

Hostalen

Low-pressure slurry process technology for the production of high-performance multimodal HDPE grades

Pipe, film, blow molding and caps & closures

At the heart of the *Hostalen* “Advanced Cascade Process” (*Hostalen* ACP) process technology are three reactors in cascade, enabling the production of multimodal HDPE resins. Extension of the well-proven and highly regarded *Hostalen* bimodal process technology to multimodal capability marks another significant milestone in LyondellBasell’s rich history of innovation.

Hostalen ACP process technology manufactures multimodal HDPE for highperformance resins with industry-leading stiffness / toughness balance, impact resistance, high stress cracking resistance and processing advantages for use in pipe, film, blow molding and caps & closures applications.

The proof of the technology is reflected in the one million tons of *Hostalen* ACP capacity in production annually at the company’s wholly-owned and joint venture locations:

- Basell Polyolefine GmbH, Wesseling, Germany – 320 kt/a
- Basell Orlen Polyolefins SP. z o.o., Plock, Poland – 320 kt/a
- Saudi Ethylene & Polyethylene Company, Al-Jubail Industrial City, Saudi Arabia – 400 kt/a
- Basell Polyolefine GmbH, Münchsmünster, Germany – 250 kt/a
- More than 10 million tonnes *Hostalen* ACP capacity has been licensed globally
- In 2024, the first *Hostalen* ACP line with a capacity of 500 kt/a has been licensed

Key characteristics of *Hostalen* ACP process technology

Technology highlights

- Slurry cascade process with three stirred polymerization reactors in series
- Customized molecular weight distribution and composition of final product, achieving “tailored molecular design”
- Polymerization conditions can be adjusted independently for each reactor
- Proven know how of black pellet production for pressure pipe applications

Design and reliability

- Developed from the leading *Hostalen* bimodal process technology with demonstrated high reliability
- Single Ziegler catalyst chemistry
- Commercially proven at plant capacities up to 450 kt/a
- *Hostalen* bimodal process can be expanded to *Hostalen* ACP technology
- Design capacity up to 550 kt/a

Product capabilities and flexibility

- Produces multimodal grades used in major HDPE applications required by customers globally
- Produces broad range of HDPE products including unimodal injection molding grades
- Stiffness / toughness performance and stress resistance / stiffness balance pushed to new limits
- In-reactor process stability and superior homogenization results in lot to lot consistency
- Manufactures HDPE used in high-performance applications including PE 100 pipe applications

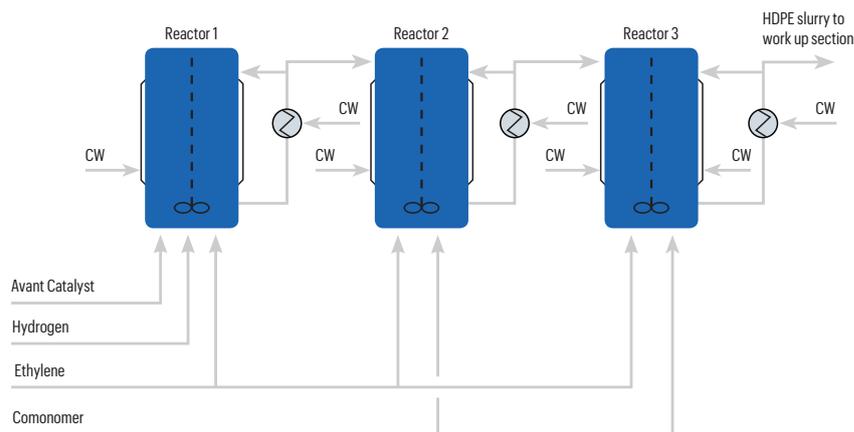
Hostalen ACP process description

Process stages

- Catalyst feeding
- Polymerization
- Powder drying
- Extruder and pellet handling
- Hexane recycling
- Butene-1 recycling

The *Hostalen ACP* process technology uses ethylene monomer (and butene-1 comonomer) to produce multimodal HDPE with outstanding properties and performance characteristics. The process consists of three polymerization reactors, continuous stirred tank (CSTR) operating in cascade, with a liquid phase of hexane as the medium in which the reaction mixture is suspended. The catalyst is injected into the first reactor only whereas raw materials are fed into all reactors.

Hostalen ACP process flow diagram



The reactor polymerization conditions are controlled independently from the previous reactor parameters.

The polymer is then separated in the work up section from the slurry and dried; the final polymer powder is transported to the additivation and extrusion section.

Hostalen ACP process technology

Capabilities and product properties

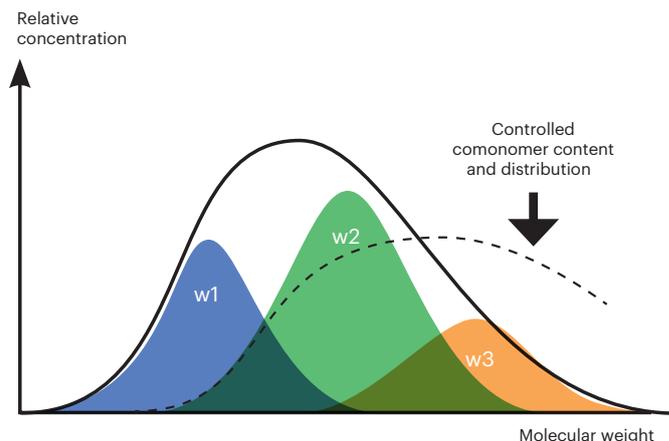
The ability to tailor the molecular weight distribution of each HDPE grade has established a new frontier in mechanical and processing properties:

- Improved toughness and impact resistance compared to conventional bimodal HDPE grades at the same densities due to the multimodal molecular weight distribution
- Increased stiffness of grades enables thinwalling capabilities, which can reduce the wall thickness of small blow molding parts by approximately 15% and increase the potential for weight savings and reduced raw material usage

Typical customer applications:

The ability to tailor the molecular weight distribution of each HDPE grade has established a new frontier in mechanical and processing properties:

- Pipe, including pressure pipe for the transport of gas, drinking water and sewage
- High-stiffness, high-tenacity film, including packaging liners and bags



w1: Low molecular weight homopolymer
 w2: High molecular weight copolymer
 w3: Ultra high molecular weight copolymer

- Large and small blow molding, including packaged consumer goods
- Tapes and monofilament, including applications in the textile industry
- Injection molding, including caps and closures

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