Online classification

The real-time online data can be collected per batch. This gives a more accurate overview of the quality variation per lot. The decision when to release the produced lot, based on a calculated weighted average, is called online classification. This process is gradually being implemented throughout Borealis.

Statistics Summary

- Average: 5.72
- Cp: 3.077
- % < LSL: 0
- St. dev.: 0.11
- CpU: 3.929
- % > USL: 0
- X-min: 5.57
- CpL: 2.225
- % in spec: 100
- X-max: 6.14
- CpK: 2.225
- LSL: 5.09
- N datapts: 188
- LCL: 5.4
- W.mean: 5.72
- W.std.dev.: 0.11
- USL: 7
- LOT specifics: B2-6013 RD735CF
- Vol (tons): 241
- Conf. fact: 100
- Start fil: 1/5 8:41
- Stop fil: 1/5 16:41

An example of a statistical report from MFR measurements at the Beringen PP2 plant.

Borealis and Borouge are leading providers of innovative, value creating plastics solutions. With more than 40 years of experience in polyolefins and using our unique Borstar® technology, we focus on the infrastructure, automotive and advanced packaging markets across Europe, the Middle East and Asia Pacific. Our production facilities, innovation centres and service centres work with customers in more than 170 countries to provide materials that make an essential contribution to society and sustainable development. We are committed to the principles of Responsible Care® and to leading the way in “Shaping the Future with Plastics™”.

Manufacturers today need to make ever-improving products even faster. At Borealis we help our customers meet these continuously higher market demands by pushing the boundaries of our polymers. But we do more than that: higher quality demands also require a true step change in quality control.

In traditional quality control, process variability of polymer properties is tracked by checking the regular final blend and through process and spot sampling. With the increase in throughput and more stringent consistency requirements, this approach has reached its limits.

Today, Borealis monitors the main quality properties online: tacticity indicators (xylene solubles, heptane insolubles, decane solubles), copolymer content for polypropylene (PP), density for polyethylene (PE), gels and contaminants determination and rheological properties.

The choice for online technology is a consistent strategy in Borealis plants and joint ventures, with several solutions already implemented:
- online NMR (Progression, USA);
- online NIR (Brimrose, USA);
- online rheology (Göttert, Germany);
- online gels and contaminants determination (OCS, Germany).

A dedicated team for Online Polymer Analysis (OLPA) supports the installation and follow-up of these instruments throughout Borealis.
Gels and contaminants measurements

Determining the level of gel (or fish eyes) and/or micro-contaminations are crucial quality parameters for the Borealis Film and Wire & Cable businesses.

The FSA100, developed by OCS, is a modular inspection system for use in laboratories and online in production. The film quality is assessed opto-electronically with high resolution line cameras and the appropriate illumination technology.

A higher resolution on the camera, a calendric unit, a marking unit and a cutting/sorting device take quality control a huge step forward. The system is used in Film & Fibre plants as well as for measuring the cleanliness of insulation material in Wire & Cable.

Because the concept is modular, it allows different equipment like APLAIRS (FTIR), thickness measurement, gloss measurement or haze measurement to be used in an integrated way within the system.

Pellet contamination and appearance

Borealis uses the PA66 from OCS for quality control and online instrumental pellet analysis. It has allowed us to standardize the reporting of pellet shape and size throughout all locations.

The online application is used in Wire & Cable to optimize production cycles and will be installed from the start-up in our new PP plant in Burghausen. The software stores defects and deviations in pellet size or shape, so they can be used for reference to allow faster trouble-shooting later.

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Online NMR

Borealis has been using low resolution online Nuclear Magnetic Resonance (NMR) technology since 1995 (Progression - USA). It controls important polyolefin quality parameters like xylene solubles, decaline solubles, total ethylene content as well as density in polypropylene and polyethylene processes.

The NMR has picked up and/or confirmed process disturbances on many occasions, avoiding plant shutdowns and improving product consistency. Thanks to the extremely high operability values of the online NMR’s software and sampling, there is a general feeling of trust in the application of this technology on both Borstar and licensed polyolefin processes.

Online rheology, online Melt mass Flow Rate (MFR) and Molecular Weight Distribution (MWD) indicators

Borealis uses Göttfert dual die RTS-TD9705 rheometers in its main extruders to monitor the molecular weight distribution as well as the MFR of the produced material in real time. These instruments are mainly used for process control and to keep an eye on the MFR during visbreaking using peroxides.

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Online polymer analysis in Borealis: a step change in process and quality control

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