High-precision profile bending machines for the most challenging applications
Innovative bending technology for more than 25 years

At the Swiss company PBT AG, we develop and produce profile bending machines and digital control systems that satisfy the highest requirements in quality and technical performance. Through the use of intelligent processes, our technologies have been setting industry standards since 1991, and are used in practically all segments of the metalworking industry: automotive, aerospace, window and building façade engineering, conveyor technology, and much more.

Our claim

Individual requirements in production technology call for specific solutions. In close cooperation with our customers, we design technical solutions for efficient manufacturing of even the most complex bending tasks. From the planning to commissioning, our experts provide support in all project phases: This includes planning, development, prototyping, series production, training of machine operators, and on-site installation. We provide advice and support during every application phase.

Global presence

Development, distribution and service for production facilities around the globe. We deliver our services and products from the two main locations of PBT AG – Weinfelden in Switzerland and Siegen in Germany (INDUMASCH GmbH). Selected service partners in many European, American and Asian countries supplement our requirement for the highest service quality.
Industry solutions

Custom-fit solutions for efficient production of curved profiles. Various industries and sectors that require the highest production quality components put their trust in the precision of PBT profile bending machines. See an overview of application examples here.
Our profile bending machines

- Are flexible, high-precision, economical, fast and efficient
- Stand out for their high performance and versatility
- Allow fast programming without the need for programming skills, increase productivity and flexibility, and are intuitive to operate
- Permit uncomplicated tool changes
- Allow the use of special tools for steel, stainless steel and aluminium profiles
- Offer numerous additional equipment and expansions
- Can be produced as individual custom machines where required
Our control systems

Manual

The manual version has a Siemens panel, which serves as the basis for the retrofit-compatible tablet versions TEACH-IN and TABLET350. This panel shows the operator the current X-axis position of the feed roller, with a position detection precision of 0.01 mm. The speeds of the feed roller and the rolling speed can be modified by the operator as required, from crawling speed to rapid traverse. As an additional function, the Siemens panel allows a variable front stop to be set on the X-axis. This simplifies the implementation of a recurring bending radius in series production. All axes are operated using touch controls.

TABLET Teach-in

The TABLET Teach-in control system allows small and large series to be manufactured automatically. The programming takes place in teach-in mode, i.e. the operator teaches the machine a single time using touch controls, and then the program can be repeated as often as desired. The program directory allows existing data to be accessed and changed. This TABLET Teach-in control system shows the operator the current X-axis position of the feed roller with a position detection precision of 0.01 mm, as well as the Y-axis position for the corresponding component length. The speeds of the feed roller and the rolling speed can be modified by the operator as required, from crawling speed to rapid traverse.

Tablet350

The PC-based control system for 3-roller bending machines was developed by PBT, and in 1995 it was the first to offer the capability of controlling bending tasks using software. The TABLET350 was derived from the uncompromising PC400 control system, and offers its main functions in an elegant format: bending programs can be created, managed and controlled using the tablet, without the need for programming skills. Illustrated control elements facilitate intuitive operation during everyday work, while the graphic display of the programmed workpiece with bending radii and bending lengths allows visual inspection of the programmed data. The communication with the bending machine takes place via WiFi. Data backups take place using a convenient USB port located on the outside of the control unit.

The tablet can be mounted on the machine using the supporting arm supplied, and can be adjusted for optimal operation. If greater freedom of movement is required, the wireless data transmission makes it possible to move around freely in the room with the TABLET350.

PC400

A detailed description of the full version of the control system variant PC400 can be found on the following pages.
**PC400**

**Convenient creation and saving of bending programs**

The PC-based control system for 3-roller bending machines was developed by PBT, and in 1995 it was the first to offer the capability of controlling bending tasks using software. The PC400 is currently the most advanced and flexible control system on the market, and offers countless advantages for small and large series production processes.

Whether integrated into a network or as an individual work station, as a 3D version or with the addition of a mandrel, the new PC400 control system can be individually configured.

On the basis of a high-performance Windows PC with a state-of-the-art multi-touch display, bending programs can be created, managed and controlled intuitively on the moveable control terminal, without the need for programming skills. Here the graphic display of the programmed workpiece allows visual inspection of the programmed data. The hardware is network-compatible and can easily be integrated into the existing IT infrastructure.

**Flexible, efficient and economical**

The control programs generated allow up to 25 different segments to be arranged in any sequence and bent in one or more passes. Subprograms for the creation of ellipses, handrails for spiral staircases, “Napoleon curves”, S-curves or special shapes are already available as standard.

By means of precise control of the X and Y-axis, perfect transitions are achieved between radii and straight sections. Non-conformances caused by the machine are excluded through the continuous regulation of the axis position during bending, from individual parts to large-scale series production. Unavoidable non-conformances in programmed data, which can result e.g. from different material elasticities, are corrected in the software by entering actual manufactured values – consistent repeat precision and low reject rates are thus ensured.

**Open and expandable**

With the PC400 control system, an open system has been created, such that the control system can be individually expanded through the use of standard components.

The PC400 can be expanded at any time through the use of options such as the automatic radius measuring system, Z-axes for bending into the third dimension, or the integration of a mandrel bending unit with a feed system.

The control panel communicates with a Siemens S7-1200. This allows the programming of other digitally controlled processes in the manufacturing sequence.

**Benefits**

- Performance of the bending process in one or more passes - even where there are different radii within a component
- Material catalogue / springback diagrams can be created for all profiles – up to and including automatic radius measurement
- All software tools / subprograms included
- Assignment and access of PDF documentation (image/text) for creation of workpieces using a corresponding program
- Optional interface with CAD software for the creation of programs based on design data
- Workplace independent creation, management and data backup of programs by means of network integration
- Direct support from PBT experts thanks to the remote maintenance capability
**Mandrel bending device**
1500 CNC-controlled

- Profile feed unit in 3, 4 or 6 m version
- Pressing force approx. 1500 kg
- For bending hollow profiles in a single pass
- With controlled feed unit (booster)
- Guarantees zero-slip bending of even small radii in a single pass
- Not shown: model 4000 with approx. 4000 kg pressing force

**Automatic radius measurement system**

- Fully automatic radius measurement based on our PC400 control systems
- The pneumatic gauge heads can be positioned variably to the right and left of the bending rollers
- Measurement of one or more different radii in the same profile is possible
- Continuous and cyclical measurement of the actual manufactured radius possible
- After measurement of the actual manufactured radius, automatic correction takes place until nominal radius is reached

**Supporting roller controlled**
(Z-axis) for 3D bending (right and/or left)

The controlled supporting roller additionally makes it possible to bend with a gradient. With the associated software, it is simple to programme and bend 3D elements.

**3D bending/turning device**
manual or CNC-controlled for model PBT25

Allows bending into the third dimension and additional turning of the profiles in two directions.
International companies in a wide range of industries benefit from the cost-effectiveness, precision and reliability of our machinery and services.

Here are a selection of our customers:


References
Our profile bending machines

**Arkus 12©**
- Pressing power: 12 t
- Positioning accuracy: 0.01 mm
- Drive system: Hydraulic
- Stroke: 200 mm
- Hydraulic oil volume: 7 litres

**Bendo©**
- Pressing power: 20 t
- Positioning accuracy: 0.01 mm
- Drive system: Hydraulic
- Stroke: 200 mm
- Hydraulic oil volume: 18 litres

**X-axis**
- Responsible for the bending radius

- Up to profile diameter approx. 60 mm or profile height 150 mm
- Up to profile diameter approx. 90 mm or profile height 200 mm

**Y-axis**
- Responsible for the segment lengths (feed)

- All 3 rollers individually! driven
- Continuously adjustable roller speed: 1 – 30 rpm with PC400
- Maximum torque per roller: 500 Nm
- Drive system of rollers: Electric motors
- Roller height: 130 mm (optional: 250 mm)
- Tool holder diameter: 40 mm

**Z-axis**
- For equalising or bending into the 3rd dimension

- Manual standard version
- Crank-operated version with position detection capability to 0.1 mm
- PC-controlled version, positioning accuracy 0.01 mm

**Special**
- Manual or PC-controlled activation possible
- Continuously adjustable front roller distance, allowing tiny bending radii: 250 mm
- Bending direction: away from operator
- Start/stop automatic when using hydraulics with PC400
- Positioning of the machine: Lift truck
- Roller supports: optional

**General technical data**
- Connection: 400 V, 16 A
- Length / width / height: 905 mm / 950 mm / 1,125 mm

**Technical data**

- Connection: 400 V, 16 A
- Length / width / height: 1,680 mm / 1,250 mm / 1,390 mm

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**PBT25©**
- Pressing power: 27 t
- Positioning accuracy: 0.01 mm
- Drive system: Hydraulic
- Stroke: 265 mm
- Hydraulic oil volume: 9 litres

**PBT35©**
- Pressing power: 35 t
- Positioning accuracy: 0.01 mm
- Drive system: Hydraulic
- Stroke: 390 mm
- Hydraulic oil volume: 110 litres

**PBT35 Servo©**
- Pressing power: 65 t
- Positioning accuracy: 0.01 mm
- Drive system: Servo drive
- Stroke: 390 mm
- Hydraulic oil volume: 200 litres

**Helix©**
- Pressing power: 65 t
- Positioning accuracy: 0.01 mm
- Drive system: Hydraulic
- Stroke: 445 mm
- Hydraulic oil volume: 200 litres

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Our profile bending machines

- Series: Manual / TEACH-IN / TABLET350 / PC400
- Connection: 400 V, 16 A
- Length / width / height: 1,250 mm / 1,480 mm / 1,640 mm

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- Series: Manual / TEACH-IN / TABLET350 / PC400
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### Production examples

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| HEA 200  | HEB 180 | Ø 219     | 250/180/6 | 250/180/6 |
| HEA 200  | HEB 180 | Ø 219     | 250/180/6 | 250/180/6 |

*Production examples*
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PBT AG
Profile Bending Technology
Dufourstrasse 71
CH-8570 Weinfelden
Switzerland
++41 71 633 21 51
info@pbt.ch
www.pbt.ch