



Terra Systems Potassium Persulfate Technical Data Sheet For In Situ Chemical Oxidation (ISCO)

Terra Systems potassium persulfate is a powerful chemical oxidant used for In Situ Chemical Oxidation (ISCO). It can be activated with ferrous sulfide and injected into the groundwater to rapidly produce the oxidative radicals $SO_4^{\bullet-}$ and OH^{\bullet} and the reductive $O_2^{\bullet-}$ radical. Unactivated potassium persulfate can be used for some contaminant mixtures. Potassium persulfate is soluble up to 47 g/L at 20 °C (68 °F).

Multiple radicals result in the rapid destruction of compounds like:

- BTEX
- MTBE
- Petroleum hydrocarbons (TPHs, GRO, DRO)
- Polyaromatic hydrocarbons (PAHs)
- Chlorinated ethenes (TCE, PCE, DCE and vinyl chloride)
- Chlorinated ethanes (TeCA, TCA, and DCA)
- Chlorinated methanes (carbon tetrachloride, chloroform, and methylene chloride)
- 1,4-dioxane
- Pesticides

Activated persulfate is frequently used to treat chlorinated solvents in a *treatment train approach* along with Terra Systems patented family of SRS[®] (slow release substrate) emulsified vegetable oil substrates.

Key Communication Points

- Safe activation methods are available such as ferrous sulfide
- Ideal for the remediation of source areas and hot spots that require rapid treatment
- Lower pH injection fluids result in greater safety for the injection crew
- Provides extended activation of the persulfates in groundwater
- Easy to inject
- Lower solubility provides extended reactivity

Dosage and Application

The specific reagent delivered to the customer is formulated based on site conditions to meet their specific treatment goals. These formulations are developed based on contaminant(s) of concerns, ORP, pH, site geology, and soil oxidant demand. Typical dosages are 0.1 pound of activator per pound persulfate.

The injectate is a slurry that is compatible with a variety of application methods including:



- Bucket mixing
- Pug milling
- In-situ mixing
- Direct injection.
- Soil blending
- Fixed well injection

Technical Data

Potassium persulfate is a white, crystalline, odorless salt consisting of technically pure potassium persulfate. It has the particular advantage of being almost non-hygroscopic, of having a good storage stability as a result of its extremely high purity and of being easy and safe to handle. As a result of the process used for its production, it is free from contamination by ammonium ions.

Property	Potassium Persulfate
CAS No.	7727-27-1
Appearance	White finely crystalline salt
KPS content (typically)	Ca 99.6% w/w
Active oxygen (typically)	Ca. 5.9% w/w
Acid content (based on H2SO4, typically)	Ca. 0.1%
Iron content (typically)	Ca. 1.0 mg/kg
Bulk density (typically)	Ca. 1,100 g/l
Solubility in water at 10, 20, 40, and 60 °C	Ca. 30, 50, 105, 210 g/L
pH of a 1% solution in water (typically)	Ca. 3.7 SU
pH of a 10% solution in water (typically)	Ca. 3.1 SU
Decomposition of the product as supplied	At above 65°C
Recommended storage temperature	Below 30°C
Storage stability as from date of delivery	12 months
Moisture content (typically)	<0.03%

Standard Packaging

- 55-pound bags

Storage

Potassium persulfate is slightly hygroscopic and must be stored under dry conditions. It has to be protected from direct sunlight and from another source of heat.