

 <b>FOSTER WHEELER</b>	
CLIENT	: IES Raffineria di Mantova
PLANT	: Refinery Upgrading Project
LOCATION	: Mantova - Italy
FW CONTRACT	: 1-BD-0344A
FW MAT. REQ. N°	: BD0264L-1917A_01
FW DWG. N°	: -
P.O. N°	: 1-BD-0264L-P IT 001
ITEM N°	: B-1001 AN / B-1001 BN
UNIT	: CTE
VENDOR REF. N°	: 06EB515-P-511
VENDOR CAD FILE N°	: BY Pensotti

## TABELLA PRESTAZIONI CALDAIA

NOTE:

03	22/06/2007	REVISIONE DOPO COMMENTI FWI	Davina	Colombo	Caratti
02	13/03/2007	REVISIONE DOPO COMMENTI FWI	Davina	Colombo	Caratti
01	01/12/2006	REVISIONE DOPO COMMENTI FWI	Davina	Colombo	Caratti
00	22/09/2006	PRIMA EMISSIONE	Davina	Colombo	Caratti
REV. Rev.	DATE Data	DESCRIPTION Descrizione	COMPILED Disegnato	CHECKED Verificato	ISSUED Emesso

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## Boiler Performance Summary

Plant Configuration		Existing Scheme (IES)					
Case		1	2	3	4	5	6
Fuel		Natural gas	Refinery fuel	Fuel Oil	Minimum Load Refinery Fuel	Minimum Load Fuel Oil	50% Natural gas 50% Oil
Load	%	100	100	100	10	20	100
Steam production	t/h	50	50	50	5	10	50
Blowdown	t/h	0,5	0,5	0,5	0,05	0,1	0,5
Pressure at Boiler B.L.	barg	50	50	50	50	50	50
Superheated steam temp.	°C	430	430	430	354	373	426
Boiler drum pressure	barg	53	53	53	52	52	53
Feedwater temp.	°C	120-125	120-125	120-125	120-125	120-125	120-125
ECO outlet temp.	°C	187	188	188	180,5	178	178
Desuperheater flow	kg/h	500	1600	<u>170</u>	/	/	/
Rangeability	%	<u>+3%</u>	<u>+3%</u>	<u>+3%</u>	/	/	/
Desuperheater flow 50%MCR	kg/h	<u>100</u>	<u>360</u>	<u>50</u>	/	/	/
Air entering tempertaure	°C	ambient	ambient	ambient	ambient	ambient	ambient
Gas temp. leaving furnace	°C	1144	1263	1151	653	765	1210
Gas temp. leaving boiler	°C	374	377	376	275	282	365
Gas temp. leaving eco	°C	172	171	172	125	130	162
Flue gas recirculation	%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Excess air	%	10	10	15	50	35	15
Air entering unit	kg/h	57036	54656	59226	7455,7	13903,6	50773
Wet gas leaving unit	kg/h	60053	57744	62901	7764,5	14638,6	53923
Gas side DP - SH	mbar	14	15	15	0,75	0,8	13
Gas side DP - Boiler+Furnace	mbar	15	16	16	0,8	2,2	15
Gas side DP - ECO	mbar	3	3	3	0,15	0,23	2,8
Gas side DP - Ducts in/out	mbar	11	11	11	0,55	1,5	11
Gas side DP - burner	mbar	25	25	25	0,5	1,1	25
Gas side DP - flow measure	mbar	2	2	2	0,1	0,2	2
Heat input	MW	41,579	41,760	41,451	4,176	8,290	41,591
Fuel fired	kg/h	3015	3088	3675	308,8	735	3150
Furnace liberation	MW/m <sup>3</sup>	0,22	0,2	0,22	0,03	0,05	0,21
Furnace Heat release(ABMA)	MW/m <sup>2</sup>	0,16	0,14	0,16	0,02	0,033	0,14
Efficiency (LHV)	%	92,2	92,5	92,5	92,5	63	92,5

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Fuel		Natural gas	Refinery fuel	Fuel Oil	Minimum Load Refinery Fuel	Minimum Load Fuel Oil	50% Natural gas 50% Oil
Load	%	100	100	100	10	20	100
<b>COMPOSIZIONE MASSICA</b>							
O2	%	1,81	1,81	2,211	9,05	6,301	0,844
H2O	%	12,33	12,33	7,243	8,57	6,145	10,179
N2	%	71,96	71,96	69,772	73,24	70,659	69,883
CO2	%	13,765	13,765	19,598	9,005	15,705	17,92
SO2	%	0	0	0,006271	0	0,005022	0,0034
ARGO	%	0	0	1,169	0	1,184	1,171