



Joint News Release

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thyssenkrupp and BASF sign joint development agreement on STAR process[®] dehydrogenation technology

- **Process reduces feedstock consumption**
- **New technology will lower customer investment and operating costs**
- **BASF catalyst enables lower CO₂ emissions**

thyssenkrupp and BASF have signed a joint development agreement to expand their cooperation on the STAR process[®]. This proprietary dehydrogenation process from thyssenkrupp produces propylene from propane feedstocks, or iso-butylene from iso-butane feedstocks, using an exceptionally stable catalyst. thyssenkrupp, focusing on process development, and BASF, focusing on catalyst development, together aim to significantly increase the resource and energy efficiency of the process through targeted improvements in catalyst and plant design. Plant operators can benefit from lower investment and operating costs as well as lower CO₂ emissions in the future.

“We are very pleased about this cooperation which combines BASF’s expertise as a world-leading catalyst manufacturer with our plant engineering competence,” says Uwe Boltersdorf, Chief Sales Officer of the business unit Chemical & Process Technologies at thyssenkrupp. “With our combined know-how we can further reduce consumption of energy and resources. New catalyst shapes will enable a smaller reformer design, which also lowers the investment costs of dehydrogenation plants.”

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Detlef Ruff, Senior Vice President Process Catalysts at BASF, says: “The cooperation between BASF and thyssenkrupp is another example of our successful approach to collaboration with engineering companies and technology providers. We contribute our unique know-how as a world-leading catalyst manufacturer, and together with our partners, drive the implementation of new processes and innovative future technologies.”

“This project is a good example of how technology development can be accelerated through cross-sector collaboration,” says Adrian Steinmetz, Vice President Global Chemical Catalysts & Adsorbents at BASF. “We will specifically address topics like reducing precious metal content. This lowers catalyst costs and additionally reduces feedstock and energy consumption through increased selectivity. This will contribute significantly to a reduction of the CO₂ footprint.”

Propylene is one of the largest volume chemicals produced globally with projected further growth. A common use is as raw material for polypropylene, a component that is mainly used in the automotive, textile and packaging industries. Thyssenkrupp’s Steam Active Reforming STAR process[®] offers an extremely reliable process with a proven plant availability of 98%, which means more than 8,500 hours per year.

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About BASF’s Catalysts Division

BASF’s Catalysts division is the world’s leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF’s Catalysts division develops unique, proprietary solutions that drive customer success. Further information on BASF’s Catalysts division is available on the Internet at www.catalysts.basf.com.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. More than 117,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €59 billion

in 2019. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com.

About thyssenkrupp Industrial Solutions AG

The thyssenkrupp Industrial Solutions AG is a leading partner for the engineering, construction and service of industrial plants and systems. Based on more than 200 years of experience we supply tailored, turnkey plants and components for customers in the chemical, fertilizer, cement, mining and steel industries. Some 11,500 employees around the world form a global network with a technology portfolio that guarantees maximum productivity and cost-efficiency.

The Chemical & Process Technologies business unit combines unique technological expertise and decades of global experience in the engineering, procurement, construction and service of chemical plants. We develop innovative processes and products for a more sustainable future and thus contribute to the long-term success of our customers in almost all areas of the chemical industry. Our portfolio includes leading technologies for the production of basic chemicals, fertilizers and polymers as well as complete value-chains for green hydrogen and sustainable chemicals.