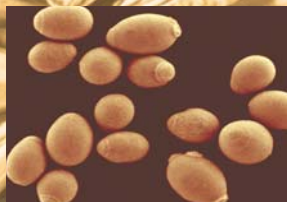


ETHANOL TECHNOLOGY LALLEMAND DISTILLING



LALLEMAND'S DISTILLING ACTIVITIES

When founded in the early 20th century in Montréal (Canada), Lallemand's original focus was to supply fresh baker's yeast to the local market. In the early 1970's, Lallemand began producing distillers' yeast for Seagram's and a few other distillers in Canada and abroad. This was the beginning of what has become the Lallemand Specialty Division, which is one of the world's leaders in the supply of yeast, bacteria, and yeast derivatives to the fermented beverage, animal and human nutrition industries.

Lallemand produces its yeasts at plants in North America, Europe and South Africa. Ethanol Technology is the marketing and distribution arm of the Specialty Division to the worldwide fuel ethanol and distilling industries. It is headquartered in Milwaukee and uses a network of refrigerated (for fresh yeast) and other warehouses to serve its customers.

ETHANOL TECHNOLOGY

Ethanol Technology was formed in 2004 with the acquisition and integration of regional alcohol and distilling activities into a new global business unit. Ethanol Technology became part of the legal entity Lallemand Specialties Inc. and established its headquarters in Milwaukee.

Ethanol Technology specializes in the development, production and marketing of yeast, yeast nutrients and antimicrobials. Its main products are :

- **Fresh yeast**, including a variety of strains and formulations developed to meet a wide range of customer needs in the fuel ethanol and beverage alcohol industries
- **Active dry yeast** for specialty fuel ethanol and beverage alcohol applications, many of which are proprietary strains developed for specific fermentation processes
- **Yeast nutrients** designed to deliver the correct nutrient balance for optimal growth and productivity in cases where the fermentation milieu is lacking critical components
- **Microbial control agents** that enable quality fermentations with minimal contamination

Ethanol Technology supports customers with a team of experienced technical sales and service professionals who serve as consultants to alcohol plant staff, identifying specific needs and providing targeted products, training, troubleshooting and laboratory services. An educational arm, Ethanol Technology Institute, conducts The Alcohol School for fuel ethanol and beverage alcohol producers in North America (September) and Europe (May/June). Ethanol Technology Institute also publishes *The Alcohol Textbook*, the industry's leading comprehensive technical reference.



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ETHANOL
TECHNOLOGY

RESEARCH AND DEVELOPMENT

Lallemand's Specialty Division, headquartered in Toulouse (France), is responsible for the selection of over 150 different yeast strains dedicated to the production of wine, beer, cider, distilled beverages, industrial alcohol and fuel ethanol. These selections were achieved through the efforts of Lallemand's own researchers in France and Canada as well as by ways of collaborations with research institutes throughout the world. In order to better understand and meet the needs of each specific distilling application, Lallemand is associated with respected microbiology laboratories and distilling technical centers in Canada, France, the U.K., Finland, Brazil, Mexico, the U.S.A., the Caribbean and Thailand. Through internal resources and international contacts, the Lallemand group is able to ensure for its customers the highest level of technical assistance.

The Ethanol Technology laboratories are located in the Industrial Partnership facility of the Canadian National Research Council's Biotechnology Research Institute (BRI) in Montréal (Canada). Internal projects are focused on strain selection, yeast nutrition and fermentation applications. Lallemand's specialized laboratories are used for yeast scale-up, fermentation modeling and molecular biology. Ethanol Technology also collaborates with academic researchers on more basic research topics and with its customers for pilot and production-scale applications development.

SPECIALTY FERMENTATION INGREDIENTS

- **Selected High Performance Yeast Strains:** In addition to custom-produced proprietary yeast strains, Ethanol Technology and other Lallemand businesses have selected and commercialized a variety of valuable *Saccharomyces cerevisiae* strains for specific applications, such as
 - Fermentation of grain mashes in continuous processes
 - Batch fermentation of grain mashes
 - Character differentiation in Scotch whisky and other grain whiskey production
 - Batch fermentation of cane juice and molasses for beverage alcohol production

- Fermentation of beet molasses and other byproducts of the sugar industry
- Continuous and fed-batch fermentation of cane juice and molasses for fuel ethanol production

- **Yeast formulations:** No matter the yeast strain, a yeast product must be readily available to the fermentation process with consistent viability and vitality for optimal performance. Yeast strains are available in a variety of forms, each with unique characteristics.
 - Active dry yeast products, available in sachets, bags or boxes, meet the needs of many producers because this commercial yeast formulation exhibits the best storage stability (up to 2 years, unrefrigerated)
 - Fresh bag (or crumble) yeast products have not been fully dried and therefore provide benefits to producers due to outstanding vitality; short lag times can result in superior fermentations
 - Stabilized liquid yeast products can be delivered to the fermentation process directly from the shipping container or storage tank using automated dosing control equipment; this yeast form provides superior "ease of use" and fermentation performance.
- **Nutrient Formulations:** Yeast fermentations, provided complete nutrition throughout the production process, finish faster with higher yields and fewer contaminating by-products. Research has shown that most commercial-scale fermentations are nutrition limited in some manner. A variety of yeast nutrient components and formulated products are available to producers. With Ethanol Technology's experienced technical support, proper nutrient products can be selected and implemented for improved bottom-line results in the production facility.
- **Microbial Control Solutions:** The two most effective microbial control tools available to fuel ethanol and beverage alcohol producers are 1- Cleanliness, and 2- Fermentation process management. When more tools are required, fuel ethanol producers can rely on proprietary antimicrobial products, troubleshooting and plant personnel training from Ethanol Technology.



FERMENTED BEVERAGES DIVISION – DISTILLING



ETHANOL
TECHNOLOGY
INSTITUTE



Anchor
BIO-TECHNOLOGIES
WHERE BIO-SOLUTIONS COME NATURALLY

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