STIMULUS INHIBITS THE ACTIVITY OF THE ENZYME UREASE THAT CONVERTS NITROGEN AND UREA TO AMMONIA

TREATMENT WITH STIMULUS CAN:
- Inhibit the formation of odors;
- Control odors before and during processing;
- Provide odor mitigation during and after processing;
- Environmentally safe: derived from natural plant extract; no chemicals, dyes or fragrances.

MODE OF ACTION

The major component of STIMULUS inhibits the activity of the enzyme urease, which facilitates the conversion of nitrogen and urea to ammonia. Although the mode of action is unclear, the principal components tend to immobilize the enzyme.

In wastewater bio-solids, the lack of odor being generated by the sludge material is generally attributed to activity against the anaerobic bacteria. The mode of action is believed to be a weakening of the cell wall by the surfactants, and a disruption of their environment severe enough to cause a reduction or elimination of the populations. The components are powerful surfactants composed of an aglycone and linked to one or more sugar chains, which form glycosides. The glycosides provide the sugar to the composting process and become a feed source for the aerobic bacteria.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Description</th>
<th>Brown, free-flowing liquid</th>
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</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>20.37 kg and 208.82 kg plastic containers</td>
</tr>
<tr>
<td>Stability</td>
<td>Stable</td>
</tr>
<tr>
<td>pH</td>
<td>6.0 – 7.0 when mixed with water</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.10 - 1.20</td>
</tr>
<tr>
<td>Nutrient Content</td>
<td>Biological nutrients and stimulants</td>
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</tbody>
</table>

Storage and Handling
DO NOT FREEZE!
Store in a cool dry location.
Do not inhale mists.
Avoid excessive skin contact.
See MSDS.
APPLICATION INSTRUCTIONS

Sewers and Lift Stations — In some urban area, sewers and lift stations generate strong smells due to hydrogen sulfide generation on slime-coated concrete surfaces or putrefying wastewater. Diluted or stock STIMULUS may be sprayed on to concrete surfaces of lift station structures to help control these odors. Stock STIMULUS may also be metered into lift station and sewage flows at rates of 1 – 5 ppm to reduce sewage odors. If wet scrubbers using caustic or chlorine are used for lift station air treatment, a 1 to 200 solution of STIMULUS may be substituted with scrubber blowdown discharge directly into the sewage flow. Use of STIMULUS may reduce or eliminate the need for active carbon in lift station odor treatment, producing substantial savings.

Grit Chambers — Grit chambers and screens are typically employed at sewage plants to remove very large and heavy grit from sewage flows before pumping to aeration basins. Since these areas accumulate large quantities of garbage, hair and other odorous materials, they are commonly the source of many odors in these plants. Stock or diluted STIMULUS may be metered directly into grit chambers, sprayed on to screens with automatic spraying equipment, or metered into the sewage plant influent prior to these processes. Typical metering dosages are 3 – 5 ppm of stock STIMULUS for effective odor control. Diluted or stock STIMULUS may also be applied to screenings as they are removed and used to deodorize surfaces and equipment on a regular basis.

Aeration Chambers and Ponds — Most sewage plants in the U.S. utilize stabilization ponds, aerated ponds or aerated activated sludge-type biological secondary treatment plants to digest sewage organics into excess bacterial sludge. Since the processes rely on efficient aerobic metabolism of the treatment microorganisms, STIMULUS has been used to increase process microbe activity and reduce odors from aerosol formation. STIMULUS application may also help to control filamentous organisms, which produce foaming and poor settling. A dosage of 3 – 5 ppm of stock STIMULUS into the sewage flow is effective. Treatment ponds or chambers should first be treated with a one-time “shock dose” of 10 – 15 ppm stock formulation to acclimatize the aerobic biomass to the effects of the product. Following the shock dose treatment, regular “maintenance doses” of 3 – 5 ppm of stock formulation should be added daily into the headworks or directly into the basins or chambers.

Final Clarifiers, Sludge Thickeners — STIMULUS may be added as 3 – 5 ppm of stock formulation to the sewage flow in final clarifiers and sludge thickeners, and may also be sprayed in stock or diluted form on to concrete weirs, metal launders, and other components which may harbour sulfide-producing slime growths.

Anaerobic Sludge Digesters — STIMULUS has been proven to control volatile fatty acid build-up in anaerobic sludge digesters. This increases process stability, reduces odors in sludge discharge, improves methane gas production, and reduces or eliminates the need for supplemental caustics such as lime, which can precipitate in digester tanks. A shock dose of 15 ppm and maintenance doses of 3 – 5 ppm stock STIMULUS is recommended. Aerobic sludge digesters will also benefit from a 3 – 5 ppm daily maintenance program.

Sludge Dewatering, Drying — Sludge dewatering and drying beds or processes typically produce the strongest and most objectionable odors at municipal treatment plants. STIMULUS may be mixed into the sludge prior to dewatering at a 10 ppm dosage to help control odors. A 1/200 solution of stock STIMULUS formulation may be spray applied onto the surface of sludge in drying beds to further reduce odors. Also, a 10 ppm dosage may be applied to the sludge prior to mechanical dewatering via belt press or centrifuge and equipment may be washed down with a 1/200 solution of STIMULUS during cleanup procedures. STIMULUS may be used during land application of sludges by mixing 10 ppm of stock STIMULUS into sludge prior to injection or surface spreading.