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Spritzgiessautomaten

Servo – Drive

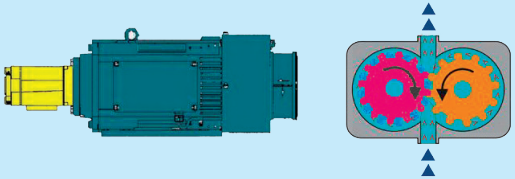
“The right response to rising electricity prices is energy efficiency“

Annegret-Cl. Agricola / Department Head of the German Energy Agency

High-tech solutions should not be compared with low-tech products – therefore, an injection moulding machine with servo drive is something completely different than machines which are driven by an electronically controlled variable displacement pump or by even older technologies.

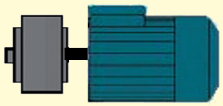
The differences in terms of performance, precision and dynamics are enormous. On the following pages you will find more information about the differences and the advantages of our servo drive technology compared with other technologies.

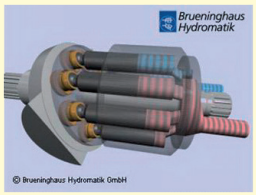
Servo–Drive



- Constant flow volume per revolution. The control is performed via change in speed. In less than 70 ms, the maximum flow rate is achieved from standstill.
- Higher dynamics of the servo drive without startup losses for optimal positioning accuracy.
- When no pump capacity is required, the servo motor switches itself off and consumes no energy.
- Energy savings up to 50 % are possible with the servo drive. Less energy supply means less heat generation. Oil cooling is mostly not needed.

Drive with electronically controlled variable displacement pump (DFE)





- Variable flow volume that is controlled via adjustment of the tilting plate. The DFE pump needs approx. 150 ms from standstill to maximum speed.
- When no pump capacity is required, the DFE pump switches to idle mode. This results in a bit more sluggish dynamics and therefore longer cycle time.
- Also the energy requirement in idle mode is higher than with the servo drive, which needs no energy in inactive phases.

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The main advantages of the servo-motor pump drive are:

- Up to 50 % reduced energy requirement
- Less connection value compared with electromechanical drives
- 10 % higher speeds and higher dynamics
- Lower thermal load, therefore less energy input in oil
- Reduction of noise emission up to 20 %
- Higher dynamics of the servo drive reduce the cycle times

What benefit do you have with the servo drive?

- High saving potential due to lower energy input (see page 6)
- Lower maintenance costs
- Better part quality by higher degree of reproducibility of the process
- Longer lifetime of the hydraulic oil because of reduced cooling capacity
- Faster startup times due to less heat requirement during heating
- Reduced CO2 emission (approx. 600 g / kWh) because of lower energy requirement

The servo-motor pump drive with highly dynamic servo motor and fixed displacement pump is energetically the most favourable solution of all hydraulic drives.

The differences in energy consumption are enormous.

Servo–Drive

Consumption measurements show the advantages

BOY 25 E	BOY 35 E	BOY 35 E VV	BOY 60 E	BOY 100 E
Drive: 0.22 kWh	Drive: 0.45 kWh	Drive: 0.49 kWh	Drive: 0.80 kWh	Drive: 0.98 kWh
Heating: 0.60 kWh	Heating: 0.61 kWh	Heating: 1.20 kWh	Heating: 1.18 kWh	Heating: 1.12 kWh
Total:* **0.82 kWh**	Total:* **1.06 kWh**	Total:* **1.69 kWh**	Total:* **1.98 kWh**	Total:* **2.1 kWh**
Competitor: 2.40 kWh	**Competitor: 2.51 kWh**	**Competitor: 3.09 kWh**	**Competitor: 7.70 kWh**	**Competitor: 10.2 kWh**
Material: PS	Material: PVC	Material: ABS	Material: PE	Material: PA 6 30% GF
Shot weight: 15.6 g	Shot weight: 5.8 g	Shot weight: 10 g	Shot weight: 33.5 g	Shot weight: 45 g
Cycle time: 29.0 s	Cycle time: 23.0 s	Cycle time: 38.0 s	Cycle time: 14.8 s	Cycle time: 34.8 s

* depending on the respective application

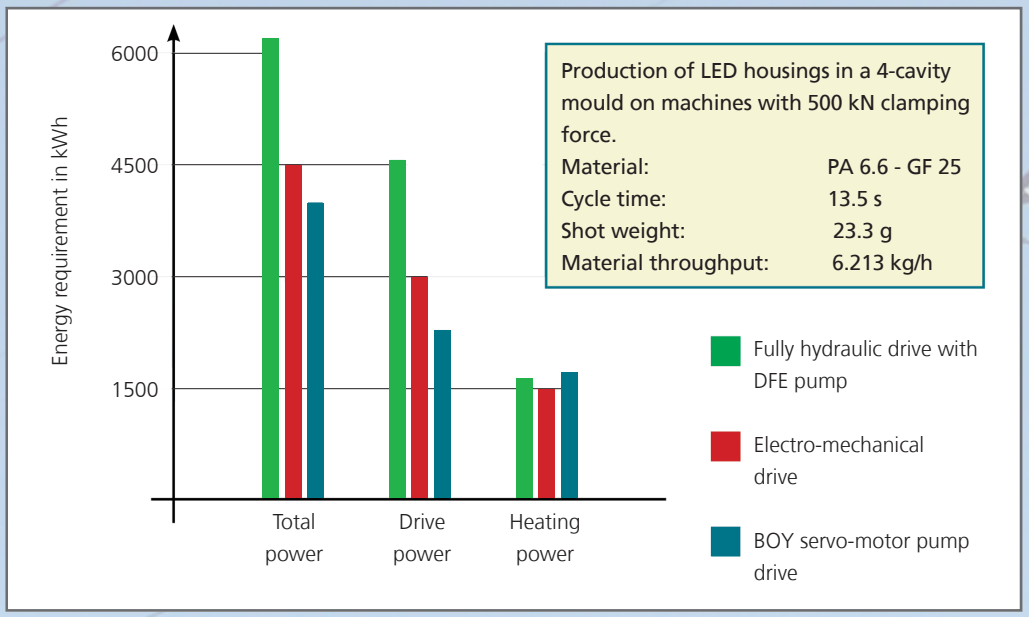
Dipl. Ing. Michael Greive
Greive GmbH & Co. KG
Ottmarsbocholt
www.greive.de

"For more than 3 decades we have been using BOY injection moulding machines.

We were so impressed with our first BOY E-Series machine that we immediately ordered more machines of this E-Series machines.

The low energy consumption, the high precision, the quietness and the reduction of cycle times exceeded all our expectations."

Drive systems in direct comparison



"We take every possible cost-saving opportunity in our production. The constantly increasing energy and raw material costs force us to use the most efficient machines and technologies.

The BOY E-Series machines precisely meet our expectations. The energy consumption has been reduced by 50%. This fact further confirms that the BOY E-Series machines are helping us to head in the right direction."

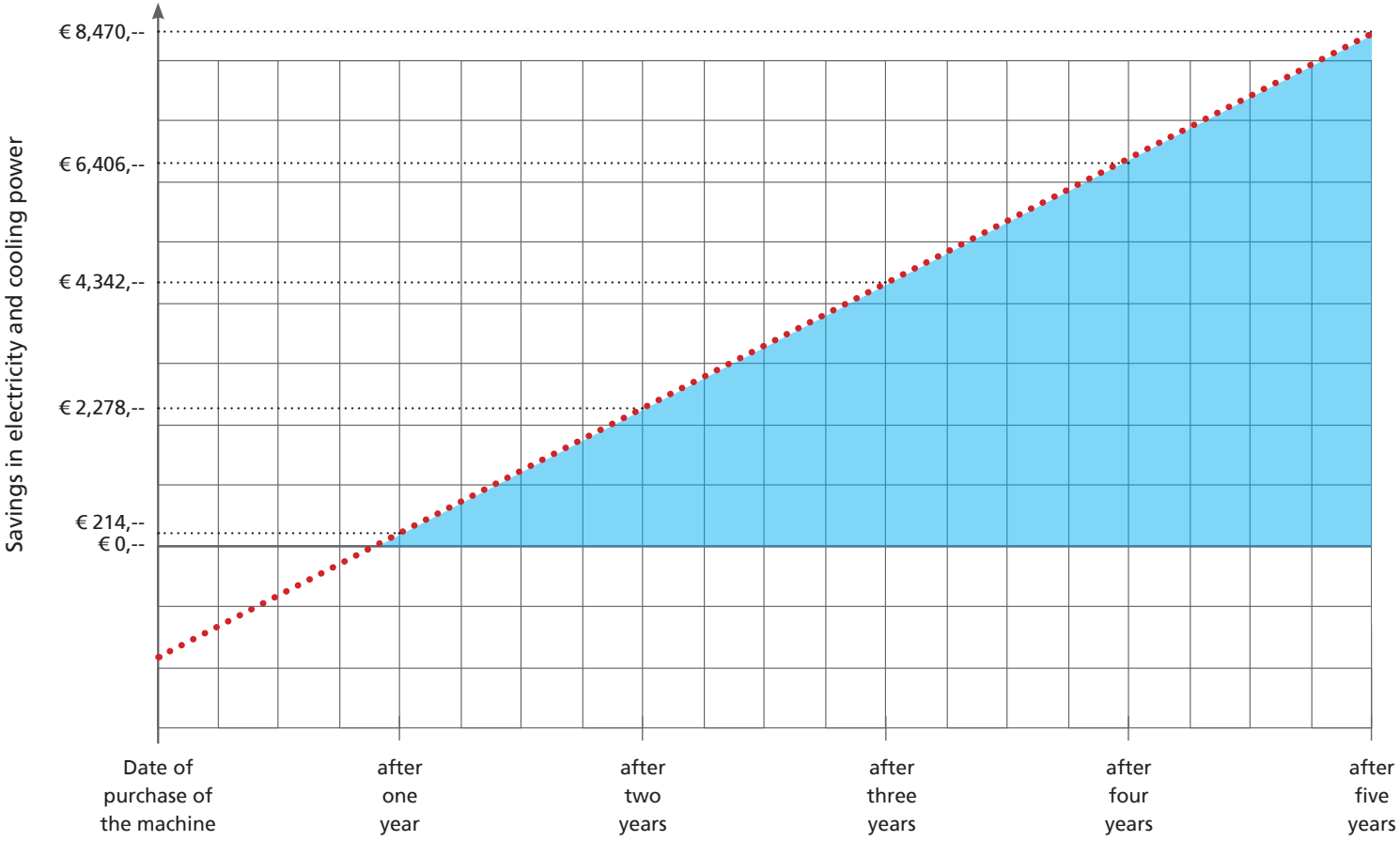
Ulrike Steiner
CENA Kunststoff GmbH
Battenberg
www.cena.de

Comparison measurements from practice

	Machine with idle mode pump (DFE)	**BOY 100 E** (Servo-Drive)	Savings
Drive energy	**6.300 kWh**	**1.850 kWh**	**70 %**
Heating energy	**2.880 kWh**	**2.880 kWh**	**0 %**
Total energy	**9.180 kWh**	**4.730 kWh**	**48 %**

Saving potential of the servo drive compared to a DFE pump

(Injection moulding machine with 500 kN clamping force / 6,000 operating hours per year / electricity costs of € 0.10 / kWh)



By using the servo-drive, the annual savings began at the 11-month timeframe.
This equals a saving in the fifth year to € 8,470,--.

After nine years – the most economic time to replace machines –
the saving potential can increase to € 16,726,--.

Servo–Drive

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René Weiner
Managing
Partner,
Technical Area
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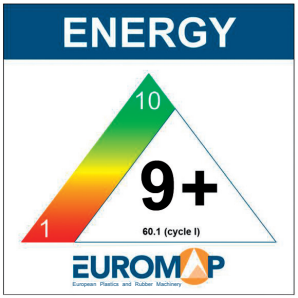
"Since 1968 we have always favored using BOY injection moulding machines in our production. We have always been impressed with their on-going technical innovations and good service.

We are especially impressed with the BOY E-Series machines with the servo-drive. The energy savings, precision, dynamic flow and quietness of our first E-Series machine was so convincing to us that we have since purchased and added seven additional BOY E-Series machines to our production."

Excellent efficiency according to EUROMAP



The specific energy use under the terms of EUROMAP specifications for a BOY 100 E with 1,000 kN clamping force is **less than 0.32 kWh / kg** material throughput (total 13 kg material per hour).

The high **classification 9+** as per EUROMAP 60.1 for the BOY 100 E corresponds to a peak in this clamping force range.

Energy-efficient BOY injection moulding machines with servo drive are the right response to rising electricity costs.

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More efficient production with the BOY servo drive

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BOY – App
free of charge at
http://app.dr-boy.de

All BOY injection molding machines – from the ultra compact BOY XXS with a clamping force of 100 kN, through the insert moulding machines, to the BOY 100 E with a clamping force of 1,000 kN – are highly precise, reliable and extremely economical. Low machine hour rates are the basis for an even more cost-effective production of parts.

You can also profit from this advantage. We would be pleased to inform you.
For further information please contact us via phone or e-mail.

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Reserve the right to modify machine specifications E 05/18 A 000 759