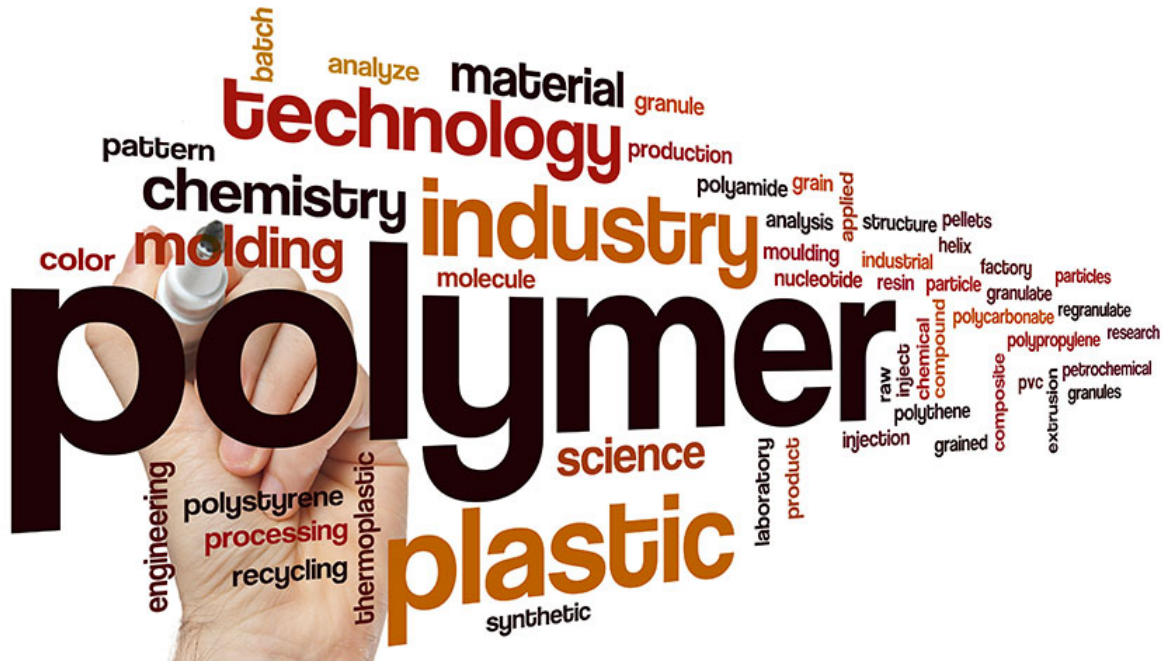
Innovations to optimise industrial batch processing

Increasing batch processing efficiency is a key challenge for European industry. An EU-funded project has demonstrated innovative technology that improves product quality while optimising energy and raw material use in the polymer, steel and silicon industries.



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Batch processing is used by many European industrial sectors. A key challenge is to improve product quality while lowering production costs and environmental impacts. Thus, new approaches are needed to make batch processing more efficient in terms of resource use and to enable European industries to remain competitive on world markets.

To address this challenge, the EU-funded RECOBA project integrated new technological solutions for batch processing. To show the flexibility of the approach across various industrial sectors, the consortium successfully applied it to three batch processes in industrial case studies.

'The project team developed innovative sensors for the real-time observation of batch processing and robust models that were applied for emulsion polymerisation, liquid steelmaking and silicon refining,' says project manager Wolfgang Gerlinger of BASF in Germany. 'The novel sensors and models were implemented for model-based predictive control and optimisation of processes.'

Real-time sensing

Project research partners developed novel sensors for the real-time observation of batch processing. For instance, a pioneering use of Raman spectroscopy for monitoring emulsion polymerisation enabled the nano-scale assessment of particle size and morphology.

DynTemp – the monitoring system developed by MINKON in Poland – is now being prepared as a key contributor to improving batch-process control in steel making. It comprises consumable optical fibres that are immersed in liquid metal to monitor steel melt temperatures, dramatically enhancing measurement accuracy. This method was also successfully tested for silicon refining.

'The system could be used in batch processes of various industry sectors and thus globally lead to massive CO2 reductions. Actually, the MINKON business size is the limiting factor for large-scale market introduction,' says Mark Potter, managing director of MINKON.

The project's continuous real-time measurements will improve quality control and help optimise the efficiency of energy and raw material use, thereby reducing costs and environmental impacts. The project demonstrated that the control of particle morphology during polymerisation, and temperature optimisation during steelmaking, both led to energy and resource savings.

Boosting European process industries

The positive results for the different case studies clearly indicate that the approach can be transferred to other industrial sectors, such as the cement and food industries. The project's state-of-the-art solutions are packaged into easily adaptable modules to facilitate this.

'The social benefits for citizens and consumers are not only limited to improved, customised products with enhanced quality, but include smaller ecological footprints for production, thus enhancing the sustainability of process industries,' says Gerlinger. 'The project improves yield and increases process efficiency, strengthening the international competitiveness of EU industry.'

Project details

- Project acronym: **RECOBA**
- Participants: **Germany (Coordinator)**, Norway, UK, Czechia, Spain, Poland
- Project N°: 636820
- Total costs: € 5 999 346
- EU contribution: € 5 999 346
- Duration: January 2015 to December 2017

See also

Project website: https://www.spire2030.eu/recoba
Project details:
https://cordis.europa.eu/project/rcn/193424_en.html

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