Weatherford

Material Safety Data Sheet

WBK-133

1. Product and Company Identification

Material name	**WBK-133**
Patent Number	Not available
Chemical name	Ammonium persulfate
Revision date	October-23-2009
Version No.	3
CAS #	Mixture
Product use	Gel Breaker
Supplier information	Weatherford Fracturing Technologies 515 Post Oak Blvd Suite 1000 Houston, TX 77027 US

2. Hazards Identification

Emergency overview

DANGER -- OXIDIZER

Toxic. Strong oxidizer. Harmful by inhalation and if swallowed. Causes skin and eye burns. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact. Contact with other combustible material can cause fire. This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

OSHA regulatory status This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure	Ingestion. Inhalation. Eye contact.
Eyes	Do not get this material in contact with eyes. Irritating to eyes.
Skin	Do not get this material in contact with skin. Irritating to skin. May cause sensitization by skin contact.
Inhalation	Do not breathe dust. Irritating to respiratory system. Inhalation of dusts may cause respiratory irritation. May cause sensitization by inhalation.
Ingestion	Do not ingest. Toxic if swallowed. Irritating to mouth, throat, and stomach. May cause stomach distress, nausea or vomiting.

Potential environmental effects May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Ammonium Persulfate	7727-54-0	90 - 100

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses after the first 5 minutes and continue washing. Get medical attention immediately.
Skin contact	Immediately flush skin with plenty of water. Remove and isolate contaminated clothing and shoes. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.
Inhalation	Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. If not breathing, give artificial respiration or give oxygen by trained personnel. Call a physician or Poison Control Center immediately. Get medical attention immediately.
Ingestion	Get medical attention immediately. Have victim rinse mouth thoroughly with water. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Do not use mouth-to-mouth method if victim ingested the substance. Never give anything by mouth to a victim who is unconscious or is having convulsions.
Notes to physician	Provide general supportive measures and treat symptomatically. Symptoms may be delayed.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	Strong oxidizer. Flammable by CPSC criteria. Runoff to sewer may cause fire or explosion hazard. Some will react explosively with hydrocarbons (fuels). Water Reactive. May explode from heat or contamination. Some may decompose explosively when heated or involved in a fire. Runoff may create fire or explosion hazard. These substances will accelerate burning when involved in a fire.

Extinguishing media

Suitable extinguishing media	Water. Dry chemical, CO2, water spray or regular foam.

Protection of firefighters

Protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Do not move cargo or vehicle if cargo has been exposed to heat. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

6. Accidental Release Measures

Personal precautions	Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Isolate spill or leak area immediately for at least 50 to 100 meters (150 to 330 feet) in all directions. Stay upwind. Keep out of low areas.

Environmental precautions	Runoff from fire control or dilution water may cause pollution.
Methods for containment	Stop leak if you can do so without risk. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Should not be released into the environment. Sweep up or gather material and place in appropriate container for disposal. Avoid dust formation. After removal flush contaminated area thoroughly with water.

7. Handling and Storage

Handling	Use only with adequate ventilation. Minimize dust generation and accumulation. Do not handle or store near an open flame, heat or other sources of ignition. Keep away from clothing and other combustible materials. Handle only in a place equipped with local exhaust (or other appropriate exhaust). Avoid release to the environment. Wash thoroughly after handling.
Storage	Store in a closed container away from incompatible materials. Use appropriate container to avoid environmental contamination. Do not store near combustible materials. Store in cool place. Keep in a well-ventilated place. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Engineering controls	Ensure adequate ventilation, especially in confined areas.
Personal protective equipment	
Eye / face protection	Wear safety glasses; chemical goggles and face shield (if splashing is possible).
Skin protection	Avoid contact with the skin. Use a chemical resistant apron or protective suit if splashing or contact with solution is likely. Wear appropriate chemical resistant gloves. Wear chemical protective equipment that is specifically recommended by the manufacturer. Protective gloves.
Respiratory protection	Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.
General hygeine considerations	When using do not smoke. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice. Wash hands after handling and before eating.

9. Physical & Chemical Properties

Appearance	Crystals
Color	White.
Odor	None known.
Odor threshold	Not available
Physical state	Solid.
Form	Crystalline Solid
pH	4 @ 1% solution
Melting point	248 °F (120 °C)
Freezing point	Not available
Boiling point	Not available
Flash point	Not available
Evaporation rate	Not available

Flammability	Not available.
Flammability limits in air, upper, % by volume	Not available
Flammability limits in air, lower, % by volume	Not available
Vapor pressure	Not available
Vapor density	Not available
Specific gravity	1.98
Relative density	1.9798 g/cm3 estimated
Solubility (water)	85 % w/w @ 77F
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available

10. Chemical Stability & Reactivity Information

Chemical stability	Instability caused by excessive moisture.
Conditions to avoid	Keep away from heat and sources of ignition. Exposure to moisture. Do not mix with other materials.
Incompatible materials	Water. Fluoride. Peroxides. Reducing agents. Avoid contact with alkalis and alkali metals This product may react with metals, halogens.
Hazardous decomposition products	May include oxides of nitrogen. May include oxides of sulphur.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Acute effects

Acute LD50: 495 mg/kg estimated, Rat, Oral
Acute LC50: 130 mg/l/4h estimated, Rat, Inhalation

Component analysis - LD50

Toxicology Data - Selected LD50s and LC50s

Ammonium Persulfate	7727-54-0	Inhalation LC50 Rat: 520 mg/L/1H; Oral LD50 Rat: 495 mg/kg

Sensitization	May cause sensitization by inhalation and skin contact.
Chronic effects	Prolonged exposure may cause chronic effects.
Carcinogenicity	Not expected to be hazardous by OSHA criteria.
Neurological effects	Not expected to be hazardous by OSHA criteria.

12. Ecological Information

Ecotoxicity

LC50 103 mg/L estimated, Fish, 96.00 Hours,
EC50 120 mg/L estimated, Daphnia, 48.00 Hours,
Components of this product have been identified as having potential environmental concerns.

Ecotoxicity - Freshwater Fish Species Data

Ammonium Persulfate	7727-54-0	96 Hr LC50 Lepomis macrochirus: 103 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 76.3 mg/L [static]

Ecotoxicity - Water Flea Data

Ammonium Persulfate	7727-54-0	48 Hr EC50 Daphnia magna: 120 mg/L

Environmental effects

Ecotoxicity - Freshwater Fish Species Data

Ammonium Persulfate	7727-54-0	96 Hr LC50 Lepomis macrochirus: 103 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 76.3 mg/L [static]

Ecotoxicity - Water Flea Data

Ammonium Persulfate	7727-54-0	48 Hr EC50 Daphnia magna: 120 mg/L

13. Disposal Considerations

Disposal instructions

Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

14. Transport Information

Department of Transportation (DOT) Requirements

Basic shipping requirements:

Proper shipping name	Ammonium persulfate
Hazard class	5.1
UN number	UN1444
Packing group	III
Additional information:	
Special provisions	A1, A29, IB8, IP3, T1, TP33
Packaging exceptions	152
Packaging non bulk	213
Packaging bulk	240
ERG number	140

Department of Transportation (DOT) Requirements

Bulk

Basic shipping requirements:

Proper shipping name	Ammonium persulfate
Hazard class	5.1
UN number	UN1444
Packing group	III
Additional information:	
Special provisions	A1, A29, IB8, IP3, T1, TP33
Packaging exceptions	152
Packaging non bulk	213
Packaging bulk	240
ERG number	140

Canadian Transportation of Dangerous Goods (TDG) Requirements

Basic shipping requirements:

Proper shipping name	AMMONIUM PERSULFATE; or AMMONIUM PERSULPHATE
Hazard class	5.1
UN number	UN1444
Packing group	III
Additional information:	
ERG number	140

IMDG

Basic shipping requirements:

Proper shipping name	AMMONIUM PERSULPHATE
Hazard class	5.1
Subsidiary hazard class	•
UN number	1444
Packing group	III

IATA

Basic shipping requirements:

Proper shipping name	Ammonium persulphate
Hazard class	5.1
UN number	1444
Packing group	III

15. Regulatory Information

Labelling

Contains	Ammonium Persulfate
US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List. CERCLA/SARA Hazardous Substances - Not applicable.

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical	Yes

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - Yes
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

International regulations

Canada - WHMIS - Ingredient Disclosure List

Ammonium Persulfate	7727-54-0	0.1 %

State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

U.S. - New Jersey - Right to Know Hazardous Substance List

Ammonium Persulfate	7727-54-0	sn 0111

U.S. - Texas - Effects Screening Levels - Long Term

Ammonium Persulfate	7727-54-0	1 µg/m3 ESL (particulate)

U.S. - Texas - Effects Screening Levels - Short Term

Ammonium Persulfate	7727-54-0	10 µg/m3 ESL (particulate)

16. Other Information

HMIS® ratings	Health: 2 Flammability: 0 Physical hazard: 1
NFPA ratings	Health: 2 Flammability: 0 Instability: 1 Special hazards: OX
Prepared by	Emilia Ugwu 515 Post Oak Blvd Suite 600 Houston TX, 77027 +1 7139682310
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