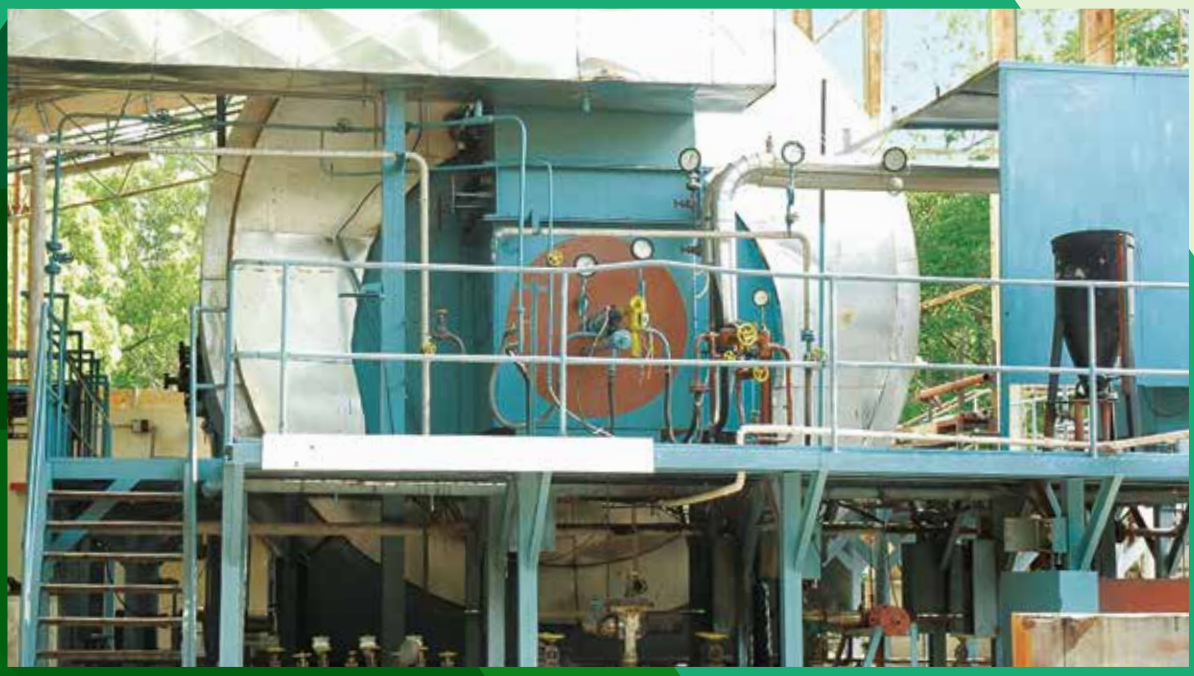
METHANOL FIRED BOILERS

CLEANER BOILERS GREENER FUTURE



Methanol Test Firing Facility

Burner

Methanol is a clean & environment friendly, novel fuel, considered as a potential alternative for decarbonizing the energy sector.

When compared to coal fired boilers, approximately 35% of CO_2 can be reduced by switching to methanol, being single carbon compound. Emissions like NOx will be reduced by about 8 to 10% and SOx will be reduced by 100%.

Methanol can be used as fuel in boilers

- 100% Methanol fired boilers for both Industrial and Utility sectors.
- Co-firing in existing boilers by retrofitting firing system
- To replace LDO as start-up fuel by retrofitting firing system in existing boilers

Methanol Flame– view from Side port

Pilot scale test firing of 100% methanol

Test fired 100% methanol in pilot scale test facility at HPBP, Trichy developed an indigenous technology for complete methanol firing system solutions including handling, pumping, burners, scanners, ignitors etc.

Major achievements from pilot scale testing

- Establishment of pressurizing methanol for pumping and atomizing.
- Testing of Ignitors
- Testing of flame scanners under various conditions
- In-house developed high performance atomizers
- Methanol firing solutions are ready for deployment in boilers

Methanol Firing Solutions / Products

1 Retrofitting of Existing Boilers

Methanol Co-firing in Boilers

Minor Modifications:
70 to 120 MW generation with methanol as co-firing fuel in 500 MW to 800 MW coal fired boilers

- Existing fuel pipes & oil guns
- Modification of Flame scanning system
- Addition of Methanol storage and forwarding station.

Major Modifications:
250 to 340 MW generation with methanol as co-firing fuel in 500 MW to 800 MW coal fired boilers

- Replacing Fuel oil piping
- Windbox and burner modification
- Modification of Flame scanning system
- Addition of Methanol storage and forwarding station.

100% Methanol firing in existing Boilers:

- Retrofitting of existing oil/ gas fired utility/ industrial boilers with 100% methanol firing system
- Retrofitting the existing coal fired boilers with 100% methanol firing system

2 100% Methanol Fired New Boilers

100% methanol fired boilers

100% methanol fired boilers of following capacity range can be offered

- **Industrial Boilers:** 40 – 450 TPH of steam
- **Subcritical Boilers:** 30 – 600 MW
- **Supercritical Boilers:** 350 – 1000 MW

Advantages of 100% methanol fired boilers

- Lower capital cost as lesser footprint & chimney height and coal & ash handling system, ESP & FGD are not required
- Less maintenance cost as no erosion
- Lesser emissions

Conventional LDO Flame

100% Methanol Flame

Methanol Vs Coal

S. No.	Parameter	Unit	Coal	Methanol	Coal	Methanol
1	Rating	MW	**500**		**800**	
2	Fuel Flow	TPH	321	217	463	313
3	Boiler Efficiency	%	86.5	83.0	86.5	83.0
4	CO_2	kg/MW-Hr	919	597	827	537
5	CO_2 Reduction	%	Base	35.1%	Base	35.1%
6	NOx	g/MW-hr	1021	931	919	838
7	NOx Reduction	%	Base	8.8%	Base	8.8%
8	SOx	g/kW-hr	67	0	87	0

Advantages of Methanol as Fuel for Boiler

- Reduction in CO_2 up to 35%, due to lower carbon footprint.
- A minimum reduction of 8.8% in NOx emissions.
- Zero SOx emission

Methanol Vs LDO as Start-up Fuel

S. No.	Parameter	LDO	Methanol
1	Cost, Rs. per Kg	70*	**32**
2	GCV, Kcal/Kg	10000	5400
3	Density, Kg/Lt	0.85	0.79
4	Fuel at 30% BMCR load, Tonne per Hour	40	75
5	Fuel Cost at 30% BMCR load, Lakh	28	22.4
6	Fuel Consumption as startup fuel, Tonne per cold/warm/hot start	65/36/16	120/68/30
7	Tentative Saving with Methanol as startup fuel considering 2000 starts (25 years of life)	Base	Rs. 52.0 Crores

*Varies from Rs. 70 to 90 per Kg

Advantages of Methanol as fuel for Start-up:

- Cost Saving
- Reduction in CO_2 emissions

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