



LAMPIRAN I

Perhitungan Efisiensi Blower C2102

Data Kuantitatif

Parameter	Value	Satuan
<i>P Dishcharge</i>	24	mmH ₂ O
<i>P Suction</i>	-280	mmH ₂ O
Q Aktual	12,6288	m ³ /s
Q Desain	14,4444	m ³ /s
Total <i>Static Pressure</i> Desain	328	mmH ₂ O
Total <i>Static Pressure</i> Aktual	304	mmH ₂ O
Power Alat	85,4	kW
Efisiensi Statis Desain	54,4	%

Diketahui:

Kec. Udara (*v*): 22,8 m/s

OD : 900 mm

Thickness : 0,5 cm

P Dishcharge : +24 mmH₂O

P Suction : -289 mmH₂O

Scaling : 5 cm

Perhitungan *Flowrate*

A. Perhitungan *Flow rate* Tanpa *Scaling*

1. Perhitungan *Inside Diameter*

$$ID = OD - 2t$$

$$ID = 0,9 \text{ m} - 2(0,005) \text{ m}$$

$$ID = 0,89 \text{ m}$$

2. Perhitungan Jari-Jari Penampang

$$r = ID/2$$

$$r = 0,89/2$$

$$r = 0,445 \text{ m}$$



3. Perhitungan Luas Penampang

$$A = \pi \cdot r \cdot r$$

$$A = 3,14 \cdot 0,445 \cdot 0,445$$

$$A = 0,6218 \text{ m}^2$$

4. Perhitungan *Flow Rate*

$$Q = v \times A$$

$$Q = 22,8 \frac{\text{m}}{\text{s}} \times 0,6218 \text{ m}^2$$

$$Q = 14,177 \text{ m}^3/\text{s}$$

$$Q = 51037,22 \text{ m}^3/\text{hr}$$

B. Perhitungan *Flow rate* Dengan *Scaling*

1. Perhitungan *Inside Diameter*

$$ID = OD - 2t - (2 \times \text{Tebal Scaling})$$

$$ID = 0,89 \text{ m} - (0,05 \text{ m})$$

$$ID = 0,84 \text{ m}$$

2. Perhitungan Jari-Jari Penampang

$$r = ID/2$$

$$r = 0,84/2$$

$$r = 0,42 \text{ m}$$

3. Perhitungan Luas Penampang

$$A = \pi \times r \times r$$

$$A = 3,14 \times 0,42 \times 0,42$$

$$A = 0,5539 \text{ m}^2$$

4. Perhitungan *Flow Rate*

$$Q = v \times A$$

$$Q = 22,8 \frac{\text{m}}{\text{s}} \cdot 0,5539 \text{ m}^2$$

$$Q = 12,6288 \text{ m}^3/\text{s}$$

$$Q = 45463,78 \text{ m}^3/\text{hr}$$



Perhitungan Efisiensi Statis Blower C2102

$$\eta \text{ Statis} = \frac{\text{Volume in } m^3/\text{sec} \times \Delta p \text{ (Static pressure) in mmwc}}{102 \times \text{Power input to the fan shaft in (kW)}} \times 100$$

$$\eta \text{ Statis} = \frac{12,6288 \text{ m}^3/\text{sec} \times 304 \text{ mmwc}}{102 \times 85,4 \text{ (kW)}} \times 100$$

$$\eta \text{ Statis} = 44,1\%$$



LAMPIRAN II

Dokumentasi Kegiatan

