

## Press release

### Mitsubishi Chemical Corporation and Linde Engineering announce transfer of HDA technology

- Hydrodealkylation (HDA) technology maximizes overall benzene yield in olefin plants
- Linde to provide optimized and highly integrated HDA applications to the petrochemicals industry

**Pullach, Germany, 01 March 2018** – The Engineering Division of The Linde Group (Linde) and Mitsubishi Chemical Corporation (MCC) have concluded a definite agreement for transfer of MCC's Hydrodealkylation (HDA) technology to Linde.

For more than 45 years, MCC's cutting edge HDA process has been deployed and successfully operated in a number of commercial plants.

The HDA technology mainly converts toluene and other aromatic components into high purity benzene. This can be leveraged for maximizing the overall benzene yield in olefin plants, e.g. steam crackers.

In addition, HDA technology can also be implemented for a variety of refinery applications. Benzene is one of the most widely used chemicals involved in manufacturing of daily use products such as detergents, plastic and rubber.

"We are very excited about MCC having given us the opportunity to further expand our portfolio adjacent to the steam cracker technology. MCC's HDA technology will facilitate our world class go-to-market licensing strategy. Our primary objective is to provide optimized and highly integrated HDA applications to the petrochemicals industry for both revamps or expansions at existing ethylene plants as well as for new world scale petrochemical complexes," said John van der Velden, Managing Director, Linde Engineering Division.

"MHC process is old HDA technology, has a history of commercial operation more than 40 years. I sincerely hope that this technology transfer will create new added value soon by integrating with Linde's

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excellent steam cracker technology,” said Yoshitaka Arakawa, Senior Associate Director, Division General Manager, Basic Petrochemicals Division, MCC.

The technology transfer to Linde is expected to be completed by June this year. Based on Linde’s long-standing and leading expertise in olefin plant design, engineering and construction, Linde now offers HDA technology solutions with best in class economic performance.

### About MCC

Established in 2017 and headquartered in Tokyo., Mitsubishi Chemical Corporation, by merger of old Mitsubishi Chemical Corporation, Mitsubishi Plastics, Inc. and Mitsubishi Rayon Co.,Ltd.. MCC is Japan’s major chemical company and offers a wide variety of products and solutions in two business domains — performance products and industrial materials. We believe “sustainability,” “health,” and “comfort” are key words in 21st century society, and aim to amalgamate our lineup of products and technologies into power of “chemistry” that can help reduce CO<sub>2</sub>, for example, and greatly contribute to solving the problems that face our global society.

For more information, see MCC online at [www.m-chemical.co.jp/en/index.html](http://www.m-chemical.co.jp/en/index.html)

### About The Linde Group

In the 2016 financial year, The Linde Group generated revenue of EUR 16.948 bn, making it one of the leading gases and engineering companies in the world, with approximately 60,000 employees working in more than 100 countries worldwide. The strategy of The Linde Group is geared towards long-term profitable growth and focuses on the expansion of its international business, with forward-looking products and services. Linde acts responsibly towards its shareholders, business partners, employees, society and the environment in every one of its business areas, regions and locations across the globe. The company is committed to technologies and products that unite the goals of customer value and sustainable development.

For more information, see The Linde Group online at [www.linde.com](http://www.linde.com)

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