

# FES

- Gravity **20 BLG**
- ABV **8.8 %**
- IBU **34**
- SRM **34.2**
- Style **Foreign Extra Stout**

## Batch size

- Expected quantity of finished beer **18 liter(s)**
- Trub loss **5 %**
- Size with trub loss **18.9 liter(s)**
- Boil time **150 min**
- Evaporation rate **10 %/h**
- Boil size **25.9 liter(s)**

## Mash information

- Mash efficiency **75 %**
- Liquor-to-grist ratio **3 liter(s) / kg**
- Mash size **21.9 liter(s)**
- Total mash volume **29.2 liter(s)**

## Steps

- Temp **67 C**, Time **20 min**
- Temp **72 C**, Time **50 min**
- Temp **76 C**, Time **4 min**

## Mash step by step

- Heat up **21.9 liter(s)** of strike water to **74.8C**
- Add grains
- Keep mash **20 min** at **67C**
- Keep mash **50 min** at **72C**
- Keep mash **4 min** at **76C**
- Sparge using **11.3 liter(s)** of **76C** water or to achieve **25.9 liter(s)** of wort

## Fermentables

Type	Name	Amount	Yield	EBC
Grain	Castle Malting - Pilszeński 6-rzędowy	3 kg (41.1%)	80 %	5
Grain	Żytni	2.5 kg (34.2%)	85 %	8
Grain	Płatki owsiane	0.8 kg (11%)	85 %	3
Grain	Simpsons - Crystal Rye	0.2 kg (2.7%)	73 %	177
Grain	Carafa III	0.4 kg (5.5%)	70 %	1034
Grain	Briess - Chocolate Malt	0.2 kg (2.7%)	60 %	690
Grain	Słód gryczany	0.2 kg (2.7%)	65 %	9

## Hops

Use for	Name	Amount	Time	Alpha acid
Boil	Columbus/Tomahawk/Zeus	12 g	60 min	17.1 %
Boil	East Kent Goldings	29 g	60 min	5.8 %

## Yeasts

Name	Type	Form	Amount	Laboratory
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us-05	Ale	Dry	22 g	safale
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### Extras

Type	Name	Amount	Use for	Time
Spice	Trawa żubrowa	20 g	Boil	60 min