

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 |
|------|------|------|--------|------------|
|------|------|------|--------|------------|

| | | | | |
|-------|-----|-----|------|--------|
| us-05 | Ale | Dry | 22 g | safale |
|-------|-----|-----|------|--------|

Extras

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