



Production Process Overview

- The sugar base is blended into hot water to reach the desired gravity, then boiled for 10-15 ~minutes.
- Nutrients are either added at the end of the boil, with 5 ~minutes to go, or right at the start of fermentation post chilling.
- The base is chilled and oxygenated/ aerated at the same rate you would for a beer based on the same gravity.
- The base is then inoculated with yeast.
- Fermentation tank temperature is set to 70-75 °F/ 20-22 °C.
- The base is fermented as low as possible; often negative gravity is desired. Fermentation can range from 4-15 days depending in your fermentation kinetics.
- The fermented seltzer is then crash chilled for 24-48 hours.
- The chilled seltzer is then filtered/ centrifuged and often times treated or filtered with carbon to achieve a desired neutral flavor and color profile.
- If high gravity fermenting, the seltzer is blended with deaerated water to achieve desired ABV. When desired ABV has been adjusted for, flavors and colorings may be blended in as well as other agents for stabilization.
- Prior to packaging, CO₂ volumes may be adjusted to achieve desired volumes between 2.6-3.0.



Base

Hard seltzers are made from sucrose, dextrose, maltose, high fructose corn syrup or a combination of brewers malted barley and one of the four.

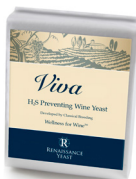
Yeast

We recommend using Renaissance Yeast – Viva or Avante, or Chr. Hansen's Merit dosed at 2lbs/1000gal or 28g per US Beer BBL.

Renaissance Yeast is a leader in the development of classical crossbred (non-GMO) H₂S-preventing *Saccharomyces* yeast, based on a unique strain of yeast, UCD932, that was recently isolated by the University of California, Davis which is naturally incapable of producing hydrogen sulfide.

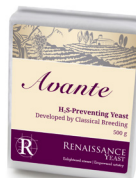
Renaissance Yeast Viva™

- *Saccharomyces cerevisiae bayanus*
- Rapid and clean fermenter
- Able to ferment at low temperature
- No H₂S production
- Killer Status - Active



Renaissance Yeast Avante™

- *Saccharomyces cerevisiae*
- Tolerant of high alcohols (up to 17% v/v)
- No H₂S production
- Killer Status – Neutral



Chr. Hansen Merit™

- *Saccharomyces cerevisiae*
- Tolerant of high alcohols (up to 17% v/v)
- Strong all around fermenter
- Restarting stuck fermentations
- Low SO₂ and H₂S production
- Killer Status - Active



Yeast Rehydration Protocol - Yeast rehydration is a key factor in fermentation performance.

1. Add yeast to unchlorinated tap water in a ratio of 1:10. Water temp should be monitored to keep the temperature between 77-86 °F.
2. Add your base into the water/yeast mixture in a ratio of 1:3 and let sit for 20 min.
3. After 20 minutes inoculate into your fermentation tank. Temp of the mixture should be within 5F~ of the fermentation tank temperature to prevent shock.

Following these instructions should results in a 95%~ yeast viability rate at start of fermentation. Watch video for tips on yeast rehydration.



SCAN CODE OR CLICK IMAGE TO VIEW VIDEO

Fermentation Nutrient

Micro**Elements**® Hard Seltzer HG is a powder blend of complex fermentation nutrients formulated for high gravity seltzer fermentations. It is composed of organic and inorganic nitrogen, vitamins, trace minerals, sterols, amino acids, proteins and peptides.

FERMENTATION CHARACTERISTICS

- High gravity seltzer fermentation ($\geq 25^\circ$ Plato)
- Fast fermentation times
- High alcohol yields
- Neutral flavor and aroma profile

INSTRUCTIONS FOR USE

Rehydrate Micro**Elements** Hard Seltzer HG in 10X the weight in process water and mix for 10 minutes. Add the hydrated solution to the fermenter with the sugar base prior to yeast inoculation in one addition.

DOSAGE RECOMMENDATIONS

$^\circ$ Plato		15-20	20-25	≥ 25
	g/L	4.95	6.2	6.6
	g/bbl.	580	725	773
	lbs./1000gal	41.2	51.6	55
Nitrogen	PPM	694	868	925

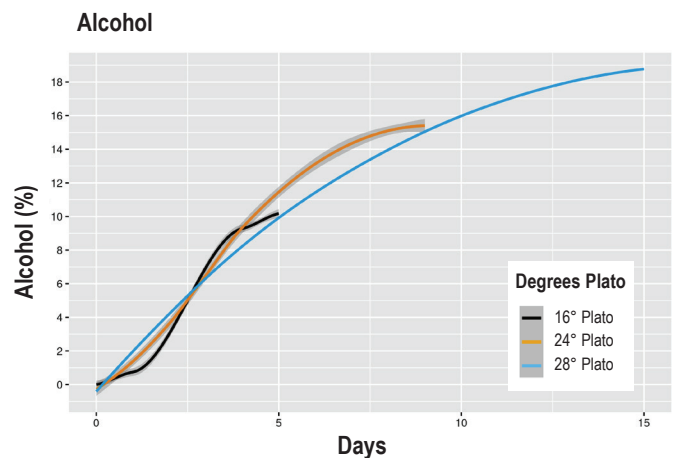
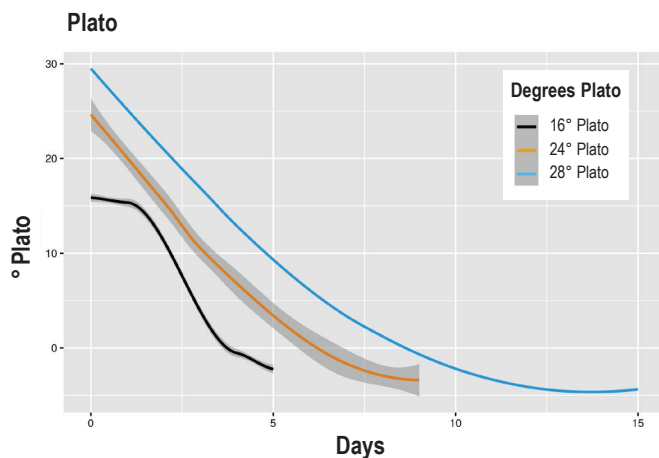
This product provides 16.8ppm of available nitrogen for every 1lb/1000 gallons.

Micro**Elements**®
Fermentation Nutrients

HARD
Seltzer
HG



Fermentation Curves



Enzymes - Diacetyl Control

Manage diacetyl by eliminating the precursors of vicinal diketones (VDK's) with the use of IFF enzymes.

IFF Alphasase® Advance 4000 α -acetolactate decarboxylase

- Breakdown VDK precursors for short and consistent maturation periods
- Keep diacetyl levels below the flavor threshold
- Shorten or eliminate diacetyl rest
- Optimize capacity and reduce processing times
- Dosed at 8ml/ US Beer BBL at inoculation
- Available in 5kg and 25kg

***Dosage rates can vary depending on processing parameters such as pH and temperature.



Filtration

There are a number of factors in the fermentation kinetics to consider that may lead to the need for further processing, including starting gravity, yeast being used, and duration of fermentation time. For those that want to process as quickly as possible, you will need to clean up your fermented product to remove undesirable flavors and odors. Here are a few options to consider:

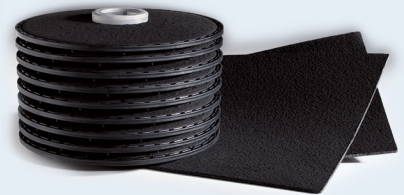
Filtration General Recommendations

Scenario #1

Desired Outcome: Clear, odorless, neutral finished product

Coarse Filtration: CSF-XC filter sheets or 1925-SD lenticular cartridge filters

Carbon Filtration: 1640 Carbac HCX media, made from chemically activated wood, shows to be the best option for all around odor, flavor and color removal when filtering hard seltzer. 1640 Carbac HCX media is available in both filter sheet or lenticular cartridge filter form.



Scenario #2

Desired Outcome: Color removed, flavor and odor not as big of an issue

Coarse Filtration: CSF-XC filter sheets or 1925-SD lenticular cartridge filters

Carbon Filtration: For more targeted color removal using filter sheets, the 1640 Carbac CRX media is recommended. For more targeted color removal using lenticular cartridge filters, 1640 Carbac CRM media, made from chemically activated pine-wood, proves to be the best option.

Scenario #3

Desired Outcome: Clear, odorless, neutral finished product using loose carbon

Coarse Filtration: CSF-XC filter sheets or 1925-SD lenticular cartridge filters

Carbon Addition: ENO carbon (Antichromos)

Secondary Filtration: CSF-SP filter sheet or 1950-SD lenticular cartridge filters would be recommended to catch any loose carbon particles.



Filter Housings

A full line of lenticular cartridge filter housings are available to accommodate the lenticular cartridge versions of the HCX and CRM carbon impregnated media, and the 1925-SD and 1950-SD filter media. These filter housings are designed for cost-effective beverage processing under sanitary conditions, and are available in many sizes to accommodate a wide range of process flow rates.



DENWEL PROCESSING EQUIPMENT

Water Deaeration Cold Column

The Deaeration unit is designed for efficient and reliable deaeration of water under atmospheric conditions. The column is filled with structured packing, enabling a large internal surface which strips out the oxygen to levels below 10 ppb.

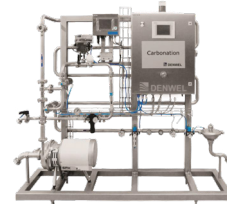
[Click here to learn more](#)



Inline Carbonator

CO₂ is injected into the beverage through the DENWEL Injector, which splits the gas into micro bubbles. The most efficient and instant dissolution of CO₂ is achieved with only minimal pressure drop and no gas or flavor loss. No static mixer, sinter candle or tank with stone is required. Designed for CIP, no parts of the Injector have to be removed for sanitation. Available in manual, semi manual and fully auto units.

[Click here to learn more](#)



Carbo-blender

The Carboblender provides precise and reliable Extract/Alcohol concentration adjustment and carbonation of Beer or Hard Seltzer at one process step. Inline process analytics guarantees very high accuracy.

[Click here to learn more](#)



Inline Dosing

The Compact Dosing Unit provides continuous dosing of one, or more additives into beverage, water or cleaning solution. A precise dosing rate is controlled by process analytics or volume / mass flow measurement. Additives are dosed from homogenizing vessels.

[Click here to learn more](#)



Flash Pasteurizer

The Flash Pasteurization Automatic Unit is designed for safe, precise and reliable heating of beverages. While reducing pathogenic microorganisms, uniform and gentle treatment is applied to maintain the original taste and appearance of the beverage.

[Click here to learn more](#)



“Seltzer System”

This is a **NEW** combination equipment skid, which includes water deaeration, ingredient dosing, blending and carbonation functions and is capable of creating “ready to drink” beverages in semi- automatic mode. The Blending Skid Unit is proposed in the following configuration: Water Deaeration Column Cold with Pre-carbonation, Dosing Compact Unit and Carboblender Semi-automatic unit.

*** For further process optimization or to obtain a quote for a piece of equipment, please reach out to your local Gusmer Technical Sales Representative. <https://www.gusmerenterprises.com/find-a-rep/>



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