PRODUCT CATALOG

Advancing fermentation. Cultivating community.

V.10.3

ESTD 1995
WHITE LABS
PURE YEAST & FERMENTATION

What began as homebrewers searching for higher quality yeast quickly grew into a team of dedicated biochemists exploring new ways to advance brewing altogether.

Today, White Labs stands at the intersection of science, education and craft. Constantly striving for perfection, and in the process continually raising the bar in the art of fermentation.

Every day, we set out on a single mission: to stretch the limits of science in order to set new standards in purity and freshness.

From the industry's first pitchable liquid yeast, to a complete revolution in the way it's propagated and packaged, our innovative spirit is tireless.

Our belief is that creating the best products goes hand-in-hand with making the best use of them. This has inspired a culture of education and collaboration with brewers, distillers and winemakers the world over.

At White Labs, our core business is making pitchable yeast for beer, wine, cider and spirits. We also supply third party testing, conduct educational seminars and consult on a variety of topics for these industries. It all started in 1995 with a hobby of homebrewing and the simple desire to make something better.

I was lucky to befriend other homebrewers who would become some of the world's greatest professional brewers, and they needed a better supply of yeast at a time when pure cultures were not readily available. Yeast is easy to make but very hard to make well, and any imperfections can be detected, which makes using fresh cultures extremely important.

As a graduate student at the University of California, San Diego, I was working in a yeast lab so my homebrewing friends would ask me to make a little brewer's yeast on the side. When I graduated with a Ph.D. in biochemistry, I never looked back and started White Labs in 1995. Today we have more than 150 employees, and offices in San Diego, CA; Asheville, NC; Copenhagen, Denmark and Hong Kong, China.

I hope we have the opportunity to serve you.

Chris White, Ph.D.
Founder, President & CEO
White Labs, Inc.

ABOUT WHITE LABS

White Labs' mission is to make the best liquid yeast, services and education accessible to professionals and enthusiasts across all fermented food and beverage industries. Since 1995, White Labs has been devoted to providing you with the best in yeast, nutrients, enzymes, education and analytical testing. We are committed to giving you the highest quality liquid yeast cultures and being your partner in creating the best products possible. We are enthusiastic about the science of brewing, winemaking, cider making and distilling.

THE WHITE LABS DIFFERENCE

At White Labs, our team is committed to helping foster the science and creativity that propels our industry. We cultivate a community whose boundaries are limitless and enrich those ambitions by providing our customers with the best possible products and services. We encourage collaboration and innovation within our company and throughout the industry.

PERFORMANCE

- White Labs yeast boasts a high concentration of liquid yeast.
- Yeast is propagated in all-malt wort which provides the perfect nutrients for growth and performance.
- Cultures are grown in small batches over a 17-day period to ensure the yeast is in optimal physiological condition for the highest viability.
- White Labs is inspected by the Food and Drug Administration as a registered facility and participates in good manufacturing practices.
- Yeast passes through 61 quality check points during the production cycle and analysis results are available through a Certificate of Laboratory Analysis report available online for each batch.
- Yeast is stored in temperature-controlled environments from production to packaging and shipping.

INNOVATION

- White Labs yeast is cultivated through our patented FlexCell™ technology, which allows liquid yeast to be grown and delivered in the same package.
- The industry's first pitchable yeast is delivered in our innovative PurePitch®
- An in-house Research & Development team conducts trials, generates data and implements ideas, based on the feedback provided by YOU—our valued customers.
- The White Labs app and yeastman.com offer convenient, one-of-a-kind ordering by providing inventory information and instant availability of our many strains.
- Our four vesssel brewhouse allows us to experiment and gain firsthand fermentation data on our strains to share with our customers.

SUPPORT

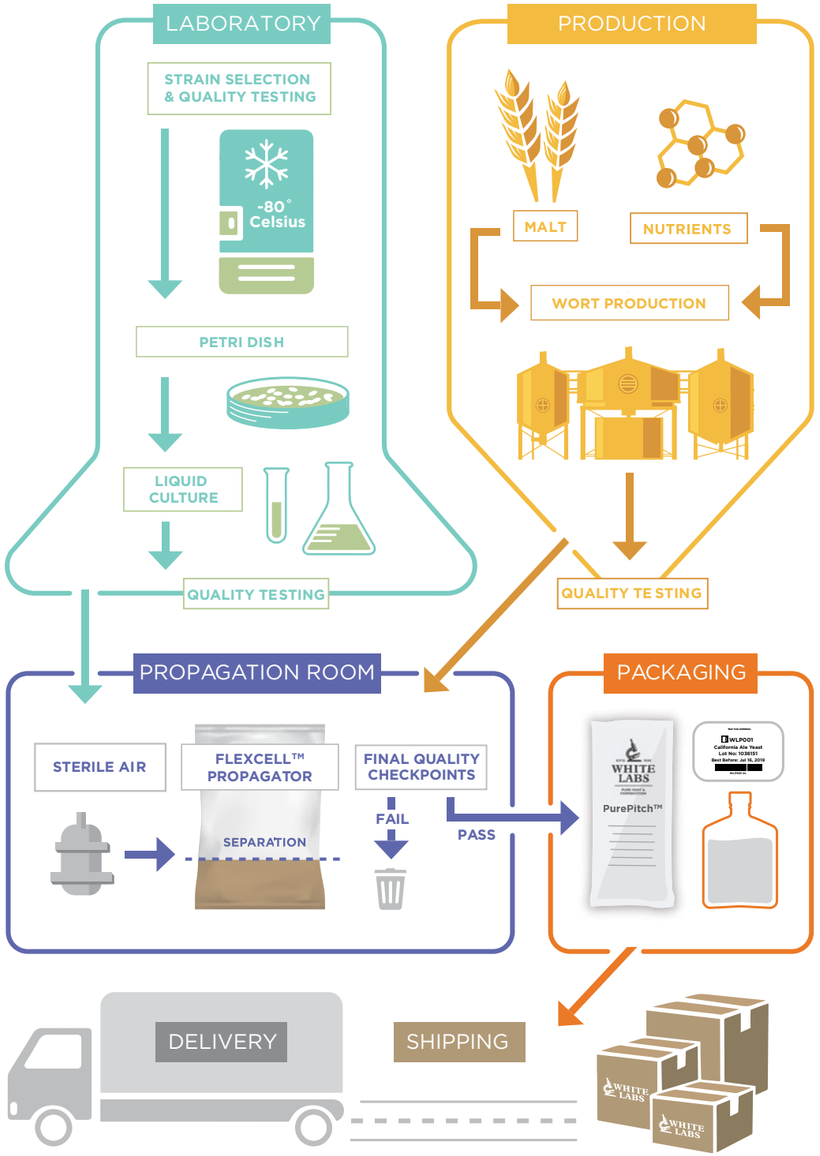
- The White Labs team is accessible and eager to assist you—whether it's placing an order or a technical support question.
- Employees are microbiologists, brewers, educators and members of many industry trade organizations and are available to answer a range of questions for any skill level.
- White Labs proudly sponsors industry events and are often presenters on topics relating to yeast, brewing, homebrewing and microbiology.
- Educational workshops are held throughout the year and cover a variety of topics in locations around the world.
- White Labs offers third-party, TTB-certified analytical testing that is independent of the White Labs internal yeast production laboratory.

White Labs Brewing Co.

In 2015, White Labs invested in a four vessel brewhouse that provides all-malt wort to propagate our yeast cultures. The brewery also supplies beer for our San Diego Tasting Room, as well as our restaurant in Asheville, NC, White Labs Kitchen & Tap. The brewhouse allows us to experiment and gain firsthand fermentation data on our strains. That data is published on our website and translated in the information we provide our professional and homebrewing customers.

Our Process

White Labs' comprehensive 17-day process ensures you are getting the highest quality yeast.



Key Quality Checkpoints

LABORATORY
- Ensure stock culture purity and performance

BREWHOUSE
- Wort FAN
- Wort and H_2O sterility
- Adequate vitamins and minerals
- SRM, pH and gravity

YEAST PRODUCTION
- Percent attenuation and pH
- Cell concentration and viability
- Propagation temperature
- Continuous automated monitoring of propogation specifications

LABORATORY
- Multiple testing points for detection of aerobic, anaerobic bacteria, wild yeast, and *S. cerevisiae* var. *diastaticus*

YEAST PACKAGING
- Yeast remains below 55°F/13°C throughout packaging process
- Final verification of packaging specifications
- Verify freshness specifications
- Lot retainer pack stored for 6 months

PurePitch®

The process for cultivating pure yeast cultures had not changed much since Emil Christian Hansen isolated the first brewers yeast and developed a process for propagation in the late 1880s. Soon after White Labs began producing liquid yeast, we embarked on a journey to revolutionize the art of fermentation. We believed there was a better way to propagate yeast that could reduce our company's environmental footprint while creating a streamlined process that would provide a better quality culture.

Our team developed the FlexCell™ process which uses proprietary patented technology to cultivate the yeast. Rather than the traditional method of transferring the finished yeast to a number of vessels and ultimately into our commercial packaging, with the FlexCell™ process we use a flexible container to propagate the yeast, and package it in this same material. This process reduces the risk of contamination and creates yeast that has had limited exposure to the environment.

In addition to creating the industry's first pitchable yeast grown and delivered in the same package, White Labs is demonstrating our commitment to sustainability by reducing water, electricity and cleaners used to sanitize traditional propagation vessels during the transfer process and reducing our overall use of rigid plastic packaging material. The PurePitch® package is more recyclable and more breathable reducing the chance of gas buildup and maintaining a favorable environment for the yeast. The FlexCell™ process and PurePitch® package delivers the purity and high-quality yeast that you expect from White Labs.

Why Liquid Yeast?

Through our Research & Development team, White Labs has done extensive research on the differences between dry yeast and liquid yeast. Yeast contributes more than 500 flavor and aroma compounds and the use of lab-grown, high-quality liquid yeast creates a cleaner more complex final product. All White Labs yeast comes with a guarantee that each culture has met our strict quality control standards.

LIQUID YEAST

- Highest possible purity
- Enhanced esters
- More concentrated yeast pack
- Higher viability after fermentation
- Multiple generational use
- Higher flocculation

DRY YEAST

- Higher fusel alcohols and acetaldehydes
- Phenolic characteristics possible
- Lower viability and flocculation
- Muted flavor and aromas
- Decrease in purity

INDUSTRY OFFERINGS

Beer

White Labs started by making liquid yeast for homebrewers and then quickly grew to offer the same liquid yeast to professionals. White Labs offers the following products and services to brewing customers:

- Liquid yeast, including wild yeast and bacteria
- Test kits
- Enzymes and nutrients
- Consulting services
- Private strain banking
- Educational workshops
- TTB beer-certified analytical laboratory tests and services
- Online resources and information
- Laboratory equipment and supplies

Wine/Mead/Cider

White Labs is one of the largest producers of liquid wine yeast in America, offering a number of strains for all varietals, as well as strains for the production of mead and cider. We offer the following products and services to customers in the wine, mead and cider making community:

- Liquid yeast
- Test kits
- Malolactic cultures
- Consulting services
- Enzymes and nutrients
- Educational workshops
- Analytical laboratory tests and services
- Online resources and information
- Laboratory equipment and supplies
- Private strain banking

Spirits

White Labs provides many options to distillers, whether it's one of our fresh liquid yeast cultures or one of the dry distillers yeast products that we distribute. We offer the following products and services to customers in the spirits community:

- Liquid yeast
- Enzymes and nutrients
- Dry distillers yeast
- Consulting services
- Analytical laboratory tests and services
- Educational workshops
- Private strain banking

Kombucha

White Labs has grown its offerings for kombucha producers to include:

- WLP600 Kombucha SCOBY
- Consulting services
- Private strain banking
- Analytical laboratory tests and services
- Educational workshops

CULTIVATING COMMUNITY

White Labs is passionate about fermentation and the industries we serve, but we are equally as passionate about causes, community involvement and non-profits that seek to educate the public on causes that we feel strongly about. White Labs proudly supports a wide-range of organizations by donating to various causes. Below are some organizations that we support through monetary donations or donation of goods and services. We also accept donation requests, please visit whitelabs.com/donations for more information.

Beer for Boobs

Founded in 2008 by White Labs Vice President Lisa White, Beer for Boobs is a non-profit whose mission is the create a positive relationship with the brewing community and compassionate business to promote breast cancer awareness and financially support cancer research and recovery organizations like Susan G. Komen and The American Cancer Society. The White Labs Tasting Room in San Diego and White Labs Kitchen & Tap routinely have pink beer on tap that support Beer for Boobs, in addition to fundraising pint nights. To find out more and get involved, visit beerforboobs.org.

JDRF

JDRF is leading the fight against type 1 diabetes (T1D) by funding research, advocating for policies that accelerate access to new therapies, and providing a support network for millions of people around the world impacted by T1D. Each year, White Labs employees join in fundraising through participation of JDRF One Walk. To learn more and get involved, visit jdrf.org.

Pink Boots Society

The Pink Boots Society was created to assist, inspire and encourage women beer industry professionals to advance their careers through education. Many White Labs employees are active members and White Labs is proud to contribute monetary funds as well as donation of goods and services to Pink Boots Society. To learn more and get involved, visit pinkbootssociety.org.

Habitat for Humanity

Habitat for Humanity is a global non-profit housing organization working in local communities across all 50 states in the U.S. and in approximately 70 countries. White Labs employees have donated their time to build housing for local families in the areas where we do business. To learn more and get involved, visit habitat.org.

PRODUCTS

The heart of White Labs is our yeast offerings, knowledge and support. Our library of strains has been built through a variety of means–from breweries to yeast banks around the world. The yeast is kept cryogenically frozen maintaining the integrity of the original sample. White Labs' strains are categorized as either Core Strains, Vault Strains or Private Strains.

PACKAGING OPTIONS

White Labs offers two packaging options for homebrewers and professionals. The development of PurePitch® was, and still is, an industry-changing advancement that we are very proud to have accomplished. We ship a majority of our yeast in PurePitch®; however, we still have traditional packaging for some of our strains.

White Labs PurePitch®

White Labs boasts a high concentration of liquid yeast, thanks to our patented FlexCell™ technology and PurePitch® packaging. The yeast contained and delivered using these innovations are propagated in all-malt wort, providing the perfect nutrients for growth and optimal performance.

Homebrew

Retailers and homebrewers will see two packaging options depending on the strain. Our Core Strains are packaged in PurePitch®, while our Vault strains and some blends are packaged in traditional vials.

Professional

Professionals have two ordering options, PurePitch® or Custom Pour. If you select the PurePitch® packaging option while ordering, we may send you multiple PurePitch® packages or deliver your order in sterile containers, which we refer to as Custom Pour, based on our current package offerings for that strain. Blended strains are packaged as Custom Pour, as well as wild yeast and bacteria and some small batch strains.

Private and Vault Strains are packaged as Custom Pour and require a minimum order of 1.5L for *Saccharomyces* strains and 1L unconcentrated for wild yeast and bacteria.

CORE STRAINS

White Labs Core Strains are grown weekly with a production lead time of one to 17 days. The Core Strains are available to professionals, retailers and homebrewers.

Organic Strains

In September of 2019, White Labs Copenhagen announced that all strains produced in our Copenhagen facility are now 100% certified Organic and available to our White Labs customers. Globally, White Labs is committed to understanding the impact that we, and the industry as a whole, have on the environment. That's why it is important for us to offer 34 organic yeast strains for our customers making organic beer, wine, cider and spirits.

STYLE RECOMMENDATION

- ALE
- LAGER
- CIDER
- WINE
- SPECIALTY & BELGIAN
- SPIRITS
- MEAD
- KOMBUCHA
- WILD YEAST & BACTERIA
- ORGANIC

ALCOHOL TOLERANCE

- **LOW: 2-5%**
- **MEDIUM: 5-10%**
- **MEDIUM TO HIGH: 8-12%**
- **HIGH: 10-15%**
- **VERY HIGH: OVER 15%**

STA1+: This strain has been genetically typed in our lab using polymerase chain reaction (PCR). Through this genetic testing, we have determined this strain to contain the STA1 gene (glucoamylase), a potential indicator of *Saccharomyces cerevisiae* var. *diastaticus*. Brewers yeast are natural hybrids, which make it possible for certain strains to display elements of the STA1 gene. These strains have the ability to utilize some dextrins (unfermentable sugars), resulting in higher levels of attenuation than what is considered typical. At White Labs, we do everything possible to detect for undesired organisms within our process and cultures. The strains we carry with known *Saccharomyces cerevisiae* var. *diastaticus* genetics have been researched and validated to perform without excessive over-attenuating, which is possible through our nearly 25 years of experience paired with internal and external fermentation data. To learn more about *Saccharomyces cerevisiae* var. *diastaticus* and access the most up-to-date list, visit whitelabs.com/diastaticus.

ALE YEAST

WLP001 | California Ale Yeast®

This strain was the first yeast strain produced by White Labs in 1995. It's our best-selling yeast, famous for its clean flavors and hardy fermentations. Known for its use in hoppy beers, it accentuates hop flavors and aromas and attenuates well, even for high gravity beers. This strain has the ability to be used in almost any style of ale ranging from IPA to porter and even kölsch, which makes it a great all-around house strain.

Attenuation: 73–80%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 68–73°F (20–23°C)

WLP002 | English Ale Yeast

This is a classic ESB strain from one of England's largest independent breweries. While it is traditionally used for English-style ales including milds, bitters, porters, and stouts, it is also ideal for American-style pale ales and IPAs. Residual sweetness accentuates malt character along with mild fruity esters, adding complexity to the flavor and aroma of finished beers. Slight diacetyl production is common. Due to this strain's high flocculation, the beer will finish clear and the yeast can easily be harvested from the fermenter for future use. It is common for this yeast to look coagulated.

Attenuation: 63–70%
Alcohol Tolerance: Medium
Flocculation: Very High
Optimum Fermentation Temperature: 65–68°F (18–20°C)

WLP004 | Irish Ale Yeast

This yeast is from one of the oldest stout-producing breweries in the world. It's great for many beer styles but really shines in malty British styles such as stouts, porters and brown ales. Medium attenuation helps with a dry finish that promotes roasty notes. Esters help round out the overall flavor making a soft drinkable stout.

Attenuation: 69–74%
Alcohol Tolerance: Medium to High
Flocculation: Medium to High
Optimum Fermentation Temperature: 65–68°F (18–20°C)

WLP005 | British Ale Yeast

Known for its use in malty English beers, this strain is a great choice for any beers using traditional English malts like Marris Otter, Golden Promise or floor malted barley. This strain will push bready, grainy malt flavors while being a mild ester producer.

Attenuation: 67–74%
Alcohol Tolerance: Medium
Flocculation: High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP007 | Dry English Ale Yeast

This yeast is known for its high attenuation, achieving 80% even with 10% ABV beers. The high attenuation eliminates residual sweetness, making the yeast well-suited for high gravity ales and clean, well-attenuated beer styles. This strain has become a go-to house strain for American breweries due to its clean profile and high attenuation. It's an ideal strain for American and English hoppy beers as well as malty ambers, porters and brown ales. This strain can be a substitute for WLP001 California Ale Yeast®.

Attenuation: 70–80%
Alcohol Tolerance: Medium to High
Flocculation: Medium to High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP008 | East Coast Ale Yeast

This strain can be used to reproduce many American versions of classic beer styles but has been gaining popularity for its use in East Coast IPAs. It is cleaner and crisper than other haze producing strains. It possesses the similar neutral character of WLP001 California Ale Yeast® with slightly higher ester production. This strain's attenuation leaves some mouthfeel and residual sweetness which balances hop bitterness. It's a great all-around strain for balanced, accessible beer styles such as blondes, pale ales and amber ales.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: Low to Medium
Optimum Fermentation Temperature: 68–73°F (20–23°C)

WLP013 | London Ale Yeast

Oak ester character makes this yeast well-suited for classic British beer styles such as pales and bitters, or dark malty beers like brown ales and porters. Medium flocculation characteristics allow attenuation up to 75% leaving beer dry while adding malt complexity and pushing hop bitterness. If you love WLP001 California Ale Yeast®, give this strain a try as it has more character.

Attenuation: 67–75%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 66–71°F (19–22°C)

WLP023 | Burton Ale Yeast

This strain is sourced from Burton upon Trent, England which is known for pushing IPAs into the spotlight. It produces a subtle fruity ester profile which can be described as notes of apple, clover honey and pear. A background sulfur note is common with this strain. Great for use in hoppy American and English styles such as pale ales, bitters and ambers. Can also be an alternative to WLP001 California Ale Yeast®.

Attenuation: 72–78%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68–73°F (20–23°C)

WLP028 | Edinburgh Scottish Ale Yeast

This strain produces underlying esters of pear and melon which work well with hop and malt derived notes. It's medium to high alcohol tolerance is well-suited for strong Scotch-style ales or barleywine beers. This is a versatile strain that can be neutral at the low end of the recommended fermentation temperature range or provide more esters at the higher range.

Attenuation: 70–75%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP029 | German/Kölsch Ale Yeast

Sourced from a small brewpub in Cologne, Germany, this strain is fitting for German ales such as kölsch and altbier. Known for accentuating hop flavor and bitterness while creating crisp, clean lager like characters, it performs exceptionally well at temperatures ranging from 65° to 69°F (18-20°C) and does not ferment well below 62°F (17°C) after peak fermentation. Typically has low flocculation characteristics after the first generation.

Attenuation: 72–78%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 65–69°F (18–21°C)

WLP036 | Düsseldorf Alt Ale Yeast

A traditional altbier-style yeast from Düsseldorf, Germany. It produces clean, malty German brown and amber ales. This strain keeps the contribution of hop bitterness in the background while promoting sweet malt notes.

Attenuation: 65–72%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 65–69°F (18–21°C)

ALE YEAST

WLP041 | Pacific Ale Yeast

Hailing from the Pacific Northwest, this strain is a mild ester producer while promoting malt character. It can be used for a range of styles from an English mild to an American IPA or Irish stout. A great flocculator, it leaves a clear beer and saves on conditioning time.

Attenuation: 72–78%
Alcohol Tolerance: Medium
Flocculation: High
Optimum Fermentation Temperature: 65–68°F (18–20°C)

WLP051 | California V Ale Yeast

This strain has more similarities to an English strain than WLP001 California Ale Yeast®. It is a big ester producer, showcasing notes of cherry and apple which compliment pale ales, blonde and brown ales. Typically leaves some residual, lager-like sulfur compounds in finished beer. Recent sequencing studies show that this strain belongs to *Saccharomyces pastorianus* species, the same hybrid species as most lager strains. However, this strain has been used to make ales for decades and was previously categorized as belonging to *Saccharomyces cerevisiae*.

Attenuation: 72–78%
Alcohol Tolerance: Medium to High
Flocculation: Medium to High
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP060 | American Ale Yeast Blend

This blend of three strains creates a clean and neutral fermentation character, making it ideal for use in many different American beer styles. The blend lends complexity to finished beer by exhibiting a crisp, clean lager-like character with accentuated hop flavors and bitterness. A slight amount of sulfur can be produced during peak fermentation.

Attenuation: 72–80%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 68–72°F (20–22°C)

WLP066 | London Fog Ale Yeast

This is the go-to strain for New England-style IPAs. It produces a medium ester profile similar to WLP008 East Coast Ale Yeast. It leaves some residual sweetness, helping accentuate both malt and hop flavors and aromas, while retaining a velvety mouthfeel.

Attenuation: 75–82%
Alcohol Tolerance: Medium to High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 64–72°F (17–21°C)

WLP067 | Coastal Haze Ale Yeast Blend

STA1+ This blend of our favorite New England-style IPA strains is great for producing beers with a hazy appearance and tropical, fruit-forward esters. Producing dry, yet juicy beers, the mango and pineapple characteristics will lend to added drinkability.

Attenuation: 75–82%
Alcohol Tolerance: Medium to High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 68–72°F (20–22°C)

ALE YEAST

WLP080 | Cream Ale Yeast Blend

A blend of ale and lager yeast, this strain produces a classic cream ale. The blend produces a pleasing light fruity note from the ale yeast, while the lager strain produces clean pilsner-like flavors and a slightly subdued hop bitterness. This blend is known for producing subtle sulfur during primary fermentation.

Attenuation: 75–80%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 65-70°F (18-21°C)

WLP090 | San Diego Super Yeast

A low ester producing strain, it's known for quick fermentations and producing a neutral flavor and aroma profile similar to WLP001 California Ale Yeast®. Due to high attenuation, this strain produces very dry beers with increased perceived bitterness. It also has a high alcohol tolerance which is suitable for a variety of styles and beverages from double IPAs to barleywines, ciders and mead. This is a great all around house strain and ideal for breweries who produce hop-forward beers.

Attenuation: 76–83+%
Alcohol Tolerance: High
Flocculation: Medium to High
Optimum Fermentation Temperature: 65-68°F (18-20°C)

WLP095 | Burlington Ale Yeast

This yeast is the signature strain for a brewery in the Northeast United States, making it ideal for New England-style IPAs. Adding personality to your beer by contributing esters and body, this strain will blend with hop flavors and aromas while balancing bitterness. Esters are higher than WLP001 California Ale Yeast® and this strain has been known to result in more diacetyl increasing the temperature at the end of fermentation is suggested.

Attenuation: 75–80%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 66-72°F (19-22°C)

WLP099 | Super High Gravity Ale Yeast

STA1+ From England, this yeast can ferment up to 25% alcohol when used correctly. It produces ester characters that increase with increasing gravity. Malt character dominates at lower gravities. To achieve >25% ABV, sugar needs to be fed over the course of the fermentation.

Attenuation: 80–100%
Alcohol Tolerance: Very High
Flocculation: Medium
Optimum Fermentation Temperature: 65-68°F (18-20°C)

SPECIALTY & BELGIAN

WLP300 | Hefeweizen Ale Yeast

This popular German strain is used in the production of traditional, authentic hefeweizen. It produces a high level of isoamyl acetate, giving the resulting beer notes of banana. With balanced phenol production, this strain produces notes of clove but remains banana forward. Low flocculation leaves the desired cloudy look, appropriate for the German wheat beer style.

Attenuation: 72–76%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 68-72°F (20-22°C)

WLP320 | American Hefeweizen Ale Yeast

This strain ferments much cleaner than it's hefeweizen strain counterparts. It produces very slight banana and clove notes and has low flocculation, leaving resulting beers with characteristic cloudiness.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 65-69°F (18-21°C)

WLP351 | Bavarian Weizen Yeast

STA1+ This is former Yeast Lab W51, the description originally used by Yeast Lab still fits: "This strain produces a classic German-style wheat beer, with medium to high spicy phenolic overtones reminiscent of cloves."

Attenuation: 75–82%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 66-70°F (19-21°C)

WLP380 | Hefeweizen IV Ale Yeast

This strain produces pronounced clove-like phenols present in the aroma and flavor while keeping banana flavors and aromas to a minimum. Refreshing citrus and apricot notes create a crisp, drinkable hefeweizen. This strain has low flocculation and minor sulfur production.

Attenuation: 73–80%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 66-70°F (19-21°C)

WLP400 | Belgian Wit Ale Yeast

This strain is the pinnacle yeast for Belgian witbiers or white ales. High phenol production contributes an herbal aroma and flavor notes which blends well with herb and fruit adjuncts. Expect nearly 80% attenuation and a slightly lower resulting pH than English or American ale strains creating a dry beer.

Attenuation: 74–78%
Alcohol Tolerance: Medium
Flocculation: Low to Medium
Optimum Fermentation Temperature: 67-74°F (19-23°C)

WLP410 | Belgian Wit II Ale Yeast

A fairly clean strain with medium intensity and spice-like phenol production. With up to 75% attenuation, this strain produces a residual malt character. It helps balance any adjuncts resulting in increased drinkability. Slightly lower resulting pH than English or American ale strains, it creates a slightly tart refreshing beer. This strain is ideal for witbiers or Belgian table beers.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: Low to Medium
Optimum Fermentation Temperature: 67-74°F (19-23°C)

WLP500 | Monastery Ale Yeast

Sourced from a Belgian monastery, this strain is ideal for Belgian quads, tripels and dubbels due to its high alcohol tolerance. It produces characteristic notes of plum and cherry with a hint of bubble gum. Lower fermentation temperatures (65-67°F/18-19°C) result in less fruity and more earthy beers.

Attenuation: 75–80%
Alcohol Tolerance: High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 65-72°F (18-22°C)

WLP510 | Bastogne Belgian Ale Yeast

A high-gravity ale yeast that produces a dry beer with a slightly acidic finish. While fruit forward, this strain is mild on spice-like phenols. With a high alcohol tolerance upwards of 15% ABV, this strain is great for any Belgian styles ranging from a table beer to a dark strong ale.

Attenuation: 74–80%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 66-72°F (19-22°C)

WLP518 | Opshaug Kveik Ale Yeast

Sourced from our friend Lars Marius Garshol, this kveik strain was isolated from a mixed culture which belonged to Harald Opshaug, a farmhouse brewer in Stranda, Norway. This strain was originally used in the 1990s to produce several kornøl-style beers. It is a clean fermenting yeast and has tolerated temperatures up to 95°F (35°C) while finishing fermentation within three to four days. The hop-forward, clean characteristics of this strain make it ideal for IPAs and pale ales.

Attenuation: 70–80%
Alcohol Tolerance: Medium to High
Flocculation: High
Optimum Fermentation Temperature: 77–95°F (25–35°C)

WLP530 | Abbey Ale Yeast

This is a traditional Belgian abbey strain perfect for use in dubbels, tripels and Belgian strong ales due to its very high alcohol tolerance of up to 15% ABV. Produces cherry, plum and pear esters. Medium flocculation results in clear, drinkable beer.

Attenuation: 75–80%
Alcohol Tolerance: High
Flocculation: Medium to High
Optimum Fermentation Temperature: 66-72°F (19-22°C)

WLP540 | Abbey IV Ale Yeast

This strain produces balanced fruit aroma and flavor characters. It is ideal for abbey-style beers including dubbels, tripels and Belgian strong ales.

Attenuation: 74–82%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 66-72°F (19-22°C)

WLP545 | Belgian Strong Ale Yeast

STA1+ From the Ardennes region of Belgium, this classic yeast strain produces moderate levels of ester and phenolic characters, often described as dried sage and black cracked pepper. High attenuation results in a dry finish ideal for high gravity beers. This strain is recommended for dark strong ales, abbey ales and seasonal specialties like Belgian holiday ales.

Attenuation: 78–85%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 66-72°F (19-22°C)

SPECIALTY & BELGIAN

WLP550 | Belgian Ale Yeast

This very expressive strain produces phenol-forward flavors and aromas reminiscent of clove, allspice and peppercorns. It has medium to high alcohol tolerance and is ideal for many classic Belgian styles including saisons, witbiers, blondes and browns.

Attenuation: 78–85%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 68-78°F (20-26°C)

WLP565 | Belgian Saison I Ale Yeast

STA1+ A classic saison strain sourced from the Wallonia region of Belgium. This strain makes a classic saison by producing flavors and aromas noted as earthy, peppery and spicy. With attenuation averaging around 70 to 75%, some malt flavor will remain present. For best fermentation results, let this strain free-rise to allow for complete attenuation and production of the subtle, traditional aroma characteristics. With high gravity saisons, it's suggested to dry the beer with an alternate yeast (such as WLP001 California Ale Yeast®) added after 50 to 60% fermentation.

Attenuation: 78–85+%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68-85°F (20-30°C)

WLP566 | Belgian Saison II Ale Yeast

STA1+ This strain is a moderate phenol producer with clove-like flavor and aromatic notes present in finished beer. Some fruit-forward ester production provides a balance between fruit and spice aroma and flavors. This strain ferments and flocculates well, making it an easy-to-use option for saison and farmhouse ales.

Attenuation: 78–85%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68-85°F (20-30°C)

WLP568 | Belgian Style Saison Ale Yeast Blend

STA1+ This blend incorporates multiple Belgian and saison strains to produce pear-like esters backed by spicy, earthy and clove-like flavors and aromas. The cultures encourage complete fermentation in a timely manner and create harmony and complexity throughout its ester and phenol production.

Attenuation: 70–80%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68-85°F (20-30°C)

WLP570 | Belgian Golden Ale Yeast

STA1+ From East Flanders, this yeast is versatile in that it can produce low to high gravity Belgian beers up to 12% ABV. A combination of fruitiness and phenolic characteristics dominate the flavor profile. Some sulfur is produced during fermentation, which will dissipate following the end of fermentation.

Attenuation: 78–85+%
Alcohol Tolerance: High
Flocculation: Low
Optimum Fermentation Temperature: 68-75°F (20-24°C)

SPECIALTY & BELGIAN

WLP575 | Belgian Style Ale Yeast Blend

A blend of two monastery-type yeast strains and one Belgian ale-type yeast. This blend creates a versatile culture which can be used for monastery-style beers or a myriad of American-Belgian style beers.

Attenuation: 74–80%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 68-75°F (20-24°C)

WLP590 | French Saison Ale Yeast

STA1+ One of our most popular saison strains, it is great for farmhouse-style beers because it produces flavors and aromas of pear, apple and cracked pepper. This strain is a high attenuator producing a very dry and drinkable finishing beer.

Attenuation: 78–85+%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68-85°F (20-30°C)

WLP644 | *Saccharomyces* "bruxellensis" Trois

STA1+ This Belgian strain, traditionally used for wild yeast fermentations, produces a slightly tart beer with delicate mango and pineapple characteristics. This wild yeast has grown in popularity for styles like American IPA, American pale and blonde ales due to its tropical and stone fruit flavors and aromas. This *Saccharomyces* strain can be used like other house strains and can be easily clean with proper CIP procedures.

Attenuation: 85+%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 70-85°F (21-30°C)

LAGER YEAST

WLP800 | Pilsner Lager Yeast

A classic pilsner strain from the Czech Republic, this strain produces a clean, crisp beer that's somewhat dry with a malty finish. A to-style pilsner strain, this yeast is also well suited for thirst quenching lagers such as Munich Helles, dunkels and American lagers.

Attenuation: 72–77%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP802 | Czech Budějovice Lager Yeast

A pilsner lager yeast from southern Czech Republic, this strain produces dry and crisp lagers with low diacetyl production. With up to 80% attenuation, this strain will make a dry beer and showcase rounded hop bitterness. Low diacetyl production makes conditioning of this beer an ease.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP810 | San Francisco Lager Yeast

A unique lager strain because it can ferment at a wide range of temperatures—50 to 65°F (10–18°C)—while retaining lager-like characteristics. This strain is traditionally used to brew the California common or steam beer styles. At lower temperatures can also produce märzens, pilsners and Helles style lagers.

Attenuation: 70–75%
Alcohol Tolerance: Medium to High
Flocculation: High
Optimum Fermentation Temperature: 58-65°F (14-18°C)

WLP820 | Oktoberfest/Märzen Lager Yeast

This strain is ideal for producing malty lagers. Residual sweetness further helps promote malt nuances while contributing to a balanced finish. The first generation of this strain can be slow, so we encourage using a larger initial culture or scheduling longer fermentation and conditioning times. Great for lagers with a wide gravity range including bocks, doppelbocks, märzens, Oktoberfests and American amber lagers.

Attenuation: 65–73%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 52-58°F (11-14°C)

WLP830 | German Lager Yeast

Our most popular lager yeast, this strain is one of the most widely used lager strains in the world. It can be used in almost any lager style and tends to produce clean and crisp beers with some accentuation of hop characteristics.

Attenuation: 74–79%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP833 | German Bock Lager Yeast

From the Alps of southern Bavaria, this yeast produces a beer that is well-balanced between malt and hop character. The excellent malt profile makes it well suited for bocks, doppelbocks, and Oktoberfest-style beers. A very versatile lager yeast, it has gained tremendous popularity for use in classic American-style lagers.

Attenuation: 70–76%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 48-55°F (9-13°C)

WLP838 | Southern German Lager Yeast

This yeast is characterized by a malty finish, balanced aroma and great flocculation. It is a strong fermenter which produces slight sulfur and low diacetyl during fermentation. This strain benefits from a diacetyl rest and conditioning.

Attenuation: 68–76%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP840 | American Lager Yeast

This strain makes dry and clean lagers with a light note of apple fruitiness. Sulfur and diacetyl production is minimal making this strain easy to work with and fitting for American-style lagers.

Attenuation: 75–80%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP850 | Copenhagen Lager Yeast

This northern European lager strain emphasizes clean and crisp characteristics. Malt flavors tend to be secondary, promoting clean drinkability. It is ideal for Vienna, schwarzbier or American-style lagers.

Attenuation: 72–78%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50-58°F (10-14°C)

WLP1983 | Charlie's Fist Bump Yeast

Licensed from Charlie Papazian, this strain can ferment at both ale and lager temperatures, allowing brewers to produce diverse beer styles. The recipes in Papazian's books, "The Complete Joy of Homebrewing," "The Homebrewer's Companion," and "Microbrewed Adverntures," were originally developed and brewed with this yeast.

Ales: Optimum cellaring temperature: 50 to 55°F (10-13°C); altbiers can be cellared at lagering temperatures.

Lagers: Optimum cellaring temperature: 32 to 37°F (0-3°C)

ALES:
Attenuation: 72–78%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 68-74°F (20-23°C)

LAGERS:
Attenuation: 66–70%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 55-58°F (13-14°C)

WLP920 | Old Bavarian Lager Yeast

From Southern Germany, this yeast finishes malty with a slight ester profile. Use in beers such as Oktoberfests, bocks, and dark lagers.

Attenuation: 66–73%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WLP925 | High Pressure Lager Yeast

Used to ferment lager beer in one week. Ferment at room temperature; 62 to 68°F (17-20°C) under 1.0 bar (14.7 PSI) until final gravity is obtained, generally in one week. Lager the beer at 35°F (2°C), 15 PSI, for 3 to 5 days to condition. Sulfur production is strong the first two days, then disappears by day five.

Attenuation: 73–82%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 62-68°F (17-20°C)

LAGER YEAST

WLP940 | Mexican Lager Yeast

From Mexico City, this strain produces clean lager beers with a crisp finish. It keeps drinkability on the forefront while allowing malt and hop flavors and aromas to be background notes. A great strain choice for light-style lagers like Vienna-style.

Attenuation: 70–78%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50-55°F (10-13°C)

WILD YEAST & BACTERIA

WLP630 | Berliner Weisse Blend

A blend of German Weizen yeast and *Lactobacillus* bacteria to create a subtly tart, drinkable beer. This blend can take several months to develop tart character making it perfect for brewing a traditional Berliner Weisse.

Attenuation: 73–80%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68–72°F (20–22°C)

WLP645 | *Brettanomyces claussenii*

Originally isolated from strong English stock beer in the early 20th century, this yeast has low-intensity *Brettanomyces* character and is closely related to *Brettanomyces anomalus*. This strain produces fruity, pineapple-like aroma with an earthy hay-like background aroma and aroma note.

Attenuation: 70–85%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 85+°F (30+°C)

WLP648 | *Brettanomyces bruxellensis Trois Vrai*

The vrai (“true” in French) *Brettanomyces bruxellensis Trois*. This infamous strain should be used for primary fermentations due to its ability to highly attenuate. It has a robust, complex sour character with aromas of pear.

Attenuation: 85+%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 70–85°F (21–30°C)

WLP650 | *Brettanomyces bruxellensis*

A classic strain used for secondary fermentation in Belgian-style beers such as lambics. It creates a medium-intensity, earth-forward character in finished beer. A historic brewery in Belgium uses this yeast in secondary fermentation and bottling to produce the signature flavor of its beer.

Attenuation: 85+%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 85+°F (30+°C)

WILD YEAST & BACTERIA

WLP653 | *Brettanomyces lambicus*

This yeast produces a high intensity of the traditional *Brettanomyces* characters—horsey, smoky and spicy flavors—in beer. As the name suggests, this strain is found most often in lambic style beers but is also commonly found in Flanders and sour brown ales.

Attenuation: 70–85%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 85+°F (30+°C)

WLP655 | Belgian Sour Mix 1

A unique blend of *Brettanomyces* and *Saccharomyces* yeasts as well as bacterial strains *Lactobacillus* and *Pediococcus*. Perfect for duplicating traditional spontaneous fermentations similar to those found in Belgian-style ales.

Attenuation: 70–80%
Alcohol Tolerance: Medium to High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 80–85°F (27–29°C)

WLP661 | *Pediococcus damnosus*

Perfect for use in any sour program, this is a cocci bacteria known for its souring capabilities through the production of lactic acid. It is a high diacetyl producer and slow growing, so it’s suggested to use in a mixed culture.

Attenuation: N/A
Alcohol Tolerance: Varies
Flocculation: N/A
Optimum Fermentation Temperature: Varies

WLP670 | American Farmhouse Yeast Blend

STA1+ Inspired by American brewers crafting semi-traditional Belgian-style ales, this blend creates a complex flavor profile with a moderate level of sourness. It consists of a traditional farmhouse yeast strain and *Brettanomyces*.

Attenuation: 75–82%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 68–72°F (20–22°C)

WLP672 | *Lactobacillus brevis*

This is a rod-shaped *Lactobacillus* bacteria used for souring beers through either traditional or kettle souring techniques. This strain typically produces more lactic acid than strains like WLP677 *Lactobacillus delbrueckii*, making it an ideal addition to any sour program. Recommended usage is below 107°F (40°C).

Attenuation: N/A
Alcohol Tolerance: Varies
Flocculation: N/A
Optimum Fermentation Temperature: Varies

WILD YEAST & BACTERIA

WLP675 | Malolactic Cultures

Malolactic fermentation is the conversion of malic acid to lactic acid by bacteria from the lactic acid bacteria family. Lactic acid is less acidic than malic acid, which in turn decreases acidity and helps to soften and/or round out some of the flavors in wine.

Attenuation: N/A
Alcohol Tolerance: Very High
Flocculation: N/A
Optimum Fermentation Temperature: >70°F (>21°C)

WLP677 | *Lactobacillus delbrueckii*

This lactic acid bacteria produces moderate levels of acidity and sour flavors found in lambics, Berliner Weisse, sour brown ales and gueuze.

Attenuation: N/A
Alcohol Tolerance: Varies
Flocculation: N/A
Optimum Fermentation Temperature: Varies

KOMBUCHA

WLP600 | Kombucha SCOBY

A symbiotic culture of bacteria and yeast that is used for fermenting sweet tea into kombucha. White Labs' SCOBY is free of food pathogens and has been genetically identified to know specially what yeast and bacteria are involved in the fermentation of kombucha.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: 72°F (22°C)

WINE/MEAD/CIDER

WLP705 | Sake #7 Yeast

Produces a full-bodied character and subtle fruity esters. For use in rice-based fermentations; typically used in conjunction with koji (to produce fermentable sugar). This strain can also be used successfully in beer fermentations.

Wine Type: Sake
Alcohol Tolerance: 16%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: >70°F (>21°C)

WLP715 | Champagne Yeast

Classic yeast that is neutral in character, and a strong fermenter. Great for use in wine, cider and mead allowing the character of the fermentables to become prominent flavors.

Wine Type: Sparkling wine, cider, dry mead, dry wines
Alcohol Tolerance: 17%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 70-75°F (21-24°C)

WINE/MEAD/CIDER

WLP720 | Sweet Mead/Wine Yeast

Produces a slightly fruity flavor and aroma while leaving more residual sweetness than WLP715 Champagne Yeast. This strain will tolerate alcohol concentrations up to 15%.

Wine Type: Sweet mead, cider, blush wines, gewüztraminer, Sauterne, riesling
Alcohol Tolerance: 15%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 70-75°F (21-24°C)

WLP735 | French White Wine Yeast

Classic yeast for white wine fermentation, giving an enhanced creamy texture. Low foam producer.

Wine Type: White wine varietals
Alcohol Tolerance: 16%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 60-90°F (16-32°C)

WLP740 | Merlot Red Wine Yeast

STA1+ Neutral character, with low fusel-alcohol production. Ferments dry.

Wine Type: Merlot, shiraz, pinot noir, chardonnay, cabernet, sauvignon blanc, sémillon
Alcohol Tolerance: 18%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 60-90°F (16-32°C)

WLP775 | English Cider Yeast

Classic cider yeast that ferments dry, but retains the flavor from apples.

Wine Type: Dry cider
Alcohol Tolerance: 13%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 68-75°F (20-24°C)

VAULT STRAINS

White Labs Vault Strains are a collection of specialty strains. Availability depends on whether you are a professional, retailer or homebrewer. For a current list of strains and availability, please visit whitelabs.com/yeastbank.

STYLE RECOMMENDATION

- ALE
- LAGER
- CIDER
- WINE
- SPECIALTY & BELGIAN
- SPIRITS
- MEAD
- KOMBUCHA
- WILD YEAST & BACTERIA
- ORGANIC

ALCOHOL TOLERANCE

- **LOW: 2-5%**
- **MEDIUM: 5-10%**
- **MEDIUM TO HIGH: 8-12%**
- **HIGH: 10-15%**
- **VERY HIGH: OVER 15%**

STA1+: This strain has been genetically typed in our lab using polymerase chain reaction (PCR). Through this genetic testing, we have determined this strain to contain the STA1 gene (glucoamylase), a potential indicator of *Saccharomyces cerevisiae* var. *diastaticus*. Brewers yeast are natural hybrids, which make it possible for certain strains to display elements of the STA1 gene. These strains have the ability to utilize some dextrins (unfermentable sugars), resulting in higher levels of attenuation than what is considered typical. At White Labs, we do everything possible to detect for undesired organisms within our process and cultures. The strains we carry with known *Saccharomyces cerevisiae* var. *diastaticus* genetics have been researched and validated to perform without excessive over-attenuating, which is possible through our nearly 25 years of experience paired with internal and external fermentation data. To learn more about *Saccharomyces cerevisiae* var. *diastaticus* and access the most up-to-date list, visit whitelabs.com/diastaticus.

ALE YEAST

WLP003 | German II Ale Yeast

A great strain for clean ales such as kölsch, altbier, and German-style pale ales. It has a strong sulfur component that will reduce with conditioning. Lager-like in flavor, this strain ferments clean and produces subdued fruity esters which are more present than WLP029 German/Kölsch Ale Yeast.

Attenuation: 73–80%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP006 | Bedford British Ale Yeast

Ferments dry and flocculates very well; produces a distinct ester profile. This yeast yields a full mouthfeel, perfect for creating English-style ales, including bitters, pale ales, porters, stouts and browns.

Attenuation: 72–80%
Alcohol Tolerance: Medium
Flocculation: High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

ALE YEAST

WLP009 | Australian Ale Yeast

This yeast produces a clean, malty beer with pleasant ester characters that can be described as “bready.” It ferments successfully and cleanly at higher temperatures, combined with good flocculation and good attenuation.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP011 | European Ale Yeast

A malty northern European-origin ale yeast. Its low ester production gives it a clean profile, with little to no sulfur production. Low attenuation helps to contribute to the malty character. Good for altbiers, kölsch-style ales, malty English-style ales, and fruit beers.

Attenuation: 65–70%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP017 | Whitbread II Ale Yeast

Traditional mixed yeast culture with British character. Slightly fruity with a hint of sulfur production. This yeast can be used for many different beer styles. The most traditional choices would be English-style ales, including milds, bitters, porters, and English-style stouts. North American-style ales will also benefit from fermentation with this strain.

Attenuation: 67–73%
Alcohol Tolerance: Medium
Flocculation: High
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP019 | California IV Ale Yeast

Moderately clean strain with a low ester profile and less sulfur production than WLP051 California Ale Yeast.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP022 | Essex Ale Yeast

A flavorful British-style yeast that produces slightly fruity and bready characters. A good top-fermenting yeast strain that is well suited for top cropping. It is ideal for classic British-style milds, pale ales, bitters and stouts. Does not flocculate as much as other English strains.

Attenuation: 71–76%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP025 | Southwold Ale Yeast

From Suffolk County, England. This yeast produces complex fruit, citrus, and spice flavors. Great for British-style bitters and pale ales. A slight sulfur note is produced during fermentation, but disappears with aging.

Attenuation: 68–75%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 66–69°F (19–20°C)

WLP026 | Premium Bitter Ale Yeast

STA1+ From Staffordshire, England. Fermentation gives a mild but complex estery character. Ferments strong and dry and is good for high-gravity beers. Best for all English-style ales, including bitters, milds, ESBs, porters, stouts and barleywines.

Attenuation: 70–75%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 67–70°F (19–21°C)

WLP030 | Thames Valley Ale Yeast

Very flocculant strain for all things English. Great for porters, stouts and ESBs. Lower ester production than most English strains but creates a bigger mouthfeel than most cleaner strains.

Attenuation: 72–78%
Alcohol Tolerance: N/A
Flocculation: High
Optimum Fermentation Temperature: N/A

WLP033 | Klassic Ale Yeast

Traditional English single-strain yeast. Produces signature ester characters and does not mask hop flavors. Leaves ales with a slightly sweet malt character. Best for bitters, milds, porters and stouts. Also good for Scottish-style ales.

Attenuation: 66–74%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP037 | Yorkshire Square Ale Yeast

This yeast produces a beer that is malty and well balanced. Expect toasty flavors with malt-driven esters. Highly flocculent and a good choice for English-style pale ales, brown ales, and milds.

Attenuation: 68–72%
Alcohol Tolerance: Medium to High
Flocculation: High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP038 | Manchester Ale Yeast

STA1+ A top-fermenting ale yeast that is traditionally good for top-cropping. Moderately flocculent with a clean, dry finish. Has a low ester profile and produces a highly balanced English-style beer.

Attenuation: 70–74%
Alcohol Tolerance: Medium to High
Flocculation: Medium to High
Optimum Fermentation Temperature: 65–70°F (18–21°C)

WLP039 | East Midlands Ale Yeast

British-style ale yeast with a very dry finish. Low to medium fruit and fusel alcohol production. A good top-fermenting yeast strain well suited for top-cropping. A great choice for pale ales, ambers, porters and stouts.

Attenuation: 73–82%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP059 | Melbourne Ale Yeast

A yeast isolated from Australia in the early 1900s, it is a clean fermenting strain well suited for many American and English beer styles. Renowned Australian homebrewer, Peter Symon, researched this strain for his book *Bronzed Brews* and asked White Labs to acquire it from a yeast bank in London, England. This historic strain was used in Australia because of its ability to ferment well in the Australian climate and Australian cane sugar.

Attenuation: 74–78%
Alcohol Tolerance: N/A
Flocculation: Medium
Optimum Fermentation Temperature: N/A

WLP064 | Buchner Ale Yeast Blend

A blend of two strains that adds creaminess with a hint of crispness. Great for pale ales, cream ales and American wheats. Flocculation is good due to one of the strains being a heavy flocculator.

Attenuation: 72–78%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 67–72°F (19–22°C)

WLP075 | Hansen Ale Yeast Blend

This is a blend of many IPA strain favorites. It has the attenuation of WLP090 San Diego Super Ale Yeast and the character of WLP007 Dry English Ale Yeast. This strain produces dry, hop-forward beers with minor ester production and is blend is a great flocculator.

Attenuation: 75–80%
Alcohol Tolerance: High
Flocculation: Medium to High
Optimum Fermentation Temperature: 66-70°F (19-21°C)

WLP076 | Old Sonoma Ale Yeast

From a historic brewery in Northern California. This strain was embraced by the early pioneers of craft beer in America and is ideal for those seeking to use a traditional British-style yeast. A neutral and versatile strain, it is great for pale ales, porters, and stouts.

Attenuation: 70–74%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 66–70°F (19–21°C)

WLP085 | English Ale Yeast Blend

A blend of British ale yeast strains designed to add complexity and attenuation to your ale. Moderate fruitiness and mineral-like character, with little to no sulfur. Drier than WLP002 English Ale Yeast and WLP005 British Ale Yeast, but with similar flocculation properties. Suitable for English pale ales, bitters, porters, stouts and IPAs.

Attenuation: 69–76%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 68–72°F (20–22°C)

SPIRITS

WLP045 | Scotch Whisky Yeast

STA1+ A strain that has been widely used for Scotch whisky production since the early 1950s. This yeast produces a complex array of ester compounds and fusel oils, as well as some spicy clover character. Suitable for Scotch or American-style whiskeys.

Attenuation: 75-80%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 72-77°F (22-25°C)

WLP050 | Tennessee Whiskey Yeast

Suitable or American-style whiskeys and bourbons, this strain is famous for creating rich, smooth flavors. A clean and dry-fermenting yeast that will tolerate high alcohol concentrations (up to 15% ABV). Ester production is low.

Attenuation: 75-80%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 75-79°F (24-26°C)

WLP065 | American Whiskey Yeast

A yeast strain that produces a low ester profile and moderate fusel oils. It is temperature and alcohol tolerant and suitable for American-style whiskeys using barley or corn bases.

Attenuation: 76-82%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 75-82°F (24-28°C)

WLP070 | Kentucky Bourbon Yeast

From a traditional distillery in the heart of Bourbon Country, this strain produces a malty caramel character with a balanced ester profile. Suitable for bourbons or other American whiskeys with barley, rye, or corn base grains.

Attenuation: 75-80%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 72-77°F (22-25°C)

WLP078 | Neutral Grain Yeast

Marked by a clean, fast fermentation, this strain is ideal for any neutral grain spirit. Alcohol and temperature tolerant.

Attenuation: 77-84%
Alcohol Tolerance: High
Flocculation: Medium
Optimum Fermentation Temperature: 76-85°F (24-29°C)

SPECIALTY & BELGIAN

WLP072 | French Ale Yeast

A clean strain that complements malt flavor. Low to moderate esters are produced when fermentation temperature is below 70°F (21°C). Moderate to high ester character achieved above 70°F (21°C). Low diacetyl production. A good yeast strain for Bière de Garde, blondes, ambers, brown ales and specialty beers.

Attenuation: 68–75%
Alcohol Tolerance: Medium
Flocculation: Medium to High
Optimum Fermentation Temperature: 63–73°F (17–23°C)

WLP073 | Artisanal Country Ale Yeast

STA1+ A classic Bière de Garde strain, it produces slight esters and mild phenols, while preserving the sweet aromatics from the malt bill. This strain fully attenuates, leaving the beer with a crisp, dry finish.

Attenuation: 75–80%
Alcohol Tolerance: Medium to High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 70–82°F (21–27°C)

WLP515 | Antwerp Ale Yeast

Clean, almost lager-like Belgian type ale yeast. Good for Belgian type pale ales and amber ales, or with blends to combine with other Belgian type yeast strains. Biscuity, ale-like aroma present. Hop flavors and bitterness are accentuated. Slight sulfur will be produced during fermentation, which can give the yeast a lager-like flavor profile.

Attenuation: 73–80%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 67–70°F (19–21°C)

WLP519 | Stranda Kveik Ale Yeast

Stranda is a kveik strain owned by Stein Langlo from Stranda, Norway. Considered a “cleaner” kveik strain, Stranda can also produce a wide range of beer styles over a large temperature gradient. Ideal for use when you have little to no temperature control of your fermentation.

Attenuation: 75–85%
Alcohol Tolerance: Medium to High
Flocculation: Medium to High
Optimum Fermentation Temperature: 72–98°F (22–37°C)

WLP520 | Sigmund Kveik Ale Yeast

Sigmund is a Kveik strain shared by Sigmund Gjernes from Voss, Norway. Also known as Voss Kveik, this strain can produce earthy-like flavors with a touch of orange peel aromas.

Attenuation: 75–83%
Alcohol Tolerance: High
Flocculation: Medium to High
Optimum Fermentation Temperature: 72–98°F (22–37°C)

SPECIALTY & BELGIAN

WLP521 | Hornindal Kveik Ale Yeast

Hornindal is a Kveik strain shared to the world by Terje Raftevold from the village of Grodås in Norway. It produces an intense tropical flavor and aroma with notes of fresh tangerine, mango and pineapple, ideal to be used with fruit-forward hops.

Attenuation: 75–82%
Alcohol Tolerance: High
Flocculation: High
Optimum Fermentation Temperature: 72–98°F (22–37°C)

WLP561 | Non STA1son Ale Yeast

This blend of two STA1 negative strains produces a complex expression of esters and phenols great for saison and farmhouse-style beers without the concern of super-attenuation commonly found with STA1+ strains. Expect fruit-like notes from this strain ranging from lemon and tropical fruit to chamomile, as well as an array of spice-like phenolic driven aromas like pepper, clove, and coriander.

Attenuation: 78–85%
Alcohol Tolerance: High
Flocculation: Low
Optimum Fermentation Temperature: 68–78°F (20–26°C)

WLP564 | Leeuwenhoek Saison Yeast Blend

STA1+ A blend of two saison strains and a low phenolic Belgian strain developed for the White Labs brewed saisons. Approximately 85% attenuation which makes for a dryer saison. This strain has proved very versatile, creating spicy, dry and clean beers.

Attenuation: 76–82%
Alcohol Tolerance: High
Flocculation: Low
Optimum Fermentation Temperature: 66–75°F (18–24°C)

WLP546 | Marañón Canyon Wild Cacao

This yeast was isolated from the thought to be extinct Pure Nacional variety of cacao. In 2007, this rare variety with white beans was rediscovered in the remote Marañón River Canyon in Peru. The fruity, phenolic, and wild-like characteristics of this strain make it an ideal choice for farmhouse and saison-style beers. For faster fermentation or higher attenuation, use in conjunction with a higher attenuating strain such as WLP001 California Ale Yeast®, WLP550 Belgian Ale Yeast or WLP590 French Saison Ale Yeast.

Attenuation: 65–70%
Alcohol Tolerance: Medium
Flocculation: Low
Optimum Fermentation Temperature: 65–75°F (18–24°C)

WLP603 | *Torulaspora delbrueckii*

Wild yeast isolated from fruit trees in Denmark. This is one of the three strains that make up WLP611 New Nordic Ale Yeast Blend. This wild yeast has been used for ciders and wine but also ferments well for beer. Produces a lot of esters and contributes some phenolics as well. The yeast species *Torulaspora delbrueckii* is traditionally a longer fermentation and slower attenuator. This strain should be used in a mixed fermentation.

Attenuation: 30–50%
Alcohol Tolerance: Medium
Flocculation: Low to Medium
Optimum Fermentation Temperature: 50–86°F (10–30°C)

WLP611 | New Nordic Ale Yeast

Isolated from spontaneously fermented apples on a remote island off the coast of Denmark in the fall of 2009, this culture is a unique blend of three yeast strains (two belonging to *Saccharomyces cerevisiae* and one *Torulaspora delbrueckii*). Although originally thriving in the simple sugar fermentations such as wine and cider, this blend ferments maltose as well and has been used to make a series of true New Nordic Beers. This blend has a specific aroma profile, especially at higher temperatures, that resemble classic styles such as Belgian saison or German hefeweizen.

Attenuation: 65–75%
Alcohol Tolerance: Medium
Flocculation: Low to Medium
Optimum Fermentation Temperature: 50–86°F (10–30°C)

WLP616 | Funky Cider Blend

This is a blend of two *Saccharomyces* strains combined with some *Brettanomyces* and *Lactobacillus*. This blend results in a slight tartness and a mild funk aroma that will result in less than two weeks. Light pellicle will form because of the *Brettanomyces*.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP640 | *Brettanomyces anomalus*

Typical barnyard funk character with some fruitiness. Acidity is medium. Primary fermentation can be done with this strain, but a starter may be necessary.

Attenuation: 70–85%
Alcohol Tolerance: Medium to High
Flocculation: Low
Optimum Fermentation Temperature: 70–85°F (21–30°C)

WLP665 | Flemish Ale Blend

Blended culture used to produce the classic beer styles of the West Flanders region of Belgium. A proprietary blend of *Saccharomyces* and *Brettanomyces* yeasts with *Lactobacillus* and *Pediococcus* bacteria, this culture creates a more complex, dark stone fruit characteristic than WLP655 Belgian Sour Mix 1.

Attenuation: 80–85%+
Alcohol Tolerance: Medium to High
Flocculation: Low to Medium
Optimum Fermentation Temperature: 68–80°F (20–27°C)

WLP669 | *Lactobacillus paracollinoides*

This strain has been isolated from Belgian lambics. Originally referred to as *Lactobacillus pastorianous*, it has now been reclassified. Can be used for secondary fermentation to produce acidity in aging beer styles.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP673 | *Lactobacillus buchneri*

This strain is recommended for souring. Can be used for sour kettle/mash or in secondary fermentation. <15 IBU tolerance. Little to no attenuation. Experiments have shown less than <5% attenuation.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP678 | *Lactobacillus hilgardii*

Lactic acid bacteria that produces medium acidity. Low hop tolerance (<10). Great for Berliner Weisse, gueuze and lambics.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP692 | *Debaryomyces hansenii*

Debaryomyces is one of the wild yeasts isolated from lambics in Belgium.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP693 | *Lactobacillus plantarum*

Typically found in probiotics, this bacteria has been found to produce high levels of lactic acid. This strain is perfect for sour kettle or sour mash beers.

Attenuation: N/A
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP700 | Flor Sherry Yeast

Creates green almond, Granny Smith apple and nougat characteristics found in sherry. For use in secondary fermentation.

Wine Type: Sherry, port, Madeira, sweet styles
Alcohol Tolerance: 16%
Fermentation Speed: Slow
Optimum Fermentation Temperature: >70°F (>21°C)

WLP707 | California Pinot Noir Yeast

STA1+ Produces fruity and complex aromas and is reliable for difficult fermentations. Isolated from pinot noir grapes in Davis, CA.

Wine Type: Hardy red varietals, aromatic white varietals
Alcohol Tolerance: 16%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 60–90°F (16-32°C)

WLP709 | Sake #9 Yeast

For use in rice-based fermentations. Traditional strain used in Ginjo-shu production because of the yeast's development of high fragrance components. Also a fairly strong fermenter, but produces a foamless fermentation.

Wine Type: Sake
Alcohol Tolerance: 16%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 62–68°F (17–20°C)

WLP718 | Avize Wine Yeast

Champagne isolate used for complexity in whites. Contributes elegance, especially in barrel-fermented Chardonnays.

Wine Type: White wine varietals
Alcohol Tolerance: 15%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 60–90°F (16–32°C)

WLP727 | Steinberg-Geisenheim Wine Yeast

High fruit ester production. German in origin and cold tolerant.

Wine Type: Riesling, gewüztraminer, fruity white wines
Alcohol Tolerance: 14%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 50–90°F (10–32°C)

WLP730 | Chardonnay White Wine Yeast

Dry wine yeast with slight ester production and low sulfur dioxide production which enhances varietal character.

Wine Type: White and blush wines including Chablis, chenin blanc, sémillon, sauvignon blanc
Alcohol Tolerance: 14%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 50–90°F (10–32°C)

WLP749 | Assmanshausen Wine Yeast

This strain is a German red wine yeast that is cold tolerant. Produces spicy, fruit aromas.

Wine Type: Pinot noir, zinfandel, hardy red varietals
Alcohol Tolerance: 14%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 50–90°F (10–32°C)

WLP750 | French Red Wine Yeast

Classic Bordeaux yeast with a rich, smooth flavor profile.

Wine Type: Hardy red varietals
Alcohol Tolerance: 17%
Fermentation Speed: Fast
Optimum Fermentation Temperature: 60–90°F (16–32°C)

WLP760 | Cabernet Red Wine Yeast

A versatile strain for full-bodied red wines with ester production that complements dry aromatic white wines.

Wine Type: Merlot, chardonnay, Chianti, chenin blanc, sauvignon blanc
Alcohol Tolerance: 16%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 60–90°F (16–32°C)

WLP770 | Suremain Burgundy Wine Yeast

Emphasizes fruit aromas in barrel fermentations. Possesses a high nutrient requirement to avoid volatile acidity production.

Wine Type: Hardy red varietals
Alcohol Tolerance: 16%
Fermentation Speed: Moderate
Optimum Fermentation Temperature: 60–90°F (16–32°C)

WLP773 | Scottish Cider Yeast Blend

This is a blend of two ale strains and one wine strain. Unlike a lot of ale strains that typically dry out most ciders, this unique blend of *Saccharomyces* strains will leave some residual sweetness for a smooth mouthfeel. This strain is perfect for those looking for a still cider with some lingering apple characteristic or a dryer sparkling cider.

Attenuation: 74-80%
Alcohol Tolerance: Medium
Fermentation Speed: Medium to High
Optimum Fermentation Temperature: 67-72°F (19-22°C)

WINE/MEAD/CIDER

WLP780 | Thai Rice Chong Yeast

Typically used for making rice wine but has shown to ferment beer just fine. The ester profile is very fruity and produces a surprising amount of alcohol (15%). The aroma and flavor were highly favorable compared to rice wine made with the traditional yeast balls.

Attenuation: 65-70%
Alcohol Tolerance: Medium
Fermentation Speed: N/A
Optimum Fermentation Temperature: 70-78°F (21-26°C)

LAGER YEAST

WLP815 | Belgian Lager Yeast

A clean, crisp European lager yeast with low sulfur production. This strain originates from a very old brewery in west Belgium. Great for European-style pilsners, dark lagers, Vienna lagers, and American-style lagers.

Attenuation: 72–78%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 50–55°F (10–13°C)

WLP835 | German X Lager Yeast

Classic yeast from a famous Bavarian monastery. This strain develops a creamy, malty beer profile with low sulfur production and low esters. It is a great choice for styles like traditional Helles, Oktoberfest, Bock, and Dunkel.

Attenuation: 70–76%
Alcohol Tolerance: Medium to High
Flocculation: Medium
Optimum Fermentation Temperature: 50–54°F (10–12°C)

WLP845 | Fast Lager Yeast

Use this strain when you need a lager sooner rather than later. Low sulfur production and medium flocculation characteristics.

Attenuation: 75–78%
Alcohol Tolerance: N/A
Flocculation: N/A
Optimum Fermentation Temperature: N/A

WLP860 | Munich Helles Lager Yeast

This yeast helps to produce a malty, but balanced traditional Munich-style lager. Clean and strong fermentor, it's great for a variety of lager styles ranging from Helles to rauchbier.

Attenuation: 68–72%
Alcohol Tolerance: Medium
Flocculation: Medium
Optimum Fermentation Temperature: 48-52°F (9-11°C)

WLP885 | Zurich Lager Yeast

STA1+ A Swiss-style lager yeast that with proper care can be used to produce lagers over 11% ABV. Sulfur and diacetyl production is minimal.

Attenuation: 70–80%
Alcohol Tolerance: Very High
Flocculation: Medium
Optimum Fermentation Temperature: 50–55°F (10–13°C)

DRY YEAST STRAINS FOR DISTILLERS

PINNACLE DISTILLERS YEAST

WLDPINNACLE G Pinnacle Distillers Yeast (G)

An active dried yeast well-suited for use in simultaneous saccharification fermentation of starch substrates from grain. It has a high tolerance to liberated glucose. Under proper conditions, this yeast can produce ethanol up to and beyond 16% w/v.

WLDPINNACLE M Pinnacle Distillers Yeast (M)

An active dried yeast well-suited for use in malt-based fermentations. It rapidly consumes maltose and produces a flavorful spirit. This yeast product can be applied in a variety of malt mashes.

WLDPINNACLE MG+ Pinnacle Distillers Yeast (MG+)

An active dried yeast well-suited for use in both malt and grain fermentations. It has the collective capability to tolerate high gravity and temperature. This yeast product can be applied in a variety of cereal-based mashes.

WLDPINNACLE S Pinnacle Distillers Yeast (S)

An active dried yeast well-suited for use in simultaneous saccharification fermentations of molasses and pure sugars. It has a high tolerance to liberated glucose. Under proper conditions, this yeast can produce ethanol up to and beyond 16% w/v.

YEAST NUTRIENTS

FanMAX BIO™

This proprietary blend of nutrients has been optimized for great solubility of nitrogen in your fermentations. This product contains peptone and yeast extract that provides essential fatty acids, free amino nitrogen, nucleic acids, vitamins and minerals for your yeast. It is 100% free of diammonium Phosphate (DAP), containing no inorganic sources of nitrogen.
Available in 1 oz, 2KG & 6KG

SeltzerMax™

This blend of nutrients has been specifically designed to create a clean, dry, and clear hard seltzer. SeltzerMax™ has been optimized to provide essential nitrogen, vitamins, and minerals for yeast health resulting in a fast and complete hard seltzer fermentation. This product does contain diammonium phosphate (DAP) and has been formulated to be balanced with organic sources of nitrogen.
Available in 1 oz, 2KG, 6KG & 20KG

WHITE LABS YEAST NUTRIENT

A proprietary blend used to increase the health of yeast and improve fermentation and re-pitching performance. It contains diammonium phosphate (DAP), essential vitamins and co-factors, nitrogen, amino acids, proteins, peptides and minerals. An effective boost for first and/or late generation yeast slurry. If the grist is not 100% malt, then White Labs Yeast Nutrient can help make up for lack of nutrients.

SERVOMYCES BY LALLEMAND

Servomyces is a natural zinc enriched single-strain brewing yeast (from the prestigious Hefebank Weihenstephan) that is used as a biological yeast nutrient. Servomyces enables any yeast strain's ability to incorporate essential nutrients into its cellular structure while providing a high concentration of zinc that is essential for healthy alcoholic fermentation.

Tested in breweries around the world, it has been proven to:

- Cut down fermentation time
- Promote flocculation
- Greatly reduce sulfur compounds
- Improve the health and viability of yeast
- Result in faster, more complete attenuations
- Increase yeast growth for a better harvest
- Improve the quality of the finished product
- Help reduce levels of diacetyl at the end of primary fermentation

FERMENTATION ENZYMES

WLE4000 | Clarity Ferm	A highly specific endoprotease that prevents chill haze in beer by hydrolyzing haze-active polypeptides where the hydrogen bonding that causes chill haze occurs. For use at the beginning of fermentation; Clarity Ferm has been proven to reduce gluten in beer made with barley and wheat.
WLE4100 | Ultra-Ferm	A liquid amyloglucosidase that completely hydrolyzes dextrins into fermentable glucose. This enzyme can be added to the brewhouse or the fermentor.
WLE4300 | Opti-Mash	A thermostable α-amylase especially useful in mashes that use adjuncts. Ensures starch liquefaction and improves extract yield.
WLE4400 | Visco-Buster	A liquid bacterial endo-beta-1,3-1,4-glucanase designed to hydrolyze ß-glucans and prevent blockage of beer filters and increase brewhouse capacity.
WLE4800 | Rapidase	A liquid pectinase used to break down pectin from fruit.

LABORATORY ANALYSIS KITS

MA1400 | Microscope Kit	Contains all items necessary for do-it-yourself routine microscope analysis: hemocytometer, methylene blue stain, microscope slides, cover slips, immersion oil, lens paper and hand counter.
MA1500 | Gram Stain Kit	Do-it-yourself kit for identifying Gram-positive and Gram-negative bacteria. Includes stains, Gram check slides with controls, sterile pipettes, gloves and instructions.
TK3010 | Brewery Contaminants Test Kit	This do-it-yourself kit contains all items needed to identify beer contaminants in your brewery and is good for up to five samples. Includes sterile tubes with rack, isopropanol, HLP media, SDA media, contaminants media, sterile spreaders, sterile water, gloves, transfer pipettes and instruction sheet. This kit requires you to send your sample to White Labs in the kit provided sample bottle.
TK3100 | HLP Test Kit	This do-it-yourself kit contains all the items needed to test for anaerobic beer spoilage organisms - *Lactobacillus* and *Pediococcus*. Requires use of a microwave. Will test five samples and one control.

SEASONAL BIG QC DAY TEST KITS

Purchase these bundled kits and save! Results depend on submission deadline and will be provided based on predetermined dates. To view dates visit whitelabs.com/bigqcday. These kits require you to send your samples to White Labs in the provided sample bottle. Return FedEx shipping label is included.

LSQCDAYSTANDARD | Big QC Day Kit	Tests two samples for diacetyl, IBUs, alcohol content, calories, SRM, attenuation (real and apparent) and microbiological contaminants.
LSQCDAYGLUTEN | Big QC Day Kit with Gluten Testing	All the same tests as LSQCDAYSTANDARD, plus two sample analysis for gluten.
LSQCDAYPCR | Big QC Day Kit with PCR Testing	All the same tests as LSQCDAYSTANDARD, plus testing of two samples for *Saccharomyces cerevisiae* var. *diastaticus* via PCR analysis.
LSQCDAYGLUTEN+PCR | Big QC Day Kit with Gluten and PCR Testing	All the same tests as LSQCDAYSTANDARD, plus testing of two samples for gluten and *Saccharomyces cerevisiae* var. *diastaticus* PCR analysis.

LABORATORY SUPPLIES

MB1400 | Binocular Compound Microscope 40x-2000x	Professional-grade compound binocular with trinocular adapter microscope with 2000x power. 10x and 20x eyepieces (10x with pointer). Four fully achromatic objective lenses - 4x, 10x, 40x, 100x. View specimens at 40x, 80x 100x, 200x, 400x, 800x, 1000x and 2000x magnification. All-metal construction with fully mechanical stage and coaxial focus with coarse and fine focusing knobs. Built-in, adjustable halogen lower illumination with Abbe condenser and iris diaphragm.
MA1410 | Hemocytometer	Glass slide used for yeast cell counts and viability counts. Each chamber consists of an H-shaped moat forming two counting areas. Each counting area contains double Neubauer rulings with 400 (counting chamber) small squares in a central 1mm square. Comes with two 0.4mm cover glasses. Does not include pipettes.
MA1422 | Alkaline Methylene Violet Stain (AMV) | 50mL	Improve the accuracy of viability testing with AMV. Dead or non-vital yeast cells stain purple. Must be refrigerated.
MA1420-50ML | Citrate Methylene Blue Stain | 50mL	Stain essential for viability testing. Dead yeast cells stain bright blue. Must be refrigerated.
MA1425 | EDTA, 10% | 25mL	Anti-coagulant to aid in breaking up yeast floccs for cell counting.

SERVICES

White Labs offers a number of services for a variety of fermentation industries. Whether it is our private strain banking, customized consulting options, informative educational workshops or independent analytical testing. White Labs serves as a company that can provide everything you need to produce the best possible products.

PRIVATE STRAINS & YEAST BANKING

Private strains are cultures that are banked by individual customers for their own future use. White Labs will test, isolate, store and propagate your organism. Production lead time is 17 to 30 days. Every Private Strain is analyzed for microbial organisms. The fermentation of the original culture is monitored to ensure optimal performance and then cryogenically frozen. Requires a minimum order of 1.5L for *Saccharomyces* strains and a minimum order of 1L unconcentrated for wild yeast and bacteria.

LS6750 | Standard Yeast Banking

Includes strain clean up, petite mutant testing, pH, flocculation characteristics, fermentation graph and the first year of banking.

LS6725 | Mixed Culture Isolation

Includes isolation of multiple organisms, genetic identification of the organisms (genetic sequencing of isolated bacteria or yeast, in bacteria the 16S rDNA region is sequenced and for yeast the ITS region is sequenced) and the ratio of the organisms in the culture. Can be banked as a mixed culture or as individual strains for an additional fee.

Our Process

PURE CULTURE | MIXED CULTURE | UNKNOWN

1 — Microbiological Verification

- Microbiological plating on WLN, SDA, HLP, WLD, LCSM
- Separating cultures if mixed and requested
- Optional: genetic identifiction for each organism (additional cost)

1 WEEK

2 — Strain Selection

- Proprietary process to select for the best performing, healthiest cells to bank

1 WEEK

3 — Mini Fermentation

- Designed to ensure fermentability and monitor fermentation performance

1 WEEK

4 — Reporting

- White Labs ID number assigned
- Description of colony morphology, optimal growth mediums and attenuation

5 — Yeast Storage

- The best performing and healthiest culture is banked in our -80°C freezer
- Culture can be stored in multiple ways
  - Mixed culture - mix of yeast and bacteria
  - Pure culture - 1 strain
  - Isolated organisms identified in mixed culture and banked individually

EDUCATIONAL WORKSHOPS

White Labs' mission is to teach, inspire and excite our customers on all things fermentation, spanning across our various locations and beyond. We offer classes to professionals and enthusiasts on a variety of topics ranging from tips and tricks to hot topics and trends happening in brewing, distilling, winemaking and other alcoholic beverage industries. We offer in-person and webcast options for many of our workshops. To learn more about our educational offerings, visit whitelabs.com/education and register through the White Labs app or yeastman.com.

NEW White Labs On-Demand Education Series

The ability to effectively communicate fermentation attributes is crucial in the business of brewing. Through use of video, slides, narration, and quizzes, this online course will explore the following topics with more to come:

Many Flavors of Fermentation

Explore ways to describe yeast influenced flavor/aroma compounds, how yeast can manipulate other ingredients, and ways to establish brand identity through sensory training

Reusing Yeast: Getting The Most From Your Culture

Consistent fermentations and high-quality beer begin with healthy yeast and consistent pitch-rates. This course offers an in-depth look at how to best harvest and store yeast for optimal performance.

Sour Beer: Alternative Microbes and Fermentation Techniques

From traditional spontaneous fermentation to inoculation techniques and overviews of the major organisms used and found in sour beer, this course reviews the behavior of select organisms and how to best utilize them in a sour program.

In-Person and Webcast Offerings

Sour Beer Essentials

In this class, we explore the finer points of fermenting sour beer including the intricacies of handling yeast and bacteria, capturing wild cultures, kettle souring and basic QA/QC techniques. Discussion of topics range from how to best produce clean and mixed culture beer in the same facility to adding complexity through secondary fermentation.

Yeast Essentials 2.0

This two-day workshop focuses on best practices when it comes to your cultures. Topics include maintaining optimal yeast performance, detecting fermentation derived off-flavors and troubleshooting problem fermentations. Participate in two hands-on lab components which expand on general lab techniques to improve brewing operations.

Lab Practicum: Putting Your Yeast Essentials 2.0 Knowledge to Work

This one-day class is a supplemental lab that continues and expands upon the topics and techniques discussed during Yeast Essentials 2.0. With a small group size and one-on-one guidance by the White Labs technical team, you will learn detailed procedures to improve your brewery's yeast handling, storage, and general quality checks.

Yeast Handling for Brewers

This course offers an in-depth look at how to best harvest and store yeast for optimal performance. Attendees explore various fermentation-related topics such as preparing yeast for pitching, what to expect when repitching, techniques for reliable brewery propagation and how to troubleshoot fermentation issues related to poor yeast-handling practices.

Yeast Handling for Distillers

This course explores the basics of yeast, its metabolic process and how to provide ideal conditions for creating the most successful fermentation. Attendees also gain an understanding of how yeast strain selection plays a critical role in spirit congeners along with how various sugar sources can impact your fermentation and final products.

Building a Descriptive Vocabulary: Describing Yeast and Fermentation

In this class, we discuss the proper vocabulary to describe yeast influence on green to finished beer and the role yeast plays in fermentation. Learn how to identify and communicate yeast attributes including flavor and aroma and yeast interactions with other ingredients.

CONSULTING

White Labs offers expert, affordable assistance with a variety of topics. Our skilled team will provide you with a customized consulting plan that can include any or all of the options below. Additionally, our team can be available to you in person, over the phone or through email.

- Laboratory staff training
- New product and/or fermentation method assistance
- Contamination risk assessment/clean-up
- Laboratory set-up, including protocol and procedure manuals
- Customized brewery audit
- Yeast propagation
- Yeast handling
- Cellar training

ANALYTICAL SERVICES & TESTING

Technical Services

White Labs offers third party analytical testing that is independent of the White Labs internal yeast production laboratory. Tests are conducted using the strictest standards employing methods prescribed by the American Society of Brewing Chemists and AOAC. Many countries require TTB certified lab documentation for export of alcohol products and White Labs has several certified TTB beer chemists on staff. The lab participates in quarterly check sample service to assess accuracy and quality control within the lab which allows White Labs to be confident in the data we are providing our customers. White Labs conducts tests and delivers results in a prompt manner, providing customers with information that is both timely and accurate.

Analytical Equipment

Anton Paar Alcolyzer ME and Density Meter ME 5000 HazeQC ME Turbidity Meter

Together, our Anton Paar Density Meter, Alcolyzer, and HazeQC meter will reliably determine the alcohol content in beer and spirits. Additionally, these highly complex instruments can determine specific gravity, extract values, attenuation, pH, color, calories and chill haze.

Perkin Elmer Clarus 500 Gas Chromatograph and TurboMatrix 110 Headspace Unit

Our Gas Chromatograph can analyze off flavors such as diacetyl and 2,3 pentanedione. It can also detect esters and fusels such as isoamyl acetate, ethyl acetate, acetaldehyde, methanol, isobutanol and acetone.

Bio Rad T100™ Thermocycler and Roche LightCycler® 480 II

We utilize both the Bio Rad T100™ Thermocycler and the Roche LightCycler® 480 II for our PCR-based analysis including genetic identification and beer spoiler detection.

Perkin Elmer Flexar™ HPLC

Our HPLC can analyze sugars, acids, caffeine and more.

Roche ThermoCycler 480

The Roche ThermoCycler 480 is used to perform quantitative PCR (qPCR). This is a probe-based method that allows for rapid detection and characterization of very small amounts of DNA. Utilizing specific designed probes, we can target, detect and identify specific bacterial and wild yeast contaminants at extremely low levels.

The following pages are some of our more popular analytical tests. Water, malt/adjuncts, and hop analyses are also available. To view an extensive list, please visit whitelabs.com.

BEER ANALYSES

LS3600 | Gluten	Method: R5-Competitive Gliadin ELISA assay. Results reported in ppm.
LS6605 | Full Process Microbiological Analysis	Great test to find out where contaminants are entering your brewery. Test your entire process- pre/post chiller, fermentors, brite tanks, hoses, rinse water, fillers, bottles, etc. Up to 10 samples can be submitted. Analysis includes WLD, LCSM, HLP and SDA selective media testing. Also includes Gram stain and genus identification of any positive contaminants.
LS6610 | Complete Microbiological Analysis	Analysis includes WLD, LCSM, HLP and SDA selective media testing. Also includes Gram stain and genus identification of any positive contaminants.
LS6620 | Complete QC Analysis	Great panel for a comprehensive look at finished product. Analysis includes microbiological testing (WLD, LCSM and HLP selective media), alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color, IBU, diacetyl and 2,3 pentanedione.
LS6643 | Nutritional Label Analysis	Analysis needed to create a nutritional label for your product. Analysis includes alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color, protein, total carbohydrates, cholesterol, total fat, calories from fat, trans fat, saturated fat, iron, calcium, sodium, sugar and dietary fiber. Results reported per 12 fl. oz. serving size.
LS6644 | Nutritional Beer Analysis	Analysis includes alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color, protein and total carbohydrates.
LS6646 | ABV/ABW	Alcohol by volume and alcohol by weight. Method: Anton Paar Beer Alcolyzer and DMA 5000 (default) or Gas Chromatograph.
LS6670 | Sugar Profile by HPLC	Analysis includes glucose, fructose, lactose, maltose and sucrose. Method: HPLC. Results reported in percent or g/12 fl. oz.
SIT0001 | Fast Track Testing	Get a range of our most requested services conducted on a fast-turnaround basis with accurate results sent back to you in 2 business days. Analysis includes alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color and IBU.
SIT0011 | Comprehensive Analysis for Packaged Beer	Analysis includes alcohol by volume and weight, extract values, attenuation, acidity, pH, SO_2, IBU, color, specific gravity, calories, CO_2 and air.

BEER ANALYSES

SIT0031 | Comprehensive Flavor Profile	Analysis includes diacetyl, 2, 3 pentanedione, ethyl acetate, 1-propanol, acetaldehyde, isoamyl alcohol, isoamyl acetate, ethyl octanoate, ethyl hexanoate, acetone, methanol and isobutanol. Method: Gas Chromatograph. Results reported in ppm or ppb.
SIT0041 | Total Acidity	Method: Titration. Results reported in percent lactic acid.
SIT0050 | Alcohol, Extract and Calculated Values	Analysis includes alcohol by volume and weight, calories, specific gravity, apparent extract, real extract, color, original extract, apparent attenuation, real degree attenuation and pH. Method: Anton Paar Alcolyzer and DMA5000.
SIT0070 | IBU Testing	Method: Spectrophotometer. Results reported in BU (Bitterness Units).
SIT0140 | Diacetyl (as-is) Analysis by GC	This testing does not represent any potential diacetyl precursor that may be present in the sample. Method: Gas Chromatograph. Results reported in ppb.
SIT0141 | Diacetyl (total) Analysis by GC	Total diacetyl allows you to measure diacetyl and diacetyl precursor in the product to help anticipate diacetyl shelf life issues. Method: Gas Chromatograph. Results reported in ppb.
SIT0200 | FAN	Free amino nitrogen. Method: Colorimetric. Results FAN reported in mg/L.

WINE/MEAD/CIDER ANALY-

LS3600 | Gluten	Method: R5-Competitive Gliadin ELISA assay. Results reported in ppm.
LS4000 | Free SO_2	Method: Aeration oxidation. Results reported in mg/L.
LS4030 | Malic Acid	Analyze the amount of malic acid in wine before, during, or after malolactic fermentation. Method: Enzymatic. Results reported in mg/L.

WINE/MEAD/CIDER ANALYSES

LS4050 | YAN (Yeast Assimilable Nitrogen)	YAN is important when determining quality of must and how much nutrient addition is necessary. Method: Enzymatic. Results reporting in mg/L.
LS4070 | Comprehensive Testing for Wine & Cider	Analysis includes titratable acidity, pH, SO_2, alcohol by volume, malic acid and Brix.
LS4071 | Juice Analysis	Great panel for grape and apple must. Analysis includes titratable acidity, pH, Brix, YAN and malic acid testing.
LS6610 | Complete Microbiological Analysis	Analysis includes WLD, LCSM, HLP and SDA selective media testing. Also includes Gram stain and genus identification of any positive contaminants.
LS6643 | Nutritional Label Analysis	Analysis needed to create a nutritional label for your product. Analysis includes alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color, protein, total carbohydrates, cholesterol, total fat, calories from fat, trans fat, saturated fat, iron, calcium, sodium, sugar and dietary fiber. Results reported per 12 fl. oz. serving size.
LS6646 | ABV/ABW	Alcohol by volume and alcohol by weight. Method: Anton Paar Beer Alcolyzer and DMA 5000 (default) or Gas Chromatograph.
LS6670 | Sugar Profile by HPLC	Analysis includes glucose, fructose, lactose, maltose and sucrose. Method: HPLC. Results reported in percent or g/12 fl. oz.
SIT0040 | Titratable Acidity	Method: Titration. Results reported in g/L.
SIT0320 | Total SO_2	Method: Enzymatic. Results reported in ppm.

SPIRIT ANALYSES

LS3010 | Methanol	Method: Gas Chromatograph. Results reported in ppm.
LS3410 | Ethyl Acetate	Method: Gas Chromatograph. Results reported in ppm.

SPIRIT ANALYSES

LS3450 | Distillation Profile by GC	Includes ethyl acetate, 1-propanol, acetaldehyde, isoamyl alcohol, isoamyl acetate, acetone, ethyl butyrate, isobutyl acetate, methanol and isobutanol. Method: Gas Chromatograph. Results reported in ppm.
LS6646 | ABV/ABW	Alcohol by volume and alcohol by weight. Method: Anton Paar Beer Alcolyzer and DMA 5000 (default) or Gas Chromatograph.
SIT0033 | Acetaldehyde	Method: Gas Chromatograph. Results reported in ppm.

KOMBUCHA ANALYSES

LS3600 | Gluten	Method: R5-Competitive Gliadin ELISA assay. Results reported in ppm.
LS6643 | Nutritional Label Analysis	Analysis includes alcohol by volume and weight, extract values, attenuation, specific gravity, calories, pH, color, protein, total carbohydrates, cholesterol, total fat, calories from fat, trans fat, saturated fat, iron, calcium, sodium, sugar and dietary fiber. Results reported per 12 fl. oz. serving size.
LS6646 | ABV/ABW	Alcohol by volume and alcohol by weight. Method: Anton Paar Beer Alcolyzer and DMA 5000 (default) or Gas Chromatograph.
LS6910 | Kombucha Final Product Testing	Analysis includes alcohol by volume via Gas Chromatograph, titratable acidity, pH and total yeast and mold (CFU/ml).
LS6920 | Kombucha Advanced Package	Analysis includes organic acid profile (gluconic, acetic, lactic and malic acid), alcohol by volume via Gas Chromatograph, titratable acidity, pH, total yeast and mold (CFU/ml), total aerobic bacteria count (CFU/ml) and pathogens (*Staphylococcus aureus*, E. coli).
LS6930 | Kombucha Shelf Life Testing	Analysis includes alcohol by volume via Gas Chromatograph, titratable acidity, pH, total yeast and mold (CFU/ml), total aerobic bacteria count (CFU/ml) and CO_2 (if applicable). Testing is performed at 0, 30, 60, 90, 180 and 240 days.
SIT0040 | Titratable Acidity	Method: Titration. Results reported in g/L.

MICROORGANISM ANALYSES

LS6671 | Viability	Viability analysis of yeast slurry. Method: methylene blue.
LS6705 | Genetic Identification	Genetic sequencing of isolated bacteria or yeast. In most cases we are able to identify both genus and species of the organism. In bacteria, the 16S rDNA region is sequenced and for yeast, the ITS region is sequenced. Results will be reported in a percent confidence level of the closest organism.
LS6725 | Mixed Culture Isolation	Includes isolation of multiple organisms, genetic identification of the organisms (up to 5 organisms included with package, additional charges for added organisms) and the ratio of the organisms in the culture. Can be banked as a mixed culture or as individual strains for an additional fee.
LS6730 | *Saccharomyces cerevisiae* var. *diastaticus* PCR Analysis	Method: Detection of the STA1 gene (glucoamylase gene) via end-point PCR.

HOW TO ORDER

White Labs has many ways to order, whether it is through our Customer Service Representatives, your Sales Representative, online at yeastman.com or through the White Labs app. You can rely on us to provide you with up-to-the-minute inventory availability and reliable ship dates. Thanks to White Labs' various delivery options, a domestic and international distribution network and strong partnerships with wholesalers and retailers, our team is able to make liquid yeast and fermentation-related products accessible to all professionals and homebrewers.

CUSTOMER SERVICE REPRESENTATIVES

For all general inquiries and comments, including new accounts:

Domestic and Canada:
888.593.2785
International Inquires
Outside of EU: +1.858.693.3441

Orders:
orders@whitelabs.com

Fax: 888.693.1026
(U.S. & Canada only)

General Inquiries:
info@whitelabs.com

Hours of Operation: Monday-Friday 6 a.m. to 5 p.m. PT

White Labs Copenhagen, Serving European Customers:

Telephone: +45 31615142

Orders & General Inquiries
orderscph@whitelabs.com

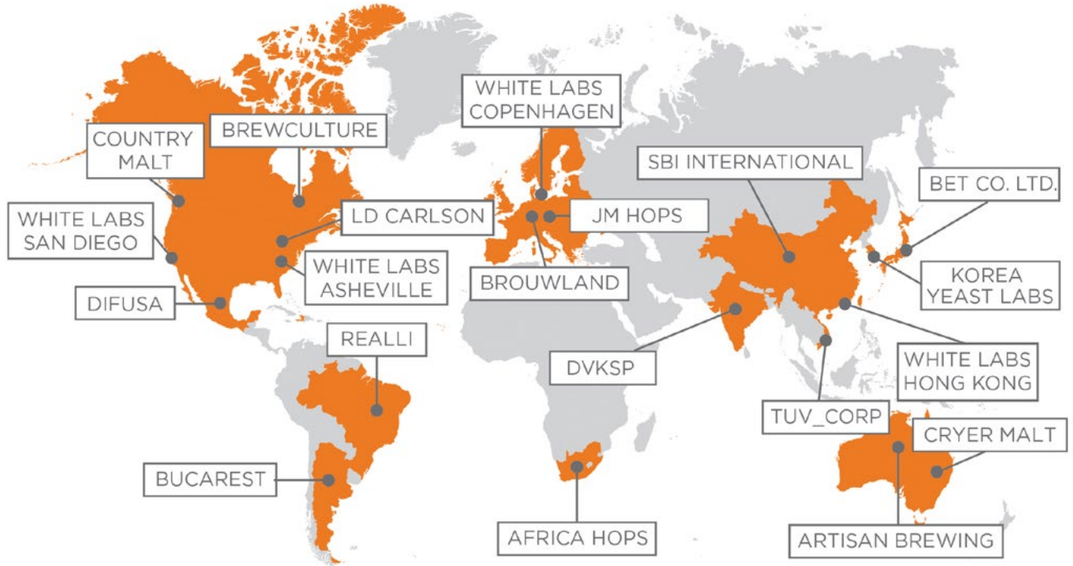
Hours of Operation:
Monday-Friday
9:00 to 16:00 CET

WHITE LABS APP OR YEASTMAN.COM

Order 24/7 with the White Labs app or yeastman.com. White Labs' custom-built tracking and ordering technology, makes it easy to order yeast whenever you need it. Download the White Labs app for iPhone or Android to quickly order yeast, enzymes, nutrients, analytical laboratory tests, educational classes and merchandise. App features include up-to-the-minute inventory availability across all White Labs facilities, Custom Culture Calculator, store locator, QC data and more. Yeastman.com also offers customers the option to order with timely availability information.

DOMESTIC & INTERNATIONAL DISTRIBUTION NETWORK

In addition to selling direct throughout the world, White Labs has wholesale distribution both domestically and internationally. Some of our valued partners are highlighted below. For a complete list, please visit whitelabs.com.



SHIPPING INFORMATION

If you're receiving a package within the U.S. or across the world, we are committed to delivering fresh yeast via temperature-regulated environments, from production to its final destination. Packages leaving our facilities are shipped cold in customized boxes with insulated bags and ice packs to ensure ideal temperatures are maintained from transit to delivery.

We offer convenient delivery options which include both domestic and international shipping via several trusted carriers. Customers residing in select zip codes from Southern to Central California are eligible for the FedEx** ground shipping option with next day delivery from White Labs San Diego. Customers in North Carolina and select zip codes in South Carolina, Virginia, West Virginia, Tennessee, Kentucky and Georgia may also take advantage of this FedEx** shipping option for orders from White Labs Asheville. If these options apply to you, "next-day ground shipping" will be displayed in the White Labs app or yeastman.com during checkout.

Whether you're a buying direct from White Labs or through one of our trusted wholesale or retail partners or the many delivery methods we offer allow us to meet our continued commitment to providing the freshest liquid yeast possible.

***For select zip codes, FedEx ground shipment with overnight delivery guarantees package will arrive by the following end of business day.*

IN-PERSON PICK UP

At all White Labs locations, customers can opt to pick up in person when placing your order. Professional brewers and homebrew retailers have the options of placing orders in advance via the White Labs app, yeastman.com or a Customer Service Representative and choosing "will-call pick up" during checkout. This method allows you to save on shipping costs, go-green with less packaging and chat with our friendly and knowledgeable White Labs' team upon arrival. Information for in-person pick up options for each location:

White Labs San Diego: Monday-Friday from 8 a.m. to 8 p.m. PT.
For details, visit whitelabs.com/sandiego.

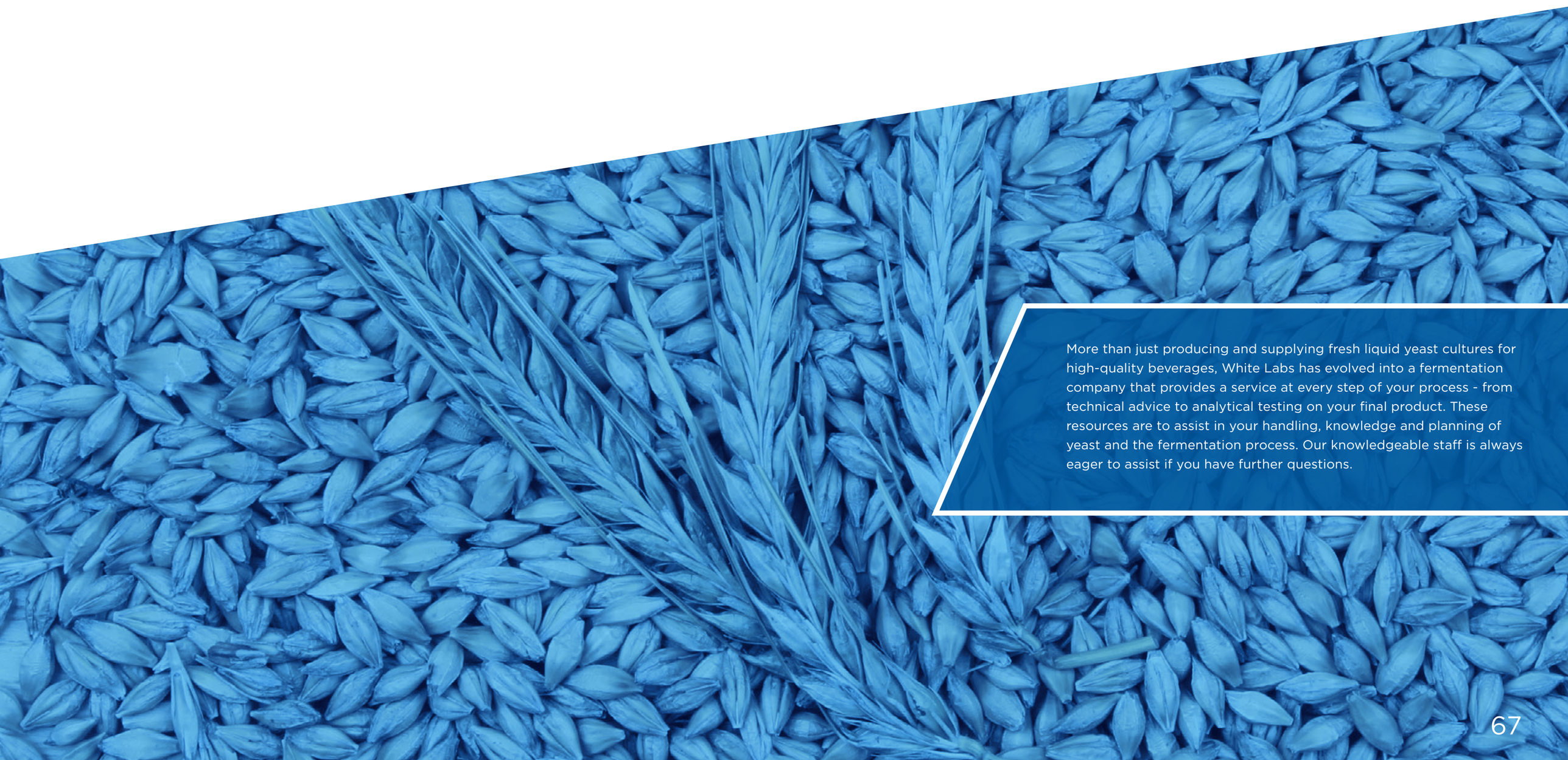
White Labs Asheville: Monday-Friday from 9 a.m. to 4 p.m. ET.
For details, visit whitelabs.com/asheville.

White Labs Copenhagen: Monday-Friday from 9:00-16:00 CET.
For details, visit whitelabs.com/copenhagen.

White Labs Hong Kong: Monday-Friday from 2 p.m. to 5 p.m. HKT.
For details, visit whitelabs.com/hongkong.

For the White Labs product guarantee and terms and conditions, please visit whitelabs.com.

RESOURCES



More than just producing and supplying fresh liquid yeast cultures for high-quality beverages, White Labs has evolved into a fermentation company that provides a service at every step of your process - from technical advice to analytical testing on your final product. These resources are to assist in your handling, knowledge and planning of yeast and the fermentation process. Our knowledgeable staff is always eager to assist if you have further questions.

BREWING YEAST USAGE

Yeast Volume Recommendation Based on Gravity & Temperature

All White Labs PurePitch® are made to contain 2.0-2.8 billion cells/mL.

>67°F (19°C)

BATCH SIZE	up to 13.5°P (<1.053 SG)	13.6-17.5°P (1.055 - 1.072 SG)	Over 17.6°P (1.072+ SG)
0.5 to 2.5BBL/ 0.6HL	0.5L	0.5 - 1L	1L
5BBL/6HL	1L	1.5L	2L
7BBL/8HL	1.5L	2L	3L
10BBL/12HL	2L	3L	4L
15BBL/18HL	3L	4L	6L
20BBL/25HL	4L	6L	8L
30BBL/35HL	6L	8L	12L
40BBL/50HL	8L	12L	16L
50BBL/60HL	10L	14L	20L
100BBL/120HL	20L	30L	40L

60-66°F (15-19°C)

BATCH SIZE	up to 13.5°P (<1.053 SG)	13.6-17.5°P (1.055 - 1.072 SG)	Over 17.6°P (1.072+ SG)
0.5 to 2.5BBL/ 0.6HL	1L	1-1.5L	1.5L
5BBL/6HL	1.5L	2.5L	3L
7BBL/8HL	2.5L	3L	4.5L
10BBL/12HL	3L	4.5L	6L
15BBL/18HL	4.5L	6L	9L
20BBL/25HL	6L	9L	12L
30BBL/35HL	9L	12L	18L
40BBL/50HL	12L	18L	24L
50BBL/60HL	15L	21L	30L
100BBL/120HL	30L	45L	60L

<59°F (15°C)

BATCH SIZE	up to 13.5°P (<1.053 SG)	13.6-17.5°P (1.055 - 1.072 SG)	Over 17.6°P (1.072+ SG)
0.5 to 2.5BBL/ 0.6HL	1L	1-2L	2L
5BBL/6HL	2L	3L	4L
7BBL/8HL	3L	4L	6L
10BBL/12HL	4L	6L	8L
15BBL/18HL	6L	8L	12L
20BBL/25HL	8L	12L	16L
30BBL/35HL	12L	16L	24L
40BBL/50HL	16L	24L	32L
50BBL/60HL	20L	28L	40L
100BBL/120HL	40L	60L	80L

YEAST, WILD YEAST & BACTERIA HANDLING

Recommendations for White Labs Pitchable Yeast Cultures

1. Always store the yeast at temperatures between 36 to 40°F (2–4°C) and follow the recommended best by dates for optimal performance.
2. For the first generation of the new yeast culture, a lighter style beer with a 10 to 12°Plato gravity is recommended for best yeast performance. WLN1000 White Labs Yeast Nutrient will help shorten the fermentation lag time and make the yeast healthier for subsequent generations.
3. Keep yeast in the refrigerator until needed. Do not freeze the culture. Remove yeast at least two hours before pitching, so the slurry can come close to room temperature. To inoculate, sanitize scissors, cut the top left of the bag and pour in.
4. Fermentation is best started warmer (approximately 70°F/21°C) and lowered to desired fermentation temperature after krausen formation or evidence of CO_2 begins, usually less than 12 hours.
5. The initial signs of fermentation should be evident within 12 to 20 hours depending on the age of the yeast. Successive generations will have a shorter lag time and faster fermentation. The first complete fermentation usually takes one to three days longer because yeast needs to adapt from a laboratory culture to a fermentation environment.

Collection, Storage & Repitching Yeast

When do I harvest the yeast?

- Ideally 5 to 7 days into the fermentation to preserve the health of the yeast

Where do I store it?

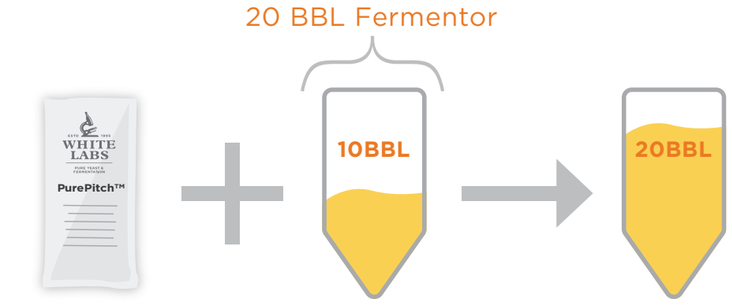
- White Labs Ferm Flask
- Modified kegs
- Food grade plastic buckets
- Large Erlenmeyer flasks

How should I store it?

- At 2-4°C in a storage vessel
- With a blow off bucket or pressure relief valve to degas CO_2
- No longer than 7 to 14 days

Double Batching - Ales

Multiple Day Method



PROS:

- Less yeast required

CONS:

- Can result in a different flavor profile due to the increase in yeast growth
- Fermentation may not be active enough at 24 hours to brew on top

Lager Yeast Options

Option 1: To start fermentation at 48 to 55°F (8–12°C), begin with more yeast. Reference the Custom Culture Calculator in the White Labs app for accurate pitch rate amount.

Option 2: Cool wort to hybrid/ale temperatures (60-65°F/15-18°C), pitch yeast and maintain temperatures until signs of fermentation are evident, CO_2 formation or pH decrease. Begin to lower fermentation temperatures until desired lager temperatures are reached. In order to maintain vitality, it's recommended to lower lager fermentation temperatures (0.5-1°C) per hour.

Option 3: Use a yeast step up. Grow in 10 percent of your fermentors final volume (i.e. for a 20BBL propagate in 2BBL of wort), pitch step up volume 0.5L of yeast per 1BBL. Maintain propagation at the same temperature you are going to pitch your yeast. After 24 to 48 hours, add propagation to fermentor. After the initial pitch, it's recommended to use higher pitching rates. Collect two to three times the normal slurry. Perform a cell count, viability analysis and a microbial stability test on the slurry to determine pitch rate from 1.2 to 2 million cells per milliliter of wort per degree Plato.

Wild Yeast & Bacteria Volume Recommendations

General use for secondary fermentations:

- 1L per 2-3BBLs for *Lactobacillus, Pediococcus* and *Brettanomyces* strains
- Souring will need maturation times around 3+ months
- Organisms will have a difficult time growing in environments below a pH of 3.5

General use of wild yeast for primary fermentation:

- Typical pitch rates are 750,000 to 1 million cells/mL
- Our general recommendation is 1L per 1-1.5BBLs
- Fermentation timeline will be slower, closer to 18 to 30 days depending on the strain

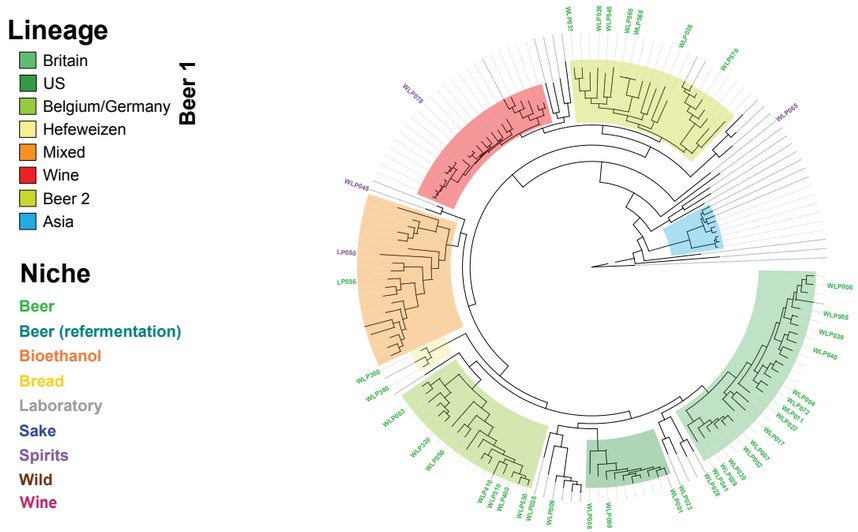
General use of bacteria for kettle souring/quick souring methods:

- Generally 1L per 5BBLs is necessary for quick souring within 48 to 72 hours
- The higher the pitching rate, the faster the souring
- Anaerobic environment is preferred for *Lactobacillus*
- Temperatures ranging from 80 to 95°F (26–35°C) are optimal for most *Lactobacillus* strains. See reference guide for strain specifics at whitelabs.com.
- Wort production needs to be very clean

RESEARCH

Domestication & Divergence of *Saccharomyces cerevisiae* Beer Yeasts

The White Labs Research & Development team collaborated on a study that did full DNA sequencing of 96 White Labs yeast strains. To read the study published in the journal *Cell*, Volume 166, Issue 6, p1397–1410.e16, 8 September 2016, visit cell.com/cell/fulltext/S0092-8674(16)31071-6.



LOCATIONS

White Labs is a global company with three production facilities in premier fermentation regions. In addition to our production facilities, we also have a San Diego Tasting Room where you can sample beer made by White Labs Brewing Co. This unique and unforgettable experience allows you to do a side-by-side beer comparison of a single beer style fermented with different yeasts.

The same concept can be found at our restaurant in Asheville, NC, White Labs Kitchen & Tap, where we showcase foods with a fermentation twist including woodfired pizzas made with White Labs liquid yeast, fermented sauces, farm-fresh salads and other beer-infused dishes and desserts. Enjoy craft cocktails, wine and 32 rotating taps of White Labs brewed and guest beers.

We also offer complimentary tours of our San Diego and Asheville production facilities. These tours provide you with the history and story of White Labs as well as a firsthand look at our production process and laboratories. For more information on days and hours of operation, and available tour times, please visit whitelabs.com.

LOCATIONS

White Labs San Diego Global Headquarters

9495 Candida Street
San Diego, CA 92126

Tel: 858.693.3441
Fax: 858.693.1026

White Labs Copenhagen

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Denmark, Europe
Tel: +45 31615142 /+45 80253595
Email: orderscph@whitelabs.com

White Labs Asheville

172 S. Charlotte Street
Asheville, NC 28801
Tel: 828.974.3880

White Labs Hong Kong

Royale International Ltd.
3/F Goodman Kwai Chung
Logistics Centre,
585-609 Castle Peak Road,
Kwai Chung, New Territories
Email: hongkong@whitelabs.com

White Labs Kitchen & Tap

172 S. Charlotte Street
Asheville, NC 28801
Tel: 858.974.3868

Visit whitelabskitchentap.com
for more information.

White Labs Brewing Co. Tasting Room

9495 Candida Street
San Diego, CA 92126
Tel: 858.693.3441 (ext. 2)

Visit whitelabsbrewingco.com
for more information.


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