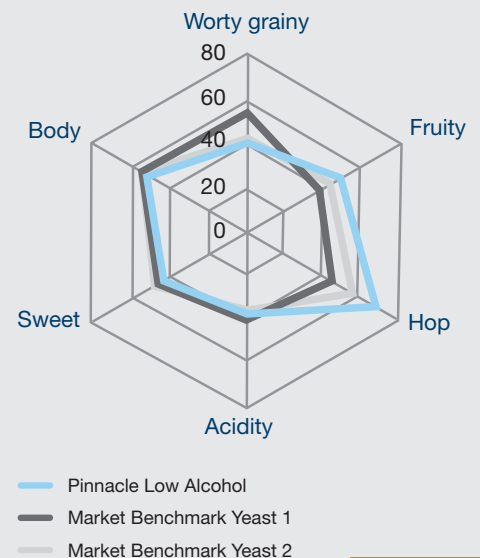


Why Pinnacle Low Alcohol?

PINNACLE™
BREWERS YEAST



- **Flavor and body**
 - Reduces warty aldehydes
 - Non-phenolic
 - Accentuates hop character
- **Maltose-negative yeasts are more economical and sustainable**
 - Requires less malt with target OG between 4-6dP
 - Avoids energy-intensive vacuum distillation
 - Eliminates need for high water-use membrane de-alcoholization
- **No upfront investment in alcohol removal equipment**
 - Achieves <0.5% ABV without alcohol removal systems
 - Ideal for brewers looking to expand into low-alc with minimal capital investment
- **Non-GMO**



SCAN TO DISCOVER MORE >>>



for **Craft Brewers** from craft beer lovers

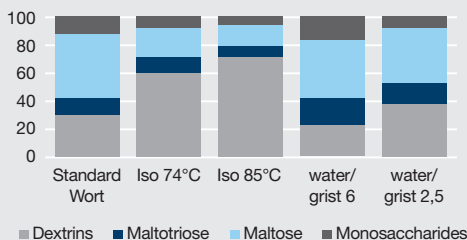
AB Biotek
PARTNERS IN FERMENTATION™
A business division of AB MAURI

Best Practices for Pinnacle Low Alcohol

Hotside

- ✓ **Mash to favor dextrins over maltose**
 - Mashing thicker: water to grist ratio of 2.5 L/kg
 - Mashing higher: 165–185°F (74–85°C)
- ✓ **Experiment with specialty and adjunct malts for flavor and body**
- ✓ **Increase percentage of dextrin malts to build body and foam**
- ✓ **Maintain a pH between 5.1-5.4 during lautering to avoid astringency**
- ✓ **Keep bitterness in check.**
Near beers won't support a hefty kettle addition
- ✓ **Knockout at 4–6° Plato to target <0.5% ABV**
- ✓ **Acidify wort to 4.8-5.0 before transferring to fermenter**
- ✓ **Skip oxygenation when using first-generation dry yeast - it's not required**

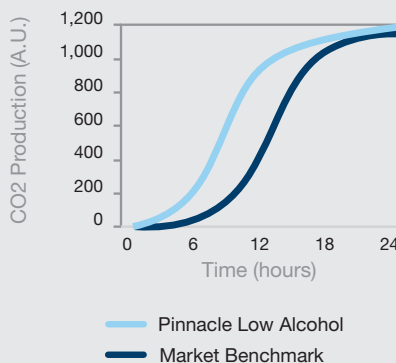
Wort Sugar Composition



Coldside

- ✓ **Lower pitch rate (50g/hL) due to limited fermentation, but avoid under-pitching to prevent spoilage or worty aldehydes**
- ✓ **Expect attenuation of 12-18%, depending on the mashing and original gravity**
- ✓ **Crash cool after initial fermentation period (4 days)**
- ✓ **Dry hop at colder temperatures to minimize hop creep and microbial growth**
- ✓ **Prevent cross-contamination.**
Brewing yeast will readily out compete a maltose-negative strain, so be extra vigilant
- ✓ **Avoid re-pitching or propagation**
- ✓ **Take caution when crash cooling - low-alcohol beers are more prone to freezing**

Fermentation Progression



Food Safety

- ✓ **Pasteurization is required to ensure product stability**
- ✓ **Follow good manufacturing practices throughout production**
- ✓ **Target a finishing pH below 4.6 (ideally a pH of 4.2) to prevent growth of food-borne pathogens**
- ✓ **Minimize warm hold times post-fermentation to reduce spoilage risk**
- ✓ **Some preservatives can be effective but require validation for use in low and no alcohol beer**
- ✓ **Draft service requires extra care - when serving non-alcoholic beer on draft, specific draft systems have been developed to minimize food safety concerns**
- ✓ **Consult with a food process authority and ensure you have a robust food safety plan in place**

Microbial Barriers in Low Alcohol Beer

