

The highest yields of high quality, low cloud point diesel

Energy lives here™

ExxonMobil's MIDW™ process provides the highest yields of low cloud point diesel. The process uses a proprietary catalyst that converts waxy paraffins to higher performance molecules, as compared with older technologies that relied on cracking. This results in a much higher diesel yield, particularly for deep reductions in cloud point.

Key benefits

Higher performance

- Better low temperature properties
- Increased unit flexibility

Higher yields

- Paraffins are isomerized instead of cracked

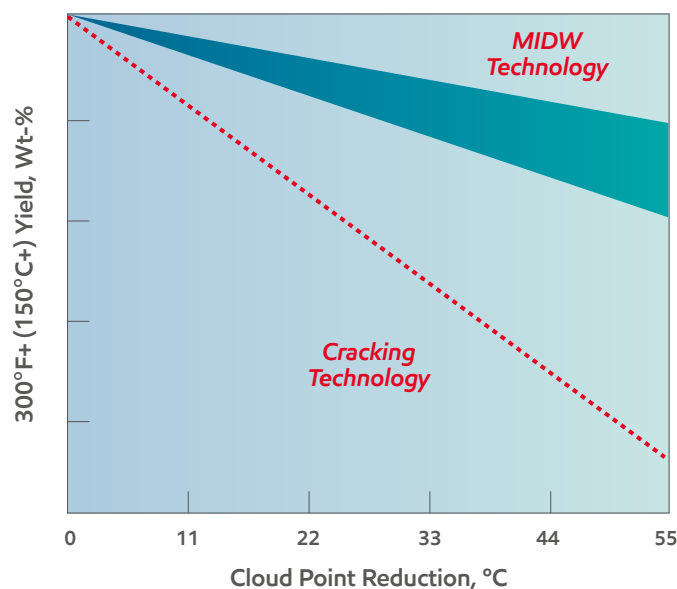
Lower operating costs

- Higher capacities
- Flexible process configurations
- Lower reactor temperatures

Growing commercial deployment

Currently, over 10 MIDW units are operating around the world, with more than five under design. While many MIDW units are located in colder climates (Russia, North America, Northern Europe), where there is a clear need for winter diesel, there are units in the Middle East, India, and Singapore that produce Euro V diesel for export. The ability to retrofit an existing unit with MIDW technology to capture significant value makes this one of the most sought-after fuels technologies in the world today.

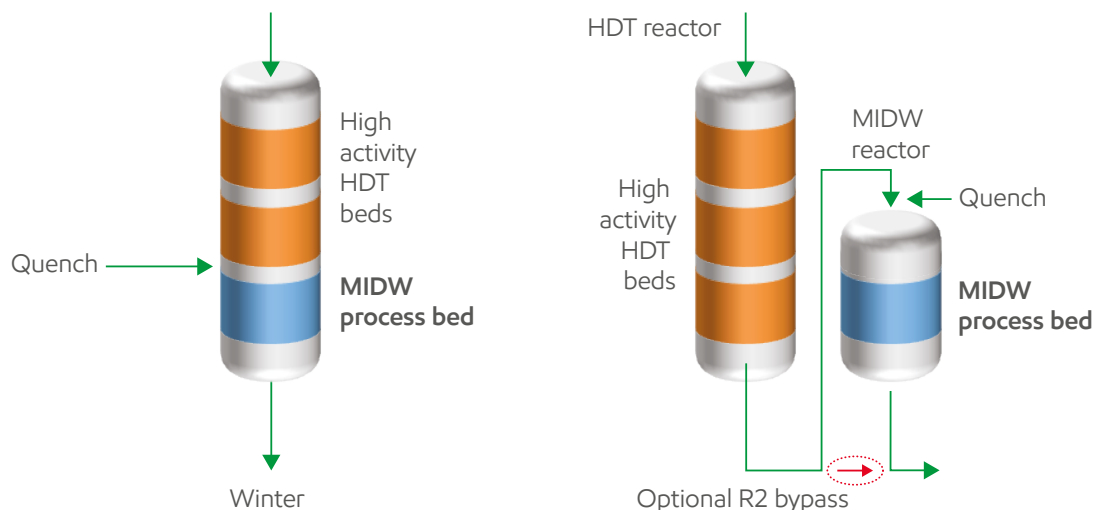
Typical yield and cloud point reduction tradeoff



Flexible, adaptable applications

- Very low pressure sweet operation with MIDW catalyst allows value extraction in an underutilized hydrotreating unit
- Trim dewaxing using MIDW catalyst drop-in allows winter diesel production (for a few months); then conversion back to summer production by simply quenching the MIDW catalysts to lower its activity
- Introduction of MIDW catalyst for processing very high sulfur feeds
- Drop-in dewaxing operations for sour service
- Integration with complementary technologies to make clean, high quality diesel.

Example processing schemes



Continuous innovation

The success of MIDW technology is based on continuous innovation at ExxonMobil. New materials and processes generated by ExxonMobil catalyst and process technology groups are then further refined and rigorously tested for commercial applicability by process engineering, which also provides the technical support for unit commissioning. The MIDW catalyst has undergone several improvements since its first deployment, with the most recent one the introduction of a base metal MIDW catalyst designed especially for sour environments. The comparison with hydrotreating only and a cracking dewaxing type process is shown on first page — the use of the MIDW catalyst provides the best combination of cloud point reduction and yield retention.

MIDW™ services include:

- Initial non-confidential consultations
- Development of licensing proposal
- Basic engineering package, including basic design specification and operating guide
- Engineering support during front-end engineering design and engineering, procurement and construction stages
- Technology transfer, training, catalyst loading and start-up support

About Technology Licensing & Catalysts

ExxonMobil licenses both downstream and chemical technologies and offers proprietary catalysts for fuels, lubricants, plastics and other chemicals. The company's extensive experience can help to provide technology solutions that contribute to cost reduction, environmental compliance, reliability, plant automation, and other areas.

ExxonMobil

Energy lives here™



Please contact us at:
www.catalysts-licensing.com

L0116-015E49

©2016 ExxonMobil. ExxonMobil, the ExxonMobil logo, the interlocking "X" device and other product or service names used herein are trademarks of ExxonMobil, unless indicated otherwise. This document may not be distributed, displayed, copied or altered without ExxonMobil's prior written authorization. To the extent ExxonMobil authorizes distributing, displaying and/or copying of this document, the user may do so only if the document is unaltered and complete, including all of its headers, footers, disclaimers and other information. You may not copy this document to or reproduce it in whole or in part on a website. ExxonMobil does not guarantee the typical (or other) values. Any data included herein is based upon analysis of representative samples and not the actual product shipped. The information in this document relates only to the named product or materials when not in combination with any other product or materials. We based the information on data believed to be reliable on the date compiled, but we do not represent, warrant, or otherwise guarantee, expressly or impliedly, the merchantability, fitness for a particular purpose, freedom from patent infringement, suitability, accuracy, reliability, or completeness of this information or the products, materials or processes described. The user is solely responsible for all determinations regarding any use of material or product and any process in its territories of interest. We expressly disclaim liability for any loss, damage or injury directly or indirectly suffered or incurred as a result of or related to anyone using or relying on any of the information in this document. This document is not an endorsement of any non-ExxonMobil product or process, and we expressly disclaim any contrary implication. The terms "we," "our," "ExxonMobil Chemical" and "ExxonMobil" are each used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliate either directly or indirectly stewarded.