

## **Furnaces Excess Oxygen Optimization**

### **Abstract**

Considering furnaces as major energy consumer in olefin plant due to nature of endothermic reaction process; team conducted combustion survey using portable "Testo" analyzer with extended probe to measure excess oxygen, CO and NOx at different location of firebox aiming to optimize excess oxygen and ensuring individual burner performance is maintained to reduce stack temperature and fuel gas consumption for same furnace feed load and conversion.

Furnace overall efficiency enhanced without capital investment, only soft change by properly optimizing excess oxygen that reduce stack temperature, reduce furnaces fuel gas consumption and reduce impact on environment

Team successfully reduce excess oxygen in three Lummus propane furnaces at stack from 3.0% to 2.0% and three ethane Lummus furnaces reduction from 2.5% to 2.0%. By doing so, estimated energy saving in six furnaces is more than 300,000 GJ/year, fuel gas of 5196.58 ton/year. That is equivalent to ~ 405.33 KUS/Year.