

# SIMPLY COMPLEX

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**Citation**

Georg Ender  
manager and head of development  
at Müller Kunststoffe GmbH

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## THE NEW ECON UNDERWATER PELLETIZING SYSTEM PROOFS ITS WORTH IN DAY-TO-DAY PRODUCTION



**DI JOHANNES SCHERLEITNER**  
Sales- & Marketing Director  
ECON GmbH

*„Due to the latest improvements of our underwater pelletizer we are proud to offer a flexible and efficient system with a special focus on compounding- and masterbatch applications.“*

**W**eißkirchen/Traun / Austria – 15,000 tons of plastic compounds, 100 of different polymers, 1,000 tons of color and additive pellets, special products such as cork compounds or masterbatches in order to produce antibacterial products. That is Horst Müller Kunststoffe GmbH in Lichtenfels, Upper Franconia.

The range of products is not just large but also extremely varied in terms of output. That is why flexibility, a quick start-up and short operational changes are of high importance. Therefore Müller GmbH searched for possibilities to boost production that could only be realised with the Austrian ECON underwater pelletizer. With meticulous attention to detail in design and construction, the ECON pelletizer guarantees previously unattainable levels of performance and stability. Both companies worked in collaboration to optimize the system with focus on easy and rapid product and color changes. The result is outstanding and represents the base for a whole series of efficient underwater pelletizing systems.

The Horst Müller Kunststoffe GmbH specializes in the production of plastic blends and compounds, which can be individually used according to requirements. Some of the best examples for polyblends, mixtures out of two or more perfectly fitting polymers, are ABS/PA, ASA/PC, PP/EPDM, PC/PBT. Müller GmbH



*ECON's area sales manager Alexander Datzinger (at left) and Georg Ender, manager and head of development at Müller Kunststoffe GmbH, look back on successful co-operation in development: An underwater pelletizing system with previously unachieved operating efficiency and featuring high process stability plus minimum start-up and changeover costs.*

enlarges this range by SBS (styrene-butadiene-styrene), SEBS (styrene-ethylene-butadiene-styrene) and SEPS (styrene-ethylene-propylene-styrene) based compounds, named LIFOFLEX®.

No matter if crystal clear, translucent, natural-colored or colored, LIFOFLEX® can be offered in a broad range of hardness.

In order to reach specific application features material compounds are completed with compounded additive batches. Georg Ender, manager and head of research department states:

“Our customers do not just require compounds with standard additives, such as UV-stabilizer, lubricants, filling media or color pigments, but they wish special solutions to create new products.

One example is an antimicrobial masterbatch, in which active molecules, so called sterions, are integrated in the material.

Application areas for these materials are hygienic, harmless components for public swimming places and hospitals. Recently we also offer plastic compounds with organic substances like wood or cork. All products share the same essential requirement to enable an economic production of smaller amounts with quick changeover times.”

Horst Müller Kunststoffe GmbH and ECON set the goal to reach the maximum flexibility and productivity of the system. There are many advantages unique to ECON pelletizing systems including the die plate's construction which provides optimum thermal stability and it is curial during the start-up and continuous operation. ECON's co-operation with Horst Müller Kunststoffe GmbH put a focus on the utmost plant flexibility. Therefore the prior aim was the cleaning effort's minimization related to the process water system. In more detail the centrifugal dryer's cleaning should be as fast as possible in terms of product changes.



# ECON-DIE HEAD'S THERMAL SEPARATION

*The operation's crucial criteria for successful underwater granulation systems is represented by the heat balance control in the die head. In addition it is necessary to be aware of the heat transfer from the die plate to the process water.*



*The components of an underwater pelletizer are combined as compact functional modules consisting of pelletizing unit and pellet dryer. During system design, particular attention was given to easy operation and servicing.*

If heat transfer is too big, particular nozzles can freeze. The lower flow cross-section leads to a higher melt pressure, which again can result in lower granule quality. As a consequence production would have to be stopped and a new start-up would be necessary.

This is certainly not the case with ECON underwater pelletizing systems whose patented constructions differ from competitors through an especially efficient insulation between melt nozzles and die plate. This insulation is of high importance, since process water, with which

the cut granules are transported to the dryer, is in direct contact with the die plate. At this point enormous differences in water- and melt temperature arise of up to 250° C.

*The pelletizer housing is coupled to the die plate by means of quick action clamps. The die plate (above) with special wear protection is thermally insulated in the nozzle head.*



Depending on thermal insulation levels, a different heat flow occurs between the die plate and nozzles. The bigger the area of contact between nozzles and die plate, the more heat is transferred, which results in a tendency for "freezing" of material in the nozzles and wasted heating energy required to balance the heat loss.

Nozzles, embedded in an ECON system, are thermally almost completely separated from the die plate with an absolute minimal contact area to the cooled side. Subsequently the heat loss to process water is avoided. In the ECON design the heat stays where it should be, melt strings stay at a stable temperature across all nozzles.

This uniformity of temperature through the nozzles also results in minimizing the back pressure required and ensures excellent granule quality and minimal stress on the material.

The excellent thermal behaviour of the ECON pelletizing systems has the additional benefit of saving up to 70% of heat capacity. It goes without saying that as the heat energy does not get transferred into the process water, no energy has to be extracted from the process water!



Fig: ECON GmbH – Weißkirchen/Traun

## REDUCED START-UP SCRAP



*The prevention of dead spots, gaps and an off-peaking housing floor are the main features of the easy maintaining centrifugal dryer.*

**B**esides lower energy consumption and the optimum process stability, thermal insulation brings additional advantages, like the noticeable reduction in start-up scrap. A bypass duct, as is required with conventional plants, is not required. Mr. Ender summarizes his experiences: "It surely was astonishing to watch the ECON system's efficiency during the start-up process. Without any risk of freezing we could start the process with just 20 percent of normal output; no necessity of a second or third start-up due to a blocked nozzle.

The result is represented by 50 to 70 percent less start-up scrap in comparison to competitors' systems. Also the material's loss and the effort for the scrap's recycling are negligible."

Especially ECON pelletizing systems with a higher output benefit from the above described start-up efficiency.

Let's demonstrate a vivid example: Assuming start-up of an underwater pelletizer with an output of about 4,000 kg/h. In order to start a 4,000 kg/h pelletizer with the whole throughput, 66 kg waste per minute would emerge. If the same plant started with only 1,000 kg/h only 16.6 kg waste per minute would have to be handled. That is just one quarter of the original waste, which represents an enormous saving potential. After start-up phase the ECON pelletizer is raised up to full throughput completely automatically. ■

## SIMPLE CHANGEOVER

*Easy handling casing units made of plastics, filter segments with snap closings and an all around accessibility are premises for the centrifugal dryer's quick cleaning.*



**E**asy and quick changes from one product to another are of high importance in terms of money, if production of smaller amounts and flexibility are one's strengths, such as for the Horst Müller Kunststoffe GmbH.

It is not the problem of cleaning the extruder or the die head. In fact it is the remaining granule's meticulous elimination from the centrifugal dryer and the process water system.

That is why the optimization of improved accessibility and the elimination of dead spots were at the core focus for both companies. Mr. Ender states: "We longed for an easy cleaning process by just washing the

dryer out with water. Remains of granules in angles or gaps were not acceptable. ECON just listened to our needs, and then optimized their system, which resulted in the cleaning cycle reduction from 30 minutes to 5 to 10 minutes"

Finally Mr. Ender sums up: "Although we have been in the compounding business for more than 40 years, and have always endeavored to improve the processes, ECON succeeded to surprise us with the ECON underwater pelletizer's enormous saving potential. Now it is up to us to make use of ECON's potential, by gradually exchanging the pelletizers with the new efficient ECON underwater pelletizing system." ■

**Further information:**

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**Fa. HORST MÜLLER KUNSTSTOFFE GmbH & Co KG** was founded in 1965 in Lichtenfels/ Upper Franconia, Germany, as a compounding company for the production of PVC blends, has specialized in the development and production of customized soft compounds since 1975. TPE/TPO and TPE-V are offered under the brand name Lifoflex. In 1998, the production of TPU compounds (Lifoprene) was started, and in 1999 the manufacture of masterbatches and additives was begun. With a range of injection-moldable thermoplastic/cork compounds (Lifocork) based on TPE, TPO, TPU and soft PVC that is available since 2003, a highly versatile basic material for innovative products is on offer. Annual production is 15,000 tons, and sales are worldwide. Since 1999 the company belongs to the Rowa Group in Pinneberg, Germany. [www.rowa-group.com](http://www.rowa-group.com) ■

The logo for ECON consists of the word 'ECON' in a bold, black, sans-serif font. The letter 'O' is replaced by a red square. The text is centered within a grey, trapezoidal shape that tapers at both ends.

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Founded in 1999, **ECON GmbH** specializes in the development and manufacture of peripheral equipment for extrusion plants. The center of activities is the manufacture of pelletizing plants for processing both virgin and recycled material, and also for recycling plants. A major part of the product range consists of underwater pelletizing plants, pellet drying stations complete with the water treating equipment, as well as screen changing devices for melt filtering. The range is completed by a selection of pyrolysis ovens for the gentle thermal cleaning of plant components. ■

FUTURE IS NOW