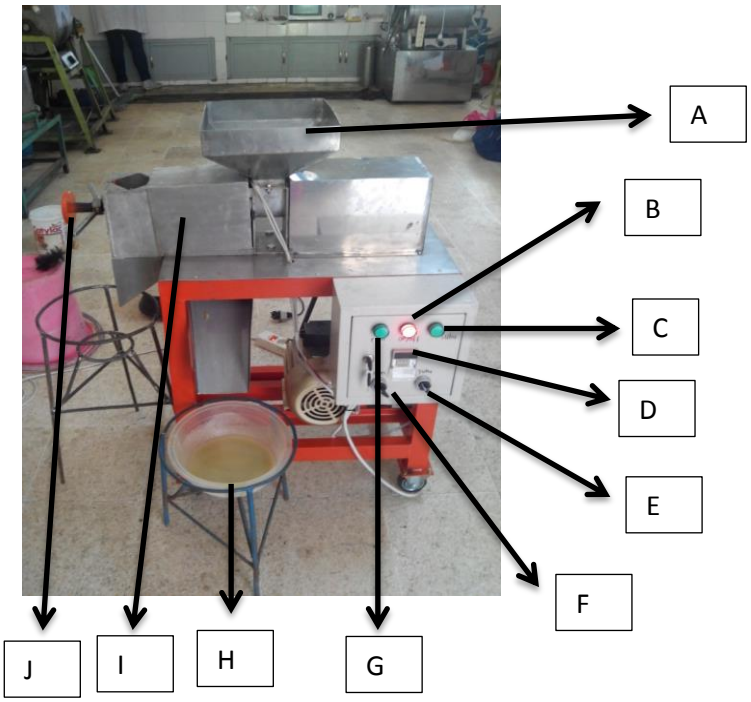
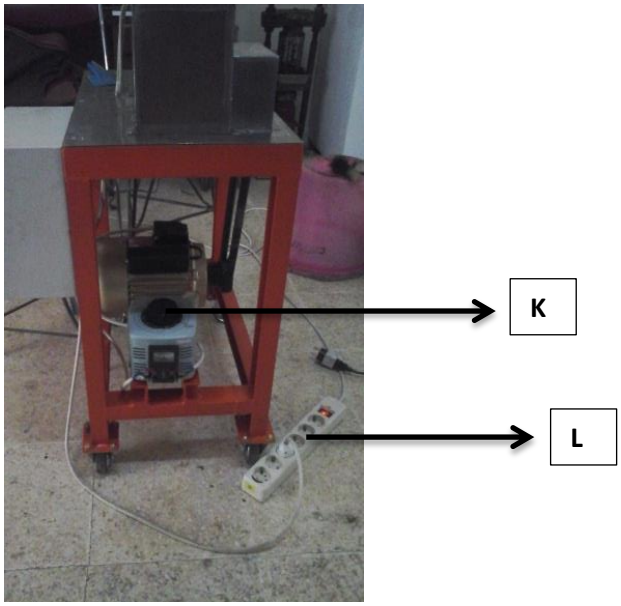
# Lampiran 1

## 1. Spesifikasi Perancangan Alat

| | |
|---|---|
| P x L x T | : 600 x 400 x 500 mm |
| Bahan | : Baja profil |
| Penggerak | : Elektro Motor 1 HP 220 volt |
| Kapasitas | : 10 kg/jam |
| Fungsi | : Untuk mengambil minyak pada biji-bijian |

## 2. Gambar Alat






Keterangan Gambar Alat :

A = Hopper

B = Indikator On-Off

C = Indikator suhu

D = Pengatur Set Point

E = Knop Suhu

F = Knop rpm

G = Indikator rpm

H = Rendemen

I = Output Ampas

J = Pemutar Pangkal Ulir

K = Regulator

L = Stop Kontak

# Lampiran 2

## Hasil Perhitungan Pengujian Alat

### 1. Persentase Rendemen

$$\% \text{ Rendemen} = \frac{massa\ minyak\ yang\ terekstrak\ (gr)}{massa\ sampel\ (gr)} \times 100\%$$

Variabel 1 = $\frac{10{,}48\ gr}{200\ gr} \times 100\%$ = 5,24 %

Variabel 2 = $\frac{10{,}99\ gr}{200\ gr} \times 100\%$ = 5,49 %

Variabel 3 = $\frac{12{,}92\ gr}{200\ gr} \times 100\%$ = 6,46 %

Variabel 4 = $\frac{13{,}48\ gr}{200\ gr} \times 100\%$ = 6,74 %

Variabel 5 = $\frac{14{,}12\ gr}{200\ gr} \times 100\%$ = 7,06 %

Variabel 6 = $\frac{14{,}73\ gr}{200\ gr} \times 100\%$ = 7,37 %

Variabel 7 = $\frac{9{,}13\ gr}{100\ gr} \times 100\%$ = 9,13 %

Variabel 8 = $\frac{9{,}25\ gr}{100\ gr} \times 100\%$ = 9,25 %

Variabel 9 = $\frac{10{,}11\ gr}{100\ gr} \times 100\%$ = 10,11 %

### 2. Densitas Minyak Biji Karet

$$\rho = \frac{(massa\ pikno\ isi\ minyak - mass\ pikno\ kosong)\ gr}{volume\ pikno\ yang\ digunakan\ (ml)}$$

Variabel 1 = $\frac{(20{,}68-11{,}41)gr}{10\ ml} = 0{,}927\ {}^{gr}/_{ml}$

Variabel 2 = $\frac{(20{,}62-11{,}41)gr}{10\ ml} = 0{,}921\ {}^{gr}/_{ml}$

Variabel 3 = $\frac{(20{,}52-11{,}41)gr}{10\ ml} = 0{,}911\ {}^{gr}/_{ml}$

Variabel 4 = $\frac{(20{,}78-11{,}41)gr}{10\ ml} = 0{,}937\ {}^{gr}/_{ml}$

Variabel 5 = $\frac{(20{,}62-11{,}41)gr}{10\ ml} = 0{,}921\ {}^{gr}/_{ml}$

Variabel 6 = $\frac{(20{,}53-11{,}41)gr}{10\ ml} = 0{,}913\ {}^{gr}/_{ml}$

Variabel 7 = $\frac{(20{,}7-11{,}41)gr}{10\ ml} = 0{,}929\ {}^{gr}/_{ml}$

Variabel 8 = $\frac{(20{,}63-11{,}41)gr}{10\ ml} = 0{,}922\ {}^{gr}/_{ml}$

Variabel 9 = $\frac{(20{,}61-11{,}41)gr}{10\ ml} = 0{,}920\ {}^{gr}/_{ml}$

### 3. Viskositas Minyak Biji Karet

$$ì_x = \frac{t_x d_x}{t_0 d_0} \cdot ì_0$$

Variabel 1 = $\frac{50{,}1\ s \times 0{,}927\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 38,934 cp

Variabel 2 = $\frac{46\ s \times 0{,}921\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 35,517 cp

Variabel 3 = $\frac{37{,}3\ s \times 0{,}911\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 28,487 cp

Variabel 4 = $\frac{50{,}8\ s \times 0{,}937\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 39,905 cp

Variabel 5 = $\frac{47\ s \times 0{,}921\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 36,289 cp

Variabel 6 = $\frac{38\ s \times 0{,}913\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 29,085 cp

Variabel 7 = $\frac{51{,}3\ s \times 0{,}929\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 39,953 cp

Variabel 8 = $\frac{48{,}6\ s \times 0{,}922\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 37,565 cp

Variabel 9 = $\frac{44{,}7\ s \times 0{,}920\ {}^{gr}/_{ml}}{1{,}2\ s \times 0{,}998\ {}^{gr}/_{ml}} \cdot 1{,}004\ cP$ = 34,476 cp

### 4. Kadar Air pada Minyak Biji Karet

Rumus = $\frac{massa\ minyak\ awal\ (gr) - massa\ minyak\ setelah\ dipanaskan(gr)}{massa\ minyak\ awal\ (gr)}$

Variabel 1 = $\frac{5\ gr - 4{,}94 gr}{5\ gr}$ x 100% = 1,2 %

Variabel 2 = $\frac{5\ gr - 4{,}95\ gr}{5\ gr}$ x 100% = 1 %

Variabel 3 = $\frac{5\ gr - 4{,}98\ gr}{5\ gr}$ x 100% = 0,4 %

Variabel 4 = $\frac{5\ gr - 4{,}95\ gr}{5\ gr}$ x 100% = 1 %

Variabel 5 = $\frac{5\ gr - 4{,}97\ gr}{5\ gr}$ x 100% = 0,6 %

Variabel 6 = $\frac{5\ gr - 4{,}98\ gr}{5\ gr}$ x 100% = 0,4 %

Variabel 7 = $\frac{5\ gr - 4{,}95\ gr}{5\ gr}$ x 100% = 1,0 %

Variabel 8 = $\frac{5\ gr - 4{,}98\ gr}{5\ gr}$ x 100% = 0,4 %

Variabel 9 = $\frac{5\ gr - 4{,}99\ gr}{5\ gr}$ x 100% = 0,2 %

**5. Angka Asam Minyak Biji Karet**

Rumus = $\frac{56{,}1 \times ml\ KOH\ yang\ dibutuhkan \times normalitas\ KOH}{massa\ sampel\ (gr)}$

Variabel 1 = $\frac{56{,}1 \times 15{,}6\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 20,70

Variabel 2 = $\frac{56{,}1 \times 16{,}1\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 21,39

Variabel 3 = $\frac{56{,}1 \times 17{,}5\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 23,21

Variabel 4 = $\frac{56{,}1 \times 15{,}9\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 21,16

Variabel 5 = $\frac{56{,}1 \times 16{,}9\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 22,41

Variabel 6 = $\frac{56{,}1 \times 17{,}6\ ml \times 0{,}1\ N}{4{,}23\ gr}$ = 23,25

**6. Bilangan Penyabunan Minyak Biji Karet**

Rumus = $\frac{(titrasi\ blanko - titrasi\ sampel) ml \times N\ HCl\ X\ 56{,}1}{massa\ sampel\ (gr)}$

Variabel 1 = $\frac{(38{,}4 - 10{,}3)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 186,64

Variabel 2 = $\frac{(38{,}4-10{,}1)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 187,63

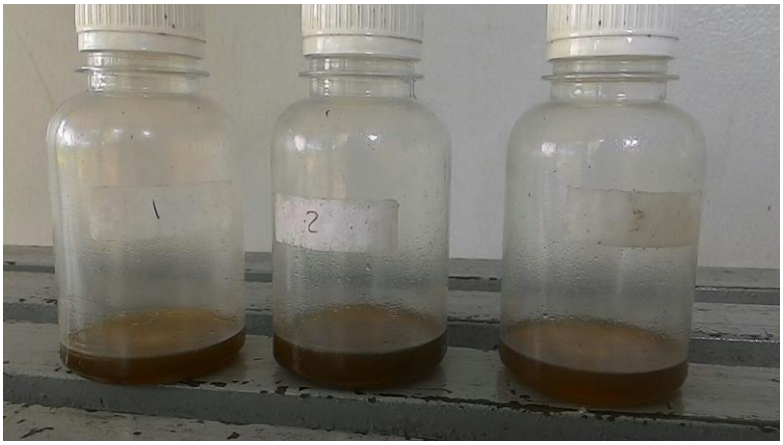
Variabel 3 = $\frac{(38{,}4-9{,}7)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 190,19

Variabel 4 = $\frac{(38{,}4-9{,}9)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 188,78

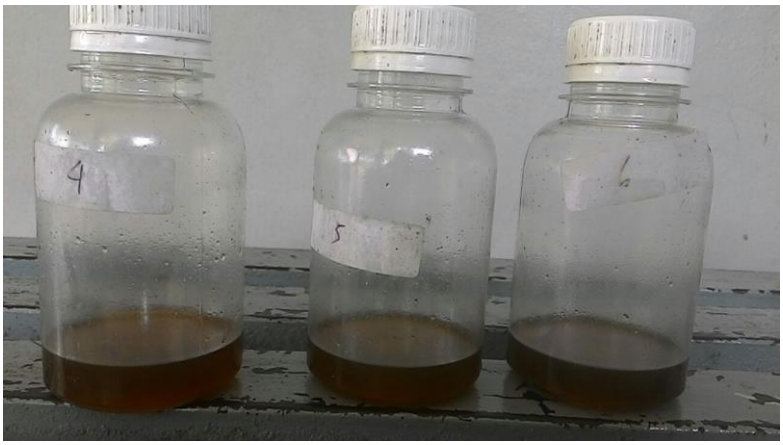
Variabel 5 = $\frac{(38{,}4-9{,}7)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 190,19

Variabel 6 = $\frac{(38{,}4-9{,}6)\ ml\ X\ 0{,}5\ N\ X\ 56{,}1}{4{,}23\ gr}$ = 190,93

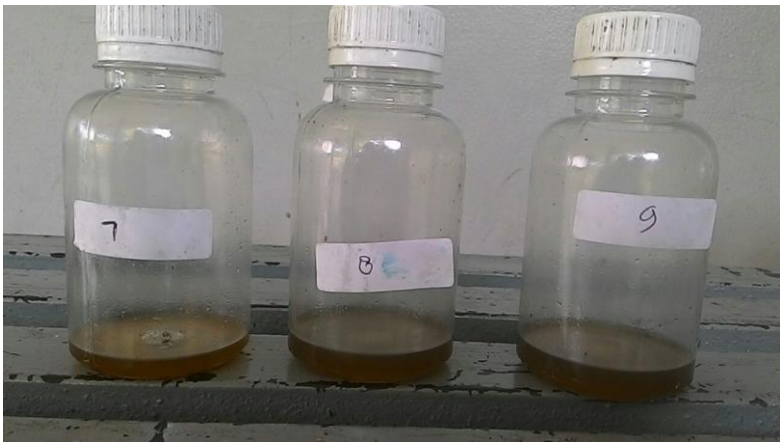
# Lampiran 3




Variasi ukuran 100 mm (+ 10 mm) dan Suhu Pemanasan Awal 50$^{o}$C, 60$^{o}$C, dan 70$^{o}$C




Variasi ukuran 50 mm (+ 10 mm) dan Suhu Pemanasan Awal 50$^{o}$C, 60$^{o}$C, dan 70$^{o}$C




Variasi ukuran 100 mesh dan Suhu Pemanasan Awal $50^{o}C$, $60^{o}C$, dan $70^{o}C$