"HEDP" liquid deflocculant, sequesterant MSDS

MONSANTO COMPANY 800 NO. LINDBERGH BLVD. ST. LOUIS, MO 63167

DEQUEST 2010 comprises:
HEDP; 1-hydroxyethylidene-1,1-diphosphonic acid, phosphonic acid, (1-hydroxyethylidene)bis
$C(OH)(CH_3)(PO_3H_2)_2$

Corrosive Liquid, N.O.S. (Contains Phosphorus Acid, 1Hydroxyethylidene -1,1 diphosphonic acid)
DOT label: Corrosive
U. S. Surface Freight Classification: Washing Compound, N.O.I.B.N., Liquid
CAS No.: 2809-21-4

WARNING STATEMENTS: DANGER, CAUSES EYE BURNS, CORROSIVE TO MILD STEEL

PRECAUTIONARY MEASURES
Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

EMERGENCY AND FIRST AID PROCEDURES
FIRST AID: IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention. Remove material from skin and clothing.
IN CASE OF: SPILL OR LEAK, contain spills and leaks to prevent discharge to the environment.

OCCUPATIONAL CONTROL PROCEDURES
Eye Protection: Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.
Skin Protection: Although Dequest 2010 does not present a significant skin concern, skin contamination should be minimized by following good industrial practice. Wearing of protective gloves is recommended. Wash hands and contaminated skin after handling.
Respiratory Protection: Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment (full face piece recommended) when airborne exposure Is excessive. If used, full face piece replaces need for chemical goggles. Consult respirator manufacturer to determine appropriate type equipment forgiven application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed.
Ventilation: Provide ventilation to minimize exposure. Use local mechanical exhaust at sources of air contamination such as open process equipment.

FIRE PROTECTION INFORMATION
Although this material does not meet the parameters for flammability, it will burn in the presence of a strong ignition source after the water is removed.
Extinguishing Media: Water spray, dry chemical, C02, or other Class B extinguishing agent.
Special Firefighting Procedures: When DEQUEST 2010 is involved in a fire, firefighters or others should wear full protective clothing and self-contained breathing apparatus n exposed to vapors or products of combustion. All fire fighting equipment, including protective clothing and self-contained breathing apparatus, needs to be decontaminated after use.

REACTIVITY DATA
Materials to Avoid: Avoid contact with concentrated caustic. Contact will result In the evolution of heat. Also, avoid contact with strong oxidizing agents.
Hazardous Decomposition Products: Phosphines may form after all the water has been removed. CO, CO2, and oxides of nitrogen may also be formed.
Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY
The following information summarizes human experience and results scientific investigations reviewed by hearth professionals for hazard evaluation of DEOUEST 2010 Deflocculant and Sequestrant and development of Precautionary Statements and Occupational Control Procedures recommended in this document.
Effects of Exposure
Skin contact Is expected to be the primary route of occupational exposure to DEOUEST 2010 Deflocculant & Sequestrant. Though occupational exposure to this material has not been reported to cause significant adverse health effects, DEQUEST 2010 deflocculant is considered, on the basis of acute animal tests, to be corrosive to the eyes.

Toxicological Data
Data from Monsanto studies indicate the following:

Oral - Slightly Toxic	(Rat LD50: 2400 mg/kg)
Dermal - Practically Nontoxic	(Rabbit LD50: >7940 mg/kg)
Eye Irritation - Corrosive	
Skin Irritation – Non-irritating	(Rabbit, 24 hr., 0.0/8.0)

Following repeated exposures (90 days) to DEQUEST 2010 deflocculant (usually as the sodium salt) in their feed, rats showed minor changes in one study and no adverse effects in another; dogs dosed orally (30 days) also showed only minor changes in one study but not in another. Rats given this material in the diet for 2 years had only minor changes to the adrenal gland which may not have been rented to treatment. Dogs given the test material in the diet for 2 years developed an anemia which corrected itself during the study. However dogs given the test material by Injection under the skin or by direct oral dosing (capsules) developed severe effects on the bone. with rib and pelvic fractures reported in many of the animals.

No birth defects were noted in rats or rabbits given DEQUEST 2010 deflocculant (as the sodium salt) orally during pregnancy. No effects were seen on the ability of male and female rats to reproduce when given DEQUEST 2010 deflocculant (as the sodium salt) in their diet for 2 successive generations. DEQUEST 2010 deflocculant produced no genetic changes in standard in vitro assays using bacterial and mammalian cells.

Components
Data from laboratory studies conducted by Monsanto and from the scientific literature on phosphoric acid, a component of DEQUEST 2010 Deflocculant, which have been identified under the criteria of the OSHA Hazards Communication Standard (29 CFR 19190.1200):
Phosphorous Acid
Phosphorous acid is considered to be slightly toxic following oral administration to rats and dermal administration to rabbits. it is corrosive to eyes and skin and, thus, may contribute to the irritation potential of DEQUEST 2010 deflocculant. Phosphorus acid produced no genetic changes In standard tests using bacteria.
Additional Information
Hydroxyethylidene-1,1-diphosphonic acid (HEDP), the active acid in DEQUEST 2010 Deflocculant, has established therapeutic application in treatment of certain bone related diseases due to its ability to alter the development of the bone mineral matrix. Many clinical observations on the use of HEDP in bone disease and skeletal imaging have been published. Additional publications extensively discuss the effects of HEDP on bone mineralization and on calcium and phosphate metabolism in man and laboratory animals. For additional toxicity information relative to these uses, please refer to the appropriate scientific literature.

PHYSICAL DATA
Appearance: Clear solution, yellow color
Odor: Characteristic odor
Freezing Point: 0°C
Specific Gravity: 1.45
Viscosity (centistokes) at 20°C: 46.01
pH (1% solution at 25°C): <2
Solubility in Water: Capable of being mixed (miscible) in all proportions

SPILL, LEAK, & DISPOSAL INFORMATION
Emergency Spill and Leak Information: When handling spills and leaks, follow good industrial hygiene and safety practices as outlined in the Precautionary Measures and Emergency and First Aid Procedures section of this document. Contain spills and leaks to prevent discharge to the environment. Absorb spillage with clay, sawdust or other absorbent material. Place all spilled material, contaminated sorbent materials, contaminated dirt, and other contaminated material in drums. If possible, it is also acceptable to contain spilled materiel and recover it as a liquid prior to disposal. Keep concentrated product out of sewers, watersheds and water systems.
Disposal Information: Dispose of in accordance with all applicable local, state and federal regulations. As currently defined in the federal Resource Conservation & Recovery Act (RCRA), DEQUEST 2000 deflocculant and sequestrant, when discarded, is a hazardous waste exhibiting the characteristic of corrosivity (D-002). See 40 CFR 261.22. Its disposal, therefore, is regulated by federal RCRA regulations. Consult your attorney or appropriate regulatory officials for information regarding additional state and local waste disposal requirements. Disposal by incineration is recommended.