



Select micronutrients for healthy bio-methanation process

Anaerobic digestion (AD) is a complex Biochemical Process Where bacterial communities breakdown organic matters of any substrate and convert them to Gaseous mixture - CH_4 , CO_2 , H_2 , H_2S etc. Diverse microbial communities collaborate to breakdown the complex substrates at different stages and turn them into a gaseous mixture. Despite being a mature technology, AD still suffers from various challenges of feedstock variability, low process efficiency, and low product quality.

Lack of micronutrients has been identified as the main reason for process efficiency and performance. Micronutrients (Fe, Ni, MO, CO etc.) are the crucial co-factors in numerous enzymatic reactions involved in the biochemistry of methane formation. Knowing this, Praj has developed a unique Micronutrient combination "NUTRASTAB" for Anaerobic digestion of Spent wash and condensates, Pressmud, Organic feedstocks and waste waters. Nutrastab provides vital micronutrients for growth and stabilization of microbial populations in anaerobic digestion systems.

Key Actions of Nutrastab: It Provides



Assimilable nutrients for microbial population



Bioavailable minerals for quick absorption



Generate optimum metabolic energy for microbes to grow in a healthy and steady manner

Nutrients required not only during active growth, but also during the Stationary phase of digestion and to prevent loss of viability.

Factors Impacting Anaerobic Digestion Process:

Retention Time

Temperature

Organic Loading Rate

pH

C/N Ratio

Anaerobic Digestion Process

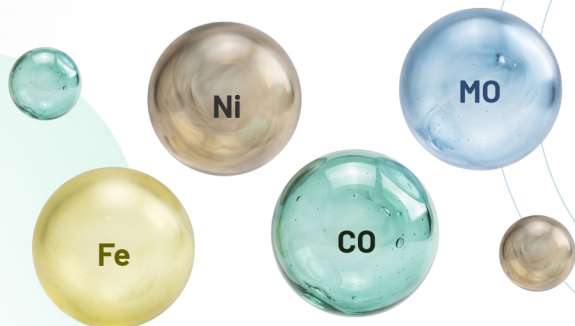


Nutrastab Typical Properties:

Appearance	White or off-white coloured powder
Bulk density - Kg /M ³	0.3 to 0.5
pH	5 to 6
Moisture -% W / W	3 to 5
Key Ingredients	Organic assimilable micronutrients and trace minerals

Advantages of Nutrastab:

- Stability during high loading or consistent low loading.
- Overcome deficiency of nutrients.
- Build up bacterial population.
- Useful during startup of new digester cycle.
- Improve Biogas and Methane formation.
- Reduced requirement of additional supplementation of nutrients.



Method of Application:

Nutrastab is recommended for anaerobic treatment of distillery and sugar mill waste streams – spent wash, press mud, waste waters etc. The product may be mixed directly with the feedstock slurry at the recommended dosage. The required quantity of Nutrastab is calculated based on digester volume. Start with low dosage and increase the dosage gradually. It depends on digester conditions and factors like hydraulic retention time, slurry retention time etc. Following is the proposed dosing regimen:

Dosage:

Period	Dosage - ppm
Week 1	2 to 4 ppm
Week 2	4 to 6 ppm
Week 3	6 to 10 ppm
Maintenance	Depends on digester conditions – Contact Praj expert.

Packing:

Nutrastab is supplied in laminated poly-pouches of sizes custom made to production capacity.

Shelf Life:

Store away from direct heat and sunlight. Preferably below 30 Deg C. When stored under recommended conditions in original container, the product is stable for one year.

This document is intellectual property of PRAJ Industries limited and is generated for confidential business purposes. It should not be used for purposes other than designated purpose or reproduced without written permission from "PRAJ INDUSTRIES LTD, "Praj Tower", 274 & 275/2, Bhumkar Chowk- Hinjewadi Road, Hinjewadi, Pune 411 057, India. (WWW.PRAJ.NET) Seller warrants that this product formulation confirms to its description and is reasonably fit for the purpose referred to in the directions for use when used in accordance with the directions under normal conditions. The conformance of product performance will be done strictly by the analytical protocols given by the seller. All risks on account of use of the product not in accordance with the directions will be with the buyer. Seller makes no other warranty or representation of any kind, express or implied, about the product, including NO IMPLIED

WARRANTY OF MERCHANTABILITY OR FITNESS OF THE GOODS for purposes other than specified by the seller. No such warranties shall be implied by law and no agent of seller is authorized to alter this warranty in any way except in writing with a specific reference to this warranty. The exclusive and maximum possible remedy against the seller shall be a claim for damages not to exceed the purchase price of the product, without regard to whether such a claim is based upon breach of contract/ warranty. Any dispute, controversy or claim arising out of this contract or breach thereof, shall be settled by arbitration in accordance with the provision of Indian arbitration and reconciliation act 1996 and shall be governed by Indian laws and shall have exclusive jurisdiction of Pune Maharashtra Court.