

# Technology Services

## Licensed Technologies and Services

Ensuring a safe, efficient and reliable operation for the life of your investment

[www.lyondellbasell.com/technology](http://www.lyondellbasell.com/technology)



LyondellBasell Technology Services provide extensive support to licensees through a broad portfolio of differentiated services covering the entire life of an investment, including all phases of a licensing project: operator training, preliminary start-up safety review, commissioning, start-up support, performance guarantee runs through optimization of plant operation, and periodic updates on the latest developments in processes, catalysts and products.

Technology Services provided support for the total portfolio of licensed process technologies including:

- *Lupotech*
- *Spherilene*
- *Hostalen*
- *Spherizone*
- *Spheripol*
- *Metocene*
- *Trans4m*
- *Superflex*
- *Prodflex*
- *Glacido*
- *Vacido*
- Aromatics Extraction
- Oxiranes and Derivatives

### Key Elements of Technology Services

#### Training

- Plant operation procedures, including start-up, shutdown and emergency procedures
- Plant maintenance procedures and guidelines
- Product testing, quality control and monitoring
- Product properties and applications

#### Safety Reviews

- Continuous safety reviews are conducted to ensure that safety remains an integral part of the entire licensing project
- Pre-Start-up Safety Review (PSSR) on-site ensures adherence to safety design criteria
- Any HSE discrepancies or deviations identified prior to plant start-up

#### Start-up Support and Performance Guarantee Runs

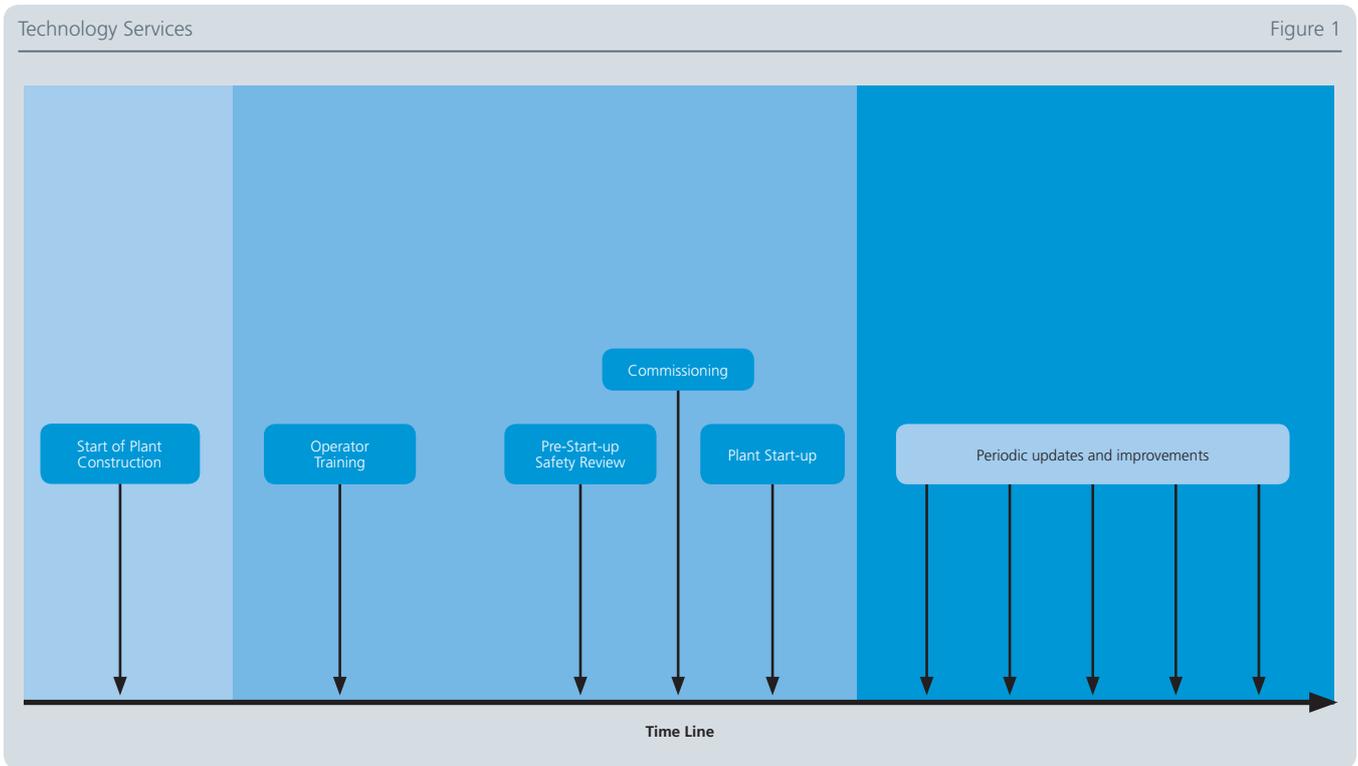
- On-site pre-commissioning assistance
- On-site commissioning assistance
- On-site start-up support
- Monitoring of performance guarantee runs

#### Technical Service Agreements

- Updates on recent process and product improvements of licensed process
- Optimization of plant operation
- Troubleshooting for process and product issues
- Periodical technical exchange meetings with focus on licensee issues, including safety and best practices

#### Engineering Services

- Modification of plant design due to changing market and product requirements
- Increasing plant capacity
- Integration of new process features



### Operator Training

Using computerized dynamic process simulators, operator training is conducted for operations and procedures in real-time, including plant start-up and steady-state operations, grade changes and shutdown operations, and emergency procedures.

### Safety Reviews

Safety reviews are conducted throughout the duration of a licensing project, from the project engineering phase to project completion. Prior to the commissioning and start-up of a licensee's plant, HSE experts at LyondellBasell conduct an on-site Pre-Start-up Safety Review (PSSR) to verify adherence to safety design criteria; special attention is focused on health and environmental aspects and to ensure that any HSE discrepancies or deviations are identified and corrected prior to plant start-up.

### Start-up

A start-up team consisting of experienced LyondellBasell engineers provides on-site assistance during the commissioning and the actual start-up phase of a licensee plant.

### Technical Service Agreements

After successful start-up of the plant, licensees can receive continued technical support from LyondellBasell by entering into a Technical Support Agreement (TSA). The TSA entitles the licensee to troubleshooting assistance for process and product issues, advice regarding the optimization of plant efficiency and periodic updates on the latest developments in processes, catalysts and products.

### Engineering Services

LyondellBasell can assist in the engineering activities required to adjust plant capacities and product ranges due to changing market conditions.

LyondellBasell is one of the world's largest plastics, chemical, and refining companies. The company manufactures products at 59 sites in 18 countries. LyondellBasell products and technologies are used to make items that improve the quality of life for people around the world including packaging, electronics, automotive parts, home furnishings, construction materials and biofuels. More information about LyondellBasell can be found at [www.lyondellbasell.com](http://www.lyondellbasell.com)

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