

# TersOx™ Powder

## Enhanced Aerobic Bioremediation



- White-to-yellow granular substance
- Releases >16.6% of its weight as oxygen
- Ideal for stimulating aerobic remediation in trenches, pits, and excavations
- Expected shelf life of 2 years

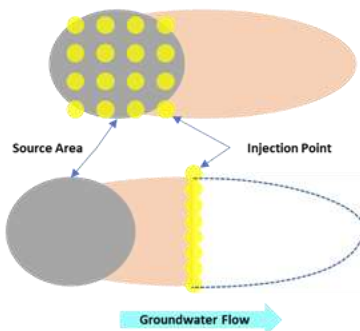
### Injectable Formulation for Groundwater Applications

#### TersOx™ Slurry



#### Grid Pattern or Barrier

Injection Layout Options



#### Direct Push Injection



### Principle

*TersOx™* Powder is a specially formulated calcium peroxide that produces a controlled release of molecular oxygen. It is designed to assist in the aerobic bioremediation of hydrocarbons in soil and groundwater. *TersOx™* stimulates the natural degradation of petroleum hydrocarbons such as benzene, toluene, ethylbenzene, and xylenes (BTEX). This is not a chemical oxidation product. The high ratio of O<sub>2</sub> in *TersOx™* (>16.6% by weight) provides a long-term oxygen source for up to 12 months in ideal conditions. This sustained release of oxygen stimulates indigenous bacteria, accelerates bioactivity, and promotes increased contaminant removal.

### Advantages

- Controlled release of molecular oxygen to support biodegradation
- Supports aerobic microbial biodegradation
- Clean, safe, low-cost application
- No operations and maintenance

### Field Application Design

- *TersOx™* and water mixture (slurry) application
- Dry powder application in soils and excavations
- Injectable slurry for source area and permeable reactive barrier applications

*TersOx™* Powder can be slurrified with water and direct push injected into aquifers in a grid of points at desired depth intervals. The required *TersOx™* mass is restricted by aquifer soil type: tighter clays can accept less slurry than permeable sands. Loading thus ranges from 5 to 15 lbs. per vertical foot injected for each point. Points are spaced between 5 and 15 points apart.

1. Measure and pour water into a small tank or container according to the following desired consistency:
  - 65% Solids Slurry: Mix 3.55 gallons with 55 pounds of *TersOx™*
  - 50% Solids Slurry: Mix 6.6 gallons with 55 pounds of *TersOx™*
  - 30% Solids Slurry: Mix 15.4 gallons with 55 pounds of *TersOx™*
  - 25% Solids Slurry: Mix 19.6 gallons with 55 pounds of *TersOx™*
2. Use an appropriate mixing device to thoroughly mix *TersOx™* and water. A stucco mixer may be used in conjunction with a small paddle to scrape the bottom and sides of the container. Standard environmental slurry mixers may also be used, following the equipment instructions for operation.

- TersOx™* may settle out of slurry if left standing and will eventually harden into a cement-like compound. If this happens, *TersOx™* cannot be remixed. We suggest that you mix the desired quantity immediately before using. Do not let *TersOx™* stand more than 30 minutes, and re-mix immediately before use, to minimize settling. If a mechanical slurry mixer attached to a pump is being used, the material may be cycled back through the mixer to maintain slurry suspension and consistency.
- Check slurry consistency for pourability. Add water if necessary (in 1 cup increments) to achieve the correct consistency.

## Helpful Hints

The consistency of the *TersOx™* slurry will depend on the amount of water used. The 65% slurry will approach the consistence of a paste. This slurry is normally used for backfilling a bore or probe hole. It is especially useful where maximum density is desired such as where groundwater is present in the hole or there are heaving sands. Thinner slurries (25% to 60% are useful for injecting through a probe or bore hole into the saturated aquifer. We suggest mixing the first slurry batch at the maximum solids content one would expect to use. Subsequent thinning of slurry is accomplished by adding additional water in small increments. By monitoring this process, the appropriate quantities of water for subsequent batches can be determined.

Mix the *TersOx™* slurry just prior to use. It is best to not hold the *TersOx™* slurry for more than 30 minutes. Thinner slurries can experience a separation upon standing. All *TersOx™* slurries will cement when left standing. Adding water helps loosen a slurry that begins to thicken too much. Avoid leaving slurries in a grout pump or hose. Hardening issue can generally be avoided by periodically recirculating the slurry through the pump and hose back into the pump's mixing or holding tank.

## Product Content

Chemical Name	CAS Number	Composition (% wt.)
Calcium Peroxide Ca(O <sub>2</sub> )	1305-79-9	60-75
Calcium Hydroxide Ca(OH) <sub>2</sub>	1305-62-0	25-40

## Product Characteristics

Parameter	Specification
Bulk Density	0.5-0.65 g/cc
Solubility in water	Insoluble
Decomposition temperature	Self-accelerating decomposition with oxygen release starting from 275C
Appearance	White-yellow powder

## Packaging Options

- 25-kg bags

## Safety

*TersOx™ Powder* is a mild oxidizer and as such should be handled with care while in the field. Field personnel should take precautions while applying pure *TersOx™*. We suggest that the operator work upwind of the product as well as use appropriate safety equipment (see SDS). These would include eye and respiratory protection, and gloves as deemed appropriate by exposure duration and field conditions. Personnel operating the field equipment utilized during the installation process should have appropriate training, supervision and experience.



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