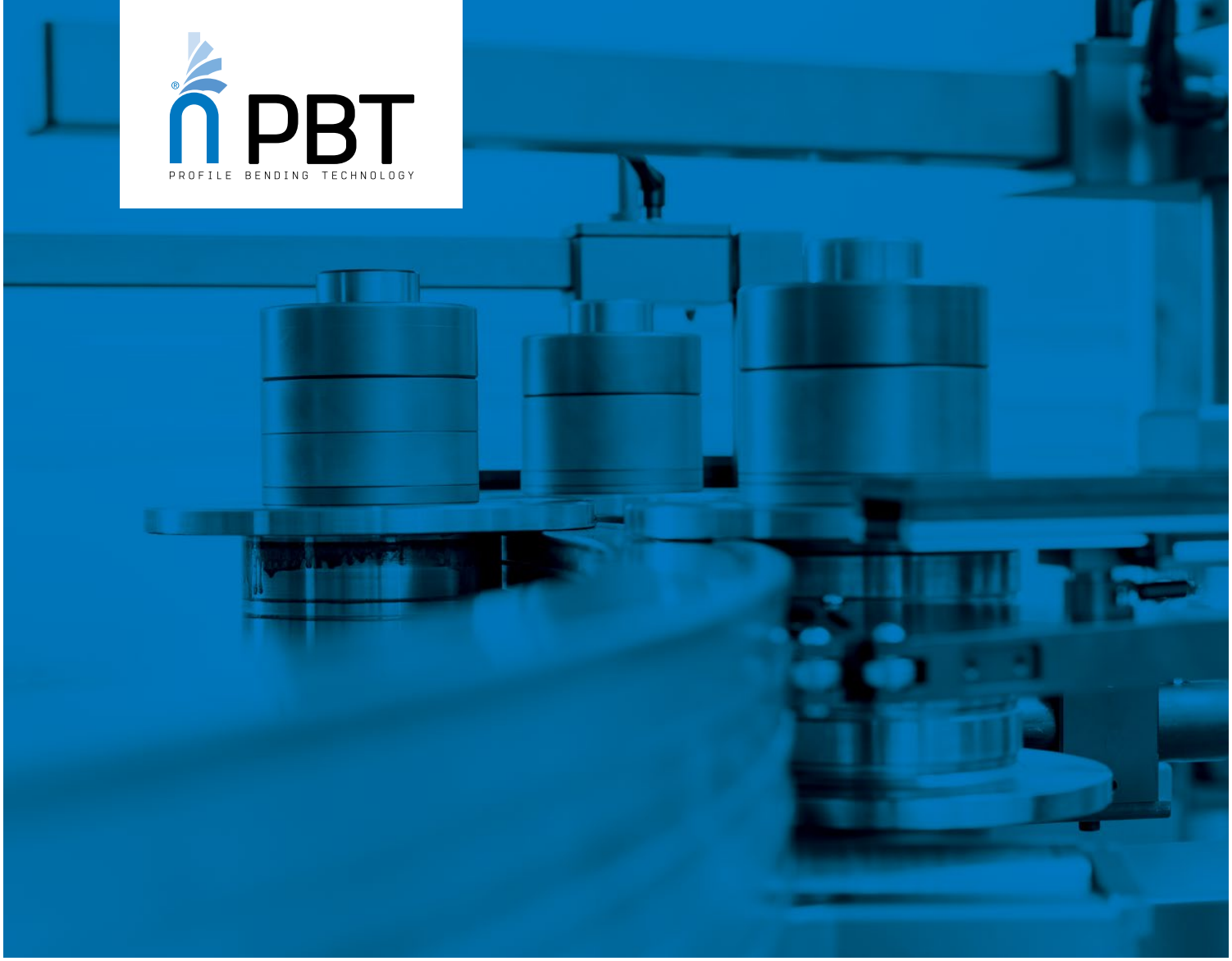
PBT
PROFILE BENDING TECHNOLOGY



High-precision **profile bending machines** for the most challenging applications

Made in Switzerland.

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.

Made in Switzerland.

R 6278

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.

Automotive engineering
Attractively shaped and safe

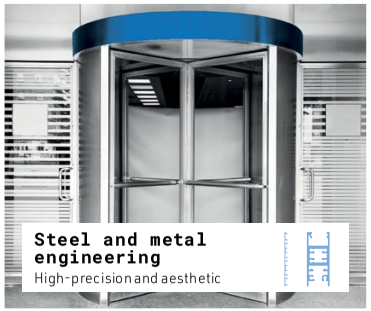
Utility vehicle engineering
Stable and dependable

Automotive engineering
Lightweight and durable

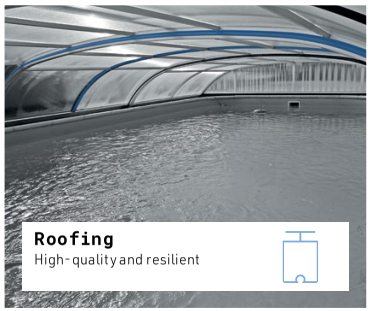
Conveyor technology
Exact and high-performance

R1011

Window and façade engineering
Creative and stylish



Steel and metal engineering
High-precision and aesthetic



Roofing
High-quality and resilient

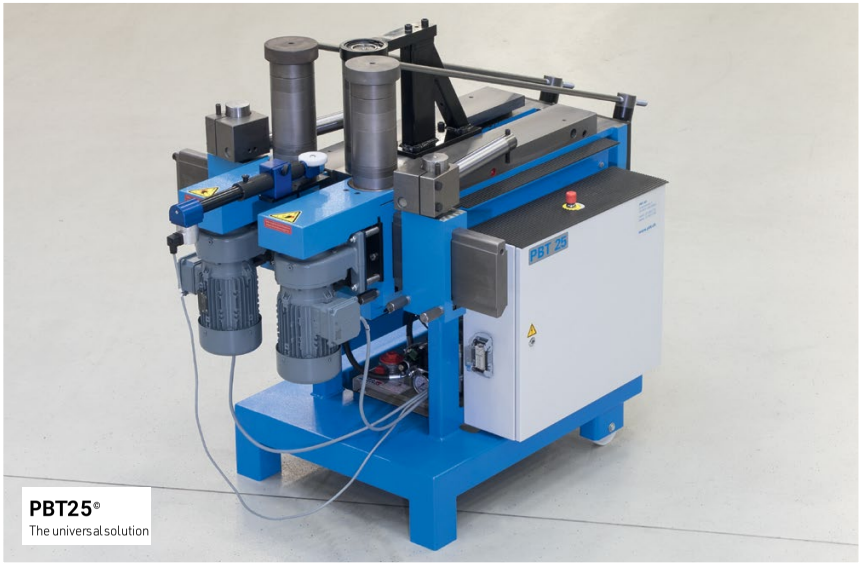
Conveyor technology
Efficient and economical

Aerospace
Lightweight and reliable

Contract manufacturer
Individual and trustworthy

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



PBT25©
The universal solution

Arkus 12©
Compact and precise

PBT35©
Quiet and powerful

Bendo©
Efficiency with technology

Helix©
The power package

R 1950

Our control systems

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

Articulated mandrel

Booster

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.

References

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:

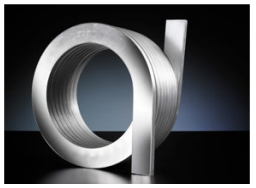
Agrikon, Airbus, Albixon, Alcan, Asas, Audi, Barnshaws, Bestbend, Biegetechnik Steinrücken, BMS, Brökelmann Aluminium, Bürstner, CWA Constructions, Die Bahn, esa, Fendt, Fritzmeier, HMT, Holden, Hydro, Hyundai, Jaguar, Jansen, Kersten Europe, Linde, Lugstein, LS Lederer, Mercedes-Benz, Metallgestaltung Eickhoff, Obru, Pemat, Porsche, Proas, Rexroth, Rimowa, Ronal Group, Sadef, SAPA, Schaeffler Group, Schüco, Siemens, Sjolund A/S, Still, Thyssen Krupp, Voest Alpine, Volkswagen, Walter Mauser, Welser Profile, XAL

Product example 1
Automotive engineering / wind deflector

Product example 2
Conveyor technology / transport systems

Product example 3
Utility vehicle engineering / cab profiles

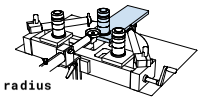
Product example 4
Conveyor technology / cladding sheet



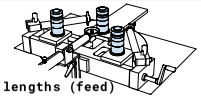
Product example 5
Cooling spiral

Product example 6
Exhibition stand construction

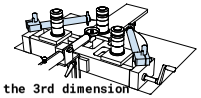
Our profile bending machines



X-axis =
responsible for the bending radius



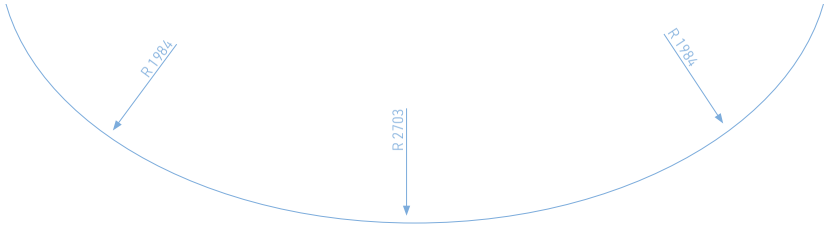
Y-axis =
responsible for the segment lengths (feed)



Z-axis =
for equalising or bending into the 3rd dimension

	Arkus 12©	Bendo©	PBT25©	PBT35©	PBT35 Servo©	Helix©
	up to profile diameter approx. 60 mm or profile height 150 mm	up to profile diameter approx. 90 mm or profile height 200 mm	up to profile diameter approx. 114 mm or profile height 300 mm	up to profile diameter approx. 180 mm or profile height 300 mm	up to profile diameter approx. 180 mm or profile height 300 mm	up to profile diameter approx. 219 mm or profile height 350 mm
Pressing power	12 t	20 t	27 t	35 t	35 t	65 t
Positioning accuracy - servo-controlled	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Drive system	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Servo drive	Hydraulic
Stroke (controlled)	200 mm	260 mm	265 mm	390 mm	390 mm	445 mm
Hydraulic oil volume	7 litres	18 litres	18 litres	110 litres	9 litres	200 litres
All 3 rollers individually! driven	YES	YES	YES	YES	YES	YES
Continuously adjustable roller speed	1 - 30 rpm with PC400	1 - 24 rpm with PC400	1 - 22 rpm with PC400	1 - 16 rpm with PC400	1 - 16 rpm	1 - 8 rpm
Maximum torque per roller	500 Nm	1200 Nm	1600 Nm	3000 Nm	3000 Nm	9000 Nm
Drive system of rollers	Electric motors	Electric motors	Electric motors	Hydraulic motors	SERVO DRIVE	Hydraulic motors
Roller height	130 mm (optional 250 mm)	250 mm	275 mm (optionally extendible)	275 mm (optional 375 mm)	300 mm (optional 400 mm)	500 mm
Tool holder diameter	40 mm	65 mm (optional 105 mm)	105 mm (on X-axis, solid material produced from a single piece)	105 mm (solid material produced from a single piece)	105 mm (solid material produced from a single piece)	130 mm (solid material produced from a single piece)
Manual standard version	Series	Series	Series	Series	-	-
Crank-operated version with position detection capability to 0.1 mm	Optional	Optional	Optional	Optional	Series	-
PC-controlled version, positioning accuracy 0.01 mm	Optional	Optional	Optional	Optional	Optional	Series
Special						
Manual or PC-controlled activation possible	Manual / TEACH-IN / TABLET350 / PC400	Manual / TEACH-IN / TABLET350 / PC400	Manual / TEACH-IN / TABLET350 / PC400	Manual / TEACH-IN / TABLET350 / PC400	PC400	PC400
Continuously adjustable front roller distance, allowing tiny bending radii	256 (optional 80) - 518 mm	280 - 860 mm	200 - 1000 mm	360 - 1100 mm	360 - 1100 mm	630 - 1330 mm
Bending direction	away from operator	away from operator	away from operator	away from operator	away from operator	away from operator
Start/stop automatic when using hydraulics with PC400	switches hydraulics off after 15 minutes of non-use	switches hydraulics off after 15 minutes of non-use	switches hydraulics off after 15 minutes of non-use	switches hydraulics off after 15 minutes of non-use	no significant power consumption during non-use	switches hydraulics off after 15 minutes of non-use
Positioning of the machine	Lift truck	Lift truck	Lift truck	Crane / forklift	Crane / forklift	Crane
Roller supports	optional	Series	Series	Series	Series	Series
General technical data						
Connection	400 V, 16 A	400 V, 16 A	400 V, 16 A	400 V, 32 A	400 V, 32 A	400 V, 63 A
Length / width / height	905 mm / 950 mm / 1,125 mm	1,340 mm / 1,330 mm / 1,350 mm	1,680 mm / 1,250 mm / 1,390 mm	2,050 mm / 1,600 mm / 1,480 mm	2,050 mm / 1,600 mm / 1,480 mm	2415 mm / 2163 mm / 1590 mm

Our profile bending machines



Production examples

Production examples

Arkus 12®	mm	70/12	100/10	30/30	30	50/50/5	50/50/5	60/60/7	60/60/7	60/60/7	UNP 80	UNP 80
	R min.	300	150	150	150	300	400	400	400	400	400	400
Bendo®	mm	100/15	200/15	50/50	50	60/60/6	60/60/6	70/70/7	70/70/7	70/70/7	UNP160	UNP160
	R min.	800	300	500	500	300	300	400	400	400	600	600
PBT25®	mm	120/15	300/15	60/60	60	80/80/8	80/80/8	80/80/8	80/80/8	80/80/8	UNP 180	UNP 180
	R min.	1.000	300	500	500	600	1.500	500	500	500	600	600
PBT35®	mm	120/15	260/20	80/80	80	100/100/10	100/100/10	100/100/10	100/100/10	100/100/10	UNP 200	UNP 200
	R min.	600	350	700	700	800	1.000	600	900	750	600	600
Helix®	mm	200/30	260/30	100/100	80	120/120/12	120/120/12	130/130/14	130/130/14	130/130/14	UNP 260	UNP 260
	R min.	2.000	450	1.000	500	1.000	1.500	750	1.000	750	1.000	1.000

Arkus 12®	mm	–	1-PE 80	2" [60]	50/50/3	60/30/4	–	–	–	Aluminium	Aluminium	–	Aluminium
	R min.	–	500	300	300	500	–	–	–	200	200	–	200
Bendo®	mm	IPE100	IPE140	3" [88,9]	120/40/4	120/40/4	Stahl	Stahl	Stahl	Aluminium	Aluminium	Aluminium	Aluminium
	R min.	800	500	500	1.000	1.000	300	300	300	200	200	400	200
PBT25®	mm	IPE120	IPE160	4" [114]	160/60/4	160/60/4	Stahl	Stahl	Stahl	Aluminium	Aluminium	Aluminium	Aluminium
	R min.	800	500	600	1.000	1.500	300	300	300	200	200	400	200
PBT35®	mm	IPE160	IPE180	Ø180	100/100/10	160/60/4	Stahl	Stahl	Stahl	Aluminium	Aluminium	Aluminium	Aluminium
	R min.	1.500	500	1.000	600	1.000	300	300	300	200	200	400	200
Helix®	mm	HEA 200	HEB 180	Ø 219	250/150/10	180/80/6	–	–	–	–	–	–	–
	R min.	3.000	2.000	2.000	1.750	1.750	–	–	–	–	–	–	–

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