LAMPIRAN A

PERHITUNGAN

Lampiran A. Perhitungan

A.1 Volume MDI

- **Massa Poliuretan**

  Massa Poliuretan = Volume Poliuretan x Massa Jenis Poliuretan

  Massa Poliuretan = 100 ml x 1,45 gram/ml

  Massa Poliuretan = 145 gram

- **Massa MDI**

  $$\text{Massa MDI} = \frac{\text{Massa Poliuretan}}{2}$$

  $$\text{Massa MDI} = \frac{145 \text{ gram}}{2} = 72{,}5 \text{ gram}$$

- **Volume MDI**

  $$\text{Volume MDI} = \frac{\text{Massa MDI}}{\text{Densitas MDI}}$$

  $$\text{Volume MDI} = \frac{72{,}5 \text{ gram}}{1{,}23 \text{ gram/ml}}$$

  Volume MDI = 58,9 ml ≈ 59 ml

- **Massa 10% MDI**

  Massa 10% MDI = Massa MDI x 10%

  Massa 10% MDI = 72,5 gram x 10% = 7,25 gram

- **Volume 10% MDI**

  $$\text{Volume MDI} = \frac{\text{Massa MDI}}{\text{Densitas MDI}}$$

  $$\text{Volume MDI} = \frac{7{,}25 \text{ gram}}{1{,}23 \text{ gram/ml}}$$

  Volume MDI = 5,89 ml ≈ 5,9 ml

- **Total Massa MDI**

  Total Massa MDI = Massa MDI + Massa 10% MDI

  Total Massa MDI = 72,5 gram + 7,25 gram = 79,75 gram

- **Volume Total MDI**

  Volume MDI$= \frac{\text{Massa MDI}}{\text{Densitas MDI}}$

  Volume MDI$= \frac{79{,}75 \text{ gram}}{1{,}23 \text{ gram/ml}}$

  Volume MDI = 64,8 ml ≈ 64 ml

A.2 Volume Poliol

Volume Poliol = 100 ml – volume MDI

Volume Poliol = 100 ml – 59 ml

Volume Poliol = 41 ml

A.3 Massa Aquades dan Surfaktan

- **Sampel 1 (1% Aquades 2% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram

  Massa Poliol + Gelas Beaker = 70,6 gram

  Massa Poliol = 70,6 gram – 35 gram

  Massa Poliol = 35,6 gram

  Massa Aquades

  Massa Aquades = 1% x Massa Poliol

  Massa Aquades = 1% x 35,6 gram

  Massa Aquades = 0,356 gram

  Massa Surfaktan

Massa Surfaktan = 2% x Massa Poliol

Massa Surfaktan = 2% x 35,6 gram

Massa Surfaktan = 0,712 gram

- **Sampel 2 (1% Aquades 10% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram

  Massa Poliol + Gelas Beaker = 70,6 gram

  Massa Poliol = 70,6 gram – 35 gram

  Massa Poliol = 35,6 gram

  Massa Aquades

  Massa Aquades = 1% x Massa Poliol

  Massa Aquades = 1% x 35,6 gram

  Massa Aquades = 0,356 gram

  Massa Surfaktan

  Massa Surfaktan = 10% x Massa Poliol

  Massa Surfaktan = 10% x 35,6 gram

  Massa Surfaktan = 3,56 gram

- **Sampel 3 (1% Aquades 18% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram

  Massa Poliol + Gelas Beaker = 70,6 gram

  Massa Poliol = 70,6 gram – 35 gram

  Massa Poliol = 35,6 gram

  Massa Aquades

  Massa Aquades = 1% x Massa Poliol

  Massa Aquades = 1% x 35,6 gram

  Massa Aquades = 0,356 gram

Massa Surfaktan

Massa Surfaktan = 18% x Massa Poliol

Massa Surfaktan = 18% x 35,6 gram

Massa Surfaktan = 6,4 gram

- **Sampel 4 (10% Aquades 2% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram

  Massa Poliol + Gelas Beaker = 70,6 gram

  Massa Poliol = 70,6 gram – 35 gram

  Massa Poliol = 35,6 gram

  Massa Aquades

  Massa Aquades = 10% x Massa Poliol

  Massa Aquades = 10% x 35,6 gram

  Massa Aquades = 3,56 gram

  Massa Surfaktan

  Massa Surfaktan = 2% x Massa Poliol

  Massa Surfaktan = 2% x 35,6 gram

  Massa Surfaktan = 0,712 gram

- **Sampel 5 (10% Aquades 10% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram

  Massa Poliol + Gelas Beaker = 70,6 gram

  Massa Poliol = 70,6 gram – 35 gram

  Massa Poliol = 35,6 gram

  Massa Aquades

  Massa Aquades = 10% x Massa Poliol

Massa Aquades = 10% x 35,6 gram
Massa Aquades = 3,56 gram

Massa Surfaktan
Massa Surfaktan = 10% x Massa Poliol
Massa Surfaktan = 10% x 35,6 gram
Massa Surfaktan = 3,56 gram

- **Sampel 6 (10% Aquades 18% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram
  Massa Poliol + Gelas Beaker = 70,6 gram
  Massa Poliol = 70,6 gram – 35 gram
  Massa Poliol = 35,6 gram

  Massa Aquades
  Massa Aquades = 10% x Massa Poliol
  Massa Aquades = 10% x 35,6 gram
  Massa Aquades = 3,56 gram

  Massa Surfaktan
  Massa Surfaktan = 18% x Massa Poliol
  Massa Surfaktan = 18% x 35,6 gram
  Massa Surfaktan = 6,4 gram

- **Sampel 7 (20% Aquades 2% Surfaktan)**

  Massa Gelas Beaker kosong = 35 gram
  Massa Poliol + Gelas Beaker = 70,6 gram
  Massa Poliol = 70,6 gram – 35 gram
  Massa Poliol = 35,6 gram

  Massa Aquades

Massa Aquades = 20% x Massa Poliol
Massa Aquades = 20% x 35,6 gram
Massa Aquades = 7,12 gram

Massa Surfaktan
Massa Surfaktan = 2% x Massa Poliol
Massa Surfaktan = 2% x 35,6 gram
Massa Surfaktan = 0,712 gram

- **Sampel 8 (20% Aquades 10% Surfaktan)**

Massa Gelas Beaker kosong = 35 gram
Massa Poliol + Gelas Beaker = 70,6 gram
Massa Poliol = 70,6 gram – 35 gram
Massa Poliol = 35,6 gram

Massa Aquades
Massa Aquades = 20% x Massa Poliol
Massa Aquades = 20% x 35,6 gram
Massa Aquades = 7,12 gram

Massa Surfaktan
Massa Surfaktan = 10% x Massa Poliol
Massa Surfaktan = 10% x 35,6 gram
Massa Surfaktan = 3,56 gram

- **Sampel 9 (20% Aquades 18% Surfaktan)**

Massa Gelas Beaker kosong = 35 gram
Massa Poliol + Gelas Beaker = 70,6 gram
Massa Poliol = 70,6 gram – 35 gram
Massa Poliol = 35,6 gram
Massa Aquades

Massa Aquades = 20% x Massa Poliol

Massa Aquades = 20% x 35,6 gram

Massa Aquades = 7,12 gram

Massa Surfaktan

Massa Surfaktan = 18% x Massa Poliol

Massa Surfaktan = 18% x 35,6 gram

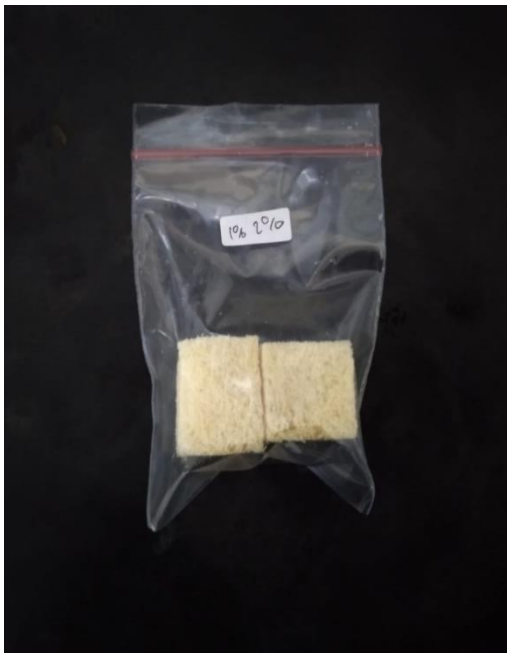
Massa Surfaktan = 6,4 gram

LAMPIRAN B
DATA DAN HASIL PENELITIAN

Lampiran B. Data Hasil Penelitian

B.1 Foam Yang Dihasilkan

Gambar B.1 Sampel 1% 2%



Gambar B.2 Sampel 1% 2% setelah dipotong

Gambar B.3 Sampel 1% 10%

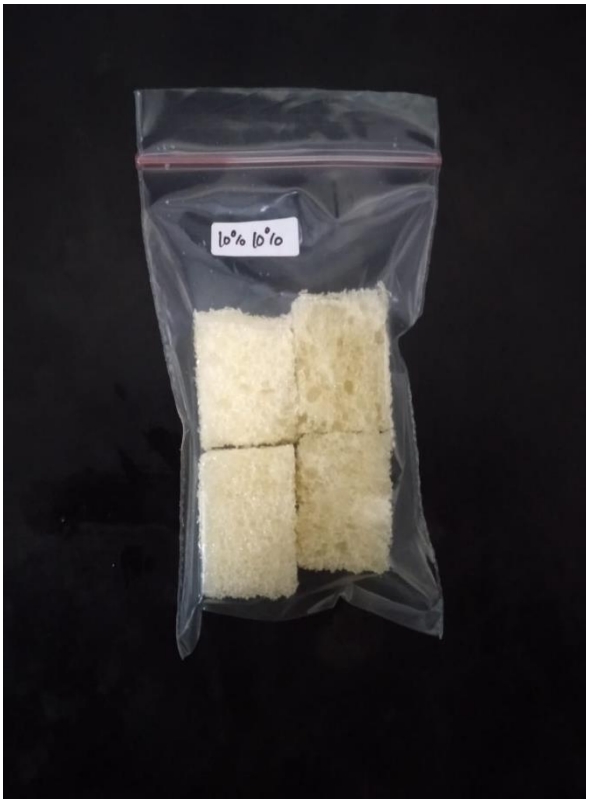
Gambar B.4 Sampel 1% 10% setelah dipotong

Gambar B.5 Sampel 1% 18%

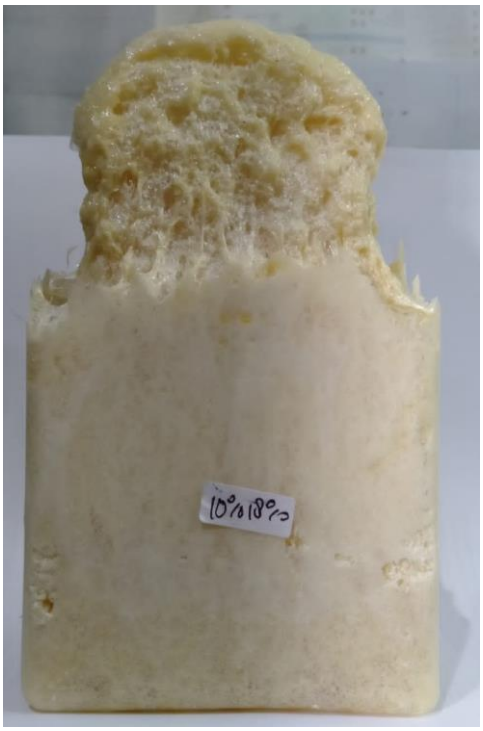
Gambar B.6 Sampel 1% 18% setelah dipotong

Gambar B.7 Sampel 10% 2%

Gambar B.8 Sampel 10% 2% setelah dipotong



Gambar B.9 Smpel 10% 10% **Gambar B.10** Sampel 10% 10% setelahdipotong



Gambar B.11 Sampel 10% 18% **Gambar B.12** Sampel 10% 18% setelah dipotong

Gambar B.13 Sampel 20% 2%

Gambar B.14 Sampel 20% 2% setelah dipotong

Gambar B.15 Sampel 20% 10%

Gambar B.16 Sampel 20% 10% setelah dipotong

Gambar B.17 Sampel 20% 18% **Gambar B.18** Sampel 20% 18% setelah dipotong

B.2 Data Densitas

PUSAT RISET METALURGI

Gedung Manajemen 720, Kawasan Sains dan Teknologi, B.J. Habibie
Setu, Tangerang Selatan, Banten, 15314
Surel: prm@brin.go.id, Laman: www.brin.go.id

LAPORAN PENGUJIAN

Penentuan Nilai Densitas Padatan Non Serbuk

Kode Sampel : Castor Oil-2 (Algi)
Deskripsi : -
Tgl. Terima sampel : 23/05/2023
Tgl. Pengujian : 05/06/2023
Alat Uji : Density Determination KIT 85 dengan Analytical Balance AS 220.R2

Data Hasil Pengujian

Jenis cairan : Aquadest Suhu cairan : 27 ^{0}C

Kode Sampel	Pengujian ke-			Nilai densitas (gram/cm^3)
	x-(1)	x-(2)	x-(3)	
1% 2%	0,147876	0,156231	0,114003	0,139370
1% 10%	0,122821	0,117195	0,109955	0,116657
1% 18%	0,116622	0,104867	0,116361	0,112617
10% 2%	0,060570	0,055000	0,052217	0,055929
10% 10%	0,069299	0,060007	0,052742	0,060683
10% 18%	0,052734	0,049022	0,052589	0,051448
20% 2%	0,086721	0,089481	0,093818	0,090007
20% 10%	0,059458	0,051228	0,049103	0,053263
20% 18%	0,054191	0,048374	0,048810	0,050458

*) Hasil pengujian hanya merepresentasikan kondisi sampel yang diuji.

Dilaksanakan oleh:	*Bunga Rani Elvira, S.T.*
Diperiksa oleh:	*Aprilia Erryani, M.Si*

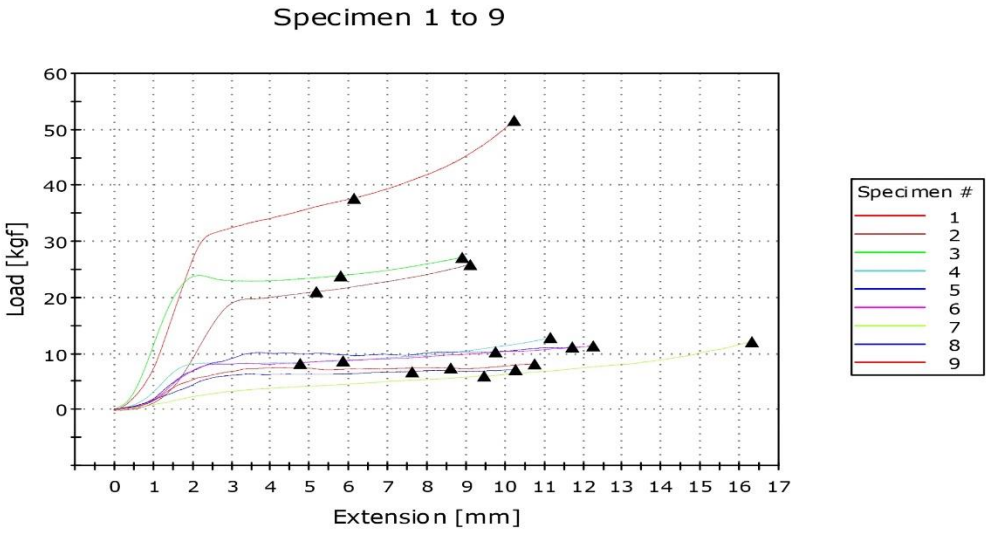
Tgl. Terbit Laporan: 08/06/2023 Halaman 2/2

Gambar B.19 Data Uji Densitas

B.3 Kuat Tekan

TEST REPORT

No. Report	069/EXT/UNT/06/23
Test Method	ASTM D1621



	Description	Width [mm]	Thickness [mm]	Maximum Load [kgf]	Load at Compresive Yield [N]	Compressive stress at Compresive Yield [MPa]
1	I	20.58	22.24	51.61	370.34	0.81
2	II	19.21	20.27	25.99	207.07	0.53
3	III	19.60	20.42	27.27	235.03	0.59
4	IV	20.86	19.95	12.95	86.28	0.21
5	V	18.59	23.92	11.27	102.21	0.23
6	VI	23.26	22.19	11.53	82.24	0.16
7	VII	21.21	22.78	12.24	60.10	0.12
8	VIII	22.45	23.85	7.29	67.76	0.13
9	IX	21.51	21.63	8.30	73.90	0.16

Page 1 of 1

Gambar B.20 Data Uji Kuat Tekan

LAMPIRAN C

GAMBAR ALAT DAN BAHAN

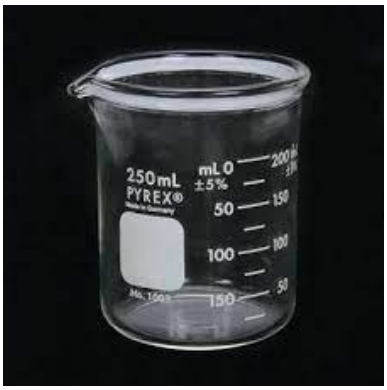
Lampiran C. Gambar Alat dan Bahan

C.1 Alat

Gambar C.1 Cetakan

Gambar C.2 *Cutter*

Gambar C.3 Gunting



Gambar C.4 Gelas Beker

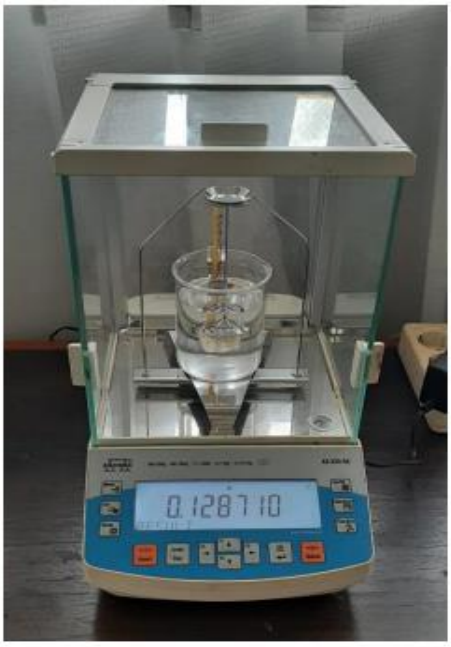
Gambar C.5 Mata Gergaji

Gambar C.6 Pipet Tetes

Gambar C.7 Plastik Sampel

Gambar C.8 Spatula *Metal*

Gambar C.9 Alat Pengujian Uji Tekan



Gambar C.10 Alat Pengujian Densitas

Gambar C.11 Timbangan Digital

C.2 Bahan

Gambar C.12 Aquades

Gambar C.13 MDI

Gambar C.14 *Castor Oil*

Gambar C.15 Surfaktan Silikon