Overview

The diversity in polyurethane chemistry is the primary reason this relatively expensive polymer is selected to overcome challenging problems – for instance, the production of flexible yet long-lasting foams and lightweight but insulating construction panels. The ability to create a cellular structure with polyurethane allows for the production of flexible foams for comfort (bedding, furniture and transportation cushioning) and rigid foams for insulation (construction and appliances industry). Non-cellular (or solid) polyurethanes are used as coatings, adhesives or elastomers where they are known for their abrasion resistance, durability, gloss, color retention and strong adhesive properties.

This report provides an overview of technological, economic and market aspects of the polyurethane industry. The following issues are addressed in the report:

- What are the major types of polyurethane and what are the formulations and technologies required to produce them?
- How much does it cost to produce each type of polyurethane and what are the key cost sensitivities?
- What are the key end-uses and market drivers for polyurethane currently?

Commercial Technologies

Nexant has analyzed the process technologies required for the production of over 20 different types of polyurethane as well as the specific formulation of raw materials required for each. An introduction is made to the polyurethane value chain and the technologies required to produce isocyanates and polyols.

Process Economics

The economic analysis provides an overview of production costs for five different polyurethanes (see below graph) in Western Europe, the United States and China in 2Q 2019 and 2Q 2020. Estimated raw material costs are made for approximately twenty more types.

Commercial Overview

Polyurethanes are available in a range of forms which are then consumed for a range of uses which are outlined in this report. The largest sources of demand for polyurethane are from the construction, appliance, automotive, furniture and bedding markets. The supply and demand for polyurethane is analyzed on a global and regional basis from 2000 to 2019 with splits made globally by isocyanate and polyurethane type. The key market drivers for demand evolution historically and over the medium-term are outlined.

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Technology and Costs

TECH 2020S6: Polyurethanes

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