Hamada Boiler HONGKONG HEAD OFFICE

SIREGRAND INDUSTRIAL LIMITED
Room 801 Far East Consortium Buiding
121 Des Voeux Road Central Hong Kong
Tel: +852-25408939 Fax. +852-25407962
Manager : Mr. Lo Kwan h/p: +85 2 97637975
web site:http://www.hamadaboiler.com
e-mail: sales@hamadaboiler.com

Energy 2010

Hamada BOILER
Fluidized Bed Boiler Specialist
web site:http://www.hamadaboiler.com

2010 EDITION HAMADA BOILER DIRECTORY

Philippine San Miguel Corp. eyes on diversification in the Energy Sector

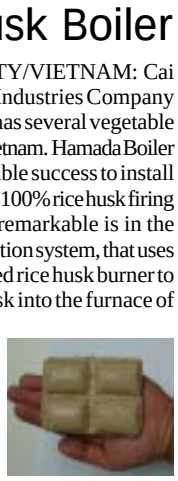
MANILA: San Miguel Corp., Southeast Asia's largest food and drink group, is diversifying further in the utility sector. In December last year, San Miguel acquired the Government Service Insurance System's 27 percent stake in power utility giant Manila Electric Co. for around P30 Billion and has agreed to buy up to 50.1 percent of giant oil refiner Petron Corp. for P32.2 billion. San Miguel, through unit San Miguel Energy Corp., is expanding its investments in the power sector by joinning biddings for government owned assets. San Miguel Energy has submitted to the Power Sector Assets and liabilitys Management Corp. a letter of intent to acquire the 620-megawatt combined-cycle power plant facilities in Limay, Batangas.

SAN MIGUEL CORPORATION AWARDS HAMADA GROUP THE SUPPLY OF FLUIDIZED BED BOILERS FOR ITS FOOD PROCESSING AND BREWERY PLANTS.

Manila: SMC awarded Hamada Group the supply of biomass-wastes fired Fluidized Bed Boilers for its Brewery in San Fernando, Purefoods-Hormel in Cavite and Ginebra San Miguel in Bacolod within the year. The boiler system will be equipped with pollution control equipment that is to comply with the R.A. 8749 otherwise known as the Philippine Clean Air Act. SMC's plan also includes the brewery plants in Polo, Cebu and Davao. In line with its fuel-saving and diversification plan SMC will go for indigenous renewable biomass wastes fuel and may even consider the use of coal over the long run. It was learned from reliable sources that San Miguel Corp is interested to purchase majority stake in one of the biggest coal mining companies in Indonesia.

Rice Husk Boiler

HOCHIMIN CITY/VIETNAM: Cai Lan Oils & Fats Industries Company Ltd of Malaysia has several vegetable oil refineries in Vietnam. Hamada Boiler made its remarkable success to install first in the history, 100% rice husk firing boiler. What is remarkable is in the design of combustion system, that uses specially designed rice husk burner to spray the rice husk into the furnace of about 800 oC and almost 80% of rice husk burns in the air in suspension, then the rest of 20% will fall onto the heavy duty chain stoker running slowly at hte bottom of the furnace. This is a very unique system of rice husk combustion without necessity to make briquet of rice husk like in the picture. For Chain stoker system if burner is not used shall have to use briquetted rice husk. In Vietnam, rice husk will cost about Dong 500 per KG (price delivered by boat along the river bank if your factory has access to the river) that is about US$0.0277 per KG($27 per ton). But this price is a raw rice husk without compressed or made into briquet. If compressed, cost will become almost double althoug transport cost will be reduced.



Fire seen from the peep hole

Demand of Biomass FBC Boiler is increasing in Japan with Government subsidy.

TOKYO: In line with the worldwide movement to reduce CO2, Japanese government is now helping industries by extending Financial assistance as big aqs 30% on the investment of equipment for utilization of biomass energy to replace petroleum fuel. There are many chicken paultry with 300,000 chicken and 10,000 chicken produce as big as one ton of Chicken Manure .so 300,000 chicken produce 30ton of manure everyday (30% wet base). Paultry is equipped dryer for the manure before it is discharged and dried up to 30% water content. For this size of poultry, we will reccommend 3-4 ton steam boiler and to generate 100 KW by using the back pressure turbine of SHINKO TURBINE WORKS of Japan. Back pressure will be utilized for Poultry in various sectors.

Chiken Manure firing BOILER with 100 KW Turbine

Chicken Manure

Elements	(%)
H2O	70.62
Ash	7.19
Combustible	75.52
H.H.V Kcal/Kg	3270
C	33.90
H	4.60
N	4.58
O	31.85
Combustible S	0.13
Combustible Cl	0.46

SHINKO BACK PRESSURE TURBINE Model DCM series 100-200 KW

入口蒸気圧力：0.5MPa
回　転　数：3600min⁻¹

機名	蒸気量T/h / 蒸気圧力 MPa	1.0	1.5	2.0	3.0	4.0	5.0
DCM1	大気圧	30	46	62	94		
	0.1	26	40	54	81		
	0.15	23	36	49	74	100	
	0.2	21	33	45	68	92	
	0.25		30	41	62	84	
	0.3		27	37	56	76	96
	0.35		24	33	51	69	87
	0.4		21	29	45	61	77
	0.45			25	39	53	68
	0.5			21	33	45	58

機名	蒸気量T/h / 蒸気圧力 MPa	2.0	3.0	4.0	5.0	6.0	7.0
DCM5	大気圧	81	124	167	209	252	
	0.1	67	103	139	175	212	248
	0.15	59	92	125	158	190	223
	0.2	52	81	111	141	171	220
	0.25		72	98	125	152	179
	0.3		62	86	110	134	158
	0.35			65	83	101	118
	0.4			60	76	92	109
	0.45			52	66	81	95
	0.5				56	69	82

EFB and Palm Waste Firing Boiler for Malaysian / Indonesian and Central American Market

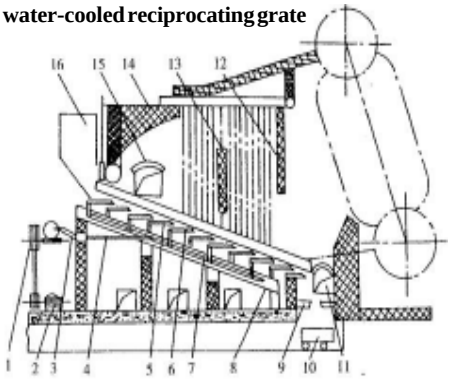
Kuala Lumpur, Malaysia: Long awaited modernization of Palm waste boiler is being developed by Hamada Boiler at present. There are two main design for Palm waste firing. One is the water-cooled reciprocating grate with large watertube membrane wall furnace to meke low temperature furnace maintaining lower than 900 oC of ash fusion point of EFB. Superheater also apply reversal system to solve the small content of CL in the palm waste by preventing outside temperature of the superheater not to exceed 480 oC. Water cooled reciprocating grate will grately solve the ash melting problem which are very common with the existing model of palm boiler. Another challenge is made with the CFBC boiler using the EFB fuel for high pressure to be used for power generation.

Palm Waste Composition

Elements	Fiber(%)	Shell(%)	EFB(%)
H2	4.0	6.4	3.01
C	29.0	40.0	24.4
S	0.1	0.1	0.1
O2	26.0	30.0	13.9
N2	~	~	0.6
Ash	1.2	0.1	7.9
H2O	29.7	23.4	35-50
L.H,V Wet	3200	3812	2345
	Kcal/KG	Kcal/KG	Kcal/KG

* EF Have 17-18% K2O in Ash
* Ash fusion temperature 900 oC (approx)
* 0,3 - 0,5 % Potash

water-cooled reciprocating grate



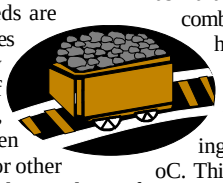
Biomass Boiler Model SHL

Pelletizing of Biomass Fuel

Boiler Illustrate at the right side (Model SHL) can accommodate various kind of biomass fuel without pelletizing. But for Fluidizing Bed, those fuel with very low density and/or fiberous condition fuel may be better to have it pelletized/ compressed like in this picture. Pelletizing machine is available to fit various condition of biomass.

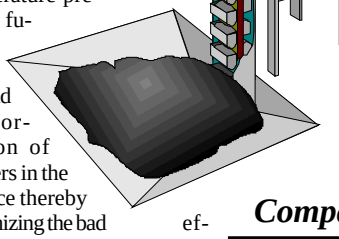
COAL-FIRED BOILER

Fluidized Bed Combustion (FBC) technology has seen rapid expansion in the last 10 years and now represents a significant sector of the market for coal fired boilers. Reasons for this success include low acid gas emissions and greatly enhanced fuel flexibility. Principles of Fluidized Beds are when solid particles can be moved by a fast stream of air or other gas, for example when pressurized air or other gas is admitted below a column of solid particles the particles are lifted and separated by the passage of the gas until, as the rate of gas flow is increased, they behave as a liquid with vigorous movement and mixing.



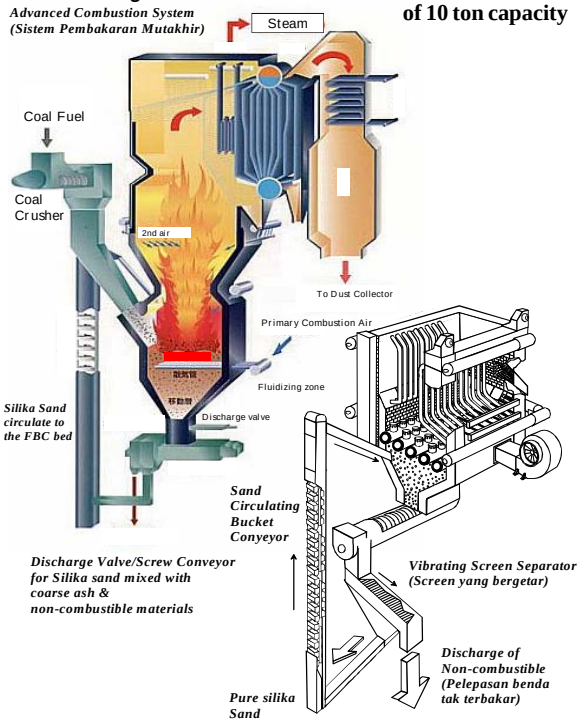
Compare to conventional boiler design, FBC boiler allows fuel to stay longer in the combustion chamber thus providing sufficient time to have enough contact with air. Also, due to the in-bed turbulence and the scouring action of the bed materials on the heat transfer surface, the fireside heat transfer coefficient can be about 3 times than that of boilers using conventional firing system. Its combustion efficiency is such that it can burn virtually every last scrap of energy in the fuel.

The very low content of unburned carbon in the disposed ash further attests to its high combustion efficiency as high as 99%. The temperature in the FBC area is kept below the ash melting point at 850 - 950 oC. This low combustion temperature prevents fusion of ash and the formation of clinkers in the furnace thereby minimizing the bad effects of fouling and erosion of heat surface. This is especially important for fuels with very high ash content like low-grade coal and low ash fusion point.



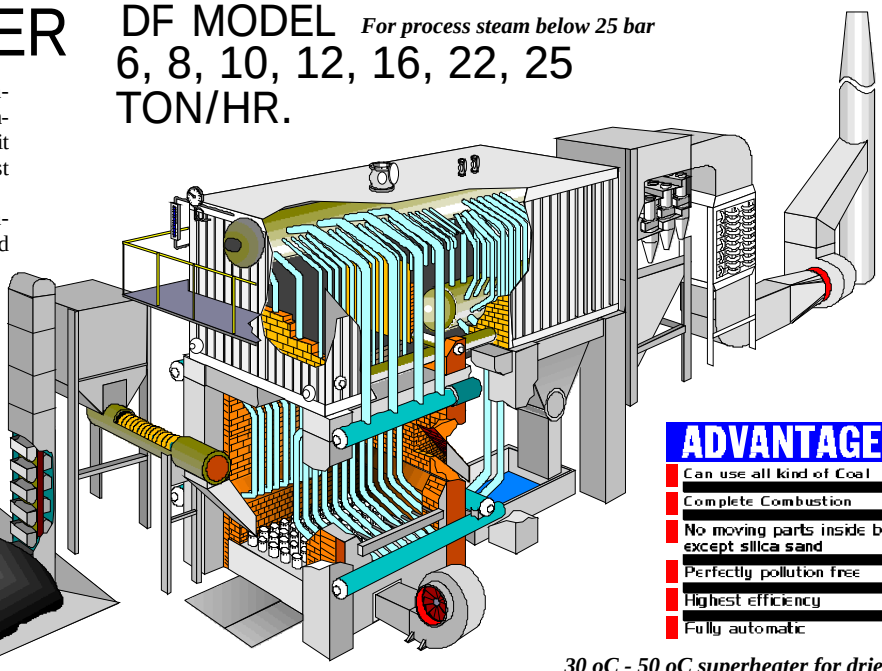
Hamada Fluidized Bed Combustion Circulating Sand Bed

Advanced Combustion System (Sistem Pembakaran Mutakhir)



Right picture
Internal Travelling Chain Stoker Fire Tube Boiler of 10 ton capacity

DF MODEL *For process steam below 25 bar*
6, 8, 10, 12, 16, 22, 25 TON/HR.



ADVANTAGES
- Can use all kind of Coal
- Complete Combustion
- No moving parts inside boiler except silica sand
- Perfectly pollution free
- Highest efficiency
- Fully automatic

Compact Fluidized Bed System

30 oC - 50 oC superheater for dried steam by option

BIOMASS GASIFICATION POWER GENERATION SYSTEM

Biomass Gasification

Most of us believe that wood (a kind of biomass) burns. However, if looking closely at the fireplace, the pyrolysing wood does not burn at the wood surface. The wood evolves a combustible gas, which burns whenever it encounters oxygen in the air. In simple term, Biomass Gasification is the breaking down of biomass material in the absence of oxygen to produce volatile vapor as a kind of combustible gas. The volatile vapor, usually known as Producer Gas, contains H2, CH4, CO as the sources of energy and typically CO2 and N2 as the unwanted diluents. The biomass is fed into the Gasifier and fluidized to heat up to about 800 oC to generate Producer Gas which needs to be cleaned and cooled down prior to being used in gas engines.

Producer Gas Treatment

The Producer Gas from the gasifier is very hot at about 750 oC. It passes through a cyclone separator to remove the coarse particulates and then passes through a series of venturi scrubbers and cooling towers. Water is employed as the cooling and scrubbing media. Waste heat recovery is also available for domestic and industrial heating purposes. The cooled and cleaned gas is pumped through a Hi-volt electrostatic participator (optional) to remove the remaining tar and particulate before being used in the gas engines.

Gas Engines and Generators

The combustible gas is directly used in reciprocating gas engines to power generators to produce electrical energy. The system is much compact and simple. In addition, it can also be used for other heating or direct combustion applications. One may ask that the biomass or producer gas can be burned in boilers to produce steam for piston engines or turbines, however these operate at a relatively low efficiency and require large steam plant and huge initial investment. The gas engines are professionally retrofitted diesel engines which are simple in operation & reliable. Relevant technical personnel are readily a vailable, even in rural regions of developing countries.

400kw RICE HUSK POWER PLANT

Actual unit operating in Indonesia since 2007 in Wonosobo, Central Jawa. Bernadi Rahaju (Director Utama) of PT Dieng Jaya/ PT National Champignon said this is a wonderful set up to produce small scale electricity without using steam boiler. And their company are going to place an repeat order of 800 KW within this year. Some people worries about tar from the combustion of rice husk/wood. But we have completely soved this tar problem by adding tar treatment system together with the existing environmental equipment.

Top and 2nd largest papermill in Taiwan are using Hamada FBC Coal Boiler

TAIPEI: Taiwan has almost 36 Boiler Manufacturing comapnies locally. But no one until now manufactures fluidized bed boiler. Due to the Taiwan government strict control on environment which set the limit of NOx as low as Japan level, chain grate boiler can not meet the requirement any more. This is the main reason that the top and 2nd largest papermill of Taiwan selected Hamada FBC Boiler. FBC boiler can easily pass the government rule on NOx because of low combustion temperature.

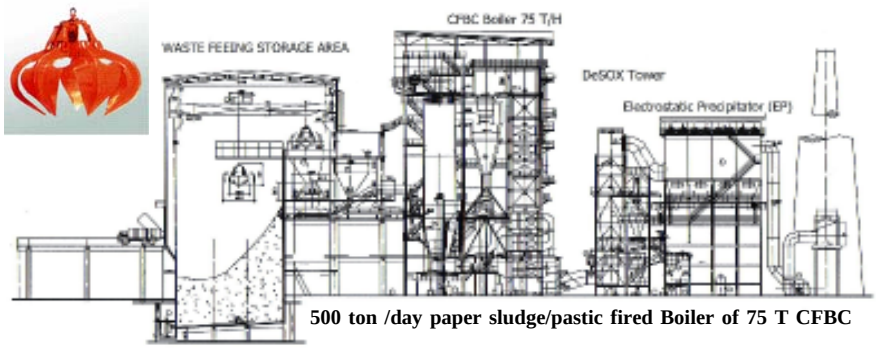
Cheng Loong PaperMill (Zhupei Factory and Tayuan Factory) and Yong Fong Yi (YFY-Yangmei Factory, YFY-Chingsui factory, and Union paper-Douryu factory) are using Hamada Boilers.

Fuel feeding equipment

Hamada Boiler also offer various kind of solid fuel feeding system. Also available pelletizing machine/ crushing machine to pre-process various kind of fuels for the best shape to feed into the boiler. 2 Picture from the left shows shaftless screw conveyor which is used for plastic waste boiler and citiwaste feeding. Picture right is the SATRINDO shredder for shredding plastic botols, containers, used tired etc. Waste tires can be shredded by this machine and pass through the magnetic steel wire removing equipment before feeding into the boiler. Our boiler operating in Taiwan are using about 20 % used tires without emitting black smoke, but the flying particles from the tire fuel need bag filter and DeSOx tower.

PAPER SLUDGE/PLASTIC WASTE FIRING CFBC BOILER

We have successfully installed boiler using paper sludge/plastic waste 500 ton a day at Tianjin City of China in 2008. This papermill has 500 tons of waste materials from their process. 200 ton of paper sludge with almost 74% water content, and 300 tons of waste plastic of mixture of screen reject, pulper reject and rag rope which has a content of steel wired that must be removed first and water content is about 59%. In order to reach required heating value and water average water content, coal of about 154 ton/day is mixed to have the average water content of 51.36%. With this water content, heating value will become 2,113 Kcal/Kg.



500 ton /day paper sludge/pastic fired Boiler of 75 T CFBC


RDF / RPF


SLUDGE CAKE


SCREEN REJECT


PULPER REJECT


RAG ROPE

Plastic Sludge / Waste + coal firing CFBC boiler

		COAL	PAPER SLUDGE	PLASTIC WASTE	AVERAGE
ANALYSIS		99.97	99.8	99.75	99.82
Car (C)	%	58.15	7.49	25.62	27.76
Har (H)	%	3.94	1	2.28	2.28
Oar (O)	%	4.87	8.89	10.52	8.69
Nar (N)	%	0.71	0.35	0.6	0.55
Sar (S)	%	0.64	0.18	0.15	0.27
Mar (H2O)	%	7.2	74	59	51.36
Aar(Ash)	%	24.46	7.89	1.58	8.91
Qar,net,p	kJ/kg	20850	1170	7760	8836.25
Qar,net,p	Kcal/Kg	4988	280	1856	2113.94
		23.6%	30.6%	45.8%	100%
FUEL INPUT (T/H)		154.5	200	300	654.5

Paper Sludge Analysis

ITEM	UNIT	BEFORE DRY	AFTER DRY
Weight	ton/day	205	84
Moisture	% (wt)	65	15
Dried conter	ton/day	71.75	71.4
Ash	% (wt)	15.09	35.67
Combustible	% (wt)	20.87	49.33
C	% (wt)	8.4	19.86
H	% (wt)	1.29	3.05
N	% (wt)	0.46	1.09
O	% (wt)	10.7	25.29
S	% (wt)	0.022	0.05
Cl	% (wt)	0.003	0.01
H.H.V/Dry	Kcal/kg	2294	2294
L.H.V/Dry	Kcal/kg	2101	2101
H.H.V/Wet	Kcal/kg	825	1950
L.H.V/Wet	Kcal/kg	374	1697

This paper factory produces paper sludge of almost 200 ton/day with 65-74 % water content and directly used to the boiler without drying but with coal mixture. If this sludge will be dried, coal consumption will be reduced accordingly.

500 T per day waste firing capacity/ 75 ton CFBC 39 bar 450 oC 15 MW turbine power plant x 2 Tianjin, near Beijin China
China do not have the restriction of transport of plastic waste and this plant uses raw and wet plastice waste as fuel.

Hamada Boiler introduces plastic waste firing FBC boiler for papermill in Thailand

BANGKOK: In the year 2008, Hamada Boiler went into a contract with HIANGSENG PAPERMILL of Thailand for building 25 ton/H waste plastic firing BFBC boiler in order to make use of huge quantity of waste plastic coming out from the recycling process of paper. Boiler pressure vessel picture shown at the right side is the model DF25, bubbling bed FBC for 25 ton/H capacity. In addition to the main screw feeder for the plastic waste, it equip with spare feeder for coal fuel so that coal can be mixed when the plastic waste contains excessive water in order to maintain the furnace temperature at about 850 oC at all time.
Right above picture is Mr. Hans Muhry, company's executive engineer, inspecting the huge quantity of plastic waste produced everyday from the process line. This is a common problem to all papermills who uses recycled paper containing plastics. Paper Factories who have similar plastic waste may contact us for this latest technology.

specially designed FBC combuster for plastic waste

Plastic waste analysis (dried to 10% moisture condition

ITEM	UNIT	Pulper Reject	sreen reject	Rage Rope	Total
Weight	ton/day	13.3	47.2	18.3	78.8
Moisture	% (wet)	10	10	10	10
Ash	% (wet)	36.47	2.57	3.22	8.45
Combustible	% (wet)	53.53	87.43	86.78	81.55
C	% (wet)	27.68	60.6	39.08	50.03
H	% (wet)	4.57	5.96	11.23	6.95
N	% (wet)	0.5	0.28	0.52	0.37
O	% (wet)	19.44	18.94	34.54	22.65
S	% (wet)	0.27	0.28	0.29	0.28
Cl	% (wet)	1.08	1.37	1.13	1.26
H.H.V/Dry	Kcal/kg	3886	6286	6818	6004
L.H.V/Dry	Kcal/kg	3613	5930	6148	5589
H.H.V/Wet	Kcal/kg	3497	5657	6136	5404
L.H.V/Wet	Kcal/kg	3192	5278	5473	4971

This chart is the data of daily disposal of plastic waste from the waste paper processing for carton box paper of one of the biggest factory in Taiwan,. There are 3 kinds of wastenamely "pulper reject" "screen reject" and Rage rope". Rage rope contains steel wires which must be removed by magnetic steel separator. In Taiwan, government restrict the transport of this kind of plastic waste if it is considered as industrial waste. Therefore, this must be processed first to become RPF. Then transporting it will be allowed as fuel. (Same law applies in Japan)

PULVERIZED COAL BURNER WITH ASPHALT MIXING PLANT

We will bring revolution to all Asphalt Mixing Plants. We will replace your oil burner with pulverized coal burner and the ash from the coal will act as FILLER to make your asphalt mix better quality. This matter has been proven in many asphalt mixing plant in Indonesia with government certificates.
ASPHALT MIXING PLANT OF 50 TON/H CAPACITY (600 LITERS OF OIL CONSUMPTION)

Most of Asphalt Mixing Plants by average consumes 600 Liters of oil per hour for the production of 50 tons of asphalt mix per hour. Do you want to cut this oil cost? YES, YOU CAN. We can change your oil burner with very unique coal burner with specially designed COMBUSTER. Do you worry about the ash from coal? No problem. In Indonesia, government issued certificate that the ash from coal mixed to the asphalt can be used as "FILLER" and the result is better than the oil. **SAVING CALCULATION**: This is a direct fire system. Saving is so simple. How much are you using for your operation? Let's say 500 liters of bunker oil or Diesel Oil? Your saving will be 80% of what you are paying for at present.

PULVERIZED COAL BURNERN FOR BOILER APPLICATION

Huge power plant boilers uses Pulverized Coal Combustion technology. We use the same principle but do it on small scale application using pulverizer/burner in one packaged unit. The said coal pulverizer/ burner can be used in many types of heating equipments as long as the ash can find the way to be disposed, or the products to be heated could accept ash, like in the case of Asphalt Mixing Plant. Picture on the right shows a successful application of a coal burner with the rotating combuster installed in front of the smoke tube boiler.

Compact coal pulverizer/burner TWO IN ONE design. Below is the application to steam boiler.

75 ton 60 bar 450 oC

HIGH PRESSURE CFBC FOR POWER PLANT BOILER

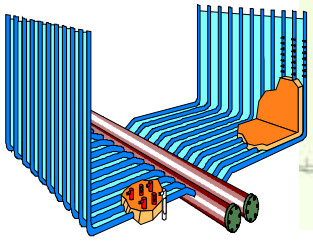
INDONESIA TORAY SYNTHETIC (75 TON X 2 UNITS, 15 MW x 2 CONDENSING TURBINE

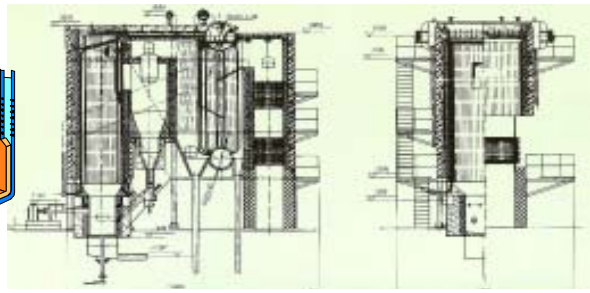
HAMADA CFBC BOILER OF 75 TON Membrane wall design, which permits standard insulation and lagging greatly reducing radiation losses as compared to the conventional tube arrangement with thick refractory

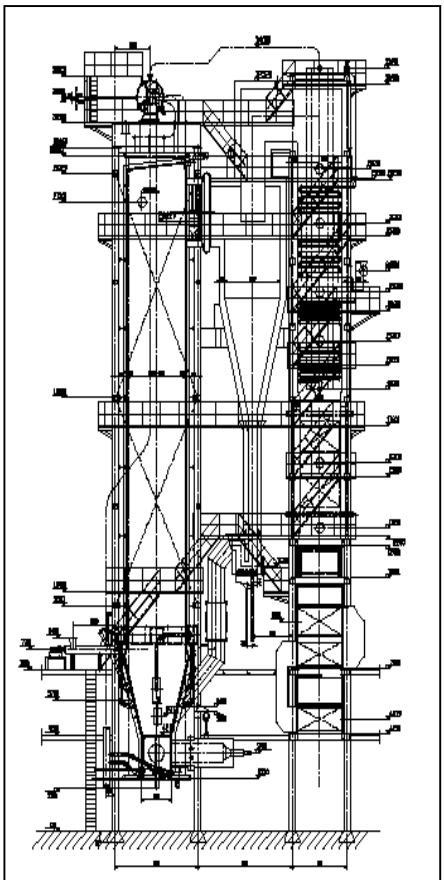
CO-GENERATION PROJECT: Utmost saving can be obtained when you generate electricity by high pressure steam and use extraction steam or exhaust steam for your processing need.

LOW PRESSURE/ BI-DRUM CFBC BOILER

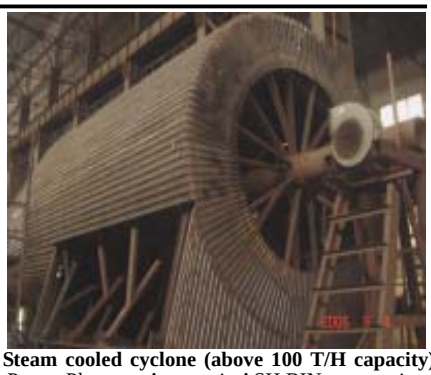
For lower pressure requirement below 25 bar, Bi-Drum design will be used instead of single drum. Hamada Boiler expanded its range of product to the lower pressure CFBC with this design to answer to the need of below 35 ton capacityu







CIRCULATING FLUIDIZED BED (CFBC) 75 TON/H 60 BAR 450 oC for POWER PLANT SPECIFICATION



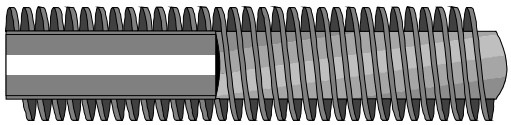
Steam cooled cyclone (above 100 T/H capacity)

Power Plant use Automatic ASH BIN pneumatic pump to collect ash to the fluidizing Ash silo for automatic discharge to the truck.(Totally closed system)

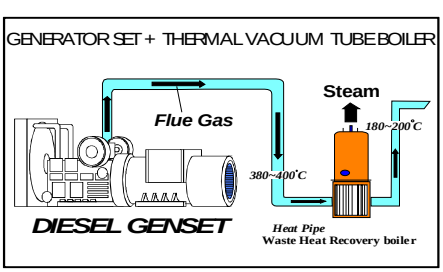
The Latest Heat Pipe Technology

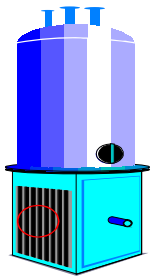
THERMAL VACUUM TUBE WASTE HEAT RECOVERY BOILER

Low Temperature Waste heat Recovery Boiler

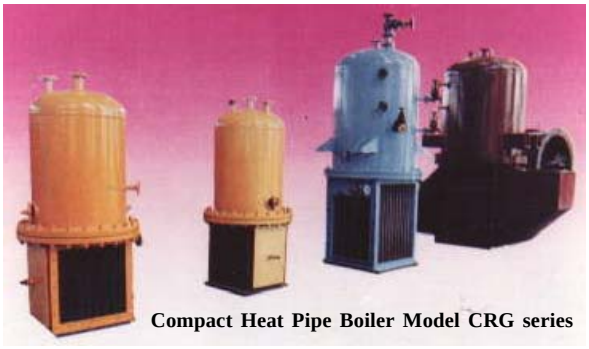


This technology is really a revolutionary for the low temperature flue gas of 200-400 oC. Before, waste heat recovery boiler uses ordinary boiler tube and low temperature flue gas passes through the boiler, thus needing huge area of heating surface for the low temperature gas and causing a serious problem of carbon accumulation inside the boiler that will automatically increase the air resistance which might cause damage to the diesel generator engine. Now, with this new technology, flue gas of low temperature do not go into the boiler, instead, gas will get in touch with only completely sealed straight tubes (finned) with total vacuum inside and filled with special chemical. Under the vacuum condition, even water (H2O) will evaporate at much lower temperature than the evaporation temperature of 100 oC below atmospheric pressure of 1 kg./cm2 (absolute pressure)





Application of Heat Pipe Technology for waste heat recovery of Diesel Powered Generators.
PT. ASAHI CHEMICAL
Indonesia



Compact Heat Pipe Boiler Model CRG series

PLEASE VISIT OUR WEB SITE:
http://www.hamadaboiler.com
FOR MORE DETAIL INFORMAITON, EMAIL TO OUR OFFICE: sales@hamadaboiler.com
Or send your question directly to our Chairman and CEO
Mr. Kazuhiro Hamada (+62 8161674489 roaming)
email: kazuhiro@hamadaboiler.com
MSN: hamadalo88@hotmail.com
Skype Name: hamadalo88

China Main Office
HAMADA BOILRER (CHINA) CO., LIMITED.
Huarong Building 1705, 3880 Jiangnan Road, Hangzhou City
Zhejiang Province, PR China
Tel. (+86 571) 8765-5979 ; 8765-5989 ; 8765-5929 ;8765-5939 Fax. (+86 571) 8765-5969