to stimulate biological activity in soils and sludges. TersOx™ Nutrients provides a unique, balanced blend of limiting nutrients to enhance the rate and consistency of biological degradation of contaminants in aquifers, soils, sludges and wastewater.

Tersus blends site-specific combinations of macro and micronutrients to meet high biodegradation rate demands. Urea-Nitrogen, phosphates dissolved iron and pH buffers can be added to the mix after reviewing site conditions. Dosing typically targets a 20:1 BOD to NH<sub>3</sub> – N ratio and 200:2 BOD to PO<sub>4</sub> – P ratio.

Product	TersOx™ Nutrients-SR (Slow Release)	TersOx™ Nutrients-QR (Quick Release)	TersOx™ Nutrients Custom
Nitrogen	36.1%	40%	Custom (0-40)
Phosphorous	0.1%	4%	Custom (0.1-19%)
Potassium and others	5.3%	n/a	Custom, TBD
Characteristics:	Long response source of Urea nitrogen, phosphate and potassium for ex situ hydrocarbon biodegradation	Soluble addition of critical nutrients (Urea-N, P) to guarantee maximum degradation rates	Site-specific blends based on analytical data and/or treatability study tests

## Field Application Design

Tersus recommends collecting nutrient analytical data and bench scale tests on site water and soils to determine requirements and bioremediation performance. Soluble products can be dosed to water stream or diluted and injected into batches. Non-soluble products can be mixed into soils or periodically injected.

## Product Content

Chemical Name	Composition (% wt.)
Urea, ammoniacal, insoluble and other water-soluble nitrogen sources	20-40
Diammonium phosphate	0-25
Tricalcium phosphate	0-10
Soluble potash	0-5
Water-soluble iron	<1

## Product Characteristics

Parameter	Specification
Specific Gravity	1.3
Solubility in water	~100 g / 100 mL
Appearance	Crystalline, white powder

## Packaging Options

- 25-lb (11.3 kg) plastic pails
- 220-lb (100 kg) fiber drums
- 2,000-lb supersacks

## Safety

The use of body protection appropriate to task being performed is always suggested when handling chemicals. Wear impervious gloves for prolonged or repeated exposure as appropriate to task. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374, the appropriate Standards of Canada or other relevant standards.



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