

Overview

Chevron Lummus Global* offers ISOCRACKING hydrocracking technology to efficiently convert heavy feedstocks into high quality middle distillates and lube oil basestocks. The technology incorporates new design techniques that significantly reduce plant investment and operating costs.

More than 100 ISOCRACKING units have been designed since 1962, with a total feed capacity exceeding 2.5 million BPSD. The process uses a family of unique catalyst systems to maximize middle distillate or naphtha yields, depending on client requirements. The process offers the following benefits over competitive hydroprocessing processes: lower capital investment, higher derived

product yields, better cold flow properties, and better control of polynuclear aromatic formation.

The ISOCRACKING technology is customized to meet specific client needs and has been integrated in many complex refining installations. It is used in most commercial installations producing lube oil base stock. Reactor configuration, catalyst type and operating conditions can be optimized for each feedstock and derived product slate.

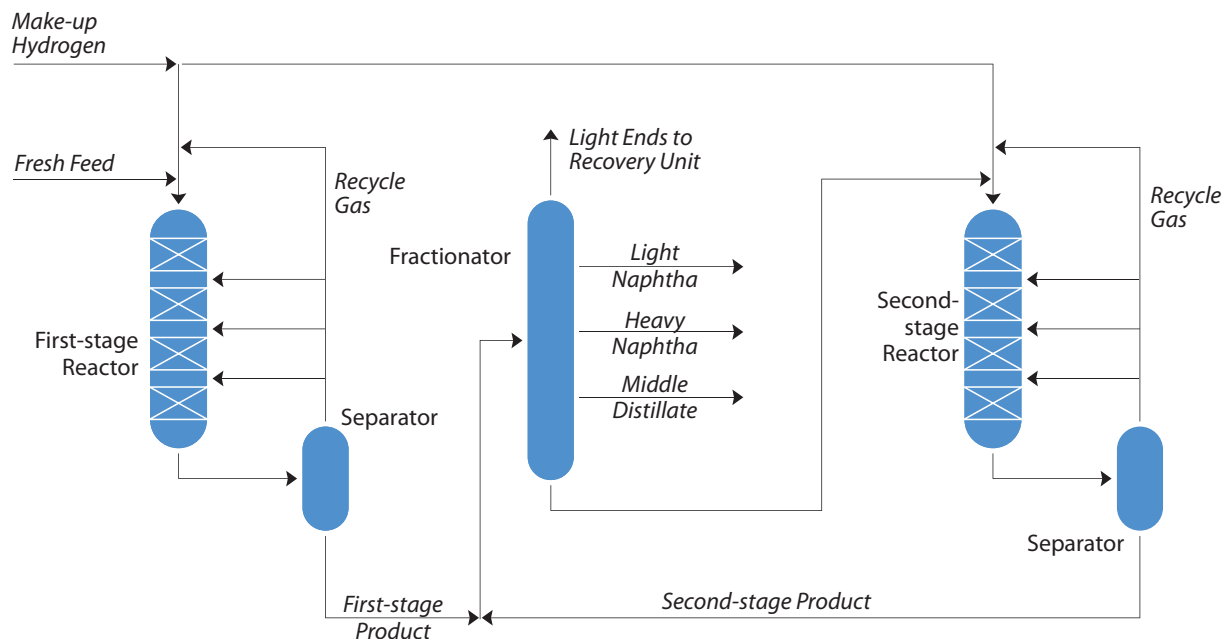
Chevron's experience in operating and maintaining more high pressure hydroprocessing capacity in the U.S. than any other refiner, has been teamed with Lummus' recognized expertise for bringing the best in processing technology to operating companies.

**Chevron Lummus Global, a joint venture between Chevron U.S.A. Inc., a wholly owned subsidiary of Chevron Corporation, and Lummus Technology, a CB&I company,*

Advantages

Process Features	Process Benefits
Produces diesel fuels with very high cetane number and low pour point	Can be blended with poorer quality streams and still meet refiner's diesel pool cetane specs
Produces kerosenes with low freeze points and high smoke points	Results in optimum fuel combustion characteristics
Produces hydrogen-rich heavy products	Excellent feedstock for downstream processing (e.g., FCC, ethylene or lube oil), providing better yields and product properties in these units
Unique catalyst systems result in maximum yield of middle distillate products and lube oil base stocks	Optimum catalyst selection will produce about 5% more higher-value distillate product yield than competing hydrocracking technologies
Minimizes formation of polynuclear aromatic (PNA) compounds in the reaction system	Achieves high unit on-stream factor by avoiding deposit of solids on process equipment.
Catalysts with superior stability result in long catalyst cycle length and ultimate life	Low catalyst replacement costs • Permits design of lower pressure hydrocrackers with lower investment cost
Extensive family of amorphous and zeolitic catalysts available for any application	Selection of optimum reactor/catalyst configuration gives refiners greater flexibility in processing a wide range of feedstocks from different crudes

Process Flow Diagram



Process Description

The hydrocracker is a high-pressure, moderate temperature conversion unit. ISOCRACKING hydrocracker designs include single-stage once through, single-stage recycle, and two-stage recycle processes. A two-stage hydrocracker with intermediate distillation represents the most common process configuration for maximizing middle distillates.

The vacuum gas oil is sent to the first stage of the hydrocracker and is severely hydrotreated. Most of the sulfur and nitrogen compounds are removed from the oil and many of the aromatics are saturated. In addition, significant conversion to light products occurs in the first stage.

The liquid product from the first stage is sent to a common fractionation section. To prevent overcracking, lighter products are removed by distillation. The unconverted oil from the bottom of the fractionator is routed to the second stage reactor section.

The second reaction stage saturates almost all of the aromatics and cracks the oil feed to light products. Due to the aromatics saturation, the second stage produces excellent quality products. The liquid product from the second stage is then sent to the common fractionator where light products are distilled. The second stage operates in a recycle to extinction mode with per pass conversions ranging from 50 to 80%.

The overhead liquid and vapor from the hydrocracker fractionator is further processed in a light ends recovery unit where fuel gas and liquefied petroleum gas (LPG) and naphtha are separated. The hydrogen supplied to the reactor sections of the hydrocracker comes from reformers or steam-reformers. The hydrogen is compressed in stages until it reaches system pressure of the reactor sections.