

The Lakewater Brewery Yeast Starter Process Records

Yeast Starter Record For: Dry Irish Stout

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| 2009-02-01 | Wyeast 1084 | Propagator Pack |
| Anticipated Pitch Date | Yeast Type | Origin |

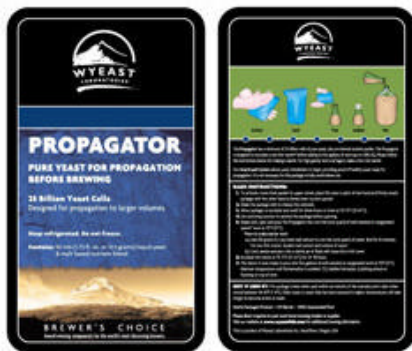
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| Session 1 | <u>Start Here For Plate and Slant Yeast Cultures</u> | |
| Date: | Start Time: | End Time: |
| <ol style="list-style-type: none"> 1. Boil 400ml spring water for 15 min 2. Loss of 100ml per 15min with aluminum foil covering 80% 3. Add 10g of DME and 1g of yeast nutrient to remaining 300ml boiled water 4. Boil down to 150ml for a 1040OG starter 5. Pour 40ml into flask. 6. Inoculate with yeast culture 7. Keep at 70f ambient on stir plate until growth is evident. (Starter becomes cloudy) | | |

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| Session 2 | | |
| Date: | Start Time: | End Time: |
| <ol style="list-style-type: none"> 1. Boil 700ml spring water 5min 2. Add 36g DME boiled water 3. Boil 15 min. Partial cover. (Down to 550ml for a 7.0b 1028OG) 4. Cool to 70f 5. Pour 400ml starter into flask 6. Add Session 1 40ml starter into 400ml step starter 7. Keep at 70f ambient on stir plate until growth is evident. (Starter becomes cloudy) | | |

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| Session 3 | <u>Start Here For Propagator Pack Cultures</u> | |
| Date: 2009-01-27 | Start Time: 2000 | End Time: |
| <ol style="list-style-type: none"> 1. Boil 1350ml spring water 15min. 1300 ml after Boil – 7brix (1030) 2. Add 91g DME(12tbl) and 1g yeast nutrient to boiled water 3. Boil 15 min. open cover to a 10.0b 1040OG. Actual OG 4. Cool to 70f 5. Add to 400ml Session 1 flask (or Propagator Pack) to obtain 1000ml starter 6. Keep at 70f ambient on stir plate until growth is evident. (Starter becomes cloudy) / / / 7. Hold for 24hr then proceed to Session 4 | | |

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| Session 4 | | |
| Date: 2009-01-30 | Start Time: 0630 | End Time: |
| <ol style="list-style-type: none"> 1. 0630 - Turn off stir plate and lower ambient temp to 50f – 2030 mover to second build up of 1.045 | | |

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| Session 5 | | |
| Date: 2009-02-01 | Start Time: 1630 | End Time: |
| <ol style="list-style-type: none"> 1. Pitch to primary | | |



Propagator™

Propagator™ Product Information and Usage

Propagator™ packages are designed for and require a propagation step (starter culture) before brewing.

Propagator™ packages contain live yeast cells in a liquid slurry. This yeast slurry is packaged in an optimum condition for storage, while maintaining the ability for rapid and complete fermentation.

Propagator™ packages include a sterile liquid nutrient pouch that, when “smacked”, releases its contents into the yeast slurry and “activates” the package. The available nutrients initiate the culture’s metabolism which in turn generates CO₂ and causes swelling of the package. This process will reduce lag times by preparing the yeast for a healthy fermentation prior to inoculation. Activation also serves as a viability test of the culture. Expansion of the package is an indicator of healthy (viable and vital) yeast. Although beneficial, cultures do not need to be activated prior to inoculation.

Usage

The Propagator™ package contains a minimum of 25 billion cells in a yeast slurry. This volume is not adequate for direct pitching into 5 gallons of wort and requires a 1-2 L propagation step prior to brewing. The Propagator™ is designed, when propagated in a 1-2 liter “starter” culture, to inoculate 5 gallons of standard strength ale wort (1.034-1.060 SG) with professional pitching rates. For lagers, we recommend pitching the starter culture into the wort at warm temperatures (68-70°F/ 20-21°C), waiting for signs of fermentation, and then adjusting to the desired temperature. Alternatively, for pitching into cold conditions (34-58°F/ 1-14°C) or higher gravity wort, we recommend increasing this pitching rate further by performing additional propagation steps. Please see the Pitch Rate section for additional information.

Instructions for the proper use of Propagator™ packages:

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1. To activate, locate and move inner packet to a corner. Place this area in palm of one hand and firmly smack package with the other hand to break inner nutrient packet. Confirm inner packet is broken.
2. Shake the package well to release the nutrients.
3. Allow package to incubate and swell for three hours or more at 70-75°F (21-24°C).
4. Use sanitizing solution to sanitize the package before opening.
5. Shake well, open and pour the liquid contents of the Propagator™ into 1-2 liter (1-2qt.) of well-aerated or oxygenated starter* wort at 70°F (21°C).
6. Incubate the starter at 70-75°F (21-24°C) for 12-24 hours, or until fermentation is complete as evidenced by gravity drop.
7. Pitch the starter into five gallons of well-aerated or oxygenated wort at 70°F (21°C). Maintain temperature until fermentation is evident: CO2 bubble formation, bubbling airlock or foaming on top of wort.
8. Adjust to desired fermentation temperature.

***Directions for starter wort:**

1. Add 100 grams (3.5 oz.) dried malt extract to one liter (1 quart) of water. Add ½ tsp Wyeast Nutrient to mixture. Boil for 20 minutes. For two liter starter, double malt extract and volume of water.
2. Cool, aerate and pour into a sterile jar or flask with loose lid or foil cover.

Full swelling of Propagator™ packages is not required for their use. The contents of Propagator™ packages may be pitched into a 1-2 liter starter without prior activation. Our smack pack technology is intended to be a tool for your use in determining viability, and in initiating metabolism for faster starts to fermentation.