

Micro-management of Furnaces Significantly Enhances the Runlength of Pyrolysis Furnaces

- Nihar Gulwadi, Project Development, Ingenero

- Jim Brigman, Executive VP - Projects, Ingenero

The furnaces are critical equipment in the production of Ethylene and the fuel consumption by the furnaces is one of the most significant costs of production. The fouling (coking) of the furnaces leads to outages for decoking which directly result in loss of production and cost for decoking. Micromanagement & deviation analysis of the furnaces and control of the firing pattern leads to uniform coking in the furnace resulting in increased runlength.

Case Study:

The average runlength of a furnace making ethylene from ethane feedstock in a particular ethylene complex was ~50 days. Increase in runlength was desired to increase production by reducing downtime & reducing the annual cost of production. Increase in furnace runlength would also decrease the utility consumption and lower the thermal air pollution.

Micro management of furnaces was done to increase the furnace runlength. Deviation analysis of the CPR, TMT & PTLE outlet temperatures of each individual coil of the furnace gave an excellent insight in the operations of the pyrolysis furnaces.

Close monitoring of the furnace parameters, Feed trims, COT Trims, and judicious burner management, done regularly, facilitated uniform heat flux in the furnace and eventually longer runlength without affecting the yields.

As a result of the monitoring and constant optimization,

- The runlength of the furnaces increased by 40%
- Production of the unit increased by 1055 tpa (Ethylene equivalent).
- Increased furnace coil life
- Better asset reliability due to reduction in decoke cycle
- Judicious burner management will also reduce hot-spots on the coil
- Burner management also ensures complete combustion, which in turn means lower fuel gas consumption.