

# Hydrocracking technology

RESEARCH | TECHNOLOGY | CATALYSTS



## Flexible hydrocracking solutions

In a world with tight product specifications and increasingly difficult feedstocks to process, it is important that process designs are optimal with minimum efficiency losses.

With hydrocracking solutions from Topsøe, refiners will benefit from our flexible approach to hydrocracking process design, allowing us to find the optimum solution in accordance with our clients' needs.

Together with our clients, we help define process objectives, design requirements and product specifications. Topsøe's process design can be tailor-made to fit any plant configuration, offering solutions for excellent plant efficiency.

Topsøe supplies integrated solutions including grading material, catalysts, licensed process design and detailed reactor engineering. Our supply of catalysts and technology offers clients a single point of expertise and responsibility.

## Clients' needs

Based on fundamental research Topsøe has developed a portfolio of hydrocracking catalysts, licensed processes and technologies for the conversion of heavier feedstocks into lighter and more valuable products.

Topsøe assists clients in all aspects of hydrocracking technology, including

- revamp of an existing unit
- design of a grassroots hydrocracking unit
- catalyst supply and replacement
- reactor internals supply and replacement

## Topsøe's hydrocracking processes

Topsøe's hydrocracking experience and catalyst portfolio are instrumental in the license and optimisation of hydrocracker units with respect to yield structure, product properties, throughput and on-stream efficiency, resulting in improved refinery margins.

Topsøe's hydrocracking catalysts and licensed technology may be used for a variety of applications, including:

### Full conversion hydrocracking

Topsøe's single stage and two stage hydrocracking technology and catalysts are especially suited for operations requiring high conversion. The technology and catalyst can be optimised to provide maximum middle distillate yields such as diesel and jet fuels.

### Mild hydrocracking

Topsøe's mild hydrocracking technology and catalysts enable a medium conversion of heavier feedstocks to lighter and more valuable products. The Topsøe mild hydrocracking technology portfolio includes Staged Partial Conversion and back-end shift.

### Staged Partial Conversion

Staged Partial Conversion is an FCC pretreatment technology designed to produce low sulphur FCC feed to allow ULSG production without gasoline post-treatment while co-producing high quality EN 590 diesel.

### Back-end shift

Topsøe's back-end shift technology significantly reduces the distillation temperature by selective hydrocracking of the heavy hydrocarbons present in the back-end distillation, thus achieving high diesel yields and moderate hydrogen consumption.

## Catalyst

Topsøe's insight into catalyst nanostructures has led to the development of a portfolio of high-activity, high-selectivity hydrocracking catalysts, which in combination with a fundamental understanding of the kinetics enable us to provide our clients with solutions and designs to meet any product specifications.

Topsøe's hydrocracker feed pretreatment BRIM™ catalyst is an integral part of Topsøe's hydrocracking processes.

## Advising our clients

The key to optimal plant designs is the dialogue with our clients, ensuring that we meet their requirements and product specifications. Therefore we make it a priority to understand the needs of our clients. Process studies and pilot plant testing are an integral part of advising our clients.

### Pilot testing facilities

In the design of new hydrocracking units, Topsøe's research and test facilities offer clients pilot plant testing opportunities allowing for detailed feedstock and process analyses, which form the basis of tailor-made solutions.

### Engineering design packages

Topsøe's engineering design packages are very flexible in their scope of supply ranging from basic packages to full engineering design packages.

The scope of supply is defined together with the client to fit the project requirements.

### Refining experience

With more than 25 years in the refining industry and more than 100 licensed units within hydroprocessing and graded bed solutions used in well over 1,500 applications, Topsøe has valuable experience allowing for optimal tailor-made designs.