

Dark horse

- Gravity **11.9 BLG**
- ABV **4.8 %**
- IBU **16**
- SRM **29.4**
- Style **Munich Dunkel**

Batch size

- Expected quantity of finished beer **20 liter(s)**
- Trub loss **5 %**
- Size with trub loss **21 liter(s)**
- Boil time **60 min**
- Evaporation rate **10 %/h**
- Boil size **25.3 liter(s)**

Mash information

- Mash efficiency **75 %**
- Liquor-to-grist ratio **3.3 liter(s) / kg**
- Mash size **16.1 liter(s)**
- Total mash volume **21 liter(s)**

Steps

- Temp **62 C**, Time **25 min**
- Temp **68 C**, Time **15 min**
- Temp **70 C**, Time **20 min**
- Temp **72 C**, Time **10 min**

Mash step by step

- Heat up **16.1 liter(s)** of strike water to **68.4C**
- Add grains
- Keep mash **25 min** at **62C**
- Keep mash **15 min** at **68C**
- Keep mash **20 min** at **70C**
- Keep mash **10 min** at **72C**
- Sparge using **14.1 liter(s)** of **76C** water or to achieve **25.3 liter(s)** of wort

Fermentables

Type	Name	Amount	Yield	EBC
Grain	Monachijski	2.5 kg (51.3%)	80 %	16
Grain	Strzegom Wiedeński	1.5 kg (30.8%)	79 %	10
Grain	Strzegom Karmel 150	0.5 kg (10.3%)	75 %	150
Grain	Carafa III	0.125 kg (2.6%)	70 %	1034
Grain	Strzegom Czekoladowy ciemny	0.25 kg (5.1%)	68 %	1200

Hops

Use for	Name	Amount	Time	Alpha acid
Boil	Perle	15 g	60 min	6.5 %
Boil	Perle	20 g	10 min	6.5 %
Aroma (end of boil)	Tettnang	25 g	0 min	3.5 %

Yeasts

Name	Type	Form	Amount	Laboratory
US 05	Ale	Slant	100 ml	---