



## TECH 2021S5: EPDM Rubber

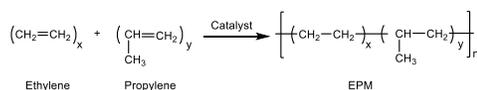
EPDM Rubber is one in a series of reports published as part of NexantECA's 2021 Technoeconomics – Energy & Chemicals (TECH) program.

### Overview

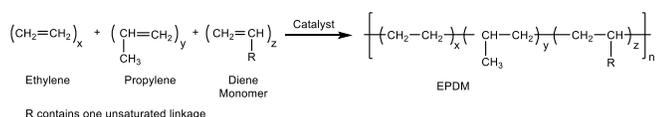
EPDM is a relatively new rubber commercially developed in the early 1960s, compared to SBR (styrene-butadiene rubber) or NBR (acrylonitrile-butadiene rubber), which were the first synthetic rubbers that were developed in the late 1930s. Unlike SBR, which was developed as an inexpensive replacement for natural rubber in tires, EPDM is primarily used in non-tire applications because of its higher performance and cost. EPDM has a fully saturated molecular backbone that provides excellent ozone resistance, weatherability and heat resistance properties, very good dielectric performance, and low temperature flexibility.

EPDM can be produced either as an ethylene/propylene copolymer (EPM) or as a terpolymer of ethylene, propylene, and another moiety containing side-chain unsaturation such as ethylidene-5-norbornene-2 (ENB).

#### EPM



#### EPDM



The advantage of side-chain unsaturation is that the resulting polymer can be sulfur cured, as is performed with other rubbers.

### Commercial Technologies

EPDM is produced in a solution reactor based on Ziegler-Natta or Metallocene-catalyzed chemistry, or in a Ziegler-Natta catalyzed slurry process. Metallocene or other single site catalysts have altered the industry, as such catalysts permit new and different molecular architectures at lower cost. The lower cost is a result of increased catalyst activity and less residual process waste.

### Process Economics

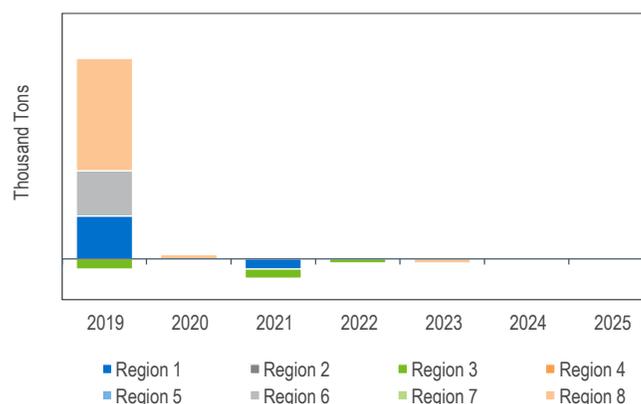
For this report, NexantECA evaluated the three main processes available for EPDM production – Ziegler-Natta solution, Metallocene solution, and Ziegler-Natta slurry processes. The evaluation provides:

- Process description with simplified flow sheets
- Recent developments related to process technology
- Investment and cost of production (COP) estimates for a grassroots facility
- Estimates are made for plants located in the USGC, Western Europe, and the China Coast

### Commercial Overview

Key end-use markets, applications and market trends are developed for EPDM for the regions – North America, Western Europe, Asia Pacific, and Rest of World. Demand and supply/demand balances are provided for 2011 to 2026.

The COVID-induced recession, which followed a period of numerous capacity additions, resulted in poor operating rates and a shut-down of a number of plants, as discussed in the report. A listing of producers is provided.





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