

Media Release

Clariant's MegaMax[®] 800 catalyst: Impressive start at CNOOC methanol plant in China

- **Superior Methanol synthesis catalyst, MegaMax 800, boosts production in first 24 hours of start-up**
- **Increases methanol yield and carbon efficiency with reduced synthesis gas consumption at lower temperatures**
- **Is demonstrated to perform across range of methanol process technology platforms**

Munich, September 20, 2018 – Clariant, a world leader in specialty chemicals, today announced the successful start-up of its MegaMax 800 methanol synthesis catalyst at China National Offshore Oil Corporation's (CNOOC) China BlueChemical methanol plant in Hainan province.

CNOOC is China's largest offshore oil and gas producer, and its China BlueChemical subsidiary is a large-scale operation unit specialized in methanol-based chemical products and mineral fertilizers such as urea, phosphates and compound fertilizers. The Hainan site's "Phase 2" methanol production plant as CNOOC Kingboard Chemical Ltd, which has been operating since 2010, has an annual capacity of 800 kilotons, and runs on DAVY™ methanol process technology. Clariant's MegaMax 800 was recently installed at the "Phase 2" facility and commissioned on June 28, 2018.

With this catalyst, all key performance indicators were significantly improved compared to the facility's previous catalyst start-up. Within the first 24 hours, the plant produced around 25 tons (1%) more methanol at 2% less make-up gas feed than in earlier performance runs. The increase in yield is largely due to the catalyst's improved temperature distribution within the catalyst beds, as demonstrated by lower inlet and hotspot temperatures. Moreover, the steam drum can now be operated at significantly lower pressure while providing higher conversion per catalyst volume. Other improvements include lower operating loop pressure and slightly higher steam production.

Stefan Heuser, Senior Vice President & General Manager Business Unit Catalysts at Clariant, commented, "We are very pleased with the results of MegaMax 800 at CNOOC's China BlueChemical methanol facility. Building on more than 45 years of experience in methanol synthesis, our catalyst provides excellent activity and selectivity for optimal methanol production in large or small production plants using various process technologies. It is the ideal solution for customers seeking higher profitability, flexibility and security."

MegaMax 800 is designed to offer up to 40 percent higher productivity than previous catalyst generations, and can maintain its performance benefit even at low temperature conditions. This results in greater carbon efficiency and methanol yield, while reducing synthesis gas consumption.

Depending on facility design and processes, methanol plant capacity can be increased by up to 10 percent with MegaMax 800.

Another advantage of the new catalyst is its enhanced selectivity. Typically, by-product formation increases with time on-stream, as the reaction temperature is raised to compensate for activity decay. With MegaMax 800, high selectivity is maintained over the catalyst's entire lifetime, thereby considerably reducing the specific by-product formation. The catalyst is also exceptionally robust and highly resistant to poisoning, thus it provides the endurance required for demanding daily operation, and protects against process upsets.

In addition to MegaMax 800, Clariant's ReforMax® 210 LDP and ReforMax 330 LDP catalysts are also used in the "Phase 2" plant, as well as in the "Phase" 1 methanol facility. With high operation loads, the operating life could recently be extended by an additional year and maintains high production rates and low pressure drop.



Methanol Production Plant of CNOOC Kingboard Chemical Co Ltd. (Photo: CNOOC Kingboard Chemical Ltd)

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STEFANIE NEHLSSEN

Phone +41 61 469 63 63
stefanie.nehlsen@clariant.com

Follow us on [Twitter](#), [Facebook](#), [Google Plus](#), [LinkedIn](#).

www.clariant.com

Clariant is a globally leading specialty chemicals company, based in Muttenz near Basel/Switzerland. On 31 December 2017 the company employed a total workforce of 18 135. In the financial year 2017, Clariant recorded sales of CHF 6.377 billion for its continuing businesses. The company reports in four business areas: Care Chemicals, Catalysis, Natural Resources, and Plastics & Coatings. Clariant's corporate strategy is based on five pillars: focus on innovation through R&D, add value with sustainability, reposition portfolio, intensify growth, and increase profitability.

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Clariant's Catalysts business unit is a leading global developer and producer of catalysts for industrial processes. It has been part of the Catalysis business area of the Clariant Group since the acquisition of Süd-Chemie in 2011. Clariant Catalysts is headquartered in Munich, Germany, and has a total of 16 production sites (incl Joint Ventures), 7 sales offices, and 11 R&D and technical centers around the world. Approximately 1 970 employees serve customers across all regional markets. Aimed at delivering sustainable value to customers, Clariant's catalysts and adsorbents are designed to increase production throughput, lower energy consumption, and reduce hazardous emissions from industrial processes. The broad portfolio also includes products that enable the use of alternative feedstock for chemical and fuel production.