

# SYMPOSIUM 2015

## EFFICIENCY MEETS FLEXIBILITY<sup>2</sup> & INNOVATIONS IN GALA FORM™



On September 8 and 9, 2015, GALA Kunststoff- und Kautschukmaschinen GmbH of Xanten (Germany) held its 6th Gala Symposium. More than 120 interested international participants out of 19 countries around the world followed presentations on the subjects of efficiency and flexibility in compounding held both by members of the Gala team and by independent guest speakers from the plastics and plastics machinery industries. The conference also included live demonstrations of the in-line crystallization of biopolymers and the processing of tacky polymers, masterbatches and expandables.



Fig. 1 Theoretical lectures



Fig. 2 Practical demonstration

The objective was to present efficiency solutions and ideas that can be easily implemented by compounders, recyclers, masterbatch and plastics producers to boost the efficiency of the existing systems in their own operations. The speakers reported on the state of the art as regards the implementation of flexibility-boosting solutions and the cost-efficient production of plastics in a wide range of applications.

Apart from a description of the measures already taken today by the attending suppliers to design flexible equipment and enhance the capability in cost-sensitive applications within the given economic constraints, the symposium had the ambitious aim of generally highlighting innovations in the wide field of plastics processing. The theoretical analyses were complemented by detailed studies of various system suppliers with a focus on long-term cost-efficiency, flexibility in equipment setup and layout, application characteristics of the technology and the resulting potentials for the future.

During the practical demonstrations, various pelletizing processes were shown both simultaneously and successively on all four extrusion lines in the Gala Technical Center. Particular benefits of the Gala underwater pelletizing technology compared with other processing techniques were highlighted: the high degree of automation resulting in reduced manpower requirements at the machines and the simple, automatic and risk-free starting and stopping of the process even in situations approaching the processing limits. Not only the engineering innovations chosen by Gala for the demonstrations but also the presented processes themselves attracted keen interest among the participants so that it sometimes became quite crowded around the pellet containers after the shut-off of the lines.



Fig. 3 Participants in the Gala Technical Center

One of the presented processes was the production of PLA pellets including the in-line crystallization of these pellets without any input of external energy. For this demonstration, Gala had installed the entire process chain including vibrating section and dwell time silo, allowing sufficient crystallization time even for extremely slowly crystallizing products. The spherical pellets were produced by a Gala underwater pelletizing system combined with a downstream Gala CPT (Crystalline Pellet Technology) process with air injection. Crystallization of these pellets was ensured by the controlled product-specific water temperature. The PLA pellets left the Gala centrifugal dryer at a temperature of more than 115 °C which provided sufficient internal heat for the direct crystallization.



Fig. 4 Amorphous PLA pellets



Fig. 5 Crystalline PLA pellets

The participants of the symposium were able to witness the transition from the amorphous to the crystalline state as the pellets independently changed their appearance from transparent to whitish. Not only were they impressed by the simplicity of the process and the resulting economic advantages, they were also able to satisfy themselves that this innovative technology even allows the crystallization of extreme PLA types over several hours without any input of external energy.

Another demonstration in front of a live camera was the pelletizing of a halogen free flame retardant (HFFR) compound. In this application, particular emphasis was placed on the pellet shape and uniformity as well as residual moisture and the generation of dust. The setup was used to show the process of the pellet formation in the water box and during the operation. This example also served to demonstrate that—contrary to general expectations—underwater pelletizing also permits the production of cylindrical pellets.



Fig. 6 HFFR pellets



Fig. 7 Start-up material downstream of the MCD

Apart from the visualized pellet formation process, the attendees were highly interested in the Gala Melt Conditioning Device (MCD), which was shown at this line and attracted particular attention during the startup. The MCD prevents the formation of large blocks or lumps of scrap material by cutting the melt into smaller portions directly as it emerges from the polymer diverter valve. The participants soon appreciated the benefits: The smaller portions are not only easier to handle but also reduce the risks for the operators since they can be easily cooled and safely removed from the line e.g. for subsequent recycling.

Apart from these two pelletizing processes, micro-pelletizing was shown on two additional laboratory systems. On one system, highly uniform masterbatch micropellets were produced while the other was used to demonstrate the production of EPS micropellets in Gala blue which were subsequently expanded so that the participants could see the cellular structure produced in this process.

The first day of the symposium was rounded off by a more in-depth discussion of the subjects of efficiency and flexibility and then Gala invited the participants to a Lower-Rhine style Oktoberfest under the motto “Innovation meets History”. Here, the guests first had an opportunity to test their own skills and afterwards enjoyed good food and drinks while discussing and evaluating what they had seen and heard during the day.

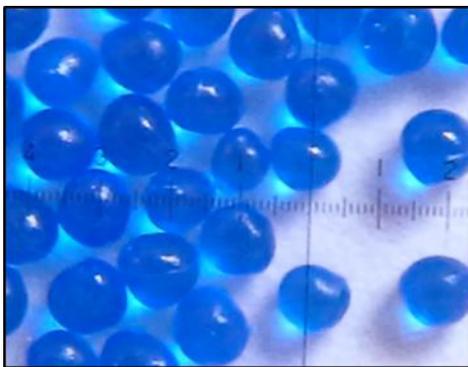


Fig. 8 EPS micropellets



Fig. 9 Visualization of the pellet formation

The second day of the symposium started off with a demonstration of the pelletizing of a tacky TPU of relatively low viscosity. The special Gala tools used for this presentation were the Heat Flux die plate to ensure a wide processing window and the integration of the Flow Guide in the water box for use in combination with knives of a corresponding geometry. With the assistance of an expert in the processing of tacky materials, the benefits of Gala underwater pelletizing systems for such materials were identified already during the demonstration. For instance, it was pointed out that pressure sensitive and hot melt adhesives but also bitumen and/or chewing gum can be processed not only with particular efficiency but also with an extremely low energy consumption.

At the same time, PVC mini-pellets were produced on the second system in the Gala Technical Center, again with the MCD and the pellet observation facility. An especially

fascinating element of this demonstration was the live presentation of the total stop of the material infeed for approx. 20 seconds, which gave the attendees an opportunity to observe the process of freezing and the resulting pellets. As this proved—or disproved—many of the theories surrounding this phenomenon, this was a demonstration that was particularly appreciated by the participants.

Also the two Gala LPU laboratory units were in operation on the second day, this time with a focus on non-standard pellet shapes. Line #3 produced star-shaped pellets of a highly filled compound, while line #4 was used to demonstrate the production of hollow pellets. The Gala process engineers described potential applications of pellets of such shapes and several attendees gratefully filed these options for their own future reference.

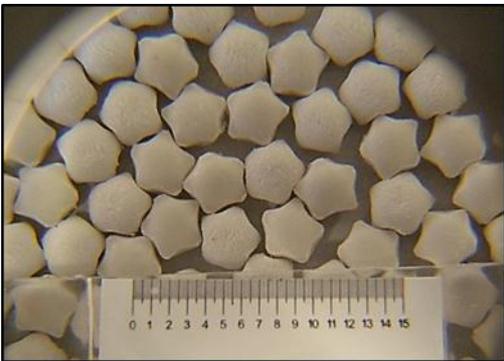


Fig. 10 Star-shaped pellets



Fig. 11 Hollow pellets

Apart from the demonstrations, Gala was able to show a number of machines in various stages of completion. Of particular interest was the variety of the state-of-the-art production lines, some with top mounted (TM) pelletizer, that incorporated the latest developments of a number of components. In the modern and well-equipped production hall, the guests were also able to see what efficient manufacturing engineering means at Gala. They were quite impressed by the comprehensive test series typically carried out by Gala before the delivery of components to ensure smooth and fast commissioning of the equipment in the field.



Fig. 12 TM pelletizer

Gala's own innovations during the past three years, both in the field of underwater pelletizing and in the field of drying, had again been quite comprehensive, so the technical papers had to focus on the most recent experience with the new developments. But the speakers were available after the presentations and demonstrations to answer specific questions, and also the exhibited displays provided opportunities for further information. Some examples of these innovations were:

- the successful **pelletizer model EAC** (Electronically Advanced Cutter) with rotary clamp and fully automatic blade advance including four variable modes
- the **Heat Flux die plate**, which was for reduced pressure loss at low energy consumption and a wide application range and which is now also available for NHF die plates, allowing full interchangeability of the die plates
- the **Continuous Band Filtration (CBF)** of the process water, the benchmark of reliable continuous filtration, and

- **EFLEX®**, the successful overall concept for a machine that permits frequent changes of material, color and product even in case of extreme challenges. With its modular design and the adaptability of the equipment, it combines all of the above-mentioned successful components for maximum performance, integrating the two apparent opposites of efficiency and flexibility, as already indicated by the name of the concept.



Fig. 13 HF die plate



Fig. 14 EFLEX®

The guests agreed that the symposium with its combination of technical papers, practical demonstrations and opportunities to exchange opinions and experience with other users and interested parties provides the perfect setting for the mutual information of equipment manufacturers, plastics producers, operators, recycling operations and compounders. Many of the attendees have already become regulars at the Gala Symposium. The guests made full use of the chance to discuss with presenters and other guests, forming their own opinions and taking along future oriented ideas from the papers and the innovations presented on this occasion.

For GALA Kunststoff- und Kautschukmaschinen GmbH, the positive response of customers and other guests during the symposium, not to mention the success of the past 28 years at the location in Xanten clearly show that involving customers and responding to their

needs is the right way to go. The objective has always been and will continue to be the successful delivery of high performing, efficient and flexible pelletizing and drying systems well oriented at the market requirements.

GALA Kunststoff- und Kautschukmaschinen GmbH would like to take this opportunity and express its gratitude to the attending and contributing companies for their unbiased presentations and detailed elaboration of the subjects covered during this Gala Symposium.

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