

THERMACT BIO SP

Introduction

World over, usage of biomass fuels is gaining importance for electricity generation, due to its local availability and competitive cost advantage. Biomass-fired plants are environment friendly & helps in reducing global warming as they use renewable resources & reduce the dependence on fossil fuel based electricity generation.

When biomass is fired in boilers, large amount of heat is lost due to its high moisture content, leading to incomplete combustion. The presence of alkaline metals in these fuels gives rise to formation of slag & clinkers which reduces the Boiler Efficiency.

What is THERMACT – BIOsp?

THERMACT - BIOsp, is a multifunctional combustion improver for biomass fuels, developed in association with IIT, Bombay. It contains proprietary combustion catalyst, which helps in complete combustion and enhances the Boiler Efficiency. It is totally non-hazardous, environment friendly and safe to use in any type of Biomass-fired boilers.

THERMACT – BIOsp, is being successfully used by many biomass-fired boilers in different parts of the world helping them in reducing biomass consumption as well as improving the Boiler Efficiency.



Technology of THERMACT - BIOsp

When THERMACT – BIOsp is added in a combustion chamber, it moves through the grid of biomass. The catalyst in THERMACT – BIOsp lowers the activation energy needed for dissociation of moisture in biomass. Hence, the moisture breaks into Hydrogen and unpaired Oxygen at elevated temperature. They Hydrogen combines with carbon in biomass forming (CH) gases. These gases on burning gives more heat due to which, biomass feed rate can be reduced.

The unpaired oxygen formed by dissociation of moisture aids the combustion due to which the operating air level is reduced. The unpaired oxygen further helps in complete combustion of biomass leading to reduction in Unburnt, Clinker, Slag and soot from Super Heater Zone. The improved steam quality leads to enhanced generation.

In nut shell, THERMACT – BIOsp reduces the heat losses by moisture in biomass and converts it into useful combustion products. This leads to improvement in Boiler Efficiency.

Effect of THERMACT – BIOsp on Inherent Moisture in biomass for improving Boiler Efficiency.



Advantage:

- Reduction in VFD, ID power
- Reduction in Dry Flue gas losses
- Increase in Boiler Efficiency
- Saving in Biomass

EVALUATION PROCEDURE

A Pre-trial (without THERMACT - BIOSP) is conducted for a period of 5-7 days in which, performance evaluation parameters are noted. A Post-trial (with THERMACT – BIOsp) is conducted for a period of 15-21 days in which, the same parameters are noted and compared.

The improvement in Boiler Efficiency is calculated as

$$\% \text{Improvement} = \frac{\text{Boiler Efficiency (Post)} - \text{Boiler Efficiency (Pre)}}{\text{Boiler Efficiency (Pre)}} \times 100$$

1% improvement in the Boiler Efficiency is equal to about 1.25% reduction in Biomass consumption.

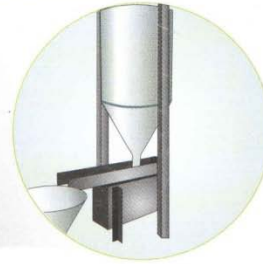
BENEFITS OF THERMACT - BIOSP

- 1) Increase in Boiler Efficiency.
- 2) Reduction in biomass consumption by 2% - 4%
- 3) Reduction in Fireside scale deposits.
- 4) Reduces Fluctuation in Steam Parameters
- 5) Extended Plant Operating cycles.
- 6) Reduction in Excess Air requirement.
- 7) Reduction in Stack emissions..
- 8) Reduction in Unburnts in Fly & Bottom Ash
- 9) Reduction in operational problems




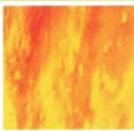
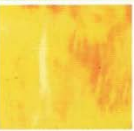
DOSING OF THERMACT - BIOsp

THERMACT – BIOsp is added directly into the Biomass Feeder.

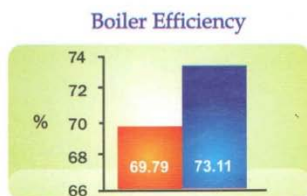
THERMACT-BIO_{SP} is added directly into the Biomass Feeder



Dosage:
1 kg of THERMACT-BIO_{SP}
for 10 Tons of Biomass

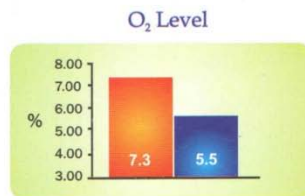
Without THERMACT-BIO _{SP}	With THERMACT-BIO _{SP}
<p>Fly Ash is blackish in color indicating presence of unburnt Carbon</p> 	<p>Fly ash is grayish in color indicating reduction in unburnt Carbon</p> 
UNBURNTS IN FLY ASH	
<p>Heavy & hard Clinker</p> 	<p>Soft & reduced amount of Clinker</p> 
CLINKER DEPOSITS IN BOILER	
<p>Flame color is blackish indicating lower flame temperature & incomplete combustion.</p> 	<p>Color of flame is bright and orange/yellow indicating higher flame temperature and more complete combustion.</p> 
FLAME PROPAGATION	

EFFECTS OF THERMACT - BIOsp



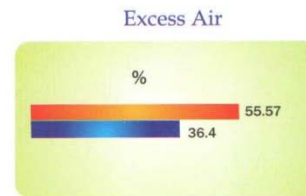
THERMACT-BIO_{SP} improves Boiler Combustion Efficiency.

Without THERMACT-BIO_{SP}



Reduced O₂ and increased CO₂ confirm improved Combustion.

With THERMACT-BIO_{SP}



Reduction in Excess Air leads to reduced ID, FD & SA Fan Power consumption. Considerable reduction in Excess Air reduces Heat Loss and Stack Temperature.

THERMACT – BIO sp is currently being used by number of prestigious Biomass Power Plants, both in India & abroad. In today's era of competition and continued escalation in input cost, THERMACT –

BIOsp, a multifunctional combustion improver additive is the best tool for Biomass based power plants to improve the Boiler Efficiency and to enhance Profitability.