

Four Roses: An overview of the process and science of making Bourbon.

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2020 Portland Cocktail
Four Roses Distillery LLC



Bourbon Facts from The Kentucky Distiller's Association.

- America's only native spirit.
- Kentucky is the birthplace of Bourbon, crafting 95 percent of the world's supply. Only the Bluegrass State has the perfect natural mix of climate, conditions and pure limestone water necessary for producing the world's greatest Bourbon.
- Bourbon is an \$8.5 billion signature industry in Kentucky, generating 17,500 jobs with an annual payroll of \$800 million. Spirits production and consumption pours more than \$825 million in federal, state and local tax coffers every year.
- More than \$1.1 billion in capital projects has been completed or is planned and underway in the past five years and the next five years, including new distilleries and aging warehouses to bottling facilities and tourism centers.
- Bourbon production has increased more than 275 percent since 1999 (455,078 barrels compared to 1,715,541 in 2017), with premium small batch and single barrel brands driving the Bourbon renaissance.
- That gives the Commonwealth a total inventory of 7.5 million barrels of Bourbon, the most since 1974 when 6,683,654 new charred oak casks were gently aging in Bluegrass warehouses.
- The Kentucky Bourbon Trail boast over 1 million visitors per year. 70% from out of state.



History of Four Roses

It began when Paul Jones, Jr., the founder of the Four Roses Bourbon, became smitten by the beauty of a Southern belle. It is said that he sent a proposal to her, and she replied that if her answer were "Yes," she would wear a corsage of roses on her gown to the upcoming grand ball. Paul Jones waited for her answer excitedly on that night of the grand ball...when she showed up in her beautiful gown, she wore a corsage of four red roses. He later named his Bourbon "Four Roses" as a symbol of his devout passion for the lovely belle, a passion he thereafter transferred to making his beloved Four Roses Bourbon.



History of Four Roses

- Trademarked in 1888
- Produced during Prohibition (*medicinal purposes*)



- Became #1 Bourbon in U.S. following Prohibition
- Purchased by Seagram in 1943
- Pulled from U.S. Market and placed "Export Only" in late 50's
- Top Selling Bourbon in Japan, and most of Mainland Europe – (*Four Roses Bourbon 80 Proof*)



Distillery built in 1910



Definition of Bourbon

Congressional Act of 1964 – Defines Bourbon
("Rules for Production")

- Minimum of 51% corn (maize)
- New charred oak barrels
- Distilled at less than 160 proof (80%)
- Maximum of 125 barrel proof (62.5%)
- Unadulterated flavor and color
- Aged at least two (2) years
 - to be called a "Straight" Bourbon
- Distinctive product of the U.S.A.



What makes Kentucky ideal for Bourbon production?

- **Steady temperatures and seasonal changes**
- **The amount of rainfall for raw material production and usable water**
- **Limestone filtration of surface water**



Yeast Propagation

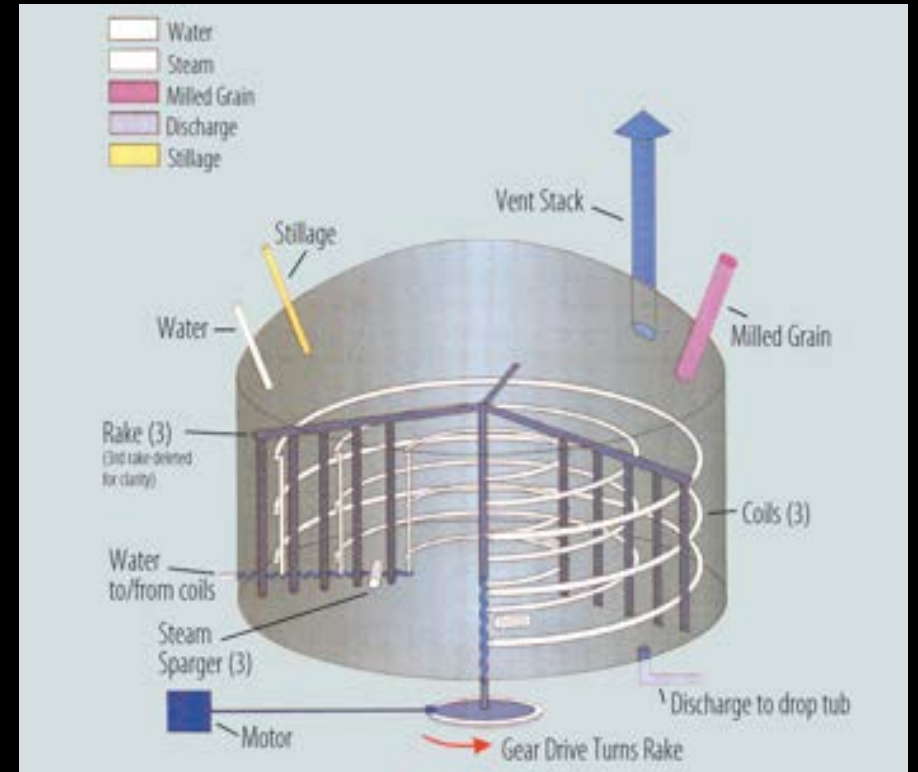


Yeast and Lactic

- Grown fresh, in laboratory
- Proprietary strains
- 100% Quality Control



Cooking and Conversion



Uniqueness of Four Roses- 2 Mash Bills

1
OBSV

2
OBSK

3
OBSS

4
OBSQ

5
OBSF

Mashbill B

60% Corn | 35% Rye | 5% Malted Barley

6
OESV

7
OESK

8
OESO

9
OESQ

10
OESF

Mashbill E

75% Corn | 20% Rye | 5% Malted Barley

Yeast: V
Delicate Fruit

Yeast: K
Slight Spice

Yeast: O
Rich Fruit

Yeast: Q
Floral Essence

Yeast: F
Herbal Notes

Fermentation Tanks

Stainless and Wooden - Red Cypress and Douglas Fir Fermenters



Fermentation

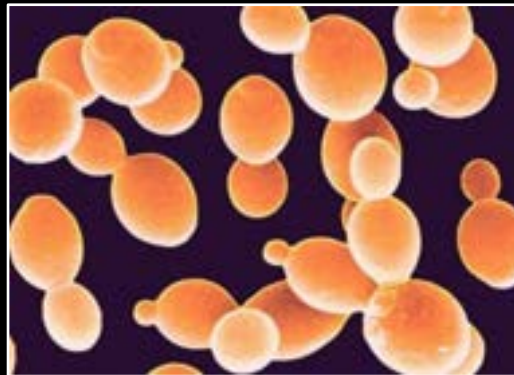
- Sugars + Yeast → Ethanol + CO₂
 - + congeners (Organic Acids, Fusel Oils, Aldehydes (carbonyls), Esters, Sulphur containing molecules, Phenolics)
- Fermentations are checked periodically until completion (72-80 hours)
 - Sugar Levels
 - Yeast Count
 - pH
 - Temperature
 - Fermentation profile (sugars and acids) via HPLC

This is probably the most delicate and important part of the process
- Congeners are the smallest percentage of the solution
 - Significant impact on the flavor profile of whiskey after concentration via distillation
 - Compounds that impact flavor immediately
 - Compounds that are precursors to the final flavor
 - Different yeasts impart different congener levels



Uniqueness of Four Roses: 5 Proprietary Yeast Strains

Yeast Codes:
V, O, Q, K, F



V
Delicate
Fruitiness



K
Light
Spice



O
Rich
Fruitiness



Q
Floral
Essence



F
Herbal
Notes

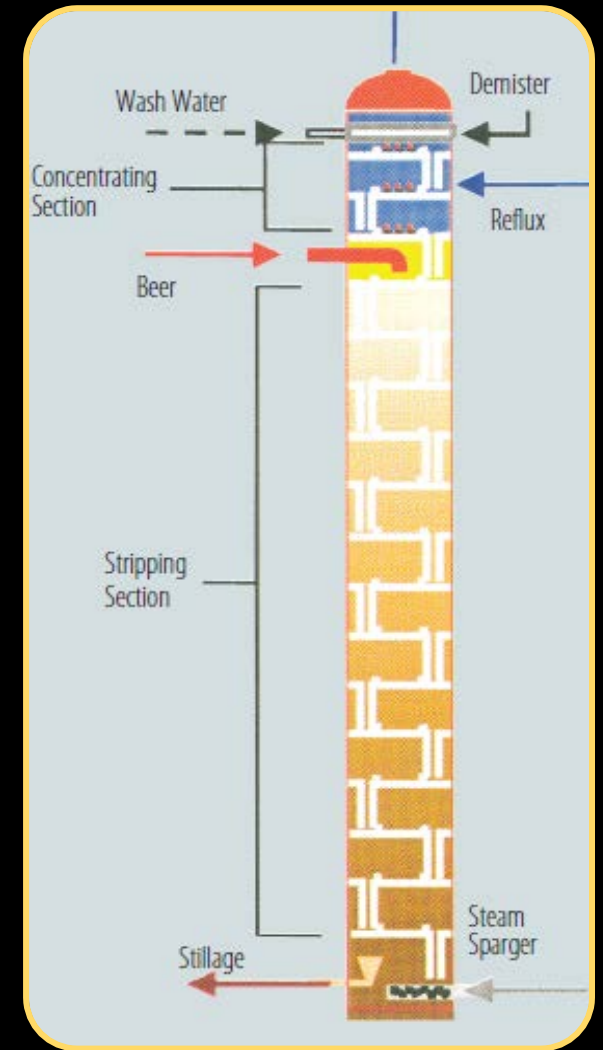


“Double” Distillation – 1st Distillation - Beer Column Still

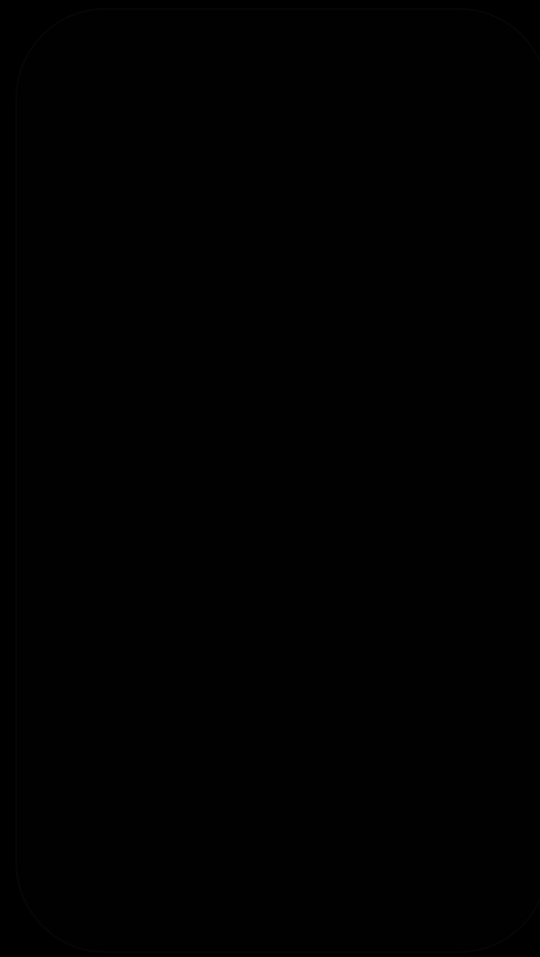
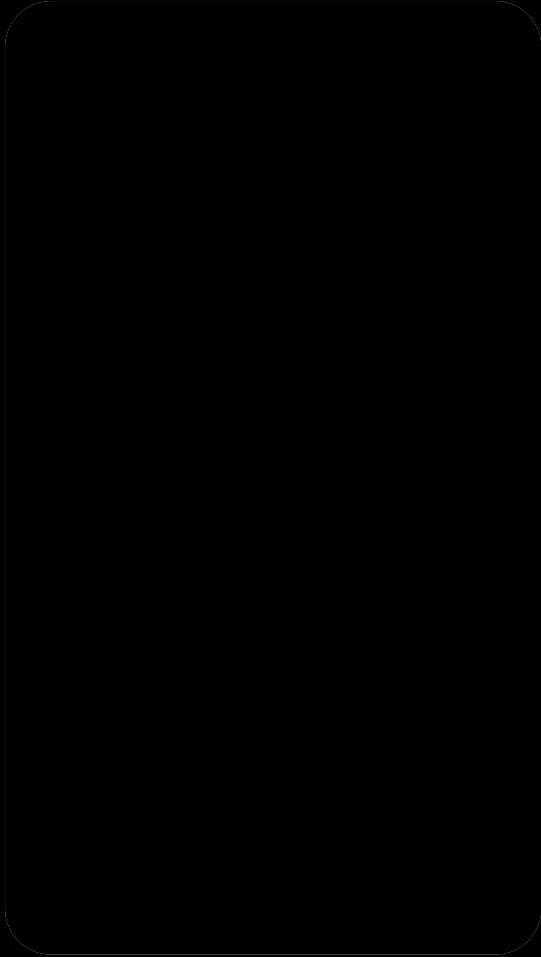


Beer Still

Beer Distillation – Separation (Vaporization) of Alcohol and Rich Flavors



2nd Distillation – Concentration of Alcohol in Doubler



Beer Column 132 Proof

Doubler (Pot Still)

- Four Roses Distillery -

**Tail Box – 140 Proof
“White Dog” / Distillate**

Distillate Shipment to Warehouse



Distillate reduced to 120° and entered into the barrel.



Barrels are stored in our Single Story Rack Warehouses.



21 Warehouses- 24,000 barrel capacity.



- Four Roses Distillery -



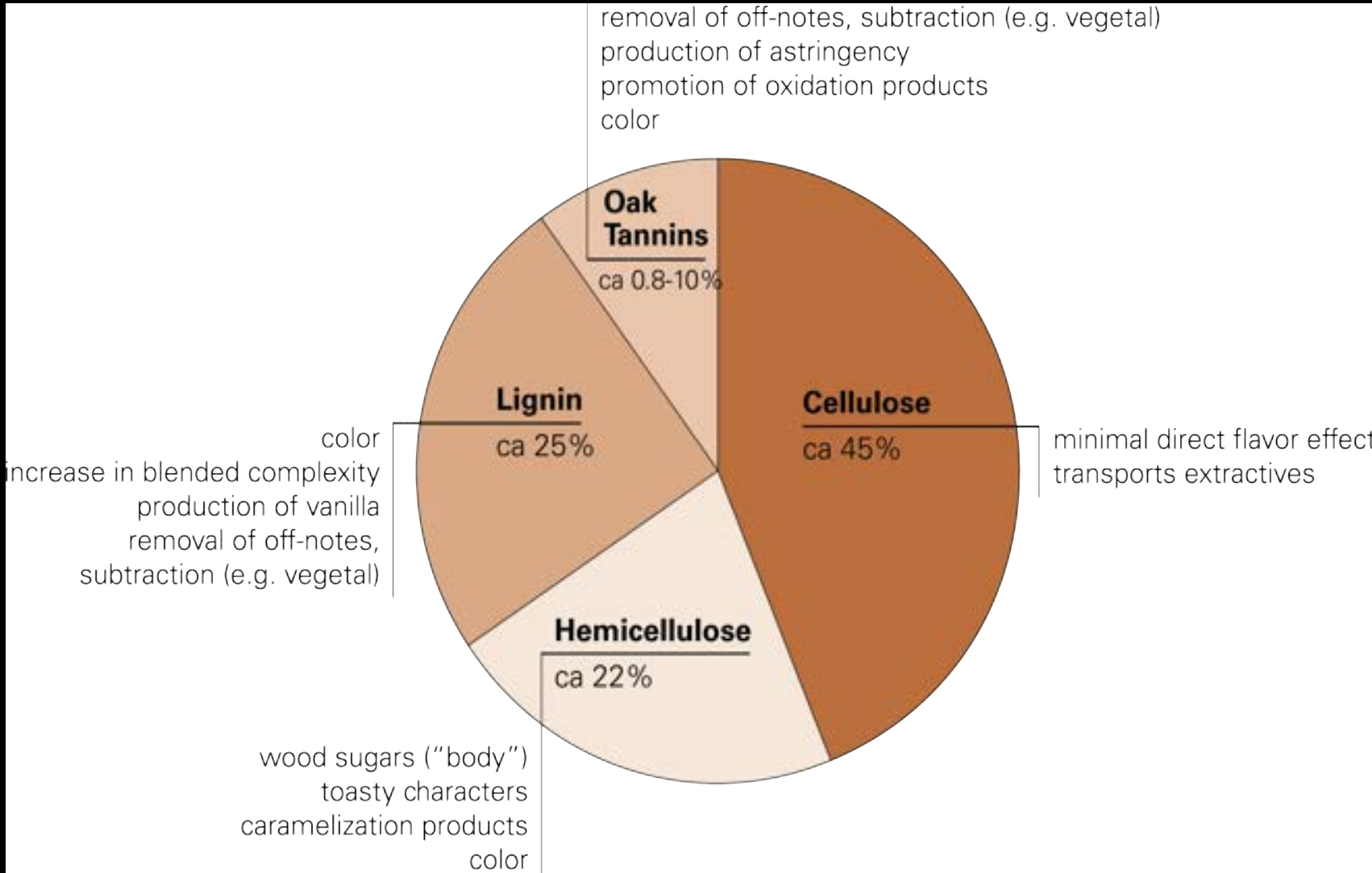
Four Roses Warehouse Aging

- Kentucky Climate
 - A full four seasons allows for large gradual temperature swings throughout the year
 - This allows the liquid to expand and contract in and out of the wood of the barrel
- In the Barrel-
- Extraction- Flavor Compounds and Color.
- Absorption- Undesirable aromas and tastes into the char and oak.
- Chemical Reactions- Primarily Esterification and Oxidative reactions





Influence on Beverage Maturation



Toasting

<i>Chemical compounds</i>	<i>Aroma</i>	<i>Source</i>
HMF	Light toasty	Hemicellulose
5MF	Medium toasty	Hemicellulose
Furfural	Dark toasty	Hemicellulose
Vanillin	Vanilla - Key ingredient	Lignin
Syringaldehyde	Marker for degree of heat application	Lignin
Coniferaldehyde	Precursor of vanillin	Lignin
Guaiacol	Smoke	Lignin
4-methyl guaiacol	Spicy/clove	Lignin
Trans lactone	Celery like	
Cis lactone	Coconut	

Liquid Processing

- Bourbon Processing can vary depending upon company and product
- Bulk liquid is filtered to remove all of the char at ambient temperature
- Lower proof bourbon is usually chill filtered to remove fatty acids
 - They are hydrophobic and drop out of solution when water is added or when temperature drops
- The chill filtration process both adds water and chills bourbon before filtration
 - Fatty acids coagulate and are captured by the filter material
 - Bourbon is then warmed back up and ready for bottling after the final water addition
 - If filtration is not performed properly it is possible to strip too much flavor (and color)
- Quality checks
 - Proof
 - Color
 - Clarity
 - Sensory



Uniqueness of Four Roses

Premium, Quality Grains



2 Mash Bills

"E" – Mash Bill
75% - Corn Recipe

"B" – Mash Bill
35%- Rye Recipe

X

Hard, Limestone Water



5 Proprietary Yeast Strains



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Single-Story Warehouses



10 Unique, Smooth & Mellow Bourbons



FOUR ROSES BOURBON

PERFECT FOR COCKTAILS



Four Roses Bourbon blends up to 10 of our distinct Bourbon recipes, resulting in a versatile, easy-drinking Bourbon that appeals to casual fans and enthusiasts alike. Perfect for cocktails.

- Crafted from up to 10 of our distinct Bourbon recipes
- 80 proof
- Aged 5 years minimum

NOSE: Fruit, floral essence, gentle spice & honey

PALATE: Crisp, soft & smooth, fresh fruit, hints of pear & apple

FINISH: Mellow, long & pleasant



FOUR ROSES BOURBON							
AGED MINIMUM 5 YEARS	RECIPE MAKE UP	1	2	3	4	5	80 PROOF
		6	7	8	9	10	

1 OBSV	2 OESK	3 OESO	4 OBSQ	5 OBSF	MASHED E 100% Grain 100% Rye 100% Malted Barley
6 OESV	7 OESK	8 OESO	9 OESQ	10 OESF	
Thank V Delicate Fruit	Thank E Light Spice	Thank O Rich Fruit	Thank Q Floral Essence	Thank F Herbal Notes	

SMALL BATCH

A EXCEPTIONALLY BALANCED, TOP-SHELF STAPLE



Four Roses Small Batch combines four of our distinct Bourbon recipes to achieve exceptional balance. Easy to drink neat, on the rocks – or as the foundation of a great craft cocktail. A top-shelf staple.

- Crafted from four of our distinct Bourbon recipes
- 90 proof
- Aged 6 years minimum

NOSE: Mellow spice, rich fruit, hints of sweet oak & caramel

PALATE: Mellow, ripened red berries, dried spice, well-balanced

FINISH: Soft, smooth & pleasantly long

FOUR ROSES SMALL BATCH						
AGED MINIMUM	RECIPE MAKE UP	1	2	3	4	90 PROOF
6 YEARS		6	7	8	9	



1 OBSV	2 OESK	3 OESO	4 OBSQ	5 OBSF	Master E 100 Cask 100% Rye 100 Malted Barley
6 OESV	7 OESK	8 OESO	9 OESQ	10 OESF	
Taste: V Delicate Fruit	Taste: E Light Spice	Taste: O Rich Fruit	Taste: Q Floral Caramel	Taste: F Herbal Notes	Master E 100 Cask 100% Rye 100 Malted Barley



SINGLE BARREL

COMPLEX, HIGH-RYE BOURBON. ONE BARREL AT A TIME.



Four Roses Single Barrel is a high-rye Bourbon made up of the OBSV recipe and hand selected by our Master Distiller – one barrel at a time – based on maturation and taste. Complex flavor revealed through a simple process.

- Made solely of one of our distinct recipes – OBSV
- 100 proof
- Aged 8-10 years
- High-rye Bourbon

NOSE: Dried spice, pear, cocoa, vanilla & maple syrup

PALATE: Hints of ripe plum & cherries, robust, full body

FINISH: Smooth & delicately long



FOUR ROSES SINGLE BARREL									
AGED 8-10 YEARS	RECIPE MAKE UP	1	2	3	4	5	HIGH RYE		
		6	7	8	9	10	100 PROOF		

1 OBSV	2 OESK	3 OESO	4 OBSQ	5 OBSF	Master E 95 Cask 95% Rye 10% Malted Barley
6 OESV	7 OESK	8 OESO	9 OESQ	10 OESF	Master E 95 Cask 95% Rye 10% Malted Barley
Taste: V Delicate Fruit	Taste: K Light Spice	Taste: O Rich Fruit	Taste: Q Floral Lintner	Taste: F Herbal Notes	

SMALL BATCH SELECT

RICH, NON-CHILL FILTERED BOURBON



Four Roses Small Batch Select is composed of six distinct recipes – an upper-premium, non-chill filtered Bourbon with a uniquely complex, herbal-forward flavor profile unlike anything in the category.

- Crafted from six of our distinct Bourbon recipes
- 104 proof
- Aged 6-7 years
- Non-chill filtered

NOSE: Raspberries, clove & nutmeg

PALATE: Apricot, berries, rich vanilla & light oak

FINISH: Lingering spearmint, light touch of cinnamon



FOUR ROSES SMALL BATCH SELECT							
AGED 6-7 YEARS	RECIPE MAKE UP	1	2	3	4	5	NON-CHILL FILTERED
		6	7	8	9	10	

1 OBSV	2 OBSK	3 OBSO	4 OBSQ	5 OBSF	Mashbill B 60% Corn 20% Rye 20% Malted Barley
6 OESV	7 OESK	8 OESO	9 OESQ	10 OESF	
Yeast: V Delicate Fruit	Yeast: K High Spice	Yeast: O Bak-Fruit	Yeast: Q Floral Esters	Yeast: F Herbal Notes	Mashbill E 70% Corn 20% Rye 10% Malted Barley

Four Roses Bourbon



Be mellow. Be responsible.

Four Roses®



BOURBON

- Four Roses Distillery -

Four Roses Small Batch

Four Roses Small Batch Select

Four Roses Bourbon



FOUR ROSES BOURBON			
AGED MINIMUM	RECIPE MAKE UP		80 PROOF
5 YEARS	1 2 3 4 5 6 7 8 9 10		



FOUR ROSES SMALL BATCH			
AGED MINIMUM	RECIPE MAKE UP		90 PROOF
6 YEARS	1 2 3 4 5 6 7 8 9 10		

Four Roses Single Barrel



FOUR ROSES SINGLE BARREL			
AGED	RECIPE MAKE UP		HIGH RYE
8-10 YEARS	1 2 3 4 5 6 7 8 9 10		100 PROOF



FOUR ROSES SMALL BATCH SELECT			
AGED	RECIPE MAKE UP		NON-CHILL FILTERED
6-7 YEARS	1 2 3 4 5 6 7 8 9 10		104 PROOF