BOY®

Spritzgiessautomaten

Innovative into the Future – BOY Injectioneering

50 1968 2018

Competence brochure

Contents

Spritzgiessautomaten

Innovative into the Future – BOY Injectioneering

Injection moulding machines from BOY – **50.000 times quality in 50 years.**

The success story of BOY began in 1968 , with the introduction of the BOY 15 to the market. The model convinced the specialists with an innovative, fully hydraulic **two-platen clamping system**, an **unique compact construction** and **easy operation**. In the following decades, BOY also remained pioneer in the sector of technological development of **injection moulding machines in the clamping force range up to 1250 kN** and promoted the optimization of the **integration of proven and the most modern technology.**

Meanwhile, as a result of the continuous market-orientated research and consequent further development, **nearly 50.000 injection moulding machines** have left the works in Neustadt-Fernthal and convinced thousands of customers worldwide.

Our designs, harmonized and perfect for the specialized application, **well-conceived down to the smallest detail**, distinguish themselves by exceptional **precision, reliability** and **economical efficiency**.

Using the most **modern software**, accurately controlled, **compact** and **economical** – the actual generation of the BOY injection moulding machines are thus presented, the **most different requirements**, can be met, also diverse special processes and the processing of exceptional materials. We are consistently concidered a trendsetter in the industry based on our innovative concepts.

Experience and innovation – you can also trust BOY with these qualities in the future.

1968
Company founded by Max Schiffer

1974
Affiliated company founded in the USA

1976
Introduction BOY 50

1982
BOY 30 with micro-processor control

1989
Presentation BOY 80

1994
Introduction of the Procan Control; Certification in accordance with DIN EN ISO 9001

1997
Premiere of the BOY 12

1998
Touch-Screen (Procan CT)

2001
Plant extension; More than 30% additional area

2002
Introduction of the BOY 55 and BOY 90

2003
Presentation of the BOY 35 and BOY 35 VV

2005
Insert moulding machine BOY 55 VV

2007
Presentation of the control Procan ALPHA®

2008
BOY E-series with servo-motor pump drive

2009
Ultra-compact injection moulding machines BOY XS and BOY XS V

2012
Procan ALPHA® 2 with PCT-Technology

2013
Presentation of energy-saving EconPlast units

2015
Reciprocating screw plasticizing unit with 8 mm diameter

2016
Benchtop machine BOY XXS

2017
Robot handling LR 5

2018
Company anniversary 50 years BOY

2019
Electro-mechanically injection unit (eSP)

Strength through Concentration

Trendsetting technologies since 50 years

Since the founding of the company in 1968, BOY concentrates on its own strengths: Development and manufacturing of injection moulding machines in the clamping force range of up to 1250 kN. The result of this concentration is a comprehensive range of machines that is used in the most diverse fields of application in numerous industry sectors.

The robust machines enthrall worldwide due to the **greatest reliability, precision and efficiency – Quality Made in Germany.**

Precisely controlled, compact and efficient, so the actual generation of the BOY injection moulding machines are presented. They convince due to **the lowest operating costs, minimum energy consumption values and durability.**

Continuous further development, service-friendly concepts and innovative details also ensure their lead in the market furthermore.

In view of the exceptional durability as well as the low operating and follow-up cost of our machines thousands of satisfied customers benefit from the favourable price-performance relationship
Also in the future, BOY remains true to the guiding principle of their product policy, organization and course of action: **concentration on the essential!**

BOY 15 – worldwide the first injection moulding machine with the fully hydraulic, two-platen clamping system, from 1968.

Innovation and continuity:

The significant design features that have been retained by the BOY injection moulding machines since 1968:

- Cantilevered two-platen clamping system
- fully hydraulic drive unit
- most modern control technologies
- compact construction

Continuity and Know-how also continue to ensure these peak performances for precise control and economic production.

Convincing Advantages

The BOY range

The universal machine concept from BOY:

The design principles of BOY have been proven by 50.000 machines:

Maximum flexibility

The **two-platen clamping system** excels over all other machine concepts, due to the variety of its options – for example, for compact clean room application, automation or integration in manufacturing lines.

Small installation surface

The **compact design** reduces the usual space requirement by nearly one third. Thus, more machines can be placed in the same space.

Optimum production conditions

The **good accessibility** to the machine components, mould and peripheral equipment, as well as handling the moulded parts, reduce setup times and simplify production and maintenance.

Large clamping dimensions

The BOY injection moulding machines attain **peak values for clearance of bar and plates**. Usually moulds one standard bigger than normal in the respective clamping force class can be used.

Flexible application of mould

Comprehensive hole patterns in the platen enable secure reception of many moulds available.

Intuitive control

Touch-Screens with graphical menu guide and ultra-quick screen display ensure **quick control with no errors.**

Easy operation

Handling the BOY injection moulding machines is very easy due to the ergonomic working height, as well as the **good accessibility** of moulds, injection unit and all of the other assemblies.

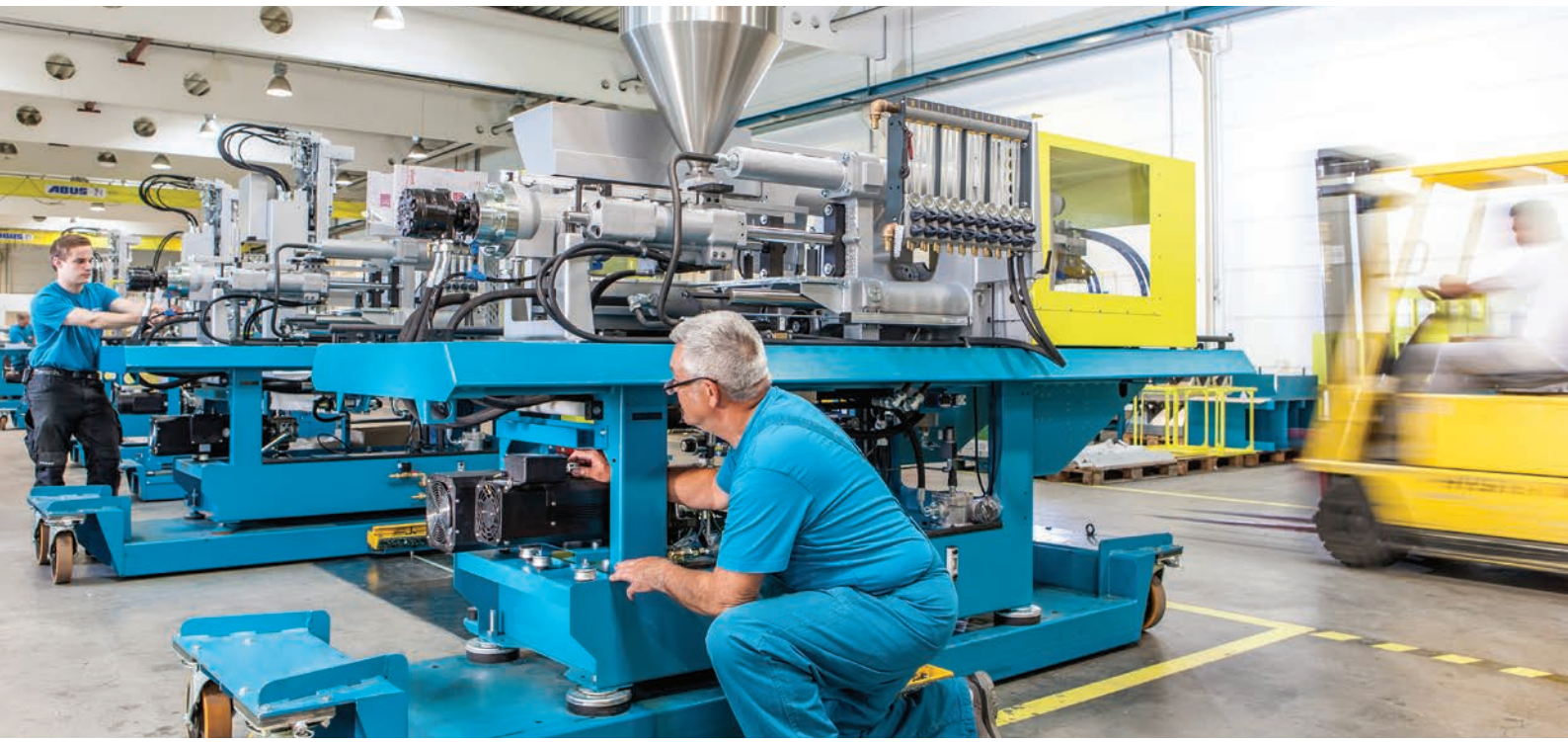
Minimum power consumption

The potential for savings using the BOY injection moulding machines with **servo-motor pump drive** is more than 50 %. Using the **EconPlast** units, the energy required for plasticizing can be reduced by up to 50 %.

Low cooling capacity

BOY injection moulding machines require **less cooling capacity** as comparable systems. Therefore, the costs for cooling are less.

The top model of the actual BOY program: The BOY 125 E with 1250 kN, clamping force, Servo Drive, Procan ALPHA® and EconPlast plasticizing unit, 289.5 cm³ injection volume, clearance of tie bars 470 x 430 mm and 825 mm max. daylight between platen.



The highly modern flexible, flow manufacturing machines are transported to the ergonomically equipped assembly stations on variable carriages.

Made in Germany

Hightech and Know-how

Quality from the beginning

High-quality materials, reliable components and their robust construction ensure the **unique reliability and durability** of the injection moulding machines from BOY.

The manufacture, marketing and service from BOY are certified since 1994 in accordance with ISO 9001, since 2010 in accordance with ISO 9001:2008 and since 2018 in accordance with ISO 9001:2015

Also after use over many years – even using seven days a week continuous operation around the clock – BOY injection moulding machines remain reliable production equipment. This is also expressed in their **high resale value**.
Stringent, systematic checks of all supplies, **the highest quality directives** for the manufacturing sequence, as well as an **extensive practical test over many days** before delivery, ensure the **exemplary level of quality** of BOY.

BOY also sets standards at the beginning by the assembly process: Assembling on the assembly-line, introduced with the founding of the company in 1968, was epochal in mechanical engineering and was consequently adapted to the technological developments and the changing market requirements.

Today, flexible assembling on the assembly-line, with synchronized sequences ensure **optimum material flow, short delivery times and, thus, maximum efficiency.**

Competence and Commitment

The motivation of every individual member of staff to produce to the highest quality has been the decisive factor for the success of the company. Thus, the inclusion of all persons involved in the manufacturing process is the maxim for the understanding of quality of BOY for more than four decades.
Responsibility for the reliability of all injection moulding machines is borne by the staff at BOY. The commitment of an **experienced and motivated member of staff** also secures the quality in the future, on which thousands of customers worldwide trust.

**BOY represents the highest engineering performance and quality work –
Made in Germany.**

Dimensions in the compact class

The range of BOY is convincing

The universal machine concept of the BOY injection moulding machines conform to individual requirements.

The actual range of BOY injection moulding machines in the clamping force range up to 1250 kN ranges from the flexible table–top machine BOY XXS and the ultra-compact BOY XS to the high performance BOY 125 E. It provides **convenient Touchscreen controls and comprehensive versions in equipment** for the different application.
The range is completed by the moulding machines with vertical clamping and injection units, as well as by additional and alternative equipment that can be individually configured.

BOY represents the **high-quality combination of proven and most modern technology**:
The design features consequently used since the company was founded, such as the **compact construction** and **fully hydraulic two-platen clamping system**, are proven in practice and unchanged.

All assemblies – from the clamping and injection unit to the drive unit – are optimally harmonized to one another. The **servo-motor pump drive** provides precise operation, which smoothly operates and is extremely energy-saving.

BOY takes a leading role in the development of the **most modern control technologies**.
The result of the innovative conceptions are the best values with regard to **precision, speed and convenient operation.**
Thus, the BOY injection moulding machines are amongst the most economic and, thereby, the **most efficient machines on the market.**
In addition to the technical aspects, the **minimal space requirement** of all BOY machines is convincing.

The cantilevered clamping system is designed very appropriate for automation. It enables simple adaptation of modern robot systems and other peripheral equipment.

For the optical highlight of each production plant, all BOY injection moulding machines, in their very **challenging design**, are painted in the most modern colour scheme.

BOY makes the difference

- Most comprehensive range of servo hydraulic injection moulding machines up to 1250 kN
- Cantilevered two-platen clamping system
- Efficient servo-motor pump drive
- EconPlast technology
- Economic and efficient operation
- High reliability and operating stability
- Intelligent control software for intuitive operation
- Small installation surface
- Low machine hourly rates

Product overview

BOY has much to offer

Extract from the delivery range:

- Servo-electric screw drive
- EconPlast technology
- Differential injection technology
- Dual pump
- Sprue separating system
- Integral sprue picker
- Integrated removal handling, with approved protective fence
- Plug facilities
- Sliding tables
- Network connection
- Clean room technology
- Processing varied thermoplastic, elastomers and silicones (LSR, solids), thermosetting plastics, as well as ceramics / metals
- Multi–component technology with various injection units (see on the right below)

Type of machine/ clamping force	Injection moulding machines	Insert moulding machines (VV)	Parting line injection (HV)	Parting line injection (VH)
BOY XXS 63 kN				
BOY XS E / XS V 100 kN				
BOY 25 E 250 kN				
BOY 35 E 350 kN				
BOY 50 E 500 kN				
BOY 55 E 550 kN				
BOY 60 E 600 kN				
BOY 80 E 800 kN				
BOY 100 E 1000 kN				
BOY 125 E 1250 kN				

Injection units for multi-component

BOY 2C up to 141.8 cm³ stroke volumes

Our quality features

Injection moulding machines from BOY – for every task, the suitable configuration

Continuity!

- As an owner-managed company, we are also your reliable partner in the future.
- Our specialization in injection moulding machines in the clamping force range up to 1250 kN provide you with greatest Know-how.

Durability!

- The majority of nearly 50.000 injection moulding machines delivered still today carry out their services – and this often in multiple shift, continuous operation.
- High resale values enables you to continuously maintain your BOY plant at the up to date level.

Low service costs!

- Profit from the average ten year experience of our service technicians.
- Utilize the low flat-rate service.
- Only pay for the actual service hour provided – independent of journey times and commuting rates.

Large clamping dimensions!

- Utilize the option – despite smaller requirement of space for the BOY injection moulding machines, to be able to clamp the largest possible standards!
- For the BOY 125 E, daylight between platen optional up to max. 900 mm and distance of tie bars, horizontal up to 470 mm.

Large moulds!

- Comprehensive hole patterns for the BOY injection moulding machines in the platen ensure secure mounting of many sizes of moulds.

More machines on the same space!

- The space requirement of up to 30 % less for the BOY injection moulding machines, ensures you optimum utilization of your production plants.

Hardly any additional space for peripherals!

- No other machine concept as that of the cantilevered two-platen clamping unit gives you more possibilities for automation, integration into the manufacturing lines, local clean room application etc.

Smallest parts!

- You provide where others give up.
- In order to access new markets, utilize the worldwide unique series plasticizing unit with 8 mm diameter.

Intuitive control!

- Reduce your operating and setup times by the intuitive and quick Touch-Screen operation using the Windows-orientated user interface.
- Precision, information and operation – the BOY controls are the market leaders in that for many years.

Economical in power consumption and cooling requirement!

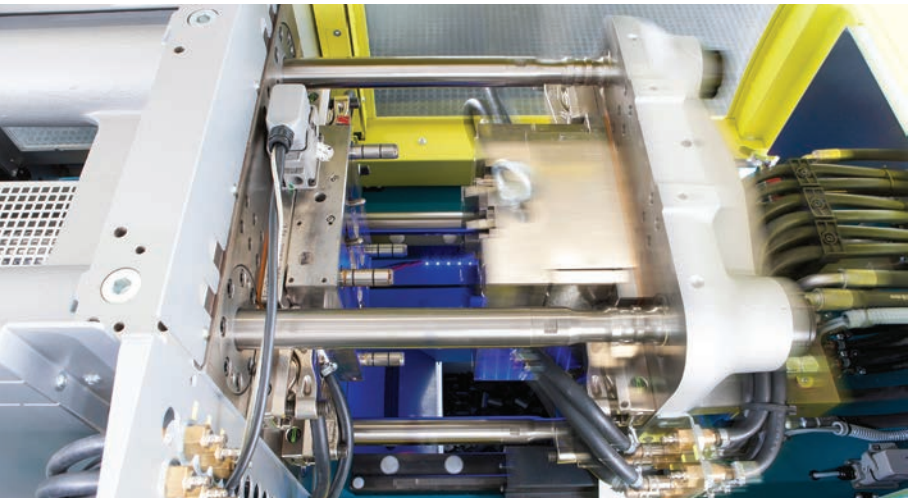
- In comparison to machines with an identical drive unit, the BOY injection moulding machines with servo-drive consumes up to 50 % less energy.
- Using the patent-registered EconPlast technology from BOY, the energy consumption is significantly reduced when plasticizing.
- Extend your production without investment in larger transformer stations or compensation systems.
- Benefit from the efficient hydraulic system and low power consumption of the BOY injection moulding machines with minimum cooling requirement.

Production Hall


BUS 5t

The Two-Platen Clamping Unit

BOY – innovative and compact since 50 years



The two-platen clamping system from BOY requires approximately 30% less space than a three-platen clamping unit. Large distances of the tie bars and platens ensure even the application of large moulds.

The characteristic of all BOY injection moulding machines are the **two-platen clamping units.**

Function and advantages:

- During the clamping motion, triple bearing piston rods pull the moveable plate towards the fixed plate, into which the clamping cylinders are integrated.
  Due to this design, the clamping unit for the BOY injection moulding machines are cantilevered and, provide **great space advantages** compared to the conventional three-platen construction.

- The moving plate is optimally supported by the **precise guides**.
  The plates are prevented from sagging and parallelism of the plates significantly increased.

- By the the local, symmetrical force induction through the bars of the injection moulding machines, which are used as piston rods, it is possible to **uniformly utilize the locking force** with no problem, also for moulds with asymmetric mould nests.

- The very generously designed clearances for the bars and platen enable **flexible manufacturing**, also with very large and complex original moulds.

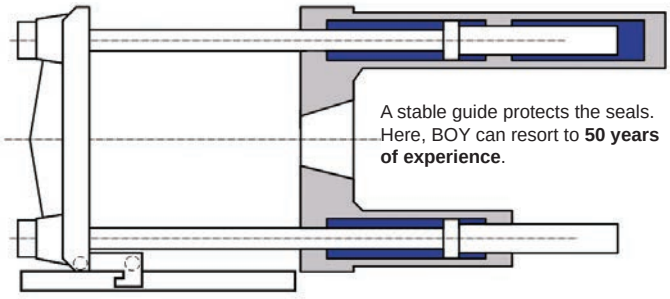
- Coupled automatic adaptation, with a zero point calibration, to the installation height of the mould, as well as the digital selection of the locking force, provide the basis for **optimum setting** of the travel motion parameter.

- The **easily accessible** central ejector, with freely programmable speed, travel, pressure and number of ejection procedures, also enables an intermediate position for start-up.

- The smooth operating safety gates, with corresponding electrical and hydraulic protection, provide the **greatest possible safety standard.**

- Optimum removal of parts in practically **all directions.** In addition to the separable bars for easy installation of the moulds, these can also be installed from below, through the clamping unit – for example, necessary if the ceiling height is low.

Principle of design *of the two-platen clamping system.*
Differential piston clamping systems with three hydraulic chambers provide a stable guide for the bars, whereby, the clearance of the **external guides** is constant.



A stable guide protects the seals. Here, BOY can resort to **50 years of experience**.

Lucid screen pages with little text, with memorable symbols enables quick and intuitive operation only on the multi-touch-display.

Procan ALPHA ® – Control at the highest level

The intuitive control technology from BOY

Procan ALPHA ®

Innovation from tradition

A decisive component for precision and efficiency of injection moulding machines is its control. A special feature is a Multiprocessor-System with a **real-time-capable Linux–operating system**, allowing response times of 125 µs.

BOY has already set standards by using the **Procan ALPHA® -control**. In a second upgrade level, again improved – with many new touch functions and in new optics – the **Procan ALPHA® -control** with graphic sequence programming now presents itself.

The new **PCT operating technology** (Projective Capacitive Touch) – is today de facto standard for modern communication appliances – surpasses the earlier film touch systems by a **significantly longer-life functionality** and makes it unnecessary to recalibrate the screen. A **more efficient CPU in the Display** provides for quick image composition.

Operating options

The **intelligent and user-friendly multi-touch capability** of the system enables modern operating strategies, such as **scrolling** of screen pages or **changing pages by simply wiping.** The gesture-controlled **zoom function** makes reading easier and details are better displayed.

The display of the BOY controls always excelled, by **attaching a machine operating keyboard at the side**, which permitted **clear and intuitive control.**

Due to the **multi-touch technology**, it is also possible to activate machine operating buttons and, simultaneously, to be able to enter a setpoint value. **Enlarged buttons with context-sensitive images** are displayed only when the function is available. Operator guidance by **animation of the buttons**; e.g. the automatic start button flashes when all conditions for starting the machine have been met.

The Easiest Operation

Maximum information

Easy operation

Operation of the **Procan ALPHA®** is carried out across the entire area using a 15“ Multi-Touch display, with extremely quick screen display and change. Furthermore, the **graphic user guide** and extensively **text-free presentation** contribute to the **quickest, fault-free operation and shortest setup times.**

The most significant difference is in the graphical sequence programming. This upgrading offers a complete new openness in the programming of the machines and the injection moulding processes. Functions like core pulling processes, delay times, freely programmable inputs and outputs and much more are now freely programmable in the control sequence.

When developing the new control, BOY has consciously taken into consideration to maintain the existing intuitive user interface to the greatest possible extent.

The display with the Touch-surface still offers the advantages of a clear and intuitive machine control. Thus the changeover to the new control will be as simple and easy as possible for the users.

The **central overview page** includes all important information in order to establish a quick overview of the actual operating condition of the machine and provide quick access to the screen pages selected. As required, brief notes can be saved on an **electronic notepad**. Alternatively a pocket calculator can be displayed and used, e.g. for the calculation of volume values, etc.

In the actual versions of the BOY controls, digital setting of the clamping and opening movements of up to eight profile points for the travel, pressure and speed are possible. The highly-sensitive mould safety can also be additionally **freely programmed** time dependent using two profile points.

Interfaces – the prerequisite for industry 4.0

Industry 4.0

An important option of **Procan ALPHA® 4** is the availability of an integrated OPC-UA Server in the machine control. Among other things this Server improves the connectivity of the injection moulding machine and is directly integrated in the control, which means the saving of high additional costs for the external OPC-Client and the wrapper. Therewith the master computer interface EUROMAP 77/83 will also be on hand. The OPC-UA Server is part of the optional interface package.

An optional interface package allows a connection to the network and remote diagnostics. This package also includes a connection for up to four temperature control units, by means of a serial interface. Via the IP addresses of the BOY injection moulding machine, the FTP and VNC-Server/Clients complete the options of this interface package.

Perfect design and logical functionality

The convenient equipment leaves nothing to be desired

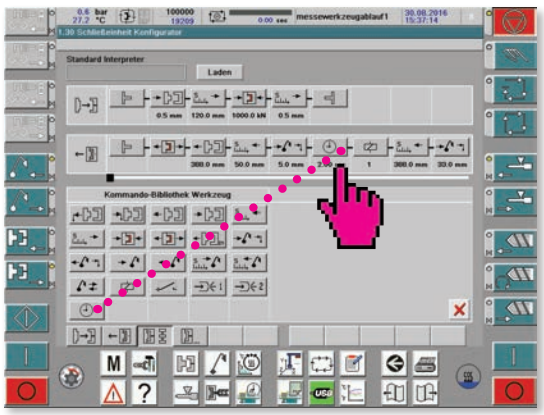
Extended scope of function

With the graphic programming of the **Procan ALPHA®** complex core pulling functions can be generated easily. Core pulling functionalities now can be used for all functions – no longer only when opening and closing the mould. Thus, less special programs are required to control the core pulling functions.

Comprehensive **envelope curve functions** significantly increase the manufacturing reliability. For example, these functions as a background check and monitor the complete injection process. For individually adjustable tolerance deviations, alarm messages or also the automatic shut down of the machine are possible.

Optimization of the temperature control is carried out by the **Procan ALPHA® -control** each time when heating up. An additional **operating point optimization** ensures even more precise control options.

Flexible use of diverse hot plates is also possible, such as the adaptation of the temperature control, without entering the PID parameter. The temperature of the nozzles and base heating band can be independently controlled.



Screen page clamping unit configurator:
For the design of a perfect programming process the individual "elements" from the command library can be integrated into the programming process by the graphic process editor.

The **Procan ALPHA® -control** provides numerous precise functions:

Optimum operation

- Access check by a password or USB stick
- Easy control using a Full-Touch display
- Ultra-quick screen display due to a real-time operating system
- Graphical menu guide for intuitive operation, free of errors
- Trend display of any process parameters
- Sequence configurator with presentation of the machine sequence programmed and all ancillary motions
- Relevant nominal- and actual values can be edited
- Electronic notepad and calculator

Perfect results

- Dynamic operating for short start-up phase and less operation-up rejection
- Low cycle times due to dynamic control and reduced down-times
- Optimized measuring and checking methods (envelope curve, temperature control etc.)
- Complete logbook for documentation
- Extended core pulling with graphic programming
- Ethernet and USB connections and serial interfaces
- Energy analysis
- Cycle time analysis
- integrated handling control
- Connection of peripheral appliances via a VNC protocol

The efficient servo-drive is installed in the BOY injection moulding machines since 2008.

Servo-Drive

Servo-Motor Pump Drive

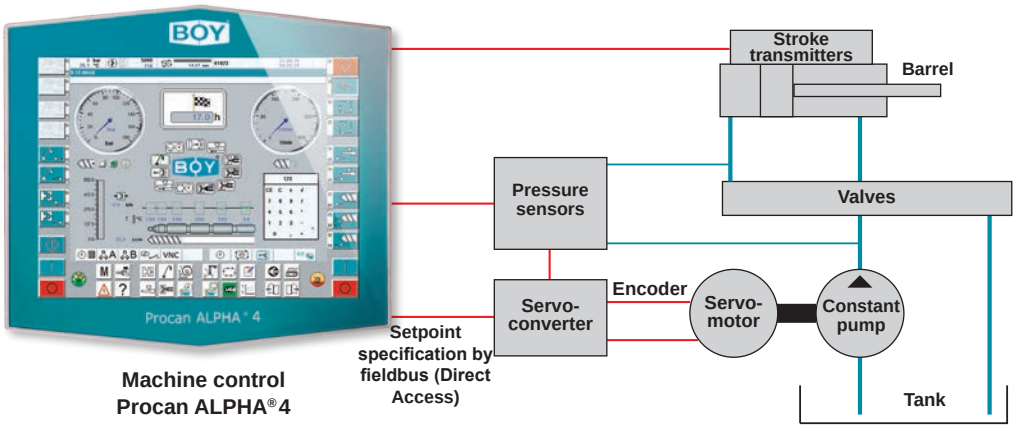
Energy-saving drive unit for the E-series

The BOY injection moulding machines of the E-series are our top products. Significant feature is the **servo-motor pump drive**. Always leading in energy-efficient solutions, in 2008 BOY succeeded another significant breakthrough with the introduction of this drive unit.

Function

A geared pump is driven by a special servo-motor. The quantity and **pressure control is carried out in a highly dynamic way** by adjusting the motor speed. This, for example, means the motor is stationary and no energy is consumed if neither oil nor pressure is requested. The kinetic energy occurring during slowing down is partly saved in an intermediate circuit of the converter and reused for the next function, for example, acceleration of an axis.

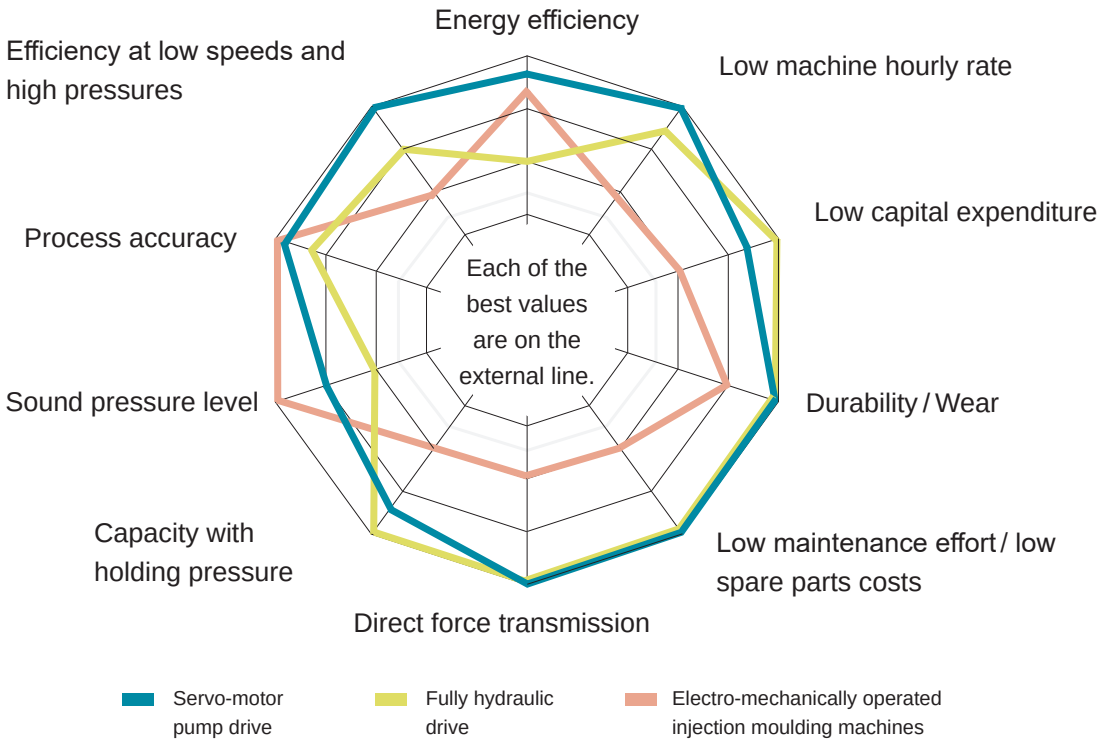
The interaction of the **highly efficient motor** as well as by the adapted motor speed for the delivery volume required the pump is always operated at the optimum operating condition using the special control of the converter. Individual parameters of the servo-drive can be visualized by the Procan ALPHA® 4.



The complete system (converter – motor – pump) distinguishes itself by a compact construction.

Drive Unit Systems Compared

Clear advantages of the servo-motor drive



By using the servo-motor pump drive, BOY has successfully attained, or even surpassed the **positive characteristics** of the electro-mechanical machines, however, without their disadvantages, such as high procurement costs and spare parts price, greater wear etc.

In comparison to the machines with electronically-controlled variable displacement pump, the **power consumption of the servo-motor drive** is **reduced by half** – and, depending on the application, even more. It is even less than that of electro-mechanical machines which have significantly greater power connection values.

Due to the servo-motor drive technology, also significant improvements in the parameters **precision** and **dynamic** is attained. Another advantage is the **lower noise level.**

The driving noise of the machine is halved. This is attained by:

- Adaptation of the speed of the motor to the respective situation. Thus, the stationary motor pump unit is completely quiet between the end of dosing and the end of the cooling time.
- Special control of the motor torque.
- Using fixed displacement pumps.
- Avoiding pressure fluctuations.
- By adapting the switching sequence of the valves, avoiding switching shocks.

Increased precision / dynamics are attained by:

- Exact, reproducible acceleration and slowing down characteristics of the motor-pump unit. The response time is 70 ms for a setpoint change from stationary to full speed and, thus, maximum delivery capacity. Speed reduction is carried out using the same dynamics.
- An optimized motor with high torque which also has a low moment of inertia, as the fixed displacement pump.
- A converter with high dynamic response.

As an option, the high wear-resistant Econplast units are available for all BOY injection moulding machines, from a screw diameter of 18 mm upward.

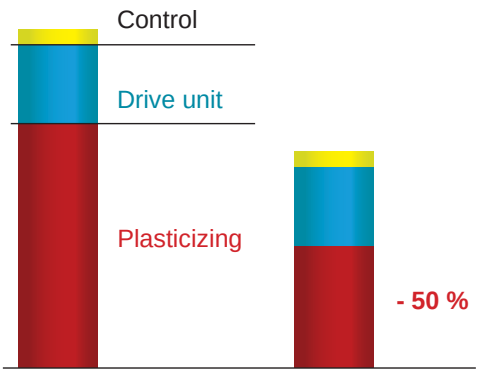
EconPlast
Technology

Using EconPlast Energy-Saving Plasticizing

Optional plasticizing unit optimizes the material processing

The plasticizing unit EconPlast developed by BOY, revolutionizes plasticizing. It enables **energy-savings of up to 50 %.** This is noticeable for on the example of a **BOY 35 E.**

Proportional energy requirement for:



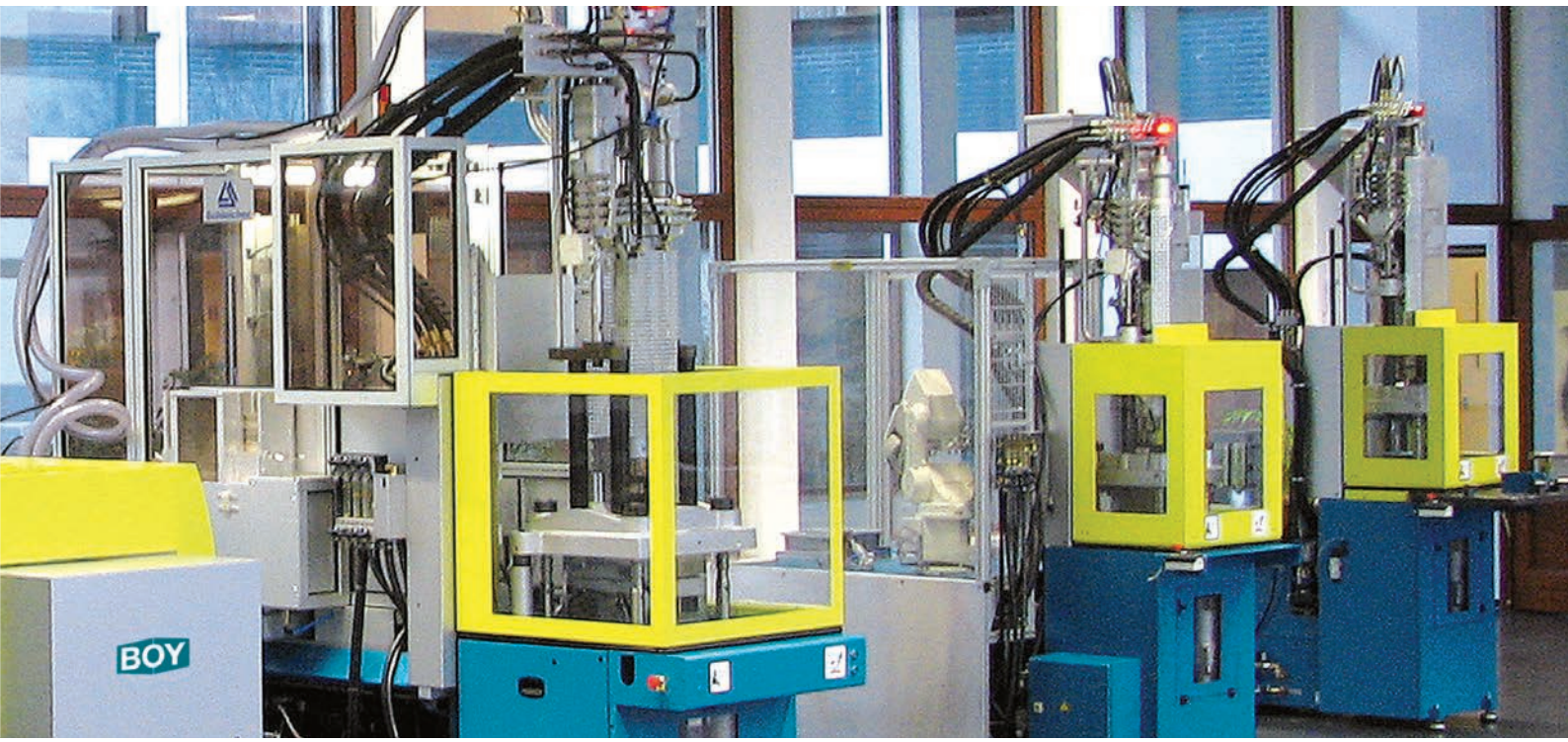
Energy requirement **without EconPlast** unit = **4.3 kW**

Energy requirement **with EconPlast** unit = **2.7 kW**

The greatest advantages of the EconPlast plasticizing units:

- Up to 40 % less energy requirement for the heating capacity
- Approximately 60 % less energy loss during dosing
- Quick and direct temperature control
- Thereby, shorter start-up and heating-up times
- Lower rejection rate due to processing the materials by protecting the material and low friction
- Longer service lifes of the **EconPlast** unit, compared to those of other high wear-resistant plasticizing units
- Improved feed zone cooling with significantly lower energy losses

As an option, the high wear-resistant **EconPlast** plasticizing units are available for all BOY injection moulding machines, from a screw diameter of 18 mm upward.



Also all insert moulding machines from BOY are available in the technical centre for individual series of tests and test injections.

BOY Insert Moulding Machines

Solutions for moulding parts inserted

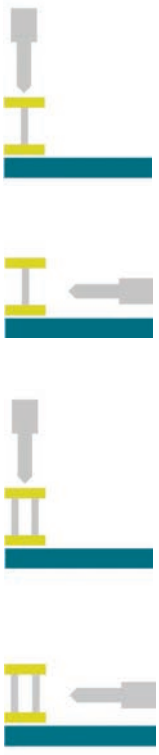
Since 45 years, BOY manufactures versatile insert moulding machines with **vertically arranged clamping unit** which can be used for moulding parts inserted.

The mature designs are the result of many years of experience with the basic concept of a **two-platen clamping unit** excellently suitable for this.
The BOY insert moulding machines have proven themselves in thousands of applications worldwide as being reliable, also distinguished through the modern, intuitive control.
With this basic concept, the BOY insert moulding machines are constructed **exceptionally ergonomically convenient**. The fixed lower plate of the mould is freely accessible. Operation and extension of the BOY insert moulding machines, by automation or auxiliary equipment, are significantly made easier. Even integration into complex production sequences or -lines – for example, for processing preconfigured continuous assembly lines – is easy.

Advantages of the BOY insert moulding machines

- Moulding machines with clamping forces of 100, 250, 350 and 550 kN
- Exceptionally small space requirements
- Ergonomic design
- Fixed lower clamping plate prevents the inserted parts from slipping
- Ideal options for extension and automation
- Perfect control due to intuitive operation

Machine concepts for insert moulding machines:



The machine controls communicate with each other via special interfaces (such as EM 67) and ensure a smooth sequence of the injection moulding cycle. So a multi-point connection of injection units on a bigger injection molding machine is possible.

BOY 2C

Multi component

Efficient Multi-Component Injection Moulding with BOY 2C

Flexible machine operability for multiple options of application

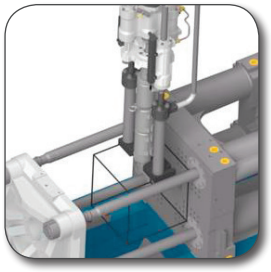
Injection unit in vertical position on top of the fixed platen

The injection units for the additional component are equipped with its own hydraulic drive unit and control. The injection unit can be supplied with different sizes (XS, S and L). Plasticizing volumes up to 141.8 cm^3, as well as injection pressures up to 3,128 bar are possible.

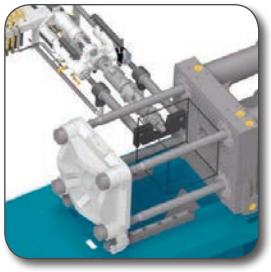
The controls of both machines communicate with each other via special interfaces and ensure a **smooth sequence of the injection moulding cycle.**

Due to the **low space requirement**, the injection unit can be positioned on the basic machine in numerous versions. Normally, installation is vertical, above the two-component mould, installation on the side is also possible. The associated drive unit, including the control, is installed on the rear of the basic machine.

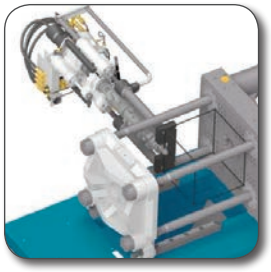
Thereby, the plasticizing unit, with open nozzle, is connected to the base unit of the injection unit using an appropriately adapted high-pressure hose. Thus, flexible operation of the machine in **innummerable options of application** is possible in the area of the multi-component injection moulding.



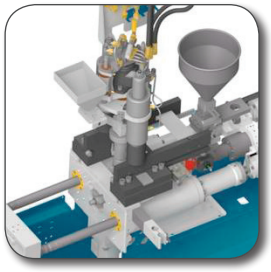
Injection unit in vertical / inclined position on top of the mould



Horizontal mounting at the side of the mould (horizontal L – Position)



Vertical mounting

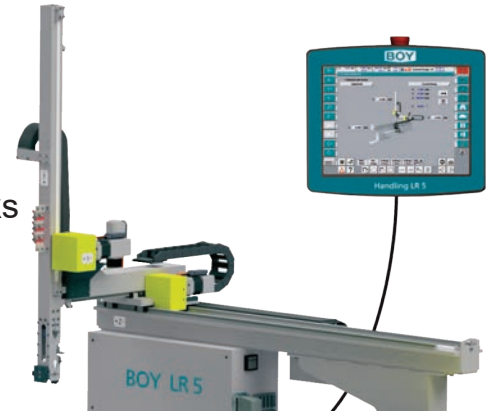


Injection unit in slidable vertical position on top of the fixed platen

A complete manufacturing system: Injection moulding machine BOY 100 E with four-axis industrial robot handling LR 5, as well as a protective enclosure conforming to CE.

BOY LR 5 – Complete Removal Automation

The most cost-effective complete solution for all removal tasks



With the BOY LR 5, BOY provides a **handling system that can be universally used** with optional integrated speed and swivel function, load capacities of up to 5 kg, as well as an individually adapted protective enclosure. The multi-talent **fulfills every removal task**, thereby, also **inexpensive.**

Standard equipment

- Three servo-motor-driven linear axes
- Complex CNC-multi axes movement
- Modern, intuitive 10“ operation hardware
- Control of external periphery
- Four programmable in- and outputs (gripper)
- Pneumatic C–axis 0/90°
- Two vacuum circuits, alternative usable for gripper
- Electric / mechanic interfaces according to EUROMAP
- Electrical safety gate circuit with selection
- Individual protection housing with CE-conformity
- Documentation in German / English / French
- Warranty 24 months

Options

- Documentation in other languages
- Commissioning of a production cell consisting of injection moulding machine, handling system and protection housing
- Conveyor belt devices (additional supply with16 A CEE socket required)
- Conveyor belt control, manual-removal switch and reflex light barriers
- Additional gripper- and vacuum functions
- Up to eight additional free programmable Inputs / Outputs
- Pneumatic B-axis 0° to 180°, adjustable (Rotation around Y-axis)

BOY-Handling

Our BOY LR 5

- Five-axis industrial robot
- Integrated rotation and swivel function possible
- Payloads of up to 5 kg
- Graphic programming

Plastics

Perfect Results in all Sectors

Special injection moulding process with BOY

The BOY 35 E, with integrated laminar-flow-box and packaging machine, is an economical solution for clean-room production of sterile, packaged parts. BOY works together with efficient, specialized partners.

In 50 years, BOY has made a name as a recognized provider of numerous **special processes**. Through continuous research and development, as well as close cooperation with customers and renowned specialists, BOY has developed special machine configurations for exceptional materials and application processes, for example, **clean room production** or economical manufacturing of **PET preforms**. The special design of the BOY machines also enables easy automation and technical extension for particular applications in the plastic processing industry (e.g. the processing of wax, hotmelt, etc.).

Elastomer processing

By using special injection units, all conventional rubber materials can be processed. Notable processors of rubber have already implemented this in a fully automated, as well as inexpensive, production.

Silicone processing (LSR, solid)

Versatile fields of application are opened, amongst others, with the nozzles developed by BOY for sprueless injection – for example, for the manufacturing of seals or teets for baby bottles. Included in the complete range from BOY are dosing and pump components for the respective injection moulding machines.

Processing Thermoset

Thermoset parts are distinguished by their heat-resistance and electrical insulation. BOY has special plasticizing units in their range for the production of these parts. With their in-house developed geometries, all thermosetting plastics that can be injected can be processed on the BOY injection moulding machines.

Overmoulding technology

This special application can be carried out quickly, precisely and reliably using the BOY insert moulding machines. The design advantage of this series is the fixed lower plate: It prevents the parts from slipping when the mould closes.

PIM

For processing ceramic and metallic powder, units developed in-house by BOY are available solutions, which have proven themselves. They have been developed in close cooperation with users.

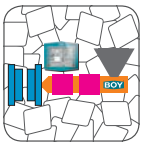
Thermoplastic

By using multiple injection units, thermoplastic parts of between 0.06 and 280.5 cm^3 can be manufactured. High wear-resistant plasticizing units are also available for abrasive materials.

The works own technicians are available for solution-orientated advice, individual test runs, practical training and first samples.

Injection moulding machines – Experience innovation live

Testing under real conditions



Process Engineering

Perfect and practical – we present the quality of the BOY injection moulding machines as such.

In **our own works demonstration centres**, as well as by sales partners abroad, there is the option to attain detailed information about the actual BOY range. In addition to advice, demonstrations and training, the option is also provided here to carry out **individual series of tests.**

The **test samples** produced with in-house moulds and under real conditions, prove of the advantages of the BOY injection moulding machines and their quality can be measured.

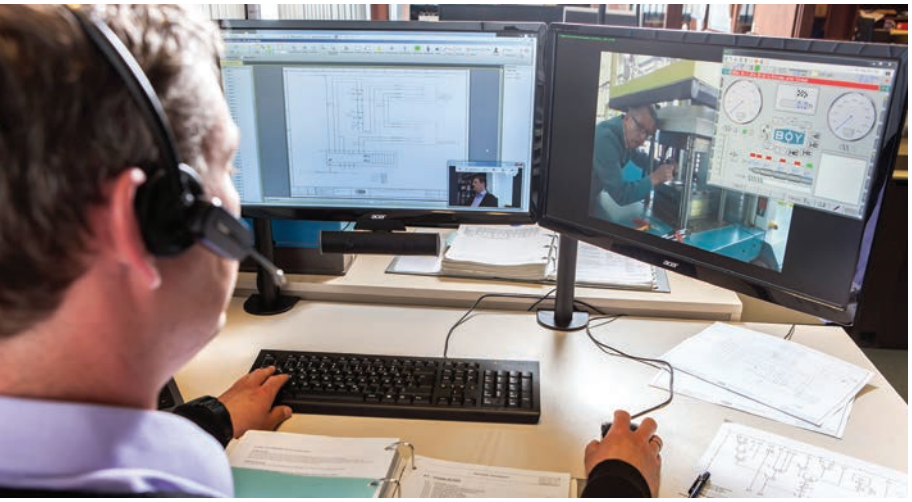
Due to this comprehensive **customer service, orientated on individual requirements,** the best possible equipment for the machine can be determined for your future production layout. That assists to avoid erroneous investment and ensures a smooth production sequence from the start.

The customer-orientated service from BOY

- Demonstrations and advisory centres worldwide
- Demonstration of the horizontal machines and insert moulding machines
- Machine testing under real conditions
- **Test samples** with own moulds
- Specialist and solution-orientated concept development
- Individual configuration harmonization

The Full-Service Package from BOY

Partnership for reliable operation



Direct advice and assistance for technical malfunctions through online access on your machines.

Remote Service

BOY represent Full-Service from the start:

- Competent system advice, individual solution proposals
- Demonstration centres for live demonstrations and individual series of tests
- Test samples under operating conditions
- Short delivery times
- Calibration service
- Software upgrades
- Immediate repair service
- Oil analysis
- Complete service for commissioning and instruction
- Permanent service standby, uncomplicated execution
- Efficient spare parts service with express delivery
- Comprehensive range of preventive maintenance actions
- Extensive range of practical training and seminar

You can trust BOY for a complete and individually harmonized Full-Service.

BOY spare parts service

The customer-orientation of BOY already begins with the design. All injection moulding machines distinguish themselves by **maximum ease of service**. Particular attention is made to **good documentation.** Reliable delivery is ensured with the correct parts. Thus longer down times due to repairs or maintenance tasks are widely excluded.

The manufacturing of larger series and a clear program are a benefit to the **quick supply of spare parts**. Even parts for machines that are more than 25 years old are in the central stores and are dispatched the same day the order is received.

BOY service network

A **dense service network** ensures the quickest use of **qualified members of staff** on site. Repairs or maintenance can be primarily carried out in a single assignment.

Due to modern **IT-supported diagnostic technology**, malfunctions can be immediately detected and analysed. The quick availability of service personnel and spare parts minimizes any pending down times.

BOY training

Individually harmonized training increases the **efficiency, precision** and **operating reliability** of the BOY injection moulding machines. Therefore, the **seminars** communicate practical knowledge for setters and users, orientated on the daily tasks of the users.

International Presence

Worldwide near you

BOY supports you **worldwide**.

Since BOY was founded in 1968, we have built up a dense network of representatives. Approximately **60 sales and service centres**, as well as an **affiliated company in the USA**, represent BOY on every continent. Highly qualified specialists and advice aimed at long-term, trustworthy customer relationships, are the criterion, by which BOY can be measured.

In addition to advice and sales, experienced **service technicians trained by BOY** maintain the machines installed on site. Contact person for sales, export, application technology or customer service are available by telephone, per E-Mail as well as personally.

Decentralized organized spare parts warehouse ensures quick supply of original parts worldwide without problems and, thus, **high operating reliability**. The customers benefit from great availability of the machines and low repair costs.

Not only let the quality of the BOY injection moulding machines convince you! Also the **comprehensive support and service performances** of BOY, as well as the competence of the contact person, can be significant decisive criterion for your investment in BOY injection moulding machines.

Benefit from the global BOY service

- Worldwide presence of competent sales and service partners
- Qualified sales and service personnel
- Comprehensive spare parts store locally

The BOY sales and service network is represented on all continents:

Europe
Headquarter with
20 representatives

America
Affiliated company
in the USA and
11 representatives

Africa and Near East
9 representatives

Asia and Oceania
13 representatives

Headquarter and affiliated company (USA)
BOY sales and service-Centre

Locations of the BOY representatives worldwide

The E-series available on the market sets new standards – and that not only regarding saving energy.

Quality and environmental awareness are the basics for sustainable economies.

Sustainability Reduces Costs

At BOY, sustainability is always experienced

Energy efficient and, thus, simultaneously to produce environmentally friendly is not only in your interest as a user, but also in ours, as manufacturer. Always a **pioneer regarding energy efficiency**, in order to retain a liveable environment for the following generations, BOY saves CO_2-emissions (refer to our example on P. 27). BOY is also distinguished by sustainable handling of the restricted resources available – already since decades.

Circular Economy

Proactive planning

The commitment for sustainability already begins in the conception phase at BOY:
Consequent adherence to the maxim, to attain the **largest possible production capacities on the smallest space** and under the least use of material, results in a **compact and intelligent design** of the BOY injection moulding machines: **Material is saved.**

Compact more sustainable

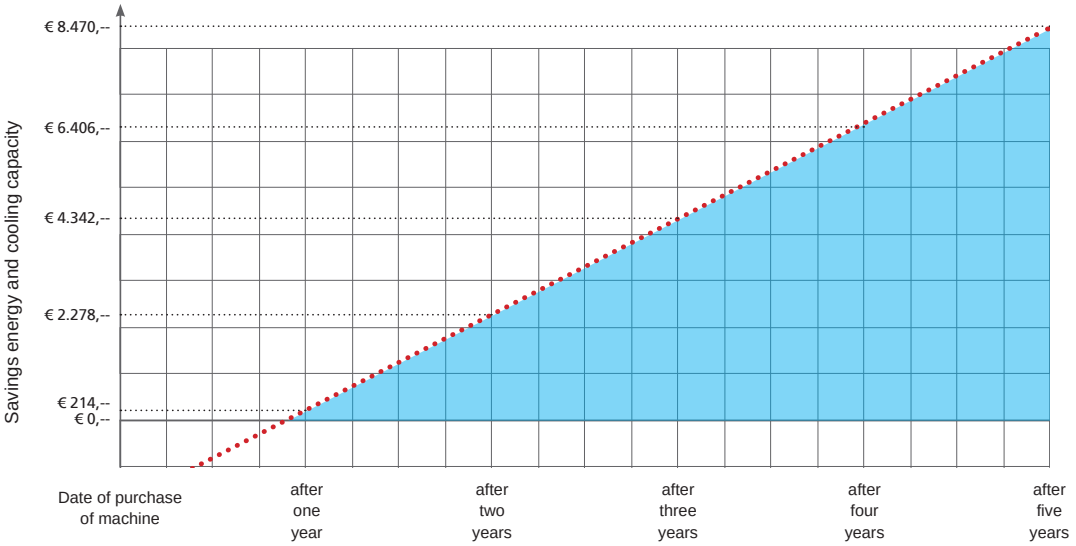
A compact and **light construction**, the BOY is et. al. also attained due to the two-platen clamping system. This design was first used by BOY since 50 years ago and is still greatly popular today worldwide.

It permits a **significant reduction of the space requirements**. By using lower masses and weights, the **energy requirement is reduced**. Also the energy consumption for transportation is significantly less.

With our machines, the user can **save installation space as well as occupancy costs** – a significant point when planning new, efficiently used production.
If multiple compact machines are installed, thus reducing the fixed costs per machine, because the operating costs, e. g. for space, air-conditioning, lighting, etc. can be allocated to more machines per production hall.

Servo-drive vs.electronically-controlled variable displacement pump (DFE)

(Injection moulding machine with 500 kN clamping force / 6000 operating hours p.a. / energy costs of € 0.15/kWh)



High potential for saving:

Already, after barely 11 months of operating time, the annual saving due to the use of the servo-drive unit. This accumulates, e.g. up to the fifth year by **€ 8,470**

After nine years operating time – the latest economically time to replace machines – the potential for saving has normally increased to **€ 16,726**

Production without sprue

Wherever mould and application technically can be realized, BOY urges **injection moulding without sprue**. Fundamentally, by injection moulding manufacturing, one should always endeavour to forgo sprue. Much unnecessary energy is consumed for fusing additional material which flows into a sprue system that is not used. Because of the cross-section, the sprue is often also prolonged by the cycle time. In addition, it must be ousted from the manufacturing process. Disposal or recycling the sprue then again devours valuable time and energy.

New drive unit technology ensures sustainable advantages

BOY is pioneer with regard to **energy efficient machines**. Already with the **servo-motor pump drive unit**, first introduced onto the European market in 2008, BOY set standards and remained leader in the development of this drive unit technology.

Increasing measurement of energy consumption document the interest of industry on energy-efficient machines. Based on this tendency, BOY immediately responded by installing an energy monitor on the **Procan ALPHA® 4** control. During operation, the actual energy consumption of each machine can be read out per Touch-Screen. The change in the parameter settings can be controlled as to which influences this has on the actual energy consumption of the BOY injection moulding machines.

Sustainability – no hot air

At 8400 operating hours p.a., a BOY 100 E with servo-drive requires approximately 68.000 kWh less energy as comparable machines with other drive unit technologies. At a power price of € 0.15 /kWh, it means that the user has approximately € 10.200 **less energy costs**. In addition, with each kWh saved, approx. 366 g **less CO_2-emission** is emitted – for the example of a BOY 100 E, this is more than 24 tons (!) per year.

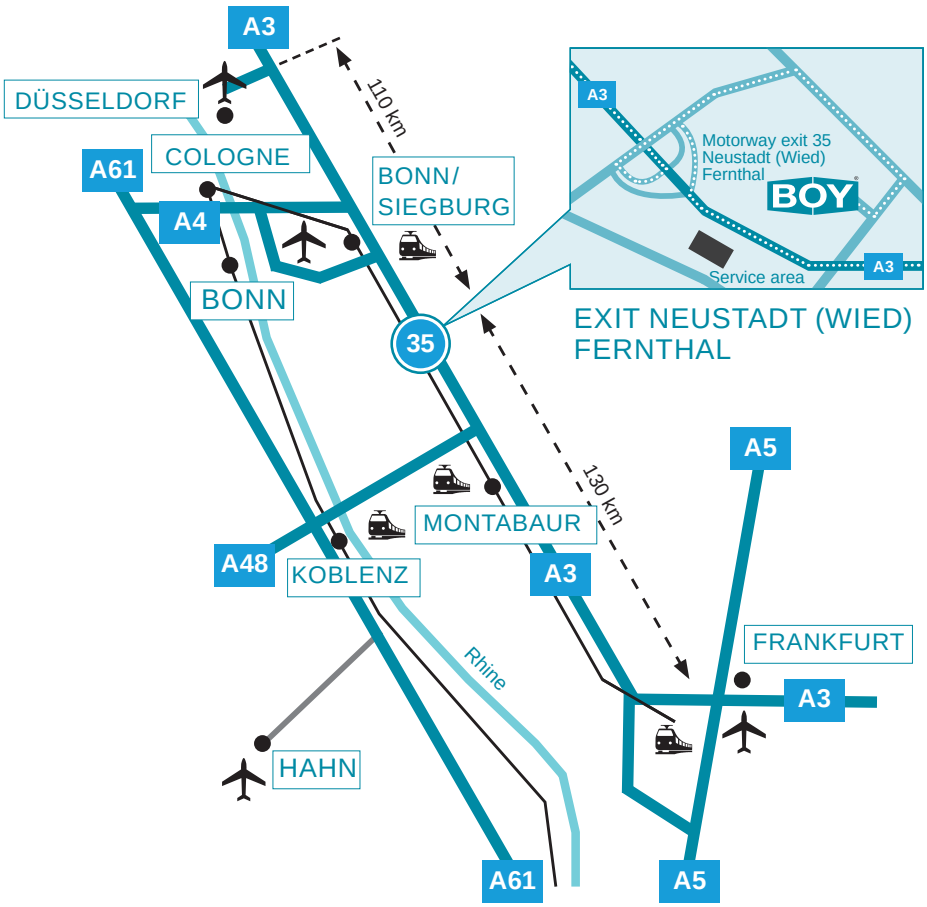
Classy efficiency!

The measured specific energy use, in accordance with EUROMAP specifications, for the example BOY 60 E, with 600 kN clamping force and **EconPlast** unit is less than 0.32 kWh/kg material flow (total of 13 kg material/h).

The specified efficiency classification is achievable depending on the respective machine equipment.

The **classification of** 9+ in accordance with EUROMAP 60.1, equates to an **injection value** in this clamping force class. The + indicates machines that feature an energy consumption of <1 kWh in idle.

Subject to design and
equipment modifications
E 01/24 A 000602



BOY®

Spritzgiessautomaten

Dr. Boy GmbH & Co. KG

Industriegebiet Neustadt / Wied
Neschener Str. 6
53577 Neustadt-Fernthal
Germany

Phone: +49 (0)2683 307-0
E-Mail: info@dr-boy.de

www.dr-boy.de

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