

MAXOFIN™ Technology

KEEPING PACE WITH RISING DEMAND FOR PROPYLENE

Refineries and petrochemical plants that maximize light olefins are finding it difficult to keep pace with the increasing demand for propylene.

Historically, steam crackers have satisfied this demand through co-product propylene, but now supply is lagging demand. As more steam crackers use ethane feedstock and produce little propylene, there is an increasing need for processes that produce large quantities of propylene with less ethylene co-product.

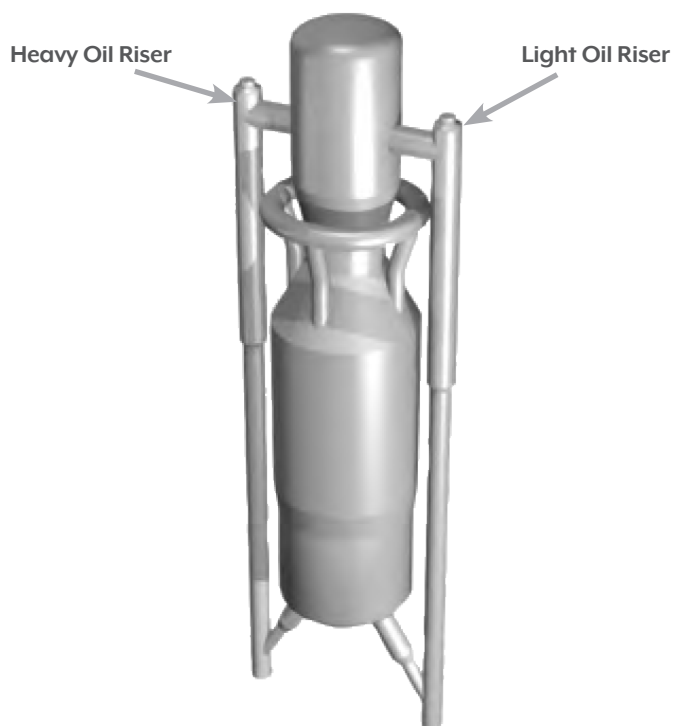
The MAXOFIN™ FCC process offered by KBR fills this niche and helps refiners stay competitive by combining KBR's proven OrthoFlow™ FCC hardware with a proprietary additive. This combined technology maximizes propylene production from conventional FCC feedstocks while producing much less ethylene than would result from traditional steam cracking.

ENHANCED FLEXIBILITY

Refiners today require a technology that can respond to market demands. KBR's MAXOFIN is an engineering process and service that can produce 20 wt% or more propylene from FCC feedstocks, yet still maintain the flexibility to produce fuels when market demand shifts. When the margin between propylene and fuels is low, the MAXOFIN FCC can operate as a conventional FCC to produce mostly gasoline, and when the demand of propylene is relatively high, the process can maximize propylene at the expense of gasoline.

If markets require distillate and propylene, our MAXOFIN FCC process allows refiners to run the primary riser at low

conversion to preserve the distillate yield. Light naphtha and C_4 s formed in the primary riser can be recycled at more severe conditions in the second riser to maximize conversion of these components to propylene. Besides processing FCC recycle streams, the high severity second riser can also accept naphthas and C_4 s from elsewhere in the refinery complex, such as coker naphtha and C_4 s. Paraffinic naphthas, such as light straight run, can receive an upgrade in the MAXOFIN unit to increase octane of the straight run naphtha while adding to the unit's propylene yield.



MAXOFIN combines OrthoFlow hardware with a proprietary additive and a secondary riser.

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ECONOMIC FACTORS TO CONSIDER

While naphtha yield is limited in the high severity propylene operating mode, octane and BTX content of the MAXOFIN FCC naphtha product is improved greatly relative to that from a conventional FCC unit. In addition to the BTX, refiners can economically recover ethylene produced by the MAXOFIN FCC process for use as high-value petrochemical feedstock. The process also allows refiners to upgrade lower-valued naphtha streams that do not fit into more lucrative product blends produced by the refinery.

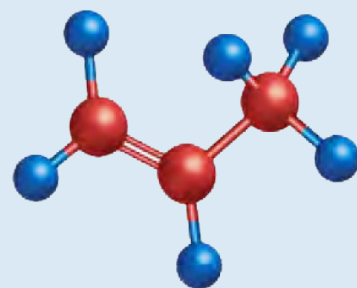
BOOST PRODUCT VALUE NOW

Maximizing high-value propylene and other petrochemicals from FCC operations will only occur with an on-purpose technology. With KBR's MAXOFIN FCC, refiners can achieve greater propylene yield while maintaining product flexibility to remain competitive in changing markets.

REVAMP EXISTING FCC TO MAXOFIN

MAXOFIN presents a great opportunity for a refiner to move to Refinery-Petrochemical Integration by revamping their existing FCC to MAXOFIN. The philosophy of using independent reaction sections for heavy and light feedstocks, and its ability to operate in conventional FCC process conditions makes this technology a great fit for revamp applications.

MAXOFIN FCC can produce 20 wt% or more propylene, yet is flexible enough to operate as a conventional FCC to produce mostly gasoline



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