

LAMPIRAN



LABORATORIUM BAHAN TEKNIK
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LAPORAN HASIL ANALISA

REPORT OF ANALYSIS

No Order : 171003 Tanggal : 03 Oktober 2017
Customer : BAGUS SUMANTI Kode Sampel : ALUMINIUM
Analisa : Spectrometer Program : ALALSI

Hasil / Result :

Unsur	%
Si	10,8306
Fe	0,9515
Cu	1,8057
Mn	0,2562
Mg	0,4169
Cr	0,0113
Ni	0,4250
Zn	0,9643
Ti	0,0421
Ca	0,0000
P	0,0018
Pb	0,0478
Sb	0,0035
Sn	0,0474
Al	84,19

Catatan : Sample diuji oleh laboratorium kami

Yogyakarta, 03 Oktober 2017

PLP

Bahan Teknik UGM


Sunhaji

196506041986121001



Perhitungan kekerasan *vickers* dengan beban indentor 100 gf (0,1 kgf) dan lama waktu pembebanan 10 detik.

- Prosentase Ti-B 0,1%

- Distribusi 1 :

Diketahui : $d_1 : 64 \mu = 0,064 \text{ mm}$

$d_2 : 65 \mu = 0,065 \text{ mm}$

$$\begin{aligned} \text{Jawab : } HVN &= \frac{2P \sin\left(\frac{\theta}{2}\right)}{D^2} = \frac{(1,854)P}{D^2} \\ &= \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{64\mu + 65\mu}{2}\right)^2} \\ &= \frac{0,1854}{4,16 \text{ mm}} \\ &= 0,041 \text{ kg/mm}^2 \end{aligned}$$

- Distribusi 2 :

Diketahui : $d_1 : 60 \mu = 0,060 \text{ mm}$

$d_2 : 50 \mu = 0,050 \text{ mm}$

$$\begin{aligned} \text{Jawab : } HVN &= \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{60\mu + 50\mu}{2}\right)^2} \\ &= \frac{0,1854}{3,0 \text{ mm}} \\ &= 0,061 \text{ kg/mm}^2 \end{aligned}$$

- Distribusi 3 :

Diketahui : $d_1 : 60 \mu = 0,060 \text{ mm}$

$d_2 : 60 \mu = 0,060 \text{ mm}$

$$\text{Jawab : } HVN = \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{60\mu + 60\mu}{2}\right)^2}$$

$$= \frac{0,1854}{3,6 \text{ mm}}$$

$$= 0,051 \text{ kg/mm}^2$$

$$\text{Rata-rata} = \frac{0,041+0,061+0,051}{3}$$

$$= 0,05 \text{ kg/mm}^2$$

- Prosentase Ti-B 0,3%

- Distribusi 1: $d_1 : 58 \mu = 0,058 \text{ mm}$
 $d_2 : 58 \mu = 0,058 \text{ mm}$

$$\text{Jawab : } HVN = \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{58\mu+58\mu}{2}\right)^2}$$

$$= \frac{0,1854}{3,36 \text{ mm}}$$

$$= 0,055 \text{ kg/mm}^2$$

- Distribusi 2 : $d_1 : 58 \mu = 0,058 \text{ mm}$
 $d_2 : 58 \mu = 0,058 \text{ mm}$

$$\text{Jawab : } HVN = \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{58\mu+58\mu}{2}\right)^2}$$

$$= \frac{0,1854}{3,36 \text{ mm}}$$

$$= 0,055 \text{ kg/mm}^2$$

- Distribusi 3 : $d_1 : 60 \mu = 0,060 \text{ mm}$
 $d_2 : 60 \mu = 0,060 \text{ mm}$

$$\text{Jawab : } HVN = \frac{(1,854) \cdot 0,1 \text{ kg}}{\left(\frac{60\mu+60\mu}{2}\right)^2}$$

$$= \frac{0,1854}{3,0 \text{ mm}}$$

$$= 0,051 \text{ kg/mm}^2$$

$$\begin{aligned} \text{Rata-rata} &= \frac{0,055+0,055+0,051}{3} \\ &= 0,053 \text{ kg/mm}^2 \end{aligned}$$

- Prosentase Ti-B 0,5%

- Distribusi 1 : $d_1 : 50 \mu = 0,050 \text{ mm}$
 $d_2 : 52 \mu = 0,052 \text{ mm}$

$$\begin{aligned} \text{Jawab: } HVN &= \frac{(1,854).0,1 \text{ kg}}{\left(\frac{50\mu+52\mu}{2}\right)^2} \\ &= \frac{0,1854}{2,6 \text{ mm}} \\ &= 0,071 \text{ kg/mm}^2 \end{aligned}$$

- Distribusi 2 : $d_1 : 50 \mu = 0,050 \text{ mm}$
 $d_2 : 55 \mu = 0,055 \text{ mm}$

$$\begin{aligned} \text{Jawab : } HVN &= \frac{(1,854).0,1 \text{ kg}}{\left(\frac{50\mu+55\mu}{2}\right)^2} \\ &= \frac{0,1854}{2,75 \text{ mm}} \\ &= 0,067 \text{ kg/mm}^2 \end{aligned}$$

- Distribusi 3 : $d_1 : 50 \mu = 0,050 \text{ mm}$
 $d_2 : 51 \mu = 0,051 \text{ mm}$

$$\begin{aligned} \text{Jawab : } HVN &= \frac{(0,1854).0,1 \text{ kg}}{\left(\frac{50\mu+51\mu}{2}\right)^2} \\ &= \frac{0,1854}{2,55 \text{ mm}} \\ &= 0,072 \text{ kg/mm}^2 \end{aligned}$$

$$\text{Rata-rata} = \frac{0,071+0,067+0,072}{3}$$

$$= 0,07 \text{ kg/mm}^2$$