Jasubhai
ENGINEERING

Energy & Environmental Solutions

Case Studies

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Solutions For Lean Fuels Firing

BLAST FURNACE GAS FIRED SOLUTION
M / s Jindal Steel & Power Angul, Orissa

SUBMERGED ARC FIRING LEAN FUELS
M / s SAIL Chandrapur

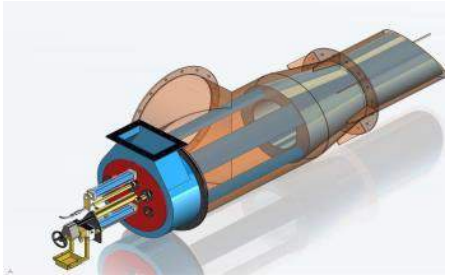
FERRO ALLOY GAS SOLUTION
M/ s Chattisgarh Electricity Ltd.

PRODUCER GAS FIRED SOLUTION WITH HYDROGEN GAS
M/ s DCW Ltd, T.N.

BIO GAS FIRED SOLUTION FOR CO-GENERATION BOILER
M/ s Kaset Thai Sugar, Thailand

Case Studies

Dual Fuel LDO & Blast Furnace Lean Gas Firing



Plant: 4x460 TPH Boiler

Application: Fuel Conversion from LDO to DUAL FUEL LDO & BFG

Customer: Jindal Steel & Power Ltd. - Orissa

Project Detail:

- M/s JSPL has Blast Furnace Gas as byproduct
- JEPL Solution for Co-firing of BF Gas along with Coal for CFBC Boiler (4 x 460 TPH)
- BF Gas as low calorific value of 575 Kcal/kg

Scope:

- BF gas solution for existing boiler
- BF Gas Valve Train
- Fuel control Station
- Combustion Control system for Dual fuel operation

Advantages:

- Over bed inclined firing system
- BF Gas firing for part load operation
- Reduced coal consumption saving INR 75 lakhs /month
- No support fuel required when furnace temp goes above 500 Deg C

Submerged Arc Furnace Lean Gas firing

Gas Control Station

Industry: Metal – Steel

Application: SAF Gas

Customer: SAIL Chandrapur

Plant: 20 TPH Waste Heat Recovery Boiler

Low Cv Fuel: Submerged Arc Furnance Gas (SAF) – 1250 Kcal/Nm3

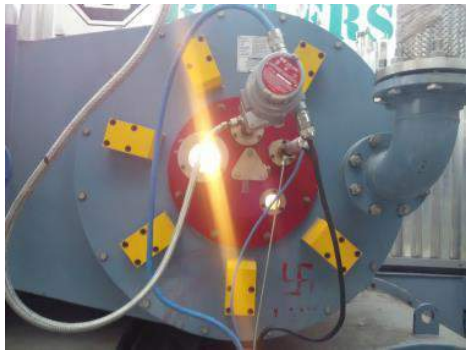
Project Synopsis

- Submerged Arc Furnace Gas firing Solution for Power generation
- Multi fuel firing option *(SAF + HFO)*
- PLC based fuel firing control system with instrumentation and automation

Advantages:

- Dual Fuel firing Solution for 20 TPH WHRB boiler
- 100% heat duty with SAF gas firing
- SAF gas firing without any support fuel after initial start up
- Steam boiler application for power generation

Ferro Alloy Gas (CO Gas) firing



CO Gas Burner

Industry: Metal – Steel

Application: SAF Gas

Customer: SAIL Chandrapur

Plant: 20 TPH Waste Heat Recovery Boiler

Low Cv Fuel: Submerged Arc Furnance Gas (SAF) – 1250 Kcal/Nm3

Project Synopsis

- Lean fuel CO gas to be used for power generation
- Multi fuel firing solution (*Oil + CO*)
- PLC based control system with instrumentation and automation

JEPL Solution Scope :

- Vertical top down firing combustor for CO gas
- Gas pressure booster blower for lean fuel firing
- CO Gas at 400º C to be fired
- Option for alternate fuel firing

Advantages:

- Process by product CO Gas as fuel
- Substitute for fossil fuel
- Fuel cost saving – OPEX advantage
- Low payback period

DCW Ltd., T.N

Multi fuel Fired Burner

Industry: Chemical

Application: Various Process Plants

Plant: OPP Dryer – 4 Plants

UGI Calciner – 2 Plants

UTOX Calciner – 2 Plants

Roaster – 4 Plants

Low Cv Fuel fired: PG – 1200kcal/kg

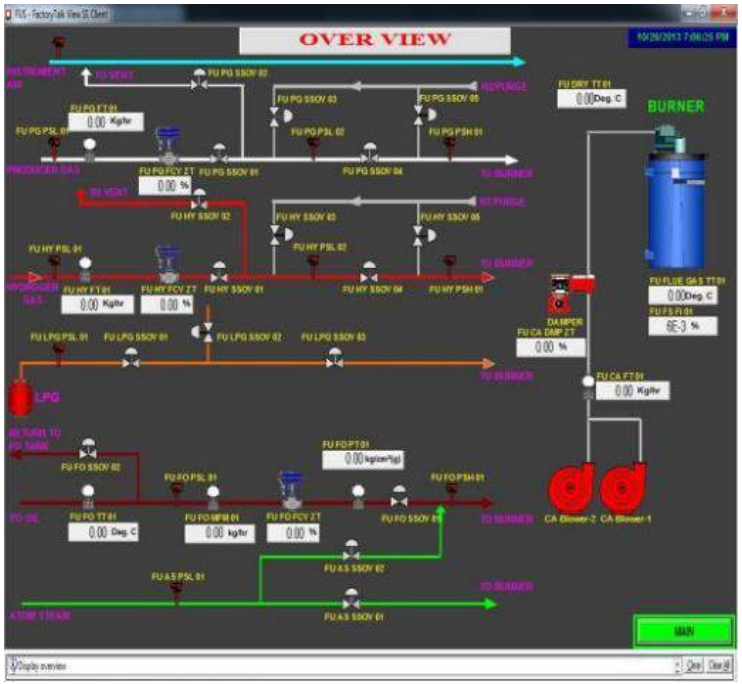
Project Synopsis

- Lean Fuel Firing and Modernization for saving on fuel cost with producer gas
- Multi fuel firing solution
- PLC based control system with instrumentation and automation

Scope:

- To convert FO fired system of various plants to Dual Fuel / Tri fuel fired system
- To use excess H2 Gas available with in the plant
- Producer Gas from coal Gasification plant as low cost of fuel

Producer & Hydrogen Gas Soln For Salt Bath Heater



End User: M / s DCW Ltd.

Application: Salt Bath Heater

Plant – Fusion Plant

Scope:

- Modernization & Retrofit for Optimum Utilization of By – Product
- Tri Fuel Solution – (H_2 + PG + FO)
- Producer & H2 Gas Valve Train
- Oil Valve Train
- BMS – PLC Based – Redundant. & *SCADA*
- Combustion Controls Instruments

Advantages:

- Using low cost fuel – Producer Gas
- Option for H2 gas firing to prevent flaring of excess quantity
- Automation & loop control for combination firing for energy efficiency

Bio Gas Fired solution for Co generation Boiler

Industry: Sugar

Customer: Kaset Thai Sugars, Thailand

Application: Bio Gas Fired solution for Co generation

Boiler: 240 TPH

Biogas CV: 4200 kcal/kg. Qty: 2000 Nm3/hr per burner

Scope

- Biogas fired solution for 240 TPH Bagasse fired Boiler
- Stand alone PLC based automation and Instrumentation system
- Biogas control station for safe operation

Advantages:

- Co firing of Biogas along with Bagasse
- Biogas generated from molasses by product of sugar industry
- Substitution for Bagasse fuel
- Effluent is used as fuel
- Increasing boiler per heater temperature
- Proven technology – many installation

Solutions For Hot Gas Generators

Case Studies

Kilburn Chemicals Ltd., Dahej, Gujarat

Industry : Dye & Pigment

Application : Rotary Dryer for Pigment

Advantages:

- No contamination of suspended particulate matter
- Provision for HFO firing for Low fuel cost
- Ceramic Fiber blanket insulation
- Insulation installed at works
- Design for 1200º C.
- Refractory curing not required
- Less weight
- Reduced life cycle cost

Description	Solution for HGG System
Fuel	HFO / NG
Heat Duty	10 x 10^6 Mkcal/ hr
Hot Gas Temperature	1050 – 1100 º C

Petrovietnam – Vietnam

Description	Solution for Hot Gas Generator System
Fuel	Natural Gas
Heat Duty	7 x 10^6 Mkcal/ hr
Hot Gas Temperature	150 – 600 º C

EPC: Thyssenkrupp Ind. Soln.

Industry: Fertilizer

Application: Rotary Dryer

Scope:

- NG fired HGG
- NG fuel control station
- PLC Based BMS Panel
- CA / DA Fan
- Control Dampers for CA / DA

Advantages:

- Low power consumption
- Maintaining skin temperature < 65º C
- Hazardous for zone II
- Pre-installed ceramic insulation
- Furnace insulation design for 1200º C
- Insulation cladded with SS 310 to prevent wear

Concast Steel & Power, Orissa

Description	Solution for Hot Gas Generator System
Fuel	HSD
Heat Duty	12 x 10^6 Mkcal/ hr
Hot Gas Temperature	850 – 900 º C

Industry : Power CFBC Boiler

Application: Hot Gas Generator for start up of 180 TPH CFBC Boiler

Description :

- For CFBC Boiler the bed material needs to be Heated to 600 – 700 ºC prior to coal induction
- Hot Gas generated is introduced from the bottom of furnace heat up bed material being continuously fluidized
- Crushed coal (8 – 10 mm) is introduced in the furnace

Advantages:

- High temperature hot gas at 850º C is generated
- Design for back pressure of 1800 mmWC
- Hot gas bypass arrangement during coal firing
- Arrangement of HGG hanging with sling support from main structure
- High efficiency due to high pressure atomizing

Case Study for Thermal Oxidizers & Incinerators

STYRENE INCINERATION SYSTEM
M / s IOCL – Panipat, India

PHENOL WASTE INCINERATION
M / s Mai Liao, Taiwan

ACID GAS INCINERATION SYSTEM FOR WSA PLANT
M/ s Conoco Phillips - Ireland

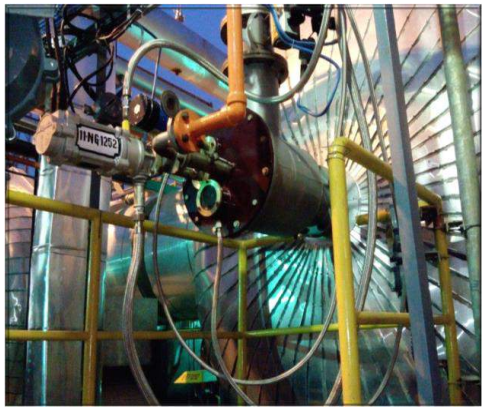
AMINE OFF GAS INCINERATION SOLUTION
M/ s Evonik Industries, China

HALOGENATED WASTE THERMAL OXIDIZER
M/ s Maktheshim Chemical Works, Israel

OFF GAS INCINERATION & SNCR
M/ s Novartis Pharma Technology Co. Ltd. China

AMMUNITION OFF GAS THERMAL OXIDIZER
M/ s CETC, China

Styrene Incineration Solution



Styrene Combustor Incinerator

Industry: Refinery / Petrochemical

Application: Styrene Incineration system

EPC: Toyo India

Customer: IOCL, Panipat

Description:

- Styrene - a bi-product of the crude oil refining process, used for Rubber Production
- Off spec styrene has shelf life, hence is a waste generated on a large scale and needs disposal
- Industry needs to find safe and economic method of disposing this waste styrene which is a critical application

JEPL Solution:

- Natural Gas as start up fuel
- Self sustaining styrene combustion solutions
- Flue gas emission control
- Steam generation by incineration of waste styrene

Solution For Phenol & Tar Incineration

Industry: Petrochemical (Plastic)

Application: Phenol Waste Incineration

EPC: Durr System GmbH

Customer: Mai Liao, Taiwan

Description:

- Liquid waste incineration system
- Incineration of combined phenolic waste from plastic industry & Heat recovery
- Vertical top down firing construction

WASTE A	75 kg/hr.	200cP @ 213 º C
Phenol	0.42 wt.%	
IPP	2.84 wt. %	
Tar	96.19 wt.%	
NaOH	0.54 wt. %	
WASTE B	300 kg/hr.	182cP @ 182 º C
Acetone	0.03 wt. %	
Phenol	49.85 wt. %	
P	35.16 wt.%	
O	7.98 wt. %	
Others	6.97 wt.%	

Acid Gas Incineration System for WSA Plant

Industry: Oil Refinery

Application: SRU Tail Gas Incinerator

EPC: Jacobs Nederland B.V.

Customer: Conoco Phillips - Ireland

Description:

- Conoco Phillips WSA plant a combustions chamber for firing H2S gases (SWS and H2S gas).
- Downstream equipment waste heat boiler for steam generation.

Capacity	8 MW	
Operating Temp.	975ºC	
Combustion Chamber Dim.	Ø 1.5 x 6.0m	
Fuel Consumption	Natural Gas	300 Nm3/hr.
	SWS Gas	115 Nm3/hr.
	Acid Gas	300 Nm
Capacity	8 MW	
Operating Temp.	975ºC	
Combustion Chamber Dim.	Ø 1.5 x 6.0m	
Fuel Consumption	Natural Gas	300 Nm3/hr.
	SWS Gas	115 Nm3/hr.

Amine Off Gas Incineration Solution

Industry: Gas Processing

Application: Amine Off Gas Incinerator

EPC: Envirotec GmbH.

Customer: Evonik Industries, China

Description:

- Off gases with NH3 and HCN
- Liquid waste with nitrogenous hydrocarbons
- Heat duty capacity 13.5 MW
- Liquid and gaseous waste incineration system

Capacity	13.5 MW	
Operating Temp.	1,100 ºC	
Combustion Air	38,500 Nm3/hr	
Fuel Consumption	Line A (Liquid)	80 – 420 Kg/hr.
	Line B (Liquid)	40 – 270 kg/hr.
	Line C (Liquid)	1,200 kg/hr.
	Line D (Gas)	200 – 810 Nm3/hr
	Line E (Gas)	1,000 – 4,000 Nm3/hr
	Natural Gas	125 – 1,350 Nm3/hr
Capacity	13.5 MW	
Operating Temp.	1,100 ºC	

Halogenated Waste Thermal Oxidizer

Industry: Chemical

Application: Halogenated Waste Thermal Oxidizer

EPC: CTU - Conzepte Technik Umwelt AG Customer: Maktheshim Chemical Works, Israel

Description:

- Chemical industry process waste
- Hazardous Waste comprising of chlorinated hydrocarbons, organics and solvents
- Vertical top down firing incinerator with a central multi fuel burner and additional liquid waste lances.
- Control systems

Capacity	14.0 MW	
Operating Temp.	Max 1,200 ºCCTU – Conzepte Technik Umwelt AG	
Combustion Chamber Dim.	Ø 3.4 x 13.5 m	
Combustion Air	Case 2 Case 1	8,500 – 15,000 $Nm^3/hr.$ 0 – 10,000 $Nm^3/hr.$
Fuel Consumption	LPG	40 – 400 $Nm^3/hr.$
	Natural Gas	110 – 1,100 $Nm^3/hr.$
	Heavy Fuel Oil No. 6	350 – 1300kg/hr.
	Off Gas	10 – 60 kg/hr.
	Waste Liq. No. A1	100 – 500 kg/hr.
	Waste Liq. No. B1	20 – 80 kg/hr.
	Waste Liq. No. B2	20-105 kg/hr.

Off Gas Incineration & SNCR

Industry: Pharmaceutical

Application: Off Gas Incineration & SNCR

Customer: Novartis Pharma Technology Co. Ltd. China

Description:

- Thermal Oxidizer Plant for pharmaceutical process waste
- Process Off gas Incineration
- Selective non catalytic reduction (SNCR) with ammonia injection
- NOx control and emission monitoring

Capacity	6.0 MW	
Operating Temp.	750 – 1,200 ºC	
Combustion Chamber Dim.	Ø 1.7 x L_1 = 4.3m. L_2 = 7.16 m	
Ammonia Water	1 l/h / 20% for SNCR	
Fuel Consumption	Off Gas 1	1,000 – 7,500 Nm^3/hr. without H_2
	Off Gas 2	0 -100 Nm^3/hr. with H_2
	Natural Gas	90 -600 Nm^3/hr.
	Quench air	18,000 Nm^3/hr.
Capacity	6.0 MW	
Operating Temp.	750 – 1,200 ºC	
Combustion Chamber Dim.	Ø 1.7 x L_1 = 4.3m. L_2 = 7.16 m	

Refinery Waste Gas Incineration

Industry: Refinery

Application: Waste Gas Incineration

EPC: Selas Linde AG

Customer: Shell Pernis, Netherlands

Description:

- Off Gases from gasification of heavy residue from thermal cracking process for hydrogen gas generation
- Sour gas from recti sol treating of Syngas for Sulphur and CO2 removal
- Sulphur and CO2 removal from downstream of CO – Shift
- Off gases from the first stage contains absorbed hydrogen gas
- Hydrogen rich off gases from catalytic reformer

Capacity	7 MW	
Combustion Air	9,000 Nm^3/hr.	
Control Range	1:10 for Natural Gas	
Fuel Consumption	Gaseous Fuels	600 Kg/hr.
	Waste Gas	1,650 kg/hr.

Ammunition Off Gas Thermal Oxidizer

Industry: Ammunition

Application: Ammunition Destruction Off Gas THO

EPC: Dynasafe Germany GmbH

Customer: CETC, China

Description:

- Off gas resulting from the pyrolysis process in the SDC (Static Detonation Chamber)
- The THO accepts off gases resulting from one feed cycle in a period of max. 180 sec.
- The oxidizer is de-signed to be oversized to handle peak flow and is able to take twice the anticipated flow.
- The THO has a residence time of three seconds or more at 1.100°C.
- Off gas is fed tangentially using a four lance system to ensure complete treatment of the contaminated gases.

Capacity	400kW	
Operating Temp.	1,100 ºC	
Combustion Air	850 $Nm^3/hr.$	
Control Range	1:10 for Natural Gas	
	Natural Gas	40 $Nm^3/hr.$

Solution For Phenol & Tar Incineration

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Application: Phenol Waste Incineration

EPC: Durr System GmbH

Customer: Mai Liao, Taiwan

Description:

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Customer: Conoco Phillips – Ireland

Description:

- Conoco Phillips WSA plant a combustions chamber for firing H2S gases (SWS and H2S gas).
- Downstream equipment waste heat boiler for steam generation.

BURNER CAPACITY	8 MW	
OPERATING TEMPERATURE	975°C	
COMBUSTION CHAMBER DIM.	Ø 1,5 x 6,0 m	
COMBUSTION AIR	6.200 Nm³/h	
FUEL CONSUMPTION	Natural gas	100 Nm³/h
	SWS gas	115 Nm³/h
	Acid gas	300 Nm³/h

Case Study for Sulphur Combustion

VISCOSE – SULPHURIC ACID PLANT – WSA
M/s Lenzing – PT. South Pacific Viscose, Indonesia

MANGANESE SULPHATE – SULPHURIC ACID PLANT – WSA
M/s Rio Seco, Peru

PULP & PAPER – SO2 PRODUCTION PLANT
M/s M Real Hallein, AG, Austria

VISCOSE – SULPHURIC ACID PLANT
M/s South Pacific Viscose Ltd., Indonesia

SPENT ACID REGENERATION
M/s BASF AG, Ludwigshafen, Germany

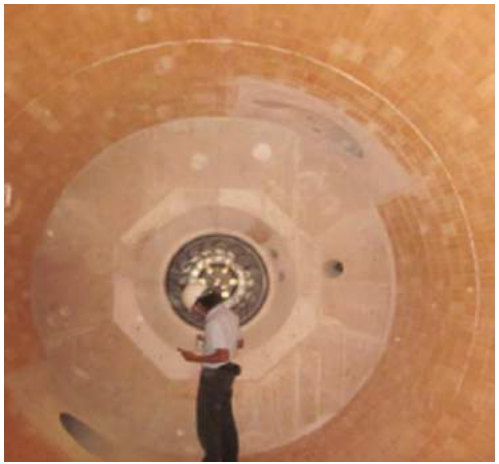
SPENT ACID
M/s Dead Sea Bromine, Israel

SULPHURIC ACID RECOVERY – WSA
M/s Ningbo Haiyue New Materials, China

SPENT ACID RECOVERY
M/s Evonic, Germany

SPENT ACID RECOVERY
M/s Petrochemia Blachownia S.A., Poland

Viscose Staple Fiber - SAP



Industry: Viscose Staple Fiber

Application: Sulphuric Acid Plant -WSA

EPC: Lenzing-PT. South Pacific Viscose

Customer: Lenzing-PT. South Pacific Viscose, Indonesia

Description:

- For a new WSA plant combined system for different media with 27.8 MW
- Natural gas or Diesel as start up fuel
- Adjustable lances for Sulphur injection
- High excess air for optimum SO2 generation

Capacity	27.8 MW	
Operating Temp.	850ºC	
Combustion Air	88000 Nm3/hr. (Pri. + Sec.)	
Combustion Chamber Dim.	Ø 3.3 m x 12.5 m	
Fuel Consumption	Natural Gas	300 – 2970 Nm3/ hr.
	Rich Gas	175 – 600 Nm3 / hr.
	Sulfur	870 – 2970 Kg / hr.
	Diesel Oil	230 – 1753 Kg / hr.
Capacity	27.8 MW	
Operating Temp.	850ºC	
Combustion Air	88000 Nm3/hr. (Pri. + Sec.)	

Manganese Sulphate Leaching - SAP

Industry: Manganese Sulphate Leaching process

Application: Sulphuric Acid Plant - WSA

Customer: Rio Seco, Peru

Description:

- Co-firing of H2S Gas and liquid sulphur
- WSA Process for Sulphuric Acid plant in Rio Seco Peru
- Acid gas is injected by a gas ring with four separate adjustable gas lances
- Liquid Sulfur is added through a centrally mounted ultrasonic
- Low Pressure steam atomization Natural gas fired through a gas sleeve tube around Sulfur lance
- The combustion air stream divided into two air layers
- First layer directly to the burner housing and the secondary stream is tangentially fed to } combustion chamber
- Operation of the system with high air excess

Capacity	3 MW	
Operating Temp.	1,000ºC	
Combustion Chamber Dim.	Ø 2.1 x 6.9 m	
Combustion Air	10,800 kg/hr.	
Fuel Consumption	Fuel Gas	140 Kg/hr.
	H2S Gas	340 – 1,400 kg/hr.
	Liq. Sulfur	150 – 850 kg/hr.
Capacity	3 MW	
Operating Temp.	1,000ºC	
Combustion Chamber Dim.	Ø 2.1 x 6.9 m	
Combustion Air	10,800 kg/hr.	

Pulp & Paper - SO2 Gas

Industry: Pulp & Paper

Application: SO2 Production Plant

Customer: M Real Hallein, AG, Austria

Description:

- Revamping of SO2 Production Plant
- horizontal combustion chamber placed in existing building
- Natural gas and sulfur firing solution
- Combustion chamber temperature of 1.500 °C
- SO2 - content in the flue gas is higher than 19%

Capacity	2.9 MW	
Operating Temp.	1500 – 1600 ºC	
Combustion Chamber Dim.	Ø 1.86 m x 6.4 m	
Fuel Consumption	Natural Gas	50 – 200 Nm3/hr.
	Sulfur	200 – 750 Kg/hr.

Viscose Staple Fibre- SAP

Industry: Viscose Staple Fibre

Application: Sulphuric Acid Plant

Customer: South Pacific Viscose Ltd., Indonesia

Description:

- Sulfuric acid production plant for South Pacific Viscose Ltd.
- Horizontal combustion sulfur and H2S gas firing
- For heating up procedure diesel fuel / HFO
- In the downstream installed WSA process equipments
- The sulfur dioxide, from the combustion of sulfur and H2S gas, is converted into sulfuric acid

Capacity	25 MW	
Operating Temp.	900 – 950 ºC	
Combustion Air.	37,000 Nm3/hr. Lean gas /start up operation with ambient air	
Fuel Consumption	Diesel / HFO	Start up
	Fuel Gas (H2S)	350 – 1000 Nm3/hr.

Petro-Chemical – Spent acid regeneration

Industry: Petro-Chemical (Polyurethane)

Application: Spent Acid Regeneration

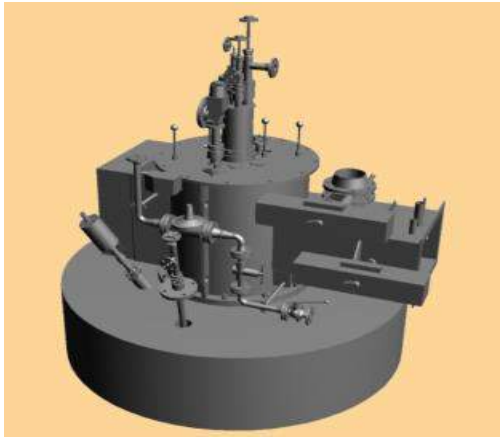
EPC: CTU – Concepte Technik Umwelt, AG Customer : BASF AG, Ludwigshafen, Germany

Description:

- For MDI and TDI Production
- In a vertical combustion chamber spent acid is combusted
- For start-up operation and additional heating the burner is equipped with a natural gas lance and is also possible to operate the burner with waste liquid fuels as visbreaker tar and EDA residue
- The spent acid is fed via four lances into the combustor
- In the centre of the lances is a multi fuel burner - top down mounted
- For enrichment the SO2, additional liquid sulfur is fired

Capacity	33 MW	
Operating Temp.	1050ºC	
Comb. Chamber Dim.	Ø 3.1 m	
Combustion Air	Pre Heated @ 250 º C	
Fuel Consumption	Natural Gas	80 – 1000 Nm3/hr.
	Spent Acid	15950 Kg/hr
	Sulphur	4460 Kg/hr
	Visbreaker Tar	200 – 1600 Kg/hr
	EDA Residue	200- 1300 Kg/hr
	High Boiling residues	200 – 1600 Kg/hr

Chemical (Elemental Bromine)- Spent Acid Recovery



Industry: Chemical (Elemental Bromine)

Application: Spent Acid

EPC: CTU – Concepte Technik Umwelt AG

Customer: Dead Sea Bromine, Israel

Description:

- Hazardous Waste Heat recovery Plant for liquid and gaseous waste fuels (with Bromine, Sulfuric Acid, halogenated Hydrocarbons and Waste Water)
- The waste fluids fired in a vertical incinerator with a central multifuel burner mounted in a top down orientation
- Solution for Spent acid recovery along with Incineration of Halogenated waste & other process waste

Capacity	6 MW	
Operating Temp.	1200 – 1300 ºC	
Combustion Chamber Dim.	Ø 2.6 x 9.4 m	
Combustion Air	Vent Gas 6000 – 10000 kg/hr. *(Halogenated CxHy* & *Organics)*	
Fuel Consumption	Natural Gas	66 – 330 Kg/hr.
	Melt Residues	470 – 1400 kg/hr *(50wt % Bromine)*
	Spent Acid	900 Kg/hr
	Liquid Waste	50 – 300 kg/hr
Capacity	6 MW	
Operating Temp.	1200 – 1300 ºC	
Combustion Chamber Dim.	Ø 2.6 x 9.4 m	

Refinery - Spent Acid Recovery

Industry: Refinery (Propylene)

Application: Sulphuric Acid Recovery - WSA

EPC: Haldor Topsoe AS

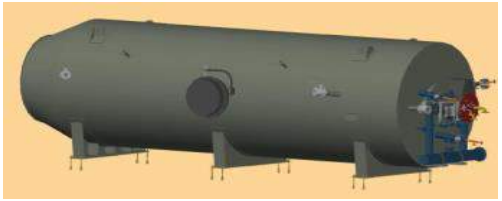
Customer: Ningbo Haiyue New Materials, China

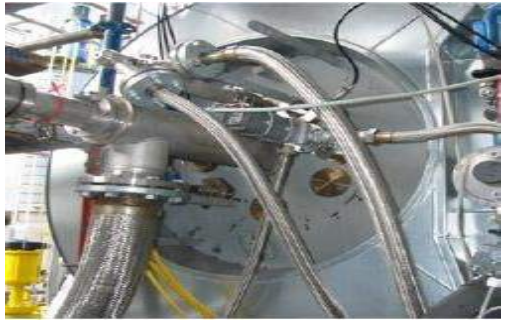
Description:

- MTBE phase out needs alkylation of propylene
- Strong sulphuric acid is used as catalyst for reaction of propylene/butylene & amylene with Isobutane to get branched paraffin alkylate.
- Alkylates used as oxylate instead of MTBE.
- These alkylate have high Octane & very low sulphur.
- Alkylates are used as blendstock for clean burning fuel.
- MTBE is water soluble & difficult to detect contamination in ground water & also is toxic

Capacity	3.7 MW	
Operating Temp.	975ºC	
Combustion Chamber Dim.	Ø 2.65 x 9.0m	
Combustion Air	11000 kg/hr	
Fuel Consumption	Natural Gas	45 – 400 kg/hr.
	Spent Acid	400 – 4610 kg/hr.

Specialty Chemical – Spent Acid Recovery





Industry: Specialty Chemical

Application: Spent Acid Recovery

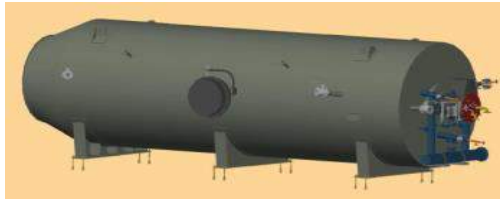
Customer: Evonic, Marl, Germany

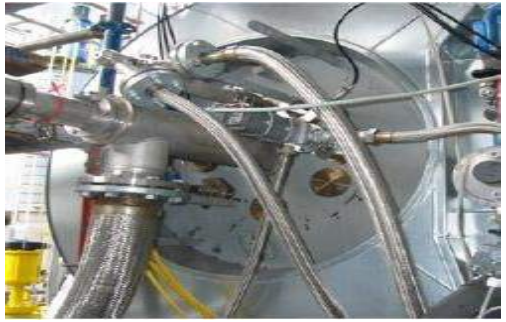
Description:

- The spent acid decomposition plant was revamped
- The combustion plant consists of a horizontal combustion chamber with a front side located multi fuel burner for heating gas, sulfur and Oxo oil
- 3 separate lances are provided for 6.1 t/h spent acid firing
- Gas sleeve tubes provided for firing H2S gas
- In the combustion chamber the spent acid and the sulfur are thermally converted into SO2 gas
- In the downstream sulfuric acid is recovered

Capacity	11.2 MW	
Operating Temp.	1050 ºC	
Combustion Chamber Dim.	Ø 2.5 x 8.0m	
Combustion Air Temp.	400 º C	
Fuel Consumption	Fuel Gas	970 Nm3/hr.
	H2S Gas	1300 Nm3/hr.

Petro-chemicals - Spent Acid Recovery





Industry: Specialty Chemical

Application: Spent Acid Recovery

Customer: Evonic, Marl, Germany

Description:

- Chemical Synthesis (Benzene / Toulene)
- MDI & TDI production for polyurethane Industry
- Toulene – di – isocynite manufacturing process
- Coke oven gas and natural gas as support fuel
- Spent acid of varying composition and quantities.
- Pump station for liquid sulphur and spent acid
- Combustion chamber
- Waste heat recovery boiler

Capacity	11.2 MW	
Operating Temp.	1050 ºC	
Combustion Chamber Dim.	Ø 2.5 x 8.0m	
Combustion Air Temp.	400 º C	
Fuel Consumption	Fuel Gas	970 Nm3/hr
	H2S Gas	1300 Nm3/hr.

Case Study for Fuel Conversion

FUEL CONVERSION – TO TRI FUEL SYSTEM HFO + H2+ BUTANE
M/s Cetex Petrochemicals, Manali, Chennai

SULPHURIC ACID PLANT FROM HFO TO NG FIRED
M/s FACT, Cochin, Kerala

HYDROGEN GAS FIRED SOLUTION
M/s Atul Ltd. Gujarat

MULTI FUEL FIRED SYSTEM HSD + LPG
M/s IOCL, Kandla, Gujarat.

NG GAS FIRED SOLUTION FOR 58 TPH BOILER
M/s ONGC, Hazira, Gujarat

FUEL CONVERSION FROM HSD TO HFO
M/s BALCO, Chhattisgarh

FUEL CONVERSION FROM HSD TO HFO
M/s Rayalseema Alkalies & Allied Chemicals

Fuel Conversion HFO + H2 Gas + Butane

Plant: 1 x 5 TPH Boiler

Application: Boiler For Steam Generation

Customer: M/s Cetex Petrochemicals, Manali, Chennai

Project Detail:

- To provide solution for Hydrogen gas fired
- Low cost fuel firing option
- Modernization and automation

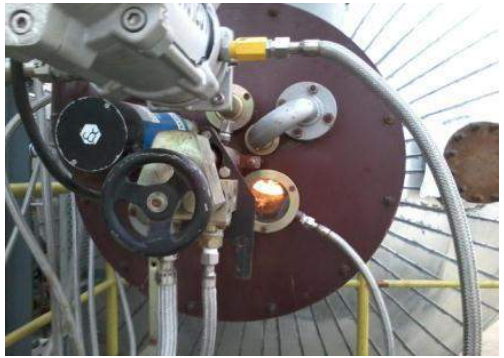
Scope :

- Tri Fuel Fired Burner
- Oil Valve Train
- H2 Gas Valve Train
- Automation and Instrumentation
- PLC based Burner Management System

Advantages :

- Multi Fuel Firing Solution
- Utilizing excess H2 gas available
- Step less modulation
- Co-firing of different fuel with control
- Safety and reliability

Fuel Conversion From HFO To NG Firing



Plant: Sulphuric Acid Plant

Application: Start up system for Sulphur Combustor Furnace

Customer: FACT, Cochin & Udyogmandal, Kerala

Project Detail:

- Existing Pant: HFO as start up fuel
- The Sulphuric acid plant is based on the sulphur combustion process to generate SO2 Gas
- JEPL Provide the fuel conversion of the sulphur combustor from HFO to NG
- To meet the criterial of NG fuel as feed stock for availing subsidy

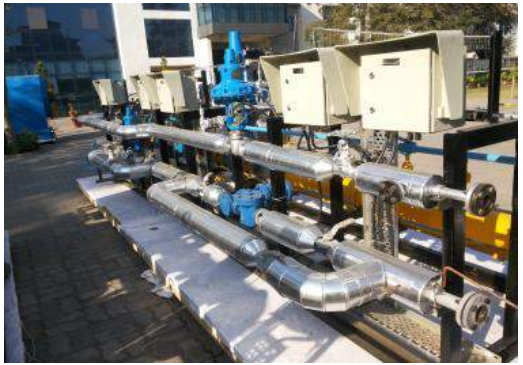
Scope :

- NG fuel firing system
- Redundant PLC Based BMS Panel
- Fuel control station fro safe start-up and shut down
- Instrumentation and automation for continuous modulation
- Suitable for Hazardous area Zone II

Advantages :

- To avail Govt. Subsidy NG fuel to be used
- Natural Gas price is less compared to HFO less emissions due to clean gas fuel
- Reliable operation of plant with safety

Fuel Conversion for H2 Gas Co-Firing



Plant : 1 x 50 TPH AFBC Boiler

Application: Co Firing of excess H2 Gas

Customer: M/s Atul Ltd., Valsad, Gujarat

Project Detail:

- Existing Pant : HFO as start up fuel
- The Sulphuric acid plant is based on the sulphur combustion process to generate SO2 Gas
- JEPL Provide the fuel conversion of the sulphur combustor from HFO to NG
- To meet the criterial of NG fuel as feed stock for availing subsidy

Scope :

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- Safety and reliability

LPG Gas Fired Solution For Fuel Conversion

Plant : LPG Import Terminal

Plant: 2 x 14 TPH Boiler

Application: Fuel Conversion from LDO to Dual Fuel LDO & LPG

Customer: M/s IOCL, Kandla, Gujarat

Project Detail:

- M/s IOCL operating LPG for only part load of boiler
- Complete plant damaged due to storm
- Customer planned to operate the boiler on full load of 14 TPH
- Complete reconditioning and modernization of fuel firing system

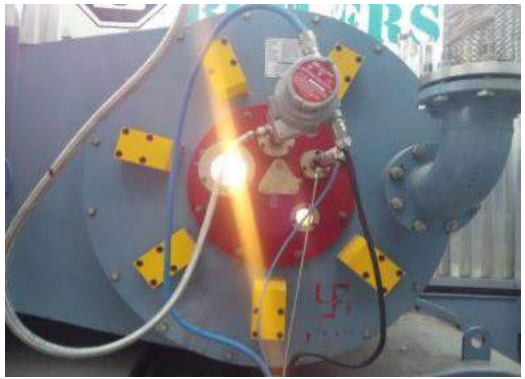
Scope :

- Modernization and retrofit for existing boiler
- Dual Fuel (LPG + LDO) Burner System
- LDO Pumping & Filtering Unit
- LPG Gas Valve Train
- PLC based Combustion Control system for Dual fuel operation with SIL 3

Advantages :

- Full load operation with LPG as main fuel
- External sourcing of fuel not required
- Establish plant for continuous operation
- Minimum modification of the existing plant
- Increase the capacity of the plant for regasification of liquefied gas

LPG Gas Fired Solution for Fuel Conversion



Plant : 1 x 58 TPH Boiler

Application: NG Fired Solution

Customer: M/s ONGC, Hazira, Gujarat

Project Detail:

- Complete turnkey solution for NG firing in 58 TPH boiler
- Air to fuel ratio trim from O2 for efficiency
- Continuous emission monitoring for SOx, NOx & SPM
- Damper and VFD control from BMS

Scope :

- NG fired burner heat duty – 2 x 18 Mkcal/hr
- NG fuel control station.
- Nitrogen purge panel.
- PLC based BMS panel – SIL 2
- Hazardous zone II
- VFD control drive
- Combustion air fan
- Emission monitoring system

Advantages :

- Meet stringent Environment Norms for NOx Emission
- Continuous monitoring of SOx, NOx & SPM
- SIL2 compliant Burner Management System
- Dual Point control of air to fuel for high efficiency
- Air Damper loop control along with VFD control for O2 trim
- Complete turnkey solution for 58 TPH boiler.

NG Fired Solution For Boiler

Plant : 4 x 63.5 MW (250 TPH) Boiler

Application: Captive Power Plant

Customer: M/s BALCO, Korba, Chattisgarh

Project Detail:

- Fuel Conversion to accommodate dual fuel firing for PC fired power boiler
- Refurbishing and automation of fuel firing system
- Custom design to suit on main burner installation
- Oil gun Lance can be removed during the boiler operation

Scope :

- Retrofit and modernization of existing system supplied along with Boiler by Chinese OEM
- Conversion of fuel firing system from HFO fired to dual fuel fired (HFO + LDO)
- PC fired power boiler need support fuel firing during initial start-up and also for part load
- Replacing the existing HFO firing system by Dual fuel fired
- Indigenous availability of spares & support
- LDO fuel pumping & filtering system
- MCC Panel
- Fuel firing capacity of 6000 kg/hr.
- Interconnecting piping & instrumentation
- Power and instrument cables
- Implementation of logic in client DCS

Advantages :

- Option for firing HFO + LDO fuels
- Avoid change of oil gun for different fuel
- System can be directly started with HFO fuel
- Constant pressure atomizing media – 5-6 bar
- Air / Steam atomizing system
- Customizing with minimum modification of the existing unit
- No detachment of flexible hoses for oil gun lance removal from the burner

Fuel Conversion from HSD to HFO

Plant : 1 x 80 MW (300 TPH) Boiler

Application: Fuel Conversion from HSD to HFO

Customer: Rayalseema Alkalies & Allied Chemicals, A.P.

Project Detail:

- M/s JSPL has supplied HSD fired start up system for 80 MW pulverized coal fired boiler
- Addition of HFO firing with minimum modification
- Reduced fuel cost and OPEX saving

Scope

- Fuel Pumping and heating system for HFO
- Interconnecting piping with Heat tracing
- Fuel control station for HFO firing

Advantages :

- Fuel conversion from HSD to HFO
- Using the existing oil gun supplied for HSD firing
- Solution with HFO fuel conditioning system
- Saving on fuel cost of HSD with HFO
- HFO firing for up to 60% of Boiler load
- Boiler can be operated on HFO fuel even when the coal is not available due to Mill shut down and other reason

Case Studies for Rotary Kiln Applications

DUAL FUEL (HFO+PC) KILN BURNER FOR PELLET PLANT
M/s Arya Iron & Steel Company, Odisha

TRI-FUEL (HFO+PC+PG) KILN BURNER FOR PELLET PLANT
M/s Shyam SEL & Power, Jamuria

TRI-FUEL (HFO+PC+PG) KILN BURNER FOR PELLET PLANT
M/s MSP Steel & Power Ltd, Raigarh

Dual Fuel Kiln Burner System

Application: Rotary Kiln – Iron Ore Pellet Plant

Customer: M/s. Arya Iron & Steel, Odisha

Plant Capacity: 0.6 MTPA

Fuel: HFO + Pulverised Coal

Project Synopsis:

- Higher fuel firing rate
- Combination firing
- Specially designed passage for coal firing

Advantages :

- 100% firing on pulverised coal eliminates the support fuel firing
- Reliable operation
- Minimum downtime for maintenance

Tri-Fuel Kiln Burner System

Application: Rotary Kiln – Iron Ore Pellet Plant

Customer: M/s. Arya Iron & Steel, Odisha

Plant Capacity: 0.6 MTPA

Fuel: HFO + Pulverised Coal

Project Synopsis:

- Lean fuel gas to be used for pellet production
- Multi fuel firing solution (Oil + PC + PG)
- Maximum coal/PG firing with minimum support firing provision

Scope:

- Tri-Fuel Kiln Burner
- HFO pumping, heating & filtering unit
- HFO Valve Train
- PLC based control system with instrumentation and automation

Advantages :

- 100% coal firing without support fuel
- More than 90% PG firing with min. support fuel
- Combination firing options
- Fully Automated operation ensures less manpower supervision and improve plant efficiency

Tri-Fuel Kiln Burner System

Application: Rotary Kiln – Iron Ore Pellet Plant

Customer: M/s. MSP Steel & Power , Raigarh

Plant Capacity: 0.6 MTPA & 0.3 MTPA

Fuel: HFO + Pulverised Coal + Producer Gas

Project Synopsis:

- 100% Coal firing without support firing
- Maximum PG firing with min. support fuel
- Minimize plant/equipment downtime
- OPEX savings

Scope:

- Tri-Fuel Kiln Burner (Retrofit)
- Engineering support for coal feeding & handling system
- Special design for 100% coal firing without support fuel

Advantages :

- 100% coal firing without support fuel
- More than 90% PG firing with min. support fuel
- Combination firing options
- Ensuring equipment availability

Case Study for Biogas Application

BIO-GAS BURNER PACKAGE FOR POWER BOILER
M/s Kaset Thai Bio Power, Thailand

BIO-GAS SYSTEM FOR UTILITY BOILER
M/s Dhampur Sugar Mills, Bijnor (U.P)

HOT GAS GENERATOR SYSTEM FOR DRYING
M/s Gayathri Sugars, Andhra Pradesh

CO-FIRING SYSTEM FOR COGEN POWER PLANT
M/s United Spirits Ltd, Rosa (H.P)

HOT GAS GENERATOR SYSTEM FOR DRYING
Bio-Gas System for Process Boiler

Co-Firing System for Power Generation

Customer: Kaset Thai Bio Power Ltd, Thailand

Plant : 240 TPH Cogen Power Plant

Application: Co-Firing of Bio-Gas with Bagasse, Cane Chips & Coal

Project Synopsis:

- M/s KTBP has bio digester and bio-gas as by-product
- JEPL Solution for Co-firing of bio-gas along with solid fuels in same boiler
- Fuel savings project with bio-gas utilisation

Scope:

- Complete Burner Assembly with Auto Ignition & Flame Monitoring System
- Bio-Gas Fuel Handling & Control Station
- Combustion Control system for burner operation

Advantages :

- Utilisation of waste bio-gas for co-firing in the boiler
- Equivalent saving of main solid fuel firing
- Higher return of investments
- Trouble free operation and minimum supervision of man power

Bio-Gas System for Utility Boiler

Application: Bio-Gas firing in Utility Boiler

Customer: Dhampur Sugar Mills, Bijnor

Plant : 10 TPH Boiler

Project Synopsis:

- Bio-Gas firing Solution for steam regeneration
- Fuel Valve Train & Controls
- PLC based fuel firing control system with instrumentation and automation

Advantages :

- Complete usage of available bio-gas for steam generation
- No additional fuel requirement
- Good ROI
- Complete Automation reduces man power supervision

Bio-Gas fired Hot Gas Generator System

Customer: Gayathri Sugars Ltd

Application: Hot Air Drier

Fuel: Bio-Gas

Project Synopsis:

- Bio-Gas firing for hot gas generation
- Minimise OPEX
- Fully Automated system

Scope:

- Horizontal firing combustor for bio-gas
- Complete fuel handling & control station
- PLC based BMS system

Advantages :

- Process by product as fuel
- Substitute for fossil fuel
- Fuel cost saving – OPEX advantage
- Attractive payback period

Co-Firing Solution for Cogen Plant

Customer: United Spirits Ltd, Rosa (H.P)

Application: Power Generation

Plant: Cogen

Fuel: Bio-Gas (Co-fired with Bagasse, Slop Oil & Coal)

Project Synopsis:

- Co-Firing and Modernization for saving on fuel cost with Bio-Gas
- OPEX Savings
- Complete Automation

Scope:

- Utilisation of Bio-Gas for steam generation assistance
- Co-firing with solid fuels in same boiler
- Corresponding fuel handling & controls
- Fully automatic burner management system for process based operation control

Bio-Gas System for Process Boiler

Application: Bio-Gas firing in Process Boiler

Customer: M/s. Kothari Sugars, Trichy

Plant: 6 TPH Boiler

Project Synopsis:

- Bio-Gas firing Solution for steam generation
- Dual fuel firing option (Bio-Gas+HFO)
- Continuous Duty

Scope:

- 100% heat duty with bio-gas firing
- Dedicated fuel handling & control system
- Fully automatic control depends on steam demand