THIOGUARD® TST

PREMIER TECHNICAL RESOURCES — TECHNICAL GRADE TREATMENT SYSTEMS FOR ODOR, CORROSION, FOG, BIOLOGICAL, AND BIOSOLIDS PROCESSING

THIOGUARD® TST
(TOTAL SYSTEM TREATMENT) – TECHNICAL GRADE MAGNESIUM HYDROXIDE "MILK OF MAGNESIA" $MG(OH)_2$

1 TON OF THIOGUARD® = 1.37 TONS OF CAUSTIC SODA

ONE TRUCKLOAD OF **THIOGUARD®**

1.37 TRUCKLOADS OF 50% **CAUSTIC SODA (NAOH)**

THIOGUARD® TST is a non-hazardous application with no required reportable quantities (RQ = None)

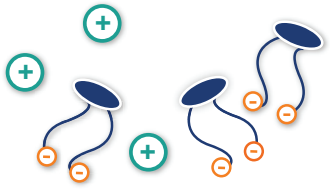
IN-PLANT AND COLLECTION SYSTEM SUMMARY

PROVIDING:
Long distance H_2S hydrogen sulfide and sulfuric acid corrosion reduction through:

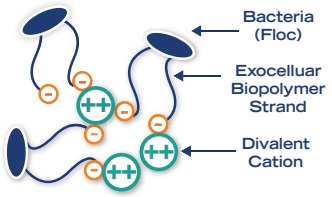
- **Low Solubility** – 0.0009 g/100ml, H_2O solubility and high surface area of 1 acre per gallon provides long distance collection system treatment to and through the wastewater treatment plant
- **SRB Inhibition** – reduces the ability of sulfate reducing bacteria (SRB) to convert sulfates to hydrogen sulfide gas
- **Magnesium Polysulfide Complexation** – promotes irreversible complexation between magnesium cation and sulfides by absorbing dissolved sulfides onto the solid magnesium hydroxide particle
- **Henry's Law** – Gas/Liquid Phase Equilibrium – resulting increase in pH keeps the dissolved hydrogen sulfide gas in solution Wastewater Treatment Plant Process Improvements through:
- **pH and Alkalinity Supplementation** – without adversely affecting pH beyond biologically healthy limits creating a more stable environment for bioremediation of BOD, nitrogen and phosphorus
- 1 mg/L ammonia-N requires 5.50 mg/L NaOH caustic soda or 4.16 mg/L $Mg(OH)_2$ for effective nitrification

Undissolved magnesium hydroxide particles react directly with H_2S converting H_2S to magnesium polysulfide.

Divalent Cations Compete With Monovalent Ions for Sites on Exocellular Biopolymers



Divalent Bridging Improves Floc Matrix



- With the addition of a slowly dissolving low solubility 0.0009 g/100ml, H_2O particle **THIOGUARD®**'s use in aerobic and anaerobic biological digesters provides a steady reactor pH conducive for maximizing bacterial development
- Negatively charged microbial flora are bridged by the divalent positive charge of magnesium hydroxide forming a large floc that settles readily
- **Biosolids Chemistry Enhancement for Land Application** – available magnesium in soil occupies the central position of the chlorophyll molecule/green pigment to utilize solar energy for the production of organic matter. Therefore, an adequate magnesium supply to plants may markedly increase photsynthetic activity of leaves. Also, magnesium is esssential to energy (vitamin) transfer within plants
- **Increasing filter cake solids by 20-40% due to divalent cation bridging** improvements in floc formation and thereby significantly reducing polymer demands

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