**SEBstar HTL®**

*Heat-Stable Liquid Bacterial Alpha-Amylase*

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**Description:**

SEBstar HTL is a heat-stable, liquid alpha-amylase enzyme. It is produced by controlled fermentation of a non-GMO strain of *Bacillus licheniformis*. This enzyme is food-grade, Kosher Certified and can be used to produce certified-organic beverages. SEBstar HTL is an endo-amylase that randomly hydrolyzes alpha-1,4-glycosidic bonds in gelatinized starch. The prolonged action of SEBstar HTL rapidly reduces the viscosity of gelatinized starch and produces large amounts of lower molecular weight dextrins.

**Application:**

SEBstar HTL is used in the starch industry to continuously liquefy and dextrinize gelatinized, wet-milled corn and wheat starch for the production of low-dextrose (DE 7 – 15) starch syrups. Because of its heat stability, broad pH tolerance and low calcium requirement, SEBstar HTL can be used to liquefy starch slurries at temperatures as high as 90°C without the addition of calcium. In the alcohol industry it is used for high-temperature liquefaction of starch containing grain mashes (corn, wheat, barley, sorghum, rice etc.) for production neutral spirits. In the brewing industry, SEBstar HTL is used to rapidly liquefy and reduce the viscosity of grain adjuncts.

**Benefits:**

- Excellent thermal stability for liquefaction of steam jet-cooked starch.
- Produces low-viscosity, liquid dextrose syrups in 90 minutes at 80 – 90°C.
- Whole corn or grain liquefaction at pH 5.8 and 80 - 85°C
- Increases wort yield and grain adjunct cooking capacity
- Produced by fermentation of non-GMO, organism. All natural, non-synthetic ingredients

**Enzyme Properties:**

SEBstar HTL is a brown liquid. The enzyme has a slight odor typical of fermented products. It is completely soluble in water. When used to liquefy cereal grain starch, the optimum pH is pH 5.6 – 6.5. SEBstar HTL has a temperature range of 50 – 90°C. For liquefaction hold times longer than 30 minutes, the optimum temperature is 80 – 85°C. Temperature inactivation begins to occur at or above 95°C and pH 6.5. SEBstar HTL can be completely inactivated in 5 minutes at pH 4.0 and 95°C. The activity of SEBstar HTL is stabilized by the presence of Ca**++** ions and is inhibited by high concentrations of heavy metals.

**Dosage:**

The optimum dosage of SEBstar HTL depends on:

- nature and dry solids (DS)% of the substrate to be liquefied
- final starch-syrup dextrose equivalent (DE, %) required
- liquefaction temperature and pH
- liquefaction time (typically 30 – 120 minutes)
- recommended dose: 200 – 800g/metric ton starch DS or whole grain.
Quality Specifications:


Packaging:

SEBstar HTL is available in 25kg Jerry Cans, 225 kg Drums and 1,100 kg tote-bins.

Storage:

SEBstar HTL should be stored in a cool, dry place. Storage in unopened containers, at or below 10°C, helps to maintain maximum activity if stored over long periods. Under these conditions, activity loss after one year should not be more than 5 – 10%. Extended storage under adverse conditions, including high temperatures (>10°C) may require the use of higher than recommended dosages.

Safety and Handling:

Liquid enzyme preparations are dust-free. However, inappropriate handling may cause the formation of aerosols or dust. Avoid formation of aerosols and dust from dried out or spilled enzyme. Avoid splashing and high-pressure washing. Unnecessary contact with the product and inhalation of aerosols or dust should be avoided. In case of spillage or contact with eye or skin, rinse affected area promptly with plenty of water. Specialty Enzymes and Biotechnologies Co., provides both Material Safety Data Sheets and advice to customers regarding the safe handling of enzymes.