# 2. Results of Flue Gas Measurement in Diagnostic Survey at 25 Establishments

# 2. Results of flue Gas Measurement in Diagnostic Survey at 25 Establishments

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A total of 25 establishments were selected for the diagnostic survey from those 97 establishments subjected to the detailed on-site questionnaire survey. Characteristics of the combustion facilities and the results of flue gas measurement conducted during the diagnostic survey are presented in the following tables by each of the 25 establishments shown below.

1		(Visit No.)
1.	Thermoelectric Power Plant (A)	(69)
2.	Thermoelectric Power Plant (B)	(70)
3.	Petroleum Refinery	(57)
4.	Chemical Products Factory (A)	(1)
5.	Chemical Products Factory (B)	(62)
6.	Chemical Products Factory (C)	(72)
7.	Chemical Products Factory (D)	(24)
8.	Chemical Products Factory (E)	(67)
9.	Petrochemical Products Factory (A)	(16)
10.	Petrochemical Products Factory (B)	(8)
11.	Petrochemical Products Factory (C)	(87)
12.	Asphalt Plant	(11)
13.	Cement Factory	(41)
14.	Glass Factory (A)	(68)
15.	Glass Factory (B)	(31)
16.	Glass Factory (C)	(23)
17.	Rubber Products Factory	(14)
18.	Paper Factory	(30)
19.	Paper Products Factory (A)	(34)
20.	Paper Products Factory (B)	(76)
21.	Metal Products Factory (A)	(55)
22.	Metal Products Factory (B)	(19)
23.	Food Products Factory	(65)
24.	Alcoholic Drinks Factory	(47)
25.	Public Bathhouse	(52)

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Sampling time       Sampling time       Power capacity     KW       Evaporation     ton/hr       Steam pressure     Kg/cm2g       Steam temperature     Kg/cm2g       The     Athomize pressure       Addition     Itel       Addition     Addition       Addition       A				for noter opr	aeneration		Contempor		fair/cloudy
capacity ation pressure temperature temperature consumption oil Consumption Atomize press Ath outlet as Ath outlet as Ath outlet as Ath outlet estion air quantity ress. Fan outlet Wind box		15:00	15:30		16:30	17:00	17:30	18:00	
ration       pressure       temperature	_	g	124.000	124.000	125.000	125,000	125,000	125.000	
pressure       temperature       temperature       oil     Consumption       oil     Aromize       fressure     Arianize       air     Arianize       Arianize     Arianize       ass     Arianize       Arianize     Arianize       air     Arianize       Arianize     Arianize       ass     Arianize       Arianize     Arianize       fair     Arianize       fical data of flue	_	435	435	440	440	440	40	440	
temperature temperature Consumption Consumption AAA atomize presss ai AAA autiet AAA autiet AAA autiet AAA autiet AAA autiet Cesser AAA autiet Vind box Ce pressuer AAA autiet	s 133.6	117	117	117	117	117	117	117	
oil <u>Pressure</u> al <u>as Atomice press.</u> <u>al A/H inlet</u> <u>A/H inlet</u> <u>A/H outlet</u> <u>ar A/H inlet</u> <u>ar A/H inlet</u> <u>ar A/H inlet</u> <u>ar A/H outlet</u> <u>ar an outlet</u> <u>ess. Fan outlet</u> <u>ress. Fan outlet</u> <u>ress. Fan outlet</u> <u>ress. Fan outlet</u> <u>ress. Fan outlet</u> <u>ress. Fan outlet</u> <u>ress. Fan outlet</u>		540	540	540	540	540	540	540	-
oil Pressure Atomize press. Atomize press. Ath outlet Ath outlet Ath outlet Ath outlet Wind box Cess Fan outlet Wind box Fassuer At heater At heater		1,641	1,641	1,641	1,641	1,641	1,641	1,641	
Alomize air Alomize air Al outie as Al outie as Al outie as Al outie etion air quan ress. Fan outie ress. Fan outie ressuer tical data of		181	18	- 18	18	18	18	18	
al gas consump air <u>A/H inle</u> as <u>A/H outle</u> as <u>A/H outle</u> as <u>A/H outle</u> estion air quan ress. Fan outle ressuer Air heater	g steam	20	20	20	20	20	20	20	
air <u>A/H inlet</u> as <u>A/H outlet</u> as <u>A/H outlet</u> stion air quantity ress. Fan outlet Wind box 200 pressuer : Air heater : Air heater	_	30,016	29,931	30,186	30,243	30, 582	30,016	30,186	
A/H         outlet           gas         A/H         inlet           A/H         outlet         inlet           stion air quantity         ress. Fan outlet         inlet           ress. Fan outlet         inlet         inlet           ress. Fan outlet         inlet         inlet           ress. Fan outlet         inlet         inlet           inlet         box         inlet         inlet           inlet         box         inlet         inlet		110	110	110	110	110	110	110	
sas <u>AVH inlet</u> stion air quantity ress. Fan outlet Wind box ce pressuer : Air heater tical data of flue sa		240	240	240	240	240	240	240	
A/H outlet stion air quantity ress. Fan outlet Wind box ce pressuer : Air heater tical data of flue sa		410. 380	407, 380	410 382	410.382	405.383	409. 381	409. 381	
stion air quantity ress. Fan outlet Wind box ce pressuer : Air heater tical data of flue sa		165.170	172	165 172	165. 172	165.175		165.170	
			ş –	.t	1		J		
lue 83		430. 450	430, 450	450 480	480. 490	470, 490	480, 500	480 500	
flue ga			280	080	280		080		
flue ga		140	150	051	150	150	150	150	
				1 22-		2			
	Inside	diameter of	f chimnev.	3.800 •					
		162			177	17/	170	100	
		20 02	20 OF		7 10	114 10 10 14			
		30	5.0	50.02	0.00	0.00	30	20-0-	
		2.0		0	+ t 0 4				
		0.0	6.6	0.0	2.1	0.0	J.C	#• <del>•</del>	
		V91	2	CPU-U	101	Cr2 1		۲ ب ب	
-+-		1001	AC1	701	COT			101	
	-	23.8	23.8	24-2	24-6	24-9	24.6	24.6	
Gas quantity		414,000	415,000	419,000	423,000	426,000	420,000	433,000	
Theoretical gas quant.   Nm3/hr	s.,	314,000	311,000	316,000	318,000	323,000	316.000	331,000	
ure		410	407	410	410	405	409	80 <del>1</del>	
02 conc. %		•	1.3	1:0	1.0	1.1	1.0	1.6	
		154	155	158	159	162	157	173	
NOX emission   kg/hr		140	140	150	150	150	150	160	
		110	1101	110	110	110	110	110	
				19					
Burner operating condition (1-oi)	dition (1-oi	burner.	18-gas burr	burners)			Siz	te of contor	of contoustion chamber
	5	ŝ	4				<u>м</u>		1000 回
	9/	20/	6				C		7.900 100
9/ 0	9/	.9/	/0				x		18.500 mm
-	/9/	/0	/0/				Volume of	chamber	1,155 ¤3
B	-0/	/0	/6				Load of c	oad of c/c .ratein	
A 1 76	~	/6	/0				Load of c	of c/c : normal	
							c/c : Con	c/c : Combustion chamber	
Burner installation c	condition (2	(20-oil burners.	ers. 20-gas	burners)					
		3							
	0/0	0/0	0/C						
	<u>9/0</u>	0/0	0/0						

# 1 Thermoelectric Power Plant (A)

1.1 Boiler No.1

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cloudy	13:20	135,000	465	125	535	869	ß	32,027			420, 415			850/ 770	040	177		85	< 0.05	8.3	4.5		170			347,000	_	'	82						100		ann Ann	<u>ස</u>	170,000 kcal/m3hr
Weather		135,000	465	125	535	869	22		4	350, 340		- 1	- 1	850/ 770	OF C	075		87	< 0.05	8.3	4.5	0.0047	180	24.0	425.000	346,000	420	3.8 2.8	22	76	99	2.0	ton mhou	COMPUTE O OCO	3,000	8,000 mm	24,000		[
4,1990	12:30	136.000	465	125	535	869	50	2,197	105	355, 340	415	170	8	850/ 770	200	1072		85	< 0.05	8.4	4.5		178	24-0	427,000	348,000	420	-	8	- 75	80		4	히				chamber	c/c :rating
Date September	12:00	135.000	465	125	535	863	50	31, 399	105	<b></b>	435	170	8	850/ 770	000	1 075		128	< 0.05	8.3	4.8		178	24.0	427,000	353,000	420	1	98	92	8	:	() ()	2126	≩ :	Ω	н	5	Load of c/
tube	11:30	8	t-	t				.055	105	335	435	021	8	850/ 770	000	410		85	< 0.05	1.8	4.5		177	23.0	410,000	347,000	420	•	82	22	60		6-0	n ka	-			A	<u> </u>
: No.2 water generation	11:00	19		124	537	898	20		105	355, 335	415	120	8	_	ncc	107	E	66	< 0.05	7.9	4.7		177	23.5	419,000	347,000	420	1	88		60								
cility power	0.01	134,000	460	124	537	8698	50	31,631	,105	339	, 415	170	8	870, 750	000	1075	3.900 mm	86	< 0.05	7.5	4.7		1771	23.1	412,000	347,000	420	-	84	ц Г	60		1000	cls)					
Type of fac boiler for		135,000	465	125	535	698	50	31,913	105	340	415	170	8	900, 720	Nec	1015	chimev.		< 0.05	7.1	4.9		175	23.5	421,000	354,000	420	1	86	75	60		0	10-8as our ners/	4	×	×	9/	/6
	┥	137.000	170	125	536	898	50		100, 105		435	120	8		Dec .	1011	inside diameter of																	ourner.	2	×	×	/0	/0
nt (A)	(Rating)	158,000	ax 503.5	134.6	540.6	34,602	20		÷	·	_					Air heator								•										110-17 101	7	×	×	9/	/0
ic Power Plant		Υ.	2	kg/cm2g	ຸ ບຸ	l i ter/hr	kg/cm2g	m3/hr	с С	່ ວຸ	ပ္	ບ ູ່	26	mm Aq	ann Aq	mirine A/H	sas	ШÖd	*	<b>8</b> 4	<b>७</b> १	g/Nm3	<u>, , , , , , , , , , , , , , , , , , , </u>	S/W	Nn3/hr	Nm3/hr	° C	24	шdd	kg/hr	kg/hr	kg/hr	- :	ALTIN CONDITION		×	×	0/0	- /6
Name of establishment No.69 Thermoelectric		acity	on	ssure	perature	Consumption			A/H inlet	A/H outlet	A/H inlet	A/H outlet	Compustion air quantity	Air press. Fan outlet	VIND DOX	1 ato	Analytical data of flue s		CO conc.	CO2 conc.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantif	al gas quant.	Temperature	02 conc.	(UZ 5%)	i on	ri on	uo	Principal according	DUITER UPELALI		ír.	<u>ы</u>	Q	C
Name of e No.69	Sampling time	Power capacity	Evaporation	Steam pressure	Steam temperature	Fuel	Heavy oil	N-gas	Comb.air	temp.	Flue gas	temp.	Compustio	ALL Press		M/A Marhania	Analytica	Chimney								Theoretical	WH inlet		VUX CODC	NOX emission	S02 emission	PM emission							

1.2 Boiler No.2 (1st surv
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Burner installation condition (16-oil burners, 16-84s burners)

4	0	0	0/0	0/G	5	6
ŝ	0	0	0/0	0/0	5	9
~	0	0	0/0	0/0	9	9
	0	0	0/0	0/0	3	9
	<u>ل</u> تر	പ	۵	U	ß	A

-	105	-

No.69-2 (Gas: 011 = 50 :	50 : 50)										
Name of establishment				[Type of f	<pre>! Content it it</pre>	No.2 water tube	r tube	Date		Weather	
No.69 Thermoelectric	tric Power Plant (A)	ant (A)		boiler fo	boiler for power generation	neration		September 13,1990	13,1990	fai	fair/cloudy
Sampling time		(Rating)	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00
Power capacity	- KW	158,000	133,000	133.000	133.000	134,000	134,000	134,000	134,000	134,000	134,000
Evaporation	ton/hr	max 503.5	455	455	455	465	465	460	465	465	460
Steam pressure	kg/cm2g	139.6		127	127	127	128	126	127	128	
Steam temperature	ູ່	540.6	536	537	537	537	537	537	537	537	537
Fuel Consumption	liter/hr	34,602	20,488	20,488	20,488	20,488	20,488	20,488	20,488	20,488	20,438
Heavy oil M/A press.	kg/cm2g	50	50	20	50	50	50	50	50	50	50
N-gas Consumption	m3/hr	35,076	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400	18,400
Comb. air A/H inlet	ر ر	27	96, 105	96, 105	95, 105	98, 105	95, 105	0.	98, 105	95, 105	95, 106
temp. A/H outlet	Ĵ,	315	330, 315	330, 315	330, 315	330, 315	330, 315	330,	330,	330, 315	330, 315
Flue gas A/H inlet	ر د	828	395, 390	395, 390	395, 390	395, 390	395, 390	395, 390	395, 390	395, 390	395, 390
temp. A/H outlet	ວ. 	133			175,	Ε.	175, 160	175.	175,		175,
Combustion air quantity	<b>8</b> 9		8	80	8	8	8	80	8	8	80
Air press. Fan outlet	mm Aq		880, 780	880, 780	880, 760	880, 760	880, 760	880, 780	880, 760	880, 760	880, 780
Wind box	THE AC		560	560	560	540		570	240	540	
Furnace pressuer	mm Aq		390	390	400	400	400	400	400	400	400
W/A * Machanical atomizing A/W	Tine A/L	· Air hostor	tor								

heater : Mechanical atomizing, A/H : Air M/A

Amalytical	Analytical data of flue gas	as	Inside	Inside diameter of chimney:	of chimney:	3,900 mm	nam					
Chimney	NOX CONC.	pont.			98	66 .	66	100	38	100	1001	100
	CO conc.	34			1 < 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	CO2 conc.	39			8.9	9.2	6.6	9.8	9.6	10.1	10.2	9.7
	02 conc.	3 <b>9</b>			5.5	5.6	5.3	4.9	5.3	5.2	5.2	5.1
	PM conc.	g/Nm3							0.47			
	Temperature	° C			115	134	127	138	150	145	154	150
	Gas velocity	s/a			24.5	21.0	21.0	21.0	26.0	25.5	26.0	25.0
	Gas quantity	Na3/hr			523,500	427,700	435,200	423,600	509,500	505,700	504,800	489,900
Theoretic	Theoretical gas quant.	Na3/hr			483,900	487,100	477,800	465,900	477,800	474,700	474,700	471,800
A/H inlet		с С			350	355	376	378	379	369	369	369
	02 conc.	39			•	•	1		     I.	•	6-1	1.9
NOX CONC. (02 5%	(02 5%)	ppm.			101	103	101	66	100	101	101	101
NOX emissi	ion	kg/hr			110	87	88	23	100	100	100	100
S02 emission	ion	kg/hr			1 400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
PM emission	on	kg/hr							240			
				•								
	Burner operati	ng condi	berating condition (7-oi)	il burners,	, 8-gas burners)	ners)			Size	of	combustion chamber	er
÷			2	3	4				W		8,580 mm	tt t
• .	μ.	×	×	×	x			LooJ	Ð		10,270 mm	H I
	ц	×	0	×	×	-			н		18,000 #	a
	D	x/x	×/0	X/0	0/x	يستعف		6.000-7 <b>0</b>	Volume of chamber	chamber	1,586 m3	3
	U	×/0 ·	×/0	×/0	X/X			and and a second	Load of c/	Load of c/c :rating	210,000 kca1/m3hr	cal/m3hr
	മ	5	9	9	9				Load of c/	Load of c/c :normail	220,000 kca1/m3hr	cai/n3hr
	A	3	ċ	5	9			•	c/c : Cont	c/c : Combustion chamber	unber	-

c/c I Combustion chamber

6-gas burners)

burners, 1

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condi

burner installation

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0/0 20

3 20

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20 0/0

Boiler No.2 (2nd survey) 1.3

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No.69         Thermoelectric Power Plant (A)         Doiler for power second from power second from power second from power second from the second fr	800 ×	generation		14 1000	
R time         (Rating)         12:30         13:00           space ty         kw         158,000         127,000         122,000           space ty         kw         158,000         127,000         122,000           amperature         %         503.5         128         48           cessure         kg/cm2g         34,602         15,000         15,000         127,000           femperature         %         735,076         539         524         48         48           Consumption         liter/hr         35,076         34,602         15,000         15,000         15,000           ressure         kg/cm2g         34,602         35,003         35,4         48         48           Consumption         m2/hr         35,076         24,902         16,4         48         48           A/H outlet         %         78         78         78         78         73         500, 385         500         350           A/H outlet         mm Aq         %         73         500, 385         500         350         350           Ss: A/H outlet         mm Aq         660, 650, 650         520         500         350         350	13:		November	14,1030	fair
ppacity         kw         158,000         127,000         122,000           ppacity         kw         158,000         127,000         127,000         127,000           morrature         °C         503.5         1485         1475         127           mperature         °C         540.6         539         64         65         524           mperature         °C         540.5         540.6         530         15,000         15,000         15,000         15,000         15,000         15,000         15,000         15,000         324,917         88         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,68         68         78,78         68         78,73         500         38         700         300	125	14:00 14:30		15:30	·
ti Attorne ton/hr 503.5 485 475 ressure ks/cm2g 134.6 125 127 ressure ks/cm2g 34.602 15,000 15,000 Resconsumption liter/hr 35,076 24,903 24,917 r Atti unlet °C 315 316, 326 314, 320 Atti unlet °C 315 316, 326 314, 320 Pressuer mm Aq 40 400 400 Stan outlet mm Aq 41-4.2 4, 90 Pressuer at Ad 200 400 400 Stan outlet mm Aq 4, 1-4.2 4, 90 Pressuer at Ad 200 80, 620 680, 620 680, 620 Pressuer at Ad 200 80, 620 80, 620 80, 620 80 Pressuer at Ad 200 80, 620 80, 620 80, 620 80 Pressuer at Ad 200 80, 620 80, 620 80, 620 80 Pressuer at Ad 4, 1-4.2 4, 90 Pressuer at Ad 4, 1-4.2 4, 90 Pressuer at Ad 4, 1-4.2 4, 90 Pressuer at Ad 4, 1-4.2		125,000 124,000	000   125,000	125,000	
ressure         ks/cm2s         134.6         125         127           emperature         °C         530.539         534         127           emperature         °C         540.6         539         524           fenerature         °C         540.5         539         524           fenerature         °C         82,002         15,000         15,000           it         Atomize press.ks/cm2s         M/A         830         80         80           sas         consumption         m3/hr         35,076         24,903         24,917         80         80           ass         consumption         m3/hr         355,053         80         80         80         80           ass         A/H inlet         °C         315         316.24,803         324,917         80           ass         A/H outlet         mm Aq         °C         316,326         314,250         80           avtH inlet         °C         315         316.24,903         80         80         80           avtH inlet         °C         316         316,24,903         80         80         80           avtH inlet         °C         316         316,24,0				470	
Interfactor         °C         540.6         539         524           Consumption         liter/hr         40         48         48           Consumption         liter/hr         500         15.000         15.000         15.000           Interview         °C         315         316.24.903         24.917           Rass         consumption         m5/hr         35.076         24.903         24.917           Rass         consumption         m5/hr         35.076         356         314.320         356           A/H outlet         mm Aq         °C         133         162.160         410         35           Ss. [A/H outlet         mm Aq         660         650         650         550         385           Ss. [A/H outlet         mm Aq         660         650         650         550         380           Ss. [A/H outlet         mm Aq         660	[ *** 1			131	-
Consumption         Iter/hr         48         48           Iter/hr         Pressure         Kez/cm2g         34,602         15,000         145         160         143         320         320,325         500,385         500         500<	542	540	531 531	531	_
It Atomize press.kg/cm2g         34,602         15,000         85         86         85         78,68         78,68         78,68         78,68         78,68         78,68         78,68         78,68         78,68         78,68         78,68         86         60,003         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,314,320         320,320         32	48	48		48	•
It         Atomize press. kg/cm2g         M/A         64         65           Reuperature         °C         27         78, 68         78, 68         78, 68           Resconsumption         m3/hr         35,076         21,393         24,917         80           Resconsumption         m3/hr         35,076         21,363         326         314,320           Resconsumption         m3/h         01         90         400         400           A/H         0utlet         °C         313         500, 385         500, 385         500, 385           Ss         A/H         0utlet         mm Aq         660, 620         660, 620         620         620         620           Dencing of FGR         x         mm Aq         660, 620         660, 620         80         80         80           Dencing of FGR         x         mm Aq         660, 620         660, 620         660, 620         660, 620         660, 620         660, 620         80         84           Dencing of FGR         x         mm Aq         km Aq         660, 620         660, 620         660, 620         660, 620         660         660         660         660         660         660         660	1			15.000	
Temperature         °C         80         80         80         80         80         80         80         80         80         80         80         80         80         80         80         80         80         73         80         73         80         73         80         73         80         73         80         73         80         73         80         73         80         73         80         73         80         73         80	64			54	
Ras         Consumption         m3/hr         35,076         24,903         24,913           r         A/H inlet         °C         373         500, 385         78,68         78,68           A/H inlet         °C         373         500, 385         314, 200         385           A/H inlet         °C         373         162, 145         160, 145           Ss. Fan outlet         °C         333         162, 145         160, 145           Wind box         mm Aq         660, 620         660, 620         290           Pressuer         mm Aq         660, 620         660, 620         290           Ss. [A/H outlet         mm Aq         80         80         80           Pressuer         mm Aq         500, 830         600, 620         660, 620           Ss. [A/H outlet         mm Aq         90         290         290           Ss. [A/H outlet         mm Aq         80         80         80         80           Ss. [A/H outlet         mm Aq         80         90         290         250           Ss. [A/H outlet         %         41-4-2         4.93         403           Intration         %         41-4-2         4.93			08		
Ir         A/H inlet         °C         27         78, 68         74         70	24,928	24,946 24,	,969	24,969	
A/H outlet         °C         315         316, 326         314, 320           ss         A/H injet         °C         373         500, 385         500         586, 620         600, 620         600, 620         600, 620         600, 620         80 <t< td=""><td>78, 68</td><td></td><td>82, 71</td><td>82, 71</td><td></td></t<>	78, 68		82, 71	82, 71	
A/H injet         °C         373         500, 385         500         250         500         250         500         250         500         250         500         250         500         250         500         250         500         500         500         500         500         500         500         500         500         500         500         500         500         500         500         500         500         500<	320, 320	3	318, 318	318, 318	-
A/H outlet         °C         133         162.         145         160.         145           Ss. Fan outlet         mm Aq         °C         133         162.         145         160.         140           Ss. Fan outlet         mm Aq         660.         630.         641.         641.	500, 385	2	500, 380	500, 380	
Ss. Fan outlet         mm Aq         400         400           Pressuer         mm Aq         660, 630         660, 530         290         290           Deressuer         mm Aq         80         80         80         80         80           Dening of FGR         x         x         4,1-4,2         4,93         80         80         80           Dening of FGR         x         x         4,1-4,2         4,93         80         17         10 <td>162, 145</td> <td>Ĩ</td> <td>165, 143</td> <td>165, 143</td> <td></td>	162, 145	Ĩ	165, 143	165, 143	
Nind box         mm Aq         660, 620         660, 620         650, 620         50         60	400		400	400	
Pressuer         tem Aq         290         200         80 <td>670, 625</td> <td>9</td> <td>660,</td> <td>660, 640</td> <td></td>	670, 625	9	660,	660, 640	
Ss.         A/H outlet         Em         Ag         80	300			290	
Dpenring of FGR         X         A         4.1-4.2         64         93         93         96         90	80		80 80	80	+
Entration         %         4.1-4.2         4.93           Mechanical atomizing, A/H : Air heater         4.1-4.2         4.93           Mechanical atomizing, A/H : Air heater         6.1-4.2         4.93           al data of flue gas         inside diameter of chimney:         90           Nox conc.         ppm         95         90           OC conc.         %         7.5         7.7           PM conc.         %         7.5         7.7           PM conc.         %         8.1         7.7           PM conc.         %         3.78         3.79           Temp. A/H in         °C         3.78         3.79           Temp. A/H out         °C         3.78         3.79           Cass velocity         m/5         122         130           Cass quantity         Mm3/hr         645,000           Cass quantity         Mm3/hr         645,000	64			64	
Pectranical atomizing, A/H : Air heater           al data of flue gas         Inside diameter of chimney:           al data of flue gas         Inside diameter of chimney:           NOX conc.         ppm         95         00           00 conc.         %         7.5         7.7           02 conc.         %         7.5         8.1           PH conc.         %         378         379           Temp. A/H in         °C         378         379           Cass velocity         m/5         122         130           Cass velocity         m/5         50.3         50.3           Cass quantity         Mm3/hr         645,000         645,000          (75 5%)         645,000        (12)         112	4.5		4	4.96	-
all data of flue gas         Inside diameter of chimney:           N0x conc.         pom         95         90           N0x conc.         prime         95         90           C00 conc.         %         7.5         7.7           002 conc.         %         7.5         8.1           002 conc.         %         7.5         8.1           PM conc.         %         7.5         8.1           Cass velocity         %         7.5         379           Temp. A/H out         °C         122         130           Cass velocity         mm3/hr         645,000         645,000          (07.5%)         mm3/hr         645,000         110					
N0x conc.         ppm         95         90           C0 conc.         %         5         95         90           C0 conc.         %         7.5         7.7         7.7           0.02 conc.         %         7.7         7.7         7.7           0.02 conc.         %         7.7         7.7         7.7           0.02 conc.         %         %/Ms3         8.1         8.1           PM conc.         %         378         379         379           Temp. A/H out         °C         378         379         379           Gas velocity         m/s         378         30.3         30.3           Gas velocity         m/s         645,000         645,000         30.3          (01 55)          172         130         30.3	3,900 mm				
C0 conc.         %         7.5         7.7           C02 conc.         %         7.5         7.7           02 conc.         %         7.5         7.7           102 conc.         %         7.5         8.1           PM conc.         %         7.5         8.1           PM conc.         %         8.4         8.1           Temp. A/H in °C         7.7         378         379           Temp. A/H in °C         1122         130         30.3           Gas velocity         m/s         8.5         30.3           Gas velocity         m/s/hr         645,000         645,000          (07.5%)         nom         112         112	1151	115	106 106	106	
Senc.         %         7.5         7.7           nc.         %         7.5         7.7           nc.         %         7.5         8.1           nc.         %         378         8.1           nc.         %         378         379           A/H in         °C         378         379           A/H out         °C         122         130           A/H out         °C         122         30.3           Auntity         MmS/hr         645,000         90           Quant.         Nom         110         110	< 0.05	۷	0.05 < 0.05	< 0.05	
mc.         %         8.1           nrc.         g/Mm3         8.1           nrc.         g/Mm3         378           A/H in         °C         378           A/H out         °C         122           elocity         m2/hr         80.3           uantity         Mm3/hr         645,000           quant.         nom         112	7.3	1.0	7.3 7.0	6.8	
nc. <u>8, Mm3</u> <u>378</u> <u>379</u> <u>A/H in °C 378 379</u> <u>A/H out °C 122 130</u> <u>elocity m//s</u> <u>80.3</u> <u>elocity Mm3/hr</u> <u>645,000</u> <u>quant.</u> <u>Nom</u> <u>112</u>	8-4		8.4 8.3	. 8.3	
A/H         in         °C         378         379           A/H         out         °C         122         130           elocity         m/s         0.3         30.3           elocity         m/s         0.00         90.3           quantity         Nm3/hr         645,000         9123,000					
A/H out         °C         122         130           elocity         m/s         30.3         30.3           uantity         Mm2/hr         523,000         90.3           quant.         Num2/hr         645,000         112	379	380	379 378	380	
elocity m/s 30.3 uuantity Nm3/hr 623,000 quant. Nm3/hr 645,000	150			130	
uantity Nm3/hr 823,000 quant. Nm3/hr 645,000			_		
quant. Nar3/hr 645,000		-	_		
112 I 112		661.000 661,000	00 656,000	656,(	
	146	ᅴ			
kg/hr   115	150	. ]	_		1
n kg/hr 1,100	1.100	1,100 1.	.100 1.100	1.100	
PM emission kg/hr		-			-

1.4 Boiler No.3

			~~~						
namper	000 mm	000 am	000 mm	-0 m3	000 kcal/#3hr	000 kcal/m3hr			
stion C	0.6	0.6	24,0	1944.0	190.1	170.0	amber		
5126 of compustion chamber	M	Δ	Ч	Volume of chamber	Load of c/c :rating	Load of c/c :norma!	c/c : Combustion chamber		

			_		_	
¢	0	0/0	0/0	0	0	-6 -16
0	0	0/0	0/0	ç	6	oil burner-6 oil burner-16
0	0	0/0	0/0	5	0	
0	0	0/0	0/0	0	U	gas burner-10 gas burner-16
	3	0	J	8	¥	ed
						er used er installed

Burner Burner

No.69-4												
Name of establishment	tablishment			-	Type of fa	cility :	ype of facility : No.4 water tube	tube	Date		Weather	
No.69 7	Thermoelectric Power Plant (A)	ower Pla	nt (A)		boiler for	boiler for power generation	eration		September 13,1990	13,1990		cioudy
Sampling time	me		(Rating)	13:00	13:30	14:00	14:30	15:00	15:30	16:00		
Power capacity	sity	k4	300,000	230,000	235,000	235,000	235,000	235,000	235,000	235,000		
Evaporation		ton/hr	906	820	830	830	830	830	830	830		
Steam pressure		kg/cm2g	174	180	185	185	185	185	185	185		- -
Steam temperature	rature	ູ່	540	540	540	540	540	540	540	540		
Fuel	Consumption	l i ter/hr	46,875	4,000	6,000	6,000	6,000	6,000	6,000	6,000		
Heavy oil	Pressure	kg/cm2g		10	10	10	10	10	10	10		
		press.kg/cm2g	steam	- 18	18	18	81	18	18	81		
Natural gas consump	s consumption	a3/hr	84,000	63,720	55,500	55,500	55,500	55.500	55,500	55,500		•••
Comb.air A/H inle	A/H inlet	°c		75/55	75/55	75/55	75/55	75/55	75/55	75/55		
temp.	A/H outlet	¢C		275/275	275/275	275/275	275/275	275/275	275/275	275/275		
Flue gas	A/H inlet	ပ္		345/330	345/330	345/330	345/330	345/330	345/330	345/330		
temp.	A/H outlet	ပ		140/140	140/140	140/140	140/140	140/140	140/140	140/140		
AIL	Fan outiet	ma Aq		580/570	580/570	580/570	600/580	600/580	600/580	600/580		
pressure	Wind box front	front man Aq i		440	420	420	420	420	420	420		
	Wind box back	na Ag		440	420	420	410	410	410	410		
Furnace pressure	ssure	mm Aq 1		290	240	240	240	240	240	240		
A/H : Air heater	heater											

lue gas	inside size of chimney : 10,850 x 3,500mm	mney: 10,	850 x 3 50	Other	37.975 a2			
ppm	104	148	148	146	146	155	143	
8	•	0.15	0.10	0.10	0.10	0.10	0.15	
94	6.5	0-7	6.9	6.7	9.9	6.7	12	
૩૧	 6.2	9-9	6.9	6.9	6.9	7.2	6.6	
g/Nm3			1 1 1		0.12			
Ĵ,	160	51	163	174	181	180	180	
a/s	14.8	14.8	14.8	14.8	14.8	15.2	15.2	
Nn3/hr	881,000	894,000	875,000	854,000	841,000	865,000	865,000	
vm3/hr	 808,000	759,000	775,000	775,000		792.000	759,000	
° C	 345	i 1	345	345	345	345	345	
24	0.4	9-0	0.8	8 0	1.4	9.1.9	1.4	
ыqq	112	164	168	166	166	081	159	
kg/hr	190	270	270	260	250	280	250	
ke/hr	280		420		420		420	
ks/hr				-	100			

Size of combustion chamber	9,745 MM	9,745 min	32,918 📠	3,126 m3	ng 230,000 kca1/a3hr	al 170,000 kcal/#3hr	chamber ·
Size of cont	W	Ω	н	Volume of chamber	Load of c/c :rating	Load of c/c :norma	c/c : Combustion chamber

s burners)							Burner installation condition (15-oil burners, 15-gas burners)				
Burner operating condition (1-oil burner, 14-gas burners)	3	/0	/0	/0	70	/6	burners,	3	0/0	0/C	0/0
(1-oil bur	2	/0	/0	9/	9/	9/	on (15-oil	2	9/0	0/0	9/0
condition	1	2/	/G	9/	/0	2/	on conditi	- 1	9/0	9/0	3/0
operating	Level	ы Э	D	C	ß	A	instal lati	Level	E	D	с О
Burner	Sied	Back			Front		Burner	Sied	Back		

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Front

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1.5 Boiler No.4

Name of establishmen	t T T	Power Pla	Plant (R)		Type of fa hoiler for	ci li ty	: No.I water	tube	Date Sentember	6,1990	Veather	fair
ž			(Rating)	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00
Power capacity	tc i ty	₹	32,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Evaporation	u	ton/hr	150	139	139	139	139	138		137	137	137
Steam pressure	sure	kg/cm2g	70.3	64.0	64.0	64-0	64.0	64.0	64.0	63.0	. 63.0	63.0
Steam temperature	berature	· - 2,	487	485	485	485	485	485		485	485	485
Fuel	Consumption	l i ter/hr	10,246	2,640	2,640	2,640	2,640	2,640	+ change		6,537	6,537
Heavy oil	Pressure	kg/cm2g		4	4	4	4	4.		4.1	4.1	4.1
	Atomize press.		steam	5	s	ເດ	5	പ		5	5	5
		ړ ډ		102	102	102	102	102		102	102	102
Natura	Consumption	m3/hr	12,278	8,310	8,310	8,310	8,310	8,310	change		4,644	4,644
gas	Pressure	kg/cm2g		0.77	1 12.0	77.0	17.0	0.77		122.0	22.0	22.0
Comb. air	A/H inlet	ູ່	:	1 02	-02	02	22	22		72	72	72
temp.	A/H outlet	ວ <u>ໍ</u> ່		269	269	269	270	270		270	270	270
Flue sas	A/H inlet	ے د		410	410	410	411	411		411	411	411
temp.	A/H outlet	ງ.		170	021	170	172	172		173	173	173
Air	Wind box	nn Ag		2	12	17	22	77		22	22	72
pressure	A/H inlet	and Ac		200	200	200	200	200		170	170	170
	A/H outlet	mm Ag	,	06	90	90	06	<b>0</b> 6		75	75	75
Furnace pressure	ressure	mm Ac		-2.5	-2.5	-2.5	-2.5	-2.5		-2.5	-2.5	-2.5
Flue gas	A/H inlet	and Ac		-100	-100	- 100	-100	-100		-100	-100	-100
pressure	A/H outlet	mm Ag		-160	-160	-160	-160	-160		-142	-142	-142
A/H : Air heater	r heater								-			
Analytica	Amalytical data of flue a	zas	Inside d	diameter of	chimnev:	2.320 1		:				
Chinney		Indc		231	1	239	232	230	182	180	204	220
1	C0 conc.	<i>7</i> 6		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.5	0.5	1	
	CO2 CONC.	૪૧		7.2	10.7	7.0	7-0	6.9	6.9	6.9	7-5	7.4
	02 conc.	35		7.4	7.2	7.1	7.0	0-2	6.6	9.9	7.4	7.7
	PH conc.	g/Nn3				0.045						0.27
	Temperature	ပ္		168	169	170	170	0/1	170	170	8	169
	Gas velocity	B/S		20.5	20.5	19.9	19.8	19.8	19.6	20.6	20.6	20.7
	Gas quantity	Nm3/hr		133,000	133,000	129,000	128,000	128,000	127,000	133,000	134,000	134,000
Theoretic		Ne3/hr		146,000	144,000	143,000	142,000	142.000	-	•	156,000	160,000
A/H inlet		ں ب		410	410	410	410	411		411	411	411
	02 conc.	36		2.4	2.3	2.3	2.3	2.3	1 8	1.8	3.1	3.5
N0x conc. (02 5%)	(02 5%)	Шdd		272	276	275	265	583 793	202	200	240	265
NOX emission	ion	kg/hr		ន	65	ន	61	8	47	49	56	61
S02 emission	ion	kg/hr		180	180	180	180	180	-	,	440	440
PM emission	on	kg/hr				00 10						98

### Thermoelectric Power Plant (B) 2.

2.1 Boiler No.1

- 109 -

Size of combustion chamberW10,380 mmD5,800 mmH7,600 mmLoad of c/c :rating 230,000 kcal/m3hrLoad of c/c :normal 230,000 kcal/m3hrLoad of c/c :combustion chamber Burner operating condition (1-oil hurner, 5-gas burners) 8 10 ç 2 2  $\hat{\phantom{a}}$ kg/hr ŕΩ 4

burners, 6-gas burners) (6-01) operation condition Burner

3 30 ā

No. 70-2 NG	NC80% : 01L20% → NG50% : 01L50%	1	101:011	50%			·					
establist Thermo	nt sctric Power Plant (B)	er Pla	nt (B)		Type of fac	ci i ty nomer	: No.2 water	· tube	Date September	6, 1990	Weather	fair
т 138 138		Ĕ	(Rating)	13:30		14:30	15:00	15:30	16:00	16:30	17:00	
Power capacity	×	-	32,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	
Evaporation	ton	ton/hr	150	140	140	140	140	140	140	140	140	
Steam pressure	kg/cm28	<u>1</u> 28	55	হ	64	8	63					
			487	485	485	485	485	485	485	485	485	
water	ار انو	, , ,		40	40	40	40	05	40	40	40	
	u	i ter/hr	10,246	2,432	2,432	2,432	2,432	←change→	6,022	6,022	6,022	
Heavy oil Pressure	- 1	<u>n28</u>		4.1	4.1	4.1	4.1	4.1	4.1	41	4.1	
Atomize pr	Seress	<b>n</b> 28	steam	2	ى ك	5	5	5	5	5	ŝ	
		- -		110	110	110		110	110	110	110	
Natural Consumption		٦ç	12,278	10,636	10,636	10,636		←change→	6,994	6,994	6,994	
-	kg/cm28	m28		0.77	0.77	0.77	_	0.76	0.76	0.75	0.76	
212		- -		80	80	80	80	80	80	80	80	
temp. A/H outlet		۔ د		272	272	276	276	276	276	276	276	
Flue gas A/H inlet		C		410	410	410	410	410	410	410	410	
temp. A/H outlet	-			180	180	180	180	180	180	180	180	
		Aq		75	75	73	22	£	52	13	73	
sure i		Aq		82	78	80	8	8	8	8	80	
	4	Aq	j	272	272	276	276	276	276	276	276	
Furnace pressure		Ad		-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	
Flue gas A/H inlet	t ma Ad	24	-	-65	-65	- 29-	-67	-67	-67	-67	-67	
pressure A/H outlet		Ag		-160	- 160	-162	-162	-162	-162	-162	-162	
[												
				-			900 Q					
8	ue gas			Inside c	nside diameter of	Chimney:						
Unimney NUX CONC.		╞		1/2			01					
C0 CONC.	32	-		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
CU2 Conc				8.5	8.6	8.4	6	8 6 8	9.6	9.3	6.9 0	
02 conc.				5.3	4.8	5.5	5.3	5.8	6.3	6.3	6-5	
PH CONC.	8/Nn3	<u>و</u>		0.025								
Tenperat	-1	ں		185	186	186	185	184	184	184	183	
Gas velo		s		28.5	28-8	28:5	29.5	31.0	30.8	30.5	30.5	
Gas quantity		Nm3/hr		168,000	169,000	167,000	173,000	183,000	181,000	180,000	180,000	
	-	/hr		148,000	144,000	150,000	148,000	1	164,000	164,000	166.000	
A/H inlet Temperatur	e U	_ _		367	368	367.	368	1	370	370	370	
02 conc.		-		1.5	1.3	1.3	1.8	3.8	4.0	9-0	4.0	
NOX CONC.(02 5%)	ling d	E		175	166	178	178	171	194	192	191	
NOX emission	kg/hr	hr		59	58	59	62	61	99	65	55	
S02 emission	/8)	Ju		164	164	164	164	I;	407	407	407	
PM emission	kg/hr	ی عد		4.2								
									Siz	Size of combustion chamber	stion cham	bèr
	Bur	Burner of	operating (	condition (	(I-oil burner,		5-gas burners)		M		10,380	
				2	С С		•		Ω		5.800	
		m	/0/	/0	<u>/c</u>				н		7.600	l
		A	/0	/6	/6				Volume of	of chamber	457.6 m3	ł.
									Load of c	.oad of c/c :rating		kcal/m3hr
•	칠	0 122	Burner operation	condition (	<u>(6-oil burn</u>	burners, 6-gas burners)	the purners)		Load of c	of c/c :normal	250,000	kcal/m3hr
				2	~				c/c:Com	: Combustion chamber	amber	•
		- ~	220		0,0						•	

2.2 Boiler No.2

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### 3. Petroleum Refinery

### 3.1 Oil Heating Furnace AA-F1, AA-F2

Name of establishment				Type of fi	facility:	AA-F1,F2 atomos-	atomos-	Date		[Weather	
No.57 Petroleum Refinery	r.v.		_	pheric distil	stillation	heating furnace	urnace	September 25,1990	25,1990	1	fair
Sampling time		11:30		12:1	8	12:	30	13:00	8	13:30	õ
Name of furnace		AA-F1	AA-F2	AA-F1	AA-F2	AA-F1	AA-F2	AA-F1	AA-F2	AA-FI	AA-F2
1 furnace	10,000kca	al/hr									
	m3/day	538.6	535.5	538.6	535.5	538.6	535.5	538.6	535.5	538.6	535.5
QL	ပ	174	172	174	172	174	172	174	221	1771	21
fluid Outlet temp.	°C	346.2	346.2	346.2	346.2	346.2	346.2	346.2	346.2	346.2	346.2
2	kg/cm2g	1	1	1		1	1	1	1	I	1
*	m3/hr	3.074	3,001	3,050	2.832	3,122	2,904	3,146	3,001	3,098	2,953
Comb. air temperature	ູ	ambience an	ambience	ambience	ambience	ambience	ambience	ambience	ambience	ambience	ambience
Furnace temperature X	ູ່	-		612	,	612	4	612	•	612	
Air press. Vind box	ittini Aq	0	0	0	0	0	0	0	0	0	0
Dumper openning at flue	¥.	05	40	40	40	0 <del>1</del> 0	40	07	40	40	40
Furnace pressure	mm Ao	-3	-3	-3 -3	ų.	£-	ښ	ę-	ų	-3	÷
by the	Refinary,	۲	of covect	: Inlet of covection zone.							
Amalitical data of flue as	1000	ineide dis	motor of	neide diemeter of chimney.	2 120 -						
	100	00000				60		ç		00	
	11 1 1	< 0 05 < 0 05		4 0 07 V 0 04		× 0.05		20 0 20 0 20 0 20 0		× 0.05	
CO2 conc.	8.2.6					0.8				8.3	
02 conc.	96	5.5		5.7		5.6		5.4		5.5	
PM CONC.	8/Nm3							< 0.0003		:	
Temperature	ပ	567		260		260		554		541	
Gas velocity	m/S	7.3		<b>7.</b> 8		T.T		8.0		8.0	
	Nm3/hr	54,500		58,700		58,000		60,700		61,600	
ty.	Nm3/hr	68,700		67,300		68,500		69,000		68,400	
N0x conc.(02 5%)	۵pa	87		88		06		32		92	
NUX emission	kg/hr	9.4		10		10		11		11	

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AA-F

NOX emission PM emission

- 111 -

No.57-6										
Name of establishment			Type of fa	Type of facility :	AA-F3 crude oi	de oil	Date		Weather	Γ
No.57 Petroleum Refinery.			feating furnace	Irnace			September 10,1990	10,1990	fair	
Sampling time	(Rating)	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	Π
Heat transfer in furnace 10.000kcal	00kca1/hr	851.6	851.6	851.6	851.6	851.6	851.6	851.6	851.6	
Process Quantity (m3/	m3/day	65.1	65.1	65.1	65.1	65.1	65.1	65.1	65.1	
fluid inlet temp.		175	175	175	175	175	175	175	175	-
Outlet temp.	2	345	345	345	345	345	345	345	345	
Natural gas consumption # m3/hr	/hr	543	543	543	543	543	543	543	543	Π
Comb. air temperature	<u>ر</u> ا	ambience	ambience ambience	ambience	ambience	ambience	ambience ambience ambience ambience	ambience	autoience	-
Furnace temperature 🕸	c.	550		550	550	550	550	550	550	
Flue gas temperature		430	430	430	430	430	430	430	430	
	min Aq	0	0	0	0	0	0	0	0	
Furnace pressure	mm Ag	-2	-2	-2	-2	-2	-2	-2	-2	
Note #:Estimated by the Refir	the Kefinary, 🕅 : Inlet of covection zone.	t of covec	tion zone.							
Analytical data of flue gas	Inside o	diameter of	nside diameter of chimney:	2.134 mm						

Analytica	Analytical data of flue gas	as	Inside	diameter of	chimney:	2,134 mm	Ē					
Chimney	NDX CONC.	uuda		54	53		50	54 {	54	54	35	
-	CO conc.	કર		< 0.05   < 0.05	< 0.05	۷	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
	CO2 conc.	24		7.4	5.7		7 1	7:5	7.8	7.6	7.8	
	02 conc.	સ્		6.8	9.3		7.0	6.8	6.7	6 <b>.</b> 8	6.5	
	PM conc.	g/Nm3			-					2000.0		
	Temperature	ູ່		415	408	. 403	396	395	399	400	400	
	Gas velocity	s/m		3.1	3.0	2.9	2.5	1.9	1.6	1.6	3.5	
	Gas quantity	Net3/hr		11,100	10,800	10,500	9,200	7,000	5,800	5.800	12,800	
Theoretic	heoretical gas quantity	Nat3/hr		6,800	8,200	6,800	6,900	6,800	6,700	6,800	6,700	
NOX CONC. (02 5%	(02 5%)	ШQd		- 19 91	72	60	57	19	60	61	03	
NOX emission	ion	kg/hr		1.2	1.2	1.1	0.94	82.0	0.64	0.64	1.4	
PM emission	0U	kg/hr								0.0041		

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	8	U U	9	
	7 1	<u>c</u>	5	
	6	<u> </u>	c C	
	5	9	3	
	4	9	9	
s burners)	3	9	0	
ion (16-gas	2	5	0	
ng condit		0	5	
urner operating co	Side	Left	Right	
ති				

	29	0	8.2	9	78	
Damper Close			8			
Damper Open	47	0	6.7	8.8	81	
Standard	54	0	7.4	8-8 8	08	
Unit	add	8	ð 2	8		
Emission Unit	NOX	<u>co</u>	C02	02	N0x ppm/02=0%	

Name of establishment				Type of f	acility :	Iype of facility : RV-HI.H2 gasoline	gasoline	Date		Weather	
No.57 Petroleum Refinery	LV V			desulfuri	zation hea	desulfurization heating furnace	8	September 10,1990	10,1990	4-	fair
Sampling time		12:30	30	13:00	00	13:30	8	14:00	00	14:30	g
Name of furnace		RV-H1	RV-H2	RV-HI	RV-H2	RV-HI	RV-H2	RV-HI	RV-H2	RV-HI	RV-H2
Heat transfer in furnace [	0,000kc	10,000kch1/hr 300	300	300	300	300	300	300	300	300	300
	m3/day	1,000	1.035	1,000	1,035	1,000	1,035	1,000	1,035	1,000	1,035
iniet temp.	J J	204/204	227/7228	204/204	227/228	204/204	227/228	204/204	227//228	204/204	227/722
Outlet temp.	, C	390/390	394/394	390/390	394/394	390/390	394/394	390/390	394/394	390/390	394/394
Pressure k	kg/cm28	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Natural gas consumption #	s #3/hr	1,543	1,543	1,543	1,543	1.543	1.543	1,543	1.543	1.543	1,543
	ູ່	28	88	28	28	29	ଝ	ଞ୍ଚ	30	ম	ଝ
urnace temperature X	Ĵ,	463/467	488/522	463/467	488/522	463/467	488/522	463/467	488/522	463/457	488/522
ir press. Wind box	nam Aq	¢	0	0	0	C	0	0	0	0	o
Jumper openning at flue	1-9-1	ŝ	1	e	Ţ	3	1	æ	I	3	1
Furnace pressure	ana Aq	4-	-2	<b>*</b> -	-3	<b>7</b> -	-2	7-	-2	-4-	-2

Analytical data of flue	828	Inside diameter of chimmey:	of chinney:	1,980 mm		
Chimney N0x conc.	udd	49	50	51	53	53
	3-¢	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
C02 CONC.	<b>8</b> 4	6.8	6.4	6.4	6.4	6.5
02 conc.	24	6.9	6.9	6.9	6.8	6.8
PM conc.	g/Nn3			0.0013		
Temperature	ပ္	386	385	384	385	379
Gas velocity	S/11 /	6.3	6.3	5.8	5.6	5.2
Gas quantity	/ Nn3/hr 1	19,800	19,800	18,200	17,600	16,500
heoretical gas quantif	SV   Nm3/hr	19,000	19.000	19,000	18,800	18,800
NOX CONC.(02 5%)	Mada	56	57	58	1 80	60
NOx emission	kg/hr	2.0	2.0	1.9	1.9	1.8
1 emission	kg/hr			0.024		

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	ម	Ŀ	5	9	c
	5	3	0	9	9
	4	9	5	9	C C
X Z SIDES/	3	د	0	נ נ	5
s purners	2	9	9	9	c
100 (12-gas	1	5	9	9	9
operating condition	side	E Side	V Side	E Side I	W Side I
BULTREL O		RV-H1		RV-H2	

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Oil Heating Furnace RV-H1, RV-H2

No.57-10								1		
Name of establishment			Type of f	Type of facility : AW-HI maphtha	AW-H1 napl	htha	Date		Weather	
No.57 Petroleum Refinery			heating furnace	urnace	•	-	September 11.1990	11,1990	Ū	cloudy
Sampling time	(Kating)	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	
Heat transfer in furnace 10.0	rnace 10,000kch1/hr 504	535	535	535	535	535.	535	535	535	
Process Quantity m3/day	day	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	
e	- - -	223	223	223	223	223	223	223	a	
Outlet temp.	0	401	401	401	401	401	401	401	401	
Natural gas consumption # m3/hr	hr 596	540	540	540	540	540	540	240	240	
Comb. air temperature		ambience	ambience	ambience	ambience	ambience	ambience ambience ambience ambience ambience ambience	a dra.s	ambience	
Furnace temperature XX °	c	599	599	599	599	599	599	599	599	
Air press. Wind box man Aq	AG	•	•	-	•	•	-	1	•	
Furnace pressure man Aq	Aq		t	1	•		t	•	ł	
Note #: Estimated by the Refin	the Refinary, 5% : inlet of covection zone.	t of covec	tion zone.							
Analytical data of flue gas.	Inside	diameter o	Inside diameter of chimney:	2,134 mm	Ē				. !	
Chimmey N0x conc. ppm			69	74	81	02	11	88 88	69	
			< 0.05	< 0 0F	< 0.0F	< 0.05 ×	< 0.05	< 0.05	< 0.05	

3	ARALYTICAL GALA OT TIUE SAS	d S	HISTOR DIAMETER OF CHIMINEY	CI OF CHIMICS.	2°104 II						
himey	NUX CONC.	bpm	· · ·	69	74	78		12	88	69 69	
	C0 conc.	24		< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	
	C02 conc.	સ્		10.2	9.6	10.2	10.1	10.4	10.2	10.5	
		39		2.0		2.0		3.1	1.9	1.8	
	PM conc.	g/Nn3				6000-0	 				
	2	ړ پر		592		595	606	609	680	690	
	ţ	m/S		5.2	·	4.5	4.5	101	5.5	6.0	
	Gas quantity	Nm3/hr		14,300		12,300	12,100	10,900	13.700	14,800	
retica	ity	Nat3/hr		4,900	4,6	4,900	9,800	5,200	4,800	4,800	
0x conc.(02 5%	02 5%)	Liad d		58	63	99 99	58	8	27	- 22	
10x emission	uo	kg/hr		2.0	1.9	2.0	1.7	1.6	1.9	2.1	
CH ISSION		kg/hr				0.011					

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condition	6
operating	
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Right	с Э	3	9	3	9	9	
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### 3.4 Oil Heating Furnace AW-H1

Name of establishment				Type of f	ype of facility : RE-HIO oil heating	RE-HIO OI	heating	Date		Weather	
No.57 Petroleum Ret	kefinery			furnace				September 21,1990	21,1990		fair
Sampling time		(Rating)	12:00	12:30	13:00	13:30	14:00	06:11	15:00	15:30	16:00
Reat transfer in furnace	ce   10,000	-	Unca lucul	atable bec	ause a letu	ent heat is	s unknoun	by accompa	incaluculatable because a letent heat is unknown by accompaning specific heat, granity	fic heat,	granity
-	kca1/hr		and phase	chang of	and phase chang of liquid fuel						
Process   Quantity	m3/day		151	151	151	151	151	151	151	151	151
fluid Inlet temp.	ပ္ ၂၂၂	:	410	410	410	410	410	410	410	410	410
Outlet temp.	ູ ເ		445	445	945	445	445	445	445	445	545
Natural gas consumption #	1 * m3/hr		1,306	1,306	1,306	1,306	1,308	1,306	1,306	1,306	1,306
Comb. air temperature	, C		ambience	ambience ambience		ambience	ambience	ambience ambience ambience ambience	ambience authience	ambience	antience
Air press. Wind box	nns Aq		0	0	0	0	0	Ð	0	0	0
Furnace pressure	mm Aq		-3	ς,	£-	e-	φ	е-	er I	<u>۴</u> -	ŝ
Note #: Estimated by the	the Refinary.		-								
Amilytical data of flue cas	235	Inside	Inside diameter of chimnev:	f chimnev:	3.048 am	Ē	• .				

malytical	Analytical data of flue g	gas	Inside d	iameter of	chimney:	3,048 ann	Ē					
Ginney	NDX CONC.	10 th		22 22	22	21	19	19	24		27	27
	CO CONC.	96		< 0.05	< 0.05	Ľ.,	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	CO2 conc.	38		3.3	2.9		2.3	2.9	3.0	ļ. I	3.8	3.6
	02 conc.	<b>2</b> 46		14.5	15.3	15.8	18.5	13.8	14.5	13.3	13.0	13.8
	PM conc.	g/Nm3		< 0.0002						< 0.0002		
	Temperature	, c		360	370	355	355 (	345	410	420	425	420
	Gas velocity	S/W		4.5	4.0	3.5	4.5	4.5	4.0	3.9	3.9	3.9
	Gas quantity	Nm3/hr		36,800	32.200	28,800	37.100	37,700	30,300	29,100	28,900	29,100
heoretica	heoretical gas quantity	Nm3/hr		36,800	41,900	46,000	53,100	33,200	36,800	31,000	29,900	<b>N</b>
0x conc.(02 5%	(02 5%)	ppm		54	62	65	68	42	59	52	5	60
NOX emission	on	kg/hr		1.7	1.5	1.2	1.4	1.5	1 5	1-5	1.6	1-6
M emissio	Ľ	kg/hr		< 0.0074						< 0.0058		

# Burner operating condition and installation(40-gas burners)

		•			
Roof 8	9	U	5	5	U
Roof 7	3	9	9	9	5
Roof 6	3	5	9	IJ	3
Roof 5	5	9	9	. 5	5
Roof 4	5	S	3	3	0
Roof 3	9	5	9	IJ	IJ
Roof 2	0	<b>9</b>	U	9	5
Roof 1	0	ю	0	0	0

### 3.5 Oil Heating Furnace RE-H10

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No.57-13												
I hame of es	Name of establishment				Type of f:	acility:	Type of facility : AR-H1, AU-H1 oil	1 011	Date		Weather	
N0.57	Petroleum Refinery	tery			heating furnace	urnace			September 10,1990	10,1990	47	fair
Sampling time	ine		12:0	00	13:00	00	14:00	00	15:00	00		
Name of furnace	rnace		AR-H1	AU-H1	AR-HI	AU-H1	AR-H1	AU-H1	AR-HJ	AU-H1		
Heat transter 10.0	ter 10.000kcai/hr	hr hr	372.6	138.9	372.6	138.9	372.6	138.9	372.6	138.9		
Process	Quantity	m3/day	253	308	253	308	253	308	253	308		
fluid	Inlet temp.	ç	168	308	168	308	168	308	168	308		
	Outlet temp.	ç	211	320	211	320	211	320	211	320		
Natural	Consumption *	m3/hr	2,111	250	2,145	144	2,145	144	2,145	144		
gas	Pressure	kg/cm2g	12	0.5	12	0.5	12	0.5	12	0.5		
Comb. air temperat	temperature	° C	ambience ambience	amb i ence	ambience ambience	ambience	ambience ambience	ambience	ambience   ambience	ambience		-
Flue gas temp.	emp.	ູ	329	312	330	317	335	315	329			
Air press. Wind boy	Wind box	Dan Ac	0	0	0	0	0	0	0	0		
Furnace pressure	essure	izm Aq	-3	-3	6- -	-3	ŝ	-3	-3	-3		
Note. Load : AR-HI	Ξ	AU-H1 0%	84%, AU-H1 0%, * : Estimated by the Refinary	nated by th	he Refinar.	۲.						
Analytical	<u>Analytical data of flue gas</u>	ças	Inside c	Inside diameter of chimney:	f chimney:	2,841 mm	대학					
		Time	12:00	12:30	13:00	13:30	13:50					
Chimney	NDX CONC.	шdd	90	8	30	31	ଝ					

									-					of the
														Note : Due to maifunction of downstream equipment, AU-M1 was being operated at a low load so as to keep warmath of the
									-					o keep
														as t
											·			8
														load
		_						-			_		-	NO.
												!		at 2
		_					~		_			~		a ted
ļ	13:50	କ୍ଷ	< 0.05	6-9	9.5		37(	4.2	9,400	36,400	4	3.1		oper
Ē	13								_					oeing
Inside diameter of chimney: 2,841 mm	13:30	31	< 0.05	6.8	10.0		365	4.2	29,600		45		1	Was
	13:													IH-O
mey.	8	8	< 0.05	6.8	9.5	0014	355	4 4	31,500	36,400	42	1.9	0.044	nt, A
chi	13:00		۷			ö			31	g			0	ui pme
er of	0	30	< 0.05	6.8	9.5		370	3.0	000		42			a equ
iamet	12:30		v						21,000					strea
de d		30	3	6.8	9.8	$\vdash$	390	3.8	8	80	43	.6		down
Ins	12:00		< 0.05	Ű					25,800	38,600				n of
	01		• •							2			ـــــــــــــــــــــــــــــــــــــ	nctio
S	Time	шdd	<u>३</u> २	<del>3</del> 6	<del>३</del> २	g/Nn3	ပိ	S/E	Na3/hr	Na3/hr	шdd	k&/hr	kg/hr	na   fu
ue g							ė	ţ	Υ.	ity				ţ
of fl		onc.	2	onc.	į	Ŀ	emperature	eloci	uanti	ouian'	:			n0
lata		NDX CODC.	CU conc.	CO2 conc.	02 conc.	PM conc.	Tempe	Gas velocity	Gas quantity	gas	2 5%)	6		Note
cal (			<u> </u>		<b>-</b>		<u> </u>			ci ca l	10°	SSIO	ssion	
Analytical data of flue gas		Chimney								[heoretical gas quantity]	0x conc.(02 5%)	NOX emission	PM emission	
An	L	5				-				Ξ	ž	ž	đ	

		Rear	side		2-gas burners)				
KOOT 2	C	U	9	C		1		0	
K00t 4	IJ	9	9	0	instal lation(	2			
K001 3	U	9	9	J	ners) and i	3			
K00f 2	9	0	9	9	(3-gas burners)	4			
Koot 1	3	9	و	ບ	condition (	5	0		
#al	c	9	5	5	operating condit	6	0		
AK-HI	Front	side			Burner	AU-HI	Left	Right	

Deu to maifunction of downstream equipment, burners being used on AU-HI were limited.

Name of establishmen	charent				Type of f:	•••	AQ-H1 diesel	sel	Date		Veather	
NO.57 Petroleum	eum Refinery	ery			feating furnace	urnace		1	September 14,1990	14,1990		fair
Sampling time			(rating)	11:00	12:30	13:00	13:30	14:00	14:30			
Heat transfer in fu	i furnace	rnace 10,000kca1/hr	11/hr		~							
Process Quantity	ti ty	m3/day		19.845	19.845	19.845	19.845	19.845	19.845			
filuid Inlet	nlet temp.	ວ.		270	270	270	270	270	0 <i>1</i> Z			
Outlet t	et temp.	, C		326	326	326	326	326	326		· · ·	
Natural gas consump	sumption a	tion # m3/hr		004	002	200	200	700	004			
Comb. air temperatu	ature.	Э°		ambience	ambience	ambience i ambience ambience	ambience	ambi	and ence			
Furnace temperature	ture 🖄	ຸ ລູ		421	421	421	421	421	421			
Flue gas temperature	tture	с. С		323	323	323	323	323	323			
Air press. Wind box	xoq	man Aq		0	0	0	0	0	0			
Furnace pressure	e	mm Aq		ę.	-3	-33	-9 9	<del>с</del> -3	-3			
Note #: Estimated by	à	kefinary,	赵 : Inle	the Refinary, & . Inlet of covection zone.	tion zone.		-					

	50	< 0.05	5.1	10.5		415	7.3		12,100	76	1.3	-
	65	< 0.05	4.8	10.3		415	7.7	13,000	11,800	22	1.3	
	52	0.05	5.4	10.01	_	422	8°.0	300	,500	92	1.4	
1,450 mm	47	< 0.05	5.0	11.3		413	8.0	13,500	13,100	81	1.3	
of chimney:	50 47	< 0.05	5.4	10.5	< 0.0005	415	7-0	11,800	12,100	92	1.2 (	< 0.0058
side diameter												
	E DOR		<del>3</del> 9	<u>م</u> و	g/Nn3			Nm3/hr		llidd	kg/hr	k3/hr
Analytical data of flue gas	N0x conc.	CO conc.	CO2 conc.	02 conc.	PM conc.	Temperature	i ty	Gas quantity	heoretical gas quantity			
Analytical	Chinney								Theoretica	N0x conc. (02 5%)	NOX emission	PM emission

	-			
	12	0/0	C/X	
	11	0/0	G/x	
	10	600	GVX	
	6	0/0	6/x	
	∞	0/0	GV×	
s)	7	0/0	C/X	
4-gas burner	ę	6/0	G/x	
lation(24-	5	6/0	G/X	
and instal	4	6/0	G/X	
burners)	3	6/0	C/X	ഖ
ion (12-gas	2		G/X	x;not in use
ting conditio	1	G/O	C/X	in use x
Burner operat	_	Left	Right	Ö
	بمحما	·		,

Test with air ratio changse

			The second se		
Entssion	Unit	Ś	Standard	Damper Open	Damper Close
NOX	Edd		54	47.3	56
0	2-R		0	0	0
202	ેર		7.4	6.7	8.2
02	<u>৯</u> ৰ		6.8	8.8	ę
NOX ppm/02=0%			80	81	78

Name of es	Name of establishment No.57 Petroleum Refine	inery		·	Type of fac boiler for	111ty power	L_	tube	Date September	27,1990	<u>е</u>	r fair/cloudy
82			(Rating)	12:00	12:30 (	13-00	0 [ 13:30 ]	14:00	14:30	15:00	15:30	16:00
Power capacity	city	Z			Ì							
Evaporation		ton/hr	56	51.0	52.5	50.0	53.0	52.0	52.0	0 3	54.0	
Steam pressure		ks/cm2g		41.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0	
Steam temperature		ပ		352	353	350	351	361	361	359	360	
Fuel	i-] [·]	i ter/hr	r 4.640	565	565	565	565	\$	•	,	•	
		m3/hh		4,890	4,890	4,890	4,890	4,890	4,890	4,890	068-4	
		iter/hr		405	405	405	405	•	•	1	-	
	Natural gas #	m3/hr		2,891		2.892	2.811	3,114	3.203	3,558	3,603	
Comb. air		i U		32		33	<u>8</u>	34	34	17. 17.	36	
temo.	A/H outlet	20		722		228	2.29	235	235	244	251	
FIRE 28S	A/H in et			365	36.7	364	363	375	375	302	403	
temo.	A/H outlet	Ċ		197		1961	204	207	204	213	217	
r press.	Air press. Fan outlet	AG AG		Draft meters	13	5						
_	Vind box											
Furnace pressure	essure											
Flue kas	A/H inlet	PA E										
presser	A/H outlet											
	A/H : Air heater,	#:Esti	*:Estimated by the	the Refinary,	, <sup>[:Estimated</sup>	F	by the Study Team.	- <b>B</b>				
alytical	Analytical data of flue za	Sex	Inside d	diameter of	f chimney:	2,134 mm	5	-			•	•
Chimney	NOX CONC.	ääö		140	145	143	145	132	135	52	72	53
• •	CO conc.	96		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	9.0	0.6	0.6
	C02 conc.	96		10.4	7.8	8.4	89	8.4	8.6	9.2	8.7	8.3
	02 conc.	96		5.1	5.1	51	5.0	5.1	5.1	3.5	3.7	3.7
	PM conc.	8/Na3			060.0						0.0016	
	Temperature	ູ່		•	230	230	223	232	237	245	255	255
	۲.	m/s		13.0	13.0	13.5	13-5	13-0	13.0	13.5	14.0	14.0
	Gas quantity (	I Na3/hr		,	62,000	64,400	65,300	62,500	61,900	63,300	64,400	64,400
eoretica		Nm3/hr	Stydy team	60,300	60,300	60,300	59,900	53,900	53,900	48,900	49,500	,
	**	Nat3/hr	REFINERIA	36,500	36,100	36,500	35,400	34,300	35,300	35,600	38,500	•
A/H inlet	Temperature	ບ 		295	299	299	298	296	306	319	325	327
•	02 conc.	28		4.4	4.4	4.2	4.1	4.0	4.0	3.1	3.2	3.1
DX CONC.(	N0x conc.(02.5%)	DDE		141	146	144	145	133	136	89	68	8
NOX CHISSION	uou	kg/hr			18	19	19	17	17	10	10	•
S02 emission	on	kg/hr	:	ß	35	35	35	4		•		
PM emission	UC	kg/hr			5.6						0.10	
:ES:	Estimated by Study	Team,	*.Estimated	by REFINERIA	RIA 18 DE MARZO	1AR20						
	-								5ize	e of combu	stion chamb	er
	Burner operating	ng cond	condition		Burner ins	installation condition	condition				5,500 BBB	
	(2-oil burners	5, 4-gas	ತ			burners, 4-gas burners	is burners,	~			5,000 m	12
			Right			Left	Right				5,000 m	ä
	Upper side	2	0/0		Upper side	0/0	0/0	<u>.</u>	Volume of	of chamber	165.0 m3	ŝ
	10101010		~					•.	· · · · · ·		L	
				<b>.</b>	LOVET SIDE					of C/C - Fatting	1 265,000 KC21/23/17	

: Combustion chamber

Boiler G1 3.8

ti					TVDA OF FO	forilitu .	10+0- C J	t ho	S-+0		· · · · · · · · · · · · · · ·	
					5						Weather	1 1 .
C-ON	O GUN KET	Terv		.0.10		pomer	Seneration		September 1	11200		CIOUDY
Sampiing time	11116		Kating/	12:40	13:10	13.40	14:10	14:40	15:10			
Power capacity	acity	X										-
Evaporation	on	ton/hr	39	39	40	42	42	42	42			
Steam pressure		kg/cm2g	42	41	41	41	41	19	15			
Steam temperature		ر د	370	370	370	365	365	362	362			
Fuel	Herv oi *	liter/hr	4.640	1.455	1.455	1.455	1.455	1.455	1.455			
1	Natural gas #	m3/hr	5,485	2.247	2,491	2.580	2.580	2.669	2.669			
Comb.air	A/H inlet	ပ		8	35	31	31	30	8			
temp.	****	Ĵ,		246	244	247	247	245	245			
Flue cas	A/H inlet	J.		370	366	370	370	369	369			
temp.	A/H outlet	ູ		228	222	23	223	221	221	.		
Air press.		mur Aq		85	85	85	<u>85</u>	35	85			. 
				50	50	50	50	45	45			
Furnace pressure	ressure	arm AG		9	9-	-2	-î	9	ę,			
Flue gas	A/H inlet	RIN AG		07-	05-	-40	07-	-40	-40			
presser	A/H outlet	ann Ag		-100	-100	-100	-100	-100	-100			-
Note. A	A/H : Air heater,		*:Estimated by th	the Refinary,	', Estimated	ted by the	e Study Team	2 <b>1</b>				
Analytica	Analytical data of flue g	gas	Inside o	diameter of	f chimney:		1011 1011					
Chimney	NOX CONC.	mod		121	116	122	114	113			- - -	
	CO conc.	34		0.10	0.05	< 0.05	< 0.05	< 0.05				
•	C02 conc.	34		8-0	8.2	7.6	8.1	8.5				
	02 conc.	કર		5.3	4.8	5.3	5.0	4.8				
	PM conc.	kg/hr		0.0060								
	Temperature	ပ		212	212	214	217	216				
	4	S/≣		4.5	4.3	4.3	6.1					
	Gas guantity	Nm3/hr		22,000	21,000	21,000	29,500	27,200				
Theoretical	gas quant. *	Nm3/hr	-	42,700	44,000		45,500	1				_
A/H inlet	ure	ູ		370	366	370	370	369				
	02 conc.	<b>ठ</b> २		4.6	4.2	4.7						
NOX CORC.	NOX CONC. (02.5%)	шdd		123	115	124	114	112				
NOX emission	ion	kg/hr		5.5	5.01	5.3	6.9	6-3				
S02 emission	ion	kg/hr		91	91	91	91	91			~	
PM emission	on	kg/hr		0.13								
		\$: EStimated	à	KEFINEKIA 18	DE MAKZU.	: `			Cino	of comba	cho on tot	tehon
	Burner oners to	ting condition	tion		Burner ind	Burner installation condition	condition					
	(2-oil burners	P _	4-gas burners)		(4-oil bur	burners, 4-ga	4-gas burners	~	Q		5,500 mm	111 111
		<b>,</b>	2				2		r		6,000	
	A	9/	- <u>0/</u> 0		A	0/0	0/0		Volume of c	chamber	165.0	ш3
	щ	9/0	9/		m	0/0	0/0		Load of c/c	c/c :rating		283,000 kca1/m3hr
									Load of c/c	. norma	=	200 000 km31/m3hr
									1			

3.9 Boiler G2

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Sampling time         (Rating)         10:30         11:30         12:30         12:30         12:30         12:30         12:30         13:00         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10         10	0 10:30 11:00 11:30		September 17, 1990	cloudv/rain
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		-	13:00	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				
$k_{\rm sc}/cm/cs$ $42$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $40$ $33$ $332$ $332$ $332$ $332$ $332$ $321$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $34$ $340$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$ $321$	10 10 13	-		
Burle         °C         360         358         358         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361         361 </td <td>40 40 40</td> <td></td> <td></td> <td></td>	40 40 40			
vy oil         liter/hr         4,640         382         382         382         382         382         1722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,722         1,732         1,722         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,732         1,532         1,55         1,55         1,55 <td>358 358 361</td> <td>1</td> <td>-</td> <td>_</td>	358 358 361	1	-	_
Inlet       5.485       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.752       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       1.252       2.255       2.255       2.255       2.252 <t< td=""><td>382 382 382</td><td></td><td></td><td></td></t<>	382 382 382			
Inlet         "C         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         35         32         32         32         32         32         32         33         36         35         35         35         35         35         35         35         36         35         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36 <th< td=""><td>1,752 1,752 1,752</td><td>1,</td><td>1.</td><td></td></th<>	1,752 1,752 1,752	1,	1.	
f outlet         °C         237         237         237         237         237         232         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24	34 34 34			
H inlet         °C         306         311         311         306         3           H outlet         °C         225         225         228         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         225         235         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15<	237   237			- <b></b> -
H outliet         °C         225         225         228         225         22           noutliet         mm Aq         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <td< td=""><td>306 311</td><td></td><td></td><td></td></td<>	306 311			
n outlet         nm Aq         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0 <t< td=""><td>225 228</td><td></td><td></td><td></td></t<>	225 228			
nd         by         10         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	0			
Ure         Am         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15	0			
H inlet         mm Aq         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -15         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -36         -	-15 -15			
H outlet         Imm         Aq         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -35         -36         -30         -36         -30         -36         -30         -36         -30         -36         -30         -36         -30         -36         -30         -36         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30	-15 -15			
Air heater, $3:$ Estimated by the Refinary, :Estimated by the Study Team. ta of flue gas Inside diameter of chimney: 2,134 nm x conc. $\frac{1}{8}$ Inside diameter of chimney: 2,134 nm x conc. $\frac{1}{8}$ $\frac{10.5}{10.0}$ $\frac{10.0}{10.0}$ $\frac{10.4}{10.5}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.7}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.7}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.7}$ $\frac{10.5}{5.6}$ $\frac{10.5}{5.0}$ $\frac{10.5}{2.35}$ $\frac{10.5}{2.35}$ $\frac{242}{2.325}$ $\frac{25}{2.325}$ $\frac{22}{2.325}$ $\frac{22}{2.32$	-35	35 35		
ta of flue gas       Inside diameter of chimey:       2.134 mm         x conc.       ppm       5.0       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50       50	, <sup>[]</sup> Estimated	/ Team.		
x conc.         ppm         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50	diameter of chimney: 2,134			
conc. $\frac{2}{8}$ <         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         <         0.05         0.05         <         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05         0.05	50 49			
2 conc.     \$     5.7     5.6     5       2 conc.     \$     10.0     10.4     10.5     10       conc.     \$     10.0     10.4     10.5     10       conc.     \$     \$     10.0     10.4     10.5     10       conc.     \$     \$     \$     10.0     10.4     10.5     10       conc.     \$     \$     \$     223     235     242     23       conc.     \$     \$     \$     20.3     20.0     34.0     40.400       conc.     \$     \$     \$     35.00     37.400     37.800     37.3       medrature     \$     \$     \$     33.0     32.6     37.400     37.3       medrature     \$     \$     \$     \$     \$     \$       momerature     \$     \$     \$     \$     \$       onc.     \$     \$     \$     \$     \$     \$       medrature     \$     \$     \$     \$     \$     \$       medrature     \$     \$     \$     \$     \$     \$       momerature     \$     \$     \$     \$     \$     \$       momerature     \$     \$ <td>0.05 &lt; 0.05 &lt;</td> <td>×</td> <td>×</td> <td></td>	0.05 < 0.05 <	×	×	
conc.         %         10.0         10.4         10.5         10           conc.         g/Mm3         10.0         10.4         10.5         10           conc.         g/Mm3         223         235         242         2           mperature         °C         200         30.00         40.400         40.5           s velocity         mS/hr         45,500         39.00         46.900         40.400         37.800           s velocity         mS/hr         36,000         36.900         37.400         37.800         37.400         37.800         37.900         37.400         37.805         37.3         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5 <t< td=""><td>5.6</td><td></td><td></td><td>-</td></t<>	5.6			-
conc.         g/Mm3         223         225         235         242         223           mperature         °C         223         225         235         242         223           s velocity         m/s         9.0         7.8         9.5         8.3         8           s velocity         m/s         10         7.8         9.0         70.400         37.30         30.400         37.30         37.30         37.300         37.400         37.300         37.400         37.300         37.400         37.300         37.400         37.300         37.400         37.400         37.400         37.300         37.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.5         32.	10.0			
mperature         °C         223         225         235         242         22           s velocity         m/s         m/s         1         9.5         8.3         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8         8	0.0	-		
s velocity         m/s         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         8.3         9.5         8.3         9.5         8.3         9.5         8.3         9.3         8.3         9.3         8.3         9.3         8.3         9.3         8.3         9.3         8.3         9.3         8.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3	225			
s quantity Nm3/hr (45.500) 39.300 (40.6) 40.6 (40.5) as quantity Nm3/hr (45.500) 36.000 (40.400) 37.400 (37.400) 37.800 (37.40) (37.800) 37.400 (37.800) (37.40) (37.800) (37.40) (37.800) (37.40) (37.80) (37.40) (37.80) (37.40) (37.80) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37.40) (37	7.8			
as quart. * Nm3/hr         36,000         37,400         37,800         37,100         37,800         37,100         37,800         37,100         37,800         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         37,100         34,100	39,300			
mperature         °C         8:30         326         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         325         326         326         326         326         326         326         326         326         326         324         324         324         324         324         324         324         326         326         326         326         326         326         326         326         324         3	36,000			-
conc.         %         8.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         9.3         71         75         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76         76          76         76         76<	326			
52         ppm         73         71         75         76         7           1         kg/hr         4.0         4.8         4.1         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4         4	8.3			
Kg/hr         4.7         4.0         4.8         4.1         4.           Kg/hr         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24         24	12			
Estimated by REFINERIA 18 DE MARZO. Burner operating condition	4.0			
: Estimated by REFINERIA 18 DE MARZO. Estimated by REFINERIA 18 DE MARZO. Ener operating condition	24			
: Estimated by REFINERIA 18 DE MARZO. rner operating condition Burner installation condition				
Burner installation condition	3 DE MARZO.			
BUFIEL INSTALLATION CONDITION	D		26 01	COMDUSTION CRANDER
		cion	×c	
				0,000 mm
		T	Valume of charber	0,000 mm
		T	Lood of ala tration	8
	200	]	5	

3.10 Boiler G3

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Name of es	establishment				1	farility :	G-5 uster	tithe	Date		1 Liesther	
No.57		lery			- <del>ч.</del>	power	generation		September 26,1990	26,1990		fair/cloudy
18			(Rating)	11:30	12:00	12:30	13:00	13:30	14:00			
Power capacity	city	KW.										
Evaporation	L	ton/hr	120	06	30	66	8	6	I			
Steam pressure	sure	kg/cm2g		42	42	42	42	42				
Steam temperature	erature	ູ ບ		361	361	361	361	361				
Fuel	Hevy oil *	liter/hr		1,130	1.130	1,130	1.130	1.130	Ŀ_			
	gas	m3/hr	11,684	8,793.6	8.793.6	8.793.6	8,793.6	8, 793, 6	8,793.6			
Comb. air	A/H inlet	С,		25	23	24	ম	R	Ŀ			
temp.	A/H outlet	ູ		234	235	233	238	238				
Flue 22S	A/H inlet	о		415	410	412	420	417				
tenp.	A/H outlet	С С		264	261	260	268	268	268			
Air press.	Air press. Fan outlet	man Ac	out of or	order								
•	Vind box	mm Ac										
Furnace pressure	essure	alen Ac		-10	-10	01-	-10	-10	<u> </u>			
lue kas	Flue kas A/H iniet	I END AC		-80	-80-	8	-88-	-80				
pressure	A/H outlet	mar Ag		-1001-	-100	-100	-100	-100	-100			
Note A/	A/H : Air heater,		lated by th	t:Estimated by the kefinary	.							
Inalytical	Analytical data of flue	gas	Inside	Inside diameter of	f chimney:	3,275						
Cianey	N0x conc.	and d		130	125	115	120	125	110			
	C0 conc.	*		<pre></pre>	< 0.05	< 0.05	< 0.05	< 0.05	) ×			
	CO2 conc.	<b>₹</b> ₹		8.3	8.4	6.8	5.8.	8.4				
	02 conc.	*		5.9	2.9	5.3	5.4	5.6	6.3			
	PM conc.	g/Nm3						0.051				
	Temperature	ې س		213	220	223	221	220	315		-	
	Gas velocity	m/S		7.5	7.5	8-0	8.0	8.0				
	Gas quantity	Nm3/hr		88,200	87,000	92.200	92,600	92,800	L			
heoretica	Theoretical gas quant.	Na3/hr		117,000	117,000	112,600	113,300	114.800	<u> </u>			
A/H inlet	Temperature	°C		208	208	209	210	210	208			
	02 conc.	<b>8</b> 9		1	3.5	2.9	2.8	2.9				
NDX CONC.(02 5%)	02 5%)	Elici d		138	132	117	123	130				
NOx emission	uo	kg/hr		24	22	22	23	24	18			
S02 emission	uo	kg/hr		12	12	12	12	12	12			
PM emission	c.	kg/hr						4.73				
		Rurner	onerating condition	condition					Size	e of combustion	ustion chamber	Jer Der
		(3-01	burners.	6-ras hurners)	rs)				M			
			ŧ.	2	3						11.000	
		1 of t	0/0	. Y	0/0				H		1 929 11	
		Right	0/0	, (	2/0				Volume of chamber	chamber	680.5	100
		Burner	1 -	instaliation condition	uo				Load of c	c/c : rating	150,000	(ca1/m3)
		(9-0)	burners,	6-gas burners)	rs)				Load of c	c/c : normal		<cal m3<="" td=""></cal>
			l I	2	3				c/c : Cont	: Combustion chamber	namber	
		1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	0/0	0/0	0/6							

3.11 Boiler G5

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3.12 CP Boild
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of establishmen				Type of fa		L	tube	Date		Weather	
No.57 Petroleum Refinery	erv			boiler for power		generation		September	19,1390	fai	fair/cloudy
Sampling time		(Rating)	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00
Steam quantity	ton/nr	55	28.8	31.5	31.5	31.5	31.5	31.5	31.5	5 18	31.5
	kg/cm2g	#BX 62.7	40.5	40.5	40.5	40.5	40.5	40.5	40.5	5.04	40.5
	ົ່ວ		430	430	430	430	430	430	430	430	430
Feed water temperature	۰ C		103	103	103	103	103	103	103	103	183
Fuei Heavy oil	ll i ter/hr		469	469	469	469	469	691	695	469	4694
Natural gas *	m3/hr	4.008	1,806	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150
ssure	kg/cm2g		0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5	0.44/2.5
	ູງ		32	33	32	32	32	32	32	28	33
Flue gas temperature	<b>့</b>		311	311	311	311	311	311	311	311	311
Furnace pressure	the Ac		80	08	08	80	88	80	8	8	8
. 1	the Refinary,	< · ·		by the Study Team.							
Analytical data of flue g	gas	Inside	Inside diameter of chimney.	chimney.	2,134 mm	U		:.		· ·	
Chimney N0x conc.	HLCC				103	106	105	106	103	102	8
CO conc.	<b>ð</b> 8				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
C02 conc.	૪૨				11.1	I0.7	10.2	11.4	11.6	6 II	11-4
02 conc.	24				1.3	1.5	1.4	1.4	1.3	1.1	1.8
PM CONC.	g/Nm3			•				< 0.0002			
Temperature	°C			-	270	280	285	290	270	285	295
Gas velocity	a/s				8.2	7.5	8.5	8.0	8.0	8.5	0.6
Gas quantity N	Nm3/hr			-	35,800	32,200	36,100	33,700	35,000	36,100	37,600
Theoretical gas quantity	Na3/hr				23,400	23,600	23,500	23,500	23,400	23,100	24,000
NCx conc. (02 5%)	ppm				84	87	86	87	84	82	89
NOX emission	kg/hr			-	7.6	7.0	7.8	7.3	7.4	7.6	6.4
S02 emission	kg/hr			_	29	29	29	50	29	23	ଝ
PM emission	+ ks/hr -						•	0.0068			
								:	:		
· ·	•	Burner op	Burner operating condition	ndition				Siz	e of combu	Size of combustion chamber	er
	:	(2-gas burners)	ners)					W		2,134 600	B
								<i>د</i>		7 117	

 Size of compusition chamber

 W
 2,134 mm

 W
 2,134 mm

 D
 7,417 mm

 H
 2,413 mm

 Volume of chamber
 38.2 m3

 Load of c/c :rating
 900,000 kcal/m3hr

 Load of c/c :normal
 410,000 kcal/m3hr

 Cc : Combustion chamber

2-gas burners) Upper /G

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No.1-5										
Name of establishment	ishment	:			Type of fa	Type of facility : No.D water tube	tube	Date	Weather	
No.1 Chem	Chemical Products Factory (A)	ts Factory	(4)		boiler for	boiler for processing		October 8,1990	•	fair
Sampling time			(Rating)	16:00	16:30	17:00				1
Feed water flow rate	w rate	ton/hr	5.0	3.0	3.0	3.0			-	
Steam pressure at darm	e at darm	kg/cm2g	30	28.0	29.0	29.0				
Steam temperat	ture	, C	saturated saturated	saturated		satu				
Feed water temperature	perature	ن ٩		85	33	85				
Fuel Con	isumption	Nm3/hr	750	450	450	450				
Natural Ten	Temperature	°C		25	25	25				4
gas Pre	Pressure	kg/cm2g		0.46	0.46	0.46			_	
air	berature	ي د		30	30	30				
Flue cas tempe	erature	ູ່		320	320	320				
Air press. Window box	ndow box	atm Aq		06	06	06				
Furnace pressure	Ire	RM AG		22	22	22				
-					-					
Analytical dai	ta of flue S	gas	Inside d	Inside diameter of chimney	chimney:	(63 mm				
Chimney N0x conc.	NOX CONC.	ltidd			30	29				
8	conc.	x			0.7	0.6			-	
	CO2 CONC.	*			10.5	10.5		-		
02	conc.	\$6			0.9	0.8				
₹.	conc.	g/Nn3				0.0015				
1 Tea	Temperature	° C			275	258				
Gas	s velocity	s/m			ю 8	8.2				
Gas	2	Nm3/hr		~	4.700	4,600				
Theoretical vas quanti	quantity	Nm3/hr		—	4.100	4,100				
N0x conc. (02 5%)		pom			24	23				_
NOX emission	_	kg/hr			0.29	0.27				
PM emission		kg/hr				0.0069				

Burner : Lance type (B & W) Register : CV type

4.

4.1 Boiler D

No.1-1										
Name of establishment				Type of fa	cility :	Type of facility : No.E water tube	tube	Date	Weather	
No.1 Chemical Products Factory (A)	icts Factory	) (E)		boiler for processing	processi	38.		October 8,1990		fair
Sampling time		(Rating)	12:30	13:00	13:30	14:00	14:30			
Feed water flow rate	ton/hr	15.0	10.0	10.0	10.0	10.01	0.01			
Steam pressure at darm	kg/cm2g	13.45	12.7	12.5	12.5	12.5	11-5			
Steam temperature	ູ່	saturated	saturated	saturated saturated saturated saturated saturated saturated	saturated	saturated	saturated			
Feed water temperature	ູ ວ		33	85	85	85	85			
Fuel Consumption	Nm3/hr	1,500	1,000	1,000	1,000	1,000	1.000			
Natural Temperature	ပို		25	25	52	25	52			
gas Pressure	kg/cm2g		0.34	0.35	0.35	0.35	0.35			
Comb. air temperature	ູ ວຸ		30	ଛ	80	30	8			
Flue gas temperature	Ĵ,		190	190	190	190	190			
Air press- Window box	mm Aq		i	1	1	1	1		-	
Furnace pressure	Inter Ac		6	6	6	6	6			
Analytical data of flue gas	gas	Inside	inside diameter of chimney.	chimney.	1,266 mm	111				
Chimney NOx conc.	шdd		64	67	65	99	67			
	a		1	100			14 4			

	67	< 0.05	9.3	4.1		251	7.6	12,400	13,000	ន	1.8	
titi	99	< 0.05	9.3	4.1		253				62	1.8	-
1,266 #	65	< 0.05	9.0	4.2				12,500				
chimney.	67	< 0.05	8.5	4.0	6000.0	249	I.		i i			0.011
e diameter of	64 67	< 0.05	8.8	4.2		252	7.5	12.200	13,000	19	1.7	
Insid								_			1	
gas	шdd	*	<b>8</b> 8	8	g/Nn3	: ] ° C	m/s	Nn3/hr	i Nm3/hr	ррт	kg/hr	kg/hr
Analytical data of flue g	NOX CONC.	CO conc.	C02 conc.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantity	heoretical gas quantity	02 5%)	on	c
Analytical	Chimney			•					Theoretica	N0X conc.(02 5%)	NOX emission	PM emission

Burner : Lance type (B & W)

4.2 Boiler E

No.1-6											
Name of establishment				Type of facility		No.100 heat medium	t medium	Date	Veather		<b></b>
No.1 Chemical Produc	oducts Factory (A)	y (A)		boiler for prosessing	prosessin	8		October 9,1990		fair	
ling time		(Rating)	13:30	14:00	14:30	15:00	15:30				
Medium guant.	m3/hr								,		Γ
Heat inlet temp.	ຸວ	•	230		230		230				Γ
medium Outlet temp.	2 I	280	255		255	:	255				
iniet. press.	kg/cm2g		5.8		5.8		5.8				<b>[</b> ]
Outlet press. k	kg/cm2g		2.9		2.9		2.9				<b>—</b>
Heat transfer	kca1/hr	1,000,000							_		
Fuel Consumption	Nm3/hr	105	100	100	100	100	100		-		
Natural Temperature	ວ_		22		25		25				
gas Pressure	rate Aq		180		180		180				
air.	ς Ω		•		•		•				<b>-</b>
Fiue gas temperature	, С		240		240		240				
Air press. (fan outlet)	mm Aq		,	-							[
Furnace pressure	mm Ac				-		-				7
5	gas	Inside d	inside diameter of chimney.	Chimney:	350 an	8					
Chimney N0x conc.	DDH		68	68	68	70	22				•
C0 conc.	8		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05				
C02 conc.	26		7.3	7.3	7.2	7.2	7.5		-		
02 conc.	8		5.5	5.0	5.0	5.1	5.0			)	-
PM conc.	8/Nm3			< 0.0004							-7
Temperature	ç I	-	130	200	200	200	189				
Cas velocity	R/S		10.3	10.3	10.2	10.1	10.0		_		
Gas quantity			1,600	1,400	1,400	1,400	1.400				
Theoretical gas quantity	N#3/hr		1,200	1,200	1,200	1,200	1.200				
NDX conc.(02 5%)	bptn		02	88	89	102	73				

Heat Transfer Medium Boiler No.100

Manufacturer : THERMOPAC(Italy)

0.21

0.20

0.20

0.20

kg/hr kg/hr

NOX emission PM emission

I nozzle mix type gas burner Downward reverse firing type. Blower location is side bottom of the boiler and the air flows from bottom to top of the wall so as to cool the wall.

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No. 1 - 8	acts h1 i schmant				T. 20 2. 6		We 200 hoot modium	1 Do 4 A	1 Neo thor	Г
	Chemical Products Factory (A)	Factor	v (A)		boiler for prose	r prosessi	no-oou icat moutum	October 9,1990	Tair	يم محس
line	tinte		(Rating)	11:30	12:00	12:00 12:30 1	13:00			Γ
	lium quant.	m3/hr	155.3							Γ
Heat	Inlet temp.	ပိ		245	245	245	245			
Imedium	Outlet temp.	ŝ	280	261	261	261	261			
-		kg/cm2g		5.2	5.2	5.2	5.2			
		kg/cm2g		1.1	1.1	1.1	1.1			<b></b>
		kca1/hr	B.000.000							
Fuel	Consumption	Nm3/hr	312.5	300	300	300	300			
Natura		ပ္		25	25	25	25			-
235	Pressure	mm Aq		06	06	06	06			<b>F</b>
Comb. air	Comb. air temperature	2*		ambience	ambience	ambience	ambience			
Flue gas 1	Flue gas temperature	J.		195	195	195	195			
Air press.	Air press. (fan outlet)	ann Ag		34	34	Ř	34			
Furnace pressure	essure			20	20	20	20			1
										}
Analytical	Analytical data of flue gas	SE	Inside c	Inside diameter of chimney:	f chimney:	580 mm	ritte 			ļ
Chinney	NOX CONC.	۵dd		85	92	92				
:	CO conc.	34		0.1	< 0.05	< 0.05				
	CO2 conc.	32		0.7	7.0	6.8				
	02 conc.	<b>3</b> 2		8.3	7.6	7.5				
	PM conc.	g/Nm3			< 0.0004					
	Temperature	ູ		165	170	170				[
	Gas verocity	a/s		9.0	9.0	9.0				
	Gas quantity	Nm3/hr		3,800	3,700	3,700				
Theoretica	tity	Nm3/hr		4,600	4,400	4,300			·	
NOX CONC.		ndd		107	110	601				
NOX emission	ion	kg/hr		0.66	0.70	02.0				
PM emission		ks/hr			< 0.0015					Π
			-							
								Size of com	Size of combustion chamber	
	I nozzle mix ty	ype sas	burner			Manufactu	rer:	W	2,695 mm	
	Downward reverse firing type.	rse firi	ng type.			THERMOPAC(Italy)	(italy)	DxH	1,570 000	
	Blower location	on is si	de bottom c	of the boi	ler and					
	the air flows from bottom to top of the wall	from bc	ottom to top	of the w	all so			Volume of chamber	5.2 m3	
	as to cool the wal	e wall.						Load of c/c :rating	_	٠ بة
								Load of c/c :normal		L.

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### Heat Transfer Medium Boiler No.300

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$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Name of establishment	tablishment				Type of facility	ci i ty :	No.1 drier for	for	Date		Vea ther	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		hemical Product	is Factor	γ (A)		powdered s	ope			je j			fair
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sampling t	ciane -		(Rating)	12:00	12:30	13:00	13:30	14:00	14:30	15:00		
on         Nm3/hr         350         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         297         2010         2014         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.4         0.	Quantity o	of product	ton/hr	10	8.5	8.5	8.5	8.5	8-5	8.5	8.5		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Fuel .	Consumption	Nm3/hr	350	297	297	297	297	297	297	297		
re         °C         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21	Natural	Pressure	kg/cm28		0.4	0.4	0.4	0.4	0.4	0.4	0.4		
et         °C $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$ $345$	gas	Temperature	<u></u> Э,		21	21	21	21	21	21	21		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Temp. of k	leater outlet	ç Ç		345	345	345	345	345	345	345		
	Input quan	t. of slutly *	ton/hr		12.3	12.3	12.3	12.3	12.3	12.3	12.3		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Input pres	s. of slully	kg/cm2g		07	40	40	40	40	05	40		
et         °C         110         111         115         117         115         116           : approx. 35%         : approx	Gas quant.	of drier	Nm3/hr	84,900	50.100	49,600	50,800	50,700	51,000	51,000	49,700		
: approx. 35% inside diameter of chimney: 1,240 mm inc loss loss loss loss loss loss loss los	Tempe. of	drier outlet	ر د		110	111	115	117	115	116	123		
Iue gas         Inside diameter of chimney:         1.240 mm           ppm         16         14         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         16         17         10.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0	* : wat	er content : a	oprox. 35										
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Analytical	data of flue ;	as	Inside (	liameter of	f chimney:	1,240			:			- :
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Chimney	NOX CONC.	midd		16	14	15	15	15	15	15		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(Outlet of	CO CONC.	24					< 0.05					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	R/C)	CO2 conc.	34		1.1	1.3	1.3	1.3	1.3	1.3	1.3		
gr/m3         110         111         115         117         115         116         116           ctty $m/s$ $^{\circ}C$ 110         111         115         117         115         116           ctty $m/s$ $^{\circ}C$ 23.7         23.5         23.4         24.4         24.4         24.5           itty         hm3/nr         50,100         49,600         50,800         50,700         51,000         51,000           otity         hm3/nr         24,500         23,400         24,500         21,400         21,400           ttp:         114         109         104         106         106         106           kg/hr         1.6         1.4         1.6         1.4         1.6         1.6         1.6		02 conc.	÷9		18.9	18.8	18.9	18.8	18.7	18.6	18.3		
Jre         °C         110         111         115         117         115         116           city         m/s         23.7         23.5         24.3         24.4         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.5         24.500         23.400         23.400         23.400         23.400         23.400         23.400         23.400         23.400         23.400         23.400         24.400         24.400         24.500         20.60         50.60         60.7         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6         10.6		PM conc.	8/Na3					•	0.027				
city         m/s         23.7         23.5         24.3         24.4         24.4         24.5           Lity         Nm3/hr         50,100         49.600         50,800         50,700         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000<		Temperature			110	111	115	117	115	116	123		
Lity         Nm3/hr         50,100         49,600         50,800         50,700         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,000         51,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400 <td>:</td> <td>Gas velocity</td> <td>R/S</td> <td></td> <td>23.7</td> <td>23.5</td> <td>24.3</td> <td>24.4</td> <td>24.4</td> <td>24.5</td> <td>24.3</td> <td></td> <td></td>	:	Gas velocity	R/S		23.7	23.5	24.3	24.4	24.4	24.5	24.3		
ntity         Nm2/hr         24,500         23,400         24,500         23,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400         21,400 </td <td></td> <td>Gas quantity</td> <td>Nn3/hr</td> <td></td> <td>50,100</td> <td>49,600</td> <td>50,800</td> <td>50,700</td> <td>51,000</td> <td>51,000</td> <td>49,700</td> <td>•</td> <td></td>		Gas quantity	Nn3/hr		50,100	49,600	50,800	50,700	51,000	51,000	49,700	•	
ppm         122         102         114         109         104         100           kg/hr         1.6         1.4         1.6         1.6         1.6         1.6         1           kg/hr         1.4         1.6         1.4         1.6         1.6         1.6         1	Theoretica	ul gas quantity			24,500	23,400	24.500	23,400	22,400	21,400	19,100		
kg/hr 1.6 1.4 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	NDX conc.(	(02 5%)			122	102	114	1001	104	100	68		
	NOX emissi	on	l kg/hr		1.6	1.4	1.6	1.6	1.6	1.6	1.5		
	PM emissic	u.	kg/hr						1.4	i			.
	M/C : Mult	ci-cyclone											

Dryer No.1 4.5

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Natural gas burner : 1

	5				Type of facility	cility :	No.2 drier for	for	Date		Weather
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		s factor	y (A)	ļ	powdered so	ope			October 8,	,1990	fa
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sampling time		(Rating)	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
m         Ma3/hr         365         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364         364 </td <td>Quantity of product</td> <td>ton/hr</td> <td>15</td> <td>15.25</td> <td>15.25</td> <td>15.25</td> <td>15.25</td> <td>15.25</td> <td>15.25</td> <td>15.25</td> <td>15.25</td>	Quantity of product	ton/hr	15	15.25	15.25	15.25	15.25	15.25	15.25	15.25	15.25
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	· !	Na3/hr	365	364	364	364	364	364	364	364	364
e         °C         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25         175         175         175         175         175         175         175         175         175         175         175         175         175         27.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4		kg/cm28	j]	0.4	0.4	0.4	0.4	0.4	1.0	0.4	0.4
t $'C$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $175$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ <td>Temperatu</td> <td>ູ</td> <td></td> <td>25</td> <td>55</td> <td>25</td> <td>25</td> <td>25</td> <td>25  </td> <td>\$3</td> <td>R</td>	Temperatu	ູ		25	55	25	25	25	25	\$3	R
$v \notin$ ton/hr $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$ $22.4$		ç		175	175	175	175	175	175	175	175
Iv         Kg/cm2g         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         40         90         000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000         90.000	~	ton/hr		22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Ľ	kg/cm2g		40	40	40.1	40	0 <del>1</del>	40	40	01
ef         °C         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100		Nm3/hr		90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	e)	ູ		100	100	18	100	100	100	100	8
Iue gas         Inside diameter of Chinney:         1.680 mm         12         12         12.5         12         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         12.5         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6         15.6	ŀ٠	orox. 35	20								
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	5	gas	1	iameter of	<pre>chimney:</pre>		332				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Chimney   N0x conc.	Edd		12	12	12	12	12	12.51	12.5	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Dutlet of CO conc.	84		< 0.05			< 0.05	< 0.05			
$\chi$ $18.3$ $18.3$ $18.3$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.8$ $18.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ $15.6$ <td>4/C) C02 conc.</td> <td>8</td> <td></td> <td>0.9</td> <td>0.8</td> <td>0.75</td> <td>0.8</td> <td>0.75</td> <td>0.75</td> <td>0.7</td> <td></td>	4/C) C02 conc.	8		0.9	0.8	0.75	0.8	0.75	0.75	0.7	
g/Mm3         g/Mm3         g         0.043         g         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         86         86         86         86         87         87         87         87         87         87         91         91         91         91         91         91         91         91         91         91         91         91         91         91	02 conc.	28		18.3	18.3	18-8	18.8	18.8	18.8	18.5	
re         °C         87         82         80         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85         85<	PM conc.	8/Nm3				0.043					
ity $\mathfrak{m}/s$ 14.8         16.1         15.2         15.6         15.6           ity         Nm3/hr         59,000         65,100         61,000         62,800         62,800           ity         Nm3/hr         24,600         24,600         30,200         30,200         30,200           ity         Nm3/hr         24,600         24,600         30,200         30,200         30,200           kg/hr         71         71         71         87         87         91           kg/hr         1.5         1.6         1.6         1.5         1.6         1.6           kg/hr         2.8         2.8         1.5         1.6         1.6         1.6		ς Ω		87	82	80	85	85	85	69	
ity Nm3/hr 59,000 65,100 65,400 61,000 62,800 62,800 61,000 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,100 10,10	Gas velocity	s/B		14.8	16.1	1.16.1	15.2	15.6	15.6	1.81	
ti ty Nm3/hr 24,600 21,600 30,200 30,200 30,200 30,200 ppm 71 71 87 87 91 91 87 81 91 91 82/hr 1.5 1.5 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	Gas quantity	Nm3/hr		59,000	65,100	65,400	61,000	62,800	62,800	67,500	
ppm         71         71         87         87         87         91           kg/hr         1.5         1.6         1.5         1.5         1.6         1.5         1.6           kg/hr         2.8         2.8         1.5         1.6         1.6         1.6	Theoretical gas quantity			24,600	24,600	30,200	30.200	30,200	30,200	26,600	-
kg/hr 1.5 1.6 1.6 1.5 1.6 1.6 1.5 1.5 1.6 1.6 kg/hr	NDx conc.(02 5%)	Bdd		12	12	287	87	87	16	80	
kg/hr   2.8	NOX emission	kg/hr		1.5	1.6	1.6	1.5	1.5	1.6	1.7	
	PM emission	kg/hr	•			2.8					
	M/C : Multi-cyclone			-							

Natural gas burner : 1

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4.6 Dryer No.2

### 5. Chemical Products Factory (B)

## 5.1 Boiler No.1

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-			facility .	No 1 cmolo tubo	a tuha	00+0-		1 Losther	
Products Factory (B)		boiler for	r prossesing	171110 I TUNI	va vanc	зег	29,1990		cloudy
(Rating)	12:00	12:30	13:00	13:30		15:00	15:30		15:40
3	approx.	<ul> <li>20% (normal</li> </ul>	al load)	_		approx. 8	80% load		
2.6 um	leasu	unmeasureable							
10.5	7.6	3.7 2.6	7.6	7.6	rarua I	6.8	8-7	normal	7.3
Satu	saturated		saturated saturated	saturated	opration	saturated	saturated	saturated opration	saturated
	ß		56	26.	discharg-	56	92	02 conc.	26
iter/hri 149	80	20	25	25	ing steam)	120	120	control	35
	2.0/0.7	1.8/0.82	1.8/0.82	1.8/0.82				1	2.4/0.85
air			1	1		1	1		1
	82.5	80	80	80		8	8		83
amb	ambience	ambience	ambience	ambience		anbience	ambience		andience
	185	5 170	170	170		208	208		205
-		1	,	•		۹.	1		•
estimated	ß	50	50	50	-	50	50		23 
treide dismeter of	5	of chimney.	400			-			•
	ŝ	1961		2151		280	255		238
v	0.05	5 < 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05
	9.5	8.0	9.5	9.4		11.2	13.0	-	10.7
	∞ ∞		7.5	8.2	:	4.8	2.5		6.0
						0.42			
	188	3 170	190	182		206	215		212
	3.0		3.8	9.2		12.8	10.3		10.5
	610		740	1,800		2,400	1,900	1	1,900
	19		390	410	-	1,500	1,300		480
	250		213	269		772	122		254
	0.25	0.24	0.27	0.79		1.4	66-0		0.93
	-		1.4	1-4		6.6	6-6	-	1.9
						1.01			
		design and the second se				and the second se			

f 02 conc. control by manual	Size of combustion chamber	D 572 Mai	L 4,242 mm	Volume of chamber 4.358 a3	Sectional area 1.027 m2	Rate Normal	Load of c/c *1) 340,000 70,000	Load of s/a \$2) 1,430,000 290,000	*1) kcal/m3h *2) kcal/n2h	c/c : Combustion chamber	1 02 conc. Size of combus D U Unte of chamber tional area d of c/c *1) kcal/m3h kcal/m3h t combustion char : : Combustion char	trol by manual trol by manual chamber chamber 2572 manual chamber 2572 manual chamber 2572 manual chamber 2528 manual chamber 25288 manual chamber 2528 manual chamber
Size of combustion chamber           D         572 mm           L         4,242 mm           L         4,558 m3           tional area         1.027 m2           tional area         1.027 m2           d of c/c         \$1)           d of c/c         \$1)           kcal/m3h         \$20,000           d of s/a         \$2)           kcal/m3h         \$2) kcal/m2h	D         572 wer           L         4,242 wm           unse of chamber         4.358 m3           tional area         1.027 m2           dof c/c *1)         340.000         70.0           d of c/c *1)         340.000         70.0           kcal/wa3h         #2)         1.430.000         290.0           kcal/wa3h         #2) kcal/m2h         kcal/m2h	L 4,242 am une of chamber 4,358 a3 tional area 1.027 m2 a30,000 70,0 d of c/c *1) 340,000 70,0 d of s/a *2) 1,430,000 290,0 kcal/m3h *2) kcal/m2h cablet on chamber	unce of chamber 4.358 a3 tional area 1.027 a2 d of c/c *1) 340,000 70.0 d of s/a \$2) 1.430,000 290.0 kcal/m3h \$20 kcal/m2h	tional area 1.027 m2 d of c/c *1) 340,000 70.0 d of s/a *2) 1.430,000 290.0 kcal/m3h *2) kcal/m2h	d of c/c *1) Rate Norma d of c/c *1) 340,000 70.0 d of s/a *2) 1,430,000 290.0 kcal/m3h *2) kcal/m2h c Combustion chamber	d of c/c *1)   340,000   70.0 d of s/a *2)  ,430,000   290.0 kcal/m3h *2) kcal/m2h :: Combustion chamber	d of s/a *2) 1,430,000 290.0 kcal/m3h *2) kcal/m2h :: Combustion chamber	kcal/m3h #2) : Combustion chambe			• •	
Size of combustion chamber           D         572 mm           L         4,242 mm           L         4,222 mm           une of chamber         4.358 m3           tional area         1.027 m2           d of c/c *1)         340.000         70.0           d of s/a         #2)         1.430.000         290.0           kcal/m3h         #2)         kcal/m2h         70.0           sconserion chamber         #2) kcal/m2h         70.0         290.000           sconserion chamber         *20 kcal/m2h         70.0         200.0	D         572 wer           L         4,242 wm           unse of chamber         4,358 m3           tional area         1.027 m2           d of c/c *1)         340.000         70.0           d of s/a *2)         1.430.000         290.0           kcal/wa3h         *22) kcal/m2h         70.0           kcal/wa3h         *22) kcal/m2h         70.0           scotional area         *22) kcal/m2h         70.0           scotional area         *22) kcal/m2h         70.0	L 4,242 am une of chamber 4,358 a3 tional area 1.027 m2 d of c/c *1) 340,000 70.0 d of s/a *2) 1,430,000 290.0 kcal/m3h *2) kcal/m2h cabustion chamber : Sectional area	unse of chamber         4.358 a3           tional area         1.027 a2           a of c/c         *1)         8ate           d of c/c         *1)         320.000         70.0           d of c/c         *2)         1.430.000         290.0           kcal/m3h         *2)         1.430.000         290.0           i         50.50 kcal/m3h         *20 kcal/m2h           :         Combustion chamber         :         Sectional area	tional area 1.027 m2 d of c/c *1) 340,000 70.0 kcal/m3h *2) 1.430,000 290,0 kcal/m3h *2) kcal/m2h : Sectional area	d of c/c *1) 340.000 70.0 d of s/a *2) 1.430.000 290.0 kcal/m3h *2) kcal/m2h : : Combustion chamber : Sectional area	d of c/c *1)   340,000   70.0 d of s/a *2)   430,000   290.0 kcal/m3h *2) kcal/m2h :: Combustion chamber : Sectional area	<u>d of s/a *2) 1,430,000   290,0</u> kcal/m3h *2) kcal/m2h : : Combustion cramber : : Sectional area	kcal/m3h #2) :: Combustion chambe :: Sectional area				

1 air and pressure atomizing oil burner 1 LPC pilot burner Manufacture:Cleaver Brooks de Mexico SA /Caldera Compact Others : Diesel oil is used when start-up the boiler.

Same life time         (Rating)	Ing time Outlet temp. Inlet. press. Inlet. press. Interpress. Real transfer Ressure air temperature sas temperature sas temperature conc. NX conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. Con		(00) 215 3.4 1.1 1.1 1.1 1.1 1.1 215 -1 -1 -1 24 0.05 24 0.05 23 3.0033 0.033 0.033 0.033 0.033 0.033 0.033 0.033 0.033 0.035 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.055 0.05500000000	11:30 3.4 3.4 1.1 1.1 1.1 1.1 1.220 1.1 220 1.1 1.220 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.	12:00 220 3.4 1.1 8.30 ambience ambience	12:30 225 3.4		13:30 235 3.4		
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It let press.       (8/0722)       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1       1.1 <th1.1< th="">       1.1       1.1<!--</td--><td>itlet press. at transfer more autor essure perature perature x conc. 0 conc. 1 conc. 1 conc. 1 conc. 1 conc. 2 conc. 2 conc. 1 conc. 2 conc. 2 conc.</td><td></td><td>1.1 8.30 8.30 1.0 340 1 1 1 1 1 1 1 </td><td></td><td>1.1 8.30 ambience</td><td></td><td>3.4</td><td></td><td></td><td></td></th1.1<>	itlet press. at transfer more autor essure perature perature x conc. 0 conc. 1 conc. 1 conc. 1 conc. 1 conc. 2 conc. 2 conc. 1 conc. 2 conc. 2 conc.		1.1 8.30 8.30 1.0 340 1 1 1 1 1 1 1 		1.1 8.30 ambience		3.4			
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Perature         °C         340         355         362         365         370         375           ure $\frac{mi}{8}$ Aq         none         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	erature ure * N conc. Conc. Conc. Conc. Conc. Conc. Conc. Conc. S conc. S conc. Conc. S conc. S c		340 1 - 1 - -1 - -1 - -1 - -1 - -1 -	<del>╡╺╡╶┨</del> ╴╴ <b>┠╾╉</b> ╼		ambience	ambience	anbience		-
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sure         #         matrix         -1         -1         -1         -1         natural dist           # a of flue gas         Inside diameter of chimney:         150 mm         23         23         23         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23         23 <td>urre * ta of flue ga x conc. 2 conc. 2 conc. 1 conc. 5 conc. 5</td> <td></td> <td>-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -</td> <td>chimney:</td> <td>,</td> <td></td> <td>1</td> <td>1</td> <td></td> <td>-</td>	urre * ta of flue ga x conc. 2 conc. 2 conc. 1 conc. 5		-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	chimney:	,		1	1		-
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al data of flue gas inside diameter of chimney. 130 mm N(M conc. 2 2 - 22 - 22 - 22 - 22 - 22 - 22 - 2	al data of flue sa N0x conc. 00 conc. 02 conc. 02 conc. 1emperature das velocity 6as quantity		liameter of 24 < 0.05 7.8 9.3 0.033	chimney. 22 < 0.05						
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T conc. $x/h_{m3}$ 0.033         5.0         5.0         5.5         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         5.1         6.1         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100	PM conc. Temperature Gas velocity Gas quantity		0.033	0	0	đ	10.5	10.5		
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as quantity       Nm3/hr       110       120       130       130       110       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       170       1710       1710       1710       1710       1710       1710       1710       1710       1710       1710 <t< td=""><td>Cas quantity</td><td></td><td>5.3</td><td>5.9</td><td>2015</td><td>2.2</td><td>22</td><td></td><td></td><td></td></t<>	Cas quantity		5.3	5.9	2015	2.2	22			
Rest quantity         Nm3/hr         150         150         150         150         160         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         170         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710         1710 <th< td=""><td></td><td>1</td><td>110-1</td><td>0.1</td><td>1001</td><td>110</td><td>110</td><td></td><td></td><td></td></th<>		1	110-1	0.1	1001	110	110			
33         90m         33         30         32         33         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         34         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         36         3	02.5 GUDDATITV		150	150	150	160	021			
Kg/hr         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005         0.005 <t< td=""><td></td><td></td><td>3</td><td>80</td><td>33</td><td>8</td><td>3</td><td></td><td></td><td></td></t<>			3	80	33	8	3			
kg/hr $0.14$ $0.14$ $0.14$ $0.14$ $0.14$ $0.14$ $0.14$ $0.14$ Mechanical atomizing heavy oil burner.Atomized fuel oil is burnt by imping the oil to the furnace floor.Brick wall type furnaceSrick wall type furnace $(0.057 mc)$ $(0.014 mc)$ $(0.14 mc)$ $(0.14 mc)$ $(0.157 mc)$ $(0.1100 mc)$			0.005	0.005	0.005	0.005	0.005	0.0		-
kg/hr     0.0036     1       Mechanical atomizing heavy oil burner.     Size of combustion champe the oil to the furnace floor.       Merized fuel oil is burnt by imping       Merized fuel oil is fuel with by fuel fuel of fuel with by the fuel fuel of fuel with by fuel fuel fuel fuel fuel fuel fuel fuel			0.14	0.14	0.14	0.14	0.14	0.14		
Mechanical atomizing heavy oil burner. Atomized fuel oil is burnt by imping the oil to the furnace floor. Brick wall type furnace Sectional area 0.092 nd Load of s/a #22, 780.000 1.024 of s/a #22, 780.000		·	0.0036	~~~						
Size of combustion champe       W     400 mm       H     200 mm       H     730 mm       Noiume of chamber     0.157 mm       Sectional area     0.092 mm       Load of c/c     #1)     480,000       Load of c/c     #1)     780,000       #10 kca1/m3)     #2)     kca1/m3)		anical atomizi	ng heavy oi	l burner.						1
W         400 m           H         230 m           Yolume of chamber         1710 m           Volume of chamber         0.157 m           Sectional area         0.092 m           Load of c/c         \$13 mode           Load of s/a         \$23 mode           Load of s/a         \$23 mode           C/c         Kcal/m37         \$20 mmber	Atom	lized fuel oil	is burnt by	v imping			Siz			
H $230 \text{ m}$ LL1710 mVolume of chamber0.157 mSectional area0.092 mLoad of c/c1.000 mLoad of c/c\$2.780.000Load of s/a\$2.780.000Load of s/a\$2.780.000C/cConfuse to chamberc/cConfuse to chamber	the	oil to the fur	mace floor.	) -			M		400 mm	Г
L         L         1710           Volume         of chamber         0.157         nd           Sectional area         0.092         nd         nd           Load of c/c         #10         480,000         10ad of c/c         #20           find of s/a         #20         780.000         100         100           find of s/a         #20         780.000         100           find of s/a         #20         rcal/m3h         #20         rcal/m2h	. 25				•		ц		230 #68	r
Volume of chamber 0.157 m Sectional area 0.092 m Load of c/c #1) 480,000 Load of s/a #2) 780,000 #1) kal/m3h #2) kcal/m2h	8ric	k wall tyme fu	irnare						1710 200	7-
oral         area         0.100 m           oral         area         0.092 m           of         c/c         \$1)         460,000           of         s/a         \$2)         780,000	5	T AND I TOM .V				-9-4-	Volume of		0 157 m3	
of c/c #1) 480,000 of s/a #2) 780,000 of s/a #2) 780,000 a1/m3h #2) kca1/m2) Combucstion chamber							Cart Iona		0 000	-
of c/c #1) 460.000 of s/a #2) 780.000 mal/m3h #2) kcal/m2) Commisc+ion chamber	•							<b>a</b> 1 Ca	4	T
of s/a *2) 780,000 al/m3h *2) kcal/m2h Combristion chamber	•						1 204 05			Tc
al/m3h *2) kcal/m2 Combinetion chamber						,	I nar of a			
Combriction chamb							1 km /		( = /   ~ / ~ /	2
								aherstion of	64/ Augustaun Sehor	

# 2 Heat Transfer Medium Boiler

5.2

### Chemical Products Factory (C) 6.

Boiler No.1 and No.2

No. 72-1.2											
Name of es	Name of establishment				Type of f	Type of facility : Nos.1,2 smoke tube	smoke tube	Date		Weather	
No. 72 Chemical Pr	hemical Product	roducts Factory	S (C)		boiler fo	boiler for prosessing		November 12,1990	12,1990		fair
Sampling time	cime		(Rating)	12:30	13:00	13:30 14:00	14:30	15:00	(Rating)	15:30	16:00
I Name of boiler	oi ler	•	No.1 boiler	er (2.4t/hr	rr)				{ No.2 boiler	er (1.6t/hr	r)
Steam pressure at d	ssure at darm	kg/cm2g	1 max 10.5	5.6	5.6		5.6		5.6 10.5 /8.8	6.0	6.0
i Steam temperature	perature	2.		saturated	saturated	saturated saturated boiler stbpped	saturated	saturated saturated saturated saturated saturated	saturated	saturated	saturated
Feed water temperat	temperature	<u>ر</u>	-	80	09	automaticaly	60	09	1	99	8
Fuel	Consumption	m3/h	168	* 109	\$ 109		* 109	* 109	* 113	* 101	* 101
N-gas	Pressure	kg/ cm28		8.2/0.027 8.2/0.027	8.2/0.027		8.2/0.027	8.2/0.027		3.2/	8.2/
Fiue gas	Fiue gas temperature	ູງ		170	0/1		170	02I		021	170
Air press.	Air press. Window box	num Aq		1	•				•	•	1
Furnace pressure	essure	totti Aq		20	ଷ୍ପ		8	8	22	8	8
: ses-N	N-gas : Natural gas		t : gas	consumptic	n was esti	: gas consumption was estimated from the opening angle of valve.	ing angle o	of valve.			
Analytical	Analytical data of flue	gas	Inside	nside diameter of chimney	of chimney:	360 mm				350	
Chimney	NOX CONC.	udd		65	35		55	65		₩.	44
		<b>3</b> 4		< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05
	CO2 CONC.	<b>3</b> 4		7.5	4.5		7.8	8.5		7.2	7.5
	02 conc.	8		7.5	11.8		10.5	9.3	j	7.1	7.1
	Phi conc.	8/Net3				-	0-0075				< 0.0009
	Temperature	ŝ		160	161		160	170		153	154
	Gas velocity	8/W		6.5	2.5		2.0	1 4.5		1.4	1.4

•••

1888

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Nn3/hr 

cuantity ias quantity **2**.35

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<u>л</u> (					<del>ا</del> ا	r. 1				
, 430, UUU KCAL/ mZhr	hamber (1.6t/hr)	1,895 m	508 mm	0.38 m3	0.20 ±2	:rating2,520,000 kcal/m3hr	rating4,780,000 kcal/m2hr	mber .		
ad of S/a . ratings, sou our kcal/m2hr	ze of combustion chamber (1.8t/hr)		D	lume of chamber	sctional area	2	ad of s/a :ratingh	c : Combustion chamber	a : Sectional area	

- 131 -

No.2 buener installation Fan separated type 1 gas burner No.1 buener installation Wind box type 1 gas burner Ke/

Burner manufacture : SELMEX Boiler manufacture : CLEVER BLOOKS de MEXICO, S.A.

7.	Chemical	Products	Factory	(D)
•	Boiler No	.4		

No.24-1						:				:	
Name of establishment				Type of facility	acility:			Date		Weather	
No.24 Chemical Products Factory (D)	s Factory	(0)		No.4 wate	No.4 water tube boiler for processing	ler for pr	ocessing	October 1	,1990	Ļ	fair
Sampling time		(Rating)	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:30	
Feed water flow rate	ton/hr	7.7	5.4	5.4	5.4	5.4	5-4	5.4	5-4	1.7	
Steam pressure at darm	kg/cm2g	12	12	12	12	12	12	12	12	11	
Steam temperature	ç	satura ted	saturated saturated saturated saturated saturated saturated	saturated	saturated	saturated	saturated	saturated	saturated saturated saturated	saturated	
Feed water temperature	Ċ		25	35	35	25	25	25	25	25	
Fuel Consumption	Nar3/hr	022	534	534	534	534	534	534	534	705	
N-gas Pressure	kg/cm2g		420	420	420	420	420	420	420	500	
Comb. air temperature	. J		30	30	30	80	30	30	30	30	
Flue gas temperature	C		280	260	260	260	260	260	250	285	
Air press. Window box	BER AG		55	55	55	55	55	55	55	65	
Furnace pressure	nam Aq		10	10	10	10	10	10	10	12	
N-gas : Natural gas											

Chimmey	Chimmey NOX come.	n n n		45	8 <sup>4</sup>	48	50	20	48	52	59
•	CO conc.	69		1.5	1.5	1.5	1.5	1.0	< 0.05	< 0.05	< 0.05
	CO2 conc.	34		8.3	8.3	9.3	10.0	9.8	9.8	9.8	9.9
	02 conc.	**		1.8	1.8	1.8	1.8	1.8	3.0	2.3	2.5
	PM conc.	g/Nn3			< 0.0002						
	Temperature	ູ່		275	275	285	280	280	270	270	305
	Gas velocity	S/E		15.5	14.5	13.5	13.0	13.0	13.0	14.0	18.0
	Gas quantity	NE3/hr	5	5,900	5,500	5,000	4,900	4,900	5,000	5.400	6,600
heoretica	Theoretical gas quantity	Na3/hr	4,	802	4,700	4,700	4,700	4,700	5,000	4,800	6,600
NDX conc.(02 5%)	02 5%)	nda		38	40	9 <del>1</del>	42	41	£1	44	51
NOX emission	uo	kg/hr	0	0.55	0.54	0.49	0.50	0.50	0.49	0.58	0.80
PM emission	c	kg/hr			< 0.0011						

ural gas burner	r:Ringt
ister : NAZ type	rmaker:
1 Natural Register	ner

Boiler waker PROTHERM DE MEXICO FABRICACION

e

rating 430,000 kcal/hr

5.4 E3

Volume of chamber

2 o S

5 Load cad

2200 mm 圕

558

3

kcal/h

c/c : Combustion chamber normal

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Name of establishment	to Eactor	(5)		Type of fa	facility:	No.1 water tube	r tube	Date	2 1000	Veather 4	<del>د</del> ہ: -
NO.01 LITERICAL FLOUDED	IN LACIO	(Rating)	08.11	10.00 100 1	17.20	13.00	12.20		0,1330		8
Estimated load		79112411	02	08:	40	06		40	08		
	kg/cm2g		12	12	12	12	12		11.5		
Ire	ں ب		144	144	144	147	147	142	144		
Feed water temp.	<u>, C</u>		44	44	100 U	42	42	44	42		
Fuel Consumption	liter/hr	567	170.1	170.1	170.1	538.65	170.1	170.1	170.1		
y oil Pressure	kg/cm28		11.5	11.5	11.5	12.0	12.0	11.0	11.5		
Atomize	kg/cm2g	steam	11.5	11.51	11.5	12.0	12.0	11.0	11.5		
Temperature	ture °C	1	122	122	122	125	125	124	130		
Comb. air temperature	ç Ç		ambience	ambience	ambience	ambience	ambience	ambience	ambience		
Flue gas temperature	ç			275	280	300	285	285	285		
Furnace pressure	TITE AG	-	-2	-2	-2	-2	-2	-2	-2		
						f load up					
Analytical data of flue aas	as	Inside d	Inside diameter of	chímnev:	930 1		· · ·			·	
6.0	tida			93		148	83	105	88		
·	82	·		< 0.05	< 0.05	< 0-05	< 0.05	< 0.05	< 0.05		
C02 conc.	8			6-0	5.8	9.0	5.3	6.3	5.8	]	
02 conc.	*		_	12.5	12.5	7.3	12.5	11.3	12.0	•	
PM conc.	g/Nm3					0.051					
Temperature	ပ္			275	280	300	285	285	285		
Gas velocity	m/s			6.5	6.9	6.9	6.8	7.4	7.4		
Gas quantity	Nm3/hr		-	5,500	5,800	5,600	5,900	6,400	6,400		
Theoretical gas quantity	- Nn3/hr			4,100	4,100	8,000	4,200	3,700	4,000		
NOX conc.(02 5%)	Шdd	-		175	169	173	156	173	165		
NOX emission	kg/hr			1.1	1.1	1.7	-	1.4	1.2		
SO2 emission	kg/hr			10	10	32	10	10	10		
PM emission	kg/hr					0.29					
•										the start	
		•						212	SIZE OF COMUN	CONDUSTION CRANCE	EL.
	2 steam	2 steam atomizing heavy oil burners.	heavy oil	burners.				×		2,600 =	
	Drafi f	Drafi fan type						0		3,000 mm	R
	Diesel	Diesel is used when start-up and shut-off the boiler.	en start-up	and shut-	off the b	oiler.		н		2,850 mm	ła
	Burner	Burner manufacture	e B & ¥					Volume of chamber	chamber	22-2 8	3
	Boiler	Boiler manufacture	. B & €					Load of c	c/c :rating		cal/a3hr
								Load of c	c/c : normal	170,000 kcal/m3hr	cal/m3hr
								c/c : Com	: Combustion chamber	rander	

8. Chemical Products Factory (E) Boiler No.1

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# 9. Petrochemical Products Factory (A)

9.1 Boiler No.3

- 134 -

Name of es	Name of establishment				Type of facility	• •	No.4 water tube	, tube	Date		4eather	
No 16 Pe	No.16 Petrochemical Pro	whicks Fa	Products Factory (A)		boiler for power	power ge	generation		September 21,1990	21,1990		fair
Sampling t	ine		(rating)	12:30	13:00	13:30	14:00	14:30	15:00	15:15	15:25	15:35
Power capa	city	κw			4							
Evaporatio	· u	ton/hr	41	32	32	32	32	32	32	32	33	3
Steam pres	Sure	kg/cm2g	38	38	38	38	38	89	38	8	88	со
Steam temp	herature	ာ	452	425	425	425	425	425	425	425	425	425
Feed water	temperature	ູ່		80	06	06	06	06	90	06	ଞ	66
Fuel	Fuel Consumption	liter/hr	3,850	gas only		,	1			,	•	
Heavy oil	Heavy oil Pressure	Kg/cm28		gas only	•		1		•	1	1	•
	5	ess.kg/cm2g		gas only		1			•	•	,	1
i Natura i	Consumption	n3/hr	4,550	3,245	3,245	3,245	3,245	3,245	3,245	3,245	3.245	3,245
gas		kg/cm2g		1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1
Comb. air		) ),		28	28	28	38	28	83	87	8	28
temp.	<u>د</u> .	ູ່	estimated	200	200	200	200	200	200	200	200	200
Flue gas	A/H inlet	ູລູ		•	•	•			•	•	•	•
[temp.	temp. [A/H outlet	, C		270	012	270	268	270	264	260	255	259
Air press.	Air press. Fan outlet	men Aq				:						
	Wind box	A He		245	240	240	240	240	240	210	190	180
Furnace pressure	essure	nam Aq		80	8	- 80	08	8	8	80	02	35 55
Fillo 030 h	Flue eac n A/H inlet	AT AC		02	C <sup>2</sup>	62	Cu	S	EO.	00	52	ſ

on build to the location of the

	200	< 0.05	0.8 8	4.7		259	10.2	28,200	34,100	2.7	1961	12	
	188	< 0.05	7.3	5.5		255	10.9	30,400	35,800	3.7	194	12	
	184	< 0.05	7.1	6.3		260	11.5	31,700	37,800	4.4	200	12	
	186	< 0.05	7.2	7.4		264	11.2	31,700	42,300	5.5	219.	12	
	160	< 0.05	6.7	7.4	< 0.0001	270	12-5	35,000	42,300	5.5	188	12	< 0.0034
E	175	< 0.05	0.7	7.4		268	12.4	34,900	42,300	л. Ю	206	13	
1.680 mm	157	< 0.05	6.4	5.7		270	12.8	35,900	37,600	3.4	164	12	
chimney:	153	< 0.05	6.6	5.8		270	12.8	35,900	37,800	3.4	161	11	
nside diameter of chimney	160	< 0.05	6.8	5.8		270	12.8	35,900	37,800	3.5	168	12	
Insid						~~~							
as	llido	39	કર	95	g/Nm3	ပို	s/æ	Na3/hr	Nm3/hr	9-6 	Eldd	kg/hr	kg/hr
data of flue gas	NOX CONC.	C0 conc.	C02 conc.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantity	heoretical sas quantity	02 conc.	02 5%)	on	
Analytical data of f	Chimney								Theoretica	A/H inlet 02 conc.	NOX CONC. (02 5%)	NOX emission	PM emission

 Size of combustion chamber

 W
 4.619 tmm

 W
 5.081 mm

 D
 5.081 mm

 H
 5.000 mm

 Volume of chamber
 131.4 m3

 Load of c/c :rating 300,000 kcal/m3hr

 Load of c/c: contrained
 210.000 kcal/m3hr

 C/c : Contrainer
 210.000 kcal/m3hr

ion condition 4-gas hurners)	2	0/0	0/0	
installation condition burners, 4-gas hurners	1	0/0	- 9/0	
Burner ins (4-oil bu		Ą	മ	

tion urners)	2	9/	Ō	of ocer. is fully closed.
ng condition 3-gas burners)	1	9/	76	
Burner operating condition (0-oil burner, 3-gas burne		A	В	<ol> <li>Burner is out Air register</li> </ol>

9.2

Boiler No.4

No.8-2												
Name of establishmen:	ishment				Type of facility		No.2 water tube	tube	Date		Weather	
No.8 Petrochemic		Products Factory (B)	actory (B)		boiler for	ser	eration		October 10,1990			cloudy
Sampling time			(Rating)	11:30	12:00	12:30	13:00	13:30	14:00	14:30		
Power capacity		AY.		3,400	3,400	3,400	3,400	3,400	3,400	3,400		
Evaporation		ton/hr	40	8	26	26	27	8		26		
Steam pressure		kg/cm2g		5	42	42	42	12	[	42		
Steam temperature	ıre	, C		385	385	385	385	385	385	385		
Feed water temperatur	perature	Ĵ.		105	105	105	105	105		105		
Fuel Cons	sumption	ll i ter/hr	3,400	2.200	2,200	2,200	2,300	2,200		2,200		
Heavy oil Pres	Pressure	kg/cm2g		3.8	3.8	3.8	3.8	3.8		3.8		
Aton	5	ress.kg/cm2g	steam	9	9	9	9	Ģ	9	ç		
Tent	Temperature	ູ ວ		112	112	112	112	112	112	112		
Comb.air A/H inlet	inlet	ູ່		80	30	30	8	8	ଛ	30		
temp. A/H	A/H outlet	ູ		170	170	170	170	021	021	170	-	
Flue gas A/H inlet	inlet	°C.		330	330	330	330	330	880	330		
temp. A/H	A/H outlet	°C °				216	222	216	220			
Air press. Fan outlet	outlet	tata Aq		300	300	300	300	300	300	300		
Vinc	d box	mm Ag		230	290	290	290	290	290	290		
Furnace pressure	re	num Aq		200	200	200	200	200	200	200		
Flue gas A/H	inlet	pA mm		077	017	40	40	40	07	40		•
pressure A/H	outlet	atter Aq		8	8	8	8	8	8	8		
A/H : Air heater	ter .					•						
Analytical data of f		ue gas	Inside	inside diameter of chimnev	f chimmev:	1.970 #				·		·
Chinney NOX		Bdd			267	265	253	244	243	235		
۰.	CO conc.	96			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
		2				1.	-			<		

AIMINTICAL DAVA OF	1 44 44 41 11 10 243	45	DDI SIII	HISTOR DISTORTED IN CULTURES								
Chinney	N0x conc.	Bdd			267	265	253	244	243	235		
	C0 conc.	<b>9</b> 6			< 0.05	< 0.05	< 0.05	< 0.05 <	< 0.05	< 0.05		
	C02 conc.	ેર				10:5	10.1	10.8	10.8	11-0		
	02 conc.	>વ			5.2	5.3	5.2	5.2	5.2		1	
	PH conc.	g/Nm3				0.037				-		
	Temperature	, c				225	216	222	216	220	1	
	Gas velocity	s/a				8.7	8.0	8.5	9.2.	8.8		
	Gas quantity	Nm3/hr				36,500	34,200	35,900	39,400	37,300	-	
Theoretical gas quan	cal gas quantity				28,300	28,400	29,600	28,300	28,500	27,900		
A/H inlet   Temperatu	Temperature	ွ			341	345	344	340	345	344		
	02 conc.	34			3.2	3.1	2.8	2.7	2.5			
NOX CONC. (02 5%)	(02 5%)	and d			270	270	256	247	246	235		
NOX emission	lon	kg/hr	۰ ۰.		•	20	18	18	20	18		-
S02 emission	ion	kg/hr				130	130	130	130	130		÷
PM emission	uc	ks/hr				1.4						
-												
•			• •					ļ.				

Petrochemical Products Factory (B) 10.

Boiler No.2 10.1

l steam atomizing oil burner

Size of contrustion charamber W 2,196 mat D 7,381 mm H 4,674 mat me of chamber 75.8 a3 load of c/c :rating Combustion chan c/c:norma Volume of ţ, 020 ŝ

kcal/#3hr kcal/#3hr

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No.8-3									
Name of establishment				Type of fa	scility :	No.3 water	tube	Date	Weather
No.8 Petrochemical P	Products	cal Products Factory (B)		boiler for	boiler for prossesing	8		October 10,1990	cloudy
Sampling time		(Rating)	11:30	12:00	12:30	13:00	13:30	14:00	-
Feed water quant.	ton/hr	13.0	6.5	6.5	6.5	6.5	6.5	6.5	
Steam pressure	kg/cm2g	13.0	12.6	12.6	12.6	12.6	12.6	12.6	
Steam temperature	ာ	saturated	saturated	saturated	saturated	saturated	saturated	saturated	
Feed water temp.	ů,		25	25	25	25	25	25	
Fuel Consumption	ks/hr	1,200		003	600	800	600	600	
ure	kg/cm28		1 1	1-1	1.1	1.1		1.1	
Atomize press	:. K8/ Cm28	steam	2.7	2.7	2.7	2.7	2.7	2.7	
	ure °C		100	100	100	100	100	100	
Comb. air temperature	Ç ,		30	30	30	30	30	30	
Flue gas temperature	ۍ د		240	240	240	240	240	240	
Air press. Vind box	nm Aq		80	09	<u>9</u> 9	60	60	60	
Furnace pressure	tititi Ac		10	10	10.	10	101	10	
			-		-			-	
3	gas	Inside (	nside diameter of	Ch H		ШШ			
Chimney NOX conc.	tido			309	320	318		287	
	9-8 			<0.05	40.05	<0.05	<0.05	<0.05	
C02 conc.	<u> </u>			12.6	12.5	12.5	11.7	12.8	
02 conc.	Å			5.5	5.5	5.6	5.9	3.6	
PM conc.	g/Nm3				0.23				
Temperature	° C			255	256	255	253	260	
Gas verocity				2.4	2.6	2.6	2.6	2.4	
Gas quantity	Nm3/hr			5,800	6,100	6,200	6,200	5,700	
Theoretical gas quantity				8,100	8,100	8,200	8,300	7,200	
N0x conc.(02 5%)	ppar			319	330	330	334	264	
NOX emission	kg/hr			3.7	4.0	4.0	4.0	3.4	
SO2 emission	kg/hr			34	34	34	34	34	
PM emission	kg/hr		-		1.4				
				•					and the second of
								>12e 01 COULD	
	I stear	I steam atomizing oil buener	oil buener					M	1,767 65
								Ω	4,627 mm
								Н	2,400 mm
								Volume of chamber	19.6 m3
								Load of c/c :rating	600,000

### 10.2 Boiler No.3

- 137 -

Weather fair																													combined i an obombon		5, JUU Riff	0.20 40	.720	7,720,000 kcal/#2hr	amber a	
Date November 16,1990	14:30	85		7.4	satur		130	1.6 / 0.6	1		ambience	290	1	20		275	< 0.05	0.8	8.3		250	11.8	2,000	2,100	346	1.1	7.4			2125 VI UNIUU	L 11-11-12 Aborbon	Continue of Citalitues	Load of c/c :rating	Load of s/a :rate	c/c : Combustion chamber s/a : Sectional area	
tube	14:00	20		7.5	saturated	20	45	6 / 0.6		-	ambience	240	1	20		195	< 0.05	5.9	12.0		203	9	1,200	1,100	347	0.48	2.6									
No.1 smoke tube z	13:30	20	_	7.0	saturated saturated	02	45	9.1.9.0 / 9.	1	•	ambience	225	l	20	Ē	1751	< 0.05	5-3	12.8		190	6.2	1,200	1,200	341	0.43	2.6									
arosessin	13:00	8		7.0	saturated			-6 / 0.6 1	1	-		225	1	20	400 mm	180	< 0.05	5.4	12.6	0.19	195	6.2	1,200	1,200	343	0.44	2.6	0.23		:		-				
Type of fac boiler for	12:30	30		7.0	saturated s	102	45	6 / 0.6 1.	I	-	ambience a	225	ł	20 :	chimey:	1.071	< 0.05	5.6	13.0	-	195	6.2	1,200	1,200	340	0.42	2.6			:	00000	CUDDA				
	12:00	20		7.0	saturated s	102	45	6 / 0.6 1	1	-		225	1	20	Inside diameter of	175	< 0.05	5.2	13-0		195	6.8	1,300	1.200	350	0.47	2.6		•	the surger		. ULEVER				
ctory (C)	(Rating)		2.352	max 10.5			158	đ	air					estimated	Inside d							_							a l bumor	Distavy of Ludinic	burner manuracture.	marteracture				
t al Products Factory (C)		96	t/hr	20	°C	ာ	líter/hr	kg/cm2g	ress.kg/cm2g	င့	ຸບ	ပ္	nan Aq		2aS	E E E E	2*	96	96	g/Nm3	¢ ¢	a/s	Nm3/hr	N#3/hr	Hidd	kg/hr	kg/nr	kg/hr	hone	DC	Burner m	121100				
No.87-1 Name of establishment No.87 Petrochemical Pr	ng time	Estimated load	Steam guantity	Steam presser	Steam temperature	Feed water temp.	Fuel Consumption	Heavy oil Pressure	Atomize p	Temperature	Comb. air temperature	Fiue gas temperature	Air press. Wind box	Furnace pressure	Analytical data of flue g			CO2 conc.	02 conc.	PM conc.	3	Cas velocity	Gas quantity	Theoretical gas quantity	conc.(02.5%)	NOX emission	emission	PM emission								

## 11. Petrochemical Products Factory (C) Boiler No.1

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#### Asphalt Plant 12.

#### Rotary Kiln No.1 12.1

tablishment sphait Plant (Rating) 12:00 duantity Pressure kg/cm2g 13:00 Consumption liter/hr 250 13:00 duantity liter/hr 250 13:00 Fressure kg/cm2g air 110-2 tamperature °C 110-2 ear of kiln °C 110-2 ear of kiln °C 2 tamperature °C 2 tamperature °C 2 data of flue gas inside size of ch data of flue gas inside size of ch 0 conc. gan inside size of ch data of flue gas inside size of ch 0 conc. gas quantity ma3/hr 0 conc. gr 0 conc. gr 0 conc. gr 0 conc. gr 0 conc. gas quantity ma3/hr 0 conc. gr 0	theory       Type of facility:       No.1 retary kiin       Date       Meather       fs.00       Heather       Heather       Heather	t 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 11	Type of fac with asona 12:30 12:22 854 8550 8,550 110-200 115 110-200 160		No.1 rotar chamber 13:30	y kiln 14:00	Date October 5		. 1	Ŀ
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	は	11 Same	12:30 12:30 12:30 12:30 12:30 12:30 12:30 12:30 12:50 11:20 12:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50 11:50		13:30	14:			1	
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n         liter/hr         E54         E34         E36         E350         E350 <the350< th="">         E350         E350         &lt;</the350<>	n         I iter/hr         E54         E55         E55 <the6< th=""> <the6< t<="" td=""><td>I         iter/hr           KS(/cm2g         C           SS.         Image           C         C           SS         C</td><td>854 3mbience 3,550 8,550 110-200 115 115 116-200 160</td><td>╞╼╂╌╂╍╂╍╋━╉╍╉╶╂╴╏╌┨╷</td><td>854</td><td>1.44</td><td></td><td>122</td><td>122</td><td>122</td><td></td></the6<></the6<>	I         iter/hr           KS(/cm2g         C           SS.         Image           C         C           SS         C	854 3mbience 3,550 8,550 110-200 115 115 116-200 160	╞╼╂╌╂╍╂╍╋━╉╍╉╶╂╴╏╌┨╷	854	1.44		122	122	122	
kg/cm2g         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -<	kg/cm2g         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -<		, ambience 1,000 8,550 8,550 115 115 110-200 140	┠╌╂╍╊╍╊╍╉╶╂╌╏╷		854		854	854	854	
$\circ$ <td>e         °C         ambience         ambienc</td> <td>に</td> <td>ambience 1,000 8,550 115 115 116-200 160</td> <td>┠╍┠╍╊╼╉╍╉╶╂╶╏╴┨╷</td> <td></td> <td>•</td> <td>ľ</td> <td>1</td> <td>•</td> <td></td> <td></td>	e         °C         ambience         ambienc	に	ambience 1,000 8,550 115 115 116-200 160	┠╍┠╍╊╼╉╍╉╶╂╶╏╴┨╷		•	ľ	1	•		
Atmize press.         mm         Aq         air         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000 <t< td=""><td>Atmize press.         min Aq         air         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000</td><td>Atmize press. mm Aq t quantity liter/hr t tmperature °C ear of kiln °C as filter °C data of flue gas Max conc. °pm Nox conc. °f 00 conc. °</td><td>1,000 8,550 115 110-200 140 160</td><td>1,000 8,550 115 110-200 140 160</td><td>┝─┥</td><td>ambience</td><td>antrence</td><td>andience</td><td>anthience</td><td>ambience</td><td></td></t<>	Atmize press.         min Aq         air         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000         1,000	Atmize press. mm Aq t quantity liter/hr t tmperature °C ear of kiln °C as filter °C data of flue gas Max conc. °pm Nox conc. °f 00 conc. °	1,000 8,550 115 110-200 140 160	1,000 8,550 115 110-200 140 160	┝─┥	ambience	antrence	andience	anthience	ambience	
t quantity         liter/hr         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.550         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250         8.250	t quantity         liter/hr         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         8,550         115         111         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200	t quantity liter/hr t tamperature °C ear of kiln °C as filter °C data of flue gas MOx conc. °C 00 conc. °C 00 conc. °C 00 conc. °C 00 conc. °C MM3 Temperature °C	8,550 115 110-200 140 160	8,550 115 110-200 140 160	1,000	1,000	1,000		1,000	1,000	
t tuneerature         °C         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         116         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         110         200         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         210         <	t type:rature         °C         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         115         116         100         100         100         100         100         100         101         100         101         100         101         100         101         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         <	t tamperature °C ear of kiln °C as filter °C data of flue gas MOx conc. ppm 00 conc. % 02 conc. % M1 conc. % M1 conc. % M1 conc. %	115 110-200 140 160	115 110-200 140 160	8,550	8,550	8,550	8,550	8,550	8,550	
cst of kiln         °C         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         160         160         160 <td>ear of kiln         °C         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         <t< td=""><td>ear of kiln °C sphit mix °C as filter °C data of flue gas NOx conc. ppm 00 conc. % 02 conc. % Mi conc. % Mi conc. % Mi conc. % Mi conc. %</td><td>110-200 140 160</td><td>110-200 140 160</td><td>115</td><td>115</td><td>115</td><td>115</td><td>115</td><td>115</td><td></td></t<></td>	ear of kiln         °C         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200         110-200 <t< td=""><td>ear of kiln °C sphit mix °C as filter °C data of flue gas NOx conc. ppm 00 conc. % 02 conc. % Mi conc. % Mi conc. % Mi conc. % Mi conc. %</td><td>110-200 140 160</td><td>110-200 140 160</td><td>115</td><td>115</td><td>115</td><td>115</td><td>115</td><td>115</td><td></td></t<>	ear of kiln °C sphit mix °C as filter °C data of flue gas NOx conc. ppm 00 conc. % 02 conc. % Mi conc. % Mi conc. % Mi conc. % Mi conc. %	110-200 140 160	110-200 140 160	115	115	115	115	115	115	
Sph1t mix         °C         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         141         141         141         141         141         141         141         141         141         141         141         141         141         141         141         141         141         141         1	Sph1t mix         °C         140         140         140         140         140         140         140         140         140         140         140         140         140         140         140         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160 <th10< td=""><td>sphlt mix °C as filter °C data of flue gas N0x conc. ppm 00 conc. % 002 conc. % M1 conc. % M1 conc. % PM1 conc. % PM1 conc. %</td><td>140</td><td>140</td><td>110-200</td><td>110-200</td><td>110-200</td><td>110-200</td><td>110-200</td><td>110-200</td><td></td></th10<>	sphlt mix °C as filter °C data of flue gas N0x conc. ppm 00 conc. % 002 conc. % M1 conc. % M1 conc. % PM1 conc. % PM1 conc. %	140	140	110-200	110-200	110-200	110-200	110-200	110-200	
as f i ter         °C         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160         160	act filter       °C       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160       160	as filter °C data of flue gas dox conc. ppm C02 conc. % 02 conc. % 02 conc. % 02 conc. % 02 conc. % 03 conc. % 03 conc. % 03 conc. % 03 conc. % 03 conc. %	160	160	140	140	140	140	140	140	
data of flue gas         Inside size of chimney: 2,020 x 750 mm         1.515 m2           Conc.         pm         1.515 m2           Conc.         pm         1.515 m2           Conc.         pm         2.6         0.05         c 0.05	data of flue gas         Inside size of chimney: 2,020 x 750 mm         1:515 m2           With conc.         Dpm         46         45         46         45         46         45         46         45         46         45         46         45         46         45         60.05         c 0.05         c 0.05 <th< td=""><td>data of flue gas Nor conc. ppm CO conc. % C02 conc. % 02 conc. % Mm3 Temperature °C</td><td></td><td></td><td>160</td><td>160</td><td>160</td><td>160</td><td>160</td><td>160</td><td></td></th<>	data of flue gas Nor conc. ppm CO conc. % C02 conc. % 02 conc. % Mm3 Temperature °C			160	160	160	160	160	160	
Diff $\frac{40}{k}$ $\frac{38}{2}$ $\frac{50}{50}$ $\frac{52}{52}$ $\frac{46}{45}$ $\frac{45}{2}$ $\frac{48}{2}$ $\frac{84}{2}$	Wix conc.         Dem         40         38         50         52         46         45         43           C0 conc. $\frac{1}{8}$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$	N0x conc. ppm C0 conc. % 02 conc. % M1 conc. %/M3 Temperature °C	size of chimne	V: 2.020 Y	750 mm	1.515 л	C.	•		••	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	C0 conc. $\varkappa$ < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05<	00 conc. 002 conc. 02 conc. PM conc.	101	38	50	52		45	48	178	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	C02 conc. $\chi$ $2.4$ $2.6$ $2.7$ $2.8$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$ $2.6$	CO2 conc. 02 conc. PM conc. Temperature	< 0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	v	0.2	
nc.         %         17.0         17.0         16.8         16.8         16.8         16.5         14.3           nc.         gluent         °         1.9         10         10.0         10.0         10.5         14.3           nc.         gluent         °         1.9         10         10.5         16.8         16.8         16.5         14.3           nc.         gluent         °         101         105         105         106         108         104         Move to the front of land           elocity         m3/hr         39.00         39.00         39.00         39.00         39.00         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.20         37.2         40         165	Re. $\chi$ IT.0         IT.0         IT.0         IT.0         IE.8		2.4	2.6	2.7	28	2.6	2.6	2.8	3.8	
mc.         g/hm3         1.9         101         105         106         108         104         Move to the front of transmission           rature         °C         101         105         165         166         166         166         167         164         Move to the front of transmission           elocity         m/s         m/s         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         23.300         23.300         23.300         23.200         37.200         37.200         37.200         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         23.300         24.0	nc.         g/Mm3         1.9         101         105         106         108         104         104         Move to           rature         °C         101         105         105         106         106         104         104         104         40ve to           elocity         m/s         15.0         15.0         15.0         15.0         15.0         15.0         104         104         40ve to           antity         m/s/hr         39,000         39,000         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,200         37,44         4         4         6	- v	17.0	17.0	16.8	16.8	16-8	16.8	-	14.3	
ature         °C         101         105         106         106         108         104         Nove to the front of hove to the front of anti ty         104         Nove to the front of hove to the front of anti ty         100         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23.00         23	ature         °C         101         105         106         108         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         104         105         104         104         105         104         104         105         106         106         106         105         106         106         106         106         106         106         106         106         105         113         114         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117         117 <td>9</td> <td>1.9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	9	1.9								
elocity         m/s         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         15.0         <	elocity m/s   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15.0   15		101	105	106	108	104	104	Move to t	front of	37F -
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	ţ	15.0	15.0	15.0	15.0	15.0	15.0		front of	3/F
Quantity         Nmm3/hr         39,000         37,200         37,200         37,200         37,200         37,200         34,700         23,33           Cc.         X         13.8         13.0         14.2         13.8         14.0         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         140         113         140         113         140         113         140         113         140         111         171         23         140         111         171         211         240         240         240         25         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15 <td>Ruminity     Nm3/hr     39,000     39,000     37,200     37,200     37,200     37,200     37,200     34,70       Run     3     13.0     14.2     13.8     14.0     13.8     13.3       Run     C     13.6     14.2     13.8     14.0     13.8     13.3       Run     S/Mm3     150     150     146     155     145     143     14.3       Run     S/Mm3     160     152     190     198     175     171     17       Ra/hr     3.3     3.1     4.1     4.2     3.8     3.7     -       Ka/hr     15     15     15     15     15     15       Na     3.3     3.1     5     15     15     15</td> <td>ty</td> <td>40,300</td> <td>39,900</td> <td>39,800</td> <td>39,600</td> <td>40,000</td> <td>40,000</td> <td></td> <td>•</td> <td></td>	Ruminity     Nm3/hr     39,000     39,000     37,200     37,200     37,200     37,200     37,200     34,70       Run     3     13.0     14.2     13.8     14.0     13.8     13.3       Run     C     13.6     14.2     13.8     14.0     13.8     13.3       Run     S/Mm3     150     150     146     155     145     143     14.3       Run     S/Mm3     160     152     190     198     175     171     17       Ra/hr     3.3     3.1     4.1     4.2     3.8     3.7     -       Ka/hr     15     15     15     15     15     15       Na     3.3     3.1     5     15     15     15	ty	40,300	39,900	39,800	39,600	40,000	40,000		•	
$c.$ $\chi$ $13.8$ $13.0$ $14.2$ $13.8$ $14.0$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.8$ $13.0$ $11$ $c.$ $\chi$ /Mm3 $m$ $150$ $155$ $155$ $145$ $145$ $140$ $11$ $m$ $160$ $152$ $190$ $198$ $171$ $47$ $40$ $kg/hr$ $3.3$ $3.1$ $4.1$ $4.2$ $3.8$ $3.7$ $171$ $171$ $kg/hr$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $kg/hr$ $77$ $77$ $77$ $15$ $15$ $15$ $15$ $15$	$cc.$ $\frac{8}{C}$ 13.8         13.0         14.2         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         13.8         14.8         14.8         14.8         14.8         14.8         14.1         13.8         3.7         2.8         3.7         2.8         3.7         2.8         3.7         2.8         3.7         2.8         3.7         2.8         3.7         2.8         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17         17	tity	39,000	39,000	37.200	37,200	37,200	37,200		23,300	
rature         °C         150         146         155         145         143         140         1           nc.         g/Mm3         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td>rature         °C         130         146         155         145         143         14           nc.         gym         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1</td> <td></td> <td>13.8</td> <td>13.0</td> <td>14.2</td> <td>13.8</td> <td>14.0</td> <td>13.8</td> <td>13.8</td> <td>6.8</td> <td></td>	rature         °C         130         146         155         145         143         14           nc.         gym         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1		13.8	13.0	14.2	13.8	14.0	13.8	13.8	6.8	
nc. $g/Ma3$ 160         152         190         198         175         171         171         20           ppm $kg/hr$ 3.3         3.1         4.1         4.2         3.8         3.7 $\cdot$ 2           kg/hr         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15	nc. $g/Mn3$ 160         152         190         198         175         171         17 $kg/hr$ $3.3$ $3.1$ $4.1$ $4.2$ $3.8$ $3.7$ $ kg/hr$ $15$ $15$ $15$ $15$ $17$ $17$ $17$ $kg/hr$ $3.3$ $3.1$ $4.1$ $4.2$ $3.8$ $3.7$ $ kg/hr$ $77$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$ $15$	e L	150	146	155	145	145	143	140	165	
ppm         160         152         190         198         175         171         171         2           kg/hr         3.3         3.1         4.1         4.2         3.8         3.7         -         -           kg/hr         15         15         15         15         15         15         15         -         -           'ze/hr         77         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15	ppm         160         152         190         198         175         171         17           kg/hr         3.3         3.1         4.1         4.2         3.8         3.7         -           kg/hr         15         15         15         15         15         15         15         1			-					40		
kg/hr         3.3         3.1         4.1         4.2         3.8         3.7         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	kg/hr         3.3         3.1         4.1         4.2         3.8         3.7         -           kg/hr         15         15         15         15         15         15         15         15         15         15         15         15         1           kg/hr         77         77         15         15         15         15         15         1		160	152	190	198	175	171	171	201	
kg/hr 15 15 15 15 15 15 15 15 15 15	kg/hr         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15		3.3	3.1	4.1	4.2	3.8	3.7	-	+	
'ke/hr	1     1     1     1     1     1       1     1     1     1     1     1		15	15	15	15	15	15	15	15	
	11		22								

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Separatic mixing chatter         October 5, 1990           00         12:30         13:00         13:30         14:00           122         122         127         Exchange         127           122         122         127         Exchange         127           122         127         Exchange         127           125         127         Exchange         127           125         115         115         115         115           115         115         115         115         115           110         200         1300         1.000         1.000           150         110         200         110         200           160         140         1.000         1.000         1.000           160         160         1.000         1.000         1.000           160         160         1.000         1.000         1.000           150         160         1.000         1.000         1.15           160         160         1.000         1.10         2.00           150         160         1.60         1.60         1.60           160         160         1.60 <th></th> <th></th> <th></th> <th>Type of f</th> <th>facility :</th> <th>No.2 rotary kilo</th> <th>rv kiln</th> <th>1 Date</th> <th>1 West Mer</th> <th>L D</th> <th></th>				Type of f	facility :	No.2 rotary kilo	rv kiln	1 Date	1 West Mer	L D	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				with asph		chanber		Octber 5.19			
122         127         Exchange         1           854         889         new splay         8           854         889         new splay         8           ambierce         V/S.         ambierce         100           1000         110.000         110.000         110         110           8.550         8.955         8.955         8.9         110         110           110         200         115         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         110         111         110         111         110         111         110         111         111         111         111         111         111         111         111         111         111         111         111         111         111	(Rating)	$\overline{\mathbf{x}}$	11:30	12:00		13:00	13:30	14:00			
854         889         new. splay         8           -         -         -         in the         -           -         -         -         in the         -           -         -         -         -         -           ambience         ambience         V/S.         ambience         -           8,555         8,955         8,955         8,89         8,89           110         200         116         110         2         110         1           140         160         160         160         110         2         1         1         2         1         2         1         2         1         2         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3	ton/hr   250	6	138	122		127	Exchange	127			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	i ter/hr		996	854		888	new splay				
ambience         ambience         M/S.         ambience           1.000         1.000         1.000         1.00           8.550         8.955         8.955         8.9           115         115         110         200           110         200         110         200         110         1           140         140         140         110         1         1           150         am         40         110         2         1         1           130         140         160         160         10         1         1         1           15.8         18.0         0.05         0.05         0         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <t< td=""><td>cg/cm2g</td><td></td><td>-</td><td>-</td><td></td><td>•</td><td>in the</td><td>-</td><td></td><td></td><td></td></t<>	cg/cm2g		-	-		•	in the	-			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C 1		ambience	ambience	ambience	ambience	V/S.	authience			
8,550         8,955         8,955         8,955         8,955         115         110         21         110         21         110         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21         21 </td <td>Aq air</td> <td></td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td></td> <td>1,000</td> <td></td> <td></td> <td></td>	Aq air		1,000	1,000	1,000	1,000		1,000			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	ter/hr		9,690	8,550	8,550	8,955		8,955			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			115	115	115	115		115			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	C	E	110 200	2.0		110 200		110 200			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	,c	F 10	140	140	140	140		140			
1,209         mm         40           68         40         0.05         0.05         0.05           0.05         0.05         0.05         0.17           15.8         18.0         17         1           15.9         15.5         15.5         15           15.9         15.5         14         1           23,200         31,500         32,1         14           23,000         31,500         32,1         14           12,3         15.5         14         12           29,200         52,7700         45,1         14           12,3         15.5         14         2           209         2.13         2.15         1         1           209         1.5         16         1         1           15         16         16         1         1			160	160	160	160		160			
68         40         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         11         12         13         13         13         13         13         13         13         14         11         11         12         13         15         14         15         14         14         12         14         12         14         12         14         12         14         12         14         12         14         12         14         12         14         12         14         12         14         12         12         14         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12         12 <th13< th=""> <th12< th=""> <th13< th=""> <th< td=""><td>Inside</td><td></td><td>diameter o</td><td>f chimnev:</td><td>1,209</td><td></td><td>· .</td><td></td><td></td><td></td><td></td></th<></th13<></th12<></th13<>	Inside		diameter o	f chimnev:	1,209		· .				
0.05         0.05         0.05         0.05         0.05           3.8         3.7         2.6         3           16.0         15.8         18.0         17           3.0         100         85         1           3.1         15.9         15.5         1           31,000         31,000         31,500         32,1           30,400         29,200         52,700         45,1           15.5         15.5         15.5         14           15.6         15.5         15.5         14           15.6         215.3         15.5         14           15.6         15.5         14         1           204         29         2.15         1         1           15.6         16         -         1         1           15.5         15         16         1         1           15         15         16         1         1           15         15         16         1         3	indo		83	02	88	0 <del>1</del> 7	:	65			
3.8         3.7         2.6         3           16.0         15.8         18.0         17           35.0         100         85         1           35.1         100         85         1           31.000         31.000         31.500         32.1           31.000         31.000         31.500         32.1           30.400         29.200         52.700         45.1           15.0         15.5         14.5         14.5           15.0         15.5         14.5         14.5           15.5         15.5         14.5         14.5           15.5         4.3         2.6         4.4           15         15         16         1           33         15         16         1           33         15         16         1           33         15         16         1           33         15         16         1	-		0.05	0.05	0.05	0.05		0.05			
16.0         15.8         18.0         17           3.0         100         35         1           35         100         35         1           35.7         15.9         15.5         15           31,000         31,500         31,500         32,1           30,400         29,200         31,500         45,1           150         15.5         145,1           150         15.5         145,1           150         15.5         14,5           150         213         22,4           224         209         213         2           4,5         4,3         2.6         4           15         16         -         1           234         209         213         2           353         15         16         1           15         15         16         2           33         15         16         1	~		41	3.8	3.7	2.6		3.5			
3.0         100         85         1           95         100         85         15           15.7         15.9         15.5         15           31,000         31,500         31,500         32,1           30,400         29,200         52,700         45,1           15.5         15.5         14           150         -         1         1           224         209         213         22           224         209         213         2           224         209         213         2           4.5         4.3         2.6         4           15         15         16         2           33         35         15         16	8		15.9	16.0	15.8	18-0		17.5			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	g/Nn3			. 3.0		-		1.2	_		
15.7         15.9         15.5         32           31,000         31,000         31,500         32           30,400         29,200         52,700         45           12.5         12.3         15.5         45           12.5         12.3         15.5         45           224         209         213         213           224         209         213         13           4.5         4.3         2.6         16           15         15         16         16           15         15         16         16           15         15         16         3.6           33         33         16         16	C		100	35	100	85		85			
31,000         31,000         31,500         32           30,400         29,200         52,700         45           12.5         12.3         15.5         45           12.6         12.3         25.700         45           12.5         12.3         25.5         45           12.6         160         -         213           234         209         213         2.6           4.5         4.3         2.6         16           15         15         15         16           33         15         16         16	m/s		17.4	15.7	15.9	15.5		15.8			
30,400         29,200         52,700         45           12.5         12.3         15.5         45           150         160         -         2           21         2.3         2.5         45           150         160         -         2           15         4.3         2.6         1           15         15         16         3           33         15         16         1	Na3/hr		33,900	31,000	31,000	31,500		32,100			
12.5         12.3         15.5           150         160         -           224         209         213           4.5         4.3         2.6           15         15         16           15         15         16	Nn3/hr		33,700	30,400	29,200	52,700		45,100		÷	
150         160         -         1           224         209         213         2           4.5         4.3         2.6         4           15         15         16         4           93         15         16         4	\$	1 1	13.4	12.5	12.3	15.5		14.0	-		
224         209         213         22           4.5         4.3         2.6         4           15         15         16         4           93         15         16         1	с [	1	160	150	160	-	-	150		-	
4.5         4.3         2.6         4           15         15         16         4           93         1         1         1	- mada	. 1	216	224	209	213		297		• •	
15 16	kg/hr {		4.8	4.5	4.3	2.6		4.3			
	kg/hr	1	71	15	15	16		16			
	kg/hr			66				39			
	I IOW pressure air atomizing memer (Ulesei 011)	÷.	r atomizin	g puener /	Uresei orr			KIIN DIMENSION	OR 2,330 P X 12,000 L	12,000	<b>г</b> .

12.2 Rotary Kiln No.2

Name of establishment         Type of facility: No.3 rotary kiln         Meather fair           Samping time         Colober 16,1990         Meather fair           Assumption         Intervine         Colober 15, 1143         Meather fair           Assumption         Meather         Meather         fair           Assumption         Meather         Meather           Colspan= 6         Sign 1143         Meather           Fease terme are fair         Meather         fair           Fease terme are fair         Sign 1143         Meather           Fease terme are fair         Sign 1143         Meather           Fease terme are faires         Sign 1143         Sign 1143 <th colspan="6" feases<="" th=""><th>Name of establishment No.11 Asphalt Plant</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th>	<th>Name of establishment No.11 Asphalt Plant</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>						Name of establishment No.11 Asphalt Plant									
me         (Rating)         12:00         12:30         13:00         13:30         14:00         16:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00         10:00 <th< th=""><th></th><th></th><th></th><th>Type of fa</th><th>acility: snhalt mivi</th><th>No.3 rotar</th><th>y kiln</th><th>ā</th><th></th><th>fair</th></th<>				Type of fa	acility: snhalt mivi	No.3 rotar	y kiln	ā		fair						
Itemption         <	mpling time	(Ratinx)	12:00	12:30	13:00	13:30	14:00									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			106	155	174	250	106		 							
Pressure         kz/cm/2z         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         23         23         23         23         23         23         23         23         23         23         24         23         24         25         25         25         25         25         25         25         25         25         25         25         25         25         25         25	on l		469	669	182	1143	747									
Temperature         °C         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         22         23         30         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         130         <	Ÿ		•	1	1 1 1		•	:								
Atmize press.         tmm Aq         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -			2	22	22	22	22	-								
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	-		ı	•	1	 	1									
Ratestate         °C         130         130         130         130         130           data of flue gas         Inside size of chimney: 990 x 910 mm         0.901 m2 $41$ $45$ $45$ $45$ NOx conc. $ppm$ $0.10$ $0.05$ $0.05$ $2.0$ NOx conc. $pm$ $0.10$ $0.05$ $2.0$ $5.05$ $2.05$ NOx conc. $pm$ $0.10$ $0.05$ $2.0$ $5.05$ $2.05$ NOx conc. $pm$ $0.201$ $0.28$ $2.8$ $2.9$ $2.9$ NOX conc. $pm$ $0.5$ $2.60$ $5.50$ $5.50$ $5.4$ $33.4$ PH conc. $s/ma3/hr$ $55.900$ $55.200$ $54.000$ $10^{10}$ Case velocity $m/s$ $m/s$ $1.56$ $156$ $14^{17}$ $5.0$ Case velocity $m/s$ $1.56$ $156$ $14^{17}$ $5.0$ Case velocity $m/s$ $1.56$ $156$ $14^{17}$ $5.0$ <t< td=""><td></td><td></td><td>600</td><td>009</td><td>600</td><td>800</td><td>009</td><td></td><td></td><td></td></t<>			600	009	600	800	009									
data of flue gas         Inside size of chimney: 990 x 910 mm         0.901 m2           N0x conc.         ppm         41         44         45         45           N0x conc.         \$         0.10         0.05         < 0.05			08	130	130	130	130									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	data of flue gas	Inside size	뉭			0.901 E										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	N0x conc.		41	44	45	45	39									
C02 conc. $\frac{1}{8}$ 2.8         2.8         3.0         2.9           02 conc. $\frac{3}{8}$ 16.8         16.5         16.1         16.1           PM conc. $\frac{1}{8}$ 16.8         16.5         16.1         16.1           PM conc. $\frac{1}{8}$ 80         83         85         93         6.2           Temperature $^{\circ}$ C $80$ 83         85         33.4         33.4           Gas velocity $\frac{1}{15}$ 5500         55.200         54.000         43.000           Iss quantity         Nm3/hr         20,600         25.200         53.000         43.000           Iss quantity         ppm         156         156         160         47         5.0           0.5 53)         0.600         28.600         53.000         43.000         0           158         156         156         160         147         0           0.5 53)         0.61         6.1         5.0         5.0         0         0           158         156         156         156         160         147         0         0           0.1         ks/hr </td <td>CO conc.</td> <td></td> <td>0.10</td> <td>0.05</td> <td></td> <td>&lt; 0.05</td> <td></td> <td></td> <td></td> <td>_</td>	CO conc.		0.10	0.05		< 0.05				_						
02         conc.         %         16.8         16.5         16.1         16.1           PM conc.         g/Nm3         16.8         16.5         16.1         6.2         93           Temperature         °C         80         83         85         93         93           Gas velocity         mr/s         53.4         33.4         33.4         33.4         33.4           Gas velocity         mr/s         55.900         55.500         55.200         54.000         13.00           Cas quantity         mr3/hr         25.900         25.200         55.200         147         00           2 say quantity         ppm         156         156         160         13.00         0           2 53         0560         25.500         55.1         5.0         0         147           0         156         156         160         147         00         0           2 53         0         5.0         5.0         5.0         5.0         0         147           0         13         14         20         14         20         0         10         10         10           0         ks/hr         8.4	CO2 conc.		2.8	2.8	3.0	2.9	3.0		-							
I conc.         g/Nm3         6.2           miperature         °C         80         83         85         93           miperature         °C         80         83         85         93         4           se velocity         m/s         33.4         33.4         33.4         33.4         33.4         33.4           se velocity         m/s         55,900         55,200         54,000         54,000         55,200         54,000           se quantity         Nm3/hr         26,600         28,600         32,000         43,000         55,000         55,100         147           se quantity         ppm         156         160         136         147         50         54         50           sk         ppm         156         160         32,000         43         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50         50	02 conc.		16.8	16.5	16.5	16.1	16.5									
Sector ature         °C         80         83         85         93         83         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93         93						6.2										
us velocity         m/s         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.4         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0         33.0	e		8	83	85	93	66									
iss quantity         Nm3/hr         55,900         55,200         54,000         54,000         53,000         54,000         54,000         53,000         43,000         43,000         43,000         43,000         43,000         43,000         43,000         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147	~		33.4	33.4	33.4	33.4	33;4	:	-							
cass quantity         Nm3/hr         20,600         28,600         32,000         43,000         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147         147	y.		55,900	55,500	55.200	54,000	54,400									
5%)         ppm         156         156         160         147           Kg/hr         4.7         5.0         5.1         5.0           Kg/hr         8.4         13         14         20           Kg/hr         8.4         13         14         20           Kg/hr         3.4         13         14         20	i tv		20,600	28,600	32,000	43,000	30,600									
kg/hr         4.7         5.0         5.1         5.0           kg/hr         8.4         13         14         20           kg/hr         8.4         13         14         20			156	156	160	147	139		-	_						
kg/hr 8-4 13 14 20 kg/hr 330			4.7	5.0	5.1	5.0	4.4									
kg/ar			8.4	13	14	20	13									
						330										

12.3 Rotary Kiln No.3

- 141 -

low pressure air atomizing buener (Diesel oii)

No.41 Cement Factory				kila			5	September	18,1990	cloudy
Sampling time		(Rating)	12:20	12:50	13:20	13:50	14:20	14:50		1
Clinker quantity	ton/hr	-96 -	85		87	68	22	94	92	
NO.1 Consumption	kg/hr		8,020	8,020	8.020	8,020	8,0	8,010	8,010	
oil Pressure	kg/cm2g		39	Ş	58	39		83	39	
-	, J.		138	8	138	138	.	88	138	
Primary air	n, mm An		RF0	RED.	SEO.	850	850	850	850	
1.	La/hr		<b>VUX</b>	008	000	1 000		<	C	
Daccourso			200	ŝ	000	66		,		
	NX/ CB28		200	3	3	00		'	'	+
burner lemperature			60	60	63	9	•	•	•	
Primary air p	. Batan Aq		'	-	•	1		4	1	
Material in			120	120	120	120	120	120	120	
Preheater temp. out	ç		830	830	830	830	88	830	830	
Gas temp			1.100	1.100	1.100	1.100	1.100	1.1001	1.100	
			002	2002	1002	2002	302	500	See See	
			200	e e					C.	
rease presses the		-	75-	74-	75	75-	7	74-	74	
	橿		-650	-650	-650	009-	939-	-029-	-650	
Clinker in			88	830	සි	g	8	88	88	
temp.			1, 300	1.200	002.1	1.200	1.200	1.300	1 300	
	<b>1</b>		2224				5			
	_	_			7	7	1	2		
- 1			-42	-42	-42	-42	-42	-42	-42	
Clinker in			1,300	1,200	1,200	1,200	1,200	1,300	1,38	
		-	145	145	145	145	145	145	145	
Cac aroo	-		200	8.'S	34.6	300	378	sec.	302	
			277	27	200			5		
È.	+		700	7 444	200		100	7000	1000	
Las temp.			280	390	38	088	230	385	2	÷
ا <u>ــــــــــــــــــــــــــــــــــــ</u>	-		130	130	130	130	130	8	130	
tower Gas press. in			-650	-650	-650	-650	-650	-650	-650	~
	星	·	-650	-650	-650	-650	-650	-650	-650	
Gas temp. in			130	- 130	130	130	130	130	130	
	L		ц С	55.	22,	, הת	1	- 5F	55,	
			30	3 =	2	3-	30	2	20	
NI SU DULLO	.:		0	<b>*</b> *	7	4		t, c	t (	
No.2 burner 02			4	4	5	4	9	9	<del>ت</del>	
content C	•			0	0	0	0	0	0	<u></u>
F/P inlet	29		0	0	G	0	0	0	0	
ę	ů.	loi loncu								
		Para lo	amotor of	F chimney	2 200	. E				
	000	n			000	00%	Yor	1000	1028	
			S L					33		
LU CONC.	re		00.U V	en-n v	SU-U >	v.0	0.0	cn-n v	c).) <	
C02 conc.	· · *			21.3	21.0	22.7	I8.3	19.8	20.1	
02 conc.	⋧₹		ı	7.6	יט ייז	7.5	8	0.0	6-8	
PM CODC.	2/Ne3							0.43		-
Tegnerature			136	147	142	141	141	681	1	
Con vol and c			15.5	10 1	15 11	1 1 1 1 1	15.7	15.5		-
MASS VCIOUL VY			0.01	0.01	10.10	2.04	200	0-10-10		
Las quantity	1		98, <del>1</del> 00	101,400	30,400	34, ruu	94 - 10U	002.02		
etical gas quantity				134,200	136,200	136,200	133,800	134.900	134,900	:
E/P inlet 02 conc.	34	-	•	<b>0</b> .3	6.4	0.0	8.0	8.1	8.2	-
onc.(02.5%)	100		•	513	391	332	380	383	687	
Nov emission	Lo/hr		110	00	65	22	95	57		-
			777	>	3		2			
						•			-	

### 13. Cement Factory

13.1 Cement Kiln No.4

No.41-8										A REPORT OF		
lanne of es lo.41 (	Name of establishment No.41 Cement Factory				Type of facility : cement raw materia	ucility: material	No.8 drier for	r for	Date September 17.1990	17.1990	Weather	cloudy
ampling t			(Kating)	13:30	14:00	14:30	15:00	15:30	16:00			
Cement raw material	material quant	quant ton/hr	180	157	157	157	157	157	157	water content	۰.	approx. 3.5%
ot stove	Hot stove Temperature	ູ່		670	665	670	670	670	670		F	
utiet	Pressure	min Aq		-25	-25	-25	-25	-25	-25			
Fuel	Consumption	Nm3/hr		644	644	544	644	644	644	+Fuel consumption was	rsumption	Mass
N-gas	Pressure	kg/cm2g		0.95	0.95	0.95	0.95	0.95	0.95	calculated from raw materia	t from ray	mater 13
ion i tsudino.	Temperature	ر		30	30	30	30	30	30	quantity.		
<u>г</u> .	air Quantity	Nm3/hr			1			ŕ	•			
	Pressure	TILE AQ		5	<u>s</u>	2	2	5	5			
Furnace pressure		The Aq		-25	-25	-25	-25	-25	-25			
Drier		ç		108	103	103	103	103	103			
outlet	Pressure	itter Aq		-140	-140	-140	-1401	-140	140			
N-gas : N	N-gas : Natural gas						· ·					-
malytical	data of flue gas	ss.	Inside o	iameter o	nside diameter of chimney:	1,774 m	ain:					
/P out-	N0x conc.	HIDO		28		26	25	8	28			
et	let C0 conc.	26		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			
	CO2 CONC.	3-2		8.1	9.1	1.5	1.5	1.7	1,8			

Inside diameter of chimney:	28 27	< 0.05 < 0.05
	mdd	~
al data of flue gas	NOX CONC.	CO CONC.
lytical	-110	

											۰.	
Π								Π				
							1			1		
								`				
28	35	8,	5		93	7.8	00	00	5	129	- 2 -	
	< 0.05						_	25				
38	< 0.05	1.7	17.5		33	7.8	30,100	27,200	15.6	126	1.6	
	< 0.05	1.5	17.4	< 0.0001	26	7.7	29,400	26,400	16.6	118	1.5	< 0.0029
1, ( ( 4 mm	< 0.05	1.5	17.3	-	92		ł	25,700	16.5	119	1	Ŷ
27	< 0.05	1.6	17.1		•	1		24,400	16.4	118	•	
11/21UE UTAME VEL 01 CITIMUEY.	< 0.05	1.8	17.0	•	•••• •		•	23,800	16.5	119		
017 201SH												
DPIII	<u>~</u>	3-2	3 <b>e</b>	g/N#3	, C	a/s	Nm3/hr	v Nm3/hr	સ્	Шdd	kg/hr	kg/hr
C. UE KAN		- 					ntity N	antity N				×
NOX CONC.	C0 CONC	C02 Con	02 conc	PM conc.	Tempera'	Gas velo	Gas quantity	il gas qui	1 02 conc	02 5%)	on	N.
E/P out-   N0x conc.   1	let						I	Theoretica	H/A outlei	NOX CONC.(02 5%)	NOx emission	PM emission

13.2 Dryer

fair													order											:																nber			<b>1</b>	183 101	KCa / #3hr	t kcat/m3hr	
Veather													out of o																				- 1							istion cha	6,60	15,000	1.500	148.5		000-000	
28,1990	15:30	173	1,354	2	2	141	35	35	642	642	1,400	1,400		1	1,400	1,536	1,278	9,600	10,400	20,000	20.3	0.03			660	< 0.05	17.2	1.9		810	8°8	11,800	14,100	1.8	553	16	72			0			ŀ	chamber	.oad of c/c :rating	canon olo to	
Uate September	1	173	1,354	2	2	141	35 -	35	642	642	1.400	1.400	-	•	1,400	1,536	1,278	9,600	10,400	20,000	20.3	0.03			66.4	<.0.05	17.9	6.0		810	3.9	11,800	17,900	1.8	208	16	72			Size	W	Д		Volume of	Load of C	~ 30 PCC	
meiting	14:30	173	1,354	2	2	141	35	35	646	637	1,438	1,438		•	1,438	1,536	1,278	9,600	10,400	20,000	20.5	0.03			644	< 0.05	17.6	3.5		810	3.9	11,800	15,400	1.8	589	16	72			<b>_</b> _	<b>b</b> i			4.			
6 glass e	14:00	173	1,354	2	2	141	35	35	646	637	1.446	1.446	1		1,446	1,536	1.278	9,600	10,400	20,000	20.8	0.03			6201	< 0.05		3.0		810	3.9	11,800	14,900	1.8	551	15	22										
l ty lass bo		173	1,400	2	2	141	35	35	646	637	1,446	1,446		,	1,446	1,536	1,278	9,600	10,400	20,000	20.5	0.03		am 1720. 1	680	<ul> <li>0.05</li> <li></li> </ul>	17.4	2.8	0.76	800	3.9	11.900	15,300	1.8	580	16	- 14	9.0									
furnace for §	13:00	173	1,400	2	2	147	35	35	644	624	1,447	1,447	-	1	1.447	1,526	1,280	10,000	10,800	20,800	21	0.03	west side	chimnev.	680	< 0.05	17.4	2.7		800	3.9	11,900	15,200	1.8	595	17	74				2 burners	-	0	0	Vorking-	-	200
- 4-	12:30	173	1,400	2	2	147	35	35	644	624	1.447	1.447		-	1,447	1,526	1,280	10,000	10,800	20,800	21	0.03	side, (V) :	diameter of		< 0.05	17.6	3.2		800	3.5	11,900	15.600	1.8	634	17	74		-				0	0 0			•
	(Rating)	230 1			air																		: east	Inside di										_	-				Mka I / ton		0110	4 5 6 7	0		Melting tank		
	$\sum_{i=1}^{n}$	ton/day	i ter/hr	kg/cm2g	kg/cm2g	ົ່ງ	ې د	, C	, C	ູ່	ູ່ວຸ	, , ,	, C	ູ່ວ	÷ پ	° C	2	Nm3/h	Nm3/h	Nm3/h	man Aq	man Aq	egenerator, (E)	269		204	201	20	g/Nn3	ۍ د	s/a	Nm3/hr	Nm3/hr	3 <b>4</b>	Bogar	ks/hr	kg/hr	kg/hr	1,897		18 heavy	1	0.00	0 - 0 - 0		:	
estabiishment Glass Factory (A)		quantity	Consumption	Pressure	Atomize press.	Temperature			R/G outlet (E)		R/G inlet (E)		R/G outlet (E)	(M)	Melting 1	tank 2	Working tank	(East side)	t si	Total	Wind box	essure		flip		C0 conc.	CD2 CONC.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantity	l gas quant.	02 conc.	02 5%)	on	on	u U	Note : Energy usage rate				East side	West side			
Name of est No.68 GI	2	Glass melting quanti	Fuel	Heavy oil Pressure			Comb. air			**-		Flue gas	temp.		Furnace	tempera-	ture	Feed air	quantity [		Air press. Wind box	Furnace pressure		Analvtiral data of	R/G 04+-								Theoretical	R/G inlet	NDX conc. (02 5%)	NOX emission	SOx emission	PM emission	Note : En		: '						

14. Glass Factory (A) Glass Melting Furnace B

- 1.44 -

Weather fair																														-										-		-	ion chamber	1.981	1 1001 H	1 ADD 100.0		150 000 kont (moke	150.000 kmai/mahr	LOUID NUCLESTER	1001		
Date September 24,1990	17:10					urner																				-			1 155 1 1	<ul> <li>1.1.00</li> <li>1.05</li> </ul>	ו••	5.0		SED 1	4.3	2.900		1.400	0.9	1,155	0.4		of comput				T.	I volume of crantoer					
delting	16:40	0.0-010	02-yas hirner			air-gas burner																							1.100	<ul> <li>0.05</li> <li></li></ul>	11 4	5.7		860	C V	2.900				1,244	-												
୍ର ହାଁ	15:10	1.018	5	311	ន	18	420		1.5	7	0	Зй З	102	13	155	30	1 5/0	C10.1	1 515	1 220 1	1.280	1.260	1.260	1.120	-	0.05				<ul> <li>0.05</li> <li>1</li> </ul>		5.5	0.48	860	4.3	2.900	3,400			1.223	1.4												
i i ty . Riass fi	14:40	1.010	22	311	62	109	420		1.5	7	0	34	[3]	19	1 <u>5</u> 2	300	1 670	1 61641	1 515	1050	1.280	1.260	1.260	1.120		0-05		1. 220 and		<ul> <li>0.05</li> </ul>	11.4	5.6		860	4.8	2.900	3,400			1,242			Working tank	Ł			<i>.</i>		, <mark>.</mark>	0	0		
> 기		-				109	420	Ŧ	1.5	7	0	¥	102	19	155	8	1 515	1 6161	1 515	1 220	1.280	1.260	1.260	1,120		0.05		chimnev.	1.200	< 0.05	11.4	5.1		843	4.3	2.900	3,300			1,208			Vor	<u> </u>	10	ŕ	17 10	10			100	2	
- y.	13:40	1.010	27	311	62	109	420	1	1.5	2	0	34	102	19	155	R C	1 515	1,010	1 515	1.230	1.280	1.260	1.260	1,120	-	-0.05		diameter of	÷	< 0.05	11.7	5.3		843	4.3	2.900	3,300			1,223					- <u>¥</u>	o x			2		al/ton	Mkal/ton	
	(Kating)	00.0												:			- <b>-</b>											Inside di			-														Melting tank		, e	0 0	irner		3.44	5	
	-1-	m3/hr	a3/hr	n3/hr	n3/hr	#3/hr	a3/hr			kg/cm2g	4rp	kuh k	Kwh K	Ş.	Kun	ي م ر	 ۲	 ېږ	) ب	, , ,	, , ,	ູ່		Butta Aq		a Ao	ž	S.	maa	200		20	g/Nm3	ç	s/B	Na3/hr	Nm3/hr	ç,	,e	100 10 / 10 /	kg/hr				Σ	1	ာပြ		oxyxen		tte (Total	mate (N eas)	
Glass Factory (8)	ting guantity	Fuel N-ras hirner	1			Working 1) N-gas burner	irai gas	N-gas burner	02 burner N-gas	02 gas		tank	នេះ		10131 A/U intot		A/H iniet	A/N-Outlet	Melting tank	Working T1	cank T2	2 2	74	Fan outlet	X		heater, t: tank	data of flue eas				02 conc.		ە بە	₽	2		e		T	Ì						left side	Right side	Note : G0 means		Energy usage ra	Energy issue in	
No.31	Glass melting	Fuel	-dunsuoo	tion	Melting t	Working t	Total natu	Fuel	pressure	- 1	<u>o</u>	heater			Comb air	temn	FILE 225	teno.	Furnace	tempera-	ture			Air press.		Furnace pressure	A/H : Air heater,	Analytical	Chimney								Theoretica	Inside of	NOV COR	NOV PRI SCI	PM emission							÷					

.

### 15. Glass Factory (B)

Glass Melting Furnace No.2

	16:30	1.440	2,280	<b>p</b> art	ambience	1,000	1.440	465	27,300	1	0.9			540	< 0.05	10.6	6.7		403	2.0	21.800	31,700	604	24											
fair	16:00	1.440	2.280		authience a	1.000	1,440	465	27,300	1	0.9			6101	< 0.05	10.6	2		403	3.2	34,900	32,400	697	14				sr.					kcal/a3hr	al/m3hr	
Weather fs	15:30	1.440	2.280		ambience a		1,440	465	27,300	1	0-91			630	< 0.05	9.2	6.5		420	3.4	36.200	31,200	695	50	~~	-		combustion chambe	6,706 #	10.973 00	2,095 mm	154.1 m3	- Kc	130,000 kcal/m3hr	mber
3, 1990	15:00	1.440	2.280	1	ambience	1,000	1,440	465	27,300		0.9			530	< 0.05	9.8	6.5	0.12	393	2.8	31,000	31,200	585	34	3.7			Size of combus				chamber	Load of C/C :rating	c inormal	c/c : Combustion chamber
Date November		1 440	2.280	1	ambience	1,000	1.440	465	27,300		0.9			540	< 0.05	9.6	6.7		400	3.0	32,900	31,700	604	8		•		Size	A	'n	H	Volume of chamber	Load of c/	Load of c/c :normal	c/c : Cont
glass melting (400 t/hr)	14:00	1.440	2.280	1	ambience	1,000	1,440	465	27,300	1	0-9			610	< 0.05	9.5	7.0		410	3.6	38,900	32,400	697	50			L			<b></b>					
	1.	1.440	2.280		ambience	1,000	1,440	465	27,300	1	0.9	•	G									•					ply		stailed						
Type of facility : No.84 furnare for viacs hottle	13:00	1 440	2.280	1	anbience	1,000	1.440	465	27, 300	1	0.9		3.784 mm			-				•						day.	Which sup	irnace.	urners ins						
Type of fa furnace fo	12:30	1 440	2.280	1	ambience	1,000	1,440	465	27,300	1	0.9		chimney:						•							ied 368 ton/	air ports	· to the fu	port, 12 b	ts.		PEMEX	,743,118	,220,101	, 349, 184
	12:00	1.440	2.280	1	ambience	1,000	1,440	465	27,300	1	0.9		Inside diameter of chimnes:												-	ant conduct	at the hot	exchanger	d on each	r is 24 se		H84	,507,770 4	1,606,520 5,220,101	1,651,760 5,349,184
	(Rating)					estimated				-			Inside d												-	tate measurement conducted 368ton/day.	Installed	ative heat	s installe	sr of burne		L H82	,035,775 1	,062,100 1	1,174,975
6		, C	I Nm3/hr	kg/cm2g	° C	°C	່. ວໍ່	, c	Nm3/hr	ann Aq	mm Aq		gas	udd	38 	28	8	8/Nm3	l °C	s/m	Nu3/hr	Na3/hr	ländid	kg/hr	kg/hr	n the date	rners are	om regener	, 2 burner	otal numbe		H81	599,990 j	651,240	<u>_</u>
stablishment Glass Factory (	ne	oerature	Consumption	Pressure	R/G inlet	R/G outlet	R/G inlet	R/G outlet	antity	Burner inlet	ssure	enerator	Analytical data of flue gas	NOX CONC.	CO conc.	CO2 conc.	32 conc.	PM conc.	Temperature	Gas velocity	Gas quantity	gas quant.	2 5%)	c.	-	Note : Production plan on the c	Nozzie mix gas burners are installed at the hot air ports which supply	combustion air from regenerative heat exchanger to the furnace.	There are 6 ports, 2 burners installed on each port, 12 burners installed	on one side, so total number of burner is 24 sets.		Gas consump.	hun	Jul	Aug
Name of establishment No.23 Glass Factor	ĕ	Furnace temperature	Fuel (	N-gas F	Comb.air F		gas	l	Feed air quantity	Air press. Burner	Furnace pressure	k/G : Regenerator	Analvtical c	R/G Out- 1					<u> </u>			Theoretical	NOX conc.(02 5%)	NOX emission	PM emission	Note: Produ	Nozz	combr	There	10 110					

### 16. Glass Factory (C)

16.1 Glass Melting Furnace No.84

2

v         (C)         (kaiing)         12:00           n         Nm3/hr         1,450         1           kg/cm2g         1,940         1         1           c         c         estimated         1,000         1           c         c         1,922         1         1           c         c         1,922         1         1           m3/hr         1,922         561-574         1         1           may/hr         1,922         561-574         1         1           c         c         561-574         1         1         1           max/hr         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	ory (C)         (Retire)         12:00         furnace for glass bottle         (200         fundame         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30         13:30						facility:		s melting	1		yeather		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	(C) 2				ଥା	or glass be	- k	) t/hr)	November	13,1990		fair	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		1	atins)	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30
h         mis/hr         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1.840         1	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		°C –		1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450	1,450
kercmöz         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1<	kerdendize         ambience		a3/hr		1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1.840	1,840
°C         estimated bit         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		/cm28		1	1	1	1		1	1	1	1	1
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m         Al         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	am Ad         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <td></td> <td>13/hr</td> <td></td> <td>18,500</td> <td>18,500</td> <td>18,500</td> <td>18,500</td> <td>18,500</td> <td>18,500</td> <td>18,500</td> <td>ł</td> <td>18,500</td> <td>18.500</td>		13/hr		18,500	18,500	18,500	18,500	18,500	18,500	18,500	ł	18,500	18.500
if mm Add         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	tit         mm         Aci         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - </td <td></td> <td>n Aq</td> <td></td> <td>•</td> <td>•</td> <td></td> <td>r</td> <td>1</td> <td>•</td> <td>ł</td> <td>1</td> <td>-</td> <td>•</td>		n Aq		•	•		r	1	•	ł	1	-	•
Imm         Add         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1.2         1.0-1	me         Air         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:2         1:0-1:	et	a Aq		1	4				1		•	•	1
Res         Inside diameter of chimney:         3,217 mm $= 500$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 600$ $= 60$	le gas         Insite tiameter of chimney:         3,217 mm         5.7         0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05		n Ag		1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2		1.0-1.2		1-0-1-2	1.0-1.2
e gas         Inside diameter of chimney:         3.217 mm $3.217$ mm $5.0$ $6.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$	gas         Inside diameter of chimney:         3.217 mm         5.0         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660         660 <t< td=""><td>tor</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td><td></td></t<>	tor										•		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	of flue gas	-	Inside d	iameter of		3,217	띝		•		:		i
%          0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05         < 0.05	$\chi$ $\chi$ $\sim 0.05$ $\sim 0$	onc.	E HOC		835	009	610	550	•	-	,	008	660	640
%         10.8         10.5         10.6         10.3         11.0         11.6         10.5         11.3         10.6         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0         5.5         6.0 <th< td=""><td><math display="block"> \begin{array}{ c c c c c c c c c c c c c c c c c c c</math></td><td></td><td><del></del></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		<del></del>					1						
$\chi$ $\kappa_{\rm S}$ $5.7$ $5.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $5.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$ $2.5$ $6.0$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		<u>م</u> ج		10.8	10.5	10.6	10.3	11.0	11.6	10.5	11.3	10.8	11.0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		8		5.5	6.0	5.8	5.7	5.0	5-0	5.5	6.0	5.5	5.8
$^{\circ}$ C         450         470         450         470         450         470         455         470         455         470         455         470         455         470         455         470         455         470         455         470         455         470         455         470         455         470         455         470         450         470         450         470         450         470         450         470         450         470         450         470         450         470         450         470         450         470         450         470         470         470         470         470         470         250         470         250         400         251         681         470         250         400         255         51         610         255         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         610         25         <	$^{\circ}$ C         <		/Nm3					ļ		0.39				
V         m/s         -         -         -         -         4.5         4.3         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         4.0         23,300         23,300         23,300         23,300         23,300         23,300         23,300         23,300         23,300         23,300         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,700         23,000         23,000         23,000         23,000         23,000         23,000         23,000         23,000	V $m(s)$ $    4.5$ $4.3$ $4.0$ $4.0$ $4.0$ $4.0$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,300$ $23,700$ $23,400$ $23,700$ $23,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,500$ $24,400$ $23,700$ $23,710$ $4.0$ $24,00$ $25,00$ $24,400$ $25,00$ $24,400$ $25,00$ $24,400$ $25,00$ $24,400$ $25,00$ $24,400$ $25,00$ $24,00$ $25,00$ $24,00$ $24,00$ $24,00$ $24,00$ $24,00$ $25,00$ $24,00$ $25,00$ $24,00$ $25,00$ $24,00$ $25,00$ <td>re ·</td> <td>J.</td> <td></td> <td>460</td> <td>470</td> <td>455</td> <td>445</td> <td>470</td> <td>460</td> <td>465</td> <td>455</td> <td>470</td> <td>465</td>	re ·	J.		460	470	455	445	470	460	465	455	470	465
W         Nm3/hr         -         -         -         -         23,300         31,300         29,900         29,300         29,300         29,300         29,300         23,500         23,500         23,600         24,400         23,600         23,600         24,400         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600 </td <td>W         Nm3/hr         -         -         -         -         -         23,300         31,300         29,300         29,300         29,300         29,300         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         20,00         20,00</td> <td>-</td> <td>1/S</td> <td></td> <td>1</td> <td>•</td> <td></td> <td>•</td> <td>4.5</td> <td>4.3</td> <td>4.0</td> <td>4.0</td> <td>4.0</td> <td>4.2</td>	W         Nm3/hr         -         -         -         -         -         23,300         31,300         29,300         29,300         29,300         29,300         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         28,700         20,00         20,00	-	1/S		1	•		•	4.5	4.3	4.0	4.0	4.0	4.2
Nm3/hr         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         24,400         23,600         23,600         24,400         23,600         23,600         24,400         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         23,600         24,400         23,600         24,400         23,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         24,600         26,600         24,600         26,600<	Nm3/hr         23.600         24,400         23.900         23.600         24,400         23.600         24,400         23.600         24,400         23.600         24,400         23.600         24,400         23.600         24,400         23.600         24,400         23.600         24,400         23.600         23.600         24,400         23.600         23.600         24,400         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         23.600         24.400         23.600         24.400         23.600         24.400         23.600         24.400         23.600         24.400         23.600         24.400         23.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600         24.600<	3	<u>a3/hr</u>	-	1		1		32,300	31,300	28,900	29,300	28,700	30,300
ppm         862         640         642         575         -         -         853         681           kg/hr         -         -         -         -         50         40         40           kg/hr         -         -         -         -         -         50         40           on the date measurement conducted 212ton/day         -         -         -         50         40           non the date measurement conducted 212ton/day         -         -         -         50         40           non the date measurement conducted 212ton/day         -         -         12         -         50         40           non resentrative heat exchanger to the furnace.         -         12         -         50         40           train resentative heat exchanger to the furnace.         -         12         -         2.05         -         -         2.055         -         -         -         2.035         -         -         2.035         -         -         -         2.035         -         -         -         2.035         -         -         -         2.035         -         -         -         -         2.035         -         -         -	ppm         862         640         642         375         -         -         853         681           kg/hr         kg/hr         -         -         50         40         40           non the date measurement conducted 212ton/day         -         -         -         50         40           non the date measurement conducted 212ton/day         -         -         -         50         40           non the date measurement conducted 212ton/day         -         -         -         50         40           non the date measurement conducted 212ton/day         -         -         12         -         50         40           torm reserent with the not at norts which supply         -         -         12         -         50         40           total number of burner is 20 sets.         -         -         -         2,095         -         2,095         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -		13/hr		23,600	24,400	24,000	23,900	22,800	22,800	23,600	24,400	23.600	24,000
r         50         40           r         12         50         40           date measurement conducted 212ton/day are installed at the hot air ports which supply enerative heat exchanger to the furnace.         50         40           installed at the hot air ports which supply enerative heat exchanger to the furnace.         5126 of combustion chamber         90           innber of burner is 20 sets.         10,973 and H82         10,973 and H82         10,973 and H82         10,973 and H82         10,973 and H82           01,035,775         1,507,770         1,743,118         10,000 kcal/m3hr         2,095 mu           40,1,035,775         1,507,770         1,743,118         100,000 kcal/m3hr           40,1,035,775         1,507,770         1,743,916         1,00,000 kcal/m3hr	r         50         40           date measurement conducted 212ton/day date measurement conducted 212ton/day are installed at the hot air ports which supply are installed at the hot air ports which supply are installed at the hot air ports which supply inters installed on each port, 10 burners installed mmber of burner is 20 sets.         40         90           90         0.035.775         1.507.770         4.706         mm           90         0.035.775         1.507.770         4.733.118           90         1.062.100         1.00.000         kcal/m3hr           40         1.174.975         1.605.100         kcal/m3hr		DDB		862	640	642	575	•	•	•	853	681	674
r     12       date measurement conducted 212ton/day     12       date measurement conducted 212ton/day     12       are installed at the hot air ports which supply     512e of combust       enerative heat exchanger to the furnace.     512e of combust       enerative heat exchanger to the furnace.     W       enerative heat exchanger to the furner is 20 sets.     Example to the furner is 20 sets.       enerative heat exchanger to the furner is 20 sets.     Example to the furner is 20 sets.       enerative heat exchanger to the furner is 20 sets.     Example to the furner is 20 sets.	Image: Conducted 212ton/day         12           date measurement conducted 212ton/day         12           are installed at the hot air ports which supply         5ize of combust           are installed on each port, 10 burners installed         W           umber of burner is 20 sets.         PPNEX           90 (.055.775 1.507.770 8.7230.101         1.507.770 8.7230.101           40 (.).74.975 1.551.600 5.309.101         Contust	kg	s/hr			-	•	-	•	-	•	20	40	40
date measurement conducted 212ton/day are installed at the hot air ports which supply enerative heat exchanger to the furnace. Inners installed W minber of burner is 20 sets. 90 1.025.775 1.507.770 4.739.118 40 1.062.100 1.506.520 5.220.101 40 1.174.975 1.551.780 5.349.134	date measurement conducted 212ton/day are installed at the hot air ports which supply enerative heat exchanger to the furnace. Inters installed on each port, 10 burners installed umber of burner is 20 sets. <u>H Volume of chamber</u> <u>H Volume of chamber</u> <u>A 0 [,174, 375 [,551, 760 [,339, 184</u> ] <u>A 0 [,174, 375 [,551, 760 [,339, 184</u> ]	kg	s/hr							12				
t, 10 burners installed <u>Wolume of combust</u> <u>Wolume of chamber</u> <u>Bill</u> <u>Bill</u> <u>Bill</u> <u>Bill</u> <u>Bill</u> <u>Combustion chamber</u> <u>Load of C/C : Trating</u> <u>C/C : Combustion cham</u>	t, 10 burners installed <u>W</u> <u>Fi</u> <u>BIX</u> <u>33.118</u> <u>0.101</u> <u>9.184</u> <u>0.101</u> <u>0.101</u> <u>c/c.:namber</u> <u>Load of c/c.:namber</u> <u>Load of c/c.:namber</u> <u>Load of c/c.:namber</u> <u>1.034</u> <u>0.101</u> <u>c/c.:c.:namber</u>	on plan on th x eas hurner	e date m sare in	easureme stalled	nt conduct at the hot	ted 212ton/	day . which su	un tv		:				
<ul> <li>4, 10 burners installed</li> <li>W</li> <li>W</li> <li>Wolume of chamber</li> <li>Volume of chamber</li> <li>Load of C/c insting</li> <li>0.0101</li> <li>Cost of C/c installed</li> </ul>	<ul> <li>4, 10 burners installed</li> <li>W</li> <li>Wolume of chamber</li> <li>33.118</li> <li>Wolume of chamber</li> <li>Used of c/c.:rating</li> <li>00.101</li> <li>Control of c/c.:normal</li> </ul>	on air from r	terenerat	tead avi	evchanger	to the fu	rnare.			512	15	stion cham	her	
9, 10 During the day for the day of the day	9, to but the of chamber 1118 13.118 10.101 10.101 1.024 of c/c.:normall 0.184 0.184		burnere		too ac b		urnere ine	64a11ad		111	5	- 30C 3		
EX Volume of chamber 3.118 0.101 0.101 0.101 0.101 0.101 0.101 0.101	EX EX 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.101 0.1010		nu lici o	1115 44 110		1 01 (3 10 f	nu e put inc	001100		<b>}</b>  (				
H81         H82         H84         PEMEX           599         990         1.035.775         1.507.770         4.743.118           599         990         1.035.775         1.507.770         4.743.118           591         240         1.062.100         1.606.520         5.220.101           584,840         1.174,975         1.651,760         5.349.184	H81         H82         H84         PEMEX           599,990         1,035,775         1,507,770         4,743,118           599,990         1,035,775         1,507,770         4,743,118           551,240         1,062,100         1,606,520         5,220,101           584,840         1,174,975         1,505,530         5,220,101           684,840         1,174,975         1,505,530         5,349,184	de, so total	number	of burne	r is 20 se	ets.						10,973 0		
H81         H82         H84         PPMEX           599.990         1.035,775         1.507,770         4.743,118           559.990         1.062,100         1.606,520         5.220,101           551.240         1.774,975         1.606,520         5.220,101           584,840         1.774,975         1.651,760         5.349,184	H81         H82         H84         PPMEX           599         1,035,775         1,507,770         4,743,118           599         1,035,775         1,507,770         4,743,118           551,240         1,065,100         1,666,520         5,220,101           581,240         1,011,606,520         5,220,101         1,651,700           684,840         1,174,975         1,551,700         5,349,184           684,840         1,174,975         1,551,700         5,349,184				- t					H		2,095 1	mm	
599.990         I,035,775         I,507,770         H,743,118         Load         of c/c         :rating           651,240         I,062,100         I,606,520         5,220,101         0         c/c         :normal           684,840         I,174,375         I,651,760         5,349,184         c/c         :normal	599.990         [.035.775         [.507.770         [.713.118]           651.240         [.062.100         1.506.520         5.220.101           684.840         [.174.975         1.551.760         5.349.184           (max/month)         684.840         [.174.975         1.651.760			H82		PEMEX	·			Volume of	chamber	_ I.	Ŷ	
684,840 [,174,975 [,651,760 5,349,184]	<u> 884,840 [,174,975 ],651,760 [,349,184</u> (m4/month) (m5/month)		9,990 L.C	35,775 1 62,100 1	<u>507,770 P</u>	1, 743, 118 5, 220, 101				Load of C	/C :rating		kca /m3hr kra /m3hr	
	(#3/#onth)		1.840 1.1	74,975 1	651,760 [	349,184				c/c : Con	bustion ch	anber		

16.2 Glass Melting Furnace No.82

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fair	-			-											5														J.			1150	<b>z</b> 3	420,000 kcal/m3hr	kca1/#3hr
Weather				-																								- da acida	SCIUL CIRA	1,700	5,588	H 2,000 am	19.0	420,000	8
25. 100h	14:40	6.0	16	saturated	102	710	2.1	3.7	113	35	300	110	ł		250	< 0.05	10.5	6.2	61-0	330	18.9	8,100	9,800	270	4.2	42	1.5		A CONTRACT				chamber	coad of c/c trating	of c/c : normal 190
Date Sentember	14:00	6.0	16	satur	102	390	2.1	3.7	113	35	300	110	1		158	< 0.05	6*9	10.0		285	14.9	6,800	7,100	230	2.2	23				8	- D	H	Volume of chamber	Load of c	Load of c
tube	13:30	4.8	16	satur	101	420	2.6	4.0	113	35	280	80	1		158	< 0.05	6.9	8.5		285	7.41	6,700	6,700	202	2.2	25									
800Hp water	13:00	5.0	16	saturated	101	438	27	4.1	113	35	280	85	1		145	< 0.05	6.7	8.5	0.26	285	14.5	6,600	7,000	186	2.0	26	1.7								
Type of facility : 8 boilar for proceeding	12:30	3.9	16	saturated	101	390	2.1	3.7	115	35	280	80	I	690		< 0.05	9.9 9	10.0		265	12:5	5,900	7,100	207	1.7	33									
Type of facility	12:00	6.3	16	saturated	102	500	3.8	5.0	115	35	320	110	60	f chimnev.	155	< 0.05	7.2	8.0		285	14.4	6,500	7,700	191	2.1	39									
	11:30	4.5	16	saturated	101	372	2.4	3.4	115	35	280		1	inside diameter of chimnev.		ŀ															type				
	(Rating)	10.0	24	saturated		814		steam	110					Incide																	de mixing	COEN CO.		ABR1CAC10N	c.v.
nt Nucts Factory	 	ton/hr	kg/cm28	ູລູ	<u></u> с	ll i ter/hr	kg/cm2g	K8/Cm28	ູ	ູ່	ູ່	man Aq	man Aq	282	DDB	<b>~</b>	<del>8</del> 4	88	g/Nm3	င့	m/s	Nm3/hr	Na3/hr	Lidd	kg/hr	kg/hr	kg/hr		1al In	DAZ type	le : insi	r : COEN		HEXICO F	S.A. DE
establishment Rubber Products	1	r quant.	ssure	perature	r temp.	Consumption	Pressure	Atomize press.	ture			Air press. Wind box	ressure	Analytical data of flue eas	÷С	CO conc.	C02 conc.	- 02 conc.	PH conc.	Temperature	Gas velocity	i Gas quantity	al gas quantity	(02 5%)	ion	tion	uo		I DEAVY OI 1 DU	Register : DAZ type	Burner nozz	Burner makei	Boiler maker	PROTHERM DE MEXICO FABRICACION	-
Name of er	1 2 2	Feed water quant	Steam pressure	Steam temperature	Feed water temp.	Fuel	Heavy oil			Comb air	Fiue gas	Air press	Furnace pressure	anal vtica	Chimpev		<del></del>		nopose 12			:	Theoretical	NUX conc. (02 5%	NOx emission	S02 emission	PM emission		:						

### 17. Rubber Products Factory Boiler

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### 18. Paper Factory Boiler No.1 and No.2

Ber         4,1990           14:30         14:30           18         11.5           18         11.5           190         90           90         90           90         90           90         90           90         90           90         90           90         90           90         90           90         90           90         90           90         270           28         462           265         100           10         -1.5           10         -10	207 00-01												
Factory         factory         Cachory         <	laure of ex	stablishment				Type of fa	acility:	No.1,2 wat	ter tube	Date		Heather	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	lo.30 P	aper Factory				boiler for	r power ger	eration		October 4	1990		r S
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sampling 1	tinne		(katir	18)	12	30		30	14	:30	15	30
kW         1.000         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900         900 </td <td>vame of bo</td> <td>oiler</td> <td></td> <td>N0.1</td> <td>N0.2</td> <td>N0.1</td> <td>N0.2</td> <td>NO.1</td> <td>ND.2</td> <td>NO 1</td> <td>N0.2</td> <td>NO.1</td> <td>N0.2</td>	vame of bo	oiler		N0.1	N0.2	N0.1	N0.2	NO.1	ND.2	NO 1	N0.2	NO.1	N0.2
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Power caps	acity	KV.	1,(	000	. 106		906		6	0	Ğ	
	Evaporatic		ton/hr		15.9	8.4	11.5	8.4	. 11.5	8.4	11-5	8.4	11.5
Ire $\mathbb{C}$ $301$ $301$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $270$ $210$ $210$ <th< td=""><td>steam pres</td><td></td><td>kg/cm28</td><td></td><td>19</td><td>18</td><td>18</td><td>18</td><td>18</td><td>18</td><td>81</td><td>18</td><td>18</td></th<>	steam pres		kg/cm28		19	18	18	18	18	18	81	18	18
ure         °C         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         9	steam temu	ıre	°C.		301	270	270	270	270	270	270	270	270
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	eed watel	uture	° C			06	06	06	<b>0</b> 6	96 06	<b>8</b>	8	8
kg/cm/2g $kg/cm/2g$ $kg/cm$	uel		l i ter/hr	1,100	1,350	714	973	714	973	714	373	714	973
press.kg/cm2g         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         <		Pressure	K8/Cm28				1	•		•	•	•	,
ure         °C         90         100         90         100         90         100         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90         90 <th< td=""><td></td><td>Atomize press.</td><td>kg/cm2g</td><td></td><td></td><td>1</td><td>ł</td><td>,</td><td>1</td><td></td><td>,</td><td>•</td><td>1</td></th<>		Atomize press.	kg/cm2g			1	ł	,	1		,	•	1
1         °C         ambience         ambienc         ambience         ambience<		Temperature	່ ວຸ			06	100	96	100	8	100	8	100
et         °C         estimated         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200         200	omb.air	A/H inlet	0, I			ambience	ambience	ambience	ambience	annience	amb i ence	ambience	aubience
t         °C         286         450         288         460         288         462         288           et         °C         163         265         153         265         166         265         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         37         65         57         57         54         54         54         54         54         54         54	enp.	A/H outlet	ے ا		estimated	200	200	200	200 200	200	200	200	200
et     °C     163     265     163     265     166     265     166       et     mm< Aq     37     65     37     65     37     65     37       mm< Aq     -     -     -     -     -     -     -     -       tmm< Aq     -5     -1.5     -5     -1.5     -5     -1.5     -5     -1.5       et     mm< Aq     -10     -10     -10     -10     -10     -10     -10	lue gas	A/H inlet	J Ĵ			286	450	288	460	388	462	88	162
et         tans         Aq         37         65         37         65         37         65         37           r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         r         <	enp.	A/H outlet	Ĵ,			163	265	163	265	166	265	166	265
Ref Act <t< td=""><td>ir press.</td><td>. Fan outlet</td><td></td><td></td><td></td><td>37</td><td>65</td><td>37</td><td><u>8</u></td><td>37</td><td>65</td><td>37-</td><td>65</td></t<>	ir press.	. Fan outlet				37	65	37	<u>8</u>	37	65	37-	65
mm         Aq         -5         -1.5         -5         -1.5         -5         -1.5         -5         -1.5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5         -5		Wind box				,	,	1		1	ŀ	e	•
t mm Aq	Urnace pi	ressuer				-5	-1.5	-5	-1-5	γ		ς.	-1-5
et mm Aq -10 -10 -10 -10 -10 -10 -10 -10	lue gas		mm Aq				•	•	9.		•	ı	•
	ressuer		mm AG			-10	-10	01-	-10	-10	01-	-10	-10

Chimney N0x conc.											
	NOX CONC.	ud d	(bioler outlet)	175	-	182		180		185	
					155		147.1		149		145
	CO conc.	9-6	(bioler outlet)	< 0.05		< 0.05		< 0.05		< 0.05	
					< 0.05		< 0.05		< 0.05		< 0.05
	C02 conc.	3-e	(bioler outlet)	8-0		11.0		8.2	_	8.0	
					6.0		6.6		6.4		6.7
<b>.</b>	02 conc.	95	(bioler outlet)	10.8		11.11		12.2		12.6	
					11.8		11.4		11.1		11.5
	PM conc.	g/Nm3					0.44				
•	Temperature	ູ່			215		215		221		220
	Gas velocity	S/W			7.5		7.5		7.8		7.8
	Gas quantity	Nm3/hr			31,100		31,100		32,000		32,000
Theoretical	heoretical gas quantity	N#3/hr			36,400		34,900		33,800		35.200
A/H inlet   Temperatu	Temperature	ູດ		286	450	288	460	288	462	288	462
	02 conc.	ઢવ		10.8	11.5	11-11	10.1	12.2	0.6	12.6	10.3
~1nc	Temperature	ာ		163	265	163	265	166	265	1961	265
let	02 conc.	<b>8</b> -6		13.2	r	12.2	12.0	13.2	1		•
Sonc. (	02 5%)	udd -			270		245		241		244
NOx emission	on	kg/hr			10		9-4		10		9.5
S02 emission	uo uo	ke/hr			81		1001		100		100

Size of combustion chamber (No.2 Boiler) 800 KG 3,524 Rm 3,500 Rm 3,000 Rm 37.0 R3 mbustion chambe c/c :rating : normal chamber olume of 0 <u>Sad</u> 2 N Š

kg/hr kg/hr ks/hr

> entission enission

hd

		2		0	
	I burners	1	0	. 0	Ter
Vo.2 boiler	s heavy oil		A	B	Y-jet burner

2°.			
burners		(	
boiler vy oil			burner
No.I bo 2 heavy	A	В	-jet b
≴ ດ)			>

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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Name of establishment	tent				Type of fa	facility:	No.1 water tube	tube	Date	Weather
time         (Rel int(x)         13:00         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30         15:30 <th< td=""><td></td><td></td><td>ctory (</td><td>A)</td><td></td><td>boiler for</td><td></td><td></td><td></td><td>i.</td><td>fair</td></th<>			ctory (	A)		boiler for				i.	fair
Result         (ton/hr         9.4         (1.0)         12.5         13.0         11.0         12.5         13.0         11.0         12.5         13.0         11.0         12.5         13.0         11.0         12.5         13.0         11.0         12.5         13.0         13.0         11.0         12.5         13.0         11.0         12.5         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0         13.0	ling time			(Rating)	13:00	13:30		<b>—</b>	15:00	15:30	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	water quant.		ton/hr	9.4							
model and the relative         °C         saturated sa	m pressure	Å	8/cm28	10.0	12.5	12.0	13.0	11.0	12.5		
$ \begin{array}{  c c c c c c c c c c c c c c c c c c $	m temperature		ς,		saturated	saturated	saturated	saturated			
$ \begin{array}{                                    $	Consump		iter/hr	808		820		800	800	•	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			8/cm28		2.8	2.8	2.8	2.8	2.8		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		s press.k	g/cm2g	steam	4.3	4.3	4.3	4.3	4.3		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Tempera	ture	ç		85	85	85	85	85		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	. air temperat	ture	ູ		ଚ୍ଚ	88	ଛ	80	90		
S. Fan outlet     mer Aq     130     130     130     130     130     130     130       Previne     mer Aq     -15     -15     -15     -15     -15     -15       Previne     mer Aq     -15     -15     -15     -15     -15     -15       all data of flue gas     inside diameter of chimmey:     1.650     mer     mer     mer       all data of flue gas     inside diameter of chimmey:     1.650     mer     115     100       Nation:     pme     10.3     9.8     113     130       Nation:     all data of flue gas     inside diameter of chimmey:     1.650     60.05     60.05     60.05       Conc.     all data     conc.     all data     113     130     13.9     13.8       Mix conc.     all data     all data     all data     all data     all data     all data       Conc.     all data     all data     all data     all data     all data     all data       Mix conc.     all data     data     all data     all data     all data       Mix conc.     all data     all data     all data     all data       Mix conc.     all data     all data     all data     all data       Mix	gas temperatu		ູ		235	235	235	235	235	-	
$ \begin{array}{  c c c c c c c c c c c c c c c c c c $	press. Fan out	-	ster Aq		130	130	130	130	130		
pressure         mad        30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30	Wind bo		ter Aq		-15	-15	-15	-15	-15		
al data of flue gas Inside diameter of chimmey. 1.650 mm N(N conc. <u>pm</u> 113 130 118 130 1330 N(N conc. <u>pm</u> 128 115 130 118 130 N(N conc. <u>pm</u> 128 115 130 118 130 N(N conc. <u>pm</u> 128 115 130 133 103 13.500 N(N conc. <u>pm</u> 13.30 10.3 9.3 10.3 9.8 11.8 P(102 conc. <u>pm</u> 13.500 15.100 14.300 13.300 R(N m3/hr 13.500 15.100 14.300 13.300 13.200 Rest ature 'C 335 381 387 382 388 376 Colored Gas quantity Ma3/hr 13.500 15.100 14.300 13.300 13.200 Rest ature 'C 335 381 387 382 388 376 Rest ature 'C 335 31 3.3 187 382 388 376 Rest ature 'C 335 31 3.1 0 3.3 18.7 5.3 2.50 Rest ature 'C 351 5.1 0 14.300 15.00 18.200 Rest ature 'C 351 5.1 0 14.300 13.200 18.200 Rest ature 'C 351 5.1 0 14.300 15.0 11.200 18.200 Rest ature 'C 351 5.1 0 14.300 13.200 18.200 Rest ature 'C 351 5.1 0 14.300 15.0 18.200 18.200 Rest ature 'C 351 5.1 0 14.200 13.200 18.200 18.200 Rest ature 'C 351 5.1 0 14.200 13.200 18.200 18.200 18.200 Rest ature type Burner atype Burner atype Burner atype Burner atker/Y	ace pressure		Mar Ag		-30	-30	-30	-30	-30	-30	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	vtical data of		s	Inside d	iameter of	f chimney:	1,650 1	臣		-	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	mey N0X con		BOd		120	128	115	130	118	130	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			24				< 0.05			< 0.05	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	C02 COT	2	ð*		7.8	7.4	8.0	6.9	7.6	5.7	
	02 CORC		24		9.6	10.3	9.3	10.3	8°6	11.8	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	PM CONC		8/N#3				0.28				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tempera	re	° C		253	258	258	249	253	250	
tv         Nm3/hr         13.500         15.100         18,000         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300         13,300 <td>Gas vel</td> <td>loci ty</td> <td>a/s</td> <td></td> <td>4.7</td> <td>5.3</td> <td>6.3</td> <td>5.1</td> <td>4.6</td> <td>4.6</td> <td></td>	Gas vel	loci ty	a/s		4.7	5.3	6.3	5.1	4.6	4.6	
ity     Nm3/hr     15,100     16,100     14,300     15,700     18,200 $a$ $c$ 385     381     387     382     388     376 $a$ $5.1$ $5.1$ $5.3$ $4.8$ $7.5$ $7.5$ $pm$ $168$ $191$ $157$ $189$ $2.26$ $kg/hr$ $3.2$ $3.2$ $3.2$ $3.6$ $kg/hr$ $4.0$ $3.2$ $3.2$ $3.6$ $kg/hr$ $3.2$ $4.0$ $3.2$ $3.6$ $kg/hr$ $4.6$ $4.6$ $4.6$ $4.6$ $kg/hr$ $1.57$ $1.94$ $1.29$ $2.26$ $kg/hr$ $3.2$ $4.0$ $3.2$ $3.6$ $kg/hr$ $1.57$ $4.6$ $4.6$ $4.6$ $kg/hr$ $5$ $4.6$ $4.6$ $4.6$ $kg/hr$ $5$ $4.6$ $4.6$ $4.6$ $kg/hr$ $7.5/r$ $1.5$ $1.6$ $1.6$ $1$ burners $5$ $5.8$ $8.6$ $1.6$ $1$ burners $1.5$ $1.5$ $1.6$ $1.6$ $1.5$ $1.5$ $1.6$ $1.6$ $1.6$	Gas qua	×	Nm3/hr		13.500	15,100	18,000	14,800	13,300	13,300	· · ·
Septerature         °C         385         381         387         382         388         376 $0.0$ conc. $1$ $5.3$ $3.8$ $5.3$ $4.8$ $7.5$ $1.5$ $0.0$ conc. $1.5$ $5.3$ $3.8$ $5.3$ $4.8$ $7.5$ $5.5$ $1.60$ $2.06$ $1.60$ $2.06$ $1.60$ $2.06$ $1.60$ $1.60$ $1.60$ $4.3$ $4.0$ $4.3$ $4.0$ $3.2$ $3.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$	retical gas qu	tv	Na3/hr		15,100	16,100	14,300	15,700	15,000	18,200	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		ature	ູວ		385	381	387	382	88 88	376	
$5\chi$ ppm         168         191         157         194         169         226         1 $kg/hr$ $3.3$ $4.0$ $4.3$ $4.0$ $3.2$ $3.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$ $4.6$	C02_C01	С.	24		5.1	5.3	3.8	5.3	4.8	7.5	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	conc.(02 5%)		ndd		168	191	157	194	169	226	
kg/hr   48 46 46 46 46 46 46 46 46 46 46 46 46 46	enission		kg/hr .	•	3.3	4.0	4.3	4.0	3.2	3.6	
kg/hr515Heavy oil burnersHeavy oil burnersSize of combustRegister : Single lower typeB $W$ $W$ Burner nozzie : Y-jet typeD $W$ Burner maker/N- $\rightarrow$ $/$ $/$ $/$ $/$ $/$ $/$ $/$ $/$ $/$ $/$	ent ssion		kg/hr		48	48	46	46	46	46	
B & W Single lower type $B$ & W $\overline{W}$ $\overline{W}$ $\overline{D}$ $D$	mission	 	kg/hr				5				
Single lower type Single i over type Ie : V-jet type FI FI Ie of chamber Ie of chamber Ie of chamber Ie od of c/c: irrating Ie od of c/c: irrating Ie od of c/c: irrating	2 Heav		ners	-					•	e L	
Single lower type zle: V-jet type $erN \rightarrow JXJL: Y - j e t$ $\vdots B & W$ $\vdots D & W$ $\frac{H}{10ad of c/c}$ incluse of chamber $\frac{Load of c/c}{c}$ incluse of chamber $\frac{Load of c/c}{c}$ incluse of chamber		-						0		,	1 700
ale : Y-jet type $erN \rightarrow JXJL$ : Y - j e t : 8 & W : 8 & W : 6 C - C : insting : 1 Combined of C/C : insting : 1 Combined of C/C : insting	Kegi	ster . 51	ngle ic	wer type				8		s c	
erN-ナノズル:Y-jet Volume of chamber Load of c/c :rating Load of c/c :normal	BULTR	er nozzie		t type						ŋ	5,568 B
: 8 & W Load of C/C : Trating Load of C/C : Trating Load of C/C : Trating	Burne	er maker	Ł	XM: Y							2,000 開
Load of c/c Trating 420,000 kca!/#3h Load of c/c iontail 420,000 kca!/#3h	Boiler	maker								Volume of chamber	F
										Load of c/c ratif	_
										I LORD OT C/C . NOTHER	

# 19. Paper Products Factory (A) Boiler No.1

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### 20. Paper Products Factory (B) Boiler No.1

				Type of facility	acility :	No.1 water	r tube	Date		Veather	
No.76 Paper Products Factory (B)	: Factory	(B)		boiler for	boiler for prosessing	ng		November 7,1990	7,1990	Q	cloudy
Sampling time		(Rating)	00:11	11:30	12:00	12:25	13:25	14:27	14:00	14:30	15:00
Estimated steam quantity	v ton/hr	9.5	8.5	8.5	8.5	8.5	8.5	8.5	8-5	8.5	۵.5 م
Steam pressure	kg/cm2g	max 17.2	8.2	8.0	8.0	8.2	8.0	8.0	8.0	8.0	8.0
Steam temperature	ç		saturated	saturated	saturated	saturated saturated saturated saturated	saturated	saturated saturated	saturated	saturated saturated	saturated
Feed water temp.	ຸງ		95	35	35	35	32	95	95	35	95
Fuel Consumption	li i ter/hr	870	783	783	783	783	783	783	783	783	182
Heavy oil Pressure	kg/cm28		0.9	. 6.0	6.0	6.0	6-0	6.0	6.0	6.0	6.0
Atomize press.	s. kg/cm28	steam	7.3	2.3	7.3	7.3	7.2	7.2	7.2	7.2	7.2
Temperature	°C		101	102	102	102	102	102	102	102	102
Comb. air temperature	ر پ		andience	ambience ambience	ambience	ambience lambience	ambience	ambience	ambience ambience		ambience
Flue gas temperature			350	355	340	345	360	355	360	355	335
Air press. Wind box	nin Aq		1	1		-		-	•		2
Furnace pressure	ann Ac		-	•	1	•			•	•	
			1 normal	normal operation		tiow air ratio	ratio 1	flow air	† low air ratio (min.) 2	.) 2	

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Analytica	Analytical data of flue gas	as	Inside 6	nside diameter of chimney	chinney:	730 mm	5					-
Chimney	NOX CONC.	шdd		190	180	180		187	185	183	183	168
	C0 conc.	*		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	CO2 conc.	<b>ð</b> 9		10.01	0.6	9.5	10.0		11.0	11.0	11.0	11.0
	02 conc.	<b>8</b> 4		6.8	6.8		541		5.4	5.2	5.2	5.2
	PM conc.	g/Nm3			0.034							
	Temperature	, C		350	355	340	345	360	355	360	355	335
	Gas velocity	m/s		14.4	14.3		13.7	13.71	13.4	12.7	12.7	13.6
	Gas quantity	Nm3/hr		6,600	6,500	6,400	6,400	6,200	6,100	5,800	5,800	6,400
Theoretic	Ela	Nm3/hr		11,200	11,200	11,000	10,200	9,900	10,200	10,100	10,100	10.100
NOX CORC.	(02 5%)	шdd		214	203	199	200	187	190	185	185	170
NOX emission	ion	kg/hr		2.6	2.4	2.4	2.6	2.4	2.3	2.2	2.2	2.2
SO2 emiss	ion	kg/hr		45	45	45	45	45	45	45	45	45
PM emission	-	kg/hr			0.22			-				

Ĵ							kcal/m3hr	i∕m3hr	
_		ther	Ш	围		٢	kca	kca	
ŝ		char	428	612	553	3.2	000	000	
		tion	1,	ŝ	3		640,0	580,	aber
£		Size of combustion chamber		(T) · · · (		chamber	/c :rating	c/c inormal	Combustion chamber
07		Size	M	) a	н	Volume of chamber	Load of c/c	Load of c	c/c : Com
ΩĪ									

Steam atomizing heavy oil burner Burner & boiler manufacture : COMBUSTION ENGINERING

Operating condition : From Monday morning at 6:00 to nexit Sunday evening at 17:30. 155.5hr/week almost no load fluctuation.

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	No.55 Metal Product	t cts Factory (	(A)		Type of fac for casting	ility: billet	Heating furnace	nace	Date November 5,1990	Veather	fair
Test in the second of the second o	ng time		(Rating)	11:00		2	12:30	13:00			
$ \begin{array}{                                    $	sumpti		1,000	782	782	782	782	782	782		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		ຸ. ເ		4.0	4.0	4.0	4.0	4.0	4.0		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Pressure	kg/cm2g		0.8	0.8	0.8	0.8	0.8	0.8		
Stemerature         °C         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000         1.000	. air temperature	ç		ambience	ambience	ambience	ambience	ambience	authience		
m.         function         0.0         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200         1.200	gas temperature	د		1 040	1,040	1,040	1.040	1,040	1,040		
Similation lock       Im Administration       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       1000000000000000000000000000000000000	temp. in furnace	ပံ		1.200	1,200	1.200	1.200	1.200	1,200		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	press. Window box	NULL AG		1		•			•		
Construction is of assumed value based on 3 months (7,8,9) monthly consumption and operating hours.         Dial of ficiency is approx. 10.5%       Inside diareter of chimney.       610 mu       120 monthly consumption and operating hours.         Nex conc.       pm       inside diareter of chimney.       610 monthly consumption and operating hours.       120 monthly consumption and operating hours.         Nex conc.       pm       inside diareter of chimney.       610 monthly consumption and operating hours.       120 monthly consumption and operating hours.         Mix conc.       pm       pm       137 monthly consumption and operating hours.       120 monthly consumption and operating hours.       120 monthly consumption and operating hours.         Mix conc.       pm       pm <t< td=""><td>ace pressure</td><td>. RIM AG</td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td></t<>	ace pressure	. RIM AG		-		-					
lied efficiency is approx. 10.5% al data of flue xas inside diameter of chimey. 610 m Mix conc. par inside diameter of chimey. 610 m Conc. par inside diameter of chimey. 610 m Mix conc. par inside diameter at the set of the set	Gas consumption it	ę	value	ed on 3 m	omths (7,8,	<ol> <li>monthl;</li> </ol>	v consumpt	on and op	erating hours.		
all data of flue asas       Inside diameter of chimney.       610 mm       100       115       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120       120	Applied efficiency	/ is approx.	=		• • •		-				
With conc.         permitty         135         100         115         125         120           C0         conc. $\frac{1}{8}$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ $-0.05$ <td< td=""><td></td><td>e 825</td><td>Inside d</td><td>liameter o</td><td>f chimney:</td><td>610-1</td><td>Mic.</td><td></td><td>:</td><td></td><td></td></td<>		e 825	Inside d	liameter o	f chimney:	610-1	Mic.		:		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	N0x conc.	$\vdash$	-	61	135	100	ľ	125	120		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		34		< 0.05				< 0.05			
(0.2 conc. $\frac{1}{8}$ $\frac{1}{10}$ $\frac{1}{1$	.CO2 conc.	<b>3</b> 5		3.3	10.0	8.6	9.2	8.3	8.5		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	02 conc.	<b>8</b> 5		14.7	2.9	4.5	3.8	4.9	4.8		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	PM conc.	R/Nm3		*							
Class velocity/ as quantity         m/s         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         17.6         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000         1000 <th< td=""><td></td><td></td><td></td><td>765</td><td>945</td><td>930</td><td>870</td><td>600</td><td>705</td><td></td><td></td></th<>				765	945	930	870	600	705		
Gas quantity         Mm3/hr         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	Gas velocit:	-		17.6	17.6	17.6	9.71	17.6			
gas quantity         Mm3/hr         -         9,200         -         -         9,200         -         -         -         107         124         119         007         124         119         007         124         119         007         123         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         124         119         007         1104         007         1007         120         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         001         0	Gas quantit	+		•	F	•	6.000	t	_		
(252)         ppm $48$ $119$ $97$ $107$ $124$ $119$ $(x,h)r$ $x x/hr$ $r$ $1.42$ $r$ $1.42$ $r$ $(mossible to measure PM because working environment was high temperature.         x x/hr r 1.42 r 1.42 r           Sloped hearth pusher furmace         Type         North and stature.         North and stature.         x x x x x x x x x x x x x x x x x x x $	ł			-		i.	9.200	t			·
n         kg/hr         -         1.42         -         -         1.42           Impossible to measure PM because working environment was high temperature.         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -<				48	119	97	107	124	119		
Impossible to measure PM because working environment was high temperature.       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td>enission</td> <td>kg/hr</td> <td></td> <td>ł</td> <td>•</td> <td></td> <td>1.42</td> <td>2</td> <td></td> <td></td> <td></td>	enission	kg/hr		ł	•		1.42	2			
Impossible to measure PM because working environment was high temperature. The Brillet heater for roc mill Burner general specification Signed heater for roc mill Burner Remeral specification Billet heater for roc mill Worth AMERICAN MPC. Co. 4,160 Wa1,860 Ha10,550 L Number 2,500 Ha10,550 L Number 2,500 Ha10,550 L Durner 1,000 Ha10,550 Ha1	mission	kg/hr		-	•	-	•		3		
Billet heater for rod mill     Burner general specification       Sloped hearth pusher furnace     Type     Noz2le mix gas burner       Billet heater for rod mill     Number     2       4,160 Wai, 260 U     Wai, 200 Ha10,550 L     Mumber     2       2,560 Wai, 200 Ha10,550 L     Mumber     2     Yolume of chamter       Sin     Mon     Tue     Wed     Thu       Sin     Mon     Tue     Wed     Thu       Closed     5:30     5:30     5:30     5:30       Closed     22:00     22:00     22:00     22:00       Closed     7:00     7:00     7:00     7:00       Closed     22:30     22:30     22:30     22:30       Noon recess from 1 o'clock pm.     16.5 houe operation in a day.	ø	to measure	M because	working e	nvi ronment	was high	temperatur				-
Slopeci hearth pusher furnace         Type         Nozzle mix gas burner         Size of combus           Billet heater for rod mill         Mumber         2         W         W           4,160 Wai, 860 H#10,550 L         Number         2         W         W           4,160 Wai, 860 H#10,550 L         Number         2         W         W           2,560 Wai, 200 H#10,550 L         Number         2         W         W           Final for condition         2         Number         2         W           Sun         Mon         Tue         Wed         Thu         Fri         Sat           Closed         5:30         5:30         5:30         5:30         5:30         5:30         5:30         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         2:00         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30         5:30	ace general specif	ication		5		fication					
Billet heater for rod mill         NORTH AMERICAN MFC. Co.         W           4,160 Wai,860 Hail0.550 L         Number         2           2,560 Wai,200 Hail0.550 L         Number         2           2,500 Wai,200 Hail0.550 L         Number         2           2010 Mon         Tue         Wed for charber           2010 Sun         Mon         Tue         Volume of c/c incrmal           Closed         5:30         5:30         5:30         5:30           Closed         22:00         22:00         22:00         22:00         22:00           Closed         7:00         7:00         7:00         7:00         7:00           Closed         22:30         22:30         22:30         22:30         s/a : Sectional area           Closed         22:30         22:30         22:30         22:30         s/a : Sectional area           Closed         22:30         22:30         22:30         22:30         s/a : Sectional area		th pusher fi	Irnace		Nozzle min	k gas burn	er		Ğ,	bustion cham	ber
4,160       Wail 360       Hamber       D       D         2,560       Wail 200       Hailo.550       L       H       H         2,560       Wail 200       Hailo.550       Lode of chamber       H         Sun       Mon       Tue       Ved       Thu       Fri       Sat         Sun       Mon       Tue       Ved       Thu       Fri       Sat         Closed       5:30       5:30       5:30       5:30       5:30       5:30         Closed       22:00       22:00       22:00       22:00       22:00       22:00         Closed       22:30       22:30       22:30       22:30       22:30       s/a : Sectional area         Closed       22:30       22:30       22:30       22:30       22:30       s/a : Sectional area         Closed       22:30       22:30       22:30       22:30       s/a : Sectional area         Noon recess from I o'clock pm.       16.5 houe operation in a day.       s/a : Sectional area	Billet heat	er for rod	nill		NORTH AME	RICAN MFC.	S.	:	M	2,560	
2,550 Wil, 200 Hil0, 550 L       H       H         erating condition       erating condition       Volume of chamber         sun       Mon       Tue       Ved       Thu         Sun       Mon       Tue       Ved       Trate         Sun       Mon       Tue       Ved       Trate         Closed       5:30       5:30       5:30       5:30         Closed       22:00       22:00       22:00       22:00         Closed       22:00       22:00       22:00       22:00         Closed       22:30       22:30       22:00       22:00         Closed       22:30       22:30       22:30       22:30         Closed       22:30       22:30       22:30       22:30         Closed       22:30       22:30       22:30       22:30         Noon recess from 1 o'clock pm. 16.5 houe operation in a day.       noon recess from 1 o'clock pm. 16.5 houe operation in a day.		60 H\$10.550		Number	2				Q	1,200	E
rating conditionSunVolume of chamberSunMonTueVedVedofc/c:rateSunMonTueVed $7.0$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $5.30$ $7.0$ $7.0$ $7.0$ $7.0$ $7.0$ $7.0$ $7.0$ $7.0$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$ $7.00$		00 H*10.550	<u>۔۔۔</u> در ا						H	1 10,550	E
Lode of c/c :rate           Lode of c/c :rate           Sun         Mon         Tue         Ved         Thu         Fri         Sat         Lode of c/c :ronmai           Closed         5:30         5:30         5:30         5:30         5:30         5:30         c/c :ronmai           Closed         22:00         22:00         22:00         22:00         22:00         c/c : Combustion chara           Closed         22:00         7:00         7:00         7:00         7:00         7:00         7:00         7:00         c/c : Combustion chara           Closed         22:30         22:30         22:30         22:30         22:30         s/a : Sectional area           Closed         22:30         22:30         22:30         22:30         22:30         s/a : Sectional area           Noon recess from 1 o'clock pm. 16.5 houe operation in a day.         noon recess from 1 o'clock pm. 16.5 houe operation in a day.         s/a : Sectional         s/a : Sectional	1.							_	Volume of chamber	32.4	<b>E</b> 3
Sun         Mon         Tue         Wed         Thu         Fri         Sat         Lode of c/c : normail           Closed $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $5:30$ $22:00$ $22:00$ $22:00$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ $22:30$ <td< td=""><td>ace operating cond</td><td>ition</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Lode of c/c :rate</td><td></td><td>kcal/E3h</td></td<>	ace operating cond	ition							Lode of c/c :rate		kcal/E3h
Closed5:305:305:305:305:305:305:30Closed22:0022:0022:0022:0022:0022:00Closed7:007:007:007:007:007:00Closed22:3022:3022:3022:3022:30Closed22:3022:3022:3022:3022:30Noon recess from 1 o'clock pm.16.5 houe operation in a day.	I Sun	Mon	Tue	Wed	Thu	والدا	Sat		Lode of c/c : norm	2 ]	kcal/a3hr
Closed         22:00         22:00         22:00         22:00         22:00         20:00         C/c:           Closed         7:00         7:00         7:00         7:00         7:00         8/a:         5/a:	-	5:30	5:30	5:30	5:30	5:30	5:30		Lode of s/a :rate	(ci	kcal/a2hr
Closed         7:00         7:00         7:00         7:00         8/a           Closed         22:30         22:30         22:30         22:30         22:30           noon recess from 1 o'clock pm.         16.5 houe operation in a day.         4ay.         10         10	Ļ	22:00	22:00	22:00	22:00	22:00	22:00		ļ	chamber	
Closed 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:30 22:20 22:20 22:20 22:20 22:20 22:20 22:20 22:20 22:20 22:20 22:20		2:00	1:00	7:00	00:2	7:60	7:00		•••	ø	
noon recess from 1 o'clock pm. 16.5 houe operation in a day.		22:30	22:20	22:30	22:30	22:30	22:30			:	
	En .	s from 1 o'	clock pn.	16.5 houe	operation	in a day.					
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								.:			
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### 21. Metal Products Factory (A) Heating Furnace

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	November 8,1990 .   fair/cloudy	30	<ul> <li>tapping and molding of ingot</li> </ul>	150 1		35 35	ambience ambience	60 60		t tapping		16	< 0.05	2.6	15.7		290	3.7	2,100	3,000	48	0.07			Size of combustion chamber		D 1,715 m	-	Volume of chamber 26.2 n.3	Lode of c/c :rate   100,000 kcal/m3hr	Lode of c/c :normai 40,000 kcal/m3hr	c/c : Combustion chamber
1.1.1	ingot		Ť	072	117-+72	35	ambience	03	Ţ	t charge hexachloroe tapping	•	Ø	< 0.05	2.7	15.5		250	3.2	2,000	•	23	0.03			_							
	Aluminum meiting on molding ingot	13:00	enove slag	062	117	35	ambience	09		t charge h		5	< 0.05	0.5	20.2	0.57	80	4.3	3,900	r	100	0.04	2.2	-			gas	с.				
ŀ	type of factify . Aluminum mu furnace for extrusion molding	12:30	Ľ	820	117	35	ambience	09	1	:	. 747		< 0.05	2.7	15.5		•	4.3	•	4,700	20	•		and dact.		ification.	natural g	HAUCK MANUFACTURING CO.	U.S.A		<u>د</u>	
	furnace for	12:00	melting	820	117.	35	ambience	60	1		chimnev:	8	< 0.05	2.8	15.7		280	4.5	2,600	4,900	24	0.04		a chianey a		Burner general specification	HMG1080	HAUCK MAN	P.A. 1	1	4,699 m3/h	
	~~~~				-	estimated		estimated			Inside diameter of chimnes:												-	was diluted with air at hood between chimney and dact.		Burner gei	Type	Manufac.		Number	Blower	
	(8)	(Rating)			264	165		279.4			Inside													h air at h				ingot	8L .	oL		
	Factory (		furnace	ļ,	Nat3/hr	mm Aq	ູ່	mm Aq			gas	Mad	26	<b>8</b> 4		8/Nm3	ົ່ວ.	ttu/S	Na3/hr	/ Nm3/hr	add	kg/hr	kg/hr	iluted wit		cation	y furnace	ion of alminum ingot	55H x 4,67	15H x 3,86	TRIALES	
No.19-1(1)	Name of establishments No.19 Metal Products Factory (B)	22	dition of		Fuel Consumption	N-gas Pressure	i r	Air press. Vindow box		N-gas : natural gas	Analytical data of flue cas		CO conc.	C02 conc.	02 conc. *	PM conc.	Temperature	Gas velocity	Gas quantity	Theoretical gas quantity	N0x conc.(02 5%)	NOX emission	PM emission	ic gas i		Furnace general specification	Type Reverberatory furnace	Use Production of		Inside 3,960W x 1,715H x 3,860L	Manufac. HORNOS INDUST	

#### 22. Metal Products Factory (B) Aluminum Melting Furnace (1st survey) 22.1

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Operation 2 times a day. Operated during a year, execept closed days of 2 weeks. When this large melting furnace is out of order, 4 of small melting furnace are to be operated at their max capacity.

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-204 Gas consumption

88°888 30%×1 7.5%×4 6.0%×1 6.0%×4 70tal 1 Large melting furnace 2 Small melting furnace 3 Car type annealing furnace 4 Hot air normalizing furnace 6

No.19-1 (2)											
of establishment				Type of f	facility :	Aluminum melting	elting -	Date		Weather	-876-
7.1	is Factory (B)	(8)		furnace fi	or extrusi	on molding	ingot	November	6	fai	fair/cloudy
Sampling time		(Rating)		12:55	13:00	13:30	14:00	14:30	15:00	15:30	16:00
dition of	furnace				charge, finish13:19-	ish13:19-+	← melting				
-	ູ່			760	760 740	720	084	8 <u>2</u> 2	180	790	062
ion	Na3/hr	264		711	117	117	711	117	117	711	117
	aan Aq	165	estimated	35	35	35	35	35	35	35	35
uir temperature	ູງ			ambience	ambience	ambience	ambience	ambience		ambien	anbience (
	nin Aq	279.4		ଡି	60	. 69	09	09	8		60
	書 AG			-	-1	-1-		•		-	ĩ
gas		-							-		
Analviical data of flue eas	U C	Incide	nside diameter of chimney.	f chimev	477 mm						
Flue duct NOX conc.	Ditto					87	28	88			ଝ
CO CONC.	8-8					< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
CO2 CONC.	<del>2</del> 9					7.0	7.0	2.0			7.3
02 conc.	ઝ્લ					6.8	6.7	6.7	6.7	5.6	6.5
	g/Nm3							0.13			
e	S S					022	840	858	880	833	893
Gas velocity	s/u				-	12.0	14.5	15.6	17.0	17-0	17.0
Gas quantity	Na3/hr		-			1,400	1,600	1,700	1,800	908 1	1,800
quanti	ty Nn3/hr					1,700	1,700	1,700	1,700	1,700	1,700
N0x conc.(02 5%)	D D D D					32	31	31	31	31	32
	kg/hr					0.08	0.09	0.10	0.10	0.10	0.11
	kg/hr							0.23			
The pattern of	standar	ern of standard operation.	ų.							·	-
1001					• .			Size	5	combustion chamber	lber
								M		3,960 700	
	<u>G</u>	ırge						Ω	:	1,715.000	周
Gas consumption		Melting						H		3,860 mm	
			Siudge					Volume of	Volume of chamber	26.2 23	<b>a</b> 3
			remova!	Discharge				Load of c	Load of c/c :rating		100,000 kcai/m3hr
				••••			-	Load of c	Load of c/c : normal		40.000 kca1/#3hr
		;	;	Molding				c/c : Con	c/c : Combustion chamber	hanber	
		4 C H	- -	י קר אי							

{ Moiding 0.109

> 0.234 ž

0.65 ť,

Gas consumption ratio 0

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# 22.2 Aluminum Melting Furnace (2nd survey)

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23.	Food	Products	Factory
	Boiler	No.2	

No.65-2						-					
Name of establishment				Type of fa	acility :	Type of facility : No.2 water tube	• tube	Date		Weather	
No.65 Food Products F	ucts Factory			boiler fo	boiler for prosessing	0 <u>8</u>		October 31,1990	1,1990	41	fair
Sampling time		(Rating)	11:00	11:30	12:00	12:30	13:00	13:30	13:50	14:50	15:15
Steam quantity	ton/hr	45.0	20.4	19.5	22.8	22.8	22.8	21.6	36.0	36.0	20.4
Steam pressure	kg/cm2g	14.0	11.5	12.0	10.9	10.9	10.9	10.8	12.0	11.6	11.8
Steam temperature	c.	saturated	saturated	saturated	saturated	saturated	saturated	saturated	saturated	saturated	saturated
Feed water temp.	ຸງ 		16	38	8	86 86	<u> 8</u> 6	<b>86</b>	96	2.6	89
Fuel Consumption #	hiter/hr	3,074	2,800	2,800	2,800	2,800	2.800	2,800	4.500	4,500	2.800
Heavy oil Pressure	kg/cm2g		11.0	0.11	11.0	11.0	11.0	11.0	13.0	13.0	13.0
Atomize press.	press.kg/cm2g	steam	11.5	11.5	11.5	11.5	11.5	11.5	11.8	11.0	11.0
Temperature	2°		66	<u>98</u>	66	66	66	88	88	16	26
Comb. air temperature	<u> </u>		21/85	22/90	23/90	23/90	23/90	25/91	24/120	25/120	27/100
Flue gas temp. A/H in/out	с Ф		280/205	275/205	280/205	280/205	280/205	280/207	352/262	370/250	265/200
Air press. Wind box	(man Ac		105	105	106	106	106	110	370	270	66
Furnace pressure	and Aq		-	•	1	•	,		1		1
			1 normal	normal operation.					1 max. Load	Load	1 low air
* : Consumption was mer	assured by	as measured by float level of tank.	e) of tank			÷					ratio

5 Analytical data of flue gas ŝ

Analytical data of flue ga	gas	Inside	diameter of	chimney:	1,677 mm	ŧ.					
NOX CONC.	bpm		1 165 163	163	182	168	188	178	205	203	172
CO conc.	२२		< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
CO2 conc.	<del>}4</del>		9.8	9.8	10.5	10.0	11.4	10.8	10.5	12.5	10.8
02 conc.	~		7.4	1.7	5.4	6.4	6.1	6.0	5.2	4.8	5-5
PM conc.	8/Nm3			-				_		0.21	
Temperature	ູ່		180	175	185	185	190	180	235	242	130
	a/s		4.1	4.1	4.1	4.1	4.1	4.11	7.9	7.9	4.4
Gas quantity	Na3/hr		13,700	13,900	13,600	13,600	13,400	13,700	23,600	23, 300	14.400
2	Na3/hr		41,800	40,900	36,400	38,900	35,300	37,900	57,800	56.400	36,700
	Mdd		194	188	187	184	187	190	208	200	178
NOX emission	kg/hr		4.6	4.7	5.1	4.7	5.2	5.0	9.9	9.7	5.1
S02 emission	kg/hr		160	160	160	160	160	160	260	260	160
PM emission	kg/hr									4.9	

amber 36.7	
Load of c/c :rating 820,000 kcal	kcal/#3hr
Load of c/c :normali 750,000 kcal	al/m3hr
c/c : Combustion chamber	

		$\widehat{}$
		>
		ы
heavy oil burner installed. Lessi oil is used when start-up the hoiler.	butane sa is used for pilot burner. Rurner : R 2 u Mark 'V' stomiser	Babcock & wilcox ( de Mexico, S.A. DE C.V. )
<u>م</u> ، د	?. <u>∽</u> a	1. 201 1. 201 1. 201
5	Ses.	
1 heavy Diesel	Butane	Boiler

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Veather fair			_	-																															on chamber	4.700 305		4.156 200	4,156 am 8,534 mm	4,156 and 8,534 nat 166.7 al3
26,1990						· ·																													Size of combustion chamber	5				f chamber
Date   September			47	8.8	345	4,700	8-5	5.8	105	30	195	317	061	280	130	73	2	( <b>B</b>		0.05	1.1	6.4		176	6.1	100	500		3.1	197	30	710	-		S					Volume
ter t	7:00 17:30					4,700 4,7					195			280			2	₩2(1,000 × 2,400		V 		6.1		-			66,200 67,500		3.1			-	-					-		
senera	16:30					4,700					195	317	190	280	130	73	2	. 2.4 10(1			11.4	5.5		176			63,600		3.1	248	0.50	2/10		• :	4					
Type of fac boiler for	15:30		61	28.8	345	5,400	5.0	6.0	105	30	190	315	190	310	145	80	6	° of durt:	5	< 0.05	12.0	4.3	0.41	178	16.9	61,800	65,600	320	2.5	727	1010	510	5	- (J	3	×0,			uo	on rs)
	8	41,800				5,400	5.0	0.9	105	8	190	315	190	310	145	8	e	Size	242	< 0.05	12.0	4.3	_	178	16.9	61,800	65,600	320	2-2	227	10 010	310	Amerating condition	0-zas hirner)		2 <sup>2</sup> /0			installation condition	tion condition 3-gas burners)
	(Rating)			30				steam										·								2				-					- 1 - 1	j)) 				
inks Factory		₹	ton/hr	Kg/cm28	ပ	li i ter/hr	kg/cm28	ss.kg/cm2e	ပ္	р. С	ູ່	ູ. 	ູ	am Aq	End Ag	men Aq	titita Ao				3€	<del>2</del> 4	S/NE3		S/m K		17 17	╉	×		1 K8/ RF	K8/nr	R8/hr	(4-v)		<b>▲</b>			Burne	Burner (3-oil
lishment oholic Dr		city		sure	erature	2	Pressure	15	Temperature	WH inlet	[++]	A/H inlet			essure	A/H inlet	A/H outlet	data of fluk	Flue duct   N0x conc.	CO CONC.	CO2 CONC.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantit	l gas quanti	AVH inlet Temperature	UZ CONC.	12 24)	uo uo	on	c	•						
Name of est No.47 A	Sampling time	Power capacity	Evaporation	Steam pressure	Steam temperature		Heavy oil			Comb. air		Flue gas	temp.	Air press. Wind box	Furnace pressure	Flue gas	•	Analvtiral	Flue duct				·		-		Theoretical	A'H INIet		NUX CONC. (UZ 2%)	NUX CHISSION	NOT CHIESSION	PM etaission				•		- 	· ·

# 24. Alcoholic Drinks Factory Boiler No.2

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#### 25. Public Bathhouse Boiler No.1

Name of es	Name of establishment				Type of fa	acility:	Type of facility : No.1 smoke tube	e tube	Date	<u>-</u> -	Weather	
No.52	Public Bathhouse	G			boiler				November 19,1990	1990		fair
Sampling time	inte		(Rating)	11:00	11:30	12:00	12:30	13:00	13:30			
Steam quantit	tity	ton/hr	1.56	1.25	1.00	0.80	0.64	0.51	0.41			
Steam presser	ser	kg/cm2g	10.5	5.4	5.0	5.2	5.0	5.3	5.2			
Steam temperature	erature	ູງ		saturated	saturated	saturated	saturated saturated saturated saturated saturated saturated	saturated	saturated			
Feed water temp.	temp.	ູ່				1		1				
Fuel	Consumption	l i ter/hr	140	100	100	1001	100	100	100			
Heavy oil	Pressure	kg/cm2g		-		ł	-	•	-			
	Atomize press.	ress.kg/cm2g	steam	ŀ	-		•	•				
	Temperature	_ى د		80	80	80	80	8	8			
Comb. air	Comb. air temperature	ç		and i ence	arrbience	ambience	ambience lambience ambience ambience ambience ambience	ambience	ambience			
Flue gas t	Flue gas temperature	Ĵ,			•	170	160	172	170			
Air press. Wind box	Wind box	man Aq		natural draft	raft							
Furnace pressure	essure	ann Ac		-	-1	<b>1</b> -	-	-	•			

	r	1	<del>، س</del>	r	r	<u>۲</u>	<b>—</b>	-	r	~~~		·~~~	÷	1 1			-	ř
	125	0.20	5.6	11.3		170	4.1	1.600	2,200	206	0.41	5.8			Size of combustion chamber	Diameter 610 mm	L 3.000 📴	Value of about a 0 00 -0
	120	0.35	5.9	10.3		172	4.2	1.600	2,000	179	0.39	5.8			Ļ			
-	125	0.15	7.1	8.8	0.15	160	3.6	1.400	1.700	164	0.36	5.8	0.21			S.A.		
550 BH	148	0.05	6.2	10.3		170	4.1	1,600	2,000	221	0.49	5.8			rner	E MEXICO, S		
r of chimney:	145	< 0.05	6.6	10.3		8	4.0	1	2,000	217	1	•			omizing oil bur	UTHERS WELLS DE	1/month	
Inside diameter of chimney:			-												matural dralt steam atomizing oil burner	Boiler manufacture : STRUTHERS WELLS DE MEXICO, S.A.	nsumption: 4.500	
as	Inga	<b>8</b> 4	<b>3</b> 2	8	g/Nm3	ູ່	m/s	NB3/hr	Nm3/hr	DOR!	kg/hr	kg/hr	kg/hr		1 matura	Boiler I	Fuel col	
Amalytical data of flue gas	N0X CONC	C0 conc.	CO2 conc.	02 conc.	PM conc.	Temperature	Gas velocity	Gas quantity	heoretical gas quantity	(02 5%)	ion	ion	on					
Analytica	Chimney						<b>.</b>		Theoretic	N0x conc. (02 5%)	NOX emission	S02 emission	PM emission					

<u>amicer</u> <u>510 mm</u> <u>3,000 mm</u> <u>1,000 mm}</u> <u>1,000 mm</u> <u>1,</u>

No.52-1