NATURAL METAL MAGNET

TECHNICAL DATA SHEET

NATURAL METAL MAGNET (NMM) is a proprietary, scientifically developed, all natural product designed to permanently bind heavy metals in water and soil applications. It is a non-hazardous product that offers an environmentally safe way to correct heavy metal issues such as copper, zinc, lead, silver and many others. It is available as an easy-to-feed liquid, and the product-to-metal ratios are very low aiding in its cost effective.

APPLICATION

For Wastewater Applications

NMM when added during the flocculation process along with existing flocculation chemistry and improve the removal of metals and other highly cationic species. Charged acrylamides may interfere with the bonding process. Dosage will depend on variables such as metal, concentration, treatment chemistry, etc. Specific site testing should be performed.

For Soil Containing Metals

This product can be directly applied to the ground. However, the product should be diluted at least 10:1 and sprayed, then soaked into the contaminated area. NMM works best in neutral to slightly alkaline soils. Its binding effectiveness is reduced in acidic (pH<6) soil. (Consider Natural Metal Magnet 2 for acidic soils. The dosage will vary by metal, soil conditions, etc. and specific site testing should be performed. Final bonding occurs in 30-90 days depending on weather conditions and soil porosity.

TYPICAL PHYSICAL PROPERTIES

Appearance	Liquid
Color	Dark Brown to Black
Odor	Earthy
Water solubility	100%
pH Neat	8-9
Density	8.5 lbs/gallon

STORAGE AND HANDLING

Non-hazardous. Do not ingest. May cause sickness if ingested in large quantities. Prolonged contact with skin may cause irritation. Safety glasses and gloves, as a minimum, are recommended when handling. Keep container closed when not in use. Store product in a dry and cool area. See Safety Data Sheet (SDS) for other safety and handling information.

PACKAGING

Shipped from the manufacturing facility in 265 gallon containers. Bulk quantities in tank trucks are available upon request.

NATURAL METAL MAGNET 2

TECHNICAL DATA SHEET

NATURAL METAL MAGNET 2(NMM2) is the next generation of natural product designed to permanently bind heavy metals in water and soil applications. It is a non-hazardous product that offers an environmentally safe way to correct heavy metal issues such as copper, zinc, lead, silver and many others. It improves on the original Natural Metal Magnet by being able to extract more contaminants with less sludge formation. It is available as an easy-to-feed liquid, and the product-to-metal ratios are very low aiding in its cost effective.

APPLICATION

For Wastewater Applications

NMM when added during the flocculation process along with existing flocculation chemistry and improve the removal of metals and other highly cationic species. Charged acrylamides may interfere with the bonding process. Dosage will depend on variables such as metal, concentration, treatment chemistry, etc. Specific site testing should be performed.

For Soil Containing Metals

This product can be directly applied to the ground. However, the product should be diluted at least 10:1 and sprayed, then soaked into the contaminated area. NMM2 works best in soil with a pH >5. The dosage will vary by metal, soil conditions, etc. and specific site testing should be performed. Final bonding occurs in 30-90 days depending on weather conditions and soil porosity.

TYPICAL PHYSICAL PROPERTIES

Appearance	Liquid
Color	Dark Brown to Black
Odor	Earthy
Water solubility	100%
pH Neat	10.5
Density	8.5 lbs/gallon

STORAGE AND HANDLING

Non-hazardous. Do not ingest. May cause sickness if ingested in large quantities. Prolonged contact with skin may cause irritation. Safety glasses and gloves, as a minimum, are recommended when handling. Keep container closed when not in use. Store product in a dry and cool area. See Safety Data Sheet (SDS) for other safety and handling information.

PACKAGING

Shipped from the manufacturing facility in 265 gallon containers. Bulk quantities in tank trucks are available upon request.

NATURAL SOIL DETOX

TECHNICAL DATA SHEET

NATURAL SOIL DETOX (NSD) is a proprietary, scientifically developed, all natural product designed to treat damage to soils due to salt contamination such as salt water or produced water spills. Natural Soil Detox promotes stimulates soil microbiology, and improves soil condition such as increasing the cation exchange capacity (CEC), increasing water retention and reducing soil compaction. A liquid form of a naturally occurring carbon source to boost the micronutrient uptake in plants. It is a non-hazardous product that offers an environmentally safe way to bind metals and slow their migration through soil. It is particularly effective with binding copper, zinc, lead, silver and many others. It is available as an easy-to-feed liquid.

APPLICATION

For Soil with High Levels of Salt

An additional benefit of NSD is that it can help improve mobility of salt (e.g. sodium and chloride ions) in the soil to help remove them from the growth zones in your soil. For direct to soil application, the product should be diluted at least 10:1 and sprayed, then soaked into the contaminated area.

Dosage for Treating Soil with High Levels of Salt

Salt (NaCl) Level, ppm	Irrigation	Direct to Soil	
		Initial	Subsequent
0 - 2,500	0.30	1.0	1.0
2,500 – 5,000	0.60	2.0	1.0
5,000 – 10,000	1.50	5.0	2.0
10,000 – 15,000	2.5	7.0	3.0
15,000 – 20,000	3.5	12.0	5.0
20,000-50,000	4.5-10.5	15.0-35.0	10.0
50,000-100,000	10.5-20.0	55.0-75.0	15.0

Dosage via Irrigation= gallons of product per 10,000 gallons

Initial and subsequent application dosages are in gallons of product per acre-foot.

TYPICAL PHYSICAL PROPERTIES

Appearance .....Liquid
Color..... Dark Brown to Black
Odor .....Earthy
Water solubility 100%
pH Neat 8-9
Density .....8.5 lbs/gallon

STORAGE AND HANDLING

Non-hazardous. Do not ingest. May cause sickness if ingested in large quantities. Prolonged contact with skin may cause irritation. Safety glasses and gloves, as a minimum, are recommended when handling. Keep container closed when not in use. Store product in a dry and cool area. See Safety Data Sheet (SDS) for other safety and handling information.

PACKAGING

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BYO-DETOX

TECHNICAL DATA SHEET

BYO-DETOX is a proprietary humified soil extract with the nine essential soil microbes included in the formulation. The product works by providing an organic substructure with an extremely high ion exchange capacity. The carbon chain then becomes a food supply for the natural soil and product's adjunct microbes, which over time dissipates the salts. Special enzymes significantly increase the degradation process by facilitating the transfer and uptake of nutrient by the microbial population.

APPLICATION

This product was designed specifically for soil remediation applications. It has the following benefits:

- Bonds and eliminates salt (sodium & chloride) ions up to 3000 ppm with a single treatment.
- Detoxifies the soil from the full spectrum of accumulated toxins associated with fertilizers and regular chemical products.
- Increases plant beneficial microbes in soil.
- Serves as an effective chelating agent, magnifying the availability of vital plant nutrients, including nitrogen, calcium, phosphorus, potassium and trace minerals.
- Increases nutrient and water storage through more efficient cellular uptake.
- Improve the natural organic soil structure through humic acid technology.
- Reduces disease pressure via beneficial microbial activity that breaks down both carbohydrates and protein components of harmful bacteria and disease pathogens.
- Contains food grade ingredients that are safe for use around animals, fish and humans.

Dosage rates should start at three (1-3) gallons (3.8-11.3 liters) of product diluted with at least 8-26 gallons of water (30-100 Liters) per acre and be applied once or twice a year depending on the contamination specifics. Salt binding will occur after the first application. Subsequent applications provide the additional benefits listed above.

TYPICAL PHYSICAL PROPERTIES

Appearance	Liquid
Color	Dark Brown to Black
Odor	Earthy
Water solubility	100%
pH Neat	7-8
Density	8.8 lbs/gallon

STORAGE AND HANDLING

Non-hazardous. Do not ingest. May cause sickness if ingested in large quantities. Prolonged contact with skin may cause irritation. Safety glasses and gloves, as a minimum, are recommended when handling. Keep container closed when not in use. Store product in a dry and cool area. See Safety Data Sheet (SDS) for other safety and handling information.

PACKAGING

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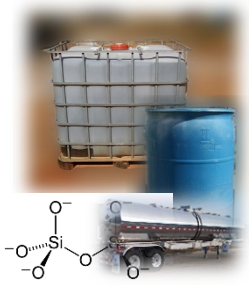

OPF Silicate 4.0

TECHNICAL DATA SHEET

A high ratio silicate manufactured using a unique process to increase the size of silicate in solution to maximize size-to-charge ratio which improves coagulation and flocculation effectiveness.

APPLICATIONS

- Coagulant aid to be used with sulfuric acid, aluminum sulfate, chlorine, ammonium salts, or carbon dioxide to enhance coagulation to add density to slow-settling flocs
- Heavy metal precipitating agent for waste water
- Metal sequestering agent including stabilizing reduced iron and manganese ions.
- General purpose waste water flocculent

FEATURES & BENEFITS

- Improved coagulation
- Stronger, more settleable floc
- Overcome effects of temperature drops
- Reduce amount of coagulant needed
- Reduce the amount of sludge produced
- Can be combined with many anionic flocculants
- Significantly reduces interfacial tensions
- Stable, safe to handle and non-toxic
- Environmentally benign
- Reduces surface tension between oil and clays

TYPICAL PHYSICAL PROPERTIES

Appearance	Liquid
Color	Slightly yellow to grey
Odor	No discernable odor
Waster solubility	100%
pH Neat	11.3 – 11.7
Density	10.4 – 10.6 lbs/gallon

STORAGE AND HANDLING

Because of their alkalinity, care should be exercised in working with this product. It can be stored in either horizontal or vertical tanks constructed of carbon steel, stainless steel, fiberglass-reinforced plastic, or other suitable materials. Aluminum and brass tanks and fittings are not suitable for storage of this product since they can be attacked by alkaline solutions. Refer to the Safety Data Sheet (SDS) for other safety and handling information.

The freezing point is nearly the same as water, 32°F (0°C). If silicate cools to the freezing point, the water component of the solution begins to crystallize into ice, and this leaves the remaining portion of liquid over-saturated with respect to silica. As a result, the silica polymerizes into a gel. It may be possible to reconstitute frozen sodium silicate if it is thawed carefully and then mixed vigorously. The performance of a recovered product may not equal that of the original material.

PACKAGING

Shipped from the manufacturing facility in 265 gallon containers. Bulk quantities in tank trucks are available upon request.

CS-1000

TECHNICAL DATA SHEET

A high ratio silicate manufactured using a unique process to maximize size-to-charge ratio which will compete with oil bonded to clay to release the oil.

APPLICATIONS

- Enhanced Oil Recovery "wetting" Agent
- Swelling Control for Formation Clays
- Stabilizing Agent for Hydrogen Peroxide – Delayed Heat Treatments
- Non-Toxic Heavy Metal Precipitating Agent for Waste Water

FEATURES & BENEFITS

- Buffers the system to maintain an optimal pH over a wide range of concentrations.
- While raising pH is beneficial, raising it too much can cause precipitation and other formation damage.
- Improves surfactant efficiency through the removal (bind or precipitate) of hardness ions from reservoir brines, thus reducing absorption of surfactants onto wellbore surfaces.
- Non-Toxic, Non-Flammable, Non-Corrosive and Environmentally Benign
- Dosage Rates should be low (1-2%) to minimize cost and complications

CASE STUDY

Treated two wells in the Orinoco Belt region (12,000' well, 10.1 API Oil)

One – 265 Gallon tote, diluted to 2% was pumped down hole and the wells shut in for 3 days.

Well # 1: Increase from 9 to 44 bopd

Well # 2: Increase from 44 to 95 bopd

Higher rates have been in place for 8 months

TYPICAL PHYSICAL PROPERTIES

Appearance	Liquid
Color	Slightly yellow to grey
Odor	No discernable odor
Waster solubility	100%
pH Neat	11.3 – 11.7
Density	10.4 – 10.6 lbs/gallon

STORAGE AND HANDLING

Because of their alkalinity, care should be exercised in working with this product. It can be stored in either horizontal or vertical tanks constructed of carbon steel, stainless steel, fiberglass-reinforced plastic, or other suitable materials. Aluminum and brass tanks and fittings are not suitable for storage of this product since they can be attacked by alkaline solutions. Refer to the Safety Data Sheet (SDS) for other safety and handling information.

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