Dr. Vladimir Cherney and his assistant in the lab. 1940s
WHO WE ARE
LALLEMAND BREWING

LALLEMAND BREWING IS A DIVISION OF LALLEMAND INC., A GLOBAL LEADER IN THE DEVELOPMENT, PRODUCTION AND MARKETING OF YEAST, BACTERIA AND SPECIALTY INGREDIENTS.

Lallemand’s presence in the brewing industry dates from the early 1970s when the company started producing dried pure culture brewing yeasts for beer kit manufacturers in Canada. In subsequent years, this activity was expanded to the production of other specific ale and lager beer yeast strains for different clients in the United States, Europe and Australia and Asia.

Lallemand’s extensive and unique knowledge in the propagation of different yeast strains led us to be consulted on yeast nutrition by a number of international breweries. As a result of this expertise, we developed -and continue to perfect- a specialized range of yeast and yeast nutrients that target brewing industry’s specific challenges.

Lallemand’s activities in the brewing industry have continued to grow, expanding beyond yeast-related production for the industrial, micro and home brewer. The acquisition of both the Siebel Institute of Technology and AB Vickers Ltd. allowed for the creation of a broader portfolio of products and services aimed at supporting the industry’s needs.

Today, Lallemand Brewing is a global business serving all segments of the brewing industry with products, services and education.

KEY MOMENTS IN LALLEMAND BREWING’S HISTORY:

From the early 1970s: production of dried pure culture brewing yeasts for beer kit manufacturers.

Our extensive and unique knowledge in the propagation of different yeast strains led us to be consulted on yeast nutrition by a number of international breweries.

Today, Lallemand Brewing is a global business serving all segments of the brewing industry with products, services and education.

Acquisition of both the SIEBEL INSTITUTE OF TECHNOLOGY and AB VICKERS LTD.

Our extensive and unique knowledge in the propagation of different yeast strains led us to be consulted on yeast nutrition by a number of international breweries.
THE SIEBEL INSTITUTE OF TECHNOLOGY IS AN INTERNATIONALLY RECOGNIZED BREWING INDUSTRY EDUCATION AND SERVICE PROVIDER.

Founded in 1872 by Dr. J. E. Siebel, the Siebel Institute of Technology’s objective is, in the founder’s own words, to promote progress of the brewing industry “based on fermentation, which is done by instruction, investigation, analysis and otherwise.” True to this promise, the Siebel Institute of Technology rapidly became one of the world’s most respected brewing schools and analytical laboratories.

SIEBEL INSTITUTE

AB VICKERS

AB VICKERS IS A GLOBAL LEADER IN THE FIELD OF BREWING PROCESS AIDS AND BREWING SERVICES.

Based in Burton upon Trent, United Kingdom, AB Vickers supplies a comprehensive portfolio of traditional and innovative processing aids, enzymes, and yeast nutrients. AB Vickers has over 200 years of experience working in partnership with brewers to drive production efficiency and improve product quality. Helping brewers overcome the day-to-day challenges of brewing great beer, allowing them to focus on innovation that drives the new and diverse styles of today and tomorrow. AB Vickers places great importance on investing in research & development and bringing solution-focused products to market.
LALLEMAND INC. IS A PRIVATELY-OWNED COMPANY THAT RESEARCHES, DEVELOPS, PRODUCES AND MARKETS YEASTS, BACTERIA AND OTHER MICROORGANISMS WITH THE AIM OF REPRODUCING, MANAGING AND OPTIMIZING NATURAL FERMENTATION PROCESSES IN THE AGRI-FOOD INDUSTRIES.

The company is organized into 11 technically-driven business units focusing on various applications of yeast and bacteria in baking, fermented beverages, human and animal nutrition, fuel ethanol and for agricultural and pharmaceutical uses.

The global vision of Lallemand Inc. is to be a world leader in markets that utilize our cutting-edge solutions while contributing to the prosperity of our clients and partners.

We take pride – individually and collectively – in the quality of our work, the advanced processes we use, the products and services we provide, and in the recognized and validated efficacy of our continuous improvement programs. We take pride in meeting our customer’s needs ahead of our competition.

For additional information about Lallemand and our research centers, plants, global contacts, and much more please visit www.lallemand.com
WHAT WE OFFER
WITH OUR LONG STANDING INDUSTRY EXPERIENCE AND EXTENSIVE NETWORK OF TECHNICAL EXPERTISE, WE ARE POSITIONED TO HELP YOUR BREWERY ACHIEVE ITS GROWTH AND QUALITY GOALS.

Along with global technical support, we offer an extensive range of products, services and education. Whether you are a small startup, a global leader in beer production or anywhere in between, we have something for you. In the following pages we have provided a comprehensive list of the products, services and educational opportunities offered by Lallemand Brewing.
OUR PRODUCTS
OUR PRODUCTS

Lallemand Brewing offers a large range of products to help your brewery achieve its growth and quality goals.

LALBREW® PREMIUM BREWING YEASTS
WILDBREW® BREWING YEAST AND BACTERIA
AB VICKERS ENZYMES
AB VICKERS YEAST NUTRIENTS
AB VICKERS PROCESS AIDS
SIEBEL INSTITUTE SENSORY KITS

PRODUCT NOTES
About Lalbrew® Premium Brewing Yeasts

**Characteristics**

Dry brewing yeast typically contains less than 7% water. Stringent quality standards are applied during manufacturing to avoid microbial contamination. The remarkable stability of dry yeast allows for significant QC testing in order to ensure less than 1 bacterium or wild yeast cell detected per million cells of brewing yeast. For most strains, 1g of dry yeast contains a minimum of 5 billion viable cells, but the number will vary slightly from batch to batch.

**Storage**

Dry yeast is packaged under vacuum in 500g packs or 11g sachets and must be stored dry, below 4°C (39°F). Exposure to humidity and oxygen will affect the viability and vitality of the yeast. Do not use soft packs or sachets that appear to have lost their vacuum. Once a pack or sachet is open, use immediately for best results. If kept sealed (or re-sealed) under vacuum and stored under appropriate conditions, dry yeast can be used until the indicated expiration date, which is typically 2-3 years after manufacture.

**A Note on Alcohol (ABV) Tolerance**

Alcohol tolerance is the measure of what level of alcohol yeast can produce and survive. Since many variables in the production of ethanol can affect the ability to reach a certain ABV (including fermentation parameters, wort composition and nutrients) alcohol tolerance in the context of each yeast strain is not meant to be an indicator of the ABV levels brewers ought to reach at the culmination of the fermentation process.
ABOUT LALBREW® PREMIUM BREWING YEASTS

DRY PITCHING
Dry pitching is the preferred method of inoculating wort. This method is simpler than rehydration and will give more consistent fermentation performance and reduce the risk of contamination. Simply sprinkle the yeast evenly on the surface of the wort in the fermenter as it is being filled. The motion of the wort filling the fermenter will aid in mixing the yeast into the wort.

For the majority of strains, there are no significant differences in fermentation performance when dry pitching compared to rehydration. Some strains will even perform better with dry pitching. Please refer to the technical data sheet for strain-specific pitching recommendations.

REHYDRATATION
Rehydration of yeast prior to pitching should be used only when equipment does not easily facilitate dry pitching. Significant deviations from rehydration protocols can result in longer fermentations, under-attenuation and increased risk of contamination.

Measure the yeast by weight within the recommended pitch rate range. Pitch rate calculators optimized for liquid yeast may result in significant overpitching.

ADVANTAGE OF DRY PITCHING
- Simple and easy process with fewer steps than rehydration.
- No extra equipment required.
- No change in fermentation performance or flavor for the majority of fermentation applications (including high gravity and sour).

FOUR IMPORTANT FACTORS TO CONSIDER DURING REHYDRATION

1. MEDIA TYPE
Sterile water should be used for rehydration, but distilled water should be avoided.

2. TEMPERATURE
The ideal rehydration temperature is different for ale and lager strains. Ale strains should be rehydrated at 30-35°C (86-95°F), whereas lager strains should be rehydrated at 25-30°C (77-86°F).

3. TIME
The rehydration period should be between 20-60 minutes. A decrease in viability and vitality will result from extended storage periods after rehydration. Once rehydrated, the yeast can be pitched into wort. To avoid shocking the yeast, the temperature of the yeast should be reduced gradually to within 10°C (18°F) of the wort temperature. This can be achieved through additions of small volumes of wort to the rehydrated yeast slurry.

4. SANITATION
Care should be taken to avoid contamination during rehydration. The rehydration vessel should be autoclaved or sanitized before use. The outside of the yeast pack and the scissors/knife should be soaked in sanitizing solution prior to opening.
**LALBREW® PREMIUM BREWING YEASTS**

**LalBrew® ABBAYE**
**BELGIAN-STYLE ALE YEAST**

LalBrew Abbaye™ is an ale yeast of Belgian origin. Selected for its ability to ferment Belgian style beers ranging from low to high alcohol, LalBrew Abbaye™ produces the spiciness and fruitiness typical of Belgian and Trappist style ales. When fermented at higher temperatures, typical flavors and aromas include tropical, spicy and banana. At lower temperatures, LalBrew Abbaye™ produces darker fruit aromas and flavors of raisin, date and fig. Traditional styles brewed with this yeast include but are not limited to Belgian White, Belgian Blonde, Belgian Golden, Dubbel, Tripel, and Quad.

**BEER STYLES**

<table>
<thead>
<tr>
<th>Belgian</th>
</tr>
</thead>
</table>

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

77 - 83%

**FLOCCULATION**

medium to high

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**ALCOHOL TOLERANCE**

14% ABV

**ADDITIONAL INFORMATION**

Fermentation rate, fermentation time and degree of attenuation depend on inoculation density, yeast handling, fermentation temperature and nutritional quality of wort.

**LalBrew® BELLE SAISON**
**BELGIAN SAISON-STYLE YEAST**

LalBrew Belle Saison™ is a Belgian-style ale yeast selected specifically for its ability to create Saison-style beers. LalBrew Belle Saison™ is a diastaticus strain that allows the brewers to achieve the high attenuation characteristic of this classic style. Designed for warm-temperature fermentation true to traditional “Farmhouse” production methods, beers brewed with LalBrew Belle Saison™ are fruity, spicy and refreshing. Through expression of a β-glucosidase enzyme, LalBrew Belle Saison™ can promote hop biotransformation and accentuate hop flavor and aroma in hoppy saison-style beers.

LalBrew Belle Saison™ is considered a Saccharomyces cerevisiae var. diastaticus. These strains are capable of utilizing some types of dextrins. Extra care should be taken to ensure proper cleaning procedures are in place to avoid any cross-contamination with other brews.

**BEER STYLES**

<table>
<thead>
<tr>
<th>Saison</th>
</tr>
</thead>
</table>

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

86 - 94%

**FLOCCULATION**

low

**TEMPERATURE RANGE**

20 - 35°C (68 - 95°F)

**ALCOHOL TOLERANCE**

15% ABV

**ADDITIONAL INFORMATION**

Use 50-100 g of active dry yeast to inoculate 100 litres of wort. Brewer may experiment with pitching rate to achieve a desired beer style or to suit processing conditions.

**WHO WE ARE**

**WHAT WE OFFER**

- LalBrew® Premium Brewing Yeasts
- WildBrew™ Brewing Yeast and Bacteria
- Yeast Nutrients
- Sensory Kits

**OUR SERVICES**

- Enzymes
- Process Aids

**EDUCATION**

**CONTACT US**
**LalBrew® BRY-97**

**AMERICAN WEST COAST ALE YEAST**

LalBrew BRY-97™ is an American West Coast-style ale yeast that was selected from the Siebel Institute Culture Collection for its ability to produce clean fermentations for high quality ales. LalBrew BRY-97™ is a neutral and highly attenuating strain with a high flocculation ability that can be used to make a wide variety of American-style beers. Through expression of a β-glucosidase enzyme, LalBrew BRY-97™ can promote hop biotransformation and accentuate hop flavor and aroma. Traditional ales made with LalBrew BRY-97™ include but are certainly not limited to American Pale Ale, American Amber, American Brown, American IPA, Imperial IPA, American Stout, Cream Ale, American Wheat, Scotch Ale, Russian Imperial Stout, Roggen/Rye, Old Ale and American Barleywine.

**BEER STYLES**

- American ales

**TEMPERATURE RANGE**

15 - 22°C (59 - 72°F)

**PITCHING RATE**

50 - 100g/hL

**FLOCCULATION**

High

**ATTENUATION RANGE**

78 - 84%

**ALCOHOL TOLERANCE**

13% ABV

**ADDITIONAL INFORMATION**

BRY-97 American West Coast Yeast is a flocculent strain. Settling can be promoted by cooling and use of fining agents and isinglass.

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**LalBrew® CBC-1**

**CASK AND BOTTLE CONDITIONING YEAST**

LalBrew CBC-1™ has been specifically selected from the Lallemand Yeast Culture Collection for Cask and Bottle Conditioning applications due to its high resistance to alcohol and pressure. LalBrew CBC-1™ has a neutral flavor profile and does not metabolize maltotriose, therefore the original character of the beer is preserved after refermentation. The yeast will settle and form a tight mat at the bottom of the bottle or cask. LalBrew CBC-1™ is also an ideal strain for primary fermentation of dry ciders, mead and hard seltzer. For simple sugar fermentations with appropriate yeast nutrition, LalBrew CBC-1™ achieves high attenuation with a clean and neutral flavor profile.

**BEER STYLES**

- Cask and bottle conditioning for all beer styles. Primary fermentation of cider, mead and hard seltzer.

**TEMPERATURE RANGE**

20 - 30°C (68 - 86°F)

**PITCHING RATE**

- Bottle conditioning: 10g/hL
- Cider and Mead: 50-100g/hL
- Hard Seltzer: 100-250g/hL

**ALCOHOL TOLERANCE**

- 12-14% ABV for cask and bottle conditioning
- 18% ABV for cider, mead and hard seltzer

**ADDITIONAL INFORMATION**

- Shows flocculation and sedimentation at the end of the refermentation period.
- LalBrew® CBC-1 does not impact on the flavor of the original beer to be refermented.
- LalBrew® CBC-1 is best used for refermentation purposes conducted preferably with priming sugars such as dextrose fermenting yeast.

When 10g of active dry yeast is used to inoculate 1hl of beer, a yeast concentration of 1-2 million cells per ml is achieved. Please note that different batch of yeast may vary in cell density; to obtain the exact cell numbers per g of dry yeast for a particular batch please contact brewing@lallemand.com.
LalBrew® DIAMOND LAGER YEAST

LalBrew Diamond™ is a true lager strain from the Group II (Frohberg) lineage selected from the Doemens Academy Culture Collection in Germany. LalBrew Diamond™ is a traditional lager strain that produces clean beers with authentic lager character. Traditional styles brewed with the LalBrew Diamond™ include but are not limited to Munich Helles, Dortmunder Export, German Pilsner, Bohemian Pilsner, American Pilsner, Vienna Lager, Oktoberfest/Märzen, Dark American Lager, Munich Dunkel, Schwarzbier, Traditional Bock, Doppelbock, Eisbock and California Common.

LalBrew® FARMHOUSE HYBRID SAISON-STYLE YEAST

LalBrew Farmhouse™ is a non-diastatic hybrid that has been selected to make saison-style and farmhouse style beers. The research team used classical and non-GMO methods to remove the STA1 gene, responsible for the diastatic activity of Saison yeasts. Care was taken to retain normal brewing sugar utilization to produce dry saisons. Additionally, the patented technology from the University of California Davis (USA) ensures that the strain will not produce hydrogen sulfide (H2S) off-flavors, therefore enhancing the saison yeast aroma characteristics.
LalBrew® Köln™ is ideal for brewing traditional Kölsch-style beers and other neutral ales. The neutral character of this strain accentuates delicate hop aromas while imparting subtle fruity esters. Through expression of a β-glucosidase enzyme, LalBrew Köln™ can promote hop biotransformation and accentuate hop flavor and aroma. Colder fermentations will be more neutral in character, while warmer fermentations will have a more fruit-forward ester profile.

LalBrew® LoNa™ is a maltose-negative hybrid strain that has been selected to have ideal characteristics for the production of low and non-alcoholic beers. Advanced classical and non-GMO breeding methods were used to select a strain that does not consume maltose or maltotriose, resulting in very low attenuation. LalBrew® LoNa™ is the first maltose-negative Saccharomyces cerevisiae strain specifically selected for beer fermentations. As a S. cerevisiae strain, LalBrew® LoNa™ performs like an ale producing a clean and neutral aroma profile, no phenolic flavors, and significantly reducing aldehydes that cause worty flavors.

Pasteurization is required when brewing with LalBrew® LoNa™ to avoid refermentation after packaging and ensure beer stability.
LalBrew® Premium Brewing Yeasts

CONTINUED

**LalBrew®**

**LONDON**

**ENGLISH-STYLE ALE YEAST**

LalBrew London™ is a true English ale strain selected for its ability to produce authentic, traditional UK beer styles. Fermentation performance is fast and consistent producing moderate esters and lower attenuation due to an inability to metabolize maltotriose. LalBrew London™ is one of the original Heritage Strains selected from the Lallemand Yeast Culture Collection when Lallemand Brewing was founded in 1992. A more subdued yeast character allows the flavors and aromas of malt and hops to shine through in styles such as Extra Special Bitter Pale Ale, Bitter and Mild. LalBrew London™ may also be used in the production of Ciders.

**Saccharomyces cerevisiae**

**BEER STYLES**

English-style ales, pale ales

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

65 - 72 %

**TEMPERATURE RANGE**

18 - 22°C (65 - 72°F)

**FLAVOR & AROMA CHARACTERISTICS**

Attenuates medium complexity. Medium attenuation preserves some beer complexity. Best for well-balanced British style ales.

**ADDITIONAL INFORMATION**

Produces a clean, well balanced ale. Medium attenuation preserves some beer complexity. Best for well-balanced British style ales.

**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**FLAVOR & AROMA CHARACTERISTICS**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ADDITIONAL INFORMATION**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**FLAVOR & AROMA CHARACTERISTICS**

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**ADDITIONAL INFORMATION**

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**FLAVOR & AROMA CHARACTERISTICS**

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**ADDITIONAL INFORMATION**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**FLAVOR & AROMA CHARACTERISTICS**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ADDITIONAL INFORMATION**

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**ALCOHOL TOLERANCE**

12% ABV

**Saccharomyces cerevisiae**

**BEER STYLES**

Bavarian-style wheat

**PITCHING RATE**

50 - 100g/hL

**ATTENUATION RANGE**

76 - 83 %

**TEMPERATURE RANGE**

17 - 25°C (63 - 77°F)

**FLAVOR & AROMA CHARACTERISTICS**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ADDITIONAL INFORMATION**

Munich is a non flocculent strain. In classic open fermentation vessels, the yeast can be skimmed off the top. Some settling can be promoted by cooling and use of fining agents and isinglass.

**ALCOHOL TOLERANCE**

12% ABV
LalBrew® NEW ENGLAND
EAST COAST ALE YEAST

LalBrew New England™ is an ale strain selected specifically for its ability to produce a unique fruit-forward ester profile desired in East Coast styles of beer. A typical fermentation with LalBrew New England™ will produce tropical and fruity esters, notably stone fruits like peach. Through expression of a β-glucosidase enzyme, LalBrew New England™ can promote hop biotransformation and accentuate hop flavor and aroma. LalBrew New England™ exhibits medium to high attenuation with medium flocculation, making it a perfect choice for East Coast style ales.

LalBrew® NOTTINGHAM
HIGH PERFORMANCE ALE YEAST

LalBrew Nottingham™ is an English-style ale yeast selected for its high performance and versatility. Neutral flavor and consistent performance across diverse fermentation conditions make LalBrew Nottingham™ an ideal house strain for producing a wide variety of beer styles. Through moderate expression of β-glucosidase and β-lyase enzymes, LalBrew Nottingham™ can promote hop biotransformation and accentuate hop flavor and aroma. LalBrew Nottingham™ is one of the original Heritage Strains selected from the Lallemand Yeast Culture Collection when Lallemand Brewing was founded in 1992. Traditional styles brewed with this yeast include but are not limited to Pale Ales, Ambers, Porters, Stouts and Barleywines. In addition to these traditional styles, LalBrew Nottingham™ can be used to produce Golden Ale, Kölsch, Lager-style beers, IPA, and Imperial Stout, among many others. LalBrew Nottingham™ is a stress tolerant making it a good choice for high gravity, sours, re-starting stuck fermentations and other challenging fermentation conditions.
**LALBREW® PREMIUM BREWING YEASTS**  

**LalBrew®**  
**NOVALAGER**  
MODERN HYBRID LAGER YEAST  
LalBrew NovaLager™ is a true bottom fermenting *Saccharomyces pastorianus* hybrid from the novel Group III lineage that has been selected to produce a robust lager strain with ideal characteristics for clean lager beer with distinct flavor characteristics and superior fermentation performance, high attenuation and medium flocculation. LalBrew NovaLager™ was selected using classical and non-GMO breeding methods and inhibits the production of hydrogen sulfide (H₂S) off-flavors.

**LalBrew®**  
**VERDANT IPA**  
ALE YEAST  
LalBrew Verdant IPA™ was specially selected in collaboration with Verdant Brewing Co. (UK) for its ability to produce a variety of hop-forward and malty beers. Prominent notes of apricot and undertones of tropical fruit and citrus merge seamlessly with hop aromas. Through expression of a β-lyase enzyme, LalBrew Verdant IPA™ can promote hop biotransformation and accentuate hop flavor and aroma. With medium-high attenuation, LalBrew Verdant IPA™ leaves a soft and balanced malt profile with slightly more body than a typical American IPA yeast strain. This highly versatile strain is well suited for a variety of beer styles including NEIPA, English IPA, American Pale, English Bitter, Sweet Stout and Sours.
**LALBREW® PREMIUM BREWING YEASTS**

**LalBrew® VOSS KVEIK ALE YEAST**

Kveik is a Norwegian word meaning yeast. In the Norwegian farmhouse tradition, kveik was preserved by drying and passed from generation to generation. Kveik is the original, traditional dried yeast! The LalBrew Voss™ strain was obtained from Sigmund Gjernes (Voss, Norway), who has maintained this culture using traditional methods since the 1980’s and generously shared it with the wider brewing community. LalBrew Voss™ supports a wide range of fermentation temperatures between 25 - 40°C (77 - 104°F) with a very high optimal range of 35 - 40°C (95 - 104°F). Very fast fermentations are achieved within the optimal temperature range with full attenuation typically achieved within 2-3 days. The flavor profile is consistent across the entire temperature range: neutral with subtle fruity notes of orange and citrus.

**Saccharomyces cerevisiae**

**BEER STYLES**
Norwegian farmhouse ales, fast-fermented neutral ales

**ATTENUATION RANGE**
76 - 82 %

**TEMPERATURE RANGE**
25 - 40°C (77 - 104°F)
Optimal: 35 - 40°C (95 - 104°F)

**PITCHING RATE**
50 - 100g/hL

**FLOCCULATION**
Very high

**ALCOHOL TOLERANCE**
12% ABV

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**LalBrew® WINDSOR BRITISH-STYLE BEER YEAST**

LalBrew Windsor™ is a true English ale strain that produces a balanced fruity aroma with lower attenuation due to an inability to metabolize maltotriose. LalBrew Windsor™ is one of the original Heritage Strains selected from the Lallemand Yeast Culture Collection when Lallemand Brewing was founded in 1992. Beers created with LalBrew Windsor™ are usually described as full-bodied, fruity English ales. LalBrew Windsor™ is a consistent and robust strain that produces moderate levels of alcohol and the balanced flavor and aroma characteristics of the best traditional English ales. Traditional styles brewed with this yeast include but are not limited to Milds, Bitters, Irish Reds, English Brown ales, Porters and Sweet Stouts.

**Saccharomyces cerevisiae**

**BEER STYLES**
Fruity English ales, pale ales, porters

**ATTENUATION RANGE**
65 - 72 %

**TEMPERATURE RANGE**
15 - 25°C (59 - 77°F)

**PITCHING RATE**
50 - 100g/hL

**FLOCCULATION**
low

**ALCOHOL TOLERANCE**
12% ABV
LalBrew® Wit
WHEAT ALE YEAST

LalBrew Wit™ is a relatively neutral wheat beer strain which can be used to produce a wide variety of wheat beer styles. LalBrew Wit™ produces lower levels of esters and phenols compared to traditional hefeweizen strains such as LalBrew Munich Classic™. LalBrew Wit™ provides a baseline profile of banana and spice aromas, but leaves space for the brewer to showcase other spice additions typical of Belgian-style beers. Traditional styles brewed with this yeast include but are not limited to Belgian Witbier, American Wheat, Berliner Weisse, Gose, Hefeweizen, Dunkelweis, and Weizenbock.

BEER STYLES
Belgian style wheat beers

PITCHING RATE
50 - 100g/hL

ATTENUATION RANGE
75 - 82 %

FLOCCULATION
low

TEMPERATURE RANGE
17 - 25°C (63 - 77°F)

ALCOHOL TOLERANCE
12% ABV

ADDITIONAL INFORMATION
Aroma is estery to both palate and nose with typical banana notes. Does not display malodours when properly handled.

Saccharomyces cerevisiae
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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BEER STYLES</td>
<td>Belgian</td>
<td>Saison</td>
<td>American ales</td>
<td>Lagers</td>
<td>Farmhouse style ales</td>
<td>Kölsch-style, neutral ales</td>
<td>Any low or non-alcohol ale styles</td>
<td>English-style ales, pale ales</td>
<td></td>
</tr>
<tr>
<td>AROMA</td>
<td>Spicy, fruity, tropical, banana</td>
<td>Citrus, pepper</td>
<td>Neutral with slight ester</td>
<td>Neutral</td>
<td>Clove, pepper, tropical fruit</td>
<td>Slightly fruity, more neutral with colder fermentations</td>
<td>Clean and neutral, no POF or sulfur, wort avors absent or minimal</td>
<td>Slight ester, malty</td>
<td></td>
</tr>
<tr>
<td>ATTENUATION RANGE</td>
<td>77 - 83 %</td>
<td>86 - 94 %</td>
<td>78 - 84 %</td>
<td>77 - 83 %</td>
<td>78 - 84 %</td>
<td>78 - 83 %</td>
<td>16 - 20 % (lower with high temperature mashing)</td>
<td>65 - 72 %</td>
<td></td>
</tr>
<tr>
<td>FLOCCULATION</td>
<td>Medium to high</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Medium to high</td>
<td>Medium</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>ALCOHOL TOLERANCE</td>
<td>14% ABV</td>
<td>15% ABV</td>
<td>13% ABV</td>
<td>12-14% ABV for cask and bottle conditioning</td>
<td>18% ABV for cider, mead and hard seltzer</td>
<td>13% ABV</td>
<td>13% ABV</td>
<td>9% ABV</td>
<td>12% ABV</td>
</tr>
<tr>
<td>PITCHING RATE</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>Bottle conditioning: 10g/hL</td>
<td>Cider and Mead: 50-100g/hL</td>
<td>Hard Seltzer: 100-250g/hL</td>
<td>100 - 200g/hL</td>
<td>50 - 100g/hL</td>
<td>100 - 200g/hL</td>
</tr>
<tr>
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</tr>
<tr>
<td>BEER STYLES</td>
<td>Bavarian-style wheat</td>
<td>NEIPA, east coast style ales</td>
<td>Wide variety of ales</td>
<td>Lager</td>
<td>NEIPA, English IPA, American Pale, English Bitter, Sweet Stout, Sours</td>
<td>Norwegian farmhouse ales, fast-fermented neutral ales</td>
<td>Fruity English ales, pale ales, porters</td>
<td>Belgian style wheat beers</td>
<td></td>
</tr>
<tr>
<td>AROMA</td>
<td>Fruity, banana, clove</td>
<td>Fruity, especially tropical and stone fruits</td>
<td>Slightly fruity, neutral</td>
<td>Clean, low to medium ester, no sulfur</td>
<td>Apricot with notes of tropical fruit and citrus</td>
<td>Relatively neutral at high temperatures, slight orange and citrus notes</td>
<td>Fruity, estery</td>
<td>Fruity, slight banana and clove</td>
<td></td>
</tr>
<tr>
<td>ATTENUATION RANGE</td>
<td>76 - 83 %</td>
<td>78 - 83 %</td>
<td>78 - 84 %</td>
<td>78 - 84 %</td>
<td>75 - 82 %</td>
<td>76 - 82 %</td>
<td>65 - 72 %</td>
<td>75 - 82 %</td>
<td></td>
</tr>
<tr>
<td>FLOCCULATION</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Very high</td>
<td>Low</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>ALCOHOL TOLERANCE</td>
<td>12% ABV</td>
<td>9% ABV</td>
<td>14% ABV</td>
<td>13% ABV</td>
<td>12% ABV</td>
<td>12% ABV</td>
<td>12% ABV</td>
<td>12% ABV</td>
<td></td>
</tr>
<tr>
<td>PITCHING RATE</td>
<td>50 - 100g/hL</td>
<td>100 - 200g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td>50 - 100g/hL</td>
<td></td>
</tr>
</tbody>
</table>
**WILDBREW™ BREWING YEAST AND BACTERIA**

**WildBrew Sour Pitch™** is a high-performance, high-purity lactic acid bacteria specifically selected for its ability to produce a wide range of sour beer styles. WildBrew Sour Pitch™ produces a clean and balanced citrus flavor profile typical of both traditional and modern sour beer styles. When inoculated at optimal temperature and the right conditions, it is a powerful, safe and easy way to handle bacteria for various beer souring techniques, such as a typical kettle souring process. Besides providing an outstanding performance, WildBrew Sour Pitch™ is capable of delivering consistent results for brewers. Styles brewed with this bacteria include, but are not limited to, Berliner Weisse, Gose, lambic, American Wild, and Sour IPA.

<table>
<thead>
<tr>
<th>BEER STYLES</th>
<th>INOCULATION RATE</th>
<th>FERMENTATION RANGE</th>
<th>PH RANGE</th>
<th>HOP TOLERANCE</th>
<th>FLAVOR &amp; AROMA CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sours</td>
<td>10g/hL</td>
<td>30 - 40°C (86 - 104°F)</td>
<td>3.2 - 3.5</td>
<td>Alpha acid: 4 ppm (IBU) Beta acid: 4 ppm</td>
<td>Sours</td>
</tr>
</tbody>
</table>

**WildBrew Helveticus Pitch™** is a high-performance, high-purity lactic acid bacteria specifically selected for its ability to produce a wide range of sour beer styles. WildBrew Helveticus Pitch™ produces an intense and sharp citrus flavor profile typical of both traditional and modern sour beer styles. When inoculated at optimal temperature and the right conditions, it is a powerful, safe and easy way to handle bacteria for various beer souring techniques, such as a typical kettle souring process. Besides providing an outstanding performance, WildBrew Helveticus Pitch™ is capable of delivering consistent results for brewers. Styles brewed with this bacteria include, but are not limited to, Berliner Weisse, Gose, lambic-style, American Wild, and Sour IPA.

<table>
<thead>
<tr>
<th>BEER STYLES</th>
<th>INOCULATION RATE</th>
<th>FERMENTATION RANGE</th>
<th>PH RANGE</th>
<th>HOP TOLERANCE</th>
<th>FLAVOR &amp; AROMA CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sours</td>
<td>10g/hL</td>
<td>38 - 45°C (100 - 113°F)</td>
<td>3.0 - 3.5</td>
<td>Alpha acid: 4 ppm (IBU) Beta acid: 4 ppm</td>
<td>Sours</td>
</tr>
</tbody>
</table>

**WildBrew Philly Sour™** is a unique species of *Lachancea* selected from nature by the University of the Sciences in Philadelphia, PA, USA (Patent pending N° PCT/US2018/043148). WildBrew Philly Sour™ produces moderate amounts of lactic acid in addition to ethanol in one simple fermentation step. This first yeast in the WildBrew® series is a great choice for innovative, sessionable sour beers with refreshing acidity and notes of stone fruit. With high attenuation, high flocculation and good head retention, WildBrew Philly Sour™ is an ideal yeast for traditional styles such as Berliner Weisse, Gose, Amencan Lambic-Style and American Wild Ales, and its resistance to hops make it perfect for Sour IPAs.

<table>
<thead>
<tr>
<th>BEER STYLES</th>
<th>TEMPORATURE RANGE</th>
<th>FLOCCULATION</th>
<th>ATTENUATION RANGE</th>
<th>ALCOHOL TOLERANCE</th>
<th>PITCHING RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sours</td>
<td>20 - 30°C (68 - 86°F)</td>
<td>High</td>
<td>74 - 82 %</td>
<td>9% ABV</td>
<td>50 - 100g/hL for &lt; 14°P wort</td>
</tr>
</tbody>
</table>

**BEER STYLES**
- Berliner Weisse, Gose, Lambic-style, American Wild, and Sour IPA

**AROMA**
- Sour, red apple, stone fruit, peach

**TEMPERATURE RANGE**
- 20 - 30°C (68 - 86°F)

**ATTENUATION RANGE**
- 74 - 82 %

**FLOCCULATION**
- High

**ALCOHOL TOLERANCE**
- 9% ABV

**PITCHING RATE**
- 50 - 100g/hL for < 14°P wort
- 100 - 150g/hL for > 14°P wort
**AB VICKERS ENZYMES**

**ALPHAMYLASE**

A Food Grade bacterial alpha-amylase derived from a selected non-GMO strain of Bacillus subtilis. Also a liquefying enzyme. Its action on starch substrates produces a decrease of viscosity.

**ALPHAMYLASE**

A liquid fungal alpha-amylase obtained from a selected strain of Aspergillus oryzae. (EC 3.2.1.1) Hydrolyses the α-1,4 glucosidic linkages in starch, producing large amounts of maltose. Can be used for liquefaction and saccharification of gelatinised starch. In the starch industry, it can be used for the production of high maltose syrups (45-60%) and in the alcohol industry, it can be used in the saccharification stage.

**GLUCANASE**

A complex enzyme blend specifically formulated for application in the brewhouse to achieve optimum wort filtration using either lauter tun or filter press whilst also guaranteeing excellent extract recovery and final beer filtration. Designed to perform efficiently over a wide range of mashing temperatures and can be used when adjuncts (wheat, barley etc.) are used at moderate levels. Derived from classical, non-GMO Fungal organisms, the primary activities of Glucanase Plus are beta-glucanase, xylanase and alpha amyrase.

**GLUCOAMYLASE**

A food grade saccharifying glucoamylase or amylglucosidase enzyme derived from a selected strain of Aspergillus niger. It is an exoglucosidase capable of hydrolysing both the α-1,6 and α-1,4 glucosidic linkages of starch, liberating single glucose units.

**BENEFITS**

- Enables a higher level of fermentable sugars in wort fermentations.
- Eliminates residual starch in wort.
- Allows control of attenuation of brewery fermentations.
- Facilitates removal of starch hazes in beer.

**GLUCOAMYLASE**

A Food Grade Beta-glucanase. Can completely or partially break down soluble and insoluble celluloses and hemicelluloses such as those found in wheat, barley and other cereals.

**BENEFITS**

- Contributes a consistent source of necessary beta-glucanase which will significantly improve lautering and wort filterability problems.
- Also guards against beta-glucan induced beer hazes and improves beer filterability.

**BENEFITS**

- Maximizes the conversion of starch containing substrates to fermentable sugars and minimises residual carbohydrates.
- Provides a high degree of attenuation.

**FA**

Maximizes the conversion of starch containing substrates to fermentable sugars and minimises residual carbohydrates.

**FA**

Provides a high degree of attenuation.

**BENEFITS**

- Efficient wort filtration on lauter tun or mash filter.
- Increased extract recovery.
- Efficient final beer filtration.
AB VICKERS ENZYMES CONTINUED

PROTOZYME

Bacterial Neutral Protease - a neutral protease enzyme derived from a selected non-GMO Food Grade strain of Bacillus subtilis.

BENEFITS
- Allows the use of higher levels of adjuncts in the mash.
- Increases soluble protein and improves free amino nitrogen levels which lead to enhanced yeast vitality in the fermentation process.
- May improve downstream processing efficiencies.

CHILLZYME

A protease obtained from the plant Carica papaya. It is used in brewing to prevent the formation of chill hazes by hydrolysing proteins to soluble peptides and amino acids. It is best added to the cold conditioning tank or may also be added to the bright beer tank prior to pasteurisation.

BENEFITS
- Prevents the formation of protein-tannin complexes.
- Reduces the risk of chill hazes in packaged beers and leading to longer shelf-life.

AROMAZYME

A food-grade enzyme preparation with a strong glycosidase activity derived from a selected strain of Aspergillus niger. It is composed of β-glucosidase enzymes that are capable of hydrolyzing the glycosidic bonds, liberating monoterpane alcohol compounds and glucose. It has been developed to increase the complexity of the hop aroma and flavor profile in beer.

The application of ABV AROMAZYME during fermentation provides brewers the opportunity to improve their hop usage by extracting more aromatic compounds and may enable them to express more character when using less sophisticated hop varieties.

BENEFITS
- Increase the diversity of hop flavors and aroma by changing the ratio of specific terpene compounds
- Enhance the beer mouthfeel and drinkability by reducing unpleasant, harsh bitterness
- Slightly increase wort fermentability
- Express more character from less sophisticated hop varieties

ALPHA ACETOLACTATE

A decarboxylase enzyme which prevents the formation of diacetyl by the decarboxylation of alpha-acetolactate to acetoain, and is derived from Bacillus licheniformis. Should be added at the start of fermentation.

CLARIZYME™

Clarizyme is a food grade liquid enzyme containing an endopeptidase. Clarizyme prevents colloidal chill haze and can also reduce gluten levels to below 20 mg/kg which is the level below which beers can be declared gluten-free in certain global regions, and gluten reduced in others.

BENEFITS
- Prevents colloidal chill haze
- Increases stability
- Reduces gluten
AB VICKERS YEAST NUTRIENTS

YeastLife Extra

YEAST NUTRIENT FOR MALT-BASED FERMENTATIONS

A powder yeast nutrient based on readily available sources of nitrogen blended with additional amino acids, minerals and vitamins. The two main requirements for consistent, predictable fermentations are healthy yeast and a nutrient balanced wort. It is generally recognised that only wort produced from a well modified, all malt grist approaches these needs, and even this requires supplementation with oxygen and zinc. The common practice of high gravity, adjunct brewing has introduced two fermentation problems: nutrient deficiency and conditions of high stress for yeast. Yeast generated under these difficult conditions typically show symptoms of reduced vigour, which can be compounded at each regeneration. Problems associated with reduced vigour include slow or sticking fermentation, off-flavours associated with sulphur containing compounds, slow diacetyl reduction, and autolysis.

BENEFITS
- Faster fermentation
- Consistent fermentation
- Reduced off flavours

YeastLife O™

YEAST NUTRIENT FOR ALTERNATIVE FERMENTATIONS

YeastLife O™ is a 100% organic source of nitrogen suitable for organic fermented beverages. Its unique formulation of different yeast autolyzed fractions supplies well-balanced nutrients for yeast. It is a source of highly bio-available amino acids and peptides, mannoprotein fraction which contribute to mouthfeels and micronutrients such as vitamins and minerals. All contributes to cleaner and more reliable fermentations. Yeastlife O™ is a robust and nutritionally diverse fermentation aid.

BENEFITS
- Avoid sluggish and stuck fermentations
- Avoid off flavors
- Improve mouthfeel
- Rapid fermentations with high attenuation

Servomyces

ZINC-ENRICHED YEAST

BIOLOGICAL NUTRIENT CONTAINING INACTIVE BREWERS YEAST

Developed by a team of scientists at TU Munich / Weihenstephan in conjunction with Lallemand, Servomyces is the most unique yeast nutrient available in brewing. This patented product is a biological substance produced without chemicals or additives. Through its specialised properties Servomyces improves yeasts ability to incorporate essential nutrients, especially zinc into its cellular structure.

BENEFITS
- Cuts down fermentation time improving process efficiency.
- Improves and increases flocculation
- Improves the overall health and viability of yeast.

WildBrew

WildBrew® Brewing Yeast and Bacteria

Our Products

- LalBrew® Premium Brewing Yeasts
- Enzymes
- Process Aids

Our Services

- Sensory Kits
The semi-refined form of the seaweed species Euchema cottonii, used for wort clarification and available in powdered form. It contains a dispersive aid, which allows effective action when added to the whirlpool as well as wort copper. The species Euchema cottonii is rich in the kappa isomer of carrageenan. When added to boiling wort, kappa carrageenan reacts strongly with soluble proteins, notably the proline rich haze precursor fraction. When the wort is cooled the carrageenan protein complex becomes unstable and precipitates out of solution. The clear wort that results produces a beer with enhanced processing characteristics.

KETTLE FININGS

**BREAKBRIGHT**

**AVAILBLE IN POWDER FORM**

**BENEFITS**

- Improved hot break compaction in whirlpool, improved filtration.
- Longer filter runs.
- Improved beer haze and colloidal stability.

**COMPAC CG**

**AVAILBLE IN GRANULE OR TABLET FORM**

**BENEFITS**

- Improved hot break compaction in whirlpool, improved filtration.
- Longer filter runs.
- Improved beer haze and colloidal stability.
AB VICKERS PROCESS AIDS

**BEER CLARIFICATION**

**ALPHAFLOC**

Alphafloc paste is a highly concentrated, stabilized isinglass finings product offering the benefits of low shipping cost and ease of use. A simple mixing process is all that is required to produce a ready-to-use liquid finings within minutes. The ready-to-use product is added to beer at the end of fermentation to rapidly sediment the yeast and proteins that would otherwise result in reduced filtration efficiency and increased beer losses.

**BENEFITS**
- Requires shorter cold storage time and has improved filterability
- Less beer is lost during sediment removal.
- Other benefits include reduced cold storage time, fewer vessels, lower energy use, reduced beer loss, improved filtration, faster throughput, reduced powder use, improved beer haze and stability, less re-work.

**CRYOFINE**

Cryofine contains purified isinglass in convenient powder form. It is added to beer at the end of fermentation to speed maturation and improve filtration by removing yeasts and protein particles. For the purposes of rapid dissolving, enhanced performance and long shelflife, the production of Cryofine involves improved disruption technology to enhance dissolving.

**BENEFITS**
- Plant derived and natural
- Reduced cold storage time
- Lower energy use
- Reduced beer loss
- Improved filtration
- Faster throughput
- Improved beer haze and stability
- Vegan Friendly

**LIQUID ISINGLASS**

Added to beer post fermentation to clarify it by removing yeast and protein particles. Ready for use (RFU) and concentrated products are available. Isinglass is essential for cask beer production in that it quickly yields bright beer with a tight, stable sediment.

**BENEFITS**
- Reduced cold storage time
- Fewer vessels, lower energy use
- Reduced beer loss and power use
- Improved filtration, beer haze and stability
- Faster throughput
- Less re-work

**PROTOFINE**

Protofine is a natural, plant-derived formulation designed to promote the flocculation and precipitation of yeast and various protein complexes during cold storage of beer. The active components of Protofine have been widely used throughout the food industry for many decades and have been developed specifically for use in beer.

**BENEFITS**
- Plant derived and natural
- Reduced cold storage time
- Improved beer haze and stability
- Improved filtration performance
- Only one simple reconstitution step needed
- Vegan Friendly
**AB VICKERS PROCESS AIDS**

**BEER CLARIFICATION**

**Protosol**

Specifically selected colloidal silica sol. Promotes sedimentation of proteins and other solids from beer and wort.

Protosol effectively clarifies wort and beer at very low addition rates → increased throughput of your brewery without the need for investment in tank or filtration capacity.

**Benefits**

- Protosol is a processing aid so is not required to be listed on labels
- Protosol does not contain animal derivatives
- Beer filterability is enhanced due to removal of solids
- Vegan friendly

**Vicfine**

Vicfine is purified isinglass in convenient powder form. It is added to beer at the end of fermentation to speed maturation and improve filtration by removing yeasts and protein particles. For ease of use Vicfine in its standard form includes the necessary acid and preservative already blended. Beer treated with Vicfine requires shorter cold storage time, and has improved filterability. The sediments produced by Vicfine in the cold storage vessel are more compact, so less beer is lost during their removal.

**Benefits**

- Reduced cold storage time
- Improved filtration
- Improved beer haze and stability

**Alternative Ingredient Options Available**
AB VICKERS PROCESS AIDS
FOAM STABILIZERS AND ANTIFOAMING AGENTS

**ALLFOAM**
A beer head stabilizer based on propylene glycol alginate. It is produced and distributed in a powder form and stabilizes foam by interacting with foam positive proteins while reducing the impact of foam negative factors. Many years of development have been undertaken to identify the ideal blend of seaweed species required to yield the right quality of Alginic acid, and to optimise the critical esterification stage.

**BENEFITS**
- Protects beer from foam negatives
- Easy to prepare
- Easy to use
- Maintains attractive, stable foam

**FOAMSTABILIZER**
A liquid form of propylene glycol alginate (which is produced by the esterification of alginic acid). It is designed to give a trouble free method of enhancing and protecting beer foam. Many years of development have been undertaken to identify both the ideal blend of seaweed species required to yield alginic acid of the necessary quality, and to optimise the critical esterification stage. Foamaid contains sodium metabisulphite (E223).

**BENEFITS**
- Enhanced beer foam
- Increased foam stability

**NOTE**
Available in the UK only- due to short shelf life

**DRIFOAM**
A powder form of propylene glycol alginate produced by the esterification of alginic acid. It is designed to give a trouble free method of enhancing and protecting beer foam. Drifoam stabilises beer in two ways: Firstly by actively interacting with foam positive hydrophobic beer polypeptides. Secondly by reducing the impact of foam negative factors. This latter effect explains the positive role Drifoam plays in protecting beer foam from external contamination, particularly from grease and detergents.

**BENEFITS**
- Pure form of foam stabilizer
- Enhanced beer foam
- Increased foam stability

**FOAMSTABILIZER**
Foamsol is a water based emulsion of dimethylpolysiloxane. Designed to control foams produced in kettle and fermenter.

**BENEFITS**
- Increased kettle, fermenter, and alpha-acid utilization
- Preservation of foam-positive proteins
- Elimination of over-foaming problems
- Optimised CO₂ recovery
- Enhanced vessel cleaning

**FOAM CONTROL**
Foam Control (20 and 30) are water based emulsions of dimethylpolysiloxane designed to control foams produced in kettle and fermenter. Dimethylpolysiloxane is an inert polymer which is highly effective in foam suppression. Bubble collapse occurs as a result of reduction of surface tension in the liquid film.

**BENEFITS**
- Increased kettle utilization
- Increased fermenter utilization
- Preservation of foam-positive proteins
AB VICKERS PROCESS AIDS

BEER ANTIOXIDANTS

VICANT SB & VICANT SBX
Vicant is an anti-oxidant and anti-browning agent designed to enhance flavor and colloidal stability in beer. It is a white, crystalline powder which is fully soluble in water. Vicant supplies sources of sulphur dioxide and ascorbate. The active component function by scavenging dissolved oxygen and blocking staling reactions.

BEER ANTIOXIDANT BENEFITS
- Improved flavor stability
- Improved colloidal stability
- Slower rate of browning

AB VICKERS INACTIVE SPECIALIZED YEASTS

BEER ANTIOXIDANTS

ISY ENHANCE™
AB Vickers ISY Enhance™ is an inactivated specific yeast autolysate designed to increase body, mouthfeel, and drinkability in beer and other fermented beverages. The resulting product is smooth and clean with enhanced flavor perception.

Applications include, but are not limited to:
- Reducing harsh hop flavors and balancing flavors in hoppy beer styles
- Increasing body and complexity in low alcohol, non-alcoholic beer styles, and other light beer styles, and
- Increasing mouthfeel and drinkability in any beer style, or other fermented beverages

BEER STABILIZERS

ALPHA CLAR S
Even after filtration, beer contains proteins which originate from the raw ingredients. These proteins will react with polyphenols, also present in the beer, to form unacceptable haze. Alphaclar S is a single-use cross-linked polyvinylpyrrolidone (PVPP). It is a colloidal haze stabiliser which increases the shelf-life of beer. Alphaclar S absorbs the haze-active polyphenols which would otherwise react with haze-active proteins in filtered beer to form colloidal haze during storage.

BEER STABILIZER BENEFITS
- Increases beer shelf-life due to preventing colloidal haze formation
- Only the specific haze-active polyphenols are removed
- PVPP is insoluble so it is removed by filtration and therefore is a processing aid so is not required to be listed on labels

BRITE SORB BK
Britesorb BK 75 silica gels offer a comprehensive range of stabilisation products to suit all your beer stabilisation needs. Britesorb silica gels are permitted for use under the German Beer purity laws. Beer naturally contains protein and polyphenol material which over time will cause chill haze and eventually lead to a permanent haze. Britesorb BK 75’s range of silica gels selectively adsorb the haze forming proteins in beer, but do not remove the head positive proteins therefore promoting a stable and attractive head of foam. Britesorb BK 75’s range of silica gels has a very short reaction time and can be used for both in line dosing or tank stabilisation, allowing you greater process flexibility. Britesorb BK 75 silica gels are removed completely by filtration and can even improve your filtration efficiency.

BEER STABILIZER BENEFITS
- Improved filtration
- Improved beer haze and stability
SENSORY KITS

THE SIEBEL INSTITUTE SENSORY TRAINING KITS ARE SHIPPED IN READY-TO-USE LIQUID FORM, MAKING THEM AS EASY TO USE AS POSSIBLE.

Each kit is designed to help tasters build their skills towards understanding beer flavor at a truly professional level. While breweries with established tasting panel structures will find this kit valuable, it can also be used for “taster calibration” by others with an interest in beer including:

- Breweries training new and existing staff to spot beer defects more effectively.
- Brewers guilds looking to add value to their regularly-scheduled meetings.
- Homebrew groups and beer judges looking to sharpen judging and flavor recognition skills.
- Distributors, wholesalers and agents who need to be able to “talk the talk” about beer attributes with beer specialty retailers.

PRODUCT NOTES
SENSORY FLAVOR DESCRIPTIONS

ACETALDEHYDE
Green apple, cut grass
COMMON SOURCES
Fermentation product, staling or contamination

ACETIC ACID
Vinegar-like
COMMON SOURCES
Contamination (mash, bacteria or wild yeast)

ALMOND (BENZALDEHYDE)
Marzipan, Almonds
COMMON SOURCES
Specific styles (Including Barrel Aging) yeast growth or raw materials

BARNYARD (4-ETHYLPHENOL)
Barnyard, Horsey, Brett-related flavors, Wine-like, Alcohol
COMMON SOURCES
Common Flavor Component in Many Beers Innoculated with Brettanomyces. Also Present in some barrel aged beers

BITTER (ISOLONE)
Hoppy, bitter
COMMON SOURCES
Hopping, hop addition

CADAVERINE (1,5-DIAMINOPENTANE)
rotten meat/Prawn, boiled shrimp water
COMMON SOURCES
contamination with lactic acid bacteria

CAPRYLIC ACID
Soapy, fatty, candle wax
COMMON SOURCES
Microbial contamination or yeast breakdown at maturation

CARAMEL (5-METHYL FURFURAL)
Caramel, Spicy, Sweet, Almond
COMMON SOURCES
Present in Specific Styles and a Common Flavor Component in Barrel Aged Beers

COCONUT (2-HEPTANOL)
Dill, Earthy, Coconut
COMMON SOURCES
Present in some barrel aged beers

CONTAMINATION
Sour, buttery
COMMON SOURCES
Contamination (Lactobacillus)

D.M.S. (DIMETHYL SULFIDE)
Cooked corn, cooked vegetables
COMMON SOURCES
Wort boil, wort cooling or contamination

DIACETYL (2,3-BUTANEDIONE)
Butter, butterscotch
COMMON SOURCES
Microbial contamination or improper maturation

DIETHYLACETATE
Solvent-like, nail polish remover
COMMON SOURCES
Fermentation product, wort composition or yeast growth

ETHYL ACETATE
Aniseed, apple or licorice
COMMON SOURCES
Fermentation product, wort composition or yeast health

EXOTIC (G-NONALACTONE)
Coconut, Vanilla, Fruity, Glue-like
COMMON SOURCES
Higher Concentrations in Aged Beers (Including Barrel Aged), Thermal Load Indicator of Brewing Process

GERANIOL
Floral, geranium flowers
COMMON SOURCES
Hop addition and variety

GRAINY (ISOBUTYRALDEHYDE)
Husk-like, nut-like
COMMON SOURCES
Excessive run-off or insufficient wort boil

GREEN APPLE
Cut grass

EARTHY (2-ETHYL FENCHOL)
Geosmin, soil-like
COMMON SOURCES
Packaging or water-derived contamination

GEOSMIN
Soil-like
COMMON SOURCES
Packaging or water-derived contamination

GRAPEFRUIT
Citrus
COMMON SOURCES
Citrus

GRAPEFRUIT
Soapy, fatty, candle wax
COMMON SOURCES
Microbial contamination or yeast breakdown at maturation

GRAPEFRUIT
Geosmin, soil-like
COMMON SOURCES
Packaging or water-derived contamination

GRAPEFRUIT
Soil-like
COMMON SOURCES
Packaging or water-derived contamination

GRAPEFRUIT
Sour, buttery
COMMON SOURCES
Contamination (Lactobacillus)

GRAPEFRUIT
Inspectors
COMMON SOURCES
Inspectors

GRAPEFRUIT
Cooked corn, cooked vegetables
COMMON SOURCES
Wort boil, wort cooling or contamination

GRAPEFRUIT
Butter, butterscotch
COMMON SOURCES
Microbial contamination or improper maturation

GRAPEFRUIT
Solvent-like, nail polish remover
COMMON SOURCES
Fermentation product, wort composition or yeast growth

GRAPEFRUIT
Aniseed, apple or licorice
COMMON SOURCES
Fermentation product, wort composition or yeast health

GRAPEFRUIT
Coconut, Vanilla, Fruity, Glue-like
COMMON SOURCES
Higher Concentrations in Aged Beers (Including Barrel Aged), Thermal Load Indicator of Brewing Process

GRAPEFRUIT
Floral, geranium flowers
COMMON SOURCES
Hop addition and variety

GRAPEFRUIT
Husk-like, nut-like
COMMON SOURCES
Excessive run-off or insufficient wort boil

GRAPEFRUIT
Rotten meat/Prawn, boiled shrimp water
COMMON SOURCES
Contamination with lactic acid bacteria
SENSORY FLAVOR DESCRIPTIONS

HEFEWEIZEN
- Spicy, banana

COMMON SOURCES
- Specific beer styles

HERBAL (MYRCENE)
- Herbaceous, Resinous, Green, Balsamic, Piney, Light Terpene/Hydrocarbon Character

COMMON SOURCES
- Higher concentrations in specific hop varieties

INDOLE
- Farm, barnyard

COMMON SOURCES
- Bacterial infection during fermentation

ISOAMYL ACETATE
- Banana, pear drop

COMMON SOURCES
- Fermentation product, wort composition or yeast health

ISOVALERIC ACID
- Cheesy, old hops, sweaty socks

COMMON SOURCES
- Use of old, degraded hops

LACTIC ACID
- Sour, sour milk

COMMON SOURCES
- Beer spoilage bacteria

LIGHT-STRUCK (3-METHYL-2-BUTENE-1-ThIOL)
- Skunky, toffee or coffee like

COMMON SOURCES
- Clear or green bottles

LINALOOL
- Fruity, Floral, Blueberry, Lavender, Rose-wood

COMMON SOURCES
- Associated with time of addition and length of boil; higher concentrations in specific hop varieties; Geraniol decomposition

MERCAPTAN (ETHANETHIOL)
- Sewer-like, drains

COMMON SOURCES
- Poor yeast health, autolysis

METALLIC (FERROUS SULFATE)
- Metal, tin-like, blood

COMMON SOURCES
- Water sources, non-passivated vessels

PAPERY (TRANS-2-NONENAL)
- Cardboard, oxidized

COMMON SOURCES
- Product of oxidation, staling

PEAT-LIKE (GUAIACOL)
- Peat-like, Smoky, Woody, Medicinal

COMMON SOURCES
- Present in some barrel aged beers

PINEAPPLE (ETHYL BUTYRATE)
- Pineapple-like, Brett-related flavors, Rum-like, Tropical Fruit

COMMON SOURCES
- Common Flavor Component in Many Beers Innoculated with Brettanomyces. Also Present in some barrel aged beers

SMOKY (SYRINGOL)
- Smoky (smoked wood/smoked fish), Phenolic

COMMON SOURCES
- Present in Specific Styles and a Common Flavor Component in Barrel Aged Beers

TOBACCO (B-DAMASCENONE)
- Natural, Woody, Sweet, Fruity, Plum, Spicy Tobacco Nuances, Menthol-like

COMMON SOURCES
- A Specific Note Found in Higher Concentrations in Certain Hop Varieties and Present in some barrel aged beers

VANILLA (VANILLIN)
- Custard powder, vanilla essence

COMMON SOURCES
- Specific Styles (Barrel Aged, Common Wood Flavor)

WHISKEY (LACTONE)
- Woody, Oakey, Coconut, Rum-like, Green

COMMON SOURCES
- Common Flavor Component in Barrel Aged Beers

WOODY (CARYOPHYLLENE AND HUMULENE FRACTION)
- Woody, Resinous

COMMON SOURCES
- Characteristic of the Hop Heavier Volatiles and Present in some barrel aged beers
AVAILABLE SENSORY KITS

REGULAR SENSORY KIT
12X1 SELECTED FLAVORS TO SPIKE 1L
The Regular Sensory Training Kit contains 12 of the most common flavors found in beer. This kit is suitable for intermediate training of groups of 3 people (12 oz.) or 10 people (1L).

CRAFT SENSORY KIT
12X1 SELECTED FLAVORS TO SPIKE 1L
The Craft Sensory Kit contains 12 flavor compounds that may be found in many unique styles of craft beer.

BARREL AGED SENSORY KIT
12X1 SELECTED FLAVORS TO SPIKE 1L
This kit contains the following flavors.
**AVAILABLE SENSORY KITS CONTINUED**

**SPECIALTY SENSORY KIT**
**24X1 INDIVIDUAL FLAVORS TO SPIKE 1L**
Our Specialty Sensory Training Kit is ideal for companies conducting sensory training on a frequent or large-scale basis.

**12 MIX&MATCH SENSORY KIT**
**12X1 INDIVIDUAL FLAVORS TO SPIKE 1L**
The 12 Mix&Match Sensory Kit can be custom designed. You may choose any 12 flavor compounds that suit your individual needs.

**5 MIX&MATCH SENSORY KIT**
**5X1 INDIVIDUAL FLAVORS TO SPIKE 1L**
The 5 Mix&Match Sensory Kit can be custom designed. You may choose any 5 flavor compounds that suit your individual needs.
Available Sensory Kits

**Essential Off-Flavor Kit**
6X1 Selected Flavors to Spike 1L
The Essential Off-Flavor Kit contains 6 of the most frequently encountered off-flavors common to beers of all styles.

**Intermediate Off-Flavor Kit**
12X1 Selected Flavors to Spike 1L
The Intermediate Off-Flavor Kit offers a total of 12 compounds that cover a variety of spoilage-related flavors as well as artifacts from other sources.

**Advanced Off-Flavor Kit**
18X1 Selected Flavors to Spike 1L
The Advanced Off-Flavor Kit offers 18 different compounds that cover the full spectrum of off-flavors that are critical for beer tasters to know towards accurately evaluating beer.
AVAILABLE SENSORY KITS CONTINUED

**COMPREHENSIVE SENSORY KIT**
*25x1 Selected Flavors to Spike 1L*

The Comprehensive Sensory Training Kit offers 25 vials representing a large variety of the most important flavors and aromatics found in beer. While breweries with established tasting panel structures will find this kit valuable, it can also be used for "taster calibration" by brewers guilds, homebrew groups and beer judges.

**BASIC SENSORY KIT**
*6x4 Selected Flavors to Spike 1L*

The Basic Sensory Training Kit offers 4 pre-measured vials of six of the most common and important beer-related flavor compounds. This kit is perfect for companies that do frequent sensory training panels using these core standards. It is also suitable for those looking for basic sensory training.

**SOUR SENSORY KIT**
*6x1 Selected Flavors to Spike 1L*

The Sour Sensory Kit contains 6 frequently encountered flavors common to sour beer styles. It can be used to identify and understand commonly desired compounds, and one potentially dangerous biogenic amine to be aware of from a food safety perspective.
OUR SERVICES
Lallemand Brewing offers a large range of services to help your brewery achieve its growth and quality goals.

OUR SERVICES

YEAST MAINTENANCE
YEAST GENETICS
ANALYTICAL SERVICES
CONSULTING SERVICES
PILOT BREWING
Through the Siebel Institute of Technology, Lallemand Brewing provides a full range of yeast banking and maintenance services to some of the greatest names in North American brewing. Now, with our expanded Microbiological Services division in Montreal (Canada), we are pleased to offer the industry’s most advanced yeast management and evaluation services.

Our services adhere to the strictest scientific standards, assuring the purity and performance of every culture under our care. We offer the most advanced range of testing available in the brewing industry, with yeast banking and maintenance packages that meet the needs of breweries of every size. Breweries can choose from one of our pre-packaged programs, or we can work with your company to build effective and affordable tailored programs.

To contact our Yeast Maintenance and Evaluation Services team directly, please email us at brewing.yeastgenetics@lallemand.com

### YEAST BANKING PACKAGES

<table>
<thead>
<tr>
<th>BRONZE (YCMB)</th>
<th>SILVER (YCMS)</th>
<th>GOLD (YCMG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INITIAL DEPOSIT (YEAR ONE)</td>
<td>FOR EACH SUBSEQUENT YEAR (YEAR TWO +)</td>
<td></td>
</tr>
</tbody>
</table>

- **CHOOSE 3 PRESERVATION METHODS**
  a. Liquid nitrogen, cryostorage at -80°C, microbank
  b. All electrical equipment on back-up power supply
  c. Limited access to all strains and database
  d. Security deposit at another facility

- **PURITY CHECK / DETECTION OF CONTAMINANTS**
  By using various selective and differential media for the detection of bacteria and wild yeasts

- **ALE AND LAGER DIFFERENTIATION**
  Melibiose utilization and fermentation. Growth test at 37°C

- **GENUS AND SPECIES IDENTIFICATION**
  Biochemical profile and genus and species identification using api ID32 galleries

- **PHENOLIC OFF FLAVORS (POF TEST)**

- **KILLER PROFILE**
  Evaluation of the strain sensitivity to known killer toxins and its ability to synthesize killer toxins

- **DNA PROFILING BY DELTA-PCR ON MIXT CULTURE + 2 COLONIES**
  To look for strain purity and to create a fingerprint at time 0 for future strain differentiation and culture yeast evaluation.

- **GENETIC STABILITY EVALUATION BY PFGE ON 5 COLONIES**
  PFGE allows strains differentiation, detection of chromosomal mutations as well as genetic stability evaluation

- **STORAGE IS INCLUDED FOR YEAR ONE**
  The Storage Package level is determined by your Yeast Banking Package level (ie Silver Yeast Banking can choose Silver [or Bronze] level of Storage)

### ANNUAL YEAST STORAGE PACKAGES

- Yeast storage using the different methods mentioned above and sub culturing if necessary
- Annual verification of your culture yeast strain against its BRY reference by delta-PCR
- Annual verification of your culture yeast strain against its BRY reference by PFGE
YEAST GENETIC SERVICES

While many of our advanced Microbiological Services use cutting-edge analytical technologies employed by some of the world’s largest breweries, their applications can be utilized by breweries and brewing-related companies of every size.

Our DNA fingerprinting and rapid analysis services can give you critical information about your yeast, improving your understanding of its characteristics, performance and purity. Have a look on the following pages for some of the most important applications of our yeast services as well as our range of testing services and their underlying technologies.

To contact our Genetic Services team directly, please email us at brewing.yeastgenetics@lallemand.com
YEAST GENETIC SERVICES

YEAST STRAIN IDENTIFICATION BY PCR FINGERPRINTING (YCSPCR)

APPLICATIONS
PCR fingerprinting can identify and differentiate production yeast strains. This is a valuable tool for checking yeast slopes, detecting cross contamination, monitoring production yeast cultures and in some instances to detect mutations.

TECHNOLOGY
While differentiation of brewing strains is notoriously difficult to perform using traditional lab techniques, PCR fingerprinting offers a quick and accurate means of differentiating brewing yeast strains based on analysis of multiple regions of the genome. This “ASBC recommended” method utilizes PCR (Polymerase Chain Reaction) technology to amplify inter-delta regions of the genome, which are known to be highly variable in terms of number, distribution and size between strains. Through this process a unique DNA fingerprint can be obtained for each individual yeast strain.

YEAST STRAIN IDENTIFICATION AND DIFFERENTIATION BY MICROSATELLITES (YCSMICRO)

APPLICATIONS
This method has the highest level of discrimination power among the methods we currently offer. It can therefore be used for the identification and differentiation of closely related strains of S. cerevisiae and S. pastorianus. It also displays a very high degree of reproducibility allowing us to build a database of controls for future comparisons.

TECHNOLOGY
Microsatellites is a method that targets short and variable tandem repeats (VNTR) in organisms. Due to their high degree of variability, these regions are considered as a good tool to analyze genetic diversity among strains.

YEAST STRAIN IDENTIFICATION BY ANALYSIS OF MTDNA (YCSMITO)

APPLICATIONS
mtDNA analysis is used for the identification and differentiation of production yeast strains, and it can also be used to indicate mitochondrial mutations.

TECHNOLOGY
It has been reported that there are more variable regions in the yeast mitochondrial DNA than in the nuclear DNA. These variations can be exploited to produce a DNA fingerprint which can be used to differentiate strains that are closely related, or to complement analysis of nuclear DNA as described above.

SACCHAROMYCES DIASTATICUS DETECTION BY PCR (YCSDIA)

APPLICATIONS
This test is used to identify Saccharomyces diastaticus, a Saccharomyces wild yeast.

TECHNOLOGY
While varieties of Saccharomyces cerevisiae strains are very difficult to identify by classical methods, the detection of the STA-1 gene by PCR enables the identification of Saccharomyces diastaticus as this gene is coding for a glucoamylase, an enzyme which enables the utilization of dextrins.

IDENTIFICATION OF YEAST SPECIES BY ITS ANALYSIS (YCSITS)

APPLICATIONS
This test is used to identify isolated yeast contaminants.

TECHNOLOGY
Yeast species can be identified by analysis of the ITS region within yeast ribosomal DNA. This method, which is cheaper to perform than DNA sequencing (See above), involves PCR amplification of the ITS region of the genome followed by digestion using restriction enzymes. The ITS region of DNA is known to vary in size and composition between yeast species. Consequently, the size and number of the resulting DNA fragments can be compared to a database comprising more than 200 species of yeast, leading to identification.
IDENTIFICATION OF BACTERIA SPECIES
BY DNA SEQUENCING  (YCSSEQB)

**APPLIcATIONS**
Identification of isolated bacterial contaminants can give breweries important information about the nature and origins of bacteria found in their yeast and in their products. Traditional methods to identify bacteria can be time consuming and often lack sensitivity, particularly when trying to differentiate closely related species of brewing microbes. DNA sequencing allows the rapid and precise identification of bacteria to the species level, based on differences within ribosomal DNA sequences.

**TECHNOLOGY**
This method involves the amplification of rDNA by PCR followed by sequencing of the resulting rDNA fragment. Identification to the species level is performed by comparison to a Basic Local Alignment Search Tool (BLAST) database comprising > 1 million entries for bacteria.

IDENTIFICATION OF YEAST MUTANTS
BY RFLP ANALYSIS OF TY ELEMENTS  (YCSRFLP)

**APPLIcATIONS**
Brewing yeast cultures can change over time due to genetic drift, leading to the accumulation of mutants. These changes typically have a negative influence on fermentation performance and can lead to altered flavor profiles, inappropriate flocculation and fermentation inconsistencies. This service analyses yeast cultures for the presence of mutants. This is an especially important tool for monitoring production yeast cultures for genetic drift, checking yeast samples for the presence of mutants, optimizing serial repitching and associated yeast handling processes. It is also useful for the differentiation of closely related strains.

**TECHNOLOGY**
Mutations can be detected by analyzing cultures using RFLP of yeast transposons (Ty elements). Ty elements are regions of the genome which are known to be highly susceptible to movement and this can indicate more widespread changes throughout the DNA. Here we use a molecular probe to produce a fingerprint of yeast DNA according to the size and location of Ty elements. Fingerprints can be seen to vary compared to the original strain when a mutant yeast is present.

IDENTIFICATION OF WILD YEAST SPECIES
BY DNA SEQUENCING  (YCSSEQY)

**APPLIcATIONS**
Wild yeast can be difficult to identify as traditional methods for yeast identification are often labor intensive and lack precision. Our DNA sequencing process allows for the accurate identification of isolated yeast contaminants to the species level including an expansive range of wild yeast strains associated with the food and beverage industry.

**TECHNOLOGY**
Sequencing of the D1-D2 domain within yeast ribosomal DNA can be used to rapidly and accurately identify yeast species. This method involves the amplification of rDNA by PCR followed by sequencing of the resulting fragment. Identification of yeast species is performed by comparison to a Basic Local Alignment Search Tool (BLAST) database of wild yeast strains common in the food and beverage industries.

ANALYSIS OF YEAST GENETIC STABILITY
BY KARYOTYPING  (YCSPFGE)

**APPLIcATIONS**
Brewing yeast strains are often susceptible to mutation, characterized by changes to the DNA. Karyotyping offers a tool for the analysis of genetic stability in new or current production strains, analysis of large scale mutations, and for strain differentiation.

**TECHNOLOGY**
The in-built capacity of a yeast strain to mutate can be assessed by analysis of chromosomes, since large scale genetic changes are frequently observed in polyploid and allopolyploid yeast. To determine genetic stability, a number of isolated colonies are analyzed using Pulsed Field Gel Electrophoresis (PFGE) to create a chromosomal fingerprint, or karyotype. If variation is seen between the karyotypes of different colonies, the yeast strain can be considered to be genetically unstable.
ANALYTICAL SERVICES

LALLEMAND BREWING’S LABORATORY SERVICES CONSTITUTE ONE OF THE INDUSTRY’S MOST COMPLETE RANGE OF BREWING-RELATED TESTS.

Our tests are conducted using the most stringent standards, employing methods prescribed by groups like the American Society of Brewing Chemists and AOAC INTERNATIONAL. We strive to conduct tests and deliver results as promptly as possible, providing our customers with information that is both timely and accurate.

For a comprehensive list of analytical services please visit siebelinstitute.com/services/analytical-services-catalog/

LALLEMAND BREWING BRINGS ADDITIONAL SERVICES TO THE BREWING INDUSTRY VIA AB VICKERS’ EXTENSIVE LABORATORY AND TECHNICAL CAPABILITIES.

Our technical support staff is composed of qualified brewers with extensive experience and technical knowledge of the entire brewing process.

We work closely with breweries by providing support both on-site and in our laboratories depending on the type of service needed. Some routine services, such as finings optimizations, can be carried out in our laboratories or -if required- at laboratories on the brewery site. Our labs allow for more complex tests, including analysis of compounds such as polyphenols and sensitive proteins in beer stability studies or assessments of enzyme addition rates and customized enzyme blend performance under defined brewhouse or raw material conditions. This service allows breweries to accurately tailor product and dose rates around their particular recipes to produce beers efficiently and up to a defined quality standard.

To contact our Analytical Services team directly, please email us at brewing.analyticalservices@lallemand.com
CONSULTING SERVICES

BREWERY CONSULTANCY

Our approach to consultancy has evolved to meet the constant evolution of the needs of the brewing industry. Rather than assigning a single consultant to a project, we draw from a worldwide team of experienced professionals with applied knowledge of every critical phase of this industry to create a shared source of knowledge for tackling the project at hand. Our team of consultants blends decades of experience with up-to-the-minute knowledge of emerging trends and technologies, creating one top consultancy teams in the world.

Our methodology for any consulting project follows a systematic approach for efficiently leveraging our worldwide pool of knowledge. In the initial phase of evaluation, you will work with a Siebel Institute Service Analyst to develop a "Needs Assessment Profile", defining your current operating standards, perceived realities, and desired outcomes. Our analyst then draws from our team of consulting experts, choosing a consultant (or multiple consultants) that best meets the demands of your project. Our consultant(s) will subsequently work with you to thoroughly evaluate your operations and to provide solutions based on the collective experience of our entire consultancy team.

CONSULTING SERVICES PROVIDED INCLUDE, BUT ARE NOT LIMITED TO:

- Planning and start-up
- Equipment acquisition and installation
- Plant design
- Fermentation and QC/QA issues
- Process evaluation
- Staff training
- Brewery management issues

To contact our Consulting Services team directly, please email us at brewing.consultingservices@lallemand.com
PILOT BREWING SERVICES

THROUGH THE SIEBEL INSTITUTE OF TECHNOLOGY, LALLEMAND BREWING OFFERS A PILOT BREWING SERVICE THAT ALLOWS EXECUTING A COMPLETE RANGE OF RESEARCH AND TESTS FOR BREWING OPERATIONS. THIS SERVICE CAN DELIVER VALUE FOR ALL BREWERIES, REGARDLESS OF SIZE.

Specifically designed to emulate the physical dynamics of a wide range of commercial brewing systems, our pilot plant enables us to design and test new recipes and to evaluate changes in a customer’s existing recipes.

Along with recipe development or enhancement, our pilot brewery facility allows for conducting research on a wide variety of brewing-related variables, including:

- Filtration products
- Effect of raw ingredient variations
- Enzyme and additive effects on recipes
- Packaging material quality, including PET bottle evaluation
- Processing aids (at all points of the process)

Our advanced pilot brewery facility is operated by senior Siebel Institute of Technology researchers. From the time you give us your requirements to the day the final report is delivered, your project will be completed with the speed, accuracy and value that the Siebel Institute of Technology has built its reputation on for over 140 years.

To contact our Pilot Brewing Services team directly, please email us at brewing.pilotbrewing@lallemand.com
Our classes include a mix of participants from breweries of all sizes who hail from locations from all over the world. This broad base of participants enhances the learning experience of each student by exposing them to differences in culture, equipment, methods and beer styles. In our formal lectures and demonstrations we focus their attention on one common theme: beer. Students may come to the Institute with the biases of their own particular brewing environment, but they all leave in the simple and honest camaraderie of being a brewer. We have a saying here at the Institute, “Not only do we teach our students, but we also help them to teach each other.” The institute continues to focus on one basic theme as was published by Dr. J. E. Siebel in a Western Brewer ad from 1893. He stated, “The object of the institute is to promote the progress of the industries based on fermentation, which is done by instruction, investigation, analysis and otherwise.”

Siebel Institute of Technology is approved by the Division of Private Business and Vocational Schools of the Illinois Board of Higher Education. For further information please visit the official IBHE website at ibhe.org.

Discover the many educational offerings of Lallemand Brewing on the following pages.
SINCE 1872, THE SIEBEL INSTITUTE HAS ATTRACTED AN EXTENSIVE GLOBAL FOLLOWING. OUR ALUMNI SPAN MORE THAN 60 COUNTRIES AND ARE FOUND IN ALMOST EVERY MAJOR BREWERY.

SIEBEL INSTITUTE
Since its founding in 1872, the Siebel Institute of Technology has educated brewers from practically every country in the world, from breweries large and small. The Siebel name is unparalleled for education in the art and science of brewing and remains one of the most respected brewing schools to this day.

WORLD BREWING ACADEMY
The World Brewing Academy is an educational alliance between Siebel Institute of Technology and Doemens Academy of Munich, Germany, offering dual campus/dual continent and web-based brewing courses and programs since 2001.

LEARN MORE ONLINE
siebelinstitute.com
worldbrewingacademy.com
The World Brewing Academy (WBA) was established in 2001 as an alliance between Doemens Academy (Munich, Germany) and Siebel Institute of Technology (Chicago, U.S.A.) in order to provide students with a truly international education in brewing technology. The programs and courses offered by the WBA give students the unique opportunity to experience different brewing cultures on two continents.

Just beginning your brewing path? Start with our entry level WBA Executive Overview of the Brewing Process course, and then continue your way up through the other offerings.

Already have some brewing experience? Depending on your level of knowledge, you may be able to jump right into one of our advanced offerings. Our three advanced-level programs will give you a solid foundation and pathway to becoming a confident professional brewer or brewmaster. You may also take the modules independently, or enroll in them over time to complete a program. Also, our online lecture series makes it very easy to pick and choose lecture topics to round out your brewing knowledge expertise.

To register or learn more visit worldbrewingacademy.com
BECOME A MASTER BREWER

Each WBA program module below can be taken independently, or together to complete the certificate programs.

★★★ ENTRY LEVEL COURSE
May be needed as a prerequisite, depending on prior brewing knowledge and experience.

- Executive Overview of the Brewing Process

★★★ INTERMEDIATE COURSE
May be needed as a prerequisite, depending on prior brewing knowledge and experience.

- Concise Course in Brewing Technology

★★★ ADVANCED PROGRAMS
B and C may be prerequisites, depending on prior brewing knowledge and experience.

- WBA Specialized Lectures (see available online lectures)
  Complete modules to receive certificate that follows

  1. WBA Raw Materials and Wort Production Module
  2. WBA Beer Production and Quality Control Module
  3. WBA Packaging and Process Technology Module

- WBA ADVANCED BREWING THEORY

  4. WBA Business of Brewing and Technical Case Studies
  5. WBA Applied Brewing Techniques Module
  6. WBA European Brewing Study Tour Module

- WBA INTERNATIONAL DIPLOMA IN BREWING TECHNOLOGY

- WBA Advanced Applied Brewing Techniques Module

To register or learn more visit worldbrewingacademy.com

- DOEMENS BIERSOMMELIER
- WBA CRAFT CIDER COURSE

COURSE LOCATION
- Available Online
- Chicago Campus
- Munich Campus
- Dual Campus (Munich/Chicago)

COURSE LEVEL
- ★★★ Entry Level Course
- ★★★ Intermediate Course
- ★★★★ Advanced Course
WBA ENTRY LEVEL COURSE

A EXECUTIVE OVERVIEW OF THE BREWING PROCESS

The web-based course touches on an extensive range of “need to know” brewery and brewing topics at a basic level in an online, 3-week format. This course has proven itself time and time again as perfect for industry executives, administrative and managerial staff, as well as those just considering entrance into the world of professional brewing operations, with the convenience of never having to leave your home.

WBA INTERMEDIATE COURSE

B CONCISE COURSE IN BREWING TECHNOLOGY

Created by the international faculty of the World Brewing Academy, this course provides students a comprehensive knowledge of the brewing process, the dynamics of brewery operations, and issues currently affecting the industry. Students gain a level of industry knowledge that will greatly benefit them in any area of responsibility in the brewery, covering critical main topics important to the success of brewery operations of any size. You’ll leave this all-encompassing course confident in your applicable knowledge of brewing and the industry as a whole.

Offered on campus, or as an online course. The online course allows students from anywhere in the world to participate from the convenience of their home or place of work, with presentations available at any time, day or night, weekdays and weekends.
Advanced Brewing Theory (ABT) offers students an in-depth understanding of the technical issues encountered in professional brewing, whether craft or industrial. With content designed around the syllabus of the Institute of Brewing and Distilling (IBD), UK, our course materials address critical topics in brewing technology, giving students the knowledge they need to improve their products, processes and profits. ABT consists of three modules. Students may take any of these modules as a separate unit, electing to complete the program at a later date. Throughout the duration of this intensive program, students are taught by the instructional staff of the WBA, drawing on the talents of some of the most knowledgeable scientists, technologists and brewmasters in the world.

(3) PROGRAM MODULES INCLUDE:
Modules can be taken individually or as a part of the certificate program.

1. RAW MATERIALS AND WORT PRODUCTION
2. BEER PRODUCTION AND QUALITY CONTROL
3. PACKAGING AND PROCESS TECHNOLOGY

To register or learn more visit worldbrewingacademy.com
INTERNATIONAL DIPLOMA IN BREWING TECHNOLOGY PROGRAM

Conducted at our campuses in Chicago and Munich, this dual continent program will prepare graduates to advance their careers through advanced classroom theory and practical application by hands-on brewing. This 12-week program is comprised of segments, divided into 1-to 3-week modules, with each module specializing in a particular area of brewing technology. The Diploma program starts with 7 weeks at our Siebel Institute campus in Chicago, and students then travel to Doemens Academy in Munich, Germany, to complete the last 5 weeks of this amazing, two-continent program.

(6) PROGRAM MODULES INCLUDE:
Modules can be taken individually or as a part of the certificate program.

1. BUSINESS OF BREWING & TECHNICAL CASE STUDIES
2. APPLIED BREWING TECHNIQUES
3. EUROPEAN BREWERY STUDY TOUR

To register or learn more visit worldbrewingacademy.com

ENTRY LEVEL COURSE
May be needed as a prerequisite, depending on prior brewing knowledge and experience.

Executive Overview of the Brewing Process

INTERMEDIATE COURSE
May be needed as a prerequisite, depending on prior brewing knowledge and experience.

Concise Course in Brewing Technology

ADVANCED PROGRAMS
May be needed as a prerequisite, depending on prior brewing knowledge and experience.

WBA Raw Materials and Wort Production Module
WBA Beer Production and Quality Control Module
WBA Packaging and Process Technology Module
WBA Business of Brewing and Technical Case Studies
WBA Applied Brewing Techniques Module
WBA European Brewing Study Tour Module
WBA Advanced Applied Brewing Techniques Module
WBA Specialized Lectures (see available online lectures)

Complete modules to receive certificate that follows

WBA ADVANCED BREWING THEORY
WBA INTERNATIONAL DIPLOMA IN BREWING TECHNOLOGY
WBA MASTER BREWER PROGRAM
Our most comprehensive, dual-campus/dual continent program offered and unique in its design, the Master Brewer will prepare graduates to advance their careers and knowledge in a 20-week “fast track” approach. Classroom theory in both Chicago and Munich, coupled with practical brewing and lab training in Munich at Doemens Academy will provide students with the knowledge and hands-on experience to obtain a head brewer or managerial position within the industry. This program is comprised of 7-modules, split between Siebel Institute in Chicago and Doemens Academy in Munich, with each module specializing in particular areas of brewing technology. The content addresses issues in brewing from an international perspective, providing students with an educational experience unlike any other offering in the world!

(7) PROGRAM MODULES INCLUDE:
Modules can be taken individually or as a part of the certificate program.

1 2 3 4 5 6

WBA Advanced Applied Brewing Techniques

To register or learn more visit worldbrewingacademy.com
Siebel Institute and the World Brewing Academy are delighted to announce the launch of the WBA Specialized Lecture Series. These lectures cover a multitude of specific topics pertaining to all processes of beer production, including: raw materials, QA/QC, mashing, alternative fermentation techniques, and all the way to brewery engineering. These specialized lectures are perfect for those in the industry looking to increase their knowledge in a specific area. Business owners will also benefit from the flexibility these lectures offer them to provide specific continuous education to their workforce.

All lectures are fully narrated and range from 20 to 90 minutes. Lectures can be enrolled in and taken at any time, and there is no waiting period for enrollment. Even though the student is not part of a specific class, each will still have access to a monitor for questions for the duration of the lecture access window.

Enroll in lectures at any point. Select the topics you want to learn about.

WBA Specialized Lectures (see available online lectures)

Complete modules to receive certificate that follows.

**INTERMEDIATE COURSE**

May be needed as a prerequisite, depending on prior brewing knowledge and experience.

- Concise Course in Brewing Technology

**ADVANCED PROGRAMS**

B and C may be prerequisites, depending on prior brewing knowledge and experience.

- WBA Specialized Lectures (see available online lectures)
- WBA Raw Materials and Wort Production Module
- WBA Beer Production and Quality Control Module
- WBA Packaging and Process Technology Module

**REACH OUT TO LEARN MORE & SIGN UP**

WBA LectureSeries@siebelinstitute.com
AVAILABLE ONLINE LECTURES

SERIES 100
MALTING AND RAW MATERIALS
Adjuncts
Introduction to Hops
Hops – Types and Forms
Structure and Morphology of Barley
Biochemical Changes in Barley
Evaluation for Malting
Malting Process – Steeping
Malting Process – Germination
Malting Process – Kilning
Evaluation of Malt – The Maltster’s View
Evaluation of Malt – The Brewer’s View
Hops: Chemistry and Analysis – Storage and Stability
Hop Character and Advanced Hop Products
Brewing Water Composition
Brewing Water Adjustments

SERIES 200
BREWHOUSE
Brewery Hazards
Milling
Wort Separation – Lautering
Mash Filters
Wort Boiling
Brewing Calculations – Mixing Formula
Recipe Formulation
Brewery Waste – Liquid and Solid Effluents
Brewhouse Cleaning and Sanitation
Hop Addition “Hot Side”
Mashing Enzymes
Mashing Techniques and Wort Composition
Wort Clarification
Wort Cooling and Aeration
Brewhouse Lab Analysis

SERIES 300
YEAST AND CELLARS
Yeast Physical Behavior
Fermentation Operations
Alternative Fermentation Techniques
Yeast – Flavor Compounds
Yeast Quality Measurement
Yeast Management – Handling Practices
Dry Yeast Production
Alternative Aging and Storage Techniques
Beer Filtration – Theory and Mechanisms
Beer Filtration – Filters and Operations
Centrifuges
Carbonation
Sterile Filtration

NEW LECTURES ARE CONTINUOUSLY BEING ADDED!
Stay up to date by visiting worldbrewingacademy.com

ENROLL BY EMAILING
WBA Lecture Series@siebelinstitute.com
AVAILABLE ONLINE LECTURES

SERIES 400
QUALITY ASSURANCE AND CONTROL
Introduction to Brewing Microbiology
Beer Spoilage Potential and Brewery Contaminants
Detection and Identification
Brewery CIP
Oxygen Control
Colloidal Stability
Flavor Stability
Beer Chemical Analyses
Interpretation of Beer Analysis
Comprehensive QA/QC Program
Beer Foam
Beer Color
Gushing Explained
Sensory Evaluation
Types of Taste Panels

SERIES 500
PACKAGING
Bottle Conditioning
Kegging Single Valve Keg
Draught Dispense
Principles of Canning
Packaging Operations Overview
Cask conditioning
Packaging Materials
Packaging Line Design and Flow
Glass Bottle and PET Technology
Empty Bottles and Crates
Inspection
Bottle Washing
Bottle Filling and Crowning
Technology
Pasteurization

SERIES 600
ENGINEERING
Brewery Design
Fluid Flow Fundamentals
Gases in a Brewery
Valves in a Brewery
Pumps in a Brewery
Steam Fundamentals
Principles of Heat Transfer
Glycol Fundamentals
Principles of Refrigeration
Materials of Construction
Basic Energy Calculations
Process Control and Automation
Hygienic Design
Introduction to PID
Liquid Processing

NEW LECTURES ARE CONTINUOUSLY BEING ADDED!
Stay up to date by visiting worldbrewingacademy.com

ENROLL BY EMAILING
WBALectureSeries@siebelinstitute.com
Siebel Institute of Technology offers some of the most comprehensive draught training in the industry. These two courses allow students to choose the level of training that meets their skill level, budget and goals. The courses offer a mix of technical theory and hands-on activities.

**CRAFT DISTILLING OPERATIONS AND TECHNOLOGY**

The Craft Distilling Operations and Technology course is designed to give students the critical information they need to create distilled spirits in a small-scale distillation environment. Students will learn the theory behind working successfully in small distillery operations as well as related management, logistical and marketing issues.

**START YOUR OWN BREWERY COURSE**

The Start Your Own Brewery course presents issues that every prospective brewery or brew pub owner should know to help plan and build a successful business from the ground up, while avoiding common pitfalls and mistakes that can compromise the efficiency and profitability of the business.
MASTER OF BEER STYLES AND EVALUATION COURSE
The Master of Beer Styles and Evaluation course is designed to offer professional brewers, home brewers, as well as beer hobbyists, the needed knowledge of beer styles in order to formulate and brew beers to style, and to evaluate and judge beer recipes. The first day involves a deep dive into all things sensory, to understand what causes certain flavor and aromatic compounds. After, the remaining 3-days is spent delving into worldwide beers styles, the evolution of these styles, and tastings to recognize the characteristics of these beers.

SENSORY PANEL MANAGEMENT COURSE
The first line of quality control and product evaluation in any brewery is formed by a trained taste panel. This course instructs you in the tools and techniques essential to utilizing taste panels appropriately and collecting and analyzing the results compiled from trained tasters, and taking the right actions based on the results, your brewery will improve quality, consistency and profitability.

ESSENTIAL QUALITY CONTROL COURSE
The Essential Quality Control course provides the basic fundamental knowledge necessary to achieve the highest levels of consistency and quality within your brewery or brew pub. In line with any successful quality program, this course includes: implementing comprehensive sensory evaluation, using basic instrumentation, and following proper and accepted methods of the ASBC.

BREWING MICROBIOLOGY COURSE
The Siebel Institute Brewing Microbiology course is designed to provide the theoretical knowledge and practical skills required to implement an effective microbiological quality control / quality assurance program. The course will acquaint the student with the appropriate methods for biological and sanitary control within the brewery, and will promote an understanding of the essential modern-day tools for effective microbiological evaluation of process and product.

LEARN MORE ONLINE
siebelinstitute.com
worldbrewingacademy.com
CONTACT INFORMATION

www.lallemandbrewing.com
brewing@lallemand.com

If you have questions, do not hesitate to contact us at brewing@lallemand.com. We have a team of technical representatives happy to help and guide you in your fermentation journey.

Follow us on Facebook, Instagram, Youtube and LinkedIn: @LallemandBrewing

WE BREW WITH YOU.
Lallemand’s newest smartphone application provides brewers with tools to help perfect their brews.

WE BREW WITH YOU.