



TECH Report 2020-7: Maleic Anhydride

Maleic Anhydride is one in a series of reports published as part of NexantECA's 2020 Technoeconomics – Energy & Chemicals (TECH) program.

Overview

Maleic anhydride (MAN, $C_4H_2O_3$) is a very reactive molecule used in a wide range of applications from commodity plastics to fine and performance chemicals.

This TECH report provides an overview of the commercial and developing technologies for producing MAN and addresses the following questions:

- What are the major production technologies for MAN and how do they differ?
- Is the technology available and who are the key technology owners and licensors? What are the key differences between their offering?
- What are the key developments in MAN technologies?
- What are the key market drivers?
- What is the business and regulatory environment like for MAN today?
- What are the key factors that impact overall economics for producing MAN across different technologies and geographic regions?

Commercial Technologies

The TECH report details the differences between the technologies of the main MAN licensors: Huntsman, CONSER, Scientific Design, Technobell, Lummus, and Mitsubishi.

Developing Technologies

Most R&D efforts are directed toward improving the MAN oxidation reactor and catalyst as well as making bio-based routes to MAN cost competitive. The two feedstocks currently being investigated at lab scale are bioethanol and furfural.

Process Economics

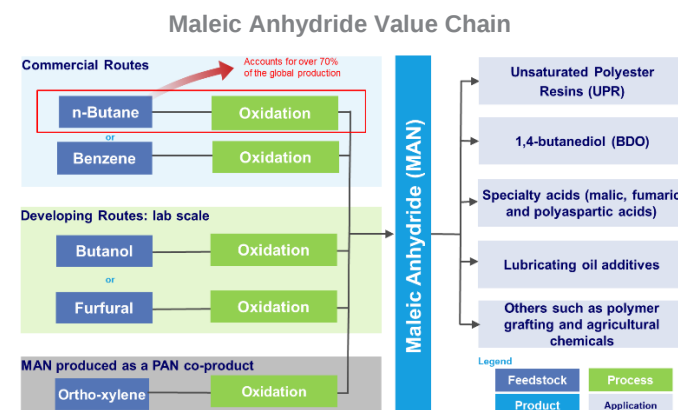
Over 70 percent of the global capacity and all the announced capacity additions are/will be based on the *n*-butane route. Thus, the cost of production via this route for plants located in the United States, Western Europe, the Middle East, and China has been estimated for the first quarter of 2020. Indeed, those regions/countries account for about 82 percent of the global MAN capacity.

Commercial Overview

The global demand for MAN in 2020 is estimated at 2.5 million tons and is forecast to grow by 4.4 percent per annum on average to about 3 million tons in 2025. Asia, North America, and Western Europe together represent about 90 percent of the total demand.

- The main end use for MAN is unsaturated polyester resins (UPR), which are rigid thermoset resins used in a wide range of construction, automotive and marine applications.
- The next largest segment is the production of 1,4-butanediol (BDO), a chemical intermediate used to produce polyurethanes, tetrahydrofuran (THF), γ -butyrolactone (GBL) and polybutylene terephthalate.
- Specialty acids, principally fumaric, malic, maleic, succinic and polyaspartic acids, are mostly used as food additives, animal feed additive, in the papermaking, textile and detergent industries, as chemical intermediates and in the UPR sector to assist in the curing of the resin.
- Lubrication oil additives are used as ash-less dispersants and corrosion inhibitors.
- Copolymers are used in the engineering plastic sector.

The MAN supply, demand, and trade on a global and regional basis (North America, South America, Western Europe, Central & Eastern Europe, Middle East & Africa and Asia Pacific) is detailed in this TECH report.





TECH Report 2020-7: Maleic Anhydride

Subscribe to TECH

The TECH program (formerly known as PERP) is globally recognized as the industry standard source of process evaluations of existing, new and emerging of interest to the energy and chemical industries.

TECH's comprehensive studies include detailed technology analyses, process economics, as well as commercial overviews and industry trends. Reports typically cover:

- Trends in chemical technology
- Strategic/business overviews
- Process Technology:
- Chemistry
- Process flow diagrams and descriptions of established/conventional, new and emerging processes
- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Overview of product applications and markets for new as well as established products
- Regional supply and demand balances for product, including capacity tables of plants in each region
- Regulatory and environmental issues where relevant

Subscription Options

A subscription to TECH comprises:

- PDF reports including detailed technology analyses, process economics, as well as commercial overviews and industry trends
- Cost of production tables in spreadsheet format
- Consultation time with the project team

An annual subscription to TECH includes twenty reports published in a given program year. Reports can also be purchased on an individual basis, including reports from previous program years.



NexantECA Subscriptions & Reports provide clients with comprehensive analytics, forecasts and insights for the chemicals, polymers, energy and cleantech industries. Using a combination of business and technical expertise, with deep and broad understanding of markets, technologies and economics, NexantECA provides solutions that our clients have relied upon for over 50 years.

Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program, the Biorenewable Insights program (BI), and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

NexantECA serves its clients from over 10 offices located throughout the Americas, Europe, the Middle East, Africa, and Asia.

Americas

Tel: + 914 609 0300
44 S Broadway, 5th Floor
White Plains
NY 10601-4425
USA

Europe, Middle East & Africa

Tel: +44 20 7950 1600
1 King's Arms Yard
London EC2R 7AF
United Kingdom

Asia Pacific

Tel: +662 793 4600
22nd Floor, Rasa Tower I
555 Phahonyothin Road
Kwaeng Chatuchak
Khet Chatuchak
Bangkok 10900
Thailand

Copyright © 2000-2021 NexantECA, the Energy and Chemical Advisory company

For more information please contact
Technology@NexantECA.com or www.NexantECA.com