

## INNOVATIONS IN REFINING

Priorities in the oil refining segment include increasing refining depth, releasing new products and improving the environmental friendliness of the production process.

### INCREASING THE REFINING DEPTH AND PRODUCTION MARGIN //

**RESULTS OF 2015:** The Omsk Oil Refinery began implementing the “Aluminium Oxide-Based Crude Deep Conversion Catalysts” project. The project aims to provide the Russian oil refining industry with modern catalytic cracking catalysts and hydrogenation processes that are used in the production of the highest environmental friendly standard Euro-5.

Production facilities for cracking and hydrogenation process catalysts are to be built as part of the project at the Omsk Oil Refinery. R&D for the catalytic cracking catalysts is being performed jointly with the Institute of Hydrocarbon Processing Problems of the Siberian Branch of the Russian Academy of Sciences. The hydrogenation process catalysts are being developed in a partnership with the Boreskov Catalysis Institute of the Siberian Branch of the Russian Academy of Sciences. The first Russian-made diesel-based hydrotreatment catalyst was developed as part of a general cooperation agreement with the Boreskov Catalysis Institute concluded in April 2015. Following the completion of industrial testing, the catalyst is to be introduced at the Company’s oil refining enterprises.

Gazprom Neft is currently the only oil and gas company in the CIS that has its own catalytic cracking catalysts. The Company and the Boreskov Catalysis Institute jointly take part in a Federal Target Programme for the development of hydroprocessing catalysts as part of alternative substitution programmes. The work will result in new brands of domestic hydrocracking catalysts, hydrotreatment and new types of zeolites (the basis for the production of catalyst components).

### RELEASE OF NEW PRODUCTS //

**RESULTS OF 2015:** Grade A needle coke has been produced at the Omsk Oil Refinery for the first time in Russia. Gazpromneft-Lubricants and Gazpromneft-Bitumen Materials have developed and launched a number of new products that meet current government standards and customer needs.

### IMPROVING THE ENVIRONMENTAL FRIENDLINESS OF THE PRODUCTION PROCESS //

**RESULTS OF 2015:** The Moscow Oil Refinery launched construction on the Biosphera biological treatment facilities. The Biosphera complex will use a final water purification technology that is unique to the Russian oil refining industry and removes 99% of contaminants. The use of a multi-stage biological treatment system will enable the plant to reduce water consumption by 60%, while 75% of the water will be recycled into the enterprise’s production cycle. The launch of the Biosphera complex is planned for 2017.

The Company and the Topchiyev Institute of Petrochemical Synthesis of the Russian Academy of Sciences are jointly building a pilot plant to produce solid acid alkylation – a new technology that ensures the environmental friendliness of the production process and has no effective analogues.

The Moscow Oil Refinery reduced water consumption per unit of the refinery’s equivalent distillation productivity by 6% in 2015 and increased the use of recycled water by 4.5 million m<sup>3</sup>. The growth in the share of recycled water enables the enterprise to consistently reduce its environmental impact through an active decrease in fresh water consumption.

## HYDROTREATMENT AND HYDROCRACKING

The widespread use of catalytic hydrotreatment and hydrocracking processes in modern oil refining is driven by the growing environmental requirements for the quality of petroleum products manufactured by refineries. Motor fuel-based hydrotreatment technology is used to remove sulphur and nitrogen compounds, which ultimately reduces the environmental impact of road transport. The hydrocracking process makes it possible to obtain a wide range of high-quality motor fuels, including from raw materials that had previously been used solely for the production of dark petroleum products.