

Record of Combustion Test

Date 94/10/3

Place	Pachuca	Atmosphere			761 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.5	7.0	7.5	7.2	7.2	7.0
Atomization							
Pressure of air atomization	kg/cm ²	6.8	6.8	6.8	6.8	6.8	6.8
Pressure of steam atomization	kg/cm ²						
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.8	8.8	8.8	7.8	7.8	7.8
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	164	163	163	199	199	199
Pressure of oil or gas	kg/cm ²	2.20	2.20	2.12	2.66	2.61	2.60
Pressure of steam(air)	kg/cm ²	3.1	3.1	3.0	3.5	3.4	3.4
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	755	780	780	735	760	770
Pressure of primary wind box	mmaq	180	170	145	385	315	250
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	110	100	90	220	180	150
Temperature							
Temp. of air for combustion	°C	46	38	37	35	34	36
Temperature of exhaust gas	°C	227	225	224	250	250	249
Damper							
Primary damper opening		3.4	3.2	3.1	4.2	3.8	3.5
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	6	6	6
Analysis of exhaust gas							
NO _x	ppm	100	137	135	102	119	107
CO	ppm	53	0	43	0	0	0
CO ₂	%	14.5	13.0	14.1	10.3	11.8	13.2
O ₂	%	1.4	3.2	2.0	6.8	4.9	3.0
SO ₂	ppm	833	744	816	593	670	761
NO _x (converted at 5% O ₂)	ppm	82	123	114	115	118	95
Smoke tester(BC)	No.	2	1	3	1	1	2
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	85	86	82	83	85
Remarks							

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Place	Pachuca	Atmosphere			761 mmh		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.0	7.0	7.2	7.2	7.2	7.3
Atomization							
Pressure of air atomization	kg/cm ²	6.8					
Pressure of steam atomization	kg/cm ²		6.9	7.0	7.0	7.0	7.1
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.8	10.0	10.0	10.0	10.0	9.9
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	199	119	119	119	119	158
Pressure of oil or gas	kg/cm ²	2.65	1.02	1.02	1.02	1.02	1.14
Pressure of steam(air)	kg/cm ²	3.5	2.0	2.0	2.0	2.0	2.1
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	780	800	800	790	790	780
Pressure of primary wind box	mmaq	225	140	100	90	80	250
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	130	75	55	50	40	140
Temperature							
Temp. of air for combustion	°C	35	35	35	39	38	35
Temperature of exhaust gas	°C	248	212	210	207	206	230
Damper							
Primary damper opening		3.4	3.0	2.8	2.6	2.5	3.7
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	4	4	4	4	5
Analysis of exhaust gas							
NO _x	ppm	105	84	89	93	92	92
CO	ppm	67	0	0	0	21	0
CO ₂	%	14.1	10.2	11.8	13.5	14.3	10.3
O ₂	%	2.0	7.1	5.1	2.8	1.9	7.0
SO ₂	ppm	812	616	709	816	867	626
NO _x (converted at 5% O ₂)	ppm	88	97	90	82	77	105
Smoke tester(BC)	No.	5	0	1	1	4	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	83	85	86	86	84
Remarks							

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Place	Pachuca	Atmosphere				761 mmb	
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	7.6	7.2	7.8	7.3	7.0	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.3	7.0	7.5	7.1	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.9	9.9	9.9	9.9	9.9	9.9
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	157	158	158	158	157	157
Pressure of oil or gas	kg/cm ²	1.15	1.13	1.16	1.18	1.16	1.15
Pressure of steam(air)	kg/cm ²	2.1	2.1	2.2	2.1	2.1	2.1
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	790	795	795	780	785	785
Pressure of primary wind box	mmaq	200	165	135	220	220	200
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	110	90	80	115	110	110
Temperature							
Temp. of air for combustion	°C	35	38	37	136	101	68
Temperature of exhaust gas	°C	230	231	230	237	237	237
Damper							
Primary damper opening		3.5	3.1	3.0	3.6	3.5	3.3
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	95	97	94	109	107	99
CO	ppm	0	0	43	0	0	0
CO ₂	%	11.8	13.3	14.6	11.7	11.8	12.0
O ₂	%	5.1	3.2	1.5	5.1	5.0	5.0
SO ₂	ppm	701	792	877	698	699	715
NO _x (converted at 5% O ₂)	ppm	96	87	77	110	107	99
Smoke tester(BC)	No.	1	1	3	0	0	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	85	86	84	84	85
Remarks							

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Place	Pachuca	Atmosphere				761 mm	
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.0	7.1	7.2	7.4		
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.9	7.0	7.2		
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.1	9.1	9.1	9.1		
Oil temp. at AC valve inlet	°C	22	22	22	22		
Flow of oil or gas	l/h, m ³ /h	202	202	200	200		
Pressure of oil or gas	kg/cm ²	1.26	1.26	1.28	1.28		
Pressure of steam(air)	kg/cm ²	2.2	2.2	2.2	2.2		
Oil temp. at burner inlet	°C	22	22	22	22		
Draft							
Pressure at FDF outlet	mmaq	730	760	770	785		
Pressure of primary wind box	mmaq	425	330	270	225		
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	240	190	150	125		
Temperature							
Temp. of air for combustion	°C	36	36	40	38		
Temperature of exhaust gas	°C	260	260	258	255		
Damper							
Primary damper opening		4.5	3.9	3.5	3.4		
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6		
Analysis of exhaust gas							
NO _x	ppm	99	103	105	100		
CO	ppm	0	0	0	107		
CO ₂	%	10.3	11.9	13.4	15.0		
O ₂	%	7.0	5.0	3.0	1.1		
SO ₂	ppm	617	699	808	909		
NO _x (converted at 5% O ₂)	ppm	113	103	93	80		
Smoke tester(BC)	No.	1	1	1	5		
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	81	83	84	85		
Remarks							

Record of Combustion Test

Date 94/10/10

Place	Pachuca	Atmosphere	764 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Diesel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.0	7.0	6.9	7.3		
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.7	7.0		
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.9	10.0	9.9	9.9		
Oil temp. at AC valve inlet	°C	20	20	20	20		
Flow of oil or gas	l/h, m ³ /h	159	160	159	159		
Pressure of oil or gas	kg/cm ²	1.09	1.08	1.10	1.09		
Pressure of steam(air)	kg/cm ²	2.0	2.0	2.0	2.0		
Oil temp. at burner inlet	°C	20	20	20	20		
Draft							
Pressure at FDF outlet	mmaq	785	775	780	780		
Pressure of primary wind box	mmaq	205	220	210	250		
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	115	110	110	115		
Temperature							
Temp. of air for combustion	°C	36	135	93	51		
Temperature of exhaust gas	°C	253	247	246	246		
Damper							
Primary damper opening		3.3	3.5	3.5	3.3		
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5		
Analysis of exhaust gas							
NOx	ppm	67	80	75	69		
CO	ppm	0	0	0	0		
CO ₂	%	11.6	11.7	11.8	11.7		
O ₂	%	5.1	5.0	5.0	5.1		
SO ₂	ppm	263	265	269	261		
NOx(converted at 5% O ₂)	ppm	67	80	75	69		
Smoke tester(BC)	No.	0	0	0	0		
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	83	83	83		
Remarks							

Record of Combustion Test

Date 94/10/14

Place	Pachuca	Atmosphere			762 mmB		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.0	7.2	6.9	6.8	6.8	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.0	6.7	6.6	6.6	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.6	9.6	9.5	9.5	9.8	9.8
Oil temp. at AC valve inlet	°C	52	55	59	6.1	61	63
Flow of oil or gas	l/h, m ³ /h	158	157	160	160	159	159
Pressure of oil or gas	kg/cm ²	1.06	1.11	1.14	1.15	2.07	2.09
Pressure of steam(air)	kg/cm ²	2.0	2.1	2.1	2.1	3.1	3.1
Oil temp. at burner inlet	°C	45	48	52	52	58	59
Draft							
Pressure at FDF outlet	mmaq	775	780	785	790	760	775
Pressure of primary wind box	mmaq	275	220	185	170	280	220
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	160	125	105	100	165	125
Temperature							
Temp. of air for combustion	°C	35	35	40	40	39	39
Temperature of exhaust gas	°C	254	252	249	248	255	253
Damper							
Primary damper opening		3.5	3.3	3.2	3.1	3.7	3.4
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	109	115	116	113	95	101
CO	ppm	0	0	0	33	0	0
CO ₂	%	10.3	11.7	13.3	13.6	10.3	11.9
O ₂	%	6.9	5.1	3.0	2.6	6.9	4.8
SO ₂	ppm	642	735	834	860	658	754
NO _x (converted at 5% O ₂)	ppm	124	116	103	98	108	100
Smoke tester(BC)	No.	0	0	3	5	0	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	81	83	84	85	82	84
Remarks		Tip70°	Tip70°	Tip70°	Tip70°	Tip50°	Tip50°

Record of Combustion Test

Date 94/10/14

Place	Pachuca	Atmosphere	762 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.1	7.0				
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	6.8				
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.8	9.8				
Oil temp. at AC valve inlet	°C	64	62				
Flow of oil or gas	l/h, m ³ /h	157	157				
Pressure of oil or gas	kg/cm ²	2.12	2.13				
Pressure of steam(air)	kg/cm ²	3.2	3.1				
Oil temp. at burner inlet	°C	60	61				
Draft							
Pressure at FDF outlet	mmaq	780	790				
Pressure of primary wind box	mmaq	170	150				
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	105	90				
Temperature							
Temp. of air for combustion	°C	44	42				
Temperature of exhaust gas	°C	251	248				
Damper							
Primary damper opening		3.2	3.1				
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5				
Analysis of exhaust gas							
NO _x	ppm	128	132				
CO	ppm	0	81				
CO ₂	%	13.2	14.4				
O ₂	%	3.1	1.7				
SO ₂	ppm	849	925				
NO _x (converted at 5% O ₂)	ppm	114	109				
Smoke tester(BC)	No.	2	3				
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	85				
Remarks		Tip50°	Tip50°				

Record of Combustion Test

Date 94/10/20

Place	Pachuca	Atmosphere		766 mm			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Diesel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	6.8	7.1	7.0	7.0	7.0	6.8
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.6	6.9	6.8	6.8	6.9	6.6
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0	9.0	9.0	9.0
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	160	160	160	160	161	160
Pressure of oil or gas	kg/cm ²	0.89	0.89	0.88	0.88	0.88	0.88
Pressure of steam(air)	kg/cm ²	1.9	1.9	1.9	1.9	1.9	1.9
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	750	755	690	670	650	605
Pressure of primary wind box	mmaq	145	140	180	180	210	240
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	75	80	95	95	110	110
Temperature							
Temp. of air for combustion	°C	44	41	58	65	73	85
Temperature of exhaust gas	°C	216	217	217	220	221	222
Damper							
Primary damper opening		2.5	2.5	3.0	3.1	3.2	3.5
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	83	70	54	50	46	42
CO	ppm	30	58	57	65	172	109
CO ₂	%	14.7	14.6	14.9	14.9	15.2	15.2
O ₂	%	1.3	1.5	1.1	1.0	0.7	0.6
SO ₂	ppm	333	335	336	338	346	351
NO _x (converted at 5% O ₂)	ppm	67	57	43	40	36	33
Smoke tester(BC)	No.	2	4	2	2	1	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening		0	0	52	60	70	90
Rate of EGR	%	0.0	0.0	15.2	19.3	23.1	28.9
Combustion efficiency	%	86	86	86	86	86	86
Remarks	mm	230	180				

Record of Combustion Test

Date 94/10/20

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Diesel Oil						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.4	7.1	6.7	7.5	7.2	
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.2	6.9	6.5	7.3	7.1	
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.7	9.5	9.5	9.5	9.5	
Oil temp. at AC valve inlet	°C	22	22	22	22	22	
Flow of oil or gas	l/h, m ³ /h	120	119	120	120	120	
Pressure of oil or gas	kg/cm ²	0.80	0.79	0.79	0.80	0.81	
Pressure of steam(air)	kg/cm ²	1.8	1.8	1.8	1.8	1.8	
Oil temp. at burner inlet	°C	22	22	22	22	22	
Draft							
Pressure at FDF outlet	mmaq	750	650	670	685	705	
Pressure of primary wind box	mmaq	80	130	120	105	100	
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	40	70	60	55	50	
Temperature							
Temp. of air for combustion	°C	45	79	76	67	62	
Temperature of exhaust gas	°C	205	207	205	205	204	
Damper							
Primary damper opening		2.1	2.8	2.6	2.5	2.3	
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		3.5	3.5	3.5	3.5	3.5	
Analysis of exhaust gas							
NOx	ppm	62	38	42	47	49	
CO	ppm	136	107	49	26	92	
CO ₂	%	14.4	15.0	14.8	14.0	14.6	
O ₂	%	1.6	0.8	1.1	1.8	1.3	
SO ₂	ppm	338	340	346	339	339	
NOx(converted at 5% O ₂)	ppm	51	30	34	39	40	
Smoke tester(BC)	No.	5	0	1	1	3	
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening		0	90	70	55	50	
Rate of EGR	%	0.0	28.6	23.9	17.2	14.2	
Combustion efficiency	%	86	86	86	86	86	
Remarks							

Record of Combustion Test

Date 94/10/20

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.3	7.0	7.5	7.5	6.5	7.4
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.1	6.8	7.2	7.2	6.3	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.6	9.6	9.6	9.6	9.6	9.6
Oil temp. at AC valve inlet	°C	47	47	47	50	52	53
Flow of oil or gas	l/h, m ³ /h	118	124	124	117	118	118
Pressure of oil or gas	kg/cm ²	0.80	0.85	0.86	0.83	0.83	0.84
Pressure of steam(air)	kg/cm ²	1.9	1.8	1.9	1.9	1.9	1.8
Oil temp. at burner inlet	°C	47	47	47	50	52	53
Draft							
Pressure at FDF outlet	mmaq	635	760	760	675	650	695
Pressure of primary wind box	mmaq	130	80	80	115	110	120
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	65	40	45	65	81	85
Temperature							
Temp. of air for combustion	°C	77	39	38	65	81	85
Temperature of exhaust gas	°C	204	198	199	201	203	205
Damper							
Primary damper opening		2.7	2.0	2.0	2.5	2.8	2.5
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	85	106	99	89	82	87
CO	ppm	73	23	20	20	45	33
CO ₂	%	15.3	15.1	15.1	15.4	15.4	15.3
O ₂	%	0.6	1.0	1.0	0.6	0.5	0.5
SO ₂	ppm	990	963	968	975	987	992
NO _x (converted at 5% O ₂)	ppm	67	85	79	70	64	68
Smoke tester(BC)	No.	1	3	6	1	3	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening				0	90	90	90
Rate of EGR	%			0.0	18.3	28.5	24.8
Combustion efficiency	%	86	87	86	87	87	86
Remarks	mm	180	245				

Record of Combustion Test

Date 94/10/21

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner						
Kind of fuel	Gas Oil(720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.2	7.0	7.1	7.0		
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	6.8	6.9	6.8		
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.3	9.3	9.2	9.2		
Oil temp. at AC valve inlet	°C	47	49	53	53		
Flow of oil or gas	l/h, m ³ /h	162	161	160	159		
Pressure of oil or gas	kg/cm ²	1.00	1.04	1.08	1.08		
Pressure of steam(air)	kg/cm ²	2.0	2.0	2.0	2.0		
Oil temp. at burner inlet	°C	47	49	53	53		
Draft							
Pressure at FDF outlet	mmaq	740	620	635	660		
Pressure of primary wind box	mmaq	165	260	235	215		
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	90	135	120	115		
Temperature							
Temp. of air for combustion	°C	45	70	77	70		
Temperature of exhaust gas	°C	216	221	225	225		
Damper							
Primary damper opening		2.3	3.1	3.0	2.8		
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5		
Analysis of exhaust gas							
NOx	ppm	104	86	89	91		
CO	ppm	24	58	51	38		
CO ₂	%	14.4	15.3	15.2	15.0		
O ₂	%	1.8	0.8	0.8	1.1		
SO ₂	ppm	990	1050	1049	1030		
NOx(converted at 5% O ₂)	ppm	87	68	70	73		
Smoke tester(BC)	No.	3	1	1	2		
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening		0	90	70	57		
Rate of EGR	%	0.0	27.4	24.0	19.0		
Combustion efficiency	%	86	86	86	85		
Remarks							

Record of Combustion Test

Date 94/10/25

Place	Pachuca	Atmosphere			766 mm		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.0	7.0	7.2	7.2	7.2	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	7.0	7.0	7.0	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.9	7.9	7.9	7.9	7.9	7.9
Oil temp. at AC valve inlet	°C	23	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	202	203	203	203	200	202
Pressure of oil or gas	kg/cm ²	1.31	1.14	1.08	0.97	1.28	1.12
Pressure of steam(air)	kg/cm ²	2.9	2.0	1.6	1.0	2.8	2.0
Oil temp. at burner inlet	°C	23	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	730	735	735	730	755	760
Pressure of primary wind box	mmaq	335	335	340	340	265	265
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	240	235	240	240	190	195
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	275	278	279	279	274	274
Damper							
Primary damper opening		4.1	4.7	4.1	4.1	3.7	3.7
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	56	57	58	61	60	61
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.0	10.2	10.1	10.1	11.4	11.5
O ₂	%	7.0	6.8	6.9	6.8	5.1	4.9
SO ₂	ppm	324	332	326	327	355	357
NO _x (converted at 5% O ₂)	ppm	64	64	66	69	60	61
Smoke tester(BC)	No.	1	1	1	1	2	2
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	80	81	80	80	82	82
Remarks							

Record of Combustion Test

Date 94/10/25

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.2	7.0	7.1	7.2	7.0	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	6.9	6.8	7.0	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.9	7.9	7.9	7.9	7.9	7.9
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	202	203	200	202	202	203
Pressure of oil or gas	kg/cm ²	1.07	0.98	1.28	1.12	1.05	0.95
Pressure of steam(air)	kg/cm ²	1.5	1.1	2.8	2.0	1.5	1.0
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	760	760	765	775	775	775
Pressure of primary wind box	mmaq	265	270	215	220	215	215
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	195	190	155	150	155	155
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	274	274	267	266	266	265
Damper							
Primary damper opening		3.7	3.7	3.4	3.4	3.4	3.4
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
N O _x	ppm	61	62	61	62	62	63
C O	ppm	0	0	28	26	23	21
C O ₂	%	11.5	11.5	12.8	12.9	12.9	13.0
O ₂	%	4.9	4.8	3.1	3.0	2.9	2.8
S O ₂	ppm	359	359	387	393	387	390
N O _x (converted at 5% O ₂)	ppm	61	61	55	55	55	55
Smoke tester(BC)	No.	1	1	6	6	5	5
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	82	82	83	84	83	83
Remarks							

Record of Combustion Test

Date 94/10/25

Place	Pachuca	Atmosphere		766 mmh			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.3	7.1	7.1	7.4	7.1	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.1	6.9	6.9	7.2	6.9	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.3	8.3	8.3	8.3	8.3	8.3
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	161	162	163	163	161	161
Pressure of oil or gas	kg/cm ²	0.93	0.74	0.65	0.58	0.92	0.75
Pressure of steam(air)	kg/cm ²	2.5	1.5	0.7	0.5	2.4	1.5
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	775	770	770	775	785	785
Pressure of primary wind box	mmaq	215	215	215	215	165	165
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	150	150	150	150	115	120
Temperature							
Temp. of air for combustion	°C	36	36	36	3.6	36	36
Temperature of exhaust gas	°C	260	260	259	259	252	248
Damper							
Primary damper opening		3.5	3.5	3.5	3.5	3.1	3.1
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	51	52	55	57	55	55
CO	ppm	0	0	0	0	0	0
CO ₂	%	9.8	9.9	9.9	9.9	11.4	11.4
O ₂	%	7.1	7.0	6.9	6.8	4.8	5.0
SO ₂	ppm	322	326	322	322	355	349
NO _x (converted at 5% O ₂)	ppm	59	59	62	64	54	55
Smoke tester(BC)	No.	1	1	1	2	4	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	81	82	81	82	83	83
Remarks							

Record of Combustion Test

Date 94/10/25

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	7.0	7.4	6.8	7.0	6.7	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.2	6.6	6.8	6.5	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.3	8.3	8.3	8.3	8.3	8.3
Oil temp. at AC valve inlet	°C	22	22	22	22	20	20
Flow of oil or gas	l/h, m ³ /h	163	160	161	161	120	121
Pressure of oil or gas	kg/cm ²	0.56	0.92	0.77	0.69	0.60	0.45
Pressure of steam(air)	kg/cm ²	0.5	2.5	1.7	1.0	2.1	1.5
Oil temp. at burner inlet	°C	22	22	22	22	20	20
Draft							
Pressure at FDF outlet	mmaq	785	795	795	795	800	805
Pressure of primary wind box	mmaq	170	135	135	135	110	115
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	120	100	100	100	80	80
Temperature							
Temp. of air for combustion	°C	35	35	35	35	33	33
Temperature of exhaust gas	°C	249	249	247	244	223	226
Damper							
Primary damper opening		3.1	3.0	3.0	3.0	2.8	2.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	4	4
Analysis of exhaust gas							
N Ox	ppm	58	99	82	57	74	67
CO	ppm	0	0	0	27	0	0
CO ₂	%	11.3	12.6	12.8	12.8	10.0	10.1
O ₂	%	5.0	3.1	3.0	3.0	7.0	7.0
SO ₂	ppm	348	383	377	380	314	315
N Ox(converted at 5% O ₂)	ppm	58	88	73	51	85	77
Smoke tester(BC)	No.	2	0	0	7	0	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	84	85	85	83	83
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere		766 mm			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	6.9	7.4	6.8	7.0	7.3	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.7	7.2	6.6	6.8	7.1	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.3	8.3	8.3	8.3	8.3	8.3
Oil temp. at AC valve inlet	°C	20	20	20	20	20	20
Flow of oil or gas	l/h, m ³ /h	120	120	120	120	121	121
Pressure of oil or gas	kg/cm ²	0.40	0.37	0.59	0.46	0.41	0.37
Pressure of steam(air)	kg/cm ²	1.0	0.5	2.1	1.5	1.0	0.5
Oil temp. at burner inlet	°C	20	20	20	20	20	20
Draft							
Pressure at FDF outlet	mmaq	805	800	800	800	800	808
Pressure of primary wind box	mmaq	110	115	85	90	90	90
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	80	80	60	60	60	60
Temperature							
Temp. of air for combustion	°C	33	34	34	34	35	35
Temperature of exhaust gas	°C	224	224	223	222	222	220
Damper							
Primary damper opening		2.8	2.8	2.6	2.6	2.6	2.6
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	57	50	88	78	64	53
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.1	10.2	11.7	11.8	11.6	11.6
O ₂	%	6.9	6.8	4.9	4.8	5.0	5.0
SO ₂	ppm	316	317	348	348	352	346
NO _x (converted at 5% O ₂)	ppm	65	56	87	77	64	53
Smoke tester(BC)	No.	3	2	0	0	0	4
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	83	84	84	84	84
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.1	7.4	7.2	6.8	7.5	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	7.2	7.0	6.6	7.2	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.3	8.3	8.3	8.3	8.3	8.3
Oil temp. at AC valve inlet	°C	21	21	21	21	21	21
Flow of oil or gas	l/h, m ³ /h	120	121	120	121	120	120
Pressure of oil or gas	kg/cm ²	0.60	0.47	0.42	0.37	0.60	0.47
Pressure of steam(air)	kg/cm ²	2.1	1.5	1.0	0.5	2.2	1.5
Oil temp. at burner inlet	°C	21	21	21	21	21	21
Draft							
Pressure at FDF outlet	mmaq	795	800	800	795	790	790
Pressure of primary wind box	mmaq	75	75	75	80	65	65
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	50	50	50	50	45	40
Temperature							
Temp. of air for combustion	°C	35	36	36	36	36	36
Temperature of exhaust gas	°C	218	218	217	214	216	215
Damper							
Primary damper opening		2.3	2.3	2.3	2.3	2.2	2.2
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	92	82	71	54	93	83
CO	ppm	0	0	0	50	85	24
CO ₂	%	13.1	13.2	13.3	13.1	14.0	14.1
O ₂	%	3.0	2.9	2.8	3.1	1.9	1.8
SO ₂	ppm	385	382	384	384	400	400
NO _x (converted at 5% O ₂)	ppm	82	72	62	48	78	69
Smoke tester(BC)	No.	1	0	2	8	3	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	86	86	86	86	87
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere	766 mmh				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	6.8	6.8	7.0	7.1	7.1	
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.6	6.6	6.8	6.9	6.8	
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.3	8.3	8.2	8.2	8.2	
Oil temp. at AC valve inlet	°C	21	21	20	20	20	
Flow of oil or gas	l/h, m ³ /h	121	121	162	163	163	
Pressure of oil or gas	kg/cm ²	0.42	0.37	0.90	0.74	0.69	
Pressure of steam(air)	kg/cm ²	1.0	0.5	2.4	1.5	1.0	
Oil temp. at burner inlet	°C	21	21	20	20	20	
Draft							
Pressure at FDF outlet	mmaq	790	790	795	795	795	
Pressure of primary wind box	mmaq	65	75	120	120	130	
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	40	45	90	90	90	
Temperature							
Temp. of air for combustion	°C	37	37	36	36	36	
Temperature of exhaust gas	°C	214	212	238	238	236	
Damper							
Primary damper opening		2.2	2.3	2.8	2.8	2.9	
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	5	5	5	
Analysis of exhaust gas							
NO _x	ppm	70	54	107	81	59	
CO	ppm	15	100	33	20	70	
CO ₂	%	14.2	13.5	14.1	14.2	13.7	
O ₂	%	1.7	2.5	1.9	1.7	2.4	
SO ₂	ppm	404	399	402	406	399	
NO _x (converted at 5% O ₂)	ppm	58	47	90	67	51	
Smoke tester(BC)	No.	4	9	3	3	8	
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	85	85	86	
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.5	7.3	7.0	6.9	7.4	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.3	7.1	6.8	6.7	7.2	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.6	7.6	7.7	7.7	7.6	7.6
Oil temp. at AC valve inlet	°C	41	47	50	52	53	54
Flow of oil or gas	l/h, m ³ /h	201	201	203	205	203	198
Pressure of oil or gas	kg/cm ²	1.44	1.33	1.25	1.11	1.56	1.34
Pressure of steam(air)	kg/cm ²	3.0	2.0	1.5	1.1	3.0	2.0
Oil temp. at burner inlet	°C	33	40	42	42	48	50
Draft							
Pressure at FDF outlet	mmaq	730	735	735	740	770	765
Pressure of primary wind box	mmaq	355	350	350	350	270	270
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	255	255	250	255	200	195
Temperature							
Temp. of air for combustion	°C	35	35	35	34	34	34
Temperature of exhaust gas	°C	281	284	285	286	281	279
Damper							
Primary damper opening		4.2	4.2	4.2	4.2	3.7	3.7
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	91	91	92	93	96	94
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.1	10.1	10.1	10.2	11.7	11.4
O ₂	%	7.0	7.0	6.9	6.9	5.0	5.3
SO ₂	ppm	748	747	754	756	855	833
NO _x (converted at 5% O ₂)	ppm	104	104	104	106	96	96
Smoke tester(BC)	No.	0	1	1	1	0	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	79	80	80	79	82	82
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.0	7.3	6.8	7.2	7.1	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.1	6.6	7.0	6.8	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.7	8.6	8.6	8.6	8.6	8.6
Oil temp. at AC valve inlet	°C	56	56	56	56	57	57
Flow of oil or gas	l/h, m ³ /h	199	200	198	200	201	203
Pressure of oil or gas	kg/cm ²	1.24	1.07	1.54	1.37	1.28	1.06
Pressure of steam(air)	kg/cm ²	1.5	1.0	3.0	2.0	1.5	1.0
Oil temp. at burner inlet	°C	52	52	52	52	52	52
Draft							
Pressure at FDF outlet	mmaq	770	765	785	780	775	780
Pressure of primary wind box	mmaq	260	260	205	210	210	220
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	185	185	155	155	150	160
Temperature							
Temp. of air for combustion	°C	35	35	35	35	36	36
Temperature of exhaust gas	°C	278	278	277	276	271	271
Damper							
Primary damper opening		3.7	3.7	3.2	3.2	3.3	3.4
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	95	97	148	146	96	99
CO	ppm	0	0	0	0	42	17
CO ₂	%	11.7	11.9	13.3	13.4	13.4	12.9
O ₂	%	5.0	4.8	2.9	2.7	2.7	3.3
SO ₂	ppm	885	873	963	972	967	943
NO _x (converted at 5% O ₂)	ppm	95	96	131	128	84	89
Smoke tester(BC)	No.	1	1	0	1	7	5
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	82	82	84	83	84	83
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.1	6.8	7.0	7.0	6.7	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.6	6.8	6.8	6.5	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.6	8.6	8.6	8.6	7.9	7.8
Oil temp. at AC valve inlet	°C	58	58	57	57	45	49
Flow of oil or gas	l/h, m ³ /h	199	201	203	204	163	161
Pressure of oil or gas	kg/cm ²	1.58	1.40	1.28	1.12	1.02	0.88
Pressure of steam(air)	kg/cm ²	3.0	2.0	1.5	1.1	2.5	1.9
Oil temp. at burner inlet	°C	54	54	54	56	40	40
Draft							
Pressure at FDF outlet	mmaq	785	780	770	780	775	780
Pressure of primary wind box	mmaq	200	190	205	205	220	205
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	150	145	150	145	160	150
Temperature							
Temp. of air for combustion	°C	36	36	36	36	35	35
Temperature of exhaust gas	°C	276	274	267	268	241	248
Damper							
Primary damper opening		3.1	3.1	3.2	3.2	3.4	3.4
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	5	5
Analysis of exhaust gas							
NOx	ppm	149	128	94	95	83	82
CO	ppm	25	50	87	96	0	0
CO ₂	%	13.9	14.0	13.8	13.7	10.0	10.3
O ₂	%	2.2	2.1	2.2	2.3	7.0	6.7
SO ₂	ppm	1008	1011	1000	999	742	763
NOx(converted at 5% O ₂)	ppm	127	108	80	81	95	92
Smoke tester(BC)	No.	0	4	8	9	1	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	84	84	84	81	82
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere	766 mmh				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	7.0	7.1	7.0	7.2	7.1	7.1
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.9	6.8	7.0	7.0	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.8	7.8	7.8	7.8	7.8	7.9
Oil temp. at AC valve inlet	°C	50	50	52	53	53	53
Flow of oil or gas	l/h, m ³ /h	162	162	160	161	161	160
Pressure of oil or gas	kg/cm ²	0.85	0.77	1.06	0.87	0.79	0.93
Pressure of steam(air)	kg/cm ²	1.5	1.0	2.6	1.5	1.0	2.1
Oil temp. at burner inlet	°C	42	42	42	46	46	46
Draft							
Pressure at FDF outlet	mmaq	780	780	785	785	790	785
Pressure of primary wind box	mmaq	215	205	160	165	165	160
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	155	150	115	120	120	115
Temperature							
Temp. of air for combustion	°C	35	35	35	36	35	35
Temperature of exhaust gas	°C	251	255	250	252	252	251
Damper							
Primary damper opening		3.4	3.4	3.2	3.2	3.2	3.2
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	82	83	87	87	88	87
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.1	10.2	11.8	12.0	12.0	11.9
O ₂	%	6.9	6.9	4.9	4.8	4.8	4.9
SO ₂	ppm	753	753	857	864	860	855
NOx(converted at 5% O ₂)	ppm	93	94	86	86	87	86
Smoke tester(BC)	No.	1	0	4	3	3	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	81	82	83	83	83	83
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.0	6.8	7.3	7.4	6.8	7.4
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.6	7.2	7.2	6.6	7.2
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.9	7.9	7.9	7.9	7.9	7.8
Oil temp. at AC valve inlet	°C	52	52	52	53	53	53
Flow of oil or gas	l/h, m ³ /h	160	160	160	161	159	160
Pressure of oil or gas	kg/cm ²	1.06	0.94	0.88	0.81	1.07	0.95
Pressure of steam(air)	kg/cm ²	2.6	2.0	1.5	1.1	2.6	2.0
Oil temp. at burner inlet	°C	48	48	48	48	48	48
Draft							
Pressure at FDF outlet	mmaq	795	790	790	790	790	795
Pressure of primary wind box	mmaq	130	130	130	130	120	120
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	95	95	95	95	90	90
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	35
Temperature of exhaust gas	°C	251	251	250	246	249	250
Damper							
Primary damper opening		3.0	3.0	3.0	3.0	2.8	2.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	141	131	118	89	143	131
CO	ppm	0	0	0	39	18	23
CO ₂	%	13.4	13.5	13.6	13.5	14.0	14.2
O ₂	%	3.0	2.9	2.9	2.9	2.2	2.0
SO ₂	ppm	951	959	967	965	991	1006
NO _x (converted at 5% O ₂)	ppm	125	116	104	79	122	110
Smoke tester(BC)	No.	0	0	0	7	1	2
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	84	85	85	85	85
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere	766 mmh				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		31	32	33	34	35	36
Pressure of boiler	kg/cm ²	7.2	7.2	6.8	7.4	6.9	6.8
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	7.0	6.6	7.2	6.7	6.6
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.8	7.8	8.5	8.5	8.5	8.5
Oil temp. at AC valve inlet	°C	53	53	53	53	52	53
Flow of oil or gas	l/h, m ³ /h	161	161	122	123	123	124
Pressure of oil or gas	kg/cm ²	0.88	0.81	0.72	0.55	0.50	0.44
Pressure of steam(air)	kg/cm ²	1.5	1.0	2.3	1.5	1.0	0.5
Oil temp. at burner inlet	°C	48	48	48	48	48	48
Draft							
Pressure at FDF outlet	mmaq	790	790	780	795	795	795
Pressure of primary wind box	mmaq	120	125	115	115	120	120
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	85	90	85	85	85	80
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	248	243	244	244	240	238
Damper							
Primary damper opening		2.8	2.9	2.8	2.8	2.8	2.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	117	87	112	102	78	80
CO	ppm	21	100	0	0	0	0
CO ₂	%	14.3	13.8	10.2	10.3	10.3	10.3
O ₂	%	1.9	2.4	6.9	6.8	6.8	6.8
SO ₂	ppm	1017	1002	763	772	776	770
NOx(converted at 5% O ₂)	ppm	98	75	127	115	88	90
Smoke tester(BC)	No.	3	9	0	0	2	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	86	82	81	82	82
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		37	38	39	40	41	42
Pressure of boiler	kg/cm ²	7.3	7.0	7.1	7.5	6.8	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.1	6.8	6.9	7.3	6.6	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.7	8.7	8.7	8.7	8.7	8.7
Oil temp. at AC valve inlet	°C	51	51	51	51	51	51
Flow of oil or gas	l/h, m ³ /h	119	120	120	121	120	121
Pressure of oil or gas	kg/cm ²	0.68	0.54	0.50	0.42	0.68	0.54
Pressure of steam(air)	kg/cm ²	2.2	1.5	1.0	0.5	2.2	1.5
Oil temp. at burner inlet	°C	48	48	46	46	46	46
Draft							
Pressure at FDF outlet	mmaq	795	795	795	795	795	790
Pressure of primary wind box	mmaq	85	90	90	90	70	75
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	60	60	65	60	50	50
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	236	234	233	231	229	227
Damper							
Primary damper opening		2.6	2.6	2.6	2.6	2.3	2.3
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	125	114	101	85	129	115
CO	ppm	0	0	0	0	0	0
CO ₂	%	11.9	11.7	11.7	11.8	13.0	13.2
O ₂	%	4.8	4.9	4.9	4.8	3.0	2.9
SO ₂	ppm	869	863	865	871	957	968
NO _x (converted at 5% O ₂)	ppm	123	113	100	84	115	102
Smoke tester(BC)	No.	0	0	0	3	1	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	84	84	84	86	85
Remarks							

Record of Combustion Test

Date 94/10/26

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Outer Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		43	44	45	46	47	48
Pressure of boiler	kg/cm ²	7.5	6.9	7.4	7.2	7.2	6.9
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.3	6.7	7.2	7.0	7.0	6.7
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.8	8.8	8.8	8.8	8.8	8.8
Oil temp. at AC valve inlet	°C	51	51	51	50	50	51
Flow of oil or gas	l/h, m ³ /h	121	121	120	121	121	121
Pressure of oil or gas	kg/cm ²	0.50	0.44	0.70	0.54	0.51	0.44
Pressure of steam(air)	kg/cm ²	1.0	0.5	2.3	1.5	1.0	0.5
Oil temp. at burner inlet	°C	46	46	44	44	44	42
Draft							
Pressure at FDF outlet	mmaq	790	790	790	790	795	790
Pressure of primary wind box	mmaq	75	75	75	70	75	75
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	50	50	50	50	45	50
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	226	223	226	225	223	220
Damper							
Primary damper opening		2.3	2.3	2.3	2.3	2.3	2.3
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	101	83	128	114	101	82
CO	ppm	0	84	21	12	12	91
CO ₂	%	13.2	13.3	13.4	13.5	13.6	13.3
O ₂	%	2.8	2.8	2.7	2.5	2.5	2.8
SO ₂	ppm	968	976	979	982	985	977
NO _x (converted at 5% O ₂)	ppm	89	73	112	99	87	72
Smoke tester(BC)	No.	2	9	1	2	2	8
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	85	85	85	86	80
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere			766 mmh		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.2	7.2	7.3	7.3	7.1	7.4
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	7.0	7.1	7.1	6.9	7.2
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.1	9.1	9.1	9.1	9.5	9.5
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	200	199	201	200	202	200
Pressure of oil or gas	kg/cm ²	1.47	0.98	0.55	0.33	1.50	0.47
Pressure of steam (air)	kg/cm ²	3.0	2.1	1.0	0.5	3.0	0.9
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at FDF outlet	mmaq	755	745	755	750	770	765
Pressure of primary wind box	mmaq	425	425	430	420	350	345
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	255	255	230	240	210	200
Temperature							
Temp. of air for combustion	°C	32	33	32	32	32	32
Temperature of exhaust gas	°C	282	284	286	286	282	282
Damper							
Primary damper opening		4.2	4.2	4.2	4.2	3.8	3.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	68	70	71	66	73	75
CO	ppm	0	0	0	15	0	0
CO ₂	%	10.2	10.3	10.3	10.3	11.7	11.7
O ₂	%	6.9	6.9	6.8	6.9	5.0	5.1
SO ₂	ppm	376	380	379	380	404	404
NO _x (converted at 5% O ₂)	ppm	77	79	80	75	73	75
Smoke tester (BC)	No.	1	2	2	3	0	2
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	80	80	80	80	81	81
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.1	7.0	7.0	7.0	7.2	7.1
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	6.8	6.8	6.8	7.0	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.0	8.2	8.2	8.2	9.5	9.5
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	199	201	201	201	201	206
Pressure of oil or gas	kg/cm ²	0.34	1.47	0.48	0.36	1.50	0.93
Pressure of steam (air)	kg/cm ²	0.5	3.0	1.0	0.5	3.0	1.9
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at PDF outlet	mmaq	765	785	785	780	780	785
Pressure of primary wind box	mmaq	345	270	270	265	250	250
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	200	160	155	155	155	150
Temperature							
Temp. of air for combustion	°C	34	34	34	34	34	34
Temperature of exhaust gas	°C	279	275	273	272	274	277
Damper							
Primary damper opening		3.8	3.4	3.4	3.4	3.3	3.3
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NOx	ppm	69	73	77	68	72	69
CO	ppm	16	0	18	860	39	99
CO ₂	%	11.5	13.3	13.3	13.3	14.1	14.5
O ₂	%	5.2	2.9	2.8	2.7	1.8	1.4
SO ₂	ppm	401	444	443	443	464	464
NOx (converted at 5% O ₂)	ppm	70	65	68	59	60	56
Smoke tester (BC)	No.	3	0	3	9	2	4
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	82	83	83	83	83	84
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.2	7.0	7.0	7.0	7.4	7.4
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	6.8	6.8	6.8	7.2	7.2
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.5	8.2	7.8	7.1	7.3	8.2
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	202	159	161	158	162	161
Pressure of oil or gas	kg/cm ²	0.49	1.36	0.83	0.50	0.30	1.40
Pressure of steam (air)	kg/cm ²	0.9	3.0	1.8	1.0	0.5	3.0
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at FDF outlet	mmaq	780	775	775	780	775	780
Pressure of primary wind box	mmaq	250	280	280	280	280	220
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	140	165	160	160	160	125
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	276	272	271	270	271	263
Damper							
Primary damper opening		3.3	3.5	3.5	3.5	3.5	3.2
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	5	5	5	5	5
Analysis of exhaust gas							
N O _x	ppm	73	59	62	62	62	62
CO	ppm	105	0	0	0	15	0
CO ₂	%	14.2	10.1	10.2	10.0	10.0	11.7
O ₂	%	1.7	7.1	6.9	7.1	6.8	4.9
SO ₂	ppm	460	377	383	382	381	417
N O _x (converted at 5% O ₂)	ppm	61	68	70	71	70	62
Smoke tester (BC)	No.	7	0	0	1	2	0
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	81	81	81	81	82
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	6.9	7.2	7.2	7.2	7.2	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.0	7.0	7.0	7.0	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.5	7	8.2	7.5	7.1	8.2
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	159	160	161	159	160	160
Pressure of oil or gas	kg/cm ²	0.83	0.30	1.38	0.84	0.28	1.42
Pressure of steam (air)	kg/cm ²	1.8	0.5	3.0	1.8	0.5	3.0
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at FDF outlet	mmaq	780	785	795	790	790	785
Pressure of primary wind box	mmaq	215	220	170	170	175	165
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	125	120	100	100	100	95
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	260	261	257	255	253	253
Damper							
Primary damper opening		3.2	3.2	3.0	3.0	3.0	3.0
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	62	65	64	62	64	66
CO	ppm	0	19	0	0	318	23
CO ₂	%	11.7	11.7	13.2	13.2	13.0	13.8
O ₂	%	5.0	4.9	3.0	3.0	3.0	2.1
SO ₂	ppm	408	413	449	447	448	452
NO _x (converted at 5% O ₂)	ppm	62	65	57	55	57	56
Smoke tester (BC)	No.	0	5	0	1	9	2
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	82	83	84	84	84	84
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.1	7.1	7.0	7.2	7.4	6.8
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	6.9	6.8	7.0	7.2	6.6
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.5	7.2	7	7.5	6.5	6.0
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	159	161	120	119	121	121
Pressure of oil or gas	kg/cm ²	0.82	0.30	1.25	1.82	0.77	0.22
Pressure of steam (air)	kg/cm ²	1.8	0.5	2.9	1.0	1.8	0.4
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at FDF outlet	mmaq	785	790	790	790	790	790
Pressure of primary wind box	mmaq	170	165	145	135	150	155
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	95	95	90	85	85	85
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	253	251	221	226	232	233
Damper							
Primary damper opening		3.0	3.0	3.0	3.0	3.0	3.0
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	62	68	56	56	55	59
CO	ppm	15	376	0	0	0	0
CO ₂	%	13.6	13.6	9.9	10.3	10.3	10.1
O ₂	%	2.5	2.3	7.1	6.8	6.9	7.0
SO ₂	ppm	452	455	374	381	382	377
NO _x (converted at 5% O ₂)	ppm	54	58	64	63	62	67
Smoke tester (BC)	No.	2	9	0	0	0	0
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	84	83	83	82	83
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere			766 mmB		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		31	32	33	34	35	36
Pressure of boiler	kg/cm ²	6.9	7.3	7.3	7.1	7.0	6.9
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.7	7.1	7.1	6.9	6.8	6.7
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.2	6.2	6	6.9	6.4	5.9
Oil temp. at AC valve inlet	°C	19	19	19	19	19	19
Flow of oil or gas	l/h, m ³ /h	121	118	121	120	119	120
Pressure of oil or gas	kg/cm ²	1.27	0.76	0.24	1.22	0.78	0.24
Pressure of steam (air)	kg/cm ²	2.8	1.8	0.5	2.9	1.8	0.5
Oil temp. at burner inlet	°C	19	19	19	19	19	19
Draft							
Pressure at FDF outlet	mmaq	790	790	785	785	785	790
Pressure of primary wind box	mmaq	115	115	120	120	100	95
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	65	65	65	65	50	55
Temperature							
Temp. of air for combustion	°C	36	36	36	36	36	36
Temperature of exhaust gas	°C	230	229	230	225	224	222
Damper							
Primary damper opening		2.7	2.7	2.7	2.6	2.6	2.6
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NO _x	ppm	59	56	60	74	66	60
CO	ppm	0	0	15	0	0	20
CO ₂	%	12.0	11.8	11.9	13.4	13.3	13.4
O ₂	%	4.8	5.1	5.0	3.1	3.1	3.1
SO ₂	ppm	413	410	419	445	446	444
NO _x (converted at 5% O ₂)	ppm	58	56	60	66	59	54
Smoke tester (BC)	No.	0	0	1	1	1	4
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	85	84	85	85	85
Remarks							

Record of Combustion Test

Date 94/10/27

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Diesel Oil						
Number		37	38	39	40	41	42
Pressure of boiler	kg/cm ²	7.3	7.0	6.9			
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.1	6.8	6.7			
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.0	6.3	6.3			
Oil temp. at AC valve inlet	°C	19	19	19			
Flow of oil or gas	l/h, m ³ /h	121	118	123			
Pressure of oil or gas	kg/cm ²	1.22	0.76	0.24			
Pressure of steam (air)	kg/cm ²	2.8	1.8	0.5			
Oil temp. at burner inlet	°C	19	19	19			
Draft							
Pressure at FDF outlet	mmaq	780	780	785			
Pressure of primary wind box	mmaq	80	80	85			
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	45	40	40			
Temperature							
Temp. of air for combustion	°C	36	36	36			
Temperature of exhaust gas	°C	222	216	217			
Damper							
Primary damper opening		2.5	2.5	2.5			
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4			
Analysis of exhaust gas							
NO _x	ppm	77	68	54			
CO	ppm	15	15	253			
CO ₂	%	14.5	14.4	14.9			
O ₂	%	1.6	1.7	1.1			
SO ₂	ppm	444	461	477			
NO _x (converted at 5% O ₂)	ppm	64	56	43			
Smoke tester (BC)	No.	1	1	9			
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	86			
Remarks							

Record of Combustion Test

Date 94/10/28

Place	Pachuca	Atmosphere			766 mmB		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Gas Oil (720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	6.9	7.6	6.7	7.4	7.1	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.7	7.4	6.5	7.2	6.9	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.1	7.6	7.2	8.2	7.6	7.4
Oil temp. at AC valve inlet	°C	62	64	64	64	64	64
Flow of oil or gas	l/h, m ³ /h	199	201	199	201	200	201
Pressure of oil or gas	kg/cm ²	1.29	0.85	0.50	1.30	0.83	0.45
Pressure of steam (air)	kg/cm ²	2.2	1.3	0.5	2.2	1.3	0.5
Oil temp. at burner inlet	°C	58	58	60	60	60	60
Draft							
Pressure at FDF outlet	mmaq	740	740	740	755	755	750
Pressure of primary wind box	mmaq	420	425	425	345	345	345
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	240	240	245	200	200	195
Temperature							
Temp. of air for combustion	°C	35	35	35	35	35	35
Temperature of exhaust gas	°C	291	296	291	286	283	284
Damper							
Primary damper opening		4.2	4.2	4.2	3.8	3.8	3.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	95	98	96	100	102	103
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.3	10.4	10.2	11.7	11.7	11.7
O ₂	%	6.9	6.8	7.0	5.1	5.1	5.1
SO ₂	ppm	666	683	671	767	762	772
NO _x (converted at 5% O ₂)	ppm	108	110	110	101	103	104
Smoke tester (BC)	No.	0	0	0	1	0	0
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	80	80	80	81	81	82
Remarks							

Record of Combustion Test

Date 94/10/28

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Inner Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.2	7.2	6.8	7.0	7.0	7.4
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	7.0	6.6	6.8	6.8	7.2
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.4	7.6	8	8	7.6	7.4
Oil temp. at AC valve inlet	°C	65	65	65	65	64	64
Flow of oil or gas	l/h, m ³ /h	201	199	199	199	200	201
Pressure of oil or gas	kg/cm ²	0.48	0.88	1.28	1.27	0.83	0.49
Pressure of steam(air)	kg/cm ²	0.5	1.4	2.2	2.2	1.3	0.5
Oil temp. at burner inlet	°C	60	62	62	62	62	62
Draft							
Pressure at FDF outlet	mmaq	780	770	775	775	780	780
Pressure of primary wind box	mmaq	270	270	270	235	235	235
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	160	155	160	135	135	135
Temperature							
Temp. of air for combustion	°C	35	35	35	35	35	35
Temperature of exhaust gas	°C	281	272	274	269	269	270
Damper							
Primary damper opening		3.4	3.4	3.4	3.2	3.2	3.2
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NO _x	ppm	105	100	101	97	99	101
CO	ppm	16	0	0	55	88	277
CO ₂	%	13.2	13.2	13.1	14.3	14.5	14.4
O ₂	%	3.1	3.1	3.1	1.8	1.5	1.6
SO ₂	ppm	865	867	858	928	945	936
NO _x (converted at 5% O ₂)	ppm	94	89	90	81	81	83
Smoke tester(BC)	No.	3	0	1	4	5	8
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	83	84	84	84	85
Remarks							

Record of Combustion Test

Date 94/10/28

Place	Pachuca	Atmosphere	766 mmB				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Gas Oil (720ppm)						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.1	7.5	7.1	6.7	7.3	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	7.3	6.9	6.5	7.1	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	6.5	6.8	6.6	6.6	7.1	7.2
Oil temp. at AC valve inlet	°C	64	51	48	48	48	49
Flow of oil or gas	l/h, m ³ /h	162	160	160	160	162	159
Pressure of oil or gas	kg/cm ²	1.09	0.73	0.35	0.35	0.73	1.02
Pressure of steam (air)	kg/cm ²	2.0	1.3	0.5	0.5	1.3	2.0
Oil temp. at burner inlet	°C	58	50	48	48	46	46
Draft							
Pressure at FDF outlet	mmaq	778	775	775	775	780	780
Pressure of primary wind box	mmaq	270	270	270	215	215	210
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	155	150	150	120	120	120
Temperature							
Temp. of air for combustion	°C	35	38	38	38	38	38
Temperature of exhaust gas	°C	268	262	267	261	254	258
Damper							
Primary damper opening		3.5	3.5	3.5	3.2	3.2	3.2
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	90	90	93	96	92	93
CO	ppm	0	0	0	0	0	0
CO ₂	%	10.2	10.2	10.3	11.7	11.8	11.7
O ₂	%	6.9	6.9	6.9	5.0	4.8	5.0
SO ₂	ppm	679	688	688	775	781	773
NO _x (converted at 5% O ₂)	ppm	102	102	106	96	91	93
Smoke tester (BC)	No.	0	0	0	3	0	0
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	81	81	81	83	83	83
Remarks							

Record of Combustion Test

Date 94/10/28

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner(Inner Mixing Atomizer)						
Kind of fuel	Gas Oil(720ppm)						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	6.9	6.8	7.2	7.3	7.2	6.9
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.7	6.6	7.0	7.1	7.0	6.7
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.2	7	6.6	6.6	6.8	7.3
Oil temp. at AC valve inlet	°C	50	50	52	52	52	53
Flow of oil or gas	l/h, m ³ /h	159	160	161	160	159	160
Pressure of oil or gas	kg/cm ²	1.04	0.70	0.34	0.40	0.70	1.08
Pressure of steam(air)	kg/cm ²	2.0	1.2	0.4	0.5	1.3	2.0
Oil temp. at burner inlet	°C	46	46	46	48	48	48
Draft							
Pressure at FDF outlet	mmaq	790	785	785	785	790	785
Pressure of primary wind box	mmaq	165	170	170	155	160	160
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	95	95	95	90	90	90
Temperature							
Temp. of air for combustion	°C	38	38	38	38	38	38
Temperature of exhaust gas	°C	244	243	249	245	244	245
Damper							
Primary damper opening		3.0	3.0	3.0	2.8	2.8	2.8
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NO _x	ppm	94	91	95	90	90	93
CO	ppm	0	0	54	299	21	25
CO ₂	%	13.3	13.4	13.1	13.8	13.9	14.0
O ₂	%	3.0	2.8	2.9	2.2	2.2	2.2
SO ₂	ppm	876	886	876	922	921	921
NO _x (converted at 5% O ₂)	ppm	84	80	84	77	77	79
Smoke tester(BC)	No.	1	1	8	5	3	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	85	85	85	85	85
Remarks							

Record of Combustion Test

Date 94/10/28

Place	Pachuca	Atmosphere	766 mm				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Normal Oil Burner (Inner Mixing Atomizer)						
Kind of fuel	Gas Oil (720ppm)						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.2	7.2	7.0	6.9		
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	7.0	6.8	6.7		
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.2	8.1	7.6	7.6		
Oil temp. at AC valve inlet	°C	46	46	46	47		
Flow of oil or gas	l/h, m ³ /h	120	120	120	120		
Pressure of oil or gas	kg/cm ²	0.87	0.54	0.28	0.27		
Pressure of steam (air)	kg/cm ²	0.5	1.1	0.5	0.5		
Oil temp. at burner inlet	°C	42	40	40	40		
Draft							
Pressure at FDF outlet	mmaq	780	785	785	785		
Pressure of primary wind box	mmaq	150	155	155	115		
Pressure of secondary wind box	mmaq						
Pressure of furnace	mmaq	80	85	85	60		
Temperature							
Temp. of air for combustion	°C	38	38	38	38		
Temperature of exhaust gas	°C	227	234	227	221		
Damper							
Primary damper opening		2.8	2.8	2.8	2.5		
Secondary damper opening							
Primary air ratio							
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4		
Analysis of exhaust gas							
NO _x	ppm	81	71.2	84	86		
CO	ppm	0	0	0	0		
CO ₂	%	10.1	10.2	10.0	12.9		
O ₂	%	7.1	6.9	7.2	4.8		
SO ₂	ppm	671	673	666	783		
NO _x (converted at 5% O ₂)	ppm	93	81	97	85		
Smoke tester (BC)	No.	0	0	0	0		
Water content	%						
Exhaust gas recirculation (EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	83	83	83	85		
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere		766 mmh			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.0	7.2	7.2	7.1	7.1	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.0	7.0	6.9	6.9	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.1	10.1	10.0	10.1	10.1	10.0
Oil temp. at AC valve inlet	°C	52	53	53	55	55	56
Flow of oil or gas	l/h, m ³ /h	120	120	120	120	119	119
Pressure of oil or gas	kg/cm ²	1.62	1.66	1.68	1.68	1.68	1.68
Pressure of steam(air)	kg/cm ²	2.0	2.1	2.1	2.1	2.1	2.1
Oil temp. at burner inlet	°C	40	42	42	43	43	44
Draft							
Pressure at FDF outlet	mmaq	710	710	710	705	705	700
Pressure of primary wind box	mmaq	90	75	75	65	60	45
Pressure of secondary wind box	mmaq	80	105	120	160	225	240
Pressure of furnace	mmaq	40	40	40	40	40	40
Temperature							
Temp. of air for combustion	°C	33	33	34	34	35	35
Temperature of exhaust gas	°C	199	196	197	199	200	201
Damper							
Primary damper opening		2.6	2.3	2.1	2.0	1.9	1.5
Secondary damper opening		2.0	2.3	2.7	3.2	3.6	3.8
Primary air ratio		0.77	0.67	0.61	0.50	0.47	0.30
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	94	81	78	74	72	74
CO	ppm	129	99	231	192	160	127
CO ₂	%	13.7	13.4	13.8	13.7	13.7	13.7
O ₂	%	2.0	2.0	1.8	1.9	2.0	2.0
SO ₂	ppm	724	734	740	737	736	736
NOx(converted at 5% O ₂)	ppm	79	68	65	62	61	62
Smoke tester(BC)	No.	5	4	4	4	5	5
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	87	87	87	87	87	87
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere		766 mmh			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.0	7.0	7.0	7.0	7.3	7.1
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.8	6.8	7.2	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.0	10.0	10.0	10.0	10.0	10.0
Oil temp. at AC valve inlet	°C	56	56	56	56	57	57
Flow of oil or gas	l/h, m ³ /h	119	119	119	119	119	119
Pressure of oil or gas	kg/cm ²	1.73	1.74	1.74	1.73	1.76	1.73
Pressure of steam(air)	kg/cm ²	2.1	2.1	2.1	2.1	2.2	2.2
Oil temp. at burner inlet	°C	52	52	52	52	53	53
Draft							
Pressure at FDF outlet	mmaq	695	690	690	680	680	680
Pressure of primary wind box	mmaq	50	65	70	75	85	95
Pressure of secondary wind box	mmaq	300	240	220	190	150	115
Pressure of furnace	mmaq	45	45	40	40	45	45
Temperature							
Temp. of air for combustion	°C	36	36	37	37	37	38
Temperature of exhaust gas	°C	203	204	204	205	206	206
Damper							
Primary damper opening		1.5	1.8	2.0	2.1	2.5	2.7
Secondary damper opening		4.1	3.8	3.7	3.4	3.0	2.5
Primary air ratio		0.48	0.54	0.57	0.61	0.67	0.72
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	76	74	74	75	81	95
CO	ppm	0	0	0	0	0	0
CO ₂	%	12.8	12.8	12.8	12.7	12.7	12.7
O ₂	%	3.0	3.0	3.0	3.2	3.2	3.2
SO ₂	ppm	683	682	683	674	669	670
NOx(converted at 5% O ₂)	ppm	68	66	66	67	73	85
Smoke tester(BC)	No.	1	3	3	1	0	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	87	87	87	87	87	87
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere	766 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.0	7.6	6.9	7.5	7.2	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.4	6.7	7.3	7.0	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.0	10.0	10.0	10.0	10.0	10.0
Oil temp. at AC valve inlet	°C	57	57	58	58	58	59
Flow of oil or gas	l/h, m ³ /h	119	119	119	119	119	119
Pressure of oil or gas	kg/cm ²	1.74	1.79	1.76	1.78	1.73	1.72
Pressure of steam(air)	kg/cm ²	2.1	2.2	2.2	2.2	2.2	2.2
Oil temp. at burner inlet	°C	55	55	56	56	56	57
Draft							
Pressure at FDF outlet	mmaq	650	655	655	660	650	655
Pressure of primary wind box	mmaq	105	100	90	85	75	65
Pressure of secondary wind box	mmaq	195	200	250	255	350	410
Pressure of furnace	mmaq	55	60	55	55	55	60
Temperature							
Temp. of air for combustion	°C	38	38	39	39	39	39
Temperature of exhaust gas	°C	209	210	210	210	210	211
Damper							
Primary damper opening		2.7	2.5	2.2	2.1	1.5	1.4
Secondary damper opening		3.6	3.4	3.7	3.9	4.5	5.0
Primary air ratio		0.67	0.66	0.63	0.61	0.54	0.50
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	86	79	72	71	70	71
CO	ppm	0	0	0	0	0	0
CO ₂	%	11.1	11.4	11.3	11.5	11.2	11.3
O ₂	%	5.2	4.9	5.0	4.8	5.1	4.9
SO ₂	ppm	595	606	604	607	597	601
NOx(converted at 5% O ₂)	ppm	87	79	72	70	70	71
Smoke tester(BC)	No.	0	0	2	1	2	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	86	86	86	85	85
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	7.0	7.0	7.0	7.0	7.2	7.1
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.8	6.8	7.0	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0	9.0	9.0	9.0
Oil temp. at AC valve inlet	°C	58	58	60	60	60	61
Flow of oil or gas	l/h, m ³ /h	161	160	160	160	160	160
Pressure of oil or gas	kg/cm ²	2.01	2.02	2.02	2.02	2.04	2.02
Pressure of steam(air)	kg/cm ²	2.4	2.4	2.4	2.4	2.5	2.4
Oil temp. at burner inlet	°C	56	57	58	58	58	58
Draft							
Pressure at FDF outlet	mmaq	670	670	670	675	700	705
Pressure of primary wind box	mmaq	140	150	170	200	160	155
Pressure of secondary wind box	mmaq	565	500	430	300	210	235
Pressure of furnace	mmaq	105	100	100	100	80	80
Temperature							
Temp. of air for combustion	°C	39	39	39	39	40	40
Temperature of exhaust gas	°C	228	229	231	232	230	229
Damper							
Primary damper opening		2.6	2.8	3.0	3.4	3.2	3.0
Secondary damper opening		6.5	5.6	4.9	4.0	3.2	3.6
Primary air ratio		0.59	0.64	0.67	0.73	0.75	0.73
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	75	76	83	111	108	102
CO	ppm	0	0	0	0	0	0
CO ₂	%	11.2	11.2	11.2	11.4	13.0	12.8
O ₂	%	5.0	5.1	5.1	4.9	2.9	3.1
SO ₂	ppm	600	599	598	606	685	680
NOx(converted at 5% O ₂)	ppm	75	76	84	110	95	91
Smoke tester(BC)	No.	2	1	1	1	1	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	84	84	85	86	86
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.1	6.9	6.9	7.2	7.0	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.9	6.8	6.8	7.0	6.8	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0	9.0	9.0	9.0
Oil temp. at AC valve inlet	°C	60	60	61	61	60	60
Flow of oil or gas	l/h, m ³ /h	161	161	161	161	161	161
Pressure of oil or gas	kg/cm ²	2.04	2.04	2.05	2.06	2.06	2.04
Pressure of steam(air)	kg/cm ²	2.4	2.4	2.4	2.5	2.5	2.5
Oil temp. at burner inlet	°C	58	58	58	58	58	58
Draft							
Pressure at FDF outlet	mmaq	705	700	705	700	715	710
Pressure of primary wind box	mmaq	135	120	110	90	80	100
Pressure of secondary wind box	mmaq	335	385	465	585	480	380
Pressure of furnace	mmaq	80	80	75	80	70	75
Temperature							
Temp. of air for combustion	°C	39	40	39	40	40	39
Temperature of exhaust gas	°C	229	229	229	230	228	228
Damper							
Primary damper opening		2.7	2.5	2.2	1.8	1.8	2.2
Secondary damper opening		4.1	4.6	5.1	6.5	5.1	4.4
Primary air ratio		0.67	0.64	0.60	0.54	0.55	0.61
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	84	82	79	78	78	81
CO	ppm	0	0	0	0	148	47
CO ₂	%	12.9	12.8	12.8	12.9	13.8	13.6
O ₂	%	3.0	3.1	3.1	3.0	1.9	2.0
SO ₂	ppm	681	683	685	685	742	734
NOx(converted at 5% O ₂)	ppm	75	73	71	69	65	68
Smoke tester(BC)	No.	1	1	3	4	6	6
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	85	86	86	86	86
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere			766 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		31	32	33	34	35	36
Pressure of boiler	kg/cm ²	7.0	7.0	7.2	7.0	7.0	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	7.0	6.8	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.0	10.0	10.0	10.0	10.0	10.2
Oil temp. at AC valve inlet	°C	55	56	50	50	50	60
Flow of oil or gas	l/h, m ³ /h	162	161	161	160	160	200
Pressure of oil or gas	kg/cm ²	2.00	1.94	1.92	1.90	1.92	2.19
Pressure of steam(air)	kg/cm ²	2.4	2.4	2.3	2.3	2.3	2.6
Oil temp. at burner inlet	°C	53	54	45	45	45	57
Draft							
Pressure at FDF outlet	mmaq	710	710	710	710	700	780
Pressure of primary wind box	mmaq	120	130	155	180	80	245
Pressure of secondary wind box	mmaq	315	235	190	150	590	300
Pressure of furnace	mmaq	80	70	70	70	70	120
Temperature							
Temp. of air for combustion	°C	39	39	39	39	39	37
Temperature of exhaust gas	°C	229	228	228	228	229	249
Damper							
Primary damper opening		2.5	2.8	3.0	3.3	1.6	3.6
Secondary damper opening		4.0	3.6	3.1	2.6	6.5	3.4
Primary air ratio		0.65	0.70	0.74	0.77	0.49	0.73
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	84	90	104	127	76	106
CO	ppm	85	62	135	66	91	200
CO ₂	%	13.9	14.0	13.8	13.6	13.8	13.9
O ₂	%	1.8	1.7	1.9	2.0	2.0	2.1
SO ₂	ppm	740	756	738	722	732	688
NOx(converted at 5% O ₂)	ppm	70	75	87	107	64	90
Smoke tester(BC)	No.	5	3	5	4	4	5
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	86	86	86	85
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere		766 mmb			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		37	38	39	40	41	42
Pressure of boiler	kg/cm ²	7.0	7.0	7.2	7.1	7.1	7.1
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	7.0	6.9	6.9	6.9
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.2	10.2	10.2	10.2	10.2	10.2
Oil temp. at AC valve inlet	°C	59	60	60	60	60	60
Flow of oil or gas	l/h, m ³ /h	200	200	200	200	200	200
Pressure of oil or gas	kg/cm ²	2.23	2.24	2.24	2.22	2.22	2.23
Pressure of steam(air)	kg/cm ²	2.6	2.6	2.6	2.6	2.6	2.6
Oil temp. at burner inlet	°C	54	55	55	56	56	56
Draft							
Pressure at FDF outlet	mmaq	790	795	790	790	790	790
Pressure of primary wind box	mmaq	220	170	155	295	180	230
Pressure of secondary wind box	mmaq	350	550	665	190	680	460
Pressure of furnace	mmaq	120	120	120	125	130	130
Temperature							
Temp. of air for combustion	°C	37	36	36	36	36	36
Temperature of exhaust gas	°C	249	250	251	253	253	252
Damper							
Primary damper opening		3.2	2.8	2.4	3.9	2.8	3.1
Secondary damper opening		4.0	5.2	6.5	2.8	6.5	4.6
Primary air ratio		0.69	0.60	0.56	0.81	0.58	0.67
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NOx	ppm	94	83	81	133	80	89
CO	ppm	120	100	99	210	0	0
CO ₂	%	14.1	14.2	14.0	13.8	12.9	13.0
O ₂	%	1.9	1.9	2.1	2.1	3.2	3.1
SO ₂	ppm	703	709	700	694	648	653
NOx(converted at 5% O ₂)	ppm	79	70	69	113	72	80
Smoke tester(BC)	No.	5	5	5	4	1	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	85	86	85	85	85
Remarks							

Record of Combustion Test

Date 94/12/5

Place	Pachuca	Atmosphere			766 mmh		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Gas Oil(720ppm)						
Number		43	44	45	46	47	48
Pressure of boiler	kg/cm ²	7.0	7.0	7.2	7.2	7.3	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	7.0	7.0	7.1	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.2	10.2	10.2	10.2	10.2	10.2
Oil temp. at AC valve inlet	°C	60	60	60	60	61	61
Flow of oil or gas	l/h, m ³ /h	199	200	199	199	199	199
Pressure of oil or gas	kg/cm ²	2.22	2.22	2.23	2.25	2.26	2.23
Pressure of steam(air)	kg/cm ²	2.6	2.6	2.6	2.6	2.7	2.6
Oil temp. at burner inlet	°C	57	57	57	57	57	57
Draft							
Pressure at FDF outlet	mmaq	790	790	780	780	785	780
Pressure of primary wind box	mmaq	275	300	240	300	400	250
Pressure of secondary wind box	mmaq	290	230	695	410	220	590
Pressure of furnace	mmaq	130	130	160	160	160	150
Temperature							
Temp. of air for combustion	°C	36	36	35	35	35	35
Temperature of exhaust gas	°C	253	254	255	256	260	256
Damper							
Primary damper opening		3.7	4.0	3.1	3.8	4.7	3.3
Secondary damper opening		3.5	2.8	7.0	4.0	2.5	5.5
Primary air ratio		0.75	0.79	0.62	0.73	0.84	0.66
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NOx	ppm	114	130	78	110	137	86
CO	ppm	20	24	0	0	0	0
CO ₂	%	13.0	12.9	11.4	11.5	11.5	11.5
O ₂	%	3.0	3.1	5.0	4.9	4.8	4.9
SO ₂	ppm	653	675	588	590	590	590
NOx(converted at 5% O ₂)	ppm	101	116	78	109	135	85
Smoke tester(BC)	No.	3	3	1	1	2	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	84	85	83	83	83
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere	767 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		1	2	3	4	5	6
Pressure of boiler	kg/cm ²	7.0	7.0	7.0	7.0	7.0	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.8	6.8	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	7.0	7.0	7.5	7.5	7.5	7.5
Oil temp. at AC valve inlet	°C	25	25	24	23	22	22
Flow of oil or gas	l/h, m ³ /h	202	203	202	202	202	202
Pressure of oil or gas	kg/cm ²	1.63	1.63	1.65	1.64	1.62	1.64
Pressure of steam(air)	kg/cm ²	2.0	2.1	2.1	2.1	2.1	2.0
Oil temp. at burner inlet	°C	25	24	24	23	22	22
Draft							
Pressure at FDF outlet	mmaq	800	800	800	800	800	805
Pressure of primary wind box	mmaq	120	80	150	290	180	210
Pressure of secondary wind box	mmaq	380	530	670	230	680	470
Pressure of furnace	mmaq	120	120	120	130	140	130
Temperature							
Temp. of air for combustion	°C	35	35	35	35	33	33
Temperature of exhaust gas	°C	237	252	254	256	258	257
Damper							
Primary damper opening		3.2	2.8	2.4	3.9	2.7	3.1
Secondary damper opening		4.0	5.1	6.5	2.8	6.5	4.6
Primary air ratio		0.72	0.65	0.59	0.79	0.61	0.69
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	6
Analysis of exhaust gas							
NOx	ppm	67	51	46	94	48	59
CO	ppm	299	93	168	502	0	0
CO ₂	%	13.5	13.8	13.7	13.3	12.9	13.2
O ₂	%	2.1	2.0	2.1	2.4	3.2	2.9
SO ₂	ppm	237	241	238	230	218	225
NOx(converted at 5% O ₂)	ppm	57	43	39	81	43	52
Smoke tester(BC)	No.	7	4	6	8	2	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	85	85	85	84	84
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere			767 mmHg		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		7	8	9	10	11	12
Pressure of boiler	kg/cm ²	7.0	7.0	7.0	7.0	7.1	7.2
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.8	6.8	6.9	7.0
Fuel							
Pressure of fuel supply unit	kg/cm ²	8.5	8.5	8.5	8.5	8.5	10.2
Oil temp. at AC valve inlet	°C	22	22	22	22	22	22
Flow of oil or gas	l/h, m ³ /h	202	202	202	202	202	121
Pressure of oil or gas	kg/cm ²	1.62	1.64	1.62	1.63	1.63	1.35
Pressure of steam(air)	kg/cm ²	2.0	2.0	2.0	2.1	2.0	1.7
Oil temp. at burner inlet	°C	22	22	22	22	22	22
Draft							
Pressure at FDF outlet	mmaq	800	805	800	800	795	695
Pressure of primary wind box	mmaq	265	310	220	320	400	110
Pressure of secondary wind box	mmaq	305	225	710	400	225	50
Pressure of furnace	mmaq	130	130	155	160	160	35
Temperature							
Temp. of air for combustion	°C	33	33	32	32	32	34
Temperature of exhaust gas	°C	257	258	259	261	264	204
Damper							
Primary damper opening		3.8	4.0	3.1	3.8	4.7	2.9
Secondary damper opening		3.6	2.5	7.0	4.0	2.5	1.0
Primary air ratio		0.76	0.80	0.65	0.75	0.84	0.86
Steam injection	kg/cm ²						
Opening of AC valve		6	6	6	6	6	4
Analysis of exhaust gas							
NOx	ppm	85	115	52	87	113	109
CO	ppm	71	115	0	0	0	126
CO ₂	%	13.0	13.1	11.8	11.6	11.7	14.1
O ₂	%	3.0	2.9	4.9	5.1	5.0	2.0
SO ₂	ppm	220	221	203	196	197	333
NOx(converted at 5% O ₂)	ppm	76	102	52	88	113	92
Smoke tester(BC)	No.	5	5	3	3	3	6
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	84	84	83	83	84	87
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere	767 mmb				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		13	14	15	16	17	18
Pressure of boiler	kg/cm ²	7.0	7.2	7.4	7.0	6.9	7.0
Atomizaiton							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.0	7.2	6.8	6.7	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.2	10.2	10.2	10.2	10.2	10.2
Oil temp. at AC valve inlet	°C	22	23	23	23	23	23
Flow of oil or gas	l/h, m ³ /h	119	119	119	119	119	119
Pressure of oil or gas	kg/cm ²	1.60	1.56	1.57	1.57	1.59	1.61
Pressure of steam(air)	kg/cm ²	2.0	2.0	2.0	2.0	2.0	2.0
Oil temp. at burner inlet	°C	22	23	23	23	23	23
Draft							
Pressure at FDF outlet	mmaq	695	695	695	690	690	680
Pressure of primary wind box	mmaq	85	70	65	60	50	50
Pressure of secondary wind box	mmaq	100	120	150	235	330	385
Pressure of furnace	mmaq	35	35	40	45	50	40
Temperature							
Temp. of air for combustion	°C	35	35	36	36	36	36
Temperature of exhaust gas	°C	203	203	204	205	205	207
Damper							
Primary damper opening		2.4	2.2	1.9	1.5	0.8	0.9
Secondary damper opening		2.3	2.7	3.3	3.8	4.5	4.8
Primary air ratio		0.86	0.71	0.67	0.57	0.43	0.43
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	59	51	44	43	39	40
CO	ppm	97	255	164	101	121	15
CO ₂	%	14.1	14.1	14.1	14.2	14.1	13.4
O ₂	%	2.1	2.0	2.0	1.9	2.1	2.9
SO ₂	ppm	345	343	347	346	342	326
NOx(converted at 5% O ₂)	ppm	50	43	37	36	33	35
Smoke tester(BC)	No.	2	4	6	3	4	1
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	87	87	87	87	87	86
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere		767 mmh			
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		19	20	21	22	23	24
Pressure of boiler	kg/cm ²	7.0	7.2	7.2	7.1	7.1	6.9
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	7.0	7.0	6.9	6.9	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.2	10.2	10.2	10.2	10.2	10.2
Oil temp. at AC valve inlet	°C	24	24	24	24	24	23
Flow of oil or gas	l/h, m ³ /h	120	120	120	120	120	121
Pressure of oil or gas	kg/cm ²	1.62	1.60	1.63	1.59	1.59	1.59
Pressure of steam(air)	kg/cm ²	2.0	2.0	2.0	2.0	2.0	2.0
Oil temp. at burner inlet	°C	24	24	24	24	23	23
Draft							
Pressure at FDF outlet	mmaq	685	680	680	675	675	650
Pressure of primary wind box	mmaq	60	70	90	110	130	130
Pressure of secondary wind box	mmaq	250	190	130	90	65	120
Pressure of furnace	mmaq	40	40	40	40	40	45
Temperature							
Temp. of air for combustion	°C	37	37	37	37	38	38
Temperature of exhaust gas	°C	208	208	209	209	211	211
Damper							
Primary damper opening		1.8	2.1	2.5	2.8	3.1	3.0
Secondary damper opening		4.0	3.4	2.9	2.1	0.8	2.5
Primary air ratio		0.55	0.62	0.71	0.77	0.88	0.77
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	4
Analysis of exhaust gas							
NOx	ppm	45	47	62	107	154	116
CO	ppm	15	15	13	13	14	13
CO ₂	%	13.4	13.4	13.3	13.3	13.3	11.9
O ₂	%	2.9	2.9	3.1	3.1	3.1	5.0
SO ₂	ppm	328	329	329	326	329	301
NOx(converted at 5% O ₂)	ppm	40	42	55	96	138	116
Smoke tester(BC)	No.	1	2	0	0	0	0
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	86	87	86	85
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere			767 mmb		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		25	26	27	28	29	30
Pressure of boiler	kg/cm ²	7.3	7.0	7.3	7.0	7.0	7.0
Atomizaiton							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.1	6.8	7.1	6.8	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	10.2	10.2	10.2	10.2	10.2	9.0
Oil temp. at AC valve inlet	°C	23	23	23	23	23	23
Flow of oil or gas	l/h, m ³ /h	120	120	120	121	121	157
Pressure of oil or gas	kg/cm ²	1.62	1.59	1.65	1.63	1.60	1.78
Pressure of steam(air)	kg/cm ²	2.1	2.0	2.1	2.0	2.1	2.3
Oil temp. at burner inlet	°C	23	23	23	23	23	23
Draft							
Pressure at FDF outlet	mmaq	650	650	645	645	650	675
Pressure of primary wind box	mmaq	100	80	75	60	60	140
Pressure of secondary wind box	mmaq	230	280	335	415	530	585
Pressure of furnace	mmaq	50	50	55	50	50	50
Temperature							
Temp. of air for combustion	°C	38	38	38	38	38	38
Temperature of exhaust gas	°C	212	211	213	213	214	225
Damper							
Primary damper opening		2.5	2.2	2.0	1.5	1.1	2.5
Secondary damper opening		3.6	4.0	4.4	5.2	6.5	7.0
Primary air ratio		0.65	0.60	0.60	0.51	0.44	0.57
Steam injection	kg/cm ²						
Opening of AC valve		4	4	4	4	4	5
Analysis of exhaust gas							
NO _x	ppm	53	46	42	44	43	48
CO	ppm	0	0	0	0	0	0
CO ₂	%	11.8	12.1	11.8	12.0	11.8	11.9
O ₂	%	5.1	4.8	5.0	4.8	5.1	5.1
SO ₂	ppm	297	303	298	297	297	296
NO _x (converted at 5% O ₂)	ppm	53	45	42	43	43	48
Smoke tester(BC)	No.	0	1	3	2	0	2
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	86	85	85	85	85
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere			767 mmB		
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		31	32	33	34	35	36
Pressure of boiler	kg/cm ²	7.0	7.0	7.0	7.1	7.2	7.0
Atomizaiton							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.8	6.8	6.9	7.0	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0	9.0	9.0	9.0
Oil temp. at AC valve inlet	°C	23	23	23	23	23	23
Flow of oil or gas	l/h, m ³ /h	159	160	159	159	160	160
Pressure of oil or gas	kg/cm ²	1.80	1.81	1.80	1.82	1.82	1.81
Pressure of steam(air)	kg/cm ²	2.3	2.3	2.2	2.3	2.3	2.3
Oil temp. at burner inlet	°C	23	23	23	23	23	23
Draft							
Pressure at PDF outlet	mmaq	680	670	675	670	700	700
Pressure of primary wind box	mmaq	140	170	210	240	200	160
Pressure of secondary wind box	mmaq	495	400	290	210	155	250
Pressure of furnace	mmaq	105	105	110	110	85	85
Temperature							
Temp. of air for combustion	°C	38	39	39	39	40	40
Temperature of exhaust gas	°C	226	231	235	236	235	233
Damper							
Primary damper opening		2.8	3.0	3.4	4.0	3.5	3.0
Secondary damper opening		5.5	4.8	4.0	3.2	2.6	3.6
Primary air ratio		0.62	0.67	0.72	0.77	0.79	0.72
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	51	64	96	121	120	77
CO	ppm	0	0	0	0	0	0
CO ₂	%	11.9	11.9	11.8	11.8	13.4	13.5
O ₂	%	5.0	5.0	5.1	5.1	3.0	2.8
SO ₂	ppm	296	297	300	302	263	270
NOx(converted at 5% O ₂)	ppm	51	64	97	122	107	68
Smoke tester(BC)	No.	1	1	0	1	1	2
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	85	85	85	84	85	84
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere				767 mmb	
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		37	38	39	40	41	42
Pressure of boiler	kg/cm ²	7.0	7.1	7.0	7.0	7.0	7.0
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	6.8	6.9	6.8	6.8	6.8	6.8
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0	9.0	9.0	9.0
Oil temp. at AC valve inlet	°C	23	23	23	23	23	23
Flow of oil or gas	l/h, m ³ /h	160	160	160	160	160	160
Pressure of oil or gas	kg/cm ²	1.81	1.82	1.83	1.83	1.81	1.83
Pressure of steam(air)	kg/cm ²	2.3	2.3	2.3	2.3	2.3	2.3
Oil temp. at burner inlet	°C	23	23	23	23	23	23
Draft							
Pressure at FDF outlet	mmaq	700	700	695	705	705	710
Pressure of primary wind box	mmaq	130	110	95	80	100	120
Pressure of secondary wind box	mmaq	380	460	610	615	375	315
Pressure of furnace	mmaq	90	90	90	70	85	75
Temperature							
Temp. of air for combustion	°C	40	40	40	40	40	40
Temperature of exhaust gas	°C	233	233	234	233	231	231
Damper							
Primary damper opening		2.8	2.3	1.9	1.5	2.3	2.5
Secondary damper opening		4.4	5.0	7.0	7.0	4.5	4.1
Primary air ratio		0.64	0.61	0.52	0.48	0.59	0.63
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5	5	5	5
Analysis of exhaust gas							
NOx	ppm	56	51	51	49	53	57
CO	ppm	0	0	0	62	133	80
CO ₂	%	13.3	13.4	13.4	14.2	14.4	14.4
O ₂	%	3.1	3.0	2.9	2.0	1.7	1.7
SO ₂	ppm	270	269	270	288	293	292
NOx(converted at 5% O ₂)	ppm	50	45	45	41	44	47
Smoke tester(BC)	No.	0	3	1	3	4	3
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	86	86	86	86
Remarks							

Record of Combustion Test

Date 94/12/6

Place	Pachuca	Atmosphere	767 mmB				
Type of boiler	FTN-30 flue and smoke-tube packaged type						
Type of burner	Low NOx Oil Burner(3)						
Kind of fuel	Deisel Oil						
Number		43	44	45	46	47	48
Pressure of boiler	kg/cm ²	7.2	7.0	7.1			
Atomization							
Pressure of air atomization	kg/cm ²						
Pressure of steam atomization	kg/cm ²	7.0	6.8	6.9			
Fuel							
Pressure of fuel supply unit	kg/cm ²	9.0	9.0	9.0			
Oil temp. at AC valve inlet	°C	23	23	23			
Flow of oil or gas	l/h, m ³ /h	160	160	160			
Pressure of oil or gas	kg/cm ²	1.83	1.83	1.82			
Pressure of steam(air)	kg/cm ²	2.3	2.3	2.3			
Oil temp. at burner inlet	°C	23	23	23			
Draft							
Pressure at FDF outlet	mmaq	710	705	705			
Pressure of primary wind box	mmaq	135	150	185			
Pressure of secondary wind box	mmaq	235	210	140			
Pressure of furnace	mmaq	70	85	75			
Temperature							
Temp. of air for combustion	°C	41	41	41			
Temperature of exhaust gas	°C	232	232	233			
Damper							
Primary damper opening		2.8	3.0	3.4			
Secondary damper opening		3.7	3.1	2.4			
Primary air ratio		0.69	0.72	0.78			
Steam injection	kg/cm ²						
Opening of AC valve		5	5	5			
Analysis of exhaust gas							
NO _x	ppm	67	82	121			
CO	ppm	71	58	64			
CO ₂	%	14.5	14.2	14.2			
O ₂	%	1.6	2.0	2.1			
SO ₂	ppm	294	287	288			
NO _x (converted at 5% O ₂)	ppm	55	69	102			
Smoke tester(BC)	No.	3	3	2			
Water content	%						
Exhaust gas recirculation(EGR)							
Damper opening							
Rate of EGR	%						
Combustion efficiency	%	86	86	86			
Remarks							

4.4 Numerical Data for the Figures in the Main Report

Table 1 (Back Data of Figure 4.4.1 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
2.4	58	2.4	61	1.0	58
3.6	63	2.8	63	2.8	69
5.5	69	5.5	77	4.9	72
7.5	88	7.0	85	6.9	68

Table 2 (Back Data of Figure 4.4.2 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
0.7	94	0.7	95	0.5	100
1.0	94	3.1	95	2.9	106
3.0	96	5.2	96	4.9	95
5.0	91	6.9	93	6.7	94
7.4	91	-	-	-	-

Table 3 (Back Data of Figure 4.4.3 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.9	77	1.5	77	1.1	80
2.8	82	3.2	87	3.0	93
5.1	90	5.1	96	5.0	103
7.1	97	7.0	105	7.0	113

Table 4 (Back Data of Figure 4.4.4 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.7	95	1.4	82	2.0	88
3.2	121	2.0	114	3.0	95
4.8	123	3.2	123	4.9	118
7.1	128	5.1	130	6.8	115
-	-	6.8	130	-	-

Table 5 (Back Data of Figure 4.4.5 in Main Report)

	Temp.(°C)	NOx(ppm)
Diesel Oil	37	67
	51	69
	93	75
	136	80
Gas Oil	36	96
	68	99
	101	107
	136	110

Table 6 (Back Data of Figure 4.4.6 in Main Report)

50°		60°		70°	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.7	109	1.5	77	2.6	98
3.1	114	3.2	87	3.0	103
4.8	100	5.1	96	5.1	116
6.9	108	7.0	105	6.9	124

Table 7 (Back Data of Figure 4.4.7 in Main Report)

120l/h		160l/h	
EGR V Ratio	NOx(ppm)	EGR V Ratio	NOx(ppm)
0.0	51	0.0	57
14.2	40	15.2	43
17.2	39	19.3	40
23.9	34	23.1	36
28.6	30	28.9	33

Table 8 (Back Data of Figure 4.4.8 in Main Report)

120l/h		160l/h	
EGR V Ratio	NOx(ppm)	EGR V Ratio	NOx(ppm)
0.0	79	0.0	87
18.3	70	19.0	73
24.8	68	24.0	70
28.5	64	27.4	68

Table 9 (Back Data of Figure 4.4.9 in Main Report)

	Forward	Backward
	NOx(ppm)	NOx(ppm)
Diesel Oil	57	67
Gas Oil	67	85

Table 10 (Back Data of Figure 4.4.10 in Main Report)

120l/h,limit			160l/h,limit			200l/h,limit		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	43	9	0.5	58	9	0.9	61	7
1.8	56	1	1.8	54	2	1.9	56	4
2.8	64	1	3.0	56	2	3.0	60	2
120l/h,O2(3%)			160l/h,O2(3%)			200l/h,O2(3%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	54	4	0.5	57	9	0.5	59	9
1.8	59	1	1.8	55	1	1.0	68	3
2.9	66	1	3.0	57	0	3.0	65	0
120l/h,O2(5%)			160l/h,O2(5%)			200l/h,O2(5%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	60	1	0.5	65	5	0.5	70	3
1.8	56	0	1.8	62	0	0.9	75	2
2.8	58	0	3.0	62	0	3.0	73	0
120l/h,O2(7%)			160l/h,O2(7%)			200l/h,O2(7%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.4	67	0	0.5	70	2	0.5	75	3
1.0	63	0	1.0	71	1	1.0	80	2
1.8	62	0	1.8	70	0	2.1	79	2
2.9	64	0	3.0	68	0	3.0	77	1

Table 11 (Back Data of Figure 4.4.11 in Main Report)

120l/h,limit			160l/h,limit			200l/h,limit		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	47	9	1.0	51	8	-	-	-
1.0	58	4	1.5	67	3	-	-	-
1.5	69	3	2.4	90	3	-	-	-
2.2	78	3	-	-	-	-	-	-
120l/h,O2(3%)			160l/h,O2(3%)			200l/h,O2(3%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	48	8	1.0	51	7	1.0	55	5
1.0	62	2	1.7	73	0	1.5	55	5
1.5	72	0	2.5	88	0	2.0	55	6
2.1	82	1	-	-	-	2.8	55	6
120l/h,O2(5%)			160l/h,O2(5%)			200l/h,O2(5%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	53	4	0.5	58	2	1.1	61	1
1.0	64	0	1.5	55	3	1.5	61	1
1.5	77	0	2.4	54	4	2.0	61	2
2.1	87	0	-	-	-	2.8	60	2
120l/h,O2(7%)			160l/h,O2(7%)			200l/h,O2(7%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	56	2	0.5	64	2	1.0	69	1
1.0	65	3	0.7	62	1	1.6	66	1
1.5	77	0	1.5	59	1	2.0	64	1
2.1	85	0	2.5	59	1	2.9	64	1

Table 12 (Back Data of Figure 4.4.12 in Main Report)

120l/h, limit			160l/h, limit			200l/h, limit		
Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No
-	-	-	0.5	77	5	0.5	83	8
-	-	-	1.3	77	3	1.3	81	5
-	-	-	2.0	79	3	2.2	81	4
120l/h, O2(3%)			160l/h, O2(3%)			200l/h, O2(3%)		
Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No
-	-	-	0.4	84	8	0.5	94	3
-	-	-	1.2	80	1	1.4	89	0
-	-	-	2.0	84	1	2.2	90	1
120l/h, O2(5%)			160l/h, O2(5%)			200l/h, O2(5%)		
Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No
0.5	85	0	0.5	96	3	0.5	104	0
-	-	-	1.3	91	0	1.3	103	0
-	-	-	2.0	93	0	2.2	101	1
120l/h, O2(7%)			160l/h, O2(7%)			200l/h, O2(7%)		
Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No	Pressure (kgf/cm ²)	NOx (ppm)	Bach.No
0.5	97	0	0.5	106	0	0.5	110	0
0.5	93	0	1.3	102	0	1.3	110	0
1.1	80	0	2.0	102	0	2.2	108	0

Table 13 (Back Data of Figure 4.4.13 in Main Report)

120l/h,limit			160l/h,limit			200l/h,limit		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	72	8	1.0	75	9	1.1	81	9
1.0	87	2	1.5	98	3	1.5	80	8
1.5	99	2	2.0	110	2	2.0	108	4
2.3	112	1	2.6	122	1	3.0	127	0
120l/h,O2(3%)			160l/h,O2(3%)			200l/h,O2(3%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	73	9	1.1	79	7	1.0	89	5
1.0	89	2	1.5	104	0	1.5	84	7
1.5	102	1	2.0	116	0	2.0	110	1
2.2	115	1	2.6	125	0	3.0	131	0
120l/h,O2(5%)			160l/h,O2(5%)			200l/h,O2(5%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	84	3	1.0	87	3	1.0	96	1
1.0	100	0	1.5	86	3	1.5	95	1
1.5	113	0	2.1	86	3	2.0	96	1
2.2	123	0	2.6	86	4	3.0	96	0
120l/h,O2(7%)			160l/h,O2(7%)			200l/h,O2(7%)		
Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No	Pressure (kgf/cm2)	NOx (ppm)	Bach.No
0.5	90	0	1.0	94	0	1.1	106	1
1.0	88	2	1.5	93	1	1.5	104	1
1.5	115	0	1.9	92	1	2.0	104	1
2.3	127	0	2.5	95	1	3.0	104	0

Table 14 (Back Data of Figure 4.4.14 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
0.6	31	1.1	39	1.3	50
2.7	31	3.1	48	1.7	51
5.1	35	4.8	52	3.3	57
6.9	48	7.0	61	5.0	73
-	-	-	-	7.0	63

Table 15 (Back Data of Figure 4.4.15 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.0	38	1.1	45	1.5	57
2.8	39	2.8	55	3.2	63
5.1	46	4.9	70	5.0	76
7.3	68	7.1	74	7.0	85

Table 16 (Back Data of Figure 4.4.16 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.1	64	0.9	72	1.5	82
3.5	70	3.0	85	3.2	97
5.0	74	4.8	97	5.2	105
7.0	95	7.6	97	6.9	112

Table 17 (Back Data of Figure 4.4.17 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
0.9	65	0.9	74	1.4	90
3.3	72	3.4	101	3.3	102
5.9	86	5.0	107	4.8	117
7.1	107	6.7	116	6.8	130

Table 18 (Back Data of Figure 4.4.18 in Main Report)

O2(3%)		O2(5%)		O2(7%)	
1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)
0.47	80	0.48	83	0.47	91
0.51	76	0.51	83	0.52	87
0.60	84	0.61	91	0.60	94
0.81	108	0.80	113	0.78	114
0.91	115	0.90	120	0.89	124

Table 19 (Back Data of Figure 4.4.19 in Main Report)

160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
3.2	76	3.2	76
5.0	83	5.2	85
6.9	87	6.7	87

Table 20 (Back Data of Figure 4.4.20 in Main Report)

O2(limit)		O2(3%)		O2(5%)	
1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)
0.48	41	0.52	45	0.57	48
0.59	44	0.61	45	0.62	51
0.63	47	0.64	50	0.67	64
0.69	55	0.72	68	0.72	97
0.72	69	0.79	107	0.77	122
0.78	102	-	-	-	-

Table 21 (Back Data of Figure 4.4.21 in Main Report)

O2(limit)		O2(3%)		O2(5%)	
1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)	1st Air Ratio	NOx(ppm)
0.49	64	0.54	69	0.59	75
0.55	65	0.60	71	0.64	77
0.61	68	0.64	73	0.67	84
0.65	70	0.67	75	0.73	110
0.70	75	0.73	91	-	-
0.74	78	0.75	96	-	-
0.77	107	-	-	-	-

Table 22 (Back Data of Figure 4.4.22 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.9	36	1.7	44	2.1	39
2.9	40	3.0	45	3.2	43
4.8	45	5.0	51	4.9	52

Table 23 (Back Data of Figure 4.4.23 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.9	62	2.0	68	2.1	69
3.0	66	3.1	71	3.2	72
4.8	70	5.0	75	5.0	78

Table 24 (Back Data of Figure 4.5.1 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	57	270	31	-	-	270	40
730	82	720	64	-	-	720	66
1270	125	1080	85	-	-	1490	93
1625	143	1500	97	-	-	2480	139
2610	181	1700	105	-	-	3270	162
-	-	2390	125	-	-	-	-

Table 25 (Back Data of Figure 4.5.2 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	60	270	35	-	-	270	45
730	90	720	74	-	-	720	70
1270	135	1080	125	-	-	1490	99
1625	156	1500	134	-	-	2480	141
2120	181	1700	147	-	-	3270	172
2610	199	2390	175	-	-	-	-

Table 26 (Back Data of Figure 4.5.3 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	60	270	48	720	76	270	45
730	87	720	85	1500	114	720	71
1270	133	1080	110	1760	146	1490	103
1625	149	1500	124	2070	159	2480	150
2120	169	1700	135	-	-	3270	187
2610	188	2390	156	-	-	-	-

Table 27 (Back Data of Figure 4.5.4 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	67	270	53	720	83	270	51
730	96	720	97	1500	122	720	75
1270	147	1080	124	1760	158	1490	107
1625	166	1500	145	2070	178	2480	155
2120	190	1700	151	-	-	3270	190
2610	208	2390	182	-	-	-	-

Table 28 (Back Data of Figure 4.5.5 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	69	270	57	720	76	270	43
730	93	720	97	1640	132	720	72
1270	140	1080	124	1760	151	1490	106
1625	158	1500	136	1858	163	2410	160
2120	180	1700	155	-	-	3240	193
2610	198	2390	171	-	-	-	-

Table 29 (Back Data of Figure 4.5.6 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)	N(ppm)	NOx(ppm)
270	72	270	73	720	85	270	52
730	103	720	105	1640	152	720	78
1270	160	1080	139	1760	158	1490	111
1625	177	1500	154	1858	180	2410	169
2120	204	1700	169	-	-	3240	213
2610	221	2390	202	-	-	-	-

Table 30 (Back Data of Figure 4.5.7 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
2.4	58	0.6	31	-	-	1.9	36
3.6	63	2.7	31	-	-	2.9	40
5.5	69	5.1	35	-	-	4.8	45
7.5	88	6.9	48	-	-	-	-

Table 31 (Back Data of Figure 4.5.8 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.9	77	1.1	64	-	-	1.9	62
2.9	82	3.5	70	-	-	3.0	66
5.1	90	5.0	74	-	-	4.8	70
7.1	97	7.0	95	-	-	-	-

Table 32 (Back Data of Figure 4.5.9 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
2.4	61	1.1	39	-	-	1.7	44
2.8	63	3.1	48	-	-	3.0	45
5.5	77	4.8	52	-	-	5.0	51
7.0	85	7.0	61	-	-	-	-

Table 33 (Back Data of Figure 4.5.10 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.5	77	0.9	72	3.2	76	2.0	68
3.2	87	3.0	85	5.0	83	3.1	71
5.1	96	4.8	97	6.9	87	5.0	75
7.0	105	7.6	97	-	-	-	-

Table 34 (Back Data of Figure 4.5.11 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.0	58	1.3	50	-	-	2.1	39
2.8	69	1.7	61	-	-	3.2	43
4.9	72	3.3	57	-	-	4.9	52
6.9	68	5.0	73	-	-	-	-
-	-	7.0	63	-	-	-	-

Table 35 (Back Data of Figure 4.5.12 in Main Report)

Normal Burner		Low NOx Burner(1)		Low NOx Burner(2)		Low NOx Burner(3)	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.1	80	1.5	82	3.2	76	2.1	69
3.0	93	3.2	97	5.2	85	3.2	72
5.0	103	5.2	105	6.7	87	5.0	78
7.0	113	6.9	112	-	-	-	-

Table 36 (Back Data of Figure 4.5.13 in Main Report)

Diesel Oil		Gas Oil	
EGR V Ratio	NOx Reduction Ratio	EGR V Ratio	NOx Reduction Ratio
0.0	0.0	0.0	0.0
14.2	22.2	18.3	10.9
17.2	23.4	24.8	13.2
23.9	34.0	28.5	18.5
28.6	41.4	-	-

Table 37 (Back Data of Figure 4.5.14 in Main Report)

Diesel Oil		Gas Oil	
EGR V Ratio	NOx Reduction Ratio	EGR V Ratio	NOx Reduction Ratio
0.0	0.0	0.0	0.0
15.2	24.4	19.0	15.6
19.3	30.4	24.0	18.6
23.1	36.9	27.4	21.4
28.9	42.6	-	-

Table 38 (Back Data of Figure 4.7.2 in Main Report)

N(ppm)	O2(limit)	O2(3%)	O2(5%)
	NOx(ppm)	NOx(ppm)	NOx(ppm)
270	48	57	60
730	77	82	90
1270	112	125	135
1625	122	143	156
2120	140	-	181
2610	155	181	199

Table 39 (Back Data of Figure 4.7.3 in Main Report)

N(ppm)	O2(limit)	O2(3%)	O2(5%)
	NOx(ppm)	NOx(ppm)	NOx(ppm)
270	52	60	67
730	77	87	96
1270	114	133	147
1625	128	149	166
2120	151	169	190
2610	163	188	208

Table 40 (Back Data of Figure 4.7.4 in Main Report)

N(ppm)	O2(limit)	O2(3%)	O2(5%)
	NOx(ppm)	NOx(ppm)	NOx(ppm)
270	58	69	72
730	80	93	103
1270	125	140	160
1625	140	158	177
2120	156	180	204
2610	168	198	221

Table 41 (Back Data of Figure 4.7.5 in Main Report)

N(ppm)	O2(limit)	O2(3%)	O2(5%)
	NOx(ppm)	NOx(ppm)	NOx(ppm)
270	31	31	35
720	64	70	74
1080	85	94	125
1500	97	109	134
1700	105	113	147
2390	125	139	175

Table 42 (Back Data of Figure 4.7.6 in Main Report)

N(ppm)	O2(limit) NOx(ppm)	O2(3%) NOx(ppm)	O2(5%) NOx(ppm)
270	39	48	53
720	72	85	97
1080	91	110	124
1500	108	124	145
1700	113	135	151
2390	135	156	182

Table 43 (Back Data of Figure 4.7.7 in Main Report)

N(ppm)	O2(limit) NOx(ppm)	O2(3%) NOx(ppm)	O2(5%) NOx(ppm)
270	50	57	73
720	82	97	105
1080	110	124	139
1500	122	136	154
1700	140	155	169
2390	155	171	202

Table 44 (Back Data of Figure 4.7.9 in Main Report)

Conradson Carbon(%)	O2 (%)
0.3	1.9
3.8	2.1
6.7	3.1
8.4	3.8

Table 45 (Back Data of Figure 4.7.10 in Main Report)

Conradson Carbon(%)	O2 (%)
0.3	1.5
3.8	2.1
6.7	3.1
8.4	4.0

Table 46 (Back Data of Figure 4.7.11 in Main Report)

Conradson Carbon(%)	O2 (%)
0.3	1.5
3.8	2.1
6.7	3.1
8.4	5.5

Table 47 (Back Data of Figure 5.1.4 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.9	77	1.5	77	1.1	80
2.8	82	3.2	87	3.0	93
5.1	90	5.1	96	5.0	103
7.1	97	7.0	105	7.0	113

Table 48 (Back Data of Figure 5.1.5 in Main Report)

120l/h		160l/h		200l/h	
O2(%)	NOx(ppm)	O2(%)	NOx(ppm)	O2(%)	NOx(ppm)
1.5	155	1.6	163	1.3	168
3.2	181	3.2	188	3.1	198
5.0	199	4.9	208	4.9	221
7.0	222	7.1	235	7.1	245

4.5 Certificate of Analysis for Standard Sample of Nitrogen
in Residual Fuel Oil



Certificate of Analysis

Standard Sample of Nitrogen in Residual Fuel Oil

Nitrogen Content 0.589 ± 0.008 wt%

Lot No. 88N5006

This Standard Sample is an analytical standard for determining nitrogen in residual fuel oil and is prepared by blending a reduced crude oil, gas oil etc.

This Standard Value is determined in accordance with Macro-Kjeldahl Method in JIS K 2609 "Testing Method for Nitrogen in Petroleum Products".

The uncertainty shown represents the 95% confidence limit of the standard value.

The Other Properties of the Sample (Reference)

Density (15°C) g/cm ³	0.9578
Flash Point (P.M.)	126 °C
Kinematic Viscosity, 50°C	264.2 cSt
Pour Point	5.0 °C
Conradson Carbon Residue	8.23 wt%
Ash	0.01 wt%

For a detailed discussion of standard sample, see PETROTECH
Vol. 2 No. 12.

December , 1988

The Japan Petroleum Institute

A4 - 91



社団法人石油学会認定

重油窒素分標準試料分析成績書

窒素分 $0.589 \pm 0.008 \text{ wt}\%$

Lot No. 88N5006

本標準試料は、常圧蒸留残油、軽油等を混合して調製した通常为重油である。

窒素分の標準値はJIS K 2609 (石油製品窒素分試験方法) のマクロケルダール法によって決定したもので、表示した限界は標準値の95%信頼限界である。

一般性状 (参考値)

密度 (15°C) g/cm ³	0.9578
引火点 (P.M.)	126 °C
動粘度, 50°C	264.2 cSt
流動点	5.0 °C
残留炭素分	8.23 wt%
灰分	0.01 wt%

詳細はペトロテック第12巻第2号を御参照下さい。

昭和63年12月

社団法人 石油

