

Recent developments in low NO_x burner technology

D Lancaster, M Young

Hamworthy Combustion

Fleets Corner, Poole, Dorset BH17 0LA

Recent developments in low NO_x burner technology in practical applications presented by David Lancaster and Mark Young, Hamworthy Combustion.

Introduction

There are several approaches to Minimising NO_x Emissions. NO_x reduction concepts include Fuel Staging, Air Staging, Fuel and Air Staging, Flue Gas Recirculation and Water / Steam Injection.

This presentation focuses on practical applications of;

Air staged – internal FGR burners for ethylene crackers

and

Fuel staged burners for water & fire tube boilers.

Theory

Air staged burners operate by limiting the amount of air available to the fuel throughout different mixing zones.

Fuel staged burners operate by controlling the amount of fuel in various parts of the flame envelope.

Some noted effects of both techniques are decreased peak flame temperatures, decreased residence time in high temperature zones and lower NO_x emissions.

Experimental

Hamworthy's R&D capabilities are world-leading. Through our Advanced Technology Centre at Poole, we provide customers with one of the best combustion test facilities in the world.

NO_x reduction concepts are thoroughly tested against specific design requirements culminating in proven and cost effective burner solutions.

Results

Ultra low NO_x performance utilising air and fuel staging techniques resulting in higher burn efficiencies, assured legislative compliance and absolute safety.

Conclusions

References

Lancaster D, Young M, Recent developments in low NO_x burner technology presentation