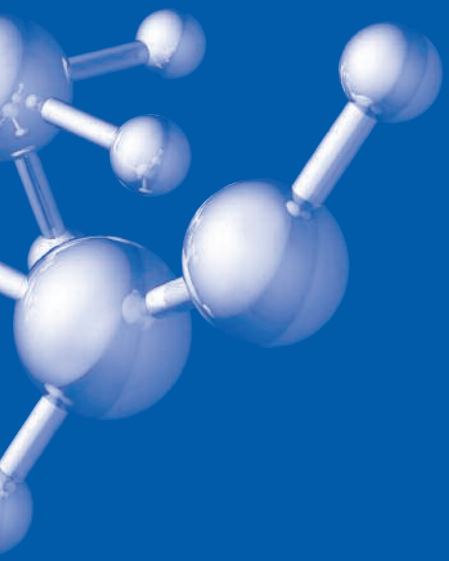
AIR LIQUIDE

Lurgi



Zimmer® Polymer Technology

Polyester Industrial Yarn

Polyester plant

Introduction

For the production of polyester industrial yarn, Zimmer® polymer technologies offer different process routes from monomers to the required grade for all applications.

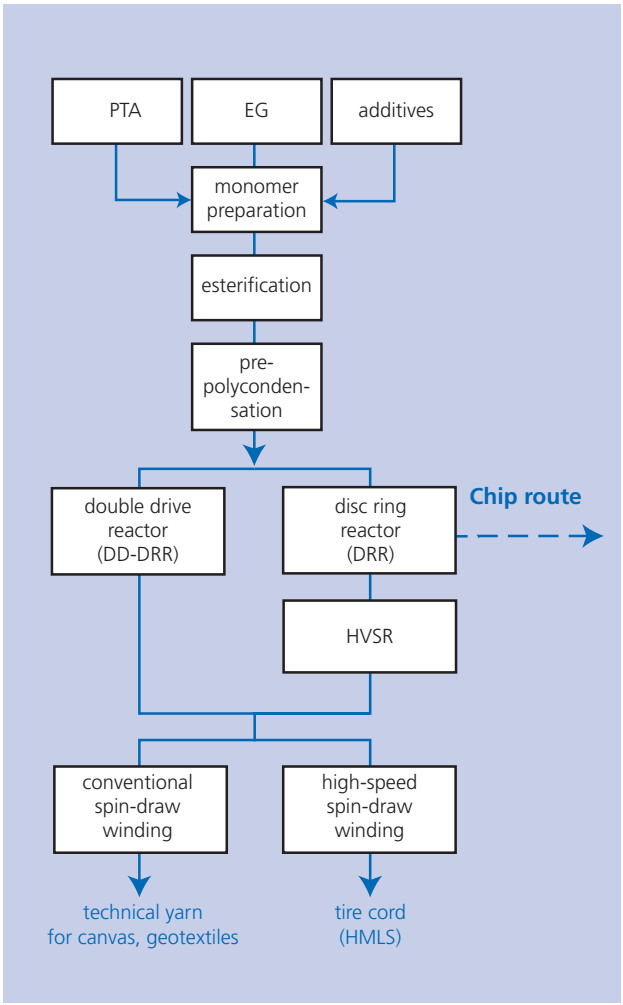
Typical final products

- Tire yarn and dipped tire cord fabric
- Conveyor belt yarn and dipped fabric
- V-belt yarn
- Yarn for hoses
- Belt and rope yarn
- Yarn for coated fabrics

Key features of Zimmer® polyester polycondensation technology

- Safe, reliable and proven technology
- Low raw material and utility consumption
- Low temperature, low pressure process
- State of the art environmental design
- Large scale production of high grade polymer
- HVSR produces a uniform high molecular weight polymer in the melt phase

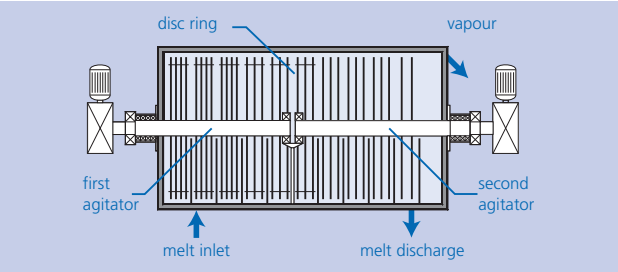
Direct melt route



End reactor technology for industrial yarns

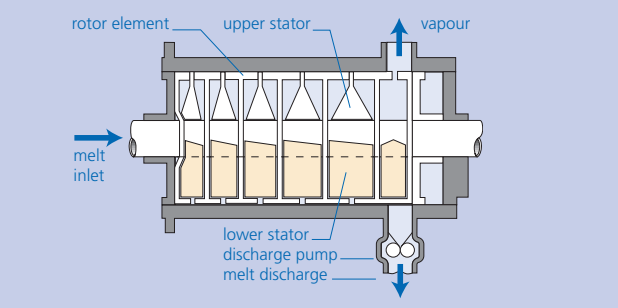
Double Drive Disc Ring Reactor (DD-DRR)

- Simultaneous use of two different agitator speeds for
- The production of high viscosity melt in one stage
- Capacity up to 250 tons/day dependent upon viscosity
- Max. viscosity PET IV 1.0

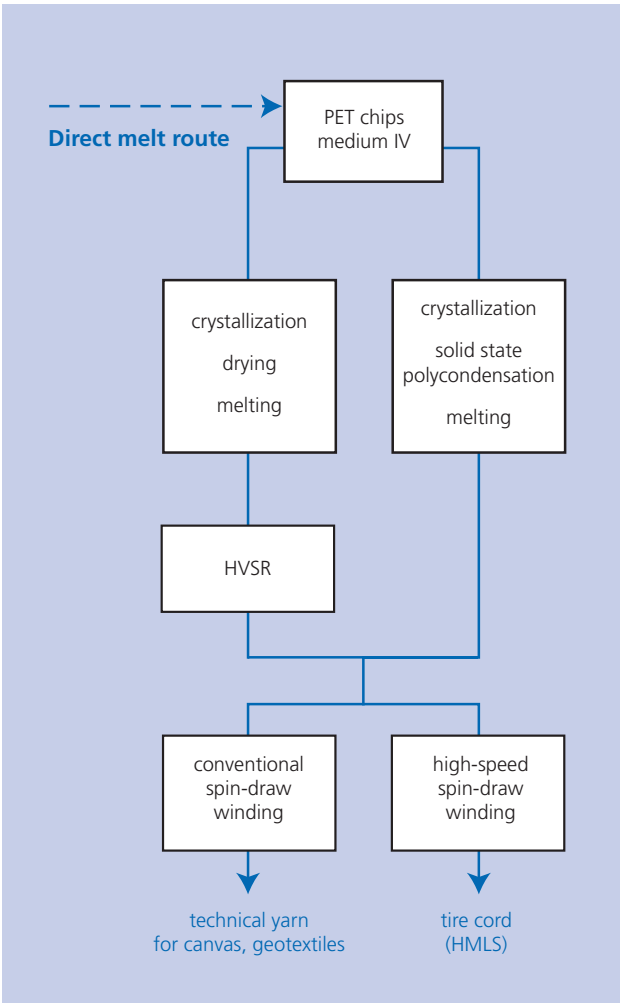


High Viscosity Self-cleaning Reactor (HVSR) at IV 0.98

- Max. capacity 44 tons/day at IV 0.98
- Max. viscosity PET IV 1.0
- Polonged operating cycles by self-cleaning-system
- Tender and uuniform melt post-polycondensation
- Especially suitable for tire cord yarn



Chip route



Zimmer® Polyester technologies provide three different process alternatives adjusted to the customers needs

HVSR

- Melt post-polycondensation with the advantages of direct spinning
- Low COOH-end groups

Tumble dryer

- Solid state polycondensation
- High flexibility for capacities up to 20 tons/day

Continuous SSP reactor

- Economic solution for capacities up to 1000 tons/day

Take-up area

Comprehensive services

Lurgi offers support and services through the complete plant life cycle.
In the preinvestment phase feasibility studies are prepared, financial engineering support given and pre-marketing events and raw material supply contracts conducted. During plant realization engineering, project management, supervision, commissioning and training services are offered. Sophisticated plant features are guaranteed. After starting production, Lurgi provides the clients with further assistance and many other specific services such as predictive maintenance or revamping. The new production management system links data through the whole external supply chain (monomer supplier to car manufacturer) and also data of different internal management systems. This system reduces transaction costs drastically and improves the planning quality.

Highlights

- Advanced integrated processes with Zimmer® know how based on comprehensive production experience and on-going intensive research and development.
- Technological leadership in polyester processes based on more than 50 years experience.
- Complete production units offering competitive advantages starting from the monomers up to the required grade for all applications.
- Proprietary design for key equipment in combination with the best quality components from the most reliable and world leading companies. Together with machinery manufacturers every production step is optimized through integration and fine tuning.
- Investor's risk is reduced through lump-sum turn-key management along the whole production chain.

Lurgi is a leading technology company operating worldwide in the fields of process engineering and plant contracting. Based on syngas, hydrogen production and clean conversion technologies for fuels or chemicals Lurgi offers innovative solutions that allow the operation of environmentally compatible plants with clean and energy-efficient production processes.
Its technological leadership is based on proprietary and exclusively licensed technologies which aim to convert all carbon energy resources (oil, coal, natural gas, biomass, etc.) in clean products.

Lurgi is a member of the Air Liquide Group

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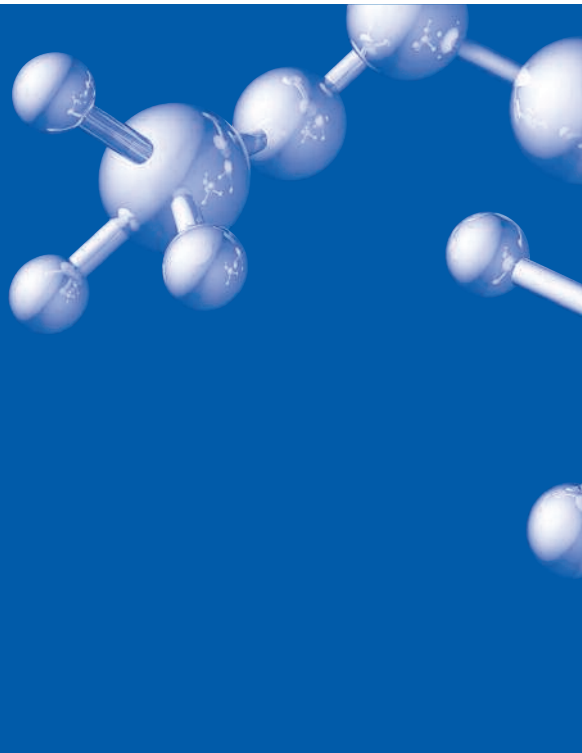

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