THE UNITED MEXICAN STATES

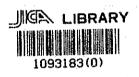
THE STUDY ON THE AIR POLLUTION CONTROL PLAN OF STATIONARY SOURCES IN THE METROPOLITAN AREA OF THE CITY OF MEXICO

FINAL REPORT APPENDIX

SEPTEMBER 1991

JAPAN INTERNATIONAL COOPERATION AGENCY





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1. Results of Detailed On-site Questionnaire at 97 Establishments

1. Results of Detailed On-site Questionnaire at 97 Establishments

(1) Objectives

A total of 97 establishments were selected for the no-site questionnaire survey: 82 factories, 11 bathhouses, 2 hotels, one sports center, and one hospital. Breakdown of the 82 factories by types and scales is shown in Table 1.1.

Table 1.2 (1) and 1.2 (2) show the names of the 97 establishments with the date of visit for survey.

(2) Results

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The results of the survey are presented in the following tables by each establishment in the order of the visit.

1 -

	Number	of Establ	ishments ł	by Scale
Type of Industry	Large	Medium	Small	Total
Food	5	1	3	9
Drinks	1	~	-	1
Leather	-	1		1
Paper and its products	5	6		11
Chemical products	9	5	4	18
Petrochemical products	4	1	2	. 7
Petroleum refinery	1	[_ ·	-	1
Coal and petroleum products	1	· •	1	2
Rubber and plastic products	2	2	1	5
Non-metallic mineral products	9	-	1	10
Basic metals	1	3	3	7
Metal products	2	3	-	5
Transportation equipment	1	_		1
Precision instruments	-	1	- .	1
Other manufacture	1	-	-	1
Electric power	2	-		2
Factories Total	44	23	15	82
Public bathhouse		11		11
Sports center		1		1
Hotel		2		• 2
Hospital		1		1
Service and Commerical Total		15		15
Total				97

Table 1.1 Number of Establishments Surveyed by Types and Scales

- 2 -

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Visit No.	Name of Establishment	Type of Industry	Date of Vis
1	FCA. DE JABON LA CORONA, S.A.	Chemical	June 12, 1990
2	POLAQUMIA, S.A. DE C.V.	Checmial	
3	PROCTOR & GAMBLE DE MEXICO, S.A. DE C.V.	Chemical	
4	BANOS RIO BLANCO	Bothhouse	
5	HARINAS Y GRASAS XALOSTOC, S.A.	Food	June 13, 1990
6	POLIESTERES BAYER, S.A.	Petrochemical	
7	CIBA GEIGY MEXICANA, S.A. DE C.V.	Chemical	
8	FIBRAS SINTETICAS, S.A. DE C.V.	Petrochemical	
9	BANOS COSTA DEL SOL	Bathhouse	
10	BANOS COACALCO	Bathhouse	
11	PLANTA DE ASFALTO D.D.F.	Coal/petroleum product	June 14, 1990
12	INDUSTRIAS DE HULE GALGO	Rubber/plastic	
13	VIDRIERA MEXICO, S.A.	Non-metallic mineral	
14	UNIROYAL, S.A. DE C.V.	Rubber/plastic	
15	CENTRO DEPORTIVO CHAPULTEPEC, A.C.	Sport center	
16	KIMEX, S.A. DE C.V.	Petrochemical	June 15, 1990
17	INDUSTRIAS RESISTOL, S.A.	Checmial	•••••••••••••••••••••••••••••••••••••••
18	NOVAQUIM, S.A.	Chemical	
19	ALCOMEX, S.A. DE C.V.	Metal product	
$\frac{1}{20}$	FUNDICION CHORNE	Basic metal	June 18, 1990
21	BANOS TACUBAYA	Bathhouse	June 10, 1990
22	BANOS NAUCALPAN	Bathhouse	
23	NUEVA FABRICA NACIONAL DE VIDRIO	Non-metallic mineral	
		Chemical	June 19, 1990
24 25	PENNWALT, S.A. DE C.V. GENERAL PRODUCTOS CO., S.A. DE C.V.	Chemical	June 19, 1990
	IDEAL STANDARD, S.A.	Non-metallic mineral	
26	FCA. DE PAPEL SAN RAFAEL	Paper	June 20, 1990
27		Paper	June 20, 1990
28	FCA. DE PAPEL MEXICO	Chemical	
29	HACO MEXICANA, S.A.		
30	CIA. PAPELERA EL FENIX, S.A.	Paper	T
31	VITRO FIBRAS, S.A.	Non-metallic mineral	June 21, 1990
32	PASTEURIZADORA LA LAGUNA	Food	
33	VIDRIO PLANO DE MEXICO, S.A.	Non-metallic mineral	
34	PAPELERA IRUNA, S.A.	Paper	June 22, 1990
35	METALURGICA ALMENA	Basic metal	
36	BANOS LA NARANJA	Bathhouse	
37	BANOS XOLALPA	Bathhouse	
38	BANOS GABIS	Bathhouse	
39	MEDIDORES AZTECA, S.A.	Basic metal	June 25, 1990
40	SALICILATOS DE MEXICO	Preciion instrument	
41	CEMENTOS ANAHUAC, S.A.	Non-metallic mineral	
42	PAPELERA ATLAS	Paper	
43	BANOS LUPITA	Bathhouse	
44	PORCELANITE, S.A.	Non-metallic mineral	June 26, 1990
45	PRODUCTOS SAN CRISTOBAL	Paper	
46	CIA, HULERA TORNEL	Rubber/plastic	
47	CERVECERIA MODELO, S.A. DE C.V.	Drinks	· .
48	BANOS TACUBA	Bathhouse	l
		· · · · · · · · · · · · · · · · · · ·	

Table 1.2	(1)	Names	of	Establishments	for	On-site	Questionnaire	(No.1)
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Visit No.	Name of Establishment	Type of Industry	Date of Vist
49	CARTONAJES ESTRELLA	Paper	June 27, 1990
50	FUNDIDORA Y LAMINADORA ANAHUAC	Basic metal	
51	ACEROS AHUEHUETES	Basic metal	Ì
52	BANOS SANTIAGO	Bathhouse	
53	ACEROS CORSA	Metal product	June 28, 1990
54	DU PONT	Chemcial	
55	INDUSTRIAS NYLBO	Metal product	
56	FUNDICIONES FIERRO-MEX	Metal product	
57	REFINERIA 18 DE MARZO	Petroleum refinery	June 29, 1990
58	ANDERSON CLAYTON, S.A.	Food	
59	FUNDICIONES DE HIERRO Y ACERO	Metal product	
60	FUNDIDORA DE ACEROS TEPEYAC	Basic metal	
61	FORD MOTOR COMPANY	Transport equipment	July 2, 1990
62	QUIMICA LUCAVA, S.A.	Chemical	
63	INDUSTRIAS UNIDAS, S.A.	Non-metallic mineral	
64	3M DE MEXICO, S.A.	Other	
65	ANDERSON CLAYTON & COMPANY, S.A. DE C.V.	Food	July 3, 1990
66	ESMALTES Y COLORANTES, S.A.	Non-metallic mineral	
67	ACEITES Y JABONES, S.A.	Cheemial	
68	VIDRIERA ORIENTAL, S.A. DE C.V.	Non-metallic mineral	
69	TERMOELECTRICA DEL VALLE DE MEXICO	Electric power	July 4, 1990
70	TERMOELECTRICA JORGE LUQUE	Electric power	
71	FUNDICION DE FIERRO Y METALES	Basic metal	1
72	P.P.G. INDUSTRIAS DE MEXICO	Chemical	
73	ORGANIZACION QUIMICA MEXICANA	Food	July 5, 1990
74	PRODUCTOS NUTRICIONALES	Food	-
75	POLIMEROS (POLIESPUMAS DE MEXICO)	Petrochemical	
76	EMPAQUES DE CARTON UNITED	Paper	
77	SILICATOS Y DERIVADOS, S.A.	Checmial	July 6, 1990
78	GANADEROS PRODUCTORES DE LECHE PURA	Food	
79	HOSIPTAL 20 DE NOVIEMBRE ISSSTE	Hospital	
80	HOTEL DEL ANGEL	Hotel	
81	MA. ISABEL SHERATON	Hotel	
82	SOSA TEXCOCO, S.A.	Chemical	July 9, 1990
83	AMERICAN TEXTILE, S.A. DE C.V.	Petrochemical	
84	MANUFACTURAS GARGO, S.A. DE C.V.	Paper	
85	INDUSTRIAL PAVIMENTADORA, S.A.	Coal/petroleum product	
86	HULE INDUSTRIAL, S.A.	Rubber/plastic	July 10, 1990
87	POLIRESINAS HUETTENES ALBERTOS, S.A.	Petrochemical	
88	AGA DE MEXICO, S.A. DE C.V.	Chemical	
89	TAMM Y CIA, S.A. DE C.V.	Petrochemical	
90	CIA. HULLRA ATLAS, S.A.	Rubber/plasitc	July 11, 1990
91	CORRUGADO Y FIBRA, S.A.	Paper	
92	SALES INDUSTRIALES DE MEXICO	Checmial	
93	TENERIA TEMOLA, S.A. DE C.V.	Leather	
94	SABRITAS, S.A. DE C.V.	Food	
95	LA HACIENDA, S.A. DE C.V.	Food	July 12, 1990
96	EMPAQUES Y CARTON CORRUGADO, S.A.	Paper	
97	DOW QUIMICA MEXICANA, S.A.	Checmial	

Table 1.2 (2) Names of Establishments for On-site Questionnaire (No.2)

		No. 1	Date of Visit	Jun	e 12, 1990			
Name of Establishment	FABRICA DE JABON	LA CORONA, S.A.	in betrefor server and a server an ender a server and a se		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
Type of Industry (Product)	Chemical (soap, detergent, cooking oil)							
Scale of Factory	Large	Large Number of Employees 2,777						
Annual Sales or Production	570,000,000 pesos/yr							
Kind of Fuel, Consumption	nd of Fuel. Consumption Natural gas (211.3 pesos/m ³)							
and Price	6,440,000 m ³ /mon	1,360,770,000 pesos/mon						
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks			
Water tube boiler	15 ton/hr	Natural gas	1,400 m ³ /hr		3 units			
Water tube boiler	15 ton/hr	Natural gas	1,130 m ³ /hr		2 units			
Water tube boiler	20 ton/hr	Natural gas	1,725 m ³ /hr					
Water tube boiler	6 ton/hr	Natural gas	416 m ³ /hr					
Water tube boiler	5 ton/hr	Natural gas	382 m ³ /hr					
Heat medium boiler	3.5 ton/hr	Natural gas	112 m ³ /hr		4 units			
Heat medium boiler	35 ton/hr	Natural gas	45 m ³ /hr	<u> </u>				
Heat medium boiler	12 ton/hr	Natural gas	336 m ³ /hr		,			
Heat medium boiler	5 ton/hr	Natural gas	45 m ³ /hr		L			
Heat medium boiler	1.5 ton/hr	Natural gas	56 m ³ /hr	<u> </u>				
Dryer	10 ton/hr	Natural gas	350 m ³ /hr					
Dryer	10 ton/hr	Natural gas	350 m ³ /hr		2 units			
Dryer	60 ton/hr	Natural gas	182 m ³ /hr					
Outline of the Facility Surveyed		ledium Boiler	3.5 ton/hr					
Capacity of the facility :	3.5 ton/hr							
Fuel consumption :	112 m ³ /hr							
Heat Medium and temperature :	Oil, 260 - 280 °C							
Fuel temperature :	Normal							
Combustion air temperature :	Normal	-1						
Operating time :	24 hr/day, 144 hr/we	ек						
Stack diameter and height :	0.4 mφ x 15 m							
Remarks :	Most of combustion fac	cilities are aged ones.						
	Ou	tline of Survey Result		<u> </u>	······································			
Present pollution control measures	: Cyclones attache	d to dryers. Natural gas use	d.					
Future plan for pollution control	None	<u>_</u>	······					
Present energy-saving measures	: None							
				·····				
 This is a large plant having m secured for reconstruction or 			o each others. Therefore	, there a	re little space			
 Exhaust gas analysis was ma content was relatively high at and may be increased to 829 was burnt, no soot was generation 	8.8% and the exhaust g 6 by means of combustic	as temperature also high at 3	30°C. Namely, the effici	ency wa	s around 76%			

		No.	.2 Date of Visit	June 12, 1990					
Name of Establishment	POLAQUMIA, S.A. DE C		anga padamang pang ang kanang kana	and the property of the second s					
Type of Industry (Product)	Type of Industry (Product) Chemical (herbicide, insecticide, glycol ester)								
Scale of Factory	Medium	Medium Number of Employees 245							
Annual Sales or Production	42,750,000,000 pesos/	/yr	· · · · · · · · · · · · · · · · · · ·	<u></u>					
Kind of Fuel, Consumption	Natural gas (211.3 peso	os/m ³)	······································	· · · · · · · · · · · · · · · · · · ·					
and Price	172,000 m ³ /mon 363,0								
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remarks					
Water tube boiler	5 ton/hr	Natural gas	272 m ³ /hr	25 Alternate use					
Water tube boiler	4 ton/hr	Natural gas	227 m ³ /hr	25					
Heat medium boiler	Small capacity	Natural gas	47 m ³ /hr	25					
		·	-						
	· · · · · · · · · · · · · · · · · · ·								
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		<u> </u>					
				+					
	<u> </u>								
·	·								
				<u> </u>					
Outline of the Facility Surveyed	Smoke tube	e boiler	5 ton/hr (steam)	<u> </u>					
Evaporatin rate	: Rating: 5 ton/hr								
	Normal: 3.3 ton/								
	: Steam pressure:		1						
Fuel consumption	Normal: 272 m ³								
Fuel pressure	: 340 mmAq								
Combustion air temperature	: Normal								
Combustion exhaust gas compositio	on : O ₂ - 5%, CO ₂ - 9	J.3%, CO - 0.15%, H ₂ (O - 7.9% (as measured b	v the plant)					
Stack	: 0.5 mo x 5.5 m		·						
Operating hour : 24 hr/day, 144 hr/week									
	Outli	ine of Survey Result		······································					
Present pollution control measures	: Natural gas used	······································		,,,,_,_,_,_,_,,_,,_,,,,,,,,,,					
Future plan for pollution control	: None	······································							
Present energy-saving measures	: None								

1. This is a relatively small plant producing herbicide and odor of chlorine was detected in the plant. Fuel used is entirely natural gas.

 The fire tube boiler has been installed 25 years ago. The O₂ content was 5.2%, with Bacharach No. 5 in spite of natural gas burning. The exhaust gas temperature was relatively low at 197°C. Overall renewal of facilities or at least renewal of all burners is necessary. (Smoke was observed visually.)

		No.3	3 Date of Visit	June	12, 1990		
Name of Establishment	PROCTOR & GAMBLE (DE MEXICO, S.A. DE 7	Ċ.V.		and a state from the second		
Type of Industry (Product)	Chemical (soap, detergent)						
Scale of Factory	Large (One of ten largest plants) Number of Employees 500						
Annual Sales or Production							
Kind of Fuel, Consumption	Heavy oil (L) 696 kl/mon (175.57 pesos/l) 122,322,000 pesos/mon						
and Price		an (traine branny	Indianation bearing				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
Water tube boiler	22.7 ton/hr	Heavy oil (L)	1,125 l/hr	12	AT REAL PROPERTY AND INCOME.		
		·					
-							
•							
			<u></u>				
		 					
·					· · · ·		
O Was of the Facility Ourroyed	Water tube	hailar	22.7 ton/hr (steam)				
Outline of the Facility Surveyed			22.7 Ion/nr (steam)				
Evaporation rate	: Rating: 22.7 ton/hr : Normal: 19 ton/hr	· .					
First concumption							
Fuel consumption	: Rating: 1.125 l/hr : Normal: 1,000 l/hr						
Channe Propouro	: Normal: 1,000 //nr : 9.2 kg/cm ² g						
Steam pressure Fuel pressure	: 9.2 kg/cm²g : 2.12 kg/cm²g						
Temperature	: 2.12 kg/chi-g : 115°C						
Atomizing steam temperature	: 115°C						
Combustion air temperature	: Normal						
Stack	: 1.2 mo x 15 m						
Operating hour	: 24 hr/day, 157 hr/w	eek					
oporaning noon		ne of Survey Result		· · · · · · · · · · · · · · · · · · ·			
Present pollution control measures		y oil (H) to heavy oil (I	<u>L)</u>				
Future plan for pollution control	: None						
Present energy-saving measures	: None						
The sent one of the sent of th		,,,,,	· · · · · · · · · · · · · · · · · · ·	,			
1. The recording peprs of instru	ments for boiler monitoring	g have gradations in p	ercent scale. It is advisable	to change	to the		

 The recording pepts of instruments for bolier monitoring have gradations in percent scale. It is advisable to change to the actual measuring unit so that everyone concerning operation can understand easily. Besides, the instrument panel was small.

2. The Bacharach value was No. 4, which is not so bad a value. This is possibly due to satisfactory atomized steam pressure and oil pressure. It is necessary, however, to install an atomized steam pressure gauge and to clean the nozzle frequently.

3. The boiler outlet temperature of 242°C and the O₂ content of 4.3% are generally approprile.

4. Boiler operation is under satisfactory control, but better result will be achieved by paying more attention to maintenance.

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		No. 4	Date of Visit	June 12, 1990			
Name of Establishment	BANOS RIO BLANCO	And the second	Constant a summittee of the summer and the provident former	ŢĦĸŢĸĬĸ <mark>Ŀĸĸĸĸ</mark> ŢŖĊŢĦĸĔĸĸĸŎĬĊĊŎŢŎŢŎĬŎŎĬŢĦĸĸĸĸĸĸĸĊĊĸŢĸŎĬĬĬĊŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎŎ			
Type of Industry (Product)	Bathhouse	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	······································			
Scale of Factory	Small Number of Employees						
Annual Sales or Production							
Kind of Fuel, Consumption	Diesel	·		· · · ·			
and Price	1999 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -			and the former of the second distance of the			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remarks			
Smoke tube boiler	<u></u>	Diesel		Alternate use every another			
Smoke tube boiler		Diesel		week			
······							
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·					
	+	+		1-1			
· · · · · · · · · · · · · · · · · · ·							
· · · · · · · · · · · · · · · · · · ·							
Outline of the Facility Surveyed	Smoke tub	ho hoiler (steam)				
Fuel temperature	: Normal		<u></u>				
Combustion air temperature	: Normal						
Stack	: 0.4 mo x 16 m						
	• •••••••••••••••						
		·····					
		line of Survey Result					
Present pollution control measures		remover on top of the stat	<u></u>				
Future plan for pollution control	: None						
Present energy-saving measures	: None	<u>,</u>					
1. Primary air for boiler is natu	ural draft and the opening	is satisfactory.					
-	-	-					
2. Air was entering between the	ŗ	-					
3. Diesel oil atomized by steam	1. The burner is desired to	be renewed because its	performance was not satis	sfactory.			
4. The boiler body was damage	d in many places and desir	red to be renewed.					
5. Upon boiler renewal, it is adv	vised to preheat air and su	upply water by utilizing ex	chaust gas.				
6. The boiler surface temperatu	•		·) on the bigh			
temperature section of 90°C		loopoury for the time 23.	ing to upply now invaluation				
 As an unexperienced person adjust air quantity and damp Measured value: O₂ - 4.8%, 	per as required.		•	also necessary to			
4							

		No. 5	Date of Visit	June	13, 1990		
Name of Establishment	HARINAS Y GRASAS			<u>La ve de a recenter de ante</u>	<u></u>		
Type of Industry (Product)	Food (feeds : processe	d bone, blood, and greas	e of animals)				
Scale of Factory	Small Number of Employees 54						
Annual Sales or Production			· · · · · · · · · · · · · · · · · · ·				
Kind of Fuel, Consumption and Price	Heavy oil (L) 33.6 kl/n	non (178 pesos/l) 5,9	980,800 pesos/mon	······			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
Water tube boiler	2.5 ton/hr	Heavy oil (L)	250 l/hr	25	a gang ang ang ang ang ang ang ang ang a		
Water tube boiler	Spare						
· ·							
·							
				- - -			
					<u></u>		
					<u></u>		
Outline of the Facility Surveyed	Water tub	a hoiler (2.5 ton/hr (steam)				
Evaporation rate	: Rating: 2.5 ton/hr						
Evaporation rate Fuel consumption	: Rating: 2.5 0////	Normal: 100					
Steam pressure	: 8.0 kg/cm ² g	Nomiat. 100	Vi K				
Fuel temperature	: 80°C						
Atomizing medium	: Steam						
Combustion air temperature	: Normal						
Stack							
Operating hours	: 0.92 mφ x 12 m : 7 - 8 hr/day						
operating nours	. To throay						
	Out	line of Survey Result					
Present pollution control measures			as treated as boiler comb	oustion air			
Future plan for pollution control	: None						
Present energy-saving measures	: None		<u></u>	· · · · · · · · · · · · · · · · · · ·			
Trobolit enoigy outing induction		· ····································	· · · · · · · · · · · · · · · · · · ·				
1. Instruments necessary for b	oiler operation were not o	omplete; data recorder a	and steam flow meter wer	e not provide	d.		
•	•			-			
2. The front door of the boiler v	vas deformed and kept op	en. The measured resul	It of exhaust gas includes	O2 content a	l 14%,		
temperature at 314°C, and E	Bacharach of No. 9. Air er	ntry is considered large.	The door should be repai	red as early a	is possible		
in view of energy saving an		the exhaust gas temper	ature is expected to rise I	lurther after r	epair of the		
door, installation of the damp	er is recommended.						
3. The flame state indicates ex	cess in air and needs to be	e adjusted.					
4. The heat insulation state of	the furnace wall was satis	sfactory, with temperatur	e being 61°C at ceiling				
		• •	•				
5. Guidance was given on the n	nethod of calculating the va	apor generation amount.					
•			•				

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		. 1	No. 6	Date of Visit	June	13, 1990		
Name of Establishment	POLIESTERES BAYER, S.A.							
Type of Industry (Product)	Petrochemical (polyester fiber, agricultural chemicals)							
Scale of Factory	Small Number of Employees 89							
Annual Sales or Production								
Kind of Fuel, Consumption and Price	Diesel 8.5 kl/mon	- <u>-</u>						
Type of Combustion Facility	Capacity	Kind of F	uel	Fuel consumption	Age	Remarks		
Heat medium boiler	700,000	Diesel		40 l/hr	15			
	kcal/hr							
					_			
	· · · · · · · · · · · · · · · · · · ·	<u> </u>			_			
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					++			
· · · · · · · · · · · · · · · · · · ·		<u> </u>				*****		
Outline of the Facility Surveyed	Heat medium boiler	700,000 kcal/hr	<u></u>					
Heat quantity	: Rating: 700,000 kca		250,000 kc	al/hr				
Fuel consumption	: Rating: 65.5 Vhr,	Normal: 10 Vhr						
Temperature of medium to be				н. 1				
heated	257°C	· .						
Steam pressure	: 3.5 kg/cm ² g							
Fuel temperature	: Normal							
Combustion air temperature	: Normal		1					
Stack	: 0.28 mộ x 7 m	un ale						
Operating hours	: 24 hr/day, 168 hr/w	leek						
	Outli	ne of Survey Res	ult					
Present pollution control measures	: None	ne of ourvey nes	un					
Future plan for pollution control	: None			· · · · · · · · · · · · · · · · · · ·				
					·	···-		
Present energy-saving measures	: None		·					
1. The heat medium (oil) is circul	ated in the boiler to raise	its temperature o	f 240°C by	13°C.				

2. Hydrocarbon produced from the production process is treated by control devices.

		Π	No. 7	Date of	Visit	June 13, 1990		
Name of Establishment	CIBA GEIGY MEXICAN	VA, S.A. DE C.V.	alan dagga dagga pergapakan kari tangga pergapakan kari tang	in in the second se	, and the first of the second se	y ya katan da katan katan katan kata katan k		
Type of Industry (Product)	Chemical (medicines, c	lyeing agent, insection	cide)	·		······································		
Scale of Factory	Large Number of Employees 1,200							
Annual Sales or Production								
Kind of Fuel, Consumption	Diesel (513 pesos/l)							
and Price	18,900 limon 9,700,0							
Type of Combustion Facility	Capacity	Kind of Fuel		nsumption	Age	Remarks		
Once-through boiler	1.5 ton/hr	Diesel		92 l/hr				
Once-through boiler	1.5 ton/hr	Diesel		92 l/hr		1 - 2 units in operation		
Once-through boiler	1.0 ton/hr	Diesel		80 l/hr				
Once-through boiler	0.5 ton/hr	Diesel		40 i/hr				
	·]							
Outline of the Facility Surveyed	Once-throu		1.5 to	n/hr (steam)			
Evaporation rate	: Rating: 1.5 ton/hr,	Normal: 92 l/hr						
Steam pressure	: 9.0 kg/cm ² g	100 A						
Fuel consumption	: Rating: 92 l/hr, 1	vormal: 92 l/hr						
Fuel pressure	: 15 kg/cm ² g	·						
Temperature	: Normal							
Combustion air temperature	: Normal							
Combustion exhaust gas	: O ₂ - 13.6%, CO ₂ -	10 to 12%, CO - 0.0	05% (as n	neasured by	the plan	t)		
composition								
Exhaust gas temperature	: 300°C (as measure	ed by the plant)						
Stack	0.4mφ x 15m							
Operating hours	: 16 hr/day, 96 hr/v							
		line of Survey Resu	lt					
Present pollution control measures	s : None							
Future plan for pollution control	: None							
Present energy-saving measures	: None	· · · · · · · · · · · · · · · · · · ·						

1. The factory is kept clean. No particular offensive odor was detected.

2. This is a vertical once-through boiler and the combustion air fan is also driven by a diesel engine. Vibration of the boiler is high. The exhaust gas O₂ content was 10.1%, with the exhaust gas temperature being at 250°C to indicate excess air combustion. The efficiency was relatively low at 79%. As the Bacharach value was No. 3, reducing the O₂ content slightly may achieve the efficiency of 80% or more.

		No. 8	Date of Visit	Jun	e 13, 1990
Name of Establishment	FIBRAS SINTETICAS, S	A. DE C.V.	<u>A Barring an Andreas an Andreas - Andrea</u>		
Type of Industry (Product)	Petrochemical (polyester	r fiber, nylon)			
Scale of Factory	Large	Number of Err	iployees	1,400	
Annual Sales or Production					
Kind of Fuel, Consumption	Heavy oil (H) (175.6 pe				
and Price		36,000 pesos/mon			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	40 ton/hr	Heavy oil (H)	3,142 l/hr	21	Alternate use
Water tube boiler	40 ton/hr	Heavy oil (H)	3,142 //hr	18	· · · ·
Smoke tube boiler	13 ton/hr	Heavy oil (H)	416 l/hr		
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			·		
Outline of the Facility Surveyed	Water tube	boiler 40 to	on/hr (steam)		
Evaporation rate	: Rating: 40 ton/h	r, Normal: 30 ton/hr			
Steam pressure	: 40 kg/cm ² g (42)				
Fuel consumption		hr, Normal: 3,142 l/hr	·		
Fuel pressure		mperature: 120°C			
Atomizing steam pressure	: 7.2 kg/cm ² g, Te	mperature: 120°C	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		
Combustion air temperature	: 161°Č	-			
Combustion exhaust gas compositio		+ 13%, CO - 0.25% (as me			
Combustion eshaust gas temperatu	ire : Recuperator outle	et 204°C (as measured b)	y the plant)		
Stack	: 1.97mø x 14m				
Operating hours	: 24 hr/day, 168				
		e of Survey Result			
Present pollution control measures		· · · · · · · · · · · · · · · · · · ·			
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·		
Present energy-saving measures	: Recuperator installe	ed .			

1. This is a tidy clean plant producing synthetic fibers of polyester and nylon.

2. The boiler was 18 years old, and the combustion control was satisfactory. The O₂ content was 2.8% and the Bacharach value was rather satisfactory at Nos. 4 to 5 in spite of heavy oil (H) burning.

3. The air preheater was also provided, with the final exhaust gas temperature as low as 238°C. The boiler efficiency was satisfactory at 86%.

		No. 9	Date of Visit	June 13, 1990
Name of Establishment	BANOS COSTA DEL	SOL	an lan sa mana sa ang anan ini ang anang ang ang ang ang ang ang ang a	a Energia Califacita Califacita de Califacita de Califacita de Califacita de Califacita de Califacita de Califa
Type of Industry (Product)	Bathhouse			
Scale of Factory	Small	Number of E	mployees	1
Annual Sales or Production		· · ·		· .
Kind of Fuel, Consumption	Heavy oil (L) (175.6	pesos/l)		
and Price	19,000 l/mon 3,340,	000 pesos/mon		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remarks
Smoke tube boiler	Unknown	Heavy oil (L)	107 l/hr	20 Alternate us
Smoke tube boiler	Unknown	Heavy oil (L)	107 l/hr	20 Alternate us
			· · · · · · · · · · · · · · · · · · ·	
		· · · · · · · · · · · · · · · · · · ·		····
Outline of the Facility Surveyed Evaporation rate	: Rating: Unknown		eam)	·
Operating hours	: 6 hr/day, 42 hr/w	eek Iline of Survey Result	*******	
Present pollution control measures		tune of ourvey fiesua		
Future plan for pollution control	: None			
Present energy-saving measures	: None			
Present energy-saving measures			· <u>·</u> ·····	
1. The boiler is installed in the t	hird floor of the bathhou	se. One boiler man is operat	ing the burner manually.	: · · · · ·
 The O₂ content was 7.4%, a the Bacharach value was hig equipment renewal, or at lease 	h at No. 7. Almost no sm	oke from the stack was obse	iler efficicency satisfacto rved. The boiler, which is	ry at 83%, except that 5 20 years old, requires
1		:	• • •	
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		No. 10	Date of Visit	June	13, 1990
Name of Establishment	BANOS COACALCO				
Type of Industry (Product)	Bathhouse		· .		
Scale of Factory	Small	Number of En	nployees		
Annual Sales or Production	·				
Kind of Fuel, Consumption	Heavy oil (L), 4.5 kl/r	mon, (176 pesos/l) 792,00)0 pesos/mon		
and Price Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	oupdony	Heavy oil (L)	11 l/hr	20	rionano
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Outline of the Facility Surveyed	Water tu	be boiler (stea	am)		
Atomizing medium Combustion air temperature		e: 4.0 kg/cm ² , Fuel tempera			
Stack	: Normal : 0.3 mộ x 10 m : 14 hr/day, 98 hr/	/week		÷.,	
	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/			· .	
Stack Operating hours	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/ Ou	Aweek utline of Survey Result			
Stack Operating hours Present pollution control measures	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/ Ou			· .	
Stack Operating hours Present pollution control measures Future plan for pollution control	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/ Ou s : None				
Stack Operating hours Present pollution control measures Future plan for pollution control	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/ Ou s : None : None : None pper part of burner, which	itline of Survey Result		mbustion	As a
Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O ₂ content was 11.9	: 0.3 mộ x 10 m : 14 hr/day, 98 hr/ Ou s : None : None : None pper part of burner, which 9%. A guidance was give	utline of Survey Result h admits entry of large quantit en to close this opening.	y of air not related to co	mbustion	. As a
Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O ₂ content was 11.5	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u S : None None None None None None None None Sone Sone	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the	y of air not related to co e entry of air.		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mo x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 0u S : None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the upresult, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mo x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 0u S : None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mo x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 0u S : None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mo x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 0u S : None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 14 hr/day, 98 hr/ 0u 15 None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 14 hr/day, 98 hr/ 0u 15 None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 14 hr/day, 98 hr/ 0u 15 None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 14 hr/day, 98 hr/ 0u 15 None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		
 Stack Operating hours Present pollution control measures Future plan for pollution control Present energy-saving measures 1. There is an opening on the up result, the O₂ content was 11.5 2. The measured exhaust gas te 3. Since the Bacharach value was 	0.3 mộ x 10 m 14 hr/day, 98 hr/ 14 hr/day, 98 hr/ 0u 14 hr/day, 98 hr/ 0u 15 None None	Itline of Survey Result h admits entry of large quantit in to close this opening. It rose further by reducing the e of steam in atomizer and poc	y of air not related to co e entry of air. or performance of burner		

Type of Industry (Product) Coal and petroleum product (asphalt mix) Scale of Factory Large Arnual Sales or Production Diesel 21.76 kl/day and Price Type of Combustion Facility Capacity Kind of Fuel, Consumption Diesel 21.76 kl/day and Price 1,360 l/hr Prote y klin 250 ton/hr Diesel 1,360 l/hr 3 Rolary klin 250 ton/hr Diesel 1,360 l/hr 3 Rolary klin 1,000 l/hr Image 1,000 l/hr Cutline of the Facility Surveyed Rotary klin for aggregate Rating :250 ton/hr, Normal: 200 ton/hr Cutline of the Facility Surveyed Rotary klin for aggregate Rating :250 ton/hr, Normal: 200 ton/hr Cutline of the Facility Surveyed Rotary klin for aggregate Rating :260 ton/hr, Normal: 200 ton/hr Cuel consumption Rating: :260 ton/hr Evel conserve :28 - 3.5 kg/cm²g Fuel temperature :00 thr Stack :1.7 kg/cm²g Combustion air temperature :1.7 kg/cm²g Combustion air temperature :1.7 kg/cm²g Combustion air temperature :1.7 kg/cm²g	Type of Industry (Product) Coal and petroleum product (asphalt n Scale of Factory Large Annual Sales or Production Diesel 21.76 kl/day Kind of Fuel, Consumption Diesel 21.76 kl/day and Price Diesel 21.76 kl/day Type of Combustion Facility Capacity Kind of 1 Rotary kiln 250 ton/hr Diesel 2 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 4 Rotary kiln 250 ton/hr Diesel 9 Outline of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/hr Normal: 200 ton. Fuel consumption : Rating: 1,360 l/hr : Normal: 800 - 1,000 l/hr Temperature of object to be heated : 140°C : Normal: 800 - 1,000 l/hr Fuel pressure : 2.8 - 3.5 kg/cm ² g : Normal Atomizing medium pressure : 800 - 155 mnAq : Outline of Survey F Combustion air pressure : 1.7 kg/cm ² g : Outline of Survey F Present pollution control measures : Fuel change, dust collection with Future plan for pollution control : Nore Present energy-sav	Number of Employees f Fuel Fuel consu 1,360 1,360 1,000	l/hr l/hr	Remarks
Scale of Factory Large Number of Employees Annual Sales or Production Diesel 21.76 ki/day And Price Type of Combustion Facility Capacity Kind of Fuel, Combustion Facility Capacity Kind of Fuel, Combustion Facility 2 Rotary kiln 250 ten/hr Diesel 1,360 //hr 3 Rotary kiln 250 ten/hr Diesel 1,360 //hr 2 Rotary kiln 250 ten/hr Diesel 1,360 //hr 2 Rotary kiln tor aggregate 1,300 //hr 1,300 //hr Dutline of the Facility Surveyed Rotary kiln for aggregate 1,400 //hr Evel consumption Rating 280 ten/hr, Normal: 200 ten/hr Evel consumption Rating 1,300 //hr Rating 2.8 - 3.5 kg/cm²g 280 - 1,000 //hr Evel consumption Rating 2.8 - 3.5 kg/cm²g Fuel pressure 1.7 kg/cm³g Combustion air temperature Normal Stack	Scale of Factory Large Annual Sales or Production Diesel 21.76 kl/day Kind of Fuel, Consumption Diesel 21.76 kl/day and Price Capacity Kind of Type of Combustion Facility Capacity Kind of 1 Rotary klin 250 ton/hr Diesel 2 Rotary klin 250 ton/hr Diesel 3 Rotary klin 250 ton/hr Diesel 4 Outline of the Facility Surveyed Rotary klin for aggregate Rating 250 ton/hr, Normal: 200 ton Fuel consumption Rating: 1,360 l/hr Fuel consumption Rating: 1,360 l/hr Fuel pressure 2.8 - 3.5 kg/cm ² g Fuel pressure 2.8 - 3.5 kg/cm ² g Combustion air pressure 1.7 kg/cm ² g Combustion air temperature Normal Stack 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control Present pollution control Nore Present energy-saving me	Number of Employees f Fuel Fuel consu 1,360 1,360 1,000	l/hr l/hr	Remarks
Annual Sales or Production Diesel 21.76 M/day Nind of Fuel, Consimption Diesel 21.76 M/day Type of Combustion Facility Capacity Kind of Fuel Fuel consumption Age Remarks 1 holary klin 250 ton/hr Diesel 1,360 //hr Age Remarks 2 Rotary klin 250 ton/hr Diesel 1,360 //hr Image Image<	Annual Sales or Production Kind of Fuel, Consumption and Price Type of Combustion Facility Capacity I Rotary kiln 250 ton/hr 2 Rotary kiln 250 ton/hr 3 Rotary kiln 250 ton/hr Outline of the Facility Surveyed Rotary kiln for aggregate Rating : Fuel consumption : Present end object to be heated : Fuel pressure : Fuel pressure : Fuel pressure : Stack : 1.7 m x 0.8 m x 9.8 m Outline of solution control : Normal : 1.7 resent pollution control measures : Fuel press of plant location :	1 Fuel consu 1,360 1,360 1,000	l/hr l/hr	Remarks
Kind of Fuel, Consumption and Price Diesel 21.76 kilday Type of Combustion Facility Capacity Kind of Fuel Fuel consumption Age Remarks 1 Rolary kiln 250 torn/hr Diesel 1,360 l/hr Image Remarks 3 Rotary kiln 250 torn/hr Diesel 1,360 l/hr Image Remarks 3 Rotary kiln 1,000 l/hr 1,360 l/hr Image	Kind of Fuel, Consumption and Price Diesel 21.76 kl/day Type of Combustion Facility Capacity Kind of 1 Rotary kiln 250 ton/hr Diesel 2 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 4 250 ton/hr Diesel 9 250 ton/hr Normal: 200 ton. 9 Rating : 250 ton/hr, Normal: 200 ton. 9 Rating: 1,360 l/hr : Normal: 800 - 1,000 l/hr 1 Rele consumption : Rating: 1,360 l/hr : Normal: 800 - 1,000 l/hr 1 Homizing medium pressure : 2.8 - 3.5 kg/cm²g : Normal Atomizing medium pressure : 800 - 155 mmAq : Outline of Survey F Combustion air temperature : Normal : 1.7 m x 0.8 m x 9.8 m : Outline of Survey F Present pollution control measures : Fuel change, dust collection wi	1,360 1,360 1,000	l/hr l/hr	<u>Flemarks</u>
and Price Type of Combustion Facility Capacity Kind of Fuel Fuel consumption Age Remarks 1 Rolary klin 250 ton/hr Diesel 1,360 //hr	and Price Kind of Type of Combustion Facility Capacity Kind of 1 Rotary kiln 250 ton/hr Diesel 2 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 4 Outline of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/hr, Normal: 200 ton Fuel consumption : Rating: 1,360 l/hr Temperature of object to be heated : 140°C Fuel pressure : 2.8 - 3.5 kg/cm ² g Fuel temperature : Normal Atomizing medium pressure : 800 - 155 mmAq Combustion air pressure : 1.7 kg/cm ² g Combustion air pressure : 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures Present pollution control measures : Fuel change, dust collection with Future plan for pollution control : Nore Present energy-saving measures : Nore 1. Problems of plant kocation : No	1,360 1,360 1,000	l/hr l/hr	Remarks
1 1 250 tor/in Diesel 1,360 I/in 2 Rotary klin 250 tor/in Diesel 1,000 I/in 3 Rotary klin 1,000 I/in 1,000 I/in 3 Rotary klin 1,000 I/in I/in I/in 0 I/in I/in I/in I/in I/in I/in 0 I/in I/in I/in I/in I/in	1 Rotary kiln 250 ton/hr Diesel 2 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln 250 ton/hr Diesel 4 0 Rotary kiln 1 9 Rotary kiln for aggregate 1 8 Rating 250 ton/hr, Normal: 200 ton 9 Rating: 1,360 l/hr 1.000 l/hr 1 Engerature of object to be heated 1.40°C 9 Fuel remperature 800 - 1,000 l/hr 1 Normal 800 - 155 mmAq 1 Combustion air pressure 800 - 155 mmAq 1 Combustion air temperature Normal 1 1.7 kg/cm ² g Outline of Survey F Present pollution control measures 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures 1. Problems of plant kocation	1,360 1,360 1,000	l/hr l/hr	Remarks
2 Rotary kiln 250 ton/hr Diesel 1,960 /hr 3 Rotary kiln 1,000 //hr 1,000 //hr 3 Rotary kiln 1,000 //hr 1,000 //hr 3 Rotary kiln 1,000 //hr 1,000 //hr 4 Rotary kiln 1,000 //hr 1,000 //hr 5 Rotary kiln for aggregate 1,000 //hr Cutifine of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/fr, Normal: 200 ton/fr Fuel consumption : Rating: 1,300 //hr Temperature of object to be heated : 140° C Cup pressure : 2.8 - 3.5 kg/cm²g Fuel temperature : Normal: 800 - 1,000 //hr Temperature of object to be heated : 140° C Combustion air pressure : 2.8 - 3.5 kg/cm²g Fuel temperature : Normal Stack : 1.7 kg/cm²g Combustion air pressure : 1.7 kg/cm²g Combustion air temperature : Normal Stack : 1.7 kg/cm²g Combustion air temperature : Normal Present of pollution control : Nore Present stack height is only 9.8m for this low place. The location is a basic mistake in view of dispersion of a	2 Rotary kiln 250 ton/hr Diesel 3 Rotary kiln Diesel Diesel 9 Diesel Rotary kiln Diesel 0 utline of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/hr, Normal: 200 ton Fuel consumption : Rating: 1,360 l/hr : Normal: 800 - 1,000 l/hr : Normal: 800 - 1,000 l/hr Temperature of object to be heated : 140°C Fuel temperature : Normal Atomizing medium pressure : 800 - 155 mmAq Combustion air pressure : 1.7 kg/cm ² g Combustion air temperature : Normal Stack : 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures : Fuel change, dust collection with Future plan for pollution control : None 1. Problems of plant location	1,360 1,000	l/hr	
3 Rotary kiln 1,000 //hr 3 Rotary kiln 1,000 //hr 1,000 //hr 1,000 //hr 0utline of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/hr, Normal: 200 ton/hr Fuel consumption : Rating: 1,360 //hr Evel consumption : Rating: 1,360 //hr Fuel consumption : Rotmat: 800 - 1,000 //hr Temperature of object to be heated : 140°C Evel temperature :: Normal: 800 - 1,55 mmAq Combustion air pressure : 800 - 155 mmAq Combustion air temperature : Normal Stack : 1.7 m x0.8 m x 9.8 m Outline of Survey Result Outline of Survey Result Present pallution control : Nore Present pallution control : Nore 1. Problems of plant location : Nore 1. Problems of plant location : Nore 1. Problems of plant location : Nore 2. Outline of the process : S0% of sand, crusted igneous rocks, and cement are dried (direct drying with 900°C flame and combustion exhaust gas) in a rotary kin. 7% of asphal No. 6 is mixed to make product. 3. Combustion conditions : The burner was of a low-pressure atomization type. The O ₂ content of stac	3 Rotary kiln 3 Rotary kiln Outline of the Facility Surveyed Rating 250 ton/hr, Normal: 200 ton. Fuel consumption Rating: 1, 250 ton/hr, Normal: 200 ton. Fuel consumption Rating: 1, 250 ton/hr, Normal: 200 ton. Fuel pressure 1, 7 kg/cm ² g Combustion air pressure 1, 7 kg/cm ² g Combustion air temperature Stack 1, 7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures Fuel pressure plan for pollution control 1. Problems of plant location	1,000		
Outline of the Facility Surveyed Rotary klin for aggregate Rating : 250 ton/hr, Normal: 200 ton/hr Fuel consumption : Rating: 1,360 hr Temperature of object to be heated : 140°C Fuel pressure : 2.8 - 3.5 kg/cm ² g Fuel temperature : Normal: 800 - 1,000 l/hr Temperature of object to be heated : 140°C Combustion air pressure : 2.8 - 3.5 kg/cm ² g Fuel temperature : Normal Atomizing medium pressure : 0.0 - 155 mmAq Combustion air pressure : 1.7 kg/cm ² g Combustion air pressure : 1.7 kg/cm ² g Combustion air pressure : 1.7 m x 0.8 m x 9.8 m Outline of Survey Result Present pollution control Present pollution control : Norme Present pollution control : Norme 1. Problems of plant location : Nore Present pregress of the process : 93% of sand, crushed igneous rocks, and cement are dried (direct drying with 900°C flame and combustion exhaust gas) in a rotary klin. 7% of asphall No. 6 is mixed to make product. 2. Outline of the process : 93% of sand, crushed igneous rocks, and cement are dried (direct drying with 900°C flame and combustion exhaust gas) in a rotary klin. 7% of asphall No. 6 is mixed to make pro	Outline of the Facility Surveyed Rotary kiln for aggregate Rating : 250 ton/hr, Normal: 200 ton. Fuel consumption : Rating: 1,360 l/hr Fuel consumption : Rating: 1,360 l/hr Temperature of object to be heated : 140°C Fuel temperature : Normal: 800 - 1,000 l/hr Temperature of object to be heated : 140°C Fuel temperature : Normal Atomizing medium pressure : 800 - 155 mmAq Combustion air pressure : 1.7 kg/cm ² g Combustion air pressure : Normal Stack : 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures : Fuel change, dust collection with Future plan for pollution control : Nore Present energy-saving measures : Nore 1. Problems of plant location : Nore			
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Stack : 1.7 m x 0.8 m x 9.8 m Outline of Survey Result Present pollution control measures : Fuel change, dust collection with bag filter/scrubber Future plan for pollution control : None Present energy-saving measures : None 1. Problems of plant location This plant is in a hollow place of several ten thousand square meter, which is the remain of mining of igneous rocks, a raw material for asphalt concrete. The stack height is only 9.8m for this low place. The location is a basic mistake in view of dispersion of air pollutants and environmental protection. 2. Outline of the process 93% of sand, crushed igneous rocks, and cement are dried (direct drying with 900°C flame and combustion exhaust gas) in a rotary kiln. 7% of asphalt No. 6 is mixed to make product. 3. Combustion conditions The burner was of a low-pressure atomization type. The O ₂ content of stack sample was said to be 12.5% and this value needs to be reevaluated because it appears to be affected by air intrusion. (Not necessarily air excess in combustion) 4. Present state of air pollution control Dust collection is made with bag filter for one kiln and with scrubber for another. Judging from visually observed dust emission	Stack : 1.7 m x 0.8 m x 9.8 m Outline of Survey F Present pollution control measures : Fuel change, dust collection with Future plan for pollution control : None Present energy-saving measures : None 1. Problems of plant location			
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 The burner was of a low-pressure atomization type. The O₂ content of stack sample was said to be 12.5% and this value needs to be reevaluated because it appears to be affected by air intrusion. (Not necessarily air excess in combustion) Present state of air pollution control Dust collection is made with bag filter for one kiln and with scrubber for another. Judging from visually observed dust emission 	rotary kiln. 7% of asphalt No. 6 is mixed to make product.	5 man 200 (O namic and 60)		840/ 11 4
Dust collection is made with bag filter for one kiln and with scrubber for another. Judging from visually observed dust emission	The burner was of a low-pressure atomization type. The O ₂ content of a	tack sample was said to be necessarily air excess in cc	12.5% and this van bustion)	alue needs to
	 Present state of air pollution control Dust collection is made with bag filter for one kiln and with scrubber for from the stack, the efficiency was not satisfactory. 	another. Judging from vis	ually observed du	ust emission

the second second		No. 12	Date of Visit	June	14, 1990
Name of Establishment	INDUSTRIAS DE HULI				
Type of Industry (Product)	Rubber and plastic pro	oduct (tire tube)		1	· · · ·
Scale of Factory	Medium	Number of E		145	······································
Annual Sales or Production	Under test operation (operation started in Febru	ary 1990)		
Kind of Fuel, Consumption	Heavy oil (L) 16.0 kl/m	on			··
and Price					
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Smoke tube boiler	2.55 ton/hr	Heavy oil (L)	28.4 l/hr	0	
					·
		1			· · · ·
			-		
	····		•		
X		1.1.1.			
Outline of the Facility Surveyed	Smoke tut		5 ton/hr (steam)		
Evaporation rate		n/hr, Present: 25%			
Fuel consumption	: Normal: 28.4	i/nr uel pressure: 3kg/cm²g			
Steam pressure Temperature	: 16 kg/chi-g, Fi : Normal	uai piassuie. skyriii-g			
Atomizing steam pressure	: 0.6 - 1.1 kg/cm ⁴	20			
Combustion air temperature	: Normal				
Combustion exhaust gas composit		- 13.4% (as measured by	the plant)		
Temperature	: 170°C (as meas	sured by the plant)			
Operating hours	: 24 hr/day, 120				
		ine of Survey Result			
Present pollution control measure					
Future plan for pollution control	: None	· ·	· · · · · · · · · · · · · · · · · · ·		
Present energy-saving measures	: None			· · · ·	
a met e casa forma da balla.			m is actisfactory and com		ubala
1. This is a Mexican-made boiler	r, three months since instal	iation, and the control syste	m is satisfactory and con	ipact as a	whole.
2. This is currently in test operation	ation at 25% of the rating.				
· · · ·	4	· · ·			
3. The burner performance durin		e of low-load operation, an	d the Bacharach value wa	as No. 9 or	more. This
value was improved to No. 3 of	during normal operation.				·
4. The atomizer uses air, but its	nressure was low Change	over to steam is recommen	ided		
4. The atomizer uses air, but its	proceduo mae iom. Onanyo		lu v v ·		
5. We were asked about additive	es to heavy oil and answer	ed that they were not nece	ssary for low-load operati	ion.	
	nor because of fine dusts o	enerated in the molding pro	ocess. We proposed dire	ecting such	I dust to the
The work environment was po outside via collection duct an	d cleaning with bag filter.				
 The work environment was provide via collection duct an 	d cleaning with bag filter.				
 The work environment was producted outside via collection duct an 	d cleaning with bag filter.		. • • • • • •	. · ·	an taon tao Ang ang ang
 The work environment was po outside via collection duct an 	d cleaning with bag filter.			. ·	
 The work environment was provide via collection duct an 	d cleaning with bag filter.			. ·	
 The work environment was provide via collection duct an 	d cleaning with bag filter.	· · ·			

- 16 -

		No. 13	Date of Visit	Jun	e 14, 1990
Name of Establishment	VIDRIERA MEXICO, S.		nter and a state of the state		nga MGP BKA SARAN PANA ANA ANA ANA ANA
Type of Industry (Product)	Non-metallic mineral p				
Scale of Factory	Large	Number of Er	nployees	1,650	
Annual Sales or Production	Glass bottle 2,400,00	00,000 bottles/year			
Kind of Fuel, Consumption and Price	Natural gas (211.4 pe 3,692,000 m ³ /mon 780	0,120,000 pesos/mon			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Glass melting furnace tank oven	8.6 ton/hr	Natural gas	1,282 m ³ /hr		Cullet 75%
Glass melting furnace tank oven	8.6 ton/hr	Natural gas	1,282 m ³ /hr		Cullet 75%
Glass melting furnace tank oven	8.6 ton/hr	Natural gas	1,282 m ³ /hr		Cullet 75%
Glass melting furnace tank oven	8.6 ton/hr	Natural gas	1,282 m ³ /hr		Cullet 75%
Glass melting furnace tank oven	8.6 ton/hr	Natural gas	1,282 m ³ /hr		Not used
				-	
Outline of the Facility Surveyed	Glass melting furnace		· · · · · · · · · · · · · · · · · · ·		
Capacity of facility Unit consumption Fuel consumption	: 8.6 ton/hr (glas : 1,260,000 kcal/ : 1,282 /hr				
Fuel pressure	0.4 kg/cm2g	-	ан -		
Combustion air pressure		Temperature: 1,200°C			
Combustion exhaust gas composit	-	2 - 5.2%, CO - 0% (as meas		-	
Combustion exhaust gas tempera		et - 1,350°C, Outlet - 240°	ru las measured by the	piant)	
Operating hours	: 24 hr/day, 168				
Regenerator		ngeover (manual)	مدارانه از الافاريخ _{الان} بين بدور برور مدر بورسه معربه اماران المرور برو		
		ine of Survey Result			
Present pollution control measure			<u></u>		
Future plan for pollution control	: None				·
Present energy-saving measures	: Regenerator instal	led			

1. The plant is a member of the VITRO group.

2. As the measuring instrument brought from Japan became faulty, the Teledyne instrument was used for measurement. Because of too small amount of air (O₂: 0.5%), CO emission was as high as 890 - 940 ppm. The unit fuel consumption was relatively low at 1.26 million Kcal/ton glass, which may be attributed to the use of cullet in a high percentage of 75%. The CO content may decrease by increasing the O₂ content to 1 - 2%, and this furnace may not present any problem.

		No	. 14	Date of Visit	Jun	ie 14, 1990
Name of Establishment	UNIROYAL, S.A. DE C.	.V.	1997 B	<u> 1999 - 1999 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997</u>	alder bljudgete skinast 212 bet	
Type of Industry (Product)	Rubber and plastic pr	oduct (tire)				· · · · · · · · · · · · · · · · · · ·
Scale of Factory	Large		er of Empl	loyees	530	· · · · · · · · · · · · · · · · · · ·
Annual Sales or Production	·	,,,,,,,, _				
Kind of Fuel, Consumption and Price	Heavy oll (L) (175.6 p 308,600 l/mon 54,19	Jesos/I) 0.000 pesos/mon		<u> </u>		.:
Type of Combustion Facility	Capacity	Kind of Fuel		Fuel consumption	Age	Remarks
Water tube boiler	10 ton/hr	Heavy oil (L)		500 l/hr	18	
Water tube boiler	6.4 ton/hr	Heavy oil (L)		· · · · · · · · · · · · · · · · · · ·	18	Not used
Hot water boiler	0.5 ton/hr	Diesel			-	For shower
· · ·						
				1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		
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		<u> </u>				
Outline of the Facility Surveyed	Water tube boile		(steam	i) a filia di seconda di s	<u> </u>	
Evaporation rate		hr, Normal: 6 ton/hr	r			
Steam pressure	: 21 kg/cm ² g					
Fuel consumption		ir Normal: 600 l/hr				
Fuel pressure		emperature: 104°C				
Atomizing steam pressure	• •	Temperature: 120°C	1 - A			
Combustion air temperature	: Normal					÷
Combustion exhaust gas compositio		2 - 12.4% (as measure	d by the	plant)		
Combustion exhaust gas temperatu		sured by the plant)				
Stack	: 1.68 mφ x 37.8 i	m				
Operating hours	: 24 hr/day, 14					
		line of Survey Result	· .	·		
Present pollution control measures	: None					
Future plan for pollution control	: None				. •	
Present energy-saving measures	: None					·····
1. Tires are produced and stear	n used for heating during	molding.		·		
		and the second	et al st	:	1 - 1 - E	Hara da Santa
2. The O ₂ content was 10.1% a	nd the exhaust gas tempe	erature was as high as	289 - 30	14°C, with the boiler of	efficiency	as poor as
76%. Besides, the Bacharach	i value was No. 9 or more	indicating soot general	tion. Sm	oke emission from the	e stack w	as visually
observed.					· ·	
				1 A.		

 The steam pressure at the burner inlet was 4.3 kg/cm²g and the oil pressure was 3.0 kg/ cm²g, with ΔP=1.3 kg/cm²g. Atomization was also considered appropriate. It is therefore necessary to carry out fundamental burner checks (air intake method, etc.).

		No. 15	Date of Visit	June	14, 1990
Name of Establishment	CENTRO DEPORTIVO	CHAPULTEPEC, A.C.	a an		
Type of Industry (Product)	Public Sports Center		1		
Scale of Factory	Medium	Number of Er	nployees	T.	
Annual Sales or Production	······································				
Kind of Fuel, Consumption	Heavy oil (H) 117.0 kl/	mon			
and Price		والمحاج والمحاجز والم	يورم فالافتاخ ويستعدون وباري فأطرف ومعصوبون أعلاكم ويتوار وتعاورته فالكر		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	9.0 ton/hr	Heavy oil (H)	307 l/hr 185 l/hr	8	13 hr/day
Water tube boiler	5.0 ton/hr	Heavy oil (H)	185 1/11	27	3 hr/day
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			· · · · · · · · · · · · · · · · · · ·		
Outline of the Facility Surveyed	Water tube boiler	9.0 ton/hr (ste	am)	.'	
Evaporation rate	: Rating: 9.0 ton/hr				
Fuel consumption	: Rating: 307 l/hr,	Normal: 185 I/nr			
Steam pressure	: 11.2 kg/cm ² g, Ten : 4 kg/cm ² g, Tempe				
Fuel pressure Atomizing steam pressure	: 4 - 6 kg/cm ² g	erature. Too G			
Combustion air temperature	: Normal				
Stack	: 0.8 mg x 32 m				
Operating hours	: 13 hr/day, 91 hr/w	eek			
Showing users					
	Outi	ine of Survey Result			
Present pollution control measures	: None				
Future plan for pollution control	: None				
Present energy-saving measures	: None				
1. The boiler efficiency was 78%	and operation conditions	s were satisfactory.			
0 The manufactory of the second realized	en was 7 70/ with relative	lu largo ovoco oir Itio poo	assant to shack for air a	ntry throu	ah hailar
 The measured O₂ concentrati wall. 	on was 7.7%, with relative	ny large excess all. It is neo	essary to check for all e	ann à muon	gri uollei
MQ8.					
3. The measured Bacharach val	ue was No. 3 and for satis	factory combustion of heavy	voil (H). Atomizer was s	atisfactor	у.
4. It is advisable to change the	graduations of recording p	paper for the boiler operation	n meter from the percen	t scale to	the
measured value.					
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	. · · · ·				

· · ·		No. 16	Date of Visit	Jur	ið 15, 1990
Name of Establishment	KIMEX, S.A. DE C.V.				
Type of Industry (Product)	Petrochemical (nylon, p	xolvester fiber)			· · ·
Scale of Factory	Large		Employees	2,280)
Annual Sales or Production				_ I	
Kind of Fuel, Consumption	N. gas 2,160,000m ³ /m	on (235.65 pesos/m ³)	511,164,000 pesos/mon		
and Price	H. oil (L) 1,499.7 kl/mc		278,719,245 pesos/mon		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	14 ton/hr	Natural gas	500 m ³ /hr	29	
Water tube boiler	14 ton/hr	Natural gas	Not operating	29	
Water tube boiler	28 ton/hr	Heavy oil (L)	2,083 l/hr	29	Superheater
Water tube boiler	41 ton/hr	Natural gas	2,500 m ³ /hr	16	Superheater
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		L		<u> </u>	
Outline of the Facility Surveyed	Water tube boiler		iteam)		
Evaporation rate		Normal: 16 ton/hr			
Fuel consumption	: Normal: 2.083 l/hr				
Steam pressure	: 38 kg/cm ² g, Temp				
Fuel pressure	: 12 g/cm ² g, Tempe	rature: 95°C			
Atomizing steam pressure	: 14 kg/cm ² g				
Combustion air temperature	: 240°C				
Stack	: 1.5 mф x 30 m				
Operating hours	: 24 hr/day, 168 hr/	week			
		· · · ·			
		ine of Survey Result			
Present pollution control measures	: Change fuel to natu	iral gas			
Future plan for pollution control	: None			·	· .
Present energy-saving measures	: With Ljungstrom t	ype recuperator	· · · · · · · · · · · · · · · · · · ·		
					· · · · · · · · · · · · · · · · · · ·
1. The result of measurement of	combustion exhaust gas a	showed the O2 content of	4% and 330°C at the recu	uperator	inlet and 4.8%
and 230°C at its outlet. The B	acharach value was No. 3	and the combustion state	e was very good.	•	
		A Second Second Second	$(-1)^{(1)}$		
It is advisable to change the g	raduations of recording pa	aper from the percent sca	ale to the actual value to ir	ndicate th	he state of
boiler operation.					
3. Since the life of the Jungstrop			desirable structure of rec	uperator	's and their
materials such as Sicrmal and	S-ten steel were explained	3. gula de la com			
	when the scient and effects as	a hata a mada fay nativita	n cantral. Eubourt coo mo		nt una mada
4. Dwelling houses are quite near				asureme	nt was made
periodically, and slightly exces	s-air compusiton was made	e to prevent black sinoke.	•		4
5. Boiler control was also satisfa	otory				
5. Doller Control was disc satisfic	actory.				

		No. 17	Date of Visit	June	15, 1990
Name of Establishment	INDUSTRIAS RESISTO				
Type of Industry (Product)	Chemical (ABS resin, lat				
Scale of Factory	Large	Number of El	nployees	430	
Annual Sales or Production			<u></u>		
Kind of Fuel, Consumption	N. gas 86,400 m ³ /mon	(211.3 pesos/m ³) 18,2	56,320 pesos/mon		
and Price		• • • • • • • • • • • • • • • • • • • •			-
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	11.8 ton/hr	Natural gas	200 m ³ /hr	25	
Water tube boiler	12.5 ton/hr	Natural gas	Not operating	8	
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Outline of the Facility Surveyed	Water tube		ton/hr (steam)		
Evaporatin rate	: Rating: 11.8 tor				
Fuel consumption	: Normal: 200 m ³				
Steam pressure		eam temperature: 180°C			
Fuel pressure	: 1.265 mmAq	· · · · · ·			
Combustion air temperature	: Normal				
Stack	: 1.1 mox 8.0 m				
Combustion exhaust gas compositio		- 8.6% (as measured by th	e plant)		
Temperature		ured by the plant)			
Operating hours	: 24 hr/day, 168				
		ne of Survey Result			
Present pollution control measures	: Fuel changed to nat	iurai gas		<u> </u>	
Future plan for pollution control	: None	· · · · · · · · · · · · · · · · · · ·			
Present energy-saving measures	: None	······			
1. The boiler was in conlinuous o		termittent operation depend	ling on the steam press	ure. The ac	ctual
operating hours were therefor	e 7.2 m/day.		· .		
2. The result of exhaust gas meas state was satisfactory.	surement showed the O2 of	content at 2%, temperature	at 180°C, and Bacaract	n at 0. The	combustion
3. Installation of a low NOx burne	r was advised in order to r	neet the emission standard	of NOx.		
4. One meter was used to indicat	e both the steam generati	on amount and fuel consur	nption (critical for boiler	operation).	. It is
recommended to separate indi	cation of these elements.				
	· ·				
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		No. 18	Date of Visit	Jur	ie 15, 1990
Name of Establishment	NOVAQUIM, S.A.	elangan dan dari bertan yang dari da Takan da Balan da Balan da Balan da Kabula da Kabula da Kabula da Kabula Kabula da Kabula da K			· ·
Type of Industry (Product)	Chemical (oxidation inhi	bitor, stabilizer)		· .	
Scale of Factory	Small	Number of	Employees	67	
Annual Sales or Production	27,000,000,000 pesos/	yr			
Kind of Fuel, Consumption	Heavy oil (L) (175.6 pe		· · · · · · · · · · · · · · · · · · ·		
and Price	95,761 l/mon 16,820,0				and the second second second second
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Smoke tube boiler	4.7 ton/hr	Heavy oil (L)	168 l/hr	3	Alternate use
Smoke tube boiler	4.7 ton/hr	Heavy oil (L)	168 l/hr	3	
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Outline of the Facility Surveyed	Smoke tube		.7 ton/hr (steam)		
Evaporation rate	: Rating: 4.7 ton	/hr			
Steam pressure	: 15 kg/cm2g				
Fuel consumption	: Normal: 168 l/h		-		
Fuel pressure		emperature: 100 - 110°	C		
Atomizing air pressure		emperature: Normal			
Combustion air temperature	: Normal	1 EO/ Los massured but	the plant)		
Combustion exhaust gas compositio		 1.5%, (as measured by I ured by the plant) 	me plant)		
Combustion exhaust gas temperatu	: 0.4 mo x 10 m	nied by the biding			
Operating hours	: 19 hr/day, 133	hrhuook	en de la companya de La companya de la comp		1
		ne of Survey Result			
Present pollution control measures		is a correg noodit	<u></u>		<u></u>
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·	<u></u>	
Present energy-saving measures	: None				

1. This is a company member of the CYDSA group, and the plant is located near a newly-built residential area.

 The O₂ content varied from 1.6 to 4.8% and the Bacharach value from No. 5 to No. 8. This is caused by faulty adjustment of the air quantity for the fuel amount which fluctuates with fluctuation of boiler load. This adjustment should be made. The exhaust gas temperature was low at 195°C, with the boiler efficiency at 87%.

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a de la companya de l		No. 19	Date of Visit	June 15, 1990
Name of Establishment	ALCOMEX, S.A. DE C			
Type of Industry (Product)	Metal product (Al sas		, ⁻	
Scale of Factory	Large		Employees	400
Annual Sales or Production	33,319,000,000 peso	is/yr	·	
Kind of Fuel, Consumption	Natural gas (211.3 p	esos/m ³)		
and Price	Natural gas (211.3 p 247,265 m ³ /mon 52	,250,000 pesos/mon	ana ana amin'ny soratra dia mampiasa amin'ny soratra dia mampiasa dia mampiasa dia mampiasa dia mampiasa dia ma	
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remar
Melting furnace	20 ton/hr	Natural gas	227 m ³ /hr	Batch typ
Melling furnace	1.75 ton/hr	Natural gas	20 m ³ /hr	Batch typ
Melting furnace	1.75 ton/hr	Natural gas	20 m ³ /hr	Batch typ
Melting furnace	1.75 ton/hr	Natural gas	20 m ³ /hr	Batch typ
Melting furnace	1.75 ton/hr	Natural gas	20 m ³ /hr	Batch typ
Heat treating furnace		Natural gas	36 m ³ /hr	
Heat treating furnace		Natural gas	36 m ³ /hr	
Heat treating furnace		Natural gas	36 m ³ /hr	
Heat treating furnace		Natural gas	36 m ³ /hr	
Heat treating furnace		Natural gas	36 m ³ /hr	
			· · · · · · · · · · · · · · · · · · ·	
-		· .		
Outline of the Facility Surveyed	Melting : 80 ton/4 hr (1 ba) ton/hr (Aluminum)	
Stack Operating hours		hes/day), 96 h/week (24 t	patches/week)	وروب وروب وروب وروب وروب وروب وروب وروب
		utline of Survey Result		
Present pollution control measure				
Future plan for pollution control	: None	· ·		
Present energy-saving measures	: None			
1. The working environment w	as relatively good.			
2. Measurement was made at the O_2 content at 4.6 - 6.8% within the furnace at 800°C installation of a recuperator	the end of batch operatio 6. The exhaust gas temp 5. It indicates that the hea	erature was 205°C, which i	is very low considering the	high temperature
 Measurement was made at the O₂ content at 4.6 - 6.8% within the furnace at 800°C 	the end of batch operatio 6. The exhaust gas temp 5. It indicates that the hea	erature was 205°C, which i	is very low considering the	high temperature
 Measurement was made at the O₂ content at 4.6 - 6.8% within the furnace at 800°C 	the end of batch operatio 6. The exhaust gas temp 5. It indicates that the hea	erature was 205°C, which i	is very low considering the	high temperature

	and the second second	No. 20	Date of Visit	June	18, 1990		
Name of Establishment	FUNDICIÓN CHORNE	Ţŗġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġġ	n and an and a second		ىرىنىڭ ئەتىلەر بەر يەر يەر يەر يەر يەر يەر تەكەر تەكەر بەر يەر يەر يەر يەر يەر يەر يەر يەر يەر ي		
Type of Industry (Product)	Basic metals (cast iron)						
Scale of Factory	Small	Number of Employees 19					
Annual Sales or Production	437,000,000 pesos/y	11			·		
Kind of Fuel, Consumption	Coke 2,000 kg/mon	(US\$670/ton) US\$1,3	40/mon				
and Price		· · · · · · · · · · · · · · · · · · ·					
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
Cupola	1.5 ton/hr	Coke	500 kg/day	10			
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Outline of the Facility Surveyed Raw materials		oola lime: 3kg, coke: 15 kg/charg	·····				
Present pollution control measures Future plan for pollution control Present energy-saving measures	s : Change to US-ma	tline of Survey Result ade coke, installation of simple plant is scheduled in two mon					
1. Operation: Two time per day	, two hours per time						
2. Combustion of the coke: C -	89.9%, Ash - 9.5%, S	- 0.52% (US-made)		÷			
3. This facility will be relocated of	ud of the metropolitan or	on in two months, and it is n	annod to use a rotany t	na moltini	n fumana		
3. This facility will be relocated of	out of the metropolitan an	ea in two months, and it is p	anneo to use a totary ij	ihe menni	y tumace.		
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		ļ	No. 21	Date of Visit	Jur	ne 18, 1990	
Name of Establishment	BANOS TACUBAYA						
Type of Industry (Product)	Bathhouse						
Scale of Factory	Small Number of Employees						
Annual Sales or Production							
Kind of Fuel, Consumption	Heavy oil (L) 51.0 kl/mon (175.0 pesos/l) 8,925,000 pesos/mon						
and Price							
Type of Combustion Facility	Capacity	Kind of F	uel	Fuel consumption	Age	A REPORT OF A DESCRIPTION OF A DESCRIPTI	
Smoke tube boiler	1.27 ton/hr	Heavy oil (L)		170 l/hr	21	Alternate use	
Smoke tube boiler	1.27 ton/hr	Heavy oil (L)		170 l/hr	20	at every other	
						week	
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						· · · · · · · · · · · · · · · · · · ·	
			!		<u> </u>	+	
Outline of the Facility Surveyed	Smoke tube	hoiler	1 27	ton/br (steam)			
	Smoke tube boiler 1.27 ton/hr (steam)						
Evaporation rate	: Rating: 1.27 ton/hr : Normal: 170 I/hr, Normal: 120 I/hr						
Fuel consumption	: Normal: 170 Mir, r : 6 kg/cm ² g	vormai. 120 min					
Steam pressure		Comporatura: 61	nor				
Fuel pressure	: Tare (head tank), Temperature: 60°C						
Atomizing steam pressure Combustion air temperature	: 6 kg/cm ² g : Normal						
· ·	. Numai				-		
Combustion exhaust gas composition	· 0 13.8% CO 5	6% las measure	d hy the ol	anti			
Temperature	 O₂ - 13.8%, CO₂ - 5.6% (as measured by the plant) 255°C (as measured by the plant) 						
Operating hours	: 12 hr/day, 84 hr/week						
Outline of Survey Result							
Present pollution control measures : Simple dust remover							
Future plan for pollution control	None	· · · · · · · · · · · · · · · · · · ·		<u> </u>			
Present energy-saving measures	: None	• · · · · · · · · · · · · · · · · · · ·					

Combustion air is supplied by natural draft, and the air is in excess with the O₂ content at 13.4%. Primary air needs to be adjusted.

2. The Bacharach number was No. 9 because of poor atomization of fuel. Atomization should be changed from current gravity feed method to the use of pump and forced drafting.

3. The burner performance is poor. A series of combustion devices need to be replaced.

4. The manager is eager to improve the combustion facilities.

	en la seconda de la second	—	No. 22	Date of Visit	18	Jun, 1990	
Name of Establishment	BANOS NAUCALPAN	CALLER BOTTOM CONTRACTOR DESCRIPTION					
Type of Industry (Product)	Bathhouse			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Scale of Factory	Small Number of Employees 7						
Annual Sales or Production	720,000,000 pesos/yr						
			.				
Kind of Fuel, Consumption and Price	Heavy oil (L) (175.6 pesos/l) 33,600 l/mon 590,000 pesos/mon						
Type of Combustion Facility	Capacity Kind of Fuel Fuel consumption Age Remarks						
Smoke tube boiler	0.6 ton/hr	Reavy oil (L)		80 l/hr	20	Alternate use	
Smoke tube boiler	0.6 ton/hr	Heavy oil (L)		80 l/hr	20		
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Outline of the Facility Surveyed	Smoke tube	e boiler	0.6 to	n/hr (steam)			
Evalporation rate	: Rating: 0.6 ton/hr,	Normal: 0.6 ton/	าก				
Steam pressure	: 6 kg/cm ² g						
Fuel consumption	: Rating: 80 Uhr, Normal: 80 Uhr						
Fuel pressure	: Unknown, Temperature: 52°C						
Combustion air pressure	: Natural draft, Temperature: Normal						
Stack	: 0.4 mo x 15 m						
Operating hours	: 14 hr/day, 98 hr/we	ek					
	·						
A <u>n and an operation with the property of the second party of the </u>	Outlin	ne of Survey Resu	ılt				
Present pollution control measures	: None						
Future plan for pollution control	: None	and the second second					
Present energy-saving measures	: None						

1. The boiler is installed in the second floor of the bathouse and a boiler operator is manually operating the boiler.

2. The O₂ content was 7% and the Bacharach value high at No. 9. The combustion state was relatively satisfactory. Certain problems may be invitable considering that the 20-year old boiler is operated by natural draft. The exhaust gas temperature was high at 325°C and the O₂ content high. Because of these factors, the efficiency was low at 78%. It is recommended to change to a forced draft burner. (Bricks laid in the lower half of the flue may be partially responsible for high exhaust gas temperature.)

		No. 23	Date of Visit	Jui	n.18, 1990
Name of Establishment	NUEVA FABRICA NACI	IONAL DE VIDRIO			
Type of Industry (Product)	Non-metallic mineral pr		· · · · · · · · · · · · · · · · · · ·		
Scale of Factory	Large	Number of E	mployees	2,100	
Annual Sales or Production	(Capital: 500,000,000 p				
Kind of Fuel, Consumption	Natural gas (211.3 pes	os/m ³)			· .
and Price		144,000,000 pesos/mon			مەلىرى بىرىدىن <u>مەلىرى بەر مەلىرىكە مەلىرى بەر مە</u> لىرى بەر
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Glass melting furnace tank oven	16.7 ton/hr	Natural gas	2,160 m ³ /hr	4	Cullet 55%
Glass melting furnace tank oven	8.3 ton/hr	Natural gas	1,500 m ³ /hr	5	Cullet 55%
Glass melting furnace tank oven	8.3 ton/hr	Natural gas	800 m ^{3/} hr	0	Cullet 55%
Decorating furnace (12 units)		Natural gas	Total		
Annealing furnace (17 units)		Natural gas	2,980 m ^{3/} hr		
		·			
Outline of the Facility Surveyed		Iting furnace tank oven (Gla	ass)		
Capacity of the facility		hr (glass)			
Unit consumption		0 kcal/ton (glass)			
Fuel consumption	: 2,160 m ³	Vhr			
Glass melting temperature	: 1,500°C				
Fuel pressure	: 300 mmA				
Combustion air pressure	: Several m				
Combustion air temperature	: 1,350 °C		west has she minut		
Combustion exhaust gas composition		% CO ₂ - 8.90% (as measu	red by the plant)	مما امبر المم	الممام
Combustion exhaust gas temperatur		ator inlet - 1,440 °C Outle	a - 400 - C (as measure	eo by the	r piant)
Stack	3.6 m		1		
Operating hours		r, 168 hr/week	Durner: 04 pee Air r	ant. 100	
Regenerator	10-minute	e changeover (automatic)	Burner: 24 pcs Air p	xort: 12p	CS .
	Outli	ne of Survey Result	······································	·	·
	: Stress on fine dust	prevention measures, natur	ral gas used		
Eutono plan fac nellution combail	: None	······			
Future plan for pollution control	: Regenerator install	hei			
Present pollution control measures	: None	·	ral gas used		

The O₂ content was 2.2% and controlled to a reasonable level. In spite of natural gas burning, smoke emission (thin purple) was observed from the stack. The Bacharach value was No.3 - 4, which is due to faulty construction of the burner which should be changed. Heat insulation of the furnace was generally satisfactory and the unit fuel consumption was rather low at 1.3 million kcal/ton (with cullet at 55%).

		No. 24	Date of Visit	Jur	. 19, 1990			
Name of Establishment	PENNWALT, S.A. DE C	V.	and and a substantial design of the second secon					
Type of Industry (Product)	Chemical (NaOH, Cl ₂ , Na							
Scale of Factory	Large							
Annual Sales or Production	80,000,000,000 pesos/	000,000,000 pesos/yr						
Kind of Fuel, Consumption	Natural gas (211.3 peso	os/m ³)						
and Price	285,000 m ³ /mon 60,20		والمتعادية والمراجع					
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks			
Water tube boiler	7.7 ton/hr	Natural gas	363 m ³ /hr	4	·			
Water tube boiler	7.7 ton/hr	Natural gas	363 m ³ /hr	12				
Smoke tube boiler	3.8 ton/hr	Natural gas		20	Spare			
Smoke tube boiler	3.8 ton/hr	Natural gas		20	Spare			
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				<u> </u>				
Outline of the Facility Surveyed		ter tube boileir	7.7 ton/hr (steam)					
Evaporation rate		/hr Normal: 3.9 ton/hr						
Steam pressure:	: 11 kg/cm ² g	0						
Fuel consumption		³ /hr Normal: 363 m ³ /hr						
Fuel pressure	: 60 mmAq							
Combustion air pressure	: Unknown	Temperature: Normal						
Combustion exhaust gas compositio		4.2% CO - 0% (as measur	red by the plant)					
Combustion exhaust gas temperatu	•	asured by the plant)						
Stack	: 0.5 m x 8 m							
Operating hours	: 24 hr/day, 168							
		ne of Survey Result						
Present pollution control measures								
Future plan for pollution control	: None	· · · · · · · · · · · · · · · · · · ·	: 		······			
Present energy-saving measures	: None	<u></u>						

This is a chemical company producing NaOH and Cl₂ from salt and odor of chlorine was felt from time to time. Gas pipings were heavily corroded. ۱.

The O₂ content was 2.4% when the combustion amount was large, and 7% when it was small. Combustion control was generally satisfactory. The exhaust gas temperature was 250 °C, with the boiler efficiency high at 86%. There was no particular problem in terms of combustion. 2.

		· []	Vo. 25	Date of Visit	Jui	n. 19, 1990
Name of Establishment	GENERAL PRODUCTO	OS CO., S.A. DE C.	V.	SECTION CERTICAL MADE ALAR A PROPERTY AND A DESCRIPTION OF COMER A DATE		
Type of Industry (Product)	Chemical (Na ₂ S ₂ O ₄ , Zn	O, SO ₂ solution)				
Scale of Factory	Large	Num	iber of Em	iployees	320	
Annual Sales or Production	30,000,000,000 pesos			·····		<u></u>
Kind of Fuel, Consumption and Price	Natural gas (211.3 per 1,137,600 m ³ /mon 24	sos/m ³) 0,400,000 pesos/m	on			
Type of Combustion Facility	Capacity	Kind of Fu	el	Fuel consumption	Age	Remarks
Smoke tube boiler	7.8 ton/hr	Natural gas		686 m ³ /hr	4	Three of four
Smoke tube boiler	7.8 ton/hr Natural gas			686 m ³ /hr	4	units in
Smoke tube boiler	4.7 ton/hr	Natural gas		208 m ³ /hr	4	operation
Smoke tube boiler	3.1 ton/hr	Natural gas		208 m ³ /hr	3	
						·
				TO A state (also and)		
Outline of the Facility Surv	- /	moke tube boiler		7.8 ton/hr (steam)		
Evaporation rate	: Normal: 7.8	3 ton/nr				
Steam pressure:	: 8 kg/cm ² g	o3				
Fuel consumption	: Normal: 68	e waar				
Fuel pressure	: 250 mmAq					
Combustion air temperature	: Normal	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	7 nom (or	a magazirad bu tha plan	43	
Combustion exhaust gas composit				s measured by the plan	y	
Combustion exhaust gas tempera		neasured by the pla	uny .			
Stack	0.6 mộ x 7.3					
Operating hours	•	168 hr/week	1			
O		line of Survey Resu	3 L			
Present pollution control measure			<u> </u>			
Future plan for pollution control	: None					
Present energy-saving measures	: None					

1. The work environment was poor with ammonium and sulfur odor detected.

2. The O₂ content was 1.7% and Bacharach value No.1, thus combustion control was extremely good. The flue gas measurement is carried out once a week using the Teledyne gas analyzer.

3. The exhaust gas temperature was also satisfactory at 209°C, with the boiler efficiency at 88%.

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	the second s	No. 26	Date of Visit		n. 19, 1990
Name of Establishment	IDEAL STANDARD, S.	and a second		UU	
Type of Industry (Product)		duct (sanitary porcelain)			
Scale of Factory	Large	Number of E	mplovees	600	
Annual Sales or Production	860,000 pieces/yr				
Kind of Fuel, Consumption	Natural gas 712,300 m ³	/day (207.36 pesos/m ³)	4,431,075,840 pesos	/mon	
and Price	Halalai guo 1 1-3000 in		il in the offered become		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1. Tunnel kiln	403,200 kcal/hr	Natural gas	245 m ³ /hr	6	
2. Tunnel kiln	403,200 kcal/hr	Natural gas	245 m ³ /hr	6	
3. Tunnel kiln	296,000 kcal/hr	Natural gas	180 m ^{3/} hr	34	
4. Tunnel kiln	296,000 kcal/hr	Natural gas	180 m ^{3/} hr	34	
5. Downdraft kiln	453,600 kcal/hr	Natural gas	500 m ^{3/} hr	3	
Infrared burner	30,200-60,600 kcal/hr	<u>_</u>		-	800 units
······································		······································		1	[
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Outline of the Facility Su	veyed Tunnel ki	n for sanitation fixture	<u></u>		
Tempeerature of an object to be Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours	: 50 mmAq : Normal illion : O ₂ - 2.09%, (: 275°C (as m 24 hr/day, 16 Outli	ne of Survey Result	ed by the plant)		
Fuel pressure Combustion air temperature Combustion exhaust gas compos Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measure	: 50 mmAq : Normal illion : O ₂ - 2.09%, (: 275°C (as m 24 hr/day, 16 Outlin es : Fuel changed to nat : None s : None	easured by the plant) 38 hr/week ne of Survey Result ural gas			offy the exhau
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln fo he preheating zone contained rise by installing the door to t	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	
Fuel pressure Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating hours Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There was no door at inlet a gas of stack on the side of t temperature is expected to 2. Kiln measuring instruments	: 50 mmAq : Normal ition : O ₂ - 2.09%, (: 275°C (as m : 24 hr/day, 16 Outlines : Fuel changed to nat : None s : None and outlet of the tunnel kiln for the preheating zone contained rise by installing the door to t and automatic control equiption	easured by the plant) 38 hr/week 10 of Survey Result 10 ural gas r kiln car and large quantit 10_2 at 12.9% and the temphe kiln, the use of air prehoment were well controlled	y of air was entering. Co perature was 275°C. As leater becomes possible except for part of equipm	the exha	

Name of Establishment	T FCA. DE PAPEL SAN	No.27	Date of Visit	JUI	n. 20, 1990
Type of Industry (Product)	Paper and its product		· · · · · · · · · · · · · · · · · · ·		
Scale of Factory	Large	Number of Er	molovoos	1,023	3
Annual Sales or Production	50,000 ton/yr		прюусса	1,021	J
Kind of Fuel, Consumption	Black liquor 5,590 kl/	mon		··	
and Price	Heavy oil (H) 6,846 kl/				
Type of Combusion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1. Black liquor boiler	12.5 ton/hr	Black liquor	3,280 l/hr	-	
2. Black liquor boiler	20.5 ton/hr	Black liquor Heavy oil (H)	4,480 l/hr 416 l/hr	15	Superheater
3. Water tube boiler	34.0 ton/hr	Heavy oil (H)	2,017 l/hr	<u>.</u>	
4. Water tube boiler	60.0 ton/hr	Heavy oil (H)	3,600 l/hr	-	
5. Water tube boiler	60.0 ton/hr	Heavy oil (H)	3,500 l/hr	15	Superheater
Outline of the Facility			· · ·		
 Black liquor boiler Evaporation rate Fuel consumption Steam pressure Fuel pressure Temperature Combustion air temperature Combustion exhaust gas compos Exhaust gas temperature Stack Operating time Water tube boiler Evaporation rate Fuel consumption Steam pressure Stack Operating time Steam temperature Fuel pressure and temperature Combustion air temperature Steam temperature Steam	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	ton/hr ck liquor 4,480 l/hr $3.0 \text{ kg/cm}^2\text{g}$ 110°C $CO_2 - 14\%$ (as measured by neasured by the plant) 5 m 168 hr/week steam), with recuperator ton/hr Normal: 45 ton/hr avy oil (H) 3,500 l/hr $1, 105^{\circ}\text{C}$ Atomizin $CO_2 - 14\%$ (as measured by inlet : 300°C, Outlet:	ng steam pressure: 5.0	γC 2g kg/cm ²	int)
Present pollution control measures					
Future plan for pollution control	: None				
Present energy-saving measures	: Economizer, recup	erator			
 Black liquor boiler Composition of the black liqu Black liquor is sprayed and be auxiliarily used at 5%. Electric precipitator is used, w precipitator is stopped. The O₂ content in exhaust ga Instruments of boilers are we Water tube boiler Measurement result of exhaus Recuperator inlet - 	urnt in the boiler by mean with white smoke generate is was 10.5% and the tem ill serviced. st gas was as follows: Temperature 360°C, O2	s of a splash type burner and ed due to water content in bl perature 165°C at the econo	I NaOH is recovered by ack liquor. Smoke char mizer outlet.		

				and the second	
		No.28	Date of Visit	Jur	1. 20, 1990
Name of Establishment	FCA. DE PAPEL MEXIC				
Type of Industry (Product)	Paper and its product (recycled paper)		· · ·	
Scale of Factory	Large (One of ten large	st plants) Number of En	nployees	286	
Annual Sales or Production	· · · · ·				
Kind of Fuel, Consumption and Price	Heavy oil (L) 1,800 kl/i	· · · · · · · · · · · · · · · · · · ·	314,000,000 pesos/mo		
Type of combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1. Water tube boiler	20.8 ton/hr	Heavy oil (L)	1,250 l/hr	18	Superheater
2. Water tube boiler	20.8 ton/hr	Heavy oil (L)	1,250 Vhr	18	Superheater
(with recuperator)					
<u></u>		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·
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<u> </u>				-t	
Outline of the Facility	W	ater tube boiler	20.8 ton/hr (steam)		A
Evaporation rate	: Rating: 20.8	ton/hr Normal: 12.5	ton/hr		
Fuel consumption	: Rating: 1,56				
Steam pressure	: 39 kg/cm ² g	Temperature			
Fuel pressure	: 3 kg/cm ² g	Temperature			
Atomizing pressure	: 7 kg/cm ² g		air temperature : 160°	0	
Combustion exhaust gas temperatu		superator inlet			
		let (as measured by the pla	ant)		
Stack	: 3.6mø x 36m				
Operating time	: 24 hr/day, 1				
		ne of Survey Result			
Present pollution control measures	: None				· · · · · ·
Future plan for pollution control	: None				
Present eneroy-saving measures	: Junostrom type re	cuperator			

1. The boiler was not operating because of expansion work on the day of the visit.

 For this boiler, instruments were faulty and automatic control not satisfactory. Combustion control is made manually by looking into the level gauge and vapor pressure gauge. Danger of the present status and urgency of improving faulty points were advised to the plant.

- 32 -

		No. 29	Date of Visit	Jun	n. 20, 1990			
Name of Establishment	HACO MEXICANA, S.A	ang din pipengan di sema dal setterado gi serian. Pater per setti paga ay semi p 1			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			
Type of Industry (Product)	Chemical (Fe203, FeSO							
Scale of Factory	Medium	Number of E	mployees	142				
Annual Sales or Production	4,560,000,000 pesos/	4,560,000,000 pesos/yr						
Kind of Fuel, Consumption and Price	Heavy oil (L) (192.65 25,500 l/mon 46,810,00	pesos/l) 00 pesos/mon		n				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Hemarks			
Smoke tube boiler	3.8 ton/hr	Heavy oil (L)	266 l/hr	6				
Roasting furnace	Unknown	Diesel	83 l/hr	15	2 day/week			
Drying furnace	Unknown	Heavy oil (L)		50				
Drying furnace	Unknown	Heavy oil (L)	Drying furnace total	50				
Drying furnace	Unknown	Heavy oil (L)	88 l/hr	50				
Drying furnace	Unknown	Heavy oil (L)		50				
Quilling of the Coollin Querran -	Smoke tub		ton/hr (steam)					
Outline of the Facility Surveyed	· · · · · · · · · · · · · · · · · · ·		torvnir (steam)					
Evaporation rate Steam pressure	: Haling: 3.8 ton/nr : 5 kg/cm ₂ g	Normal: 2.9 ton/hr						
Fuel consumption	: Rating: 340 l/hr	Normal: 266 l/hr						
Fuel pressure	: 9 kg/hr	Temperature : 120°C						
Atomizing steam pressure	: 4.2 kg/cm ² g	Temperature : 120°C						
Combustion air temperature	: Normal							
Stack	: 0.6 mo x 15 m							
Operating time	: 24 hr/day, 168 hr/v	veek						
		Ided in the near future for a	liternate use.					
	Outli	ne of Survey Result						
Present pollution control measures	Outli : None	ne of Survey Result						
Present pollution control measures Future plan for pollution control		ne of Survey Result						

1. This is an old plant. Inside of the plant is totally yellow.

2. The O₂ content was 10.2% and the Bacharach value No. 8, with combustion control unsatisfactory. Carbon deposit was also observed in the boiler. The exhaust gas temperature was relatively satisfactory at 251°C. As only one boiler was used for 24-hour operation, it had to be operated continuously without maintenance. As another boiler will be added in one month, operation control is said to be planned.

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		. ľ	No. 30	Date of Visit	Jur	. 20, 1990
Name of Establishment	J CIA. PAPELERA EL FE	NIX, S.A.	يطيبون ومحمد ومستعم		an an interaction and a stability of the state	And Bridden and a second
Type of Industry (Product)	Paper and its product	(high-grade paper	, carton pa	per)		
Scale of Factory	medium		nber of Emp		232	· · ·
Annual Sales or Production	(Capital : 748,492,400) pesos)	· · · ·			
Kind of Fuel, Consumption	Heavy oil (L) (192.65				· · · · · · · · · · · · · · · · · · ·	
and Price	745,700 l/mon 143,66	30,000 pesos/mon				
Type of Combustion Facility	Capacity	Kind of Fi	iel	Fuel consumption	Age	Remarks
Water tube boiler	16 ton/hr	Heavy oil (L)		750 l/hr	29	turbine
Water tube boiler	14 ton/hr	Heavy oil (L)		600 l/hr	24	turbine
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		a service and				
Outline of the Facility Surveyed	Water tube	e boiler	16 ton	/hr (steam)		
Evaporation rate	: Rating : 16 ton/hr	Normal : 9.5 ton/h	r			
Steam pressure	: 18 kg/cm ² g					
Fuel consumption	: Normal : 750 l/hr B	Burner: 3 pcs				
Fuel pressure	: 2.5 - 3.5 kg/cm ² g	Temperature : 10)-110°C			
Atomizing steam pressure	. 3.5 - 4.5 kg/cm ²	•				
Combustion air temperature	: 80°C					
Combustion exhaust gas		·	÷			
composition	: 0.2 - 5.0%, CO ₂ - 1	3.0%, CO - 0.0 pp	m (as mea	sured by the plant)		
Combustion exhaust gas			:	·		
temperature	: Recuperator outlet :	: 204°C (as meas	sured by the	e plant)		
Stack	2.2 mφ x 36 m					
Operating time	24 hr/day, 144 hr/					
		ine of Survey Rest	ilt <u> </u>			
Present pollution control measures	: None					
Future plan for pollution control	: None					
Present energy-saving measures	: Recuperator instal	lled				

1. Corrugated fiber board and high-grade paper are produced from used paper and cellulose. Boilers are used for power generation, with remaining steam used for paper drying.

2. The boiler load was minimum because of trouble in turbine on the day of measurement. As a consequence, the exhaust gas O₂ content was 12% and the Bacharach value No. 5.

3. No improvement was observed though air pressure was lowered during operation. Unburnt fuel particles were scattering in the boiler with poor atomization. As the air preheater was provided, the exhaust gas temperature was normal at 252°C. As the boiler is outdated, its renewal is advisable.

		N	b. 31 Date of Vi	sit Ju	n. 21, 1990			
Name of Establishment	VITRO FIBRAS, S. A.	an in an	aley, ay haaray oo dhadhada ahaa ahaa ahaa ahaa ahaa ah	1247-6884-644-699-699-699-699-699-	an na fa fan de ser an			
Type of Industry (Product)	Non-metallic mineral p	roduct (glass wool, gl	ass fiber)					
Scale of Factory	Large	Numb	er of Employees	671	· · · · · · · · · · · · · · · · · · ·			
Annual Sales or Production	79,554,800,000 pesos	79,554,800,000 pesos/yr 950 ton/yr						
Kind of Fuel, Consumption and Price	Natural gas 1,448,000	m ³ /mon (211.19 p	esos/m ³) 305,803, ⁻	120 pesos/mon				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consur	nption Age	Remarks			
1. Melting furnace	1.3 ton/hr	Natural gas	535.6 m ³		Glass wool			
2. Melting furnace	0.9 ton/hr	Natural gas	495.2 m ³		Glass fiber			
3. Melting furnace	0.7 ton/hr	Natural gas	569.1 m	³ /hr 6	Glass fiber			
4. Water tube boiler	3.1 ton/hr	Natural gas	2,300 m ³	³ /hr 10	Alternate use			
					by every six months			
5. Water tube boiler	3.1 ton/hr	Natural gas	2,300 m ³	³ /hr 5	Alternate use			
					by every six			
					months			
Outline of the Facility Surveyed	Melling	lurnace	0.9 ton/hr (glass)					
Rating	: 0.9 ton/hr (glass)							
Fuel consumption	: Rating : 916 m ³ /hr	Normal :	450 m ³ /hr					
Temperature of object to be	· ·							
heated	: 1,350°C	. '						
Fuel pressure	: 40 mmAq							
Combustion air temperature	: 730°C With re	cuperator						
Combustion exhaust gas		·						
composition	: O ₂ 1.5% CO - 0.0							
Temperature	: 1,250°C at recuper	rator inlet 900°C a	t outlet (as measured	by the plant)	·			
Stack	: 1.68 mφ x 21 m				-			
Operating time	: 24 hr/day, 168 hr/			وراد ورجو برجوارت وخفف الدراك فكالكس				
		line of Survey Result						
Present pollution control measures		natural gas	<u> </u>					
Future plan for pollution control	: None							
Present energy-saving measures	: Recuperator							
1. The melting furnace is renew		-	•	at 1,500°C.				

2. Instruments and automatic control system necessary for operation of the furnace are complete.

3. There are two stacks for the furnace. The stack on the melting room side discharges 3/4 of total exhaust gas, with temperature at 1,250°C while that on the extractor side dischargesz 1/4 with the temperature at 1,000°C. A part of waste heat is recovered for drying of units. Further utilization of waste heat is necessary. For example, waste heat may be used for a boiler.

4. This furnace has a gap in a part of the wall. Air-tightening is necessary.

			No. 32	Date of Visit	Jui	n. 21, 1990
Name of Establishment	PASTEURIZADORA LA	A LAGUNA	a con un se con a constant de la con	<u>na ana ana amin'ny faritr'ora dia dia dia amin'ny faritr'ora amin'ny faritr'ora dia dia dia dia dia dia dia dia</u>		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Type of Industry (Product)	Food (dairy products, m	ilk, yogurt)		· · ·		
Scale of Factory	Large	Nu	mber of Em	ployees	500	
Annual Sales or Production	Orange : 240,000 l/yr,	Milk : 120,000,0	000 l/yr		··· •	
Kind of Fuel, Consumption	Heavy oil (L) (175.6 pt	esos/I)				· · · · ·
and Price	32,000 l/mon 5,619,200					Destander i
Type of Combustion Facility	Capacity	Kind of F	uel	Fuel consumption	Concession of the local division of the loca	Remarks
Smoke tube boiler	2.6 ton/hr	Heavy oil (L)		42 l/hr	13	Alternate use
Smoke tube boiler	2.6 ton/hr	Heavy oil (L)	· · · · · · · · · · · · · · · · · · ·	42 l/hr	13	Alternate use
· · · · · · · · · · · · · · · · · · ·				and an		· · · ·
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			·			
Outline of the Enellity Conserved	Smoke tube	hoilor	261	on/hr (steam)		<u> </u>
Outline of the Facility Surveyed				un/ni (steam)		
Evaporation rate	: Rating : 2.6 ton/hr	Normal: 0.52	IOH/HE			
Steam pressure	: 8 kg/cm ² g	Normal 40 H	h-			
Fuet consumption	: Rating: 230 l/hr	Normal : 42 //	1.1			
Fuel pressure	: 0.85 kg/cm ² g	Temperature		. * •		· · ·
Atomizing steam pressure	: 1.0 kg/cm ² g	Temperature	: Normai			
Combustion air temperature	: Normal					
Combustion exhaust gas	17E00 los mossuros	thu the plant)				
temperature Stack	: 175°C (as measured	i by the planty				
6	: 0.5 mφ x 18 m : 24 hr/day, 168 hr/v	iont	1.1			
Operating time	••	ne of Survey Res	nult			
		ne of Survey ries	5011		······	
Present pollution control measures		· .	·			
Future plan for pollution control	: None			·		· · · .
Present energy-saving measures	: None					· · · · ·

1. Boiler steam is used as heat source for sterilization of milk.

2. The O₂ content was suitable at 4.8%, without smoke emission from the stack. The high Bacharach value of No. 9 may be possibly due to too low atomizing steam pressure. The exhaust gas temperature was very low at 165°C. The boiler efficiency was satisfactory at 88%. The combustion state was satisfactory except that the flame was offset to right.

e de la companya de la		No. 33	Date of Visit	Jun). 21, 1990		
Name of Establishment	VIDRIO PLANO DE ME	XICO, S.A.	an an air ann an an ann an Arlann a' Arl	ni geograph, femilie en a	alla an an ann an an an an an an an an an a		
Type of Industry (Product)	Non-metallic mineral pr	oducts (plate glass, glass	for automobile)				
Scale of Factory	Large	arge Number of Employees 1,480					
Annual Sales or Production	210,000,000,000 peso	syr					
Kind of Fuel, Consumption and Price	Natural gas (211.3 per 5,380,630 m ³ /mon 1,2	sos/m ³) 232,010,000 pesos/mon			······································		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
Glass melting furnace tank oven	3.3 ton/hr Cullet 30%	Natural gas	2,050 m ³ /hr	22	6,210,000 kcal/ton		
Glass melting furnace tank oven	15.8 ton/hr Cullet 30%	Natural gas	3,618 m ³ /hr	20	2,290,000 kcal/ton		
Outline of the Facility Surveyed	Glass meltir	ng lumace 15.	.8 ton/hr (Glass)	and and the second second			
Capacity of facility	: 15.8 ton/hr (Glass))					
Unit consumption	: 2,290,000 kcal/ton	(Glass)					
Fuel consumption	: 3,618 m ³ /nr Glas	s melting temperature : 1	,450°C				
Fuel pressure	: 245 - 2,450 mmAo						
Combustion air pressure Combustion exhaust gas	: a few mmAq						
composition Combustion exhaust gas	: O ₂ - 9.39%, CO ₂	- 11.17%, H ₂ O - 7.35% (a	as measured by the plant)	ŧ			
temperature	: Regenerator inlet :	1,560°C, Outlet : 521°C	(as measured by the pla	nt)			
Stack	: 3.9 mo x 81 m						
Operating time	: 24 hr/day, 168 hr						
Regenerator	: 20-minule changeo		30%				
		line of Survey Result					
Present pollution control measures	: Fuel changed to na	atural gas			- 		
Future plan for pollution control	: None						
Present energy-saving measures	: Regenerator insta	lled		•			

The O_2 content was 7% because of unsatisfactory sampling position. Although control is made to prevent leak in the furnace up to the regenerator, air leak is permitted after this regenerator (about 2.9% in the regenerator). The flame was satisfactory and no smoke generated. The fuel consumption per unit product was 2.29 million kcal/ton, with cutlet of around 30%.

		No. 34	Date of Visit	Jun	. 22, 1990	
Name of Establishment	PAPELERA IRUNA, S.	A.				
Type of Industry (Product)	Paper and its product	(recycled paper)				
Scale of Factory	Medium	n Number of Employees 250				
Annual Sales or Production	72,000 ton/yr					
Kind of Fuel, Consumption and Price	Heavy oil (L) 913.8 kl/r		019,000 pesos/mon			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks	
1. Water tube boiler	9.4 ton/hr	Heavy oil (L)	902 1/hr	30		
2. Smoke tube boiler	7.8 ton/hr	Heavy oil (L)		17	Not operating	
3. Smoke tube boiler	7.8 ton/hr	Heavy oil (L)	283 l/hr	15	· · ·	
4. Smoke tube boiler	7.8 ton/hr	Heavy oil (L)	283 l/hr	12		
5. Smoke tube boiler	7.8 ton/hr	Heavy oil (L)	283 l/hr	10		
Outline of the Facility Surveyed	Smoke tul	be boiler 7.8	ton/hr (steam)		1	
Evaporation rate	: Rating : 7.8 ton/hr	Normal : 6.4 ton/hr				
Fuel consumption	: Rating : 566 l/hr	Normal : 283 l/hr		. 1		
Steam pressure	: 8 kg/cm ² g	Temperature : 170°C				
Fuel pressure	: 3.5 kg/cm ² g	Temperature : 110°C				
Atomizing pressure	: 1.75 kg/cm ² g	· ·				
Combustion air temperature Combustion exhaust gas	: Normal					
composition	: O ₂ - 5.5%, CO ₂ - 1	3.0% (as measured by the p	lant)			
Temperature	: 200°C (as measur		•			
Stack	0.61 mo x 7 m					
Operating time	24 hr/day, 168 hr	/week				
		line of Survey Result				
Present pollution control measures	: Exhaust gas meas	ured while making effort to in	nprove combustion.			
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·			
Present energy-saving measures	: None		······································			

1. This boiler is compact and the control of steam pressure - air/fuel ratio is made. Atomazed air is manual adjusted, and well serviced as a whole.

2. Analysis of exhaust gas is entrusted to a professional firm, but the result contained some theoretical errors.

3. The O₂ content was 9.5%, temperature 211°C, and the Bacharach value of No. 5. It was advised that the O₂ content be reduced to 4% and the atomization ratio be increased while checking the flame state.

	and a second	No. 35	Date of Visit	Jun. 2	22, 1990		
Name of Establishment	METALURGICA ALMENA						
Type of Industry (Product)	Basic metals (copper, br	ass, bronze castings)					
Scale of Factory	Medium Number of Employees 170						
Annual Sales or Production	17,616,145,000 pesos/y	IC	a di se si la companya di se si				
Kind of Fuel, Consumption and Price	Kerosin 6,000 kl/m Electricity 10,640 kwh	on (630.00 pesos/l) /mon (171.19 pesos/l	/m ³) 4,467,935,640 pe 3,780,000,000 pe kwh) 1,773,528 pesos/n	sos/mon non			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
1. Crucible furnace	600 kg/charge	Natural gas	48,300m ³ /hr	35	· · · · · · · · · · · · · · · · · · ·		
2. Electric furnace	600 kg/charge	Electricity	11 kw/hr	11			
3. Electric furnace	600 kg/charge	Electricity	11 kw/hr	11			
4. Electric furnace	600 kg/charge	Electricity	11 kw/hr	11			
5. Electric furnace	600 kg/charge	Electricity	11 kw/hr	11	·		
Outline of the Facility Surveyed	Crucible fu		0 kg/charge (brass etc.))			
Rating Fuel consumption Temperature of object to be heated Combustion air temperature	: 600 kg/charge : Normal : 48,300 m ³ : 912 - 1,100°C : 500°C with recuper		ığe				
Stack Operating time	: 0.41 mφ x 10 m : 12 hr/day, 60 hr/we	ek, 2 - 3 charge/day					
	Outlir	ne of Survey Result		and the second secon			
Present pollution control measures	: Fuel changed to nat	ural gas		ىنى بەركىيى بەركىنى تەركىيى يەركىيى بەركىيى بەركىيى بەركىيى بەركىيى			
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·				
Present energy-saving measures	: Radiation type recu	perator	······································				

1. Air is entering from the wide gap between the crucible furnace and hood. As a result, the exhaust gas temperature was measured to be low at 840°C. Repair of hood is necessary to enhance the efficiency of the recuperator. Measures against dust must also be taken.

2. There is no engineer with expertise on the combustion facilities in this plant. No detailed explanation was given concerning the facilities.

		ſ	No. 36	Date of Visit	Jun	. 22, 1990		
Name of Establishment	BANOS LA NARANJA	and with the second	and the second second second	an an an an Anna an Ann				
Type of Industry (Product)	Bathhouse			:				
Scale of Factory	Small	Nun	ber of Em	ployees	4			
Annual Sales or Production	73,000,000 pesos/yr							
Kind of Fuel, Consumption and Price	Diesel (478.26 pesos/l) 3,300 l/mon 1,580,000) pesos/mon						
Type of Combustion Facility	Capacity	Kind of FL	e	Fuel consumption		Remarks		
Smoke tube boiler	0.8 ton/hr	Diesel		55. l/hr	15	Alternate use		
Smoke tube boiler	0.8 ton/hr	Diesel		55 l/hr	25	·		
Hot water boiler	Unknown	Diesel			25	used as required		
Hot water boiler	Unknown	Diesel			25	used as required		
Hot water boiler	Unknown	Diesel		· · · · · · · · · · · · · · · · · · ·	25	used as required		
Hot water boiler	Unknown	Diesel			25	used as required		
Outline of the Facility Surveyed	Smoke tube	e boiler	0.8 to	on/hr (steam)				
Evaporation rate	: Rating : 0.8 ton/hr	Normal : 0.6 to	vhr	······································				
Steam pressure	: 6 kg/cm ² g		· · · ·			· .		
Fuel consumption	: Rating : 70 Vhr	Normal : 55 l/h	r ·	•				
Fuel pressure	: 7 kg/cm ² g	Temperature :	Normal		÷ .			
Combustion air temperature	: Normal			· .				
Stack	: 0.3 mφ x 15 m			•	· .			
Operating time	: 2 hr/day, 14 hr/we	ek	- 					
	-							
		ne of Survey Resu						
Present pollution control measures	: Due attention paid o	on prevention of sn	noke gene	ration				
Future plan for pollution control	: None							
Present energy-saving measures	: None							
1. Considerable attention is paid	on smoke generation. Dir	esel oil is used, the	uoh auite	exceptional for the ba	athhouse.			

1. attention is c ON SI noke ge ese 15 u, Ŋ q v

The O_2 content was 7.3% and the Bacharach value No. 0. Combustion was satisfactory and control superior, except that the O_2 content was slightly high. The exhaust gas temperature was in an average at 203°C and the boller efficiency was satisfactory at 85%. 2.

		No. 3	37 Date of Visit	Jun). 22, 1990		
Name of Establishment	BANOS XOLALPA						
Type of Industry (Product)	Bathhouse						
Scale of Factory	Small	Number	of Employees	3			
Annual Sales or Production		·					
Kind of Fuel, Consumption and Price	11,700 l/mon 1,910,00						
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	COLOR STREET, STRE	Remarks		
Smoke tube boiler	1.0 ton/hr	Heavy off (L)	130 l/hr	44	Steam and hot water		
Smoke tube boiler	0.8 ton/hr	Heavy oil (L)	130 l/hr	44	Spare		
•							
Culling of the Equility Suprayod	Smoke tub	<u> </u> vo boilor	1.0 ton/hr (steam)				
Outline of the Facility Surveyed	: Rating : 1.0 ton/hr		1.0 Winn (Steamy		·····		
Evaporation rate	\therefore Halling \therefore 1.0 to 1/11 \therefore 5 kg/cm ² g	Norman . 1.0 toroni					
Steam pressure	Rating: 130 l/hr	Normal: 130 l/hr					
Fuel consumption	Unknown	Temperature : 40°	»ሮ				
Fuel pressure	: Unviowi	Temperature . 40	C				
Atomizing steam pressure and temperature	Unknown						
Combustion air pressure	: Natural draft	Temperature : nor	mal				
Stack	: 0.4 mo x 15 m	· · · · · ·					
Operating time	: 3 hr/day, 21 hr/we	ek					
	-						
	Out	line of Survey Result					
Present pollution control measures	: None						
Future plan for pollution control	: None	<u>.</u>					
Present energy-saving measures	: None	· · ·					

1. The boiler is more than 40 years old and manually operated by the intuition of the operator.

 Control was extremely poor with the O₂ content at 13.3% and the Bacharach value at No. 8, and smoke generation was observed. The exhaust gas temperature was in an average at 205°C, but the boiler efficiency was 77% because of large amount of exhaust gas.

3. Renewal of equipment is recommended.

		No. 38	Date of Visit	Jur	. 22, 1990				
Name of Establishment	BANOS GABIS								
Type of Industry (Product)	Bathhouse								
Scale of Factory	Small	Number of En	nployees	8					
Annual Sales or Production	91,250,000 pesos/yr								
Kind of Fuel, Consumption and Price	Heavy oil (L) (175.65 pesos/l) 10,800 l/mon 1,900,000 pesos/mon								
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks				
Smoke tube boiler	0.4 ton/hr	Heavy oil (L)	51 l/hr	31					
Smoke tube boiler	0.6 ton/hr	Heavy oil (L)	51 l/hr	31	Not operating				
					· · · · · · · · · · · · · · · · · · ·				
·									
	· · · · · · · · · · · · · · · · · · ·			·					
	One she with	hailes 0.4 h	andha (ataam)						
Outline of the Facility Surveyed	Smoke tube		ion/hr (steam)						
Evaporation rate	: Rating : 0.4 ton/hr	Normal: 0.4 ton/hr							
Steam pressure	: 4 kg/cm ² g	NI							
Fuel consumption	: Rating : 51 I/hr	Normal : 51 l/hr							
Fuel pressure	: Unknown	Temperature : normal							
Atomizing steam pressure and	: Uunknown				,				
temperature Combustion air pressure	: Natural draft	Temperature : normal							
Stack	: 0.4 mo x 15 m	Temperatore : normai			•				
Operating time	7 hr/day, 49 hr/wei	ek							
	initial, it initial		· · · ·						
	Outli	ne of Survey Result			· · · · · · · · · · · · · · · · · · ·				
Present pollution control measures									
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·						
Present energy-saving measures	: None				······				
r rogeir energy-saving measures				· · · · · ·					

1. The boiler is 31 years old and manually operated by the intuition of boiler man.

Combustion control was extremely poor with the O₂ content at 15.3% and the Bacharach value at No. 8. The oil temperature was 25°C and not heated and atomization poor. Though the exhaust gas temperature was in an average of 230°C, the boiler efficiency was poor at 67%.

	and the second	No. 39	Date of Visit	Jun. 25, 19
Name of Establishment	MEDIDORES AZTECA,		an kan seri kana kana kana kana kana kana kana kan	nan alah leman nangangan pagantar bertan dinis
Type of Industry (Product)	Basic metal (brass cast		· · · · · · · · · · · · · · · · · · ·	
Scale of Factory	Medum	Number of E	mployees	120
Annual Sales or Production	9,000,000,000 pesos/y		······	· • • · · · · · · · · · · · · · · · · ·
Kind of Fuel, Consumption	Electricity 31,200 kwt		h) 4,978,272 pesos/	mon
and Price				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Ren
1. Electric furnace	69 kg/hr	Electricity	1.2 kwh/kg	5
,				
			·	
	<u></u>			
0 - Nu		upp.p.a. 00	Lathe (brana)	
Outline of the Facility Surveyed	Electric fu	0HIBC6 68	kg/hr (brass)	
Normal	: 69 kg/hr			
Power consumption	: Normal 1.2 kwh/kg			
Temperature of an object to be	1 00000	·		
	: 1,000°C : `12 hr/day			
Temperature of an object to be heated	: 1,000°C : `12 hr/day			
Temperature of an object to be heated	: `12 hr/day			
Temperature of an object to be heated	: `12 hr/day	na af Sanan Danili		
Temperature of an object to be heated Operating time	: `12 hr/day Outli	ne of Survey Result		
Temperature of an object to be heated Operating time Present pollution control measure	: `12 hr/day Outli s : Transfer of diesel	ne of Survey Result		
Temperature of an object to be heated Operating time Present pollution control measure Future plan for pollution control	: `12 hr/day Outli s : Transfer of diesel : None in particular	ne of Survey Result		
Temperature of an object to be heated Operating time Present pollution control measure	: `12 hr/day Outli s : Transfer of diesel	ne of Survey Result		
Temperature of an object to be heated Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular	ne of Survey Result operating facility	e and melting metal unit	naded from the ot
Temperature of an object to be heated Operating time Present pollution control measure Future plan for pollution control	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular	ne of Survey Result operating facility	e and melting metal unio	paded from the ot
Temperature of an object to be heated Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal	ne of Survey Result operating facility terial charged from one sid		
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	
Temperature of an object to be heated Operating time Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a U type electric indu 2. As this furnace has the load	: `12 hr/day Outli s : Transfer of diesel : None in particular : None in particular uction furnace, with raw mal ling port left open, installati	ne of Survey Result operating facility terial charged from one sid on of a lid to the loading p	ort was proposed to pre	

	e a la tracta	No.	40 Date of Visit	Jun. 25, 1990			
Name of Establishment	SALICILATOS DE MI		ېلىلىغۇمە ئەيەمەتىمەيىيىيەن ئالىشەتلىسىغانىك ئەتسەرسىيەرەرى يەرەمەتىك <mark>ىسى م</mark> ەمەرىمە	<u>Martin Brezze and Anno and A</u>			
Type of Industry (Product)	Precision instruments						
Scale of Factory	Medium Number of Employees 239						
Annual Sales or Production	17,300,000,000 pesos/yr						
Kind of Fuel, Consumption and Price	Heavy oil (H) 233.92	• • • •	42,105,600 pesos/mon				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remarks			
Water tube boiler	7.6 ton/hr	Heavy oil (H)	311 l/hr	50			
· · · · ·							
	-	······					
	· · · · · · · · · · · · · · · · · · ·						
			· · · · · · · · · · · · · · · · · · ·				
Outline of the Facility Surveyed	Water tu	ibe boiler	7.6 ton/hr (steam)				
Evaporation rate	: Rating : 7.6 ton/	hr		······			
Fuel consumption	: Normal : 311 l/hr						
Steam pressure	: 11 kg/cm ² g	Fuel temperature : 157°	C				
Atomizing steam pressure	: 11 kg/cm ² g						
Combustion air temperature Combustion exhaust gas	: Normal						
composition	: 02-9.3%, CO2-	8.8%, CO - 7 ppm (as m	easured by the plant)				
Temperature	: 320°C (as measu	ired by the plant)	· · · ·				
Stack	0.96 mφ x 22 m						
Operating time	24 hr/day, 168 h	itline of Survey Result	فالالار فبالبراب وسيسم كالالانت المستوحين والمعالم المتعار والمتعاد والمتعار والمتعاد والمتعار المتعا				
Present pollution control measures		Junie of Survey Result					
Future plan for pollution control	: Plant relocation r		<u></u>				
Present energy-saving measures	: None			······			
Tresent chergy outrig inclosited							
1. This boiler has been operate	d for about 50 years.		· · ·				
2. Exhaust gas measurement re	sult is shown below:	·	the second se				
Present: O ₂ - 12.8%, Tem After adjustment of primary	air : O2 - 11.2%, Tem	harach No. 9 or more perature - 340°C	an An Antonio Antonio Antonio Antonio				
After adjustment of fuel	: O ₂ . 8.5%, Tem	perature - 339°C					
Combustion air is natural dr	aft and air reduction is	difficult.					
3. Plant relocation is being plan	ned.						
				·			
		•					
		· .					
		•					
		- 44 -					

Name of Establishment		No. 41	Date of Visit	، UIII, د	25, 1990		
	CEMENTOS ANAHUAC		·. 		·····		
Type of Industry (Product)	Non-metallic mineral pro		1	1 =			
Scale of Factory	Large Number of Employees 755						
Annual Sales or Production		209,909,000,000 pesos/yr					
Kind of Fuel, Consumption and Price	Heavy oil (H) (152.17 pe Heavy oil (H) 14,580,00	esos/I), Natural gas (211. 0 I/mon, 1,690,000,000 pe	.3 pesos/m ³) esos/mon				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks		
Rotary kiln	96 ton/hr	Heavy oil (H)	9,000 l/hr	19			
Rotary kiln	96 ton/hr	Heavy oil (H)	9,000 1/hr	18			
Rotary kiln	25 ton/hr	Heavy oil (H)	2,250 l/hr	20			
Drying lurnace.	180 ton/hr	Natural gas		15			
Drying furnace	180 ton/hr	Natural gas		15			
Drying lurnace	45 ton/hr	Natural gas		20			
Heat medium boiler	1.3 ton/hr	Heavy oil (H)		15			
Heat medium boiler	1.3 ton/hr	Heavy oil (H)		15			
Hot water boiler	1.3 ton/hr	Heavy oil (H)		20			
Outline of the Easility Supposed	Rotary	kiln 06	ton/hr (cement)				
Outline of the Facility Surveyed	: Rating : 96 ton/hr	<u>- 50</u>	torgin (content)				
Capacity of facility	. naung so torvin						
Cement heating temperature	: Normal : 9,000 l/hr				•		
Fuel consumption	: 870 - 890 kcal/kg (comont)					
Unit consumption	: 35 kg/cm ² g	Temperature	12000				
Fuel pressure	: 600 - 800 mmAq		re : 1,000 - 1,100°C				
Combustion air pressure	. oou toou namwy	remperatur	ע עעררי יעערי י				
Combustion exhaust gas composition	: O ₂ -8-9%, CO ₂ -1	18 - 20% (as mea	sured by the plant)				
Fuel proportion between primary	. 02.0 3%, 002.1		ourse of the planty				
and secondary burners	: 90% : 10%						
Operating time	: 24 hr/day, 168 hr/	week					
- F		ne of Survey Result					
Present pollution control measures	: Electrostatic preci	•		·····	·····		
· · · · · · · · · · · · · · · · · · ·		······································					
Future plan for pollution control Present energy-saving measures 1. This is the sole cement plant l control, dust collection is not	: None : None located in the metropolitar effective.	n area of Mexico City. Tho 189 was said to be relativel	ly low, fuel was changed	from heav	y oil (L) to		
heavy oil (H) under consent of 8.7 million kcal/kg of clinker w					npuon nuo		

		No. 4	2 Date of Visit	Jur	n. 25, 1990		
Name of Establishment	PAPELERA ATLAS	,	ann an an ann ann ann an an an an an ann an a	89-99-97-962-963-969-96-96-96-96-96-96-96-96-96-96-96-96	- (************************************		
Type of Industry (Product)	Paper and its product (Recycled paper)						
Scale of Factory	Medium	Number of	of Employees	200			
Annual Sales or Production	14,400,000,000 pesos/yr						
Kind of Fuel, Consumption	Heavy oil (H) (163.48 pesos/l)						
and Price		78,470,000 pesos/mon					
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption		Remarks		
Water tube boiler	9.6 ton/hr	Heavy oil (H)	400 l/hr	19			
Smoke tube boiler	6.4 ton/hr	Heavy oil (H)	270 l/hr	6			
Smoke tube boiler	2.4 ton/hr	Heavy oil (H)	· .	5	Spare		
· · · · · · · · · · · · · · · · · · ·							
Outline of the Facility Surveyed			9.6 ton/hr (steam)				
Evaporation rate	: Rating: 9.6 ton/hr	Norma	I: 5.0 ton/hr				
Steam pressure	: 5 - 6 kg/cm ²						
Fuel consumption	: Normal : 400 l/hr						
Fuel pressure		emperature: 108°C		1.1			
Atomizing steam pressure	: 4.8 kg/cm ² g	i.					
Temperature	: Saturated steam	temperature					
Combustion air temperature	: Normal						
Combustion exhaust gas							
temperature	: 275°C (as measu	ired by the plant)					
Stack	: 1 møx 10 m						
Operating time	: 24 hr/day, 168 h		·				
		Itline of Survey Result	· · · · · · · · · · · · · · · · · · ·				
Present pollution control measures	: None						
Future plan for pollution control	: None						
Present energy-saving measures	: None						

1. This plant produces corrugated fiber board paper from used paper and cellulose and uses the boiler for drying. The stack is provided with a sampling port.

2. The exhaust gas O₂ content was relatively satisfactory at 3.9 - 4.0%. But the Bacharach value was high at No. 9 because of the use of heavy oil (H). The exhaust gas temperature was 268°C and the boiler efficiency 84%

	· · ·	Γ	No. 43	Date of Visit	Jun	. 25, 1990
Name of Establishment	BANOS LUPITA	in may be properly in the first of a much watch for more start, a star		nden na en en gerig y a de Sie de Land, han han men in jampej na engagy y de Andija		د و بیرو در مرد به دارند. : :
Type of industry (Product)	Bathhouse			· · ·		
Scale of Factory	Small	Nur	nber of Em	ployees	5	
Annual Sales or Production	200,750,000 pesos/yr			······································		
Kind of Fuel, Consumption and Price	Heavy oil (L) (175.65 15,000 l/mon 3,320,00	00 pesos/mon		. :		
Type of Combustion Facility	Capacity	Kind of Fi	iel	Fuel consumption	Age	Remarks
Smoke tube boiler	0.6 ton/hr	Heavy oil (L)		83 l/hr	25	Alternate use
Smoke tube boiler	0.5 ton/hr	Heavy oil (L)		83 1/hr	25	
· · · · · · · · · · · · · · · · · · ·						
	·					
		·····				
Outline of the Englity Surroyed	Smoke tube	n hoilor	0.6.1	on/hr (steam)		
Outline of the Facility Surveyed	· · · · · · · · · · · · · · · · · · ·					
Evaporation rate	: Rating: 0.6 ton/hr : Normal: 83 l/hr	Steam press	ure : o kĝ	cm-g		
Fuel consumption		moratura - 5500	1. A. A.			
Fuel pressure	: Unknown Ter	mperature : 55°C				
Atomizing steam pressure and temperature	: Unknown					
Combustion air pressure		nperature : norm	al			
Stack	: 0.25 m¢ x 15 m					
Operating time	: 6 hr/day, 42 hr/wee	ek				
	; ;					
	Outlin	ne of Survey Res	ult	· · · · · · · · · · · · · · · · · · ·	-	
Present pollution control measures	: None					
Future plan for pollution control	: None		_			
Present energy-saving measures	: None					
1. Two units of natural draft bo	biler (25 years old) are op	erated alternately	·. · ·			

2.

The exhaust gas O₂ content was 10.3%, indicating excess air intake. The Bacharach value was No. 9, with thin smoke observed from the stack. The exhaust gas temperature was 233°C and the boiler efficiency 80%.

3. The facility is old as a whole and equipment renewal is advisable.

- 47 -

			No. 44	Date of Visit	Jun	. 26, 1990	
Name of Establishment	PORCELANITE, S.A.	and a subscription of the	y napangangan di Kanarang sinya gerantakan (antakan sinya di katika	charlanda san ayada san iyo kana lada sana ana ang ang ang ang ang ang ang ang	Int Carlot a Crath is Francisco		
Type of Industry (Product)	Non-metallic mineral pro	duct (tile fo	r building)		· . ·		
Scale of Factory	Large		Number of Em	ployees	360		
Annual Sales or Production	1,200,000 m ³ /yr (area	1,200,000 m ³ /yr (area of tile)					
Kind of Fuel, Consumption	Natural gas 811,577	m ³ /mon	(211 pesos/m3)	171,242,7	747 pesos/	mon	
and Price			NAME AND DESCRIPTION OF A				
Type of Combustion Facility	Capacity		of Fuel	Fuel consumption	Age	Remarks	
1. Tunnel kiln	108,000	Natural ga		100 m ³ /hr	9	length 62 m	
2. Tunnel kiln	108,000 *	Natural ga		100 m ³ /hr	15	length 62 m	
3. Tunnel kiln	108,000 *	Natural ga		100 m ³ /hr	15	length 62 m	
4. Tunnel kiln #	875,000 *	Natural gas * : kcai/i		145.7 m ³ /hr	0	length 67 m	
# : hearth roller type	(00,00 and 00 m in addition		<u></u>	· · · ·	· · · · ·		
There are three more kilns o	1 30, 60 and 80 m in additio	IT to above					
				<u>_,, _</u> , _, _, _, _, _, _, _, _, _, _, _, _, _,			
	· · · ·						
				· · · · · · · · · · · · · · · · · · ·	<u> </u>		
	· · · · · · · · · · · · · · · · · · ·	~~		<u> </u>			
				<u></u>			
Outline of the Facility Surveyed	tunnel kiln	for tile	108,0	00 kcal/hr			
Heat quantity	: 108,000 kcal/hr	Kiln I	ength : 62 m				
Fuel consumption	: Normal : 100 m ³ /hr						
Temperature of object to be							
heated	: 1,105°C						
Product residence time in kiln	: 56 hr						
Combustion air temperature	: Normal						
Stack	: 1.0 mộ x 2.5 m	- ole			· ·		
Operating time	: 24 hr/day, 168 hr/w	eek				:	
······································	Outlin	e of Survey	Result				
Present pollution control measures				······································			
Future plan for pollution control	: None	a ai yao					
Present energy-saving measures	Part of exhaust gas	used for dr	vina				
r resert energy-saving measures	. Part of childust yas		<u>יייז</u>				
1. Waste heat should be utilized	for preheating of combusti	on air.					

2. The equipment as a whole is well serviced and the operation state satisfactory. Equipment investment is also active, with the hearth roller type tunnel kiln was introduced from Italy.

			0. 45	Date of Visit	Jur	n. 26, 1990
Name of Establishment	PRODUCTOS SAN CRISTOBAL					
Type of Industry (Product)	Paper and its product	(tissues, toilet pape	r, etc.)			
Scale of Factory	Large	Number of Employees			2,100)
Annual Sales or Production	126,000 ton/yr					
Kind of Fuel, Consumption and Price	Natural gas 3,600,000 m ³ /mon (211.3 pesos/m ³) 760,680,000 pesos/mon					
Type of Combustion Facility	Capacity	Kind of Fue		Fuel consumption	Age	Remarks
1. Water tube boiler	18 ton/hr	Natural gas		Not operating	36	Recuperator
2. Water tube boiler	35 ton/hr	Natural gas		1,681 m ³ /hr	33	Recuperator
3. Water tube boiler	45 ton/hr	Natural gas		2,162 m ³ /hr	8	Recuperator
4. Dryer		Natural gas	_	363 m ³ /hr		
5. Dryer		Natural gas		250 m ³ /hr		
6. Dryer		Natural gas		242 m ³ /hr		
7. Dryer		Natural gas		467 m ³ /hr		<u> </u>
8. Dryer		Natural gas		854 m ³ /hr		
···					_	
Outline of the Facility Surveyed	Water tub			on/hr (steam)	<u></u>	
Evaporation rate	: Rating : 45 ton/hr	Normai : 32 -	38 ton/h	n,		
Fuel consumption	: Normal : 2,162 m ³		:			
Steam pressure	U . U	emperature : 190°C				
Fuel pressure	: 5 kg/cm ² g		÷			
Combustion exhaust gas				· · · · · ·		
composition	: O ₂ - 5.6%, CO ₂ - 8	3.6%, CO - 0.002% (as meas	sured by the plant)		
Recuperator temperature		outlet: 178°C (as m	easured	by the plant)		
Stack	: 1.2 mox 15 m					
Operating time	: 24 hr/day, 168 hr/	week				
		line of Survey Resul		<u></u>		
Present pollution control measure		atural gas, low NO _X b	urner			
Future plan for pollution control	: None				· · ·	·····
Present energy-saving measures	•				-	

1. The O₂ content of exhaust gas is slightly high at 5.9% and should be reduced to about 2% by adjusting the air ratio.

2. It is recommended to change the scale of instruments indicating the operation state from percent to actual value.

3. As there is no preheating air thermometer, we instructed the place of installation.

		No. 4	6 Date of Visit	Jui	1. 26, 1990			
Name of Establishment	CIA, HULERA TORNE	L	C		and a second			
Type of Industry (Product)	Rubber and plastic pr	oduct (tire, tube)	······································					
Scale of Factory	Large Number of Employees 475							
Annual Sales or Production	Capital: 54,967,000,000 pesos							
Kind of Fuel, Consumption	•	Diesel (478.026 pesos/I)						
and Price	182,000 l/mon	87,000,000 pesos/mon						
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks			
Smoke tube boiler	2.6 ton/hr	Diesel	180 l/hr	9				
Smoke tube boiler	1.6 ton/hr	Diesel	112 l/hr	10				
Smoke tube boiler	1.3 ton/hr	Diesel		19	Not operating			
Smoke tube boiler	0.8 ton/hr	Diesel		22	Not operating			
Heat medium boiler	5,040 kcal/hr	Diesel			Intermittent			
· · ·		· · · · · · · · · · · · · · · · · · ·			operation			
		···			· · · · · · · · · · · · · · · · · · ·			
	 			_				
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	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			<u> </u>			
Outline of the Facility Surveyed	Smoke tul	pe boiler 2	2.6 ton/hr (steam)		J			
Evaporation rate	: Rating : 2.6 ton/hr	and the second	·····					
Steam temperature	: 160°C							
Fuel consumption	: Rating : 221 I/hr	Normal : 180 l/hr						
Fuel pressure	: 1.8 kg/cm ² g	Temperature : no	imal					
Atomizing air pressure	: 0.7 kg/cm ² g	Temperature : no	ormal					
Combustion air temperature	: Normal							
Combustion exhaust gas								
temperature	: 200°C (as measure	ed by the plant)						
Stack	: 0.41 mф x 9.6 m							
Operating time	: 24 hr/day, 144 hr							
		line of Survey Result		_				
Present pollution control measures	: None							
Future plan for pollution control	: None	÷						
Present energy-saving measures	t None							
 Boiler steam is used for heat plant is filled with odor. The extremet are Q - content of the plant is filled with odor. 		·		evaporate	ed and the			

 The exhaust gas O₂ content was 6.5% and air was in excess for the use of diesel oil. The Bacharach value was Nos. 1 - 2, without soot generation. The exhaust gas temperature was low at 175°C, with the boiler efficiency satisfactory at 87%.

		No. 47	Date of Visit	Jur	1. 26, 1990
Name of Establishment	CERVECERIA MODELC), S.A. DE C.V.		an a	
Type of industry (Product)	Drinks (beer)				·····
Scale of Factory	Large	Number of Err	ployees	6,500)
Annual Sales or Production	Capital : 111,817,563,00)0 pesos	·····		· · ·
Kind of Fuel, Consumption and Price	Heavy oil (H) (175.6 pe Natural gas (211.3 pe	esos/I), 4,700,000 l/mon esos/m ³) 4,500,000 m ³ /m	on		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boller	100 ton/hr	Heavy oil (H)	3,333 l/hr	30	Two of three
Water tube boiler	63 ton/hr	Mixed burning of heavy	6,250 m ³ /hr	16	units in
Water tube boiler	27 ton/hr	oil (H) and natural gas		36	operation
Water tube boiler	82 ton/hr				Not operating
				_	
			· · · · · · · · · · · · · · · · · · ·		
		· · · · · · · · · · · · · · · · · · ·			
			· · · · · · · · · · · · · · · · · · ·		
	Ulaine hite failer for	400	lantha (ala an)		L
Outline of the Facility Surveyed		power generation 100	· · ·		
Evaporation rate	: Rating : 100 ton/hr	Normal : 70 ton/f	r		
Steam pressure	: 30 kg/cm ² g	h- Nu 0.000	311		
Fuel consumption	: Rating : 10,000 m ³ /	hr Normal : 6,000 m	i%/nr		
Fuel pressure	: 0.8 kg/cm ² g	Tomporative (1000	~		
Combustion air	: Pressure: 340 mmA	q Temperature : 180°			
Stack	: 4.1 mo x 75 m	work			
Operating time	: 24 hr/day, 168 hr/v	YEER			
* Only natural gas was burnt of					
 * The steam used for power get * A new boiler is under construct 		uction processes.			
A new boner is under construc		ne of Survey Result			
Present pollution control measure		ng vi dulvey neoul			
Future plan for pollution control	None	······································			
Present energy-saving measures	: Recuperator instal	iod	<u> </u>		
rieseni energy-saving measures	. necuperator instal				

1. This is the largest company specialized in beer production in Mexico. The boiler is used for independent power generation, with remaining steam used for brewery. Mixture of heavy oil and natural gas is usually burnt. But, at the time of the measurement of exhaust gas, only natural gas was burnt.

2. The exhaust gas O₂ content was 2.5% and air-fuel ratio satisfactory. The burner combustion state was good.

3. The Bacharach value was Nos. 2 to 3, slightly high for gas burning. The exhaust gas temperature was 320°C at the inelt of the air preheater and the temperature at the outlet is estimated at 140°C.

		No. 48	Date of Visit	Jun	n. 26, 1990
Name of Establishment	I BANOS TACUBA		NET DELAND AN AND AN	ana an agus shinin a sua	
Type of Industry (Product)	Bathhouse				, ,
Scale of Factory	Small	Number of E	Employees	10	
Annual Sales or Production	5,400,000,000 pesos/y			l	······································
Kind of Fuel, Consumption		35 pesos/l)			
and Price		000 pesos/mon			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Smoke tube boiler	0.6 ton/hr	Heavy oil (L)	43 l/hr	30	Selected
· · · · · · · · · · · · · · · · · · ·					depending on
Smoke tube boiler	0.3 ton/hr	Heavy oil (L)	27 l/hr	30	the situation
	· · · · · · · · · · · · · · · · · · ·				
			<u></u>		·····
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					· · · · · · · · · · · · · · · · · · ·
			· · · · · · · · · · · · · · · · · · ·	-†	
					·
Outline of the Facility Surveyed	Smoke tub		i ton/hr (steam)		
Evaporation rate	: Rating : 0.6 ton/hr	Normal : 0.5 ton/i	nr		
Steam pressure	: 3 kg/cm ² g				
Fuel consumption	: Rating : 54 l/hr	Normal: 43 l/hr			
Fuel temperature	: Unknown				
Atomizing steam pressure and	Unknown				· :
temperature Combustion air pressure		emperature : Normal	4		· .
Stack	: 0.3 mox 18 m	Mipolatore : Normal			
Operating time	: 14 hr/day, 98 hr/w	nek .			
	,,,				
	Outli	ne of Survey Result			······································
Present pollution control measures	: None				an a
Future plan for pollution control	: None	· · · · · · · · · · · · · · · · · · ·			
Present energy-saving measures	: None			· . ·	1
<i></i>					
1. The boiler is 30 years old.			-		
			an garan an an Anna an		
2. The exhaust gas O ₂ content to	was 7.0 - 9.5%, indicating e	excess air combustion. The	e Bacharach value was N	0.9 WID	considerable
soot generation.			· ·		•
3. The exhaust gas temperatur	e was relatively low at 214	PC and the boiler efficien	cv 84%.		
o. The exhaust gus temperator			• • • • • •		
			i -		
		dia di			
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		No. 49	Date of Visit	Jur	0. 27, 1990
Name of Establishment	CARTONAJES ESTRE	ILA			and galantin the Start and Starting
Type of Industry (Product)	Paper and its product (carlon)	······································		
Scale of Factory	Large	Number of Er	nployees	1,050)
Annual Sales or Production	20,000,000,000 pesos/)		·		
Kind of Fuel, Consumption and Price	Natural gas 3,500,000 m	³ /mon (211 pesos/m ³)	738,500,000 pes	sos/mon	
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1. Water tube boiler	35 ton/hr	Natural gas	Not operating	17	Superheater
2. Water tube boiler	60 ton/hr	Natural gas	Not operating	12	Superheater
3. Water tube boiler	112 ton/hr	Natural gas	8,500 m ³ /hr	9	Superheater
· · · ·					
	-				
		· · · · · · · · · · · · · · · · · · ·			
Outline of the Facility Surveyed	Water tube		ton/hr (steam)		
Evaporation rate	: Rating: 112 ton/hr	Normal : 60 ton/hr			
Fuel consumption	: Rating : 8,500 m ³ /h				
Steam pressure	: 42 kg/cm ²	Temperature : 450°	5		
Fuel pressure	: 1.0kg/cm ²				
Combustion air temperature	: Normal				
Stack	1.3 mộ x 24.5 m	walt			
Operating time	: 24 hr/day, 168 hr/w	/eek			
	Outli	ne of Survey Result			
Present pollution control measures					
Future plan for pollution control	: None		~ <u></u>		
Present energy-saving measures	· · · · · · · · · · · · · · · · · · ·				
1. The exhaust gas at the boile combustion state. Note that			ure of 249°C, indicating	satisfac	ctory
2. It is recommended to change	the scale of instruments in	dicating the operation state	from percent to actual v	alue.	
	•				500/ . (P .
 Efficiency may be higher whe rating. 	en a 60 ton/hr boiler is oper	ated at rating than when a	112 ton/hr boiler is oper	ated at :	50% of the
4. The plant was kept tidy and in	good order and engineers	seemed eager to improve t	he combustion state.		
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	· .		No. 50	Date of Visit	Jun	.27, 1990
Name of Establishment	FUNDIDORA Y LAMI					
Type of Industry (Product)	Basic metals (angle st	eel, channe				
Scale of Factory	Medium		Number of Er	nployees	110	
Annual Sales or Production	19,230 ton/yr					
Kind of Fuel, Consumption and Price	Natural gas 174,668 n		(211.3 pesos/m	·	pesos/mon	
Type of Combustion Facility	Capacity	and the second states in the	Kind of Fuel	Fuel consumption		Remarks
leating furnace	10 ton/hr	Natura	gas	539 m ³ /hr	30	
	· · · · · · · · · · · · · · · · · · ·	_				
			<u></u>			
			·			
	<u></u>					
Dutline of the Facility Surveyed	L	lurnace	10 t	on/hr (billet)		
Rating	: 10 ton/hr		Normal : 8 to			
Fuel consumption	: Normal : 539 m ^{3/}	/hr				
Temperature of object to be			•			
heated	: 1,100°C					
Fuel pressure	: 4 kg/cm ²					
Combustion air temperature	: Normal					
Stack	: 0.5 m x 2.55 m x 3.		. 1		•	
Operating time	: 13 hr/day, 76 hr/w	/eek				
		· .	5	· ·		·
· · · · · · · · · · · · · · · · · · ·	~X.	tline of Su	rvey Result			
Present pollution control measures			INCY FICSUIL			<u> </u>
Future plan for pollution control	: Energy saving thr		no improvement	·		
Present energy-saving measures	: None	vogniund	re imbioaement	·····		
resolit energy-saving measures	. 100.00				 	·····
 As the natural gas is used, the installation of a recuperator is There is a plan in future to say 	recommended.	-		•		· .
automation of current manual	rolling process.	6 16001188 0	cuon, to improve e	HANOLUHOH NEIKIG AM	ar energy sa	ang, ang
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		• T				
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			.51	Date of Visit	Jun	. 27, 1990
Name of Establishment	ACEROS AHUEHUET	ES		n in an the second s	ng ji keti in katikana n	an baile ga an an ann an sta an th' dh' i n Chair an an th' an
Type of Industry (Product)	Basic metals (steel ba	r)		· ·		
Scale of Factory	Small	Numbe	er of Emp	ployees	50	
Annual Sales or Production	12,000,000,000 pesos	s/yr				
Kind of Fuel, Consumption	Heavy oil (H) (175.6	5 pesos/l)		· · · · · · · · · · · · · · · · · · ·		
and Price	150,000 l/mon 33,150					
Type of Combustion Facility	Capacity	Kind of Fuel		Fuel consumption	Age	Remarks
Heating furnace	6 ton/hr	Heavy oil (H)		400 <u>l/hr</u>	8	
Smoke tube boiler	······································	Heavy oil (H)				For shower
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· · · · · · · · · · · · · · · · · · ·				P	-	
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				·		
	<u> </u>	·				
						·····
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Outline of the Facility Surveyed	Heating f	furnace	6 ton/	/hr (iron)		
Capacity of facility	: Rating: 6 ton/hr	Normal : 5 ton/hr				
Heating temperature	: 1,100°C					
Fuel consumption	: Rating: 480 I/hr	Normal: 400 l/hr		of burners : 1 pc		
Combustion air pressure	: Natural draft	Temperature : No	ormal			
Combustion exhaust gas						
temperature Stack	: 749°C (as measur	ed by the plant)				
Operating time	: 1.5 mφ x 25 m : 15 hr/day, 90 hr/w	iook				
* Smoke tube boiler is also used			na of the	fuel in addition for sh	ower	
	o for prenoung of heary	on the oregin etoman	ig or and			
	Out	line of Survey Result		<u></u>		<u> </u>
Present pollution control measures		and the date y needed	· · ·			
Future plan for pollution control	: None			· · · · · · · · · · · · · · · · · · ·		
Present energy-saving measures	: None					
rieson energy daving meadares					<u> </u>	
1. This plant purchases angle si manually. Facilities are outda		el through reheating ar	n d rollin ç	g. Loading and unload	ling of ste	el are made
2. The exhaust gas O ₂ content	wae 11 80/ indication ava	see air comhustion Ti	hie mov	ha dua ta sir laskara f	rom tho a	niheol loot
 ne exhaust gas 02 content port. Soot measurement with 						
exhaust gas is discharged at 640,000 kcal/ton.						
3. It is advisable to renew the fi	urnace with a recuperator	r.				

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Manua of Catchlighmant		No. 52	Date of Visit	Jun	
Name of Establishment	BANOS SANTIAGO	·			
Type of Industry (Product)	Bathhouse				·····
Scale of Factory	Small	Number of E	mployees	6	
Annual Sales or Production				· · · · · · · · · · · · · · · · · · ·	
Kind of Fuel, Consumption	Heavy oil (L) (175.65	pesos/i)			
and Price Type of Combustion Facility	21,400 I/mon 4,740,0 Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Smoke tube boiler	1.3 ton/hr	Heavy oil (L)	71 l/hr	22	Alternate use
Smoke tube boiler	1.3 ton/hr	Heavy oil (L)	71 I/hr	22	
	· · · · · · · · · · · · · · · · · · ·				
	<u> </u>				· · · · · · · · · · · · · · · · · · ·
			L.,		
Outline of the Facility Surveyed			ton/hr (steam)		
Evaporation rate	: Rating : 1.3 ton/hr	Normal : 0.9 ton/r	าก		
Steam pressure	: 6 kg/cm ² g : Rating : 110 l/hr	Normal : 71 I/hr			
Fuel consumption Fuel pressure	: Unknown	Temperature : 45	5-50°C		
Combustion air pressure	: Natural draft	Temperature : no			
Stack	: 0.3 mộ x 12 m				· · ·
Operating time	: 10 hr/day, 70 hr/w	veek			
		•			· . ·
· · ·	1. C.	and the second			
	<u></u>	Hino of Pupyoy Dogult			<u></u>
Present pollution control measures		tline of Survey Result			
Present pollution control measures	: None	lline of Survey Result			
Future plan for pollution control		Iline of Survey Result			
Future plan for pollution control Present energy-saving measures	: None : None : None				
Future plan for pollution control	: None : None : None		ed alternately.		
Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in	: None : None : None nstalled on the second flo	por of the bathhouse and use		oh at No	9 with
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No.	. 9, with was not
Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. Ificiency	. 9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	.9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	. 9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	. 9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	.9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	9, with was not
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 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	9, with was not
 Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O₂ content we considerable soot generation 	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	.9, with was not
Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O ₂ content we considerable soot generation	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	bor of the bathhouse and use ess air combustion. The Bac erature was relatively high a , their renewal is recommend	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	.9, with was not
Future plan for pollution control Present energy-saving measures 1. Two 22-year old boilers are in 2. The exhaust gas O ₂ content we considerable soot generation	: None : None : None nstailed on the second flo vas 10.4%, indicating exc . The exhaust gas temp	por of the bathhouse and use ess air combustion. The Bac erature was relatively high a	harach value was also hi t 289°C, and the boiler e	gh at No. fficiency	9, with was not

e de la tratación de		No. 53	Date of Visit	Jun	. 28, 1990
Name of Establishment	ACEROS CORSA				
Type of Industry (Product)	Metal product (steel for				
Scale of Factory	Medium	Number of Em	ployees	250	
Annual Sales or Production	60,000,000,000 peso				
Kind of Fuel, Consumption	Natural gas (211.3 p	esos/m ³)	· · ·		
and Price		0,560,000 pesos/mon	and an and the second		Barness
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Heating furnace	12 ton/hr	Natural gas	610 m ³ /hr	22	Dalah hura
Electric furnace	30 ton/hr		· · · · · · · · · · · · · · · · · · ·	4	Batch type
		· · · · · · · · · · · · · · · · · · ·			
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					,
Outline of the Facility Surveyed	Heating		n/hr (iron)		
Capacity of facility	: Rating : 12 ton/hr				
Heating temperature	: 1,300°C				
Fuel consumption	: Rating : 640 m ³ /hr				
Combustion air temperature	: Normal	Burner: 4 pcs			
Stack	: 0.4 mộ x 15 m : 24 hr/day, 144 hr	huak			
Operating time					-
mere are somenines compiant	nts by inhabitants on dust	emitted by the plant.			
mere are somenines complain	•				
	Ou	lline of Survey Result			
Present pollution control measures	Ou s : Bag filter installed		EDUE		
Present pollution control measures Future plan for pollution control	Ou s : Bag filter installed	tline of Survey Result I on the electric furnace	EDUE		
Present pollution control measures Future plan for pollution control Present energy-saving measures	Ou s : Bag filter installed : Discussion made d : None	tline of Survey Result 1 on the electric furnace on the improvement plan with S			
Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in	Ou s : Bag filter installed : Discussion made of : None the industry, which melts	tline of Survey Result I on the electric furnace		, then re	heat them to
Present pollution control measures Future plan for pollution control Present energy-saving measures	Ou s : Bag filter installed : Discussion made of : None the industry, which melts	tline of Survey Result 1 on the electric furnace on the improvement plan with S		, then re	heat them to
Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron t	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars.	tline of Survey Result I on the electric furnace on the improvement plan with S scraps in the electric furnace	to produce angle steels		
Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron t 2. The exhaust gas O ₂ content	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the opera	tline of Survey Result I on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra	to produce angle steels	mpled d	uring
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 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels and iron to the surgement with a smoke to the surgement with a smoke to the steels and steels and steels and steels and the surgement with a smoke to the surgement with a smoke to the steels and st	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels and iron to the surement with a smoke to 1,040°C, without heat exchanged 	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels are steels and iron to the steels are steels	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels are steels and iron to the steels are steels	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
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 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels are steels and iron to the steels are steels	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
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 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels are steels and iron to the steels are steels	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
 Present pollution control measures Future plan for pollution control Present energy-saving measures 1. This is a leading company in produce bar steels and iron to the steels are steels and iron to the steels are steels	Ou s : Bag filter installed : Discussion made of : None the industry, which melts bars. was 3.4% and the operatester (BC), but no soot en nge, and the furnace efficiency	tline of Survey Result d on the electric furnace on the improvement plan with S scraps in the electric furnace tion made with adequate air ra mission observed. The exhau ciency was 50% and the unit o	to produce angle steels tio. Brown dust was sa st gas is released at hig	mpled d h tempe	uring rature of
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Name of Establishment	T DU PONT	No. 54	Date of Visit		. 28, 1990
Type of Industry (Product)		2, 22 and electronics parts)	······································		
Scale of Factory	Medium	Number of Em	plovees	238	······
Annual Sales or Production	15,424,000,000 pesc			1	
Kind of Fuel, Consumption	Natural das (159.06	nesos/m ³)			·····
and Price	Natural gas (159.06 113,686 m ³ /mon 18,0 Capacity	080,000 pesos/mon			
Type of Combustion Facility	Capacity		Fuel consumption	Age	Remarks
Smoke tube boiler	4.6 ton/hr	Natural gas	360 m ³ /hr	10	Alternate use
Smoke tube boiler	4.6 ton/hr	Natural gas	360 m ³ /hr	8	
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Couline of the Prosition October 1	1 Omalie II	the beller	an/br (ataom)	1	
Outline of the Facility Surveyed			on/hr (stearn)	<u></u>	
Evaporation rate Steam pressure	: Rating : 4.6 ton/hr : 10 kg/cm ² g	vapor pressure .	ю құсы-у		
Fuel consumption	: Normal : 360 m ³ /ł	nr			
Fuel pressure		" Femperature : normal			
Combustion air temperature	: normal	· · · · · · · · · · · · · · · · · · ·			
Stack	: 0.3 mp x 5 m				
Operating time	: 18 hr/day, 76 hr/w	/eek			
an an an air an		•	· · · · · · · · · · · · · · · · · · ·		
		tline of Survey Result			
	: The plant is a clos	tline of Survey Result ed system, and there is almost			
Future plan for pollution control	The plant is a clos: None	tline of Survey Result			
Future plan for pollution control	: The plant is a clos	tline of Survey Result ed system, and there is almost			
Future plan for pollution control Present energy-saving measures	: The plant is a clos : None : None	tline of Survey Result ed system, and there is almost			
Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat	The plant is a clos None None Source of freon distillation	itline of Survey Result ed system, and there is almost			
Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O ₂ content	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli	itline of Survey Result ed system, and there is almost on. ight excess of air, but there wa		bugh CO	
Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli	itline of Survey Result ed system, and there is almost on. ight excess of air, but there wa		bugh CO	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result ed system, and there is almost on. ight excess of air, but there wa	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures Boiler steam is used as heat The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
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 Future plan for pollution control Present energy-saving measures Boiler steam is used as heat The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures 1. Boiler steam is used as heat 2. The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures Boiler steam is used as heat The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	Itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem. at 165°C and the boiler efficie	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures Boiler steam is used as heat The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem.	s no soot emission. The	· .	
 Future plan for pollution control Present energy-saving measures Boiler steam is used as heat The exhaust gas O₂ content to concentration was 114 ppm, 	The plant is a clos None None Source of freon distillatio was 4.3%, indicating a sli there was no particular p	Itline of Survey Result sed system, and there is almost on. ight excess of air, but there wa problem. at 165°C and the boiler efficie	s no soot emission. The	· .	

		No. 55	Date of Visit	Jun. 28, 199	
Name of Establishment	INDUSTRIAS NYLBO		·		
Type of Industry (Product)	Metal product (bar ste		1		
Scale of Factory	Medium	Number of E	mployees	185	
Annual Sales or Production	25,000,000,000 pesos				
Kind of Fuel, Consumption and Price	Natural gas 589,452 n		124,551,207 pe		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption		narks
1. Heating furnace	10 ton/hr	Natural gas	634 m ³ /hr	45	
2. Heating furnace	8 ton/hr	Natural gas	634 m ³ /hr	45	
3. Electric furnace	25 ton/charge	Electricity	7,500 kwh/charge		
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		· · · · · · · · · · · · · · · · · · ·	1		
Outline of the Facility Surveyed	Heating		ton/hr (billet)		
Rating	: Rating : 10 ton/h		hr		
Fuel consumption	: Normal : 634 m ³	hr			
Temperature of object to be heated	: 1,200°C				
Combustion air temperature	: Normal				
GUINNINSBUT AF KINERBURE	. NOUND				
	: 0.6 m x 0.6 m x 2.0	m			
Stack					
Stack	: 0.6 m x 0.6 m x 2.0		·		
Stack	: 0.6 m x 0.6 m x 2.0				
Stack	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h	r/week			
Stack Operating time	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h	r/week tline of Survey Result			
Stack Operating time Present pollution control measure	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou s : Fuel changed to n	r/week tline of Survey Result atural gas	duct		
Stack Operating time Present pollution control measure Future plan for pollution control	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou s : Fuel changed to n : Improvement of fi	r/week tline of Survey Result	duct		
Stack Operating time Present pollution control measure Future plan for pollution control	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou s : Fuel changed to n : Improvement of fi	r/week tline of Survey Result atural gas	duct		
Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. Billets of 75 x 75 x 2,000 m	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou : Fuel changed to n : Improvement of fi : None m are heated to 1,100 - 1,	r/week tline of Survey Result atural gas		planned to be	
Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou : Fuel changed to n : Improvement of fi : None m are heated to 1,100 - 1,	r/week Iline of Survey Result atural gas vel consumption per unit pro		planned to be	
Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. Billets of 75 x 75 x 2,000 m improved from present 80	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou s : Fuel changed to n : Improvement of fi : None m are heated to 1,100 - 1, m ³ /ton to 40 m ³ /ton.	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun	nption per unit product is		
Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures I. Billets of 75 x 75 x 2,000 m improved from present 80 2. The furnace is the inclined	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou : Fuel changed to n : Improvement of fi : None m are heated to 1,100 - 1, m ³ /ton to 40 m ³ /ton. type, with opening at bille	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace	nption per unit product is wall, thereby causing dr	op of the inside	ing
Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. Billets of 75 x 75 x 2,000 m improved from present 80 2. The furnace is the inclined temperature. Automation of	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h Ou s : Fuel changed to n : Improvement of fi : None m are heated to 1,100 - 1, m ³ /ton to 40 m ³ /ton. type, with opening at bille i discharge (currently exe	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun	nption per unit product is wall, thereby causing dr nded while repairing oper	op of the inside	ing
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 m improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 m improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	
 Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures Billets of 75 x 75 x 2,000 mm improved from present 80 2. The furnace is the inclined temperature. Automation of the size of billet. As the extension of the size of billet. 	: 0.6 m x 0.6 m x 2.0 : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 15.5 hr/day, 93 h : 0u : 15.5 hr/day, 93 h : 0u : 0u : 15.5 hr/day, 93 h : 0u :	r/week tline of Survey Result atural gas uel consumption per unit pro 170°C. Natuiral gas consun t extraction port and furnace cuted manually) is recommen high (740°C), the use of rec	nption per unit product is wall, thereby causing dr nded while repairing oper uperator should be cons	op of the inside nings and increas idered.	

All a state of the second	FUNDICIONES FIERR	A MEY	B Date of Visit	Jun. 28, 1990	
Name of Establishment	Metal product (bar ste				,
Type of Industry (Product) Scale of Factory	Medum		f Employees	185	
Annual Sales or Production	29,000,000,000 peso:		·		
Kind of Fuel, Consumption	Heavy oil (L) 250 kl/m		44,150,000 pesos/mon		
and Price			•		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remark	(S
1. Heating furnace	6 ton/hr	Heavy oil (L)	360 l/hr	44	
2. Heating furnace	4.5 ton/hr	Heavy oil (L)	320 l/hr	44	
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Outline of the Facility Surveyed	Heating	furnace 6	ton/hr (billet)		· .
heated Fuel temperature Combustion air temperature Stack Operating time	: 900°C : 100°C : Normal : 1.9 mø x 28 m : 24 hr/day, 135 hr/	/week		1	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure	: 100°C : Normal : 1.9 mφ x 28 m : 24 hr/day, 135 hr/ Out s : None in particular	lline of Survey Result			
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular	Iline of Survey Result			
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of	tline of Survey Result bil with exhaust gas	billet size is 10 x 10 x 700 m	Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated many time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated many time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated man- time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	
Fuel temperature Combustion air temperature Stack Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. This furnace is operated many time is 1.5 hr.	: 100°C : Normal : 1.9 mó x 28 m : 24 hr/day, 135 hr/ Out s : None in particular : None in particular : Heating of heavy of ually including charge and	tline of Survey Result bil with exhaust gas discharge of billets. The		Im and the heating	

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Name of Establishment	REFINERIA 18 DE M	MARZO	na ngung di samp ng pangang ng pangang kanang kanang kanang manang kanang pangang pangang ng pangang pangang k Pangang di samp ng pangang pangang pangang kanang kanang kanang kanang pangang pangang pangang pangang pangang p	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	ar fardin in Leonau of Million Academics, and
Type of Industry (Product)	Petroleum refinery				· · · · · · · · · · · · · · · · · · ·
Scale of Factory	Large	Number of	Employees	5,429	
Annual Sales or Production		······································			
Kind of Fuel, Consumption and Price	Heavy oil	Natural gas			
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Water tube boiler	56 ton/hr	Heavy ol Natural gas	450-353 l/hr 1,880-2,700 m ³ /hr		4 units
Water tube boiler	120 ton/hr	Heavy oil Natural gas	783 l/hr 6,000 m ³ /hr		
Packaged boiler	55 ton/hr	Heavy oil Natural gas	273 l/hr 2,090 m ³ /hr		··· .
CO boiler	124 ton/hr	Heavy oil Natural gas	1,055 l/hr 4,530 m ³ /hr		
Outline of the Facility Surveyed	Water	tube boiler 56	6 ton/hr (steam)		
Evaporation rate	: Rating : 56 ton/		n/hr		
Fuel consumption	: Rating : natural heavy o Normal : natural heavy o	gas: 2,300 m ³ /hr and			
Fuel consumption (natural gas)	: Rating : 5,060 n		าก		
Steam pressure	: 42 kg/cm ² g	(380°C)			
Fuel pressure	: 1.0 kg/cm ² g	Temperature : normal			
Combustion air pressure	: 100 mmAq	Temperature : 200°C			
Stack	: 2 mp x 23 m				
Operating time	24 hr/day, 168				
		Dutline of Survey Result		<u>.</u>	
Present pollution control measures			·	<u></u>	
Future plan for pollution control		NOx burner. Continuous exha	iust gas measurement and	combusti	on control.
Present energy-saving measures	: Recuperator in	stalled			

1. There are 17 heating furnaces and 7 boilers, with boilers used for independent power generation.

Boilers are 40 to 50 years oild. Air intrusion occurs when the internal pressure is controlled to -5 to 10 mmAq, which is
indicated by the O₂ content at 7.6% measured by the O₂ gauge in the site. No smoke generation is observed from the stack. In
view of considerable oldness, renewal of equipment and substantial maintenance are necessary.

Manage of Parkel Jaka and	DEFINITION IN CENT	1070			
Name of Establishment	REFINERIA 18 DE M	AHZO			
Type of Industry (Product)	Petroleum refinery			· · · · · · · · · · · · · · · · · · ·	
Scale of Factory	Large	Number of El	npioyees		
Annual Sales or Production		······			
Kind of Fuel, Consumption and Price	Natural gas				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
Heating furnace	117 ton/hr	Natural gas	4,270 m ³ /hr	50	AA-F1,2
Heating furnace	59 ton/hr	Natural gas	2,140 m ³ /hr	50	AA-F3
Heating furnace	45 ton/hr	Natural gas	1,600 m ³ /hr	50	AR-H7,8,9
Heating furnace	4.3 tonhr	Natural gas	140 m ³ /hr	50	AF- H1,2
Heating furnace	12 ton/hr	Natural gas	400 m ³ /hr	50	RV-H1,2
Heating furnace	14 ton/hr	Natural gas	470 m ³ /hr	50	AW-H1
Heating furnace	49 ton/hr	Natural gas	810 m ³ /hr	50	RE-H9
Heating furnace	29 ton/hr	Natural gas	270 m ³ /hr	50	RE-H10
Heating furnace	31 ton/hr	Natural gas	810 m ³ /hr 780 m ³ /hr	50 50	AR-H1 AU-H1
Heating furnace	19ton/hr 50 ton/hr	Natural gas	4,050 m ³ /hr	50	AU-H1 Al-H1
Heating furnace	10ton/hr	Natural gas Natural gas	250 m ³ /hr	50	AQ-H1
Heating furnace		Natural yas	200 11/11	50	
	· · · · · · · · · · · · · · · · · · ·	•			
		tline of Survey Result			
Present pollution control measure		tline of Survey Result			
Future plan for pollution control	IS :	tline of Survey Result			
		tline of Survey Result			
Future plan for pollution control	IS :	tline of Survey Result			
Future plan for pollution control	IS :	tline of Survey Result			
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Future plan for pollution control Present energy-saving measures	<u>'S :</u> : :				
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Future plan for pollution control Present energy-saving measures	<u>'S :</u> : :				
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			No. 58	Date of Visit	Jur	1. 29, 1990
Name of Establishment	ANDERSON CLAYTON	, S.A.				
Type of Industry (Product)	Food (dressing, peanul t	outter, jelly, cake	mix)			
Scale of Factory	Large	Nu	mber of En	nployees	450	
Annual Sales or Production	Capital : 585,000,000 p	esos		· · · · · · · · · · · · · · · · · · ·		
Kind of Fuel, Consumption	L.P.G. (180.36 pesos/l),	4,000 l/mon		,440 pesos/mon		
and Price	Diesel (408.67 pesos/l)			370 pesos/mon		
Type of Combustion Facility	Capacity	Kind of F	uel	Fuel consumption	Contraction of the local division of the loc	Remarks
Water tube boiler	0.9 ton/hr	Diesel		27 l/hr	10	Alternate use
Water tube boiler	0.4 ton/hr	Diesel		27 l/hr	9	
Drying oven	400 kg/hr	L.P.G.		7 l/hr	10	
Drying oven	450 kg/hr	L.P.G.	· · · · · · · · · · · · · · · · · · ·	8 l/hr	10	
			· · · · · · · · · ·			
			<u> </u>			
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· · · · · · · · · · · · · · · · · · ·						
Quilling of the Coeffity Suproved	Water tube	hailar	0.0.1	on/hr (steam)		
Outline of the Facility Surveyed		Normal : 0.4		on/in (Steam)		· · · · ·
Evaporation rate	: Rating: 0.9 ton/hr	Normai 1 0.4	IONAL			
Steam pressure	: 7 kg/cm ² g : Rating : 80 l/hr	Normal : 27 V	hr			
Fuel consumption	0	erature : normal				
Fuel pressure Combustion air temperature	: Normal	elature . nonnai				
Exhaust gas temperature	: 201°C (as measured	by the plant)				
Stack	: 0.3 mo x 8 m	by the planty				
Operating time	12 hr/day, 63 hr/wee					
Operating time	The fill day, ou his wee	'n				
	Outlin	ne of Survey Res	sult			
Present pollution control measures	: Use of diesel oil and					
Future plan for pollution control	: None			· · ·		······
Present energy-saving measures	: None	······································				

 This water tube boiler is rare for small size. The exhaust gas O₂ content was 8.0 - 8.7%, indicating excess air combustion. The Bacharach value was No. 0 - 1, without soot generation. The exhaust gas temperature was high at 370°C and the boiler efficiency was low at 74%. It is recommended to reduce the exhaust gas O₂ content to 3 - 4%. Then, the efficiency may rise to around 80%.

		No. 59	Date of Visit	Jur	n. 29, 1990
Name of Establishment	FUNDICIONES DE HIE		Dato os mos	U 141	
Type of Industry (Product)	Metal product (wheel,			·····	
Scale of Factory	Large		Employees	304	·····
Annual Sales or Production	9,520 ton/yr	1		·	
Kind of Fuel, Consumption	Natural gas				
and Price	There are a second second				
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1. Electric furnace	15 ton/charge	Electricity	859 kwh/charge	17	
2. Electric furnace	4 ton/charge	Electricity	800 kwh/charge	42	
3. Electric furnace	4 ton/charge 4.4 ton/hr	Electricity	800 kwh/charge 420 m ³ /hr	42	·
4. Annealing furnace	4.4 1011/11	Natural gas	420 m-//m		Not operating
5. Heating furnace 6. Cupola	<u> </u>	······			Not operating
0. 000010					
· · · · · · · · · · · · · · · · · · ·	<u> </u>				
	+		· · · · · · · · · · · · · · · · · · ·	1	
	Annooline		tion the Juppicel		<u></u>
Outline of the Facility Surveyed	Annealing		4 ton/hr (wheel)		
Rating	: 4.4 ton/hr	Normal : 3.3 ton r Normal : 420 m			
Fuel consumption	: Rating : 525 m ³ /hr	NVHIIA1 - 420 H	.~/fii		
Temperature of an object to be heated	: 920°C				
Fuel pressure	: 52.7 mmAq	· · ·	· ·		
Combustion air temperature	Normal				
Stack	: 0.68 mø x 16 m				,
Operating time	: 24 hr/day, 144 hr/	/week, 6 mon/yr			
		· .			
مىلىنى بىرىمى يېزىكى يېزىك يېزىكى يېزىكى		the and Currier Deput	·		·
		tline of Survey Result			<u> </u>
Present pollution control measures		natural gas, use of bag filte	<u> </u>		
Future plan for pollution control	: None	·			
Present energy-saving measures	: None		·		
1. This is a rotary annealing furna	and which performs contin	none subsequent tailtoad.	whoole		
1. THIS IS & IV(ary annearing rome	tee miter perioritis conen	nons anneam à ar ran an a	MICCIO.		
2. Cupola and melting furnace ar	e not operating.				
	•				
					·
	:				

Name of Establishment	FUNDIDORA DE ACEI	HOS TEPEYAG.			
Type of Industry (Product)	Basic Metals (Cast iro	n)			
Scale of Factory	Large		Employees		815
Annual Sales or Production	4,800 ton/yr		· · · · · · · · · · · · · · · · · · ·		
Kind of Fuel, Consumption	Natural gas	86,560 m ³ /mon	(211.304 pesos/m ³)		74 pesos/mo
and Price	Electricity	1,506,000 kwh/mon	(165.50 pesos/kwh))00 pesos/m
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remark
1 Electric furnace	2.5 ton/charge	Electricty	500 kw/h	25	
2 Electric futnace	6.0 ton/charge	Electricty	500 kw/h	30	~
3 Electric futnace	3.5 ton/charge	Electricty	500 kw/h	35	
4 Electric fulnace	6.0 ton/charge	Electricty	500 kw/h	20	
5 Electric futnace	2.5 ton/charge	Electricty	500 kw/h	15	
6 Electric futnace	6.5 ton/charge	Electricty	500 kw/h	8	
7 Annealing furnace	40 ton/charge	Natural gas	459.7m ³ /hr		
8 Annealing furnace	20 ton/charge	Natural gas	554.5m ³ /hr		
9 Annealing furnace	4 ton/charge	Natural gas	173.5m ³ /hr		
	and the second second				
There are 16 units of annealing fu	mace in addition to above.				
Outline of the Facility Surveyed	Annealing furna	ce	40 ton/charge		
Fuel consumption Temperature of object to be heat Combustion air temperature Operating time	: Normal : 20 hr/day Out	line of Survey Result			
Temperature of object to be heat Combustion air temperature	ted : 1,200°C : Normal : 20 hr/day Out	lline of Survey Result atural gas, use of bag filte			
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures	ted : 1,200°C : Normal : 20 hr/day Out :s : Fuel changed to n : None : None : None	atural gas, use of bag filte		e) in this r	Nant
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control	ted : 1,200°C : Normal : 20 hr/day Out : S : Fuel changed to n : None : None : None : turnaces (2.5 - 6.5 ton/ch	atural gas, use of bag filte arge) and 19 annealing fu	urnaces (4 - 40 ton/charg		
Temperature of object to be head Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		
Temperature of object to be heat Combustion air temperature Operating time Present pollution control measure Future plan for pollution control Present energy-saving measures 1. There are six small electric 2. Due to secular change, the should be pushed forward.	ted : 1,200°C : Normal : 20 hr/day <u>Outes : Fuel changed to n</u> : None : None : None : turnaces (2.5 - 6.5 ton/ch annealing furnace has gaps	atural gas, use of bag filte large) and 19 annealing fu s. These must be repaired	urnaces (4 - 40 ton/charg		

	a na pangal	No. 61	Date of Visit	July	2, 1990
Name of Establishment	FORD MOTOR COMP/		n an bhail an		
Type of Industry (Product)	Transportation equipme	ont (Vehicle engine, car bo	ody assembly)		· · · · · · · · · · · · · · · · · · ·
Scale of Factory	Large	Number of		T	4,175
Annual Sales or Production	65,000 units/yr				
Kind of Fuel, Consumption and Price	Natural gas	292,000 m ³ /mon	: · · ·		
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remarks
1 Drying furnace	0.6 - 3.2 ton/hr	Natural gas	50 - 60 m ³ /hr	10	3 units
2 Hot water boiler	1 - 3.5 ton/hr	Natural gas	16 - 88 m ³ /hr	26	13 units
3. Air heater		Natural gas	80 m ³ /hr	. 10	1 unit
4 Electric furnace	8 ton/hr	Electricty	600 kw/hr	26	4 units
5 Annealing furnace		Natural gas		26	1 unit
		· · · · ·			
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			·
	·				
Outline of the Facility Surveyed	Drying furn		1.5 ton/hr (mold)		
Normal	: 1.5 ton/hr				
Fuel consumption	: Normal: 60	m ³ /hr	·		÷ .
Temperature of object to be heated	i : 260°C				
Combustion air temperature	: Normal				
Combustion exhaust gas compositio	n : 0 ₂ -14%, C	O2 - 0.4%, CO - 0.0013%	(as measured by the plan	nt)	
Temperature	: 130°C (as i	measured by the plant)		-	
		80 hr/week			

		Outline of Survey Re	esult
Present pollution control measures		Transfer to natural gas	
Future plan for pollution control	:	None in particular	
Present energy-saving measures	:	None in particular	para tanàna amin'ny fisiana amin'ny fisiana amin'ny fisiana amin'ny fisiana amin'ny fisiana amin'ny fisiana ami

1. The foundry is well maintained.

2. About 66 kl of organic solvent is discharged annually into atomsphere during painting of the car body.

3. For the NOx problem, the low NOx burner may be an economical solution.

4. It is said that the bag filter with 99.5% efficiency is installed to collect dust generated during production of castings.

		Edition of the second strength of the second	And the second	A second	-
		No. 62	Date of Visit	July 2, 1990	
Name of Establishment	QUIMICA LUCAVA, S.A				
Type of Industry (Product)	Chemical (Agricultural c	hemicals, plasticizer, cultur			
Scale of Factory	Medium	Number of Er	nployees	137	
Annual Sales or Production	18,500,000,000 pesos/	уř			
Kind of Fuel, Consumption	Heavy oil (L) 56.4	4 kl/mon (192.65 peso	s/l) 108,654,600 p	esos/mon	
and Price	Diesel 6	.7 ki/mon (495.29 pesc	os/l) 3,318,443 j	vesos/mon	
Type of Combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age Remark	(S
1. Smoke tube boiler	2.6 ton/hr	Heavy oil (L)	84 l/hr	17	CALLER AND A DOCTOR
2. Heat medium boiler	100,000 kcal/hr	Diesel	10 l/hr	17	
	[
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			<u></u>		· · · ·
		<u></u> <u></u>	1		
Outline of the Facility Surveyed	Smoke tube	boiler	3.1 ton/hr (steam)		<u> </u>
Evaporation rate :	Rating : 3.1 ton/hr		011 10111 (010 001)		
Fuel consumption	Normal: 84 1/hr	4 a			
Steam pressure		perature: 190°C			
Fuel pressure :		erature: 110°C			
Atomizing pressure :	2.8 kg/cm ² g				
Combustion air temperature :	Normal				
Stack :	0.6 mφ x 6 m				
Operating time	24 hr/day, 168 hr/weel				
		ne of Survey Result			
Present pollution control measures	: None				
Future plan for pollution control	: None		· · · · · · · · · · · · · · · · · · ·		-
Present energy-saving measures	: None				
1. The exhaust gas O_2 content is	at boiler outlet was 8.4 - 11	.2%, the temperature 250°	C, and Bacharach va	lue No.9. As operation	is
made with excess air combu	stion, it is auvisable to abju				1
2. The boiler has no fuel gauge,	and its installation is recom	mended.			
3 The heat medium boiler suffe	ers extremely noor atomiza	ition and a half of letted die	sel oil falls on the flo	or of the furnace. It is	

The heat medium boiler suffers extremely poor atomization and a half of jetted diesel oil falls on the floor of the furnace. It is necessary to increase the atomizing air and to decrease the primary air of natural draft.

Name of Establishment	I INDUSTRIAS UNI	DAS, S.A.			
Type of Industry (Product)	Non-metallic miner	al product (ceramics, wireles	ss telephone, electric parts)		
Scale of Factory	Large		of Employees	1	1,600
Annual Sales or Production	Capital: 398,403,	200,000 pesos			
Kind of Fuel, Consumption	Natural gas (211.3				
and Price	380,000 m ³ /mon	80,300,000 pes	os/mon		
Type of combustion Facility	Capacity	Kind of Fuel	Fuel consumption	Age	Remark
Electric furnace	0.25 ton/h	-		39	Melting
Electric furnace	0.25 ton/hr	-		25	Hardining
Hardening kiln	0.50 ton/hr	Natural gas		25	Pipe
Tunnel kiln	0.33 ton/hr	Natural gas	132 m ³ /hr	35	Ceramic
Tunnel kiln	0.33 ton/hr	Natural gas	132 m ³ /hr	40	Ceramic
Tunnel kiln	0.17 ton/hr	Natural gas	70 m ³ /hr	45	Ceramic
Outline of the Facility Surveyed	Ha	ardening tunnel kiln	0.33 ton/hr (ceramic)		
Fuel consumption Combustion air temperature Combustion exhaust gas compos Exhaust gas temperature Operating time * There are other combustion	: 200 - 300° : 24 hr/day, facilities in addition to a)	e plant.	
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion	: Normal sition : O ₂ - 10%, (: 200 - 300% : 24 hr/day, facilities in addition to a	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result)	e plant.	
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result)	e plant.	
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us : None	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result)	e plant.	
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
Combustion air temperature Combustion exhaust gas compose Exhaust gas temperature Operating time * There are other combustion for Present pollution control measure Future plan for pollution control Present energy-saving measures This company produces ins within the Mexico City area	: Normal sition : O ₂ - 10%, (: 200 - 300°(: 24 hr/day, facilities in addition to a res : Natural gas us i : None s : None ulator for power transmi is moving to the industr	C (as measured by the plant 144 hr/week bove, but a sufficient informa Outline of Survey Result sed ssion lines and wireless telep ial complex (outside the surv) ation was not provided by th bone sets and belongs to th ev area). The existing insul	e IUSA (group. The p
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