



## **EYES ON MAN PRODUCTION**

SIBUR has decided to build a maleic anhydride (MAN) production facility at its Tobolsk site scheduled for completion in 2021.

### **Widely used feedstock**

Today's demand for MAN in Russia is fully covered by imports. According to industry sources, with proper support from the processing sector and subject to market development as a whole, this could be a promising area, as MAN is a basic monomer, and its products are used in almost all industries, including mechanical engineering, construction, food and agriculture.

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MAN affords resistance to temperature differences, humidity and other external factors, thus ensuring high durability and quality of the finished products. Maleic anhydride is used as a feedstock component in the production of polyester resins, alkyd resins, plasticisers and toughening agents, as well as tetrahydrofuran, tetrahydrophthalic anhydride, films, and synthetic fibres.

The food industry employs MAN in the synthesis of fumaric, malic and tartaric acids. MAN is also utilised in lubricant additive manufacturing. However, over 50% of its global output finds application in the production of unsaturated polyester resins, which are mostly used as binding materials for fibreglass.

Unsaturated polyester resins are ubiquitous in the manufacture of pipes, tanks, components of cars, yachts and wind farms. Polyester resins are also used in the production of various paints and coatings, plumbing fixtures (acrylic baths, sinks) and artificial marble.



*MAN is used to produce unsaturated polyester resins, which find application in the manufacturing of functional elements for wind farms.*

All in all, unsaturated polyester resin is a multi-purpose material finding an increasingly wide application. The polyester resin production technology is also improving to meet the ever increasing requirements of consumers of this reliable and time-tested material.

Worldwide MAN output is approaching 3 mt, with about 1 mt produced in China, which is home to over 30 factories of various capacity producing end products of various quality. The USA, Japan, Saudi Arabia and some EU countries are following far behind.



*Guangzhou Chemical Factory. Around 1 mt of MAN is produced in China.*

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In Russia, 80% of MAN is used in the production of unsaturated polyester resins, which in turn are utilised in the manufacturing of pipes and coatings. Another 10 to 15% finds application in copolymer production. At the moment, Russian industry consumes ca. 6 ktpa of MAN, with an annual 5% increase in demand.

### **From theory to practice**

Back in 2011, Russian producers planned to build a local MAN plant. At that time, Yelabuga had glass fibre production established that triggered demand for polyester resins. However, the project was considered unprofitable.

The sanctions imposed by a number of countries against Russia have drastically changed the situation in the domestic market. Now the Russian economic policy focuses on the development of local production capacities. The Russian Ministry of Industry and Trade has developed a plan for import substitution in the chemical industry to completely replace imported MAN, among other products, with locally produced.

The Ministry also encourages Russian businesses to concentrate on the external market and to increase by several times the volume of outbound supplies. SIBUR has taken on this challenging and ambitious task.





*In 2011, Yelabuga launched production of glass fibre triggering demand for polyester resins. Photo: PD Tatneft-Alabuga Fibreglass Press Office.*

## **SIBUR at the forefront**

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SIBUR's new production facility will run on the company's own butane feedstock, which will help to monetise the raw material transforming it into a globally competitive product.

SIBUR's expertise gives rise to a whole new development stage. Russian companies are now ready to export not only resources, but also high-quality components successfully competing with global peers.

SIBUR decided to launch its own MAN production back in 2016. The preparatory stage included designing the site, purchasing license from Italy's CONSER, developing design documents, gaining approval from the General Board of State Expert Review (Glavgosexpertiza), updating the required investment amount and optimising the project, all of which made it possible to go forward with the project.

When selecting a licensor, SIBUR was primarily looking for experience and high quality of end product. According to Project Manager Vladimir Mishin, CONSER offers one of the most cutting-edge MAN production technologies globally. Its state-of-the-art technology and unique equipment prevent negative impact on the environment. The secured approval of the design documents by the state expert review board and the results of the public discussions confirm that the project fully complies with environmental laws and regulations.



*Italy's CONSER offers one of the most cutting-edge MAN production technologies globally.*

Initially, several options were considered for locating the new site, including the Baltic Sea coast. Eventually, however, Tobolsk was selected because of feedstock availability and developed infrastructure.

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The Company has always carefully considered possibilities of integrating energy resources. MAN production is characterised by a highly exothermic reaction and large amounts of steam released, the excess of which is integrated back into the existing production. The use of lean production technologies generates significant savings and reduces the impact on the environment.

## **New horizons**

The new facility is designed to produce 45 ktpa of MAN, much above of what the Russian producers need. However, according to SIBUR's expert estimates, local production will stimulate the growth of demand in the domestic market due to Russia-based production capacities, predictable logistics and, consequently, easier long-term planning.

SIBUR is ready to support the implementation of projects involving further MAN processing. As early as at the design stage of the new production facility, SIBUR signed an agreement with the Agency for Technological Development, covering joint efforts to develop a chain of MAN-based products.





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At the moment, the Company plans to develop exports, while also stimulating the domestic market. Part of the output will be exported to Eastern Europe and Turkey. According to Pavel Lyakhovich, SIBUR's Managing Director, a number of consumers and distributors have already expressed their interest in the Russian MAN.

MAN is going to be produced in two forms – liquid and solid – depending on Clients' needs and specific uses of the component. With in-house raw materials, own production site, well-established distribution channels, and portfolio approach to monomer supplies, the Company is set to have a strong competitive position in the market.

“This project is a landmark venture for both SIBUR and the Russian economy,” says Mikhail Nebesny, Senior Manager at the Business Development Function. “The new production facility will solve the problem of high-tech product import substitution, create a more efficient channel for butane monetisation, stimulate the development of further MAN processing in Russia, thus unlocking growth potential of the domestic market.”