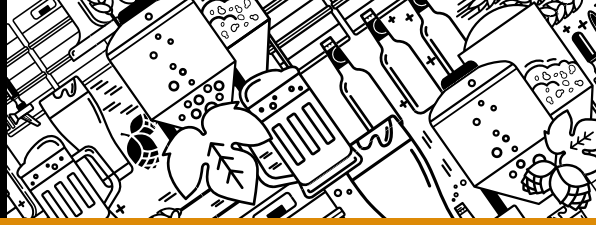
PINNACLE™
BREWERS YEAST



ACTIVE DRY BREWING YEAST

Crisp Sour

product information

for **Craft Brewers**
from craft beer lovers

Pinnacle Crisp Sour is a unique *Lachancea thermotolerans* species isolated from nature and selected for its ability to produce lactic acid and its excellent performance in beer production.

Pinnacle Crisp Sour produces acids and alcohol during fermentation, without the need for a pre-fermentation acidification step (like kettle souring) or cofermentation.

Product contains material patented by US11008539.
Patent valid in US.

Ingredients: Yeast *(Lachancea thermotolerans)*, emulsifier (E491).

Typical analysis at packaging:

% dry weight	> 93%
Viable Yeast Count (cfu/g)	> 6.0E+09
Non Saccharomyces spp.	This strain will grow on **Wild Yeast Media*** (e.g. lysine)
Total Bacteria	< 1 cfu per 10^6 yeast cells

Packaging: 500 g vacuum packs, 10 kg vacuum packs & 11.5 g sachets.

Shelf life: Three years from production date.

Storage conditions: Product should be stored under dry conditions at 39-50°F (4-10°C). The vacuum package is hard until the seal is broken. Opened packs should be resealed if not completely used, and stored at 39°F (4°C) used within five days.

Pitching rate: The pitching rate varies with original gravity of the wort as well as brewing conditions. We advise to inoculate a minimum of 50-100 g/hL for a regular wort and 100-200 g/hL for a high gravity wort above 14°P.

The yeast can be direct pitched successfully but if you prefer to rehydrate, follow these steps:

1. Prepare the rehydration medium:
   10 times the weight of yeast (5 liters for a 500 g package), using either sterile wort (<5° Plato) or sterile water at 82-95°F (28-35°C), optimum 86°F (30°C). Do not use demineralized water.
2. Open the 500 g package with sterile scissors. Sprinkle on surface gently to avoid clumping.
3. Gently stir then leave for 15-20 minutes. A slow rehydration allows yeast membranes to reform.
4. Never subject the yeast to temperature shock: adjust the temperature of the rehydrated yeast to within 9°F (5°C) of the wort to be inoculated by adding wort.
5. Gently stir and leave for 5-10 minutes.
6. Stir well and pour into the wort to start fermentation. Use the rehydrated yeast within 30 minutes of rehydration.

*Wild Yeast Media: this strain is known to grow on some wild yeast media including LCSM

Attenuation:
70-82%

Pitching rate:
50-200 g/hL

Fermentation temperature:
72-86°F (22-30°C)

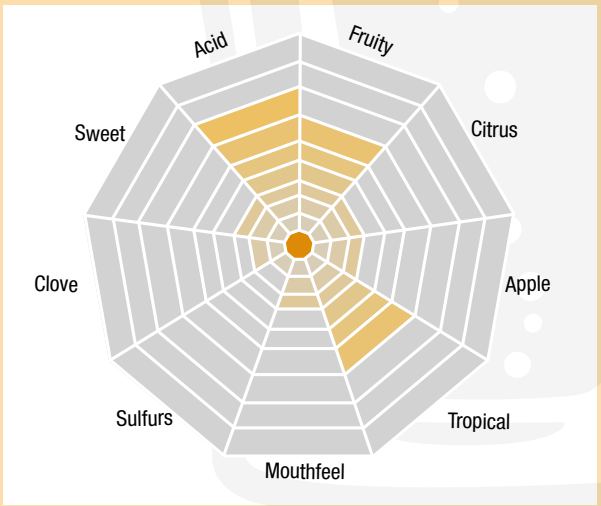
Fermentation rate:
Medium

Flocculation:
Medium

Alcohol tolerance:
Up to 6-8% abv
(increase pitching rate for higher tolerance)

Beer styles
Pinnacle Crisp Sour is a great choice to produce traditional and modern sour beer styles, like Sour IPA, Berliner Weisse, Gose, Lambic/Geuze-style and Fruit Sour.

Flavor and aroma
Pinnacle Crisp Sour is selected for its unique ability to produce lactic acid, resulting in a smooth and refreshing acidity with a subtle to moderate intensity, depending on the brewing conditions. This strain brings on a lovely aroma of tropical fruit, citrus. A subtle hint of traditional Belgian sour beer aromas is possible in recipes with low flavor complexity.



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A business division of AB MAURI

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BREWERS YEAST

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Origin of Pinnacle Crisp Sour From Our Partners At Lachancea LLC

This discovery began with wasps

The story of **Pinnacle Crisp Sour** brewers yeast begins not in a research laboratory or a brewery but with scientist Dr. Anne A. Madden - the "microbe wrangler", as named by PBS Newshour - hanging from a barn rafter in 2013, collecting live wasps and the yeast they might harbor. This is not where most brewing yeasts come from, not even wild ale yeasts - known to frequent sugary environments such as fruit, nectar, or tree sap. But at the time, Dr. Madden's doctoral research revealed that some wild yeasts use wasps, and other sugar-seeking insects, as airplanes - helping the yeast get from one sugary location to another. So, when a team of scientists from **North Carolina State University** asked her to find a wild yeast to make a beer for a science outreach event, their adventure began with wasps.

A "lucky" yeast unlike any other

Back in the lab, Dr. Madden grew out the microscopic jungle of creatures that live in association with insects - carefully sorting infectious microbes and toxin-producing fungi from safe yeasts, and using a proprietary set of genetic, chemical, and sensory tests to find the very best yeast - putting them through a 'Yeast Olympics'. One out-performed the others. But surprisingly, it wasn't a wild ale yeast at all. It wasn't even a *Saccharomyces* species of yeast. Instead, **it was a species of yeast that had diverged from - evolved away from - brewing yeasts over 150 million years ago**. There was no evidence that it could make beer and no record that it had ever been used for brewing.

But there was a hint in its name. The yeast species was a *Lachancea* species. **The scientific name "*Lachancea*" is derived from the French "la chance", meaning "lucky"**. And this was indeed a lucky yeast. Because when the brewing team at NC State, headed by Professor of Brewing Science, Dr. John Sheppard, gave this yeast a chance, **it made beer - a crisp, tart beer, the likes of which had never been created before.**

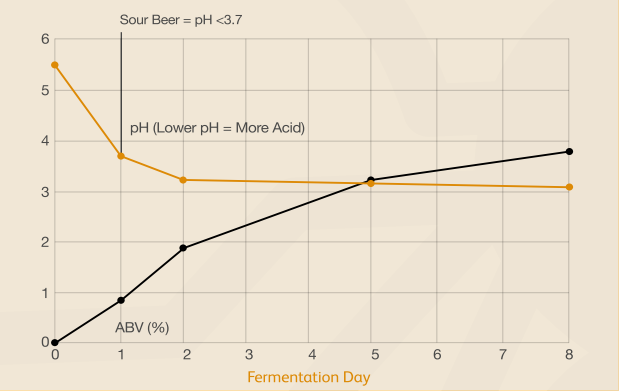
Technical Insights

This yeast surprised the world with its unique metabolism. It produces a crisp, flavorful sour beer without the challenges of wild bacteria, barrel-aging, or mixed microbial cultures. Surprisingly, this yeast behaves like a standard, tame ale yeast—fermenting grains efficiently, tolerating hops, producing plenty of alcohol (7-8% ABV), and creating a beer on an ale timeline. But unlike any yeast before it, it could simultaneously generate plenty of lactic acid—the preferred "soft" tartness in sour beers. Beyond an easier process for making sour beer, the yeast crafts a beer with a good mouthfeel and a blend of alcohols, acids, and esters that conjures associations with delicate tropical, fruity, floral, and even honey notes.

Moreover, it generates these sour beer flavors without producing dominating off-flavors that often plague traditional kettle sours, or "wild" yeast beers, such as over-powering phenolic notes (band-aid or vinyl flavors), overwhelming levels of acetic acid (vinegar), funk or horse sweat, or THP (mousiness). * This was something new. Working with innovative craft brewers in North Carolina, this team commercialized the first lactic acid yeast for sour brewing in 2016. Drs. Madden and Sheppard (now at Lachancea LLC) spent the next decade working with brewers across the world to understand what this yeast was capable of, how it could produce at any scale tested, and understanding how it offered new flavor opportunities to both craft and cider brewers.

Lachancea produces valuable flavors & no off-flavors

- ✓ **Lactic Acid** (Preferred Tartness)
- ✓ **Preferred aromas** (Fruity, tropical, stone fruit, honey)
- ✓ **Glycerol** (Preferred Mouthfeel)
- ✗ **No Diacetyl** (Butterscotch)
- ✗ **No other off-flavors** (Band aids, Funk, Barnyard)
- ✗ **No High Acetic Acid** (Harsh vinegar notes)
- ✗ **No THP - Tetrahydropyridine** (Cheerios, Mousy, Urine)



The acidification by lactic acid production is typically achieved in the first 2 to 3 days (while alcohol will be produced simultaneously). After the first 2 days, the yeast will switch its metabolism to solely alcohol fermentation. In some recipes, this can cause a temporary slowdown of the fermentation for up to 3 days. After that, the fermentation rate will accelerate again until the end of fermentation.

This Wasp yeast flocculates well, is efficient at fermenting grains, is hop tolerant, and is remarkably easy to clean from brewery equipment using standard practices, not presenting a contaminant risk like most wild yeast and bacteria.

Why Is *Lachancea* Yeast So Unique

Part of why these insect-associated *Lachancea* yeasts are so unique remains a mystery, but the team at Lachanea LLC eventually worked out some of their biological secrets with colleagues at NC State and other universities. The answer was ancient and related to the yeast-providing wasps. The yeast produces some of those unique and valuable aromas and flavors - those floral, fruity and honey notes - to attract wasps searching for sugar sources on which to feed. In this evolutionary partnership, the yeast helps the wasp find food, and the wasp serves as an airplane for the yeast, helping it get from sugar source to sugar source. And it turns out, we enjoy many of the same flavors that wasps do!

AB Biotek Pinnacle Crisp Sour Brewers Yeast

The original ***Lachancea* Wasp Yeast** - crafted over one hundred million years of evolution, selected by a wasp, and tested by teams of scientists and innovative brewers - is now available as a dehydrated (dry) yeast product exclusively from **AB Biotek** under the **Pinnacle Crisp Sour** label.

lachancea

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