

1.

가

DUST FAN

가, , ,

BOD, COD, SS, PH,

가

(Boiler)

0.7~1.5gm/Nm³가

가

가

1gm/Nm³

가

Carbon

Black

CO가

SO_x가

가

가

가?

2.

가

가

가

가

가

가

NO_x, SO_x, CO가

SO_x, NO_x,

CO가

SO₂

SO₂

가

CaSO₄

(Cyclone Scrubber)

SO₂

가?

가

(coating)

가

SO₂

가 가

(Boiler)

3.

: 가
6Ts/Hr 3Ts/Hr

500l/hr

85%

: R = 1.9m

A=2.8m²

種類	CO ₂	O ₂	SO ₂	NO ₂	CO	N ₂	備考
成分							
濃度 %	8.0	11.0	0.16	0.018	0.025	80.8	
分子量	44.01	32.0	64.07	46.01	28.01	28.02	
臨界溫度	31.0	-118.4	157.3	-93.0	-140.0	-147.0	
臨界壓力	72.9	50.1	77.8	64.0	34.5	33.5	
臨界密度	0.468	0.410	0.524	—	0.301	0.311	

:
: Blow down(5~10%)

18,144m³/Hr

300

가

: 0.689kg/m³(CO₂, O₂, N₂)

: 224 × 10⁻⁷kg/m. sec

(-c)

粒徑μm (μ)	粉塵重量 (mg)	粒徑分布 率 (%)	粒徑累積 分布 率	備 考
13.00以上	0.5	7.14	7.14	
8.00~13.00	0.5	7.14	14.28	
4.35~8.00	0	0	14.28	
3.80~4.35	1.0	14.29	28.57	
2.35~3.80	1.5	21.43	50.00	
2.35~1.20	0.5	7.14	57.14	
1.20~0.74	0.5	7.14	64.28	
0.74~0.5	1.0	14.29	78.57	
0.5~0.1	1.5	21.43	100.00	
計	7.0	100		

: 20mmH₂O

Multiclone 50 × 4 = 200mmH₂O

40mmH₂O

260mmH₂O

(3Ts/Hr 85%)

測 定 項 目	測 定 地 點	
	除塵裝置入口	除塵裝置出口
① 排氣水分量	0.097%	0.065%
② 排氣靜壓	10.2mmH ₂ O	3.8mmH ₂ O
③ 大氣壓	760mmHg	760mmHg
④ 排氣動壓	0.51mmH ₂ O	0.89mmH ₂ O
⑤ 排氣流速	2.88m/sec	3.81m/sec
⑥ 排氣口斷面積	0.64m ²	1.08m ²
⑦ 排氣流量	110.6m ³ /min	246.9m ³ /min
⑧ 吸出口內徑	4mm	6mm
⑨ 동속흡인용량	21/min	41/min
⑩ 粉塵濃度	0.224gm/Nm ³	0.0399gm/Nm ³
⑪ 排氣게스조성		
산 소	18.8%	
탄산게스	2.3%	
기 타	78.9%	
⑫ 除塵效率	吸, 出口粉塵濃度와 같은 83%	

4. (FAN) (MOTOR)

260mmH₂O

350m³/min

Fan motor 20 , 760mmHg, 75%

$$HP = \frac{Q \times Ps}{75kg \cdot m/sec \times 60 \times \eta}$$

Q : Ps : η :

$$L_1 = \frac{350 \times 260}{75 \times 60 \times 0.5} = 40$$

$$\text{Fan} \quad \text{가} \quad 150 \quad = 0.8 \text{kg/Nm}^3$$

$$L_2 = L_1 \times 0.8 = 40 \times 0.8 = 32 \text{HP}$$

TURBO FAN MOTOR

$$. \quad 40 \text{HP}, \quad 220 \text{V}, \quad 99(\text{A}), \quad 4 \text{P} \quad 350 \text{m}^3/\text{min} \times$$

$$250 \text{mmH}_2\text{O} \quad 103(\text{A})$$

$$50(\text{A})$$

가

$$\text{가} \quad . \quad \text{JIS}$$

$$\text{가} \quad \text{가}$$

$$(\text{Boiler}) \quad \text{DUCT}$$

가

(가)

$$20 \quad , \quad 760 \text{mmHg}, \quad 75\%$$

$$1.2 \text{kg/m}^3$$

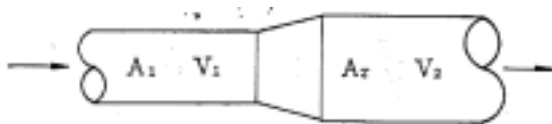
DUCT

$$Q = \quad (\text{m}^3/\text{min}), \quad A = \quad (\text{m}^2) \quad Q = 60AV \quad V = \text{DUCT} \quad (\text{m/sec})$$

$$A_1 \quad A_2 \quad V_1 \quad V_2 \quad Q = 60 \times$$

$$A_1 \cdot V_1$$

$$Q = 60 \times A_2 \cdot V_2 \quad A_1 \cdot V_1 = A_2 \cdot V_2 \quad .$$



DUCT

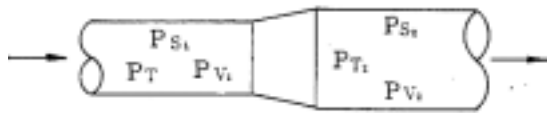
$$P_T = P_s + P_v$$

$$P_s = \quad P_v = \quad (\quad)$$

$$\text{DUCT} \quad P_v \quad V$$

$$P_v = \frac{\gamma V^2}{2g} = \frac{1.2 \times V^2}{2 \times 9.8} = \frac{V^2}{16.3} = \left(\frac{V}{4.03} \right)^2$$

DUCT



$$P_{T1} = P_{T2} + P_R, P_{s1} + P_{v1} = P_{s2} + P_{v2} + P_R$$

$$P_{s1} - P_{s2} = P_R + (P_{v2} - P_{v1})$$

$$P_{T1}, P_{T2} : \quad 1 \quad 2$$

$$P_{s1}, P_{s2} : \quad 1 \quad 2$$

$$P_{v1} + P_{v2} : \quad 1 \quad 2$$

$$P_R : \quad 1 \quad 2$$

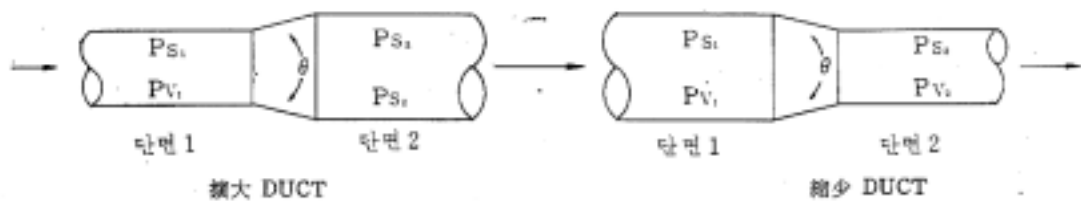
$$P_{s1} = -30 \text{ mmH}_2\text{O}, P_{v1} = P_{v2} = 20 \text{ mmH}_2\text{O}$$

$$P_{s2} = -35 \text{ mmH}_2\text{O} \quad P_R \quad \text{mmH}_2\text{O} \quad \text{가?} \quad ?$$

$$\text{Sol : } P_R = P_{s1} - P_{s2} = -30 - (-35) = 5$$

$$b = \frac{P_R}{P_{v2}} = \frac{5}{20} = 0.25$$

() DUCT



$$P_{S1}-P_{S2}=P_R+(P_{V2}-P_{V1}), P_{V2} \neq P_{V1}$$

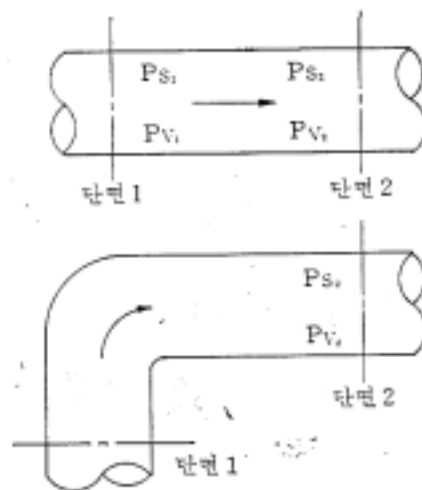
DUCT $P_{V1} > P_{V2}$

$$b = \frac{P_R}{P_{V1} - P_{V2}}$$

DUCT

$P_{V2} > P_{V1}$

$$b = \frac{P_R}{P_{V2} - P_{V1}}, \quad b \quad \theta$$



() DUCT

$$P_{V1}=P_{V2}$$

$$P_{S1}-P_{S2}=P_R$$

$$b = \frac{P_R}{P_{V1}} = \frac{P_R}{P_{V2}}$$

() (cyclone)

15~25m/sec가

600m³/min,

20m/sec

$$A = \frac{Q(\text{m}^3 / \text{sec})}{V_i(\text{m} / \text{sec})} = 0.5$$

가

$$\Delta P = 2.68 \times \frac{\sigma V_{ti}^2}{2g} \times \left(\frac{D}{d} \right)^2 \times \sqrt{\frac{D}{H}}$$

g : 가 , σ :

$$150 \quad 0.8 \quad V_i \quad V_{ti} \quad d/D > 0.35$$

$$V_{ti}/V_i=1.4, 0.35 > d/D > 0.2 \quad V_{ti}/V_i=4\sqrt{a \cdot b} / D$$

$$0.20 > d/D, V_{ti}/V_i=0.8 \quad . \quad d/D=\frac{0.7}{1.61} \quad 0.43$$

$$V_{ti}/T_i=1.4 \quad V_{ti}=1.4 \times 20=28\text{m/sec}$$

$$\Delta P = 26.8 \times \frac{0.8 \times 28^2}{2 \times 9.8} \times \left(\frac{1.61}{0.7} \right)^2 \times \sqrt{\frac{1.61}{5.635}} = 105 \text{mmH}_2\text{O}$$

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가?

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$$36\%, \quad 31\%, \quad 24\%$$

$$(\text{CO}) \quad 50\%$$

가 가

$$123, \quad 964$$

$$(\text{SO}_x, \text{CO}, \quad) \quad 528,370 \quad 23\%$$

가

가

, , ,

가 .

.

가 가 .

SO₂가 : , -c 가 SO₂
가 가 .

SO₂가 가 . ,

가 , , 가,
가 . SO₂
0.5ppm 0.2ppm . SO₂
0.5ppm 0.2ppm .

SO₂

NOx() : NOx NO, NO₂, NO₃, N₂O₃, NO₂O₄, N₂O₅ 가
가 NO₂ . NO₂
smog 가 가 ,
, .
1.3ppm 500ppm 1 150~200ppm 3~5
. 10~40ppm .

NO₂ , , 가 ,
NO₂가

(CO) : 가 가 가 가
. 가 100ppm 30ppm . 가

가 가

.

가

가

10

가