

# APA MACIINAC, MICHIGAN COPPER

---

- Gravity **12.1 BLG**
- ABV **4.9 %**
- IBU **29**
- SRM **4.4**
- Style **American Pale Ale**

## Batch size

- Expected quantity of finished beer **21 liter(s)**
- Trub loss **5 %**
- Size with trub loss **23.1 liter(s)**
- Boil time **60 min**
- Evaporation rate **10 %/h**
- Boil size **30 liter(s)**

## Mash information

- Mash efficiency **75 %**
- Liquor-to-grist ratio **3.8 liter(s) / kg**
- Mash size **22 liter(s)**
- Total mash volume **27.8 liter(s)**

## Steps

- Temp **68 C**, Time **60 min**

## Mash step by step

- Heat up **22 liter(s)** of strike water to **74.3C**
- Add grains
- Keep mash **60 min** at **68C**
- Sparge using **13.8 liter(s)** of **76C** water or to achieve **30 liter(s)** of wort

## Fermentables

Type	Name	Amount	Yield	EBC
Grain	Strzegom Pale Ale	5 kg (86.2%)	79 %	6
Grain	Pszeniczny	0.8 kg (13.8%)	85 %	4

## Hops

Use for	Name	Amount	Time	Alpha acid
Boil	Marynka	17 g	60 min	8.8 %
Aroma (end of boil)	Michigan Cooper	25 g	10 min	8 %
Aroma (end of boil)	Mackinac	25 g	10 min	9.2 %
Whirlpool	Michigan Cooper	15 g	0 min	8 %
Whirlpool	Mackinac	15 g	0 min	9.2 %
Dry Hop	Mackinac	60 g	3 day(s)	9.2 %

## Yeasts

Name	Type	Form	Amount	Laboratory
Safale US-05	Ale	Dry	11.5 g	Fermentis