

The top image shows an industrial environment. On the left, a Siemens control panel with a monitor displaying a graphical interface is visible. To the right, a large green KraussMaffei injection molding machine is in operation. The background shows a factory floor with various equipment and overhead lighting.

Solutions with SINAMICS servo pump – reference

# Häfner & Krullmann GmbH goes the energy efficiency route

## Modernizing hydraulic injection molding machines slashed their energy consumption by 48%

Häfner & Krullmann GmbH from Leopoldshöhe close to Bielefeld, Germany, has been developing, designing and manufacturing molded parts from thermoplastics for over 60 years now. Europe's leading manufacturer of spools also manufactures containers for the widest range of applications in environmental protection. Keeping in trend with energy efficiency, the company modernized four injection molding machines which were still in good condition mechanically, but where the control and drives no longer represented state-of-the-art technology. The old swivel angle and fixed displacement pumps with induction motors in the injection molding machines, which had proven themselves for over 20 years, were replaced by new controlled servomotors from Siemens, which specifically match the process. These servomotors drive hydraulic pumps that are also new, manufactured by Voith Turbo H + L Hydraulic GmbH & Co. KG.

Coordinated with the manufacturers, suitable combinations were specified for the machines. These combinations each comprise an internal gear pump from the IPVP series and a SIMOTICS M-1PH8 compact synchronous motor. This motor is a new development, which from an energy-related perspec-

tive, represents the latest state-of-the-art technology. Each of the servomotors is driven from a Siemens SINAMICS S120 converter equipped with the SINAMICS Control Unit CU310 – specifically designed for individual axes. The use of high-quality, energy-saving oil with a viscosity of 32 from ExxonMobil, which was tested for the first time in this combination, brought additional energy savings. At the same time, as a result of the servo operation, the hydraulic oil temperature was able to be reduced from 45 °C down to 35 °C. In the servo mode adapted to meet the specific requirements, the heat transfer to the hydraulic oil was able to be reduced so that cooling is practically no longer required.



[siemens.com/servo-pump](https://www.siemens.com/servo-pump)

Positive spinoff: "This fuel-efficient oil drastically increased the lifetime of the extremely fine mesh filter used by Häfner", explained Klaus Lange, operations engineer with Häfner & Krullmann, also responsible for environmental issues. The combination of all of these measures meant that the retrofit paid for itself within just a few years. Another positive spinoff is that all of the machines are significantly quieter.

### Efficient use of energy

The modernized systems only use as much energy as actually required by the injection molding process in the various phases (closing, injecting, post-pressure, dosing, cooling, opening, ejecting). The largest energy saving effect is in the cooling and non-operational times. This is because the servo-driven pumps are essentially at a standstill and only use very little energy. With the previous combination, they always had to continuously operate at a reduced power (15–20%). A power measuring device was connected via PROFIBUS to monitor the success. This also supports setting-up technicians, so that they can directly understand the impact of certain machine settings and in turn develop a feeling for energy-efficient injection molding.

### Established standards create production safety

The core of this solution – based on standard components available worldwide from Siemens – is the "Plastics package" IMH 3300, a complete system for hydraulic injection molding machines. It comprises updated I/O and operating panel with preconfigured user interface for injection molding.

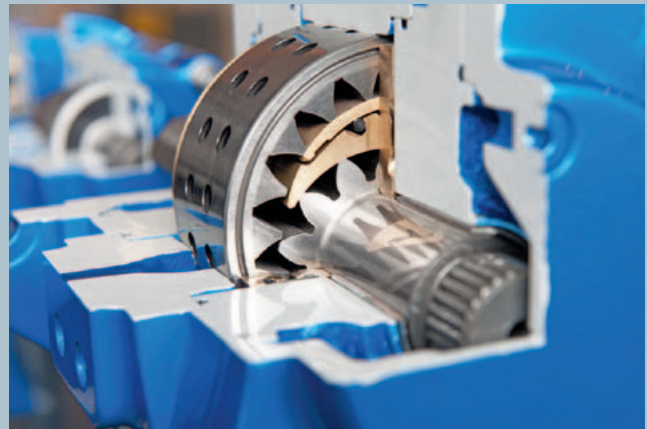
The system integrator IIS UG precisely adapted the standard user interface – developed by Siemens – to address the requirements of the Häfner machines, and also implemented the control of three core-pulling units (maximum of eight are possible). With the appropriate preliminary work and organization, also from the side of the operating company, a retrofit such as this only takes up to three weeks.

### Benefits as a result of the retrofit

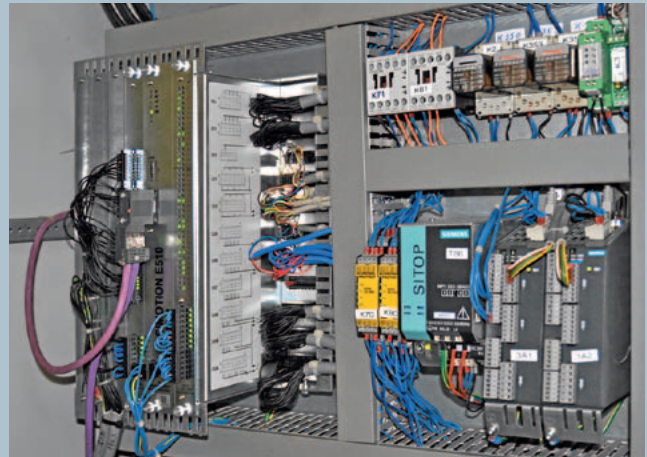
- Energy usage slashed by 48%
- Simple system integration
- Lower complexity
- Simple preventive maintenance
- Enormous reduction in the noise level

### Häfner & Krullmann GmbH

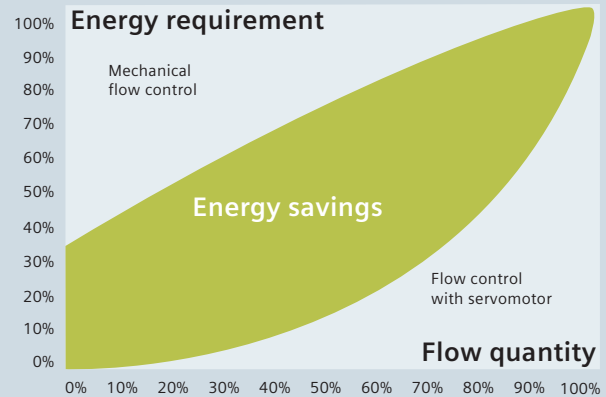
Plastics processing  
Krentruper Strasse 7–15  
33818 Leopoldshöhe



Inner gearwheel pumps from Voith



New cabinet after the retrofit



Servo pumps save energy as a result of the application-specific speed control

This QR code leads you straight to the SINAMICS servo pump video!



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