Standard Operating Procedure Monitoring Yeast During the Beer Brewing Process	

Scope

This procedure applies to monitoring yeast pitch levels for brewing craft beers.

Overview

Yeast levels in pitch tanks for craft beers are typically in the 1B/ml plus range. Therefore a protocol that minimizes steps, errors introduced during pipette steps and minimizes cost to craft breweries is detailed in this SOP. These steps are required to insure the final test sample falls within the upper concentration limit of the Moxi Z, 2.5M yeast/ml.

Additionally yeast levels play a critical role in the carbonation, alcohol content and taste of the final product `. The Moxi Z is and ideal instrument for monitoring yeast pitch counts, due to it's accuracy, precision, ease of use and rapid test time. The estimated time to perform test is 2 minutes.

Total Procedure Time

2 minutes

Materials

Description	**Catalog number**	**Vendor**
MoxiZ Cell Analyzer	MXZ001	Orflo
MoxiZ S-Cassette	MXC003	Orflo
NERL Diluent	DIL5522	Thermo Scientific
10-100ul Pipette	AP-100 (0.2% CV)	Accupet
10-100ul Pipette Tips	UR-100	Accupet
50ml centrifuge dilution tube w/ cap	21-106	Genesse Scientific

Process

High level dilution table

The value in the red box indicates dilution factor used to calculate actual concentration of yeast in tank. You will need this in the final step of the "Step by Step Procedure" below.

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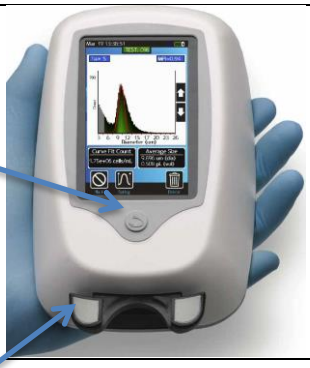
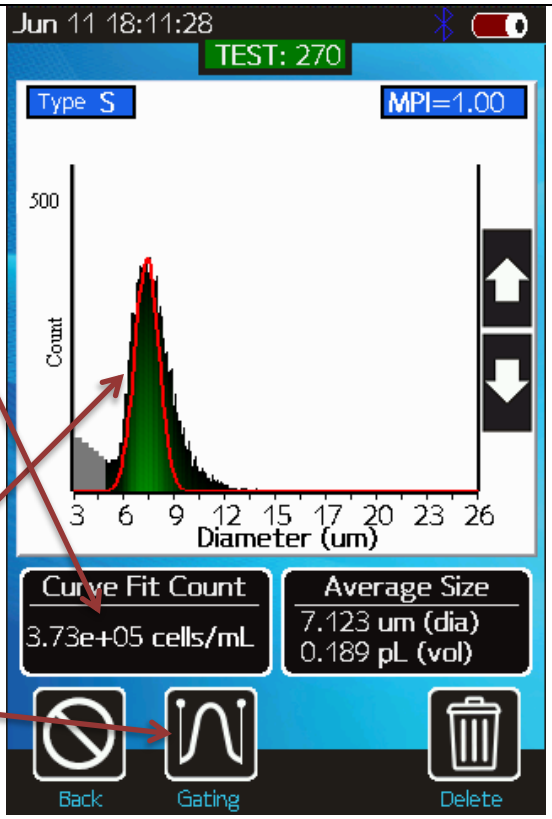
Step	Sample Volume ul	Diluent	Dilution Factor	Cummulative Dilution factor	Concentration (yeast/ml)
Initial sample concentration					1.00E+10
Dilution Step 1	5,000	40,000	9	9	1.11E+09
Dilution Step 2	75	40,000	534	4,809	2.08E+06

Step by Step Procedure

Procedure	Graphic
Place two 50ml centrifuge tubes (Genesse Scientific PN 21-106) into tube rack (Genesse Scientific PN 27-208G) and label tubes #1 and #2	
Pour 40 ml of NERL Diluent (Thermo PN DIL5522 into Tube #1	
Add 5ml of brew sample to Tube #1	
Pour 40 ml of NERL Diluent (Thermo PN DIL5522 into Tube #2	
Place cap on Tube #1 and invert and swirl until brew sample is evenly mixed throughout tube	
Pipette 75ul's from Tube #1 immediately after mixing, if sample appears to have settled remix as per above step	
Inspect pipetted sample and make sure no air bubbles exist in pipette tip	
Pipette this 75ul sample into tube	

#2	
Place cap on Tube #2 and mix thoroughly by inverting and swirling tube for20 seconds	
Turn on Moxi Z by pressing the power button	
Insert Moxi Z Cassette into Moxi Z by pressing down on grey tab	
Pipette 75 ul's of sample from Tube #2 and deliver pipette into the Moxi Z Cassette	
After pipetting out all 75 solution, touch screen to begin test, test will complete in about 8 seconds	

After the count is complete, record yeast concentration from box in lower left corner, make sure system is in auto-gate mode, a red curve will outline the reading. 3.73e+05 cells/ml = 373,000 cells per/ml Make sure the system is in auto-gate mode, you will see a red line around the green curve. If it is not press the "Gating" icon, it will say "Curvefit" underneath it	
Multiply the result by the dilution factor, 4,809X to get actual yeast concentration in the brewing tank. Record the number on your log sheet, also record the test number (in this example 270, see top of screen)	373,000 * 4,809 = 1.79 billion yeast /ml measured in the tank