



Spheripol

Leading polypropylene technology for the production of homopolymers, random and heterophasic copolymers.

Technology Description

Spheripol is the world's leading technology for the production of polypropylene including homopolymers, random and heterophasic copolymers to serve the full range of polypropylene applications.

The *Spheripol* process is the result of 50 years of continuous improvement in polypropylene technology. However, to truly appreciate the unique capabilities of this technology, it is helpful to understand the evolution of the Polypropylene industry and the breakthroughs that led to the discovery of the *Spheripol* process.

1960s and 1970s:

Polypropylene processes were costly and difficult to operate. With the discovery of second-generation high-yield catalysts, the initial need for catalyst residue removal was overcome but the atactic content was still unacceptably high.

1980s:

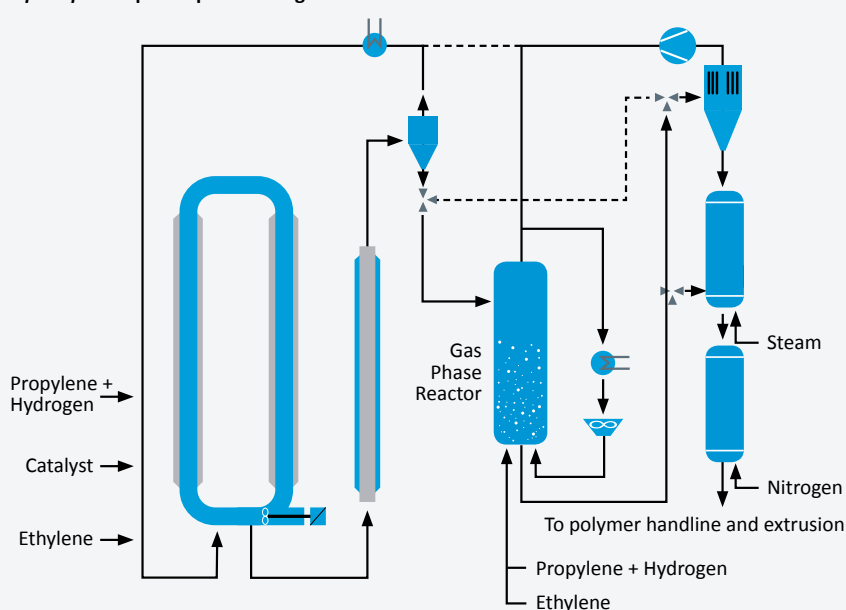
Third generation, high-yield and high-selectivity catalysts eliminated the need for catalyst and atactic content removal. This further simplified the process and improved product quality.

1982:

Spheripol technology was introduced, incorporating breakthroughs in process design with the refinement of gas-phase and bulk polymerization reactors.

Today, the capabilities of the *Spheripol* process are further enhanced by the current catalyst generation, which has the ability to produce new families of reactor-based products with superior properties. New frontiers in the development of propylene polymers are constantly being explored.

Spheripol simplified process diagram



You can find out more by visiting our website at: www.hmcpolymers.com

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POLYPROPYLENE TECHNOLOGY

HMC Polymers is applying this latest generation of LyondellBasell's catalysts in its plants.

Spheripol process – Key characteristics

The *Spheripol* process is a modular technology consisting of 3 main units:

- Catalyst feeding
- Polymerisation
- Finishing section

Common to all polymerisation units is the bulk polymerisation section for homo and random copolymers. This bulk polymerisation employs tubular loop reactors filled with liquid propylene, to which the catalyst and hydrogen for molecular weight control is continuously fed. In the case of random copolymers, a comonomer such as ethylene is also added.

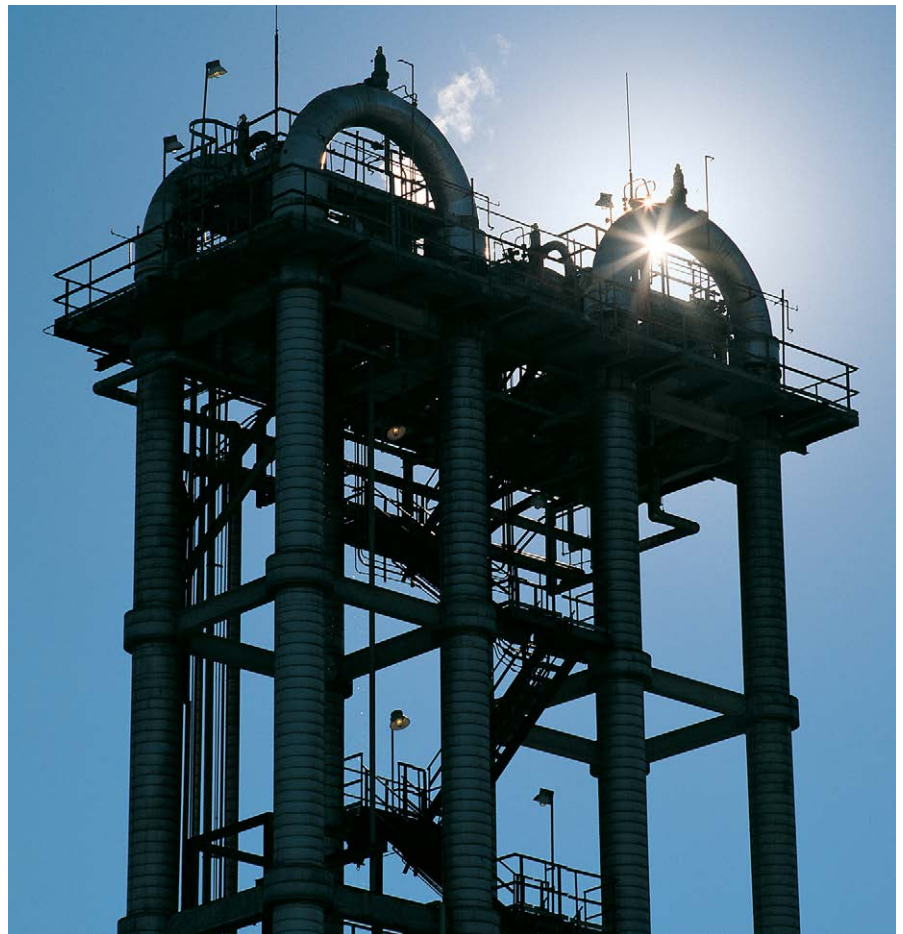
The resulting polymer is continuously discharged from the reactor, and any unreacted propylene is recovered and pumped back into the loop reactor.

The production of impact copolymers also requires a gas phase reactor, which the polymer from the loop reactor is transferred to. In this reactor an elastomer, formed by the polymerisation of ethylene and propylene, is allowed to polymerise with the homopolymer matrix produced in the first reactor.

Spheripol process – Capabilities and product properties

The *Spheripol* technology produces a complete portfolio for use in the full range of polypropylene applications. Many *Spheripol* process resins are recognized as industry leading products in many application areas.

Spheripol polypropylene homo-polymers range from grades with a fractional melt flow rate for pipe and sheet extrusion applications to very high flow specialty grades for melt blown applications. The comprehensive product portfolio includes a vast



number of tailor-made products for a variety of film and fibre applications.

Spheripol polypropylene random copolymers are characterised by excellent optical properties and extremely low catalyst residues. The product portfolio also includes specialty grades for pressure pipe applications and copolymers with very low seal initiation temperatures.

Spheripol polypropylene heterophasic copolymers have outstanding low-temperature impact strength. The product portfolio includes a broad range of grades for specialty applications such as pipes and automotive bumpers, and reactor-grade, high-flow heterophasic copolymers for thin-wall injection moulding applications.

FOR MORE INFORMATION

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