

Air Preheating System designed and supplied by Foster Wheeler Italiana

The Crude Oil price increase in the past years has rendered particularly important the fuel consumption reduction in the refinery processes

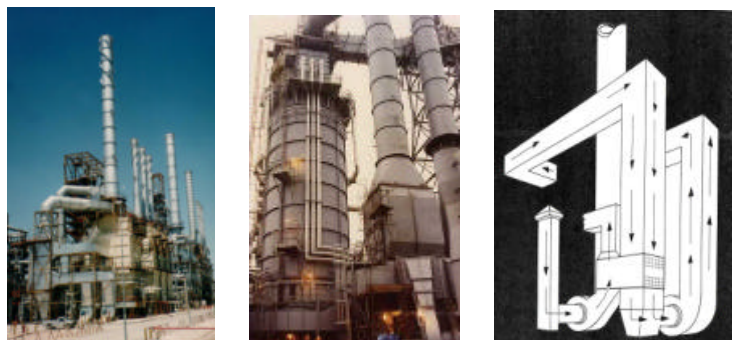
Foster Wheeler Italiana has a long experience in designing air-preheating systems. The first application is dated 1962 when, despite the low fuel cost, air preheating systems were installed on two big process heaters of a new refinery in north Italy.



The fuel saving by preheating the comburent can be performed in several modes:

- Preheating air with flue gases utilising fix type, rotary type or heat-pipe type air pre-heaters.
- Preheating air with hot fluids available in refinery such as low pressure steam, process steam, and hot water.
- Utilising oxygen-rich hot streams such as gas turbine exhaust.

The most convenient solution shall be selected on a case-by-case basis, after an appropriate analysis of utility cost, plot area availability and type of unit. Foster Wheeler Italiana has designed all types of air preheating system and therefore is in position to provide the most convenient and reliable solution for each project.



A partial list of air preheating system installation by Foster Wheeler Italiana is herewith included.

Partial List of Air Preheating Systems designed and built by Foster Wheeler Italiana

Date	Company and Location	Heater Service	Heater Duty (MM Kcal/h)	Air Heater Type	Duty (MM Kcal/h)	Net Eff. (%)	T air to burners (°C)
2008	Taneco Nishnekamsk (Russia)	Hydrocraker	29.73	Fix	3.58	90	335
2008	Taneco Nishnekamsk (Russia)	Hydrocraker	29.73	Steam Coil	0.90	90	80 (#)
2007	Slavneft Yaroslavl (Russia)	Hydrogen	68.32	Fix	8.65	90	337
2007	Slavneft Yaroslavl (Russia)	Hydrogen	68.32	Steam Coil	1.60	90	15 (#)
2006	Ufaneftechim Ufa (Russia)	Coker	17.89	Fix	3.25	91	256
2006	Ufaneftechim Ufa (Russia)	Coker	17.89	Water Coil	0.77	91	65 (#)
2006	Lukoil Odessa Odessa (Ukraine)	Visbreaker	11.15	Fix	1.4	91	280
2006	Lukoil Permnefteorgsintez Perm (Russia)	Crude/Preflash	54.6+15	Fix	9	92	330
2005	PNCHZ Pavlodar (Kazakhstan)	Steam Reformer	31.03	Fix	3.35	89.5	336
2005	PNCHZ Pavlodar (Kazakhstan)	Steam Reformer	31.03	Steam Coil	0.53	89.5	60 (#)
1999	Sasref Al Jubail (Saudi Arabia)	Thermal Cracker	71,00	GTE outlet	69,0	N.A.	558
1999	Parco Mahmood Kot (Pakistan)	Crude	56.96	Steam Coil	4.21	91	157
1999	Parco Mahmood Kot (Pakistan)	Vacuum	15.17	Steam Coil	1.12	91	157
1999	Parco Mahmood Kot (Pakistan)	Visbreaker	30.54	Steam Coil	2.26	91	160
1996	Pemex Tula (Mexico)	Steam Reformer	149.96	Fix	14.36	93.44	260
1995	Nephtechimik Kremenchug (Ukraine)	Vacuum	15.9	Fix	1.73	90	250
1992	NIOC Arak (Iran)	Charge	35.88	Fix	3.42	90.5	245
1992	NIOC Arak (Iran)	Vacuum	43.92	Fix	6.5	90.5	344
1992	NIOC Arak (Iran)	Crude	88.19	Fix	13.35	90.5	344
1991	Sasa Adana (Turkey)	Hot-Oil	30.24	Fix	2.91	91.5	248

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1989	Esso Singapore	Visbreakers	21.9	Fix	22	91.1	259
1988	Esso Augusta (Italy)	Powerformer	31.8	Fix	4.59	93.5	371
1987	Tringen Point Lisas (Trinidad)	Steam Reformer	94	GTE outlet	40.1	86.6	542
1986	Fina Rome (Italy)	Visbreaker	26.35	Water coil	1.1	91	116
1990	NPC Shiraz (Iran)	Steam Reformer	31.29	Fix	4.16	90	394
1990	Maraven Cardon (Venezuela)	Crude	65.83	Fix	8.54	87.5	298
1987	KNPC Kuwait	Steam Reformer	71.1	Heat Pipe	2 x 4.5	93.8	325
1985	KNPC Kuwait	Steam Reformer	60.7	Heat Pipe	2 x 3.8	93.8	326
1984	SIBP Antwerp (Belgium)	Crude	103.8	Fix	9	90	200
1981	SIBP Antwerp (Belgium)	Visbreaker	44.07	Fix	1.72	91.3	110
1984	Esso Karlsruhe (Germany)	Coker	29.4	Fix	3.5	92.2	308
1983	SIBP Antwerp (Belgium)	Vacuum (revamping)	19.5	Fix	3	90	381
1983	SIBP Antwerp (Belgium)	Vacuum (revamping)	17.5	Fix	2	90	298
1984	KNPC Kuwait	Steam Reformer	60.7	Heat Pipe	2 x 3.8	93.8	326
1982	Total Trieste (Italy)	Platforming (revamp)	26.3	Heat Pipe	3.9	90	346
1981	SIBP Antwerp (Belgium)	Crude (revamp)	65.6	Fix	6.2	90	254
1981	Esso Trecate (Italy)	Crude (revamp)	125	Fix	11.96	90	257
1981	Esso Kalundborg (Denmark)	Visbreaker	25.5	Rotary	3.88	89.4	345
1981	Esso Slagen (Norway)	Visbreaker	28.2	Rotary	4.21	90	360
1984	INA Sisak (Yugoslavia)	Xilene Reboiler	35.1	Heat Pipe	4.37	93.5	292
1982	NOC Tobruk (Lybia)	Crude	114.2	Rotary	10.94	91	216
1980	Semadco Talkha (Egypt)	Steam Reformer	75.4	Rotary	10.33	92	250

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1976	ANIC Sannazzaro (Italy)	Crude	89.4	Rotary	8.24	92	290
1968	SIR Porto Torres (Italy)	Superheaters	15.5	Air bank	1.63	85	250
1962	ANIC Sannazzaro (Italy)	Vacuum	30	Rotary	2.7	86	200
1962	ANIC Sannazzaro (Italy)	Crude	71.5	Rotary	6.2	86	200

(#): Air temperature to Heat Exchanger