

# pan Twardowski

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- Gravity **18.7 BLG**
- ABV **8.1 %**
- IBU **78**
- SRM **9**
- Style **Imperial IPA**

## Batch size

- Expected quantity of finished beer **23 liter(s)**
- Trub loss **5 %**
- Size with trub loss **24.1 liter(s)**
- Boil time **60 min**
- Evaporation rate **10 %/h**
- Boil size **29 liter(s)**

## Mash information

- Mash efficiency **75 %**
- Liquor-to-grist ratio **3 liter(s) / kg**
- Mash size **25.5 liter(s)**
- Total mash volume **34 liter(s)**

## Steps

- Temp **65 C**, Time **45 min**
- Temp **72 C**, Time **15 min**
- Temp **77 C**, Time **4 min**

## Mash step by step

- Heat up **25.5 liter(s)** of strike water to **72.5C**
- Add grains
- Keep mash **45 min** at **65C**
- Keep mash **15 min** at **72C**
- Keep mash **4 min** at **77C**
- Sparge using **12 liter(s)** of **76C** water or to achieve **29 liter(s)** of wort

## Fermentables

Type	Name	Amount	Yield	EBC
Grain	Pilzneński	5 kg (58.8%)	81 %	4
Grain	Pszeniczny	1 kg (11.8%)	85 %	4
Grain	Płatki owsiane	1 kg (11.8%)	85 %	3
Grain	Monachijski	1 kg (11.8%)	80 %	16
Grain	Cara Gold	0.5 kg (5.9%)	75 %	120

## Hops

Use for	Name	Amount	Time	Alpha acid
Boil	Columbus/Tomahawk/Zeus	25 g	45 min	15.5 %
Boil	Magnum	20 g	30 min	11.5 %
Boil	Citra	20 g	30 min	12.9 %
Boil	Columbus/Tomahawk/Zeus	10 g	30 min	15.5 %
Boil	Magnum	10 g	15 min	11.5 %
Boil	Opal	20 g	30 min	8.4 %

## Yeasts

Name	Type	Form	Amount	Laboratory
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Safale US-05	Ale	Dry	20 g	Fermentis
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