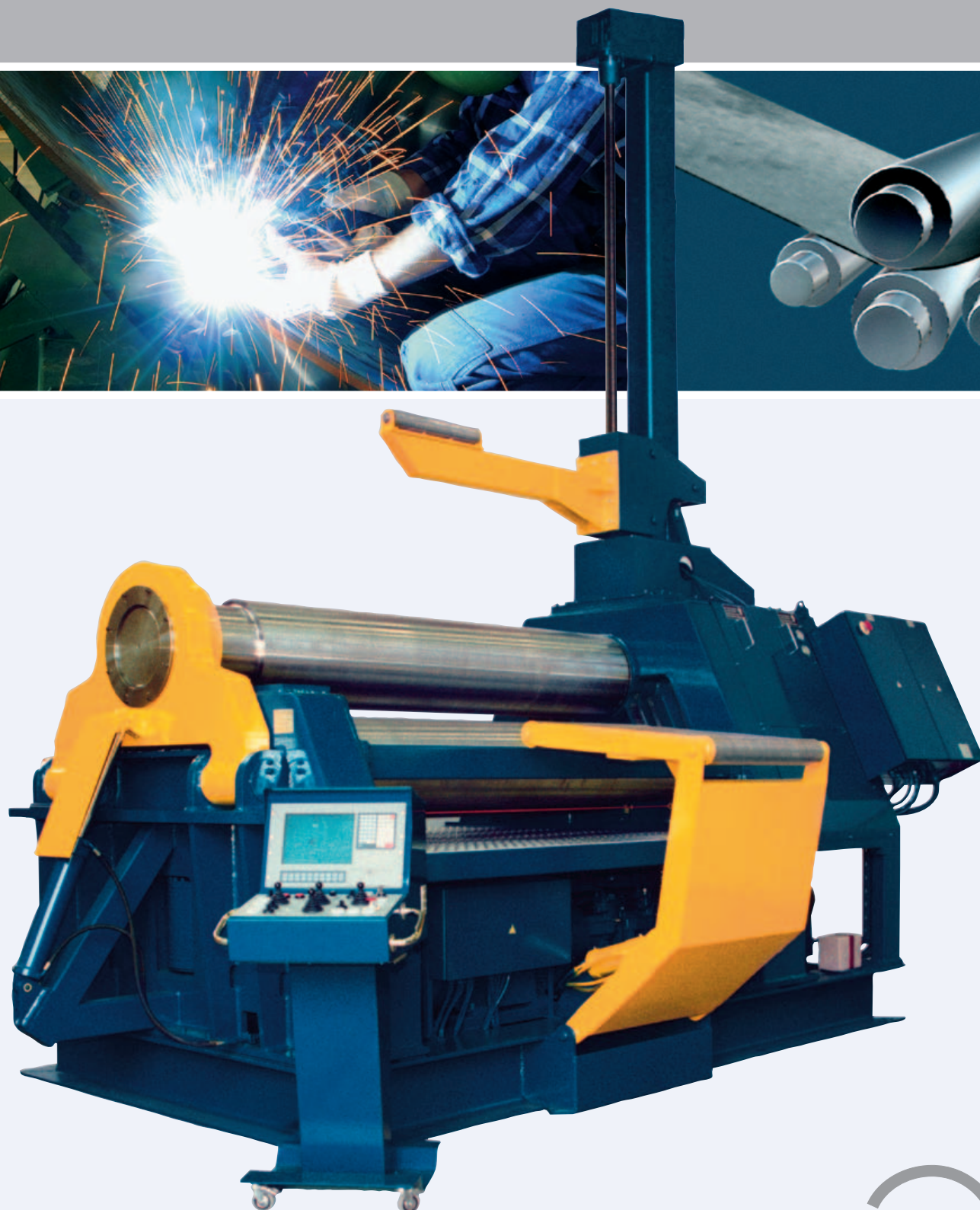


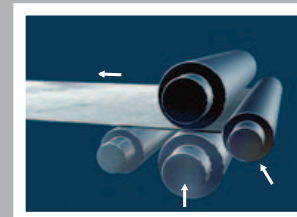
ROUND0

4-Roll Plate Bending Machines

Type PAS/PASS/PASC



Highest Demand on Performance and Reliability meets lowest overall Cost



1. Align the plate against the raised rear side roll. Raise the lower roll to pinch the plate. Return the plate to prebending position.

PASS 255
equipped with CNC control



ROUND O is the world's leading manufacturer of plate and section bending machines. The company was formed in 1964, and has since delivered more than 15 000 machines to satisfied customers around the globe. ROUND O machines are world-renowned for outstanding performance, reliability and quality.

Wide range of Machines

The standard range of 4-roll plate bending machines covers plate thicknesses from 3 mm (1/8") to 100 mm (4") and widths from 1 000 mm to 8 000 mm (3' to 26'). All machines have unique features needed for high precision and high output rates:

- **Outstanding prebending capacities.** In many cases, the remaining flat end is as short as one time the plate thickness.
- **Fully hydraulic, infinitely variable speed drive and adjustment of the rolls.**
- **Highest drive torque of any competitive machine.**
- **Frames made of high-strength steel, fully welded and stress relieved before machining to have sufficient strength to absorb bending forces and to achieve highest possible accuracy.**
- **Built as standard with such mechanical precision and rigidity that all machines can be equipped with CNC-control.**
- **Excellent for cone bending, including prebending of cone plate.**
- **Easy to integrate into a production line when equipped with automatic infeeding of the plates, automatic ejection and down-line transport of the finished cylinder.**



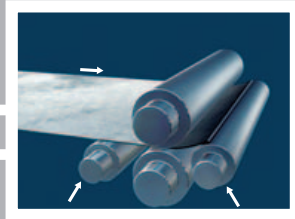
PAS 460 in standard execution



PAS 600



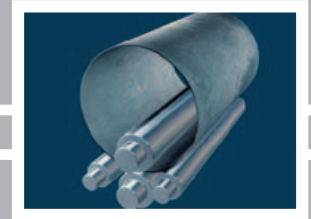
2. Raise the front side roll. Prebend and roll.



3. Lower the front side roll and raise the rear side roll until it reaches the prebent edge.



4. Continue to roll the plate.



5. The cylinder is finished.

Construction

Machines from ROUND0 are always more powerful and more heavily proportioned in terms of frame, roll size, bearings and drive torque than machines from other suppliers. The result is higher reliability, higher precision and longer service life.

The Rolls and Bearings

The rolls are manufactured of high carbon-content steel forgings for maximum surface hardness. The rolls are crowned to fit the largest possible thickness range within the capacity of the machine. To increase the thickness range further, the machines can be equipped with support rolls for the lower roll.

For machines used for bending stainless steel or when frequent cone bending is anticipated, hardened and ground rolls are recommended. To avoid cracking and warping issues, the rolls are hardened using the preferred 7-step surface hardening process, followed by precision grinding and polishing.

All rolls on ROUND0 plate bending machines are journalled in **spherical roller bearings** of the highest quality, resulting in minimal friction losses and longer service life. In addition, the rolls can easily be tilted to achieve the best result in operations such as cone bending.

Ensured Parallelism

The parallelism of the rolls is one of the most crucial factors in achieving good bending results and is absolutely essential for optimal use of CNC controls. This is ensured on all ROUND0 machines, even under maximum load.

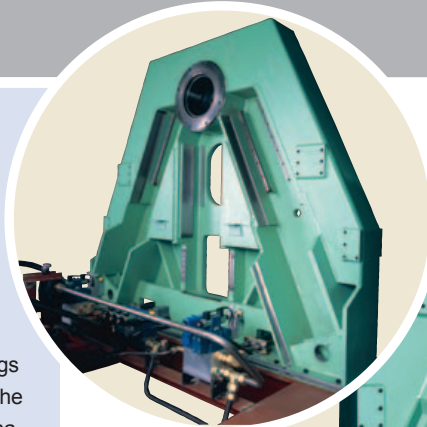
On PASS machines, the lower roll is adjusted by wedge blocks and a hydraulic cylinder, as shown to the right. This adjustment is very accurate and guarantees perfect parallelism of the rolls.

On PAS machines, the parallelism of the lower roll and both side rolls is electronically regulated by the digital control system. A precision glass-scale linear encoder, fitted to each end of the rolls, monitors the exact position of the roll. This trouble-free system ensures parallelism under all conditions and makes it possible to easily tilt the rolls for cone bending.

Hydraulic Drive and High Drive Torque

All machines have fully hydraulic roll rotation, side roll and lower roll adjustment and drop end control. Combined with **infinitely variable speed adjustment**, the operator will have full control of the process in any bending situation.

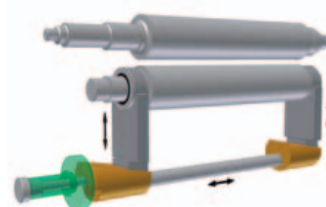
The high drive torque makes it possible to prebend with maximum capacity and to bend a plate with maximum plate thickness down to a small radius in only one pass. All ROUND0 4-roll plate bending machines have precise control of the speed difference between top roll and lower roll in all situations.



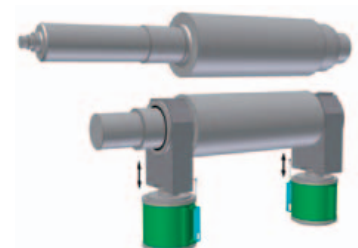
PAS 500 during assembly



PASS 310

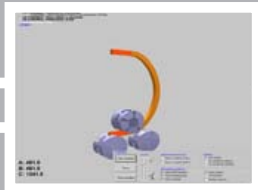


Ensured parallelism on PASS with wedge blocks adjusted by a hydraulic cylinder



Ensured parallelism on PAS with linear encoders connected to the master controller

ROUND0 CNC Control



Control panel



For Maximum Performance

Efficient multiple production of simple cylinders or complex parts is the main advantage of a CNC control. With its unique capability to control up to 12 axes, ROUND0's wCNC² system can control not only the rotation and the positioning of the rolls, but also the crowning effect of the support rolls, material support and lifting devices, and even tilt the side rolls during the bending operation, a feature unique to the ROUND0 wCNC² control. Where automatic infeeding of the plates and automatic ejection are required, the whole automatic process can be controlled by the wCNC² system.

Precise Positioning

The wCNC² system controls the machine and positioning of rolls with the highest possible precision. We guarantee a positioning within 0,1 mm (0,004") of the side rolls and lower roll, even under varying load. These tight tolerances, unmatched by any competitive machine, are a direct result of the high mechanical precision and rigidity of the machine.

Easy-to-Use

With clear commands and preset functions, the operator can create programs in a simple, yet logical way. Programs can also be created via the "Teach-in" function. Our unique geometry program enables users to create programs directly from drawings, and to quickly calculate the position of the side rolls to achieve a given radius. The interpolation function allows the machine to simultaneously rotate and change position of one of the side rolls, achieving varying radii and smooth transitions on the plate. For detailed information about our CNC system, ask for our separate CNC leaflet.

PASS 255



PASS with lifting roll to avoid double plate

PASS 150



Machines ideal for Serial Production

ROUND0 4-roll plate bending machines equipped with CNC control and lifting roll with ejection device are ideal for manufacturing of cylinders, ovals and square shaped objects. With the lifting roll, overlap of the leading plate edge during the last part of the bending sequence is effectively avoided. After completion of the bending process, the part can be automatically ejected from the machine.

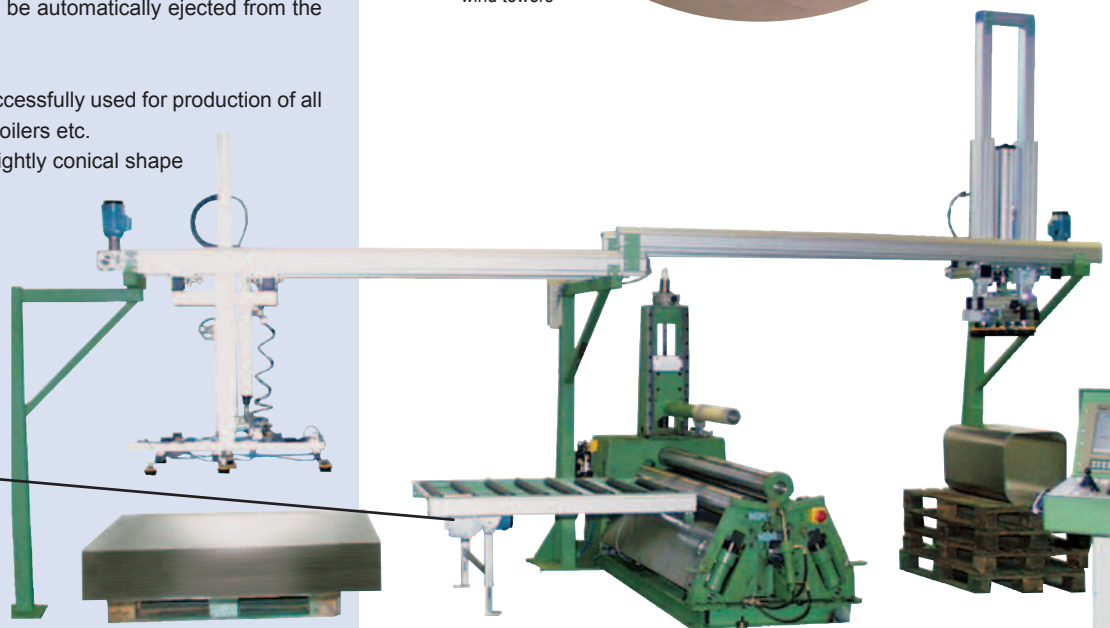
Larger 4-roll machines are successfully used for production of all types of cylinders, for tanks, boilers etc. Towers for wind mills with a slightly conical shape are often produced in ROUND0 PAS machines.



PAS 700
producing
wind towers



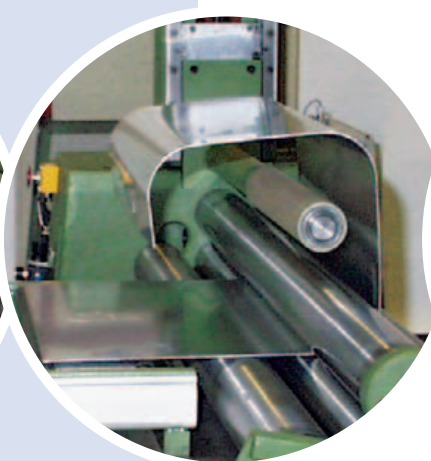
Bar code reader



Complete production line for production of fuel tanks. Includes PASS 150, automatic infeeding of plates off a stack and automatic outfeeding of the finished tank body. Equipped with bar code reader for automatic change of CNC program to correspond to the actual plate being placed on the infeeding table, resulting in true just-in-time production.



Automatic infeeding of plate



Bending process



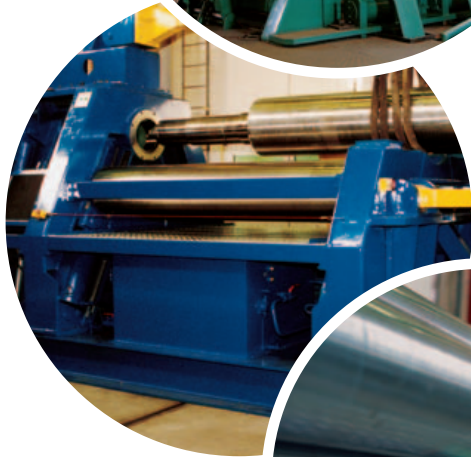
Automatic outfeeding of finished tank body



PAS 700 with top support, side support and infeding table



PAS 420 with rolls for bending of corrugated plates



Interchangeable top roll



Adjustable support rolls for the lower roll

Accessories

All ROUND0 4-roll plate bending machines can be equipped with a wide range of accessories to increase the versatility of the machine:

- Hydraulically operated side support (can be mounted on one or both sides of the machine)
- Electro-mechanically or hydraulically operated top support
- Lifting roll
- Ejection device
- Cone bending device
- Interchangeable top roll
- Adjustable support rolls for the lower roll
- Full CNC control
- Electronic positioning system
- PLC control
- Infeeding systems
- Other customized accessories



Cone bending

ROUND0 4-Roll Plate Bending Machine Type PASC

The type PASC is a 4-roll plate bending machine with reduced cost due to simplified hydraulic and electronic systems. This is a viable, cost-effective option in situations where slightly reduced versatility compared with PAS and PASS is accepted.

PASC has the same prebending and circular bending capacities as the corresponding PAS and PASS model.



PASC 360



PASS 205 Vertical

Capacities and Specifications

ROUND O Plate Bending Machines Type PASS

Model PASS	Machine Capacity	Diameter of top and lower roll	Diameter of side rolls	Motor HP @ 480 Volts*	Net Weight ¹	Gross Weight ¹
		inches	inches	HP	pounds	pounds
110/4	4' x 3/16"	4.33"	4.33"	4	3100	3750
130/4	4' x 7/32"	5.12"	5.12"	6	4400	5100
150/4	4' x 1/4"	5.90"	5.90"	6	4850	5500
110/5	5' x 10 ga.	4.33"	4.33"	4	3300	4000
130/5	5' x 3/16"	5.12"	5.12"	6	4850	6000
150/5	5' x 1/4"	5.90"	5.90"	6	5300	6400
185/5	5' x 5/16"	7.28"	5.90"	8	7500	8600
205/5	5' x 7/16"	8.07"	6.30"	11	11000	12100
230/5	5' x 9/16"	9.06"	7.68"	11	16100	17200
255/5	5' x 5/8"	10.04"	8.47"	11	18700	19800
280/5	5' x 13/16"	11.02"	9.65"	20	22000	23800
310/5	5' x 7/8"	12.20"	10.43"	20	23500	25300
110/6	6' x 1/8"	4.33"	4.33"	4	3750	4400
130/6	6' x 3/16"	5.12"	5.12"	6	5500	6400
150/6	6' x 7/32"	5.90"	5.90"	6	6000	7100
185/6	6' x 1/4"	7.28"	5.90"	8	8400	9500
205/6	6' x 3/8"	8.07"	6.30"	11	12500	13650
230/6	6' x 1/2"	9.06"	7.68"	11	17200	18500
255/6	6' x 9/16"	10.04"	8.47"	11	19800	21350
280/6	6' x 11/16"	11.02"	9.65"	20	24000	25750
310/6	6' x 3/4"	12.20"	10.43"	20	25750	27500
110/8	8' x 12 ga.	4.33"	4.33"	4	4400	5100
130/8	8' x 5/32"	5.12"	5.12"	6	6400	7500
150/8	8' x 3/16"	6.10"	5.90"	6	6800	8000
185/8	8' x 1/4"	7.28"	5.90"	8	9200	10400
205/8	8' x 3/8"	8.07"	6.30"	11	14100	15200
230/8	8' x 7/16"	9.06"	7.68"	11	19400	20700
255/8	8' x 1/2"	10.04"	8.47"	11	22000	23600
280/8	8' x 5/8"	11.02"	9.65"	20	26200	28200
310/8	8' x 11/16"	12.20"	10.43"	20	28000	30000
150/10	10' x 10 ga.	6.30"	5.90"	6	7700	9000
185/10	10' x 3/16"	7.28"	5.90"	8	10200	11500
205/10	10' x 5/16"	8.07"	6.30"	11	15600	17000
230/10	10' x 3/8"	9.06"	7.68"	11	21600	23600
255/10	10' x 7/16"	10.04"	8.47"	11	24200	26400
280/10	10' x 9/16"	11.02"	9.65"	20	28000	30200
310/10	10' x 11/16"	12.20"	10.43"	20	30200	32400
150/12	12' x 1/8"	6.69"	5.90"	6	8900	10300
185/12	12' x 5/32"	7.48"	5.90"	6	11400	12800
205/12	12' x 1/4"	8.46"	6.30"	8	17400	19000
230/12	12' x 9/32"	9.65"	7.68"	11	24200	26400
255/12	12' x 3/8"	10.63"	8.47"	11	26400	28900
280/12	12' x 1/2"	11.81"	9.65"	20	30000	32400
310/12	12' x 9/16"	12.90"	10.43"	20	32350	37800

ROUND O Plate Bending Machines Type PAS

Model PAS	Machine Capacity	Diameter of top and lower roll	Diameter of side rolls	Motor HP @ 480 Volts ²	Net Weight ¹	Gross Weight ¹
		inches	inches	HP	pounds	pounds
340/5	5' x 1-1/8"	13.40"	11.42"	36	32200	34400
360/5	5' x 1-1/4"	14.17"	12.40"	36	35600	37800
420/5	5' x 1-11/16"	16.54"	13.58"	65	48800	52400
460/5	5' x 2"	18.11"	15.35"	80	64800	68200
340/6	6' x 1"	13.40"	11.42"	36	34800	37200
360/6	6' x 1-1/8"	14.17"	12.40"	36	38800	41400
420/6	6' x 1-1/2"	16.54"	13.58"	65	53000	57000
460/6	6' x 1-7/8"	18.11"	15.35"	80	69600	73200
500/6	6' x 2-1/8"	19.69"	16.54"	135	84400	88400
550/6	6' x 2-3/8"	21.65"	17.72"	135	100800	105200
600/6	6' x 2-13/16"	23.62"	19.10"	170	138400	147400
650/6	6' x 3-1/4"	25.60"	20.87"	220	148000	156600
700/6	6' x 3-1/2"	27.56"	22.44"	240	182200	193200
340/8	8' x 7/8"	13.40"	11.42"	36	37400	40000
360/8	8' x 1"	14.17"	12.40"	36	41800	44400
420/8	8' x 1-3/8"	16.54"	13.58"	65	57200	61200
460/8	8' x 1-5/8"	18.11"	15.35"	80	74400	78400
500/8	8' x 1-7/8"	19.69"	16.54"	135	90200	94600
550/8	8' x 2-1/8"	21.65"	17.72"	135	107600	112000
600/8	8' x 2-1/2"	23.62"	19.10"	170	147200	155200
650/8	8' x 2-11/16"	25.60"	20.87"	220	158800	167600
700/8	8' x 3-1/4"	27.56"	22.44"	240	194400	205200
340/10	10' x 3/4"	13.40"	11.42"	36	40000	43000
360/10	10' x 1"	14.17"	12.40"	36	45000	47800
420/10	10' x 1-1/4"	16.54"	13.58"	65	61400	66000
460/10	10' x 1-1/2"	18.11"	15.35"	80	79200	83600
500/10	10' x 1-11/16"	19.69"	16.54"	135	96000	100800
550/10	10' x 2"	21.65"	17.72"	135	114400	119200
600/10	10' x 2-3/8"	23.62"	19.10"	170	156000	163600
650/10	10' x 2-9/16"	25.60"	20.87"	220	169800	178600
700/10	10' x 3"	27.56"	22.44"	240	206400	216800
340/12	12' x 11/16"	13.40"	11.42"	36	42600	46000
360/12	12' x 3/4"	14.17"	12.40"	36	48000	51000
420/12	12' x 1-1/16"	16.54"	13.58"	65	65600	70400
460/12	12' x 1-1/4"	18.11"	15.35"	80	84200	89000
500/12	12' x 1-7/16"	19.69"	16.54"	135	101800	107000
550/12	12' x 1-5/8"	22.85"	17.72"	135	121200	126600
600/12	12' x 2-1/8"	24.80"	19.10"	170	165000	172800
650/12	12' x 2-3/8"	26.75"	20.87"	220	180800	189600
700/12	12' x 2-3/4"	28.75"	22.44"	240	218200	229400

* - in the most popular configuration

- 1) Weight for basic machine without optional equipment
- 2) HP for basic machine. HP will increase with the addition of CNC control and other options

- Machine capacities based on rolling steel Type A-36 with 38,000 PSI yield strength to 5 x top roll diameter
- Machine lengths to 25' and larger capacities can be delivered on request
- All data subject to change without prior notice



PASS 255 with infeding table

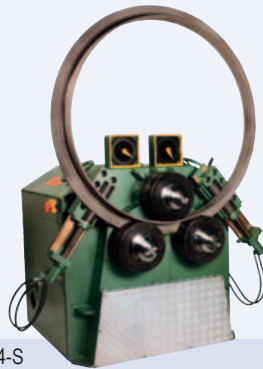
Other Machines from ROUND0



PS 310

3-Roll Plate Bending Machines

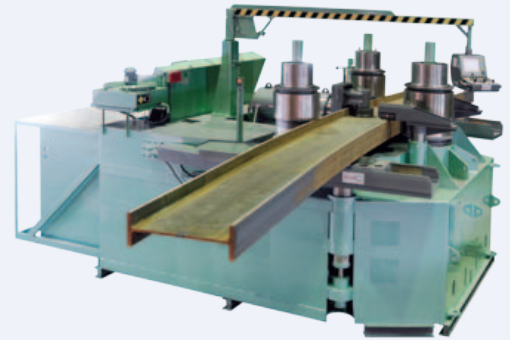
The standard range of 3-roll plate bending machines covers plate thicknesses of 3-100 mm (1/8" to 4") and widths of 1 000-8 000 mm (3' to 26').



R-4-S

Section Bending Machines

Largest selection of section bending machines on the market, with over 20 standard sizes.



R-16-S

Section Bending Machines

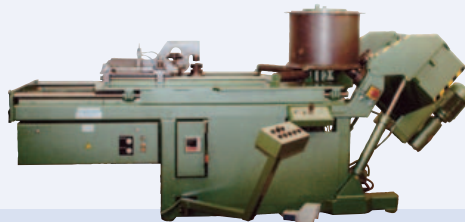
The larger sizes of section bending machines are designed also for bending I, U and H beams the hard way. R-16-S, the world's largest section bending machine, can bend up to HE 1000 (W-44") the hard way.



PM-1

Quick Rolling Machines

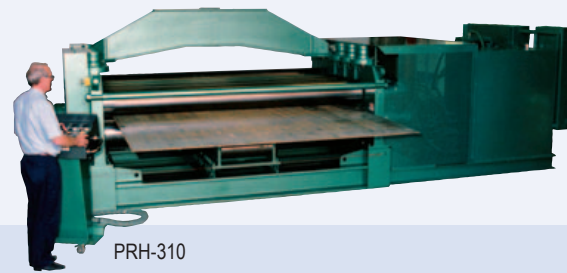
Plate bending machines for large production runs of cylinders with cycle times as short as 10 sec. For plate thicknesses up to 12 mm (1/2") and widths up to about 2 000 mm (6').



SF-2

Flanging and Punching Machines

For flanging and punching cylinders in the same operation. Cylinder diameters of 350-3 000 mm (14" to 120") and plate thicknesses up to 8 mm (5/16").



PRH-310

Plate Straightening Machines

Straighten plates with thicknesses of 2-40 mm (0,074" to 1 9/16") and widths up to 4 000 mm (13'). Produced with 5, 7 or 9 rolls depending on tolerance requirement.

ROUND0 also produce: Beambenders, beading and joggling machines, welding positioners and other customized machines.



Exclusive North American Distributor:

Trilogy Machinery, Inc.
P. O. Box 70 Belcamp, MD 21017
Phone - 1-410-272-3600
Fax - 1-410-272-3601
www.trilogymachinery.com
sales@trilogymachinery.com

ROUND0

www.roundo.com

Roundo AB
Box 171
SE-281 22 Hässleholm
Sweden
Tel: +46 451 422 00
Fax: +46 451 824 04
info@roundo.com