AKYAPAK®
METALWORKING TECHNOLOGIES

APK 101

PROFILE BENDING MACHINE

AKYAPAK®
METALWORKING TECHNOLOGIES

OFFER

SUBJECT: APK 101

AKYAPAK EXPORTS TO 6 CONTINENTS

HIGH TECHNOLOGY FROM TURKEY TO THE WORLD

One of the longest-established producers in Bursa, Akyapak celebrates its 58th foundation anniversary. Akyapak proudly exports metal-bending, drilling, cutting machines and welding solutions to 110 countries in 6 continents and delivers high quality from Turkey to the world. Akyapak is a source of pride to Bursa and Turkey with its total 32.000 m^2 covered technological manufacturing facilities. Akyapak, established in 1962 in Bursa, is continuing to shape technology in Turkey and the world with its 370 qualified and experienced staff.

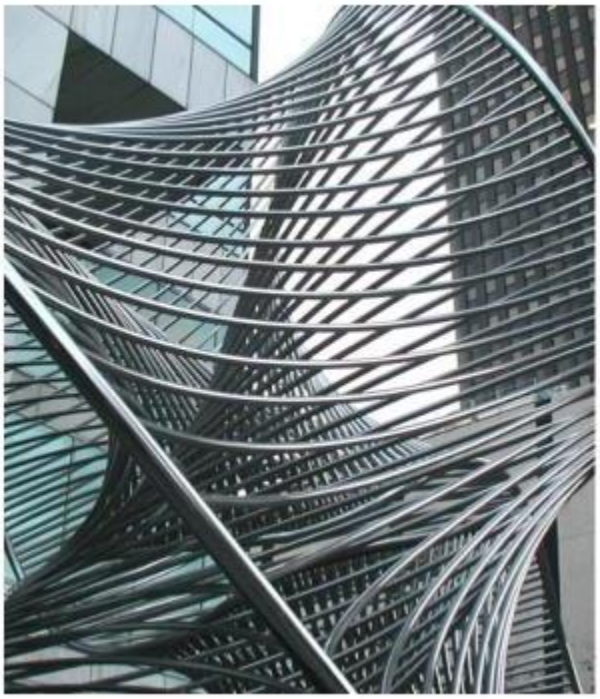
Akyapak has taken new steps to reinforce its strong image all over the world and most recently, opened Akyapak USA and Akyapak Russia offices in Tampa, Florida and Moscow.

AKYAPAK®
METALWORKING TECHNOLOGIES

THE **GIGANTIC** POWER THAT CHALLENGES THE **HEAVY** *INDUSTRY*

Akyapak offers a wide range of profile bending solutions that help customers overcome the most challenging bending applications. The high quality components combine with special design in a strong and reliable machine body and construct the advanced technology hydraulic profile bending machine.

The bigger roll diameters enable the APK series have minimum flexion and hence less deformation. Beside, employment of bigger size bearings also results in longer product life.



The operator-friendly and universal rolls allow for easier operations and bending various kinds of sections. The APK series empower customers to perform high capacity bending operations as the APK models are 3-roll drive machines and the risk of material slippage during the process is minimized.

Akyapak profile bending machines curve even the biggest sections with ease thanks to the power of their hydraulic cylinders and high bending moment and all the following exceptional features make the Akyapak's APK models significant in section forming.

STANDARD FEATURES

PLANETARY GUIDES

Various types of profiles are easily rolled with the power applied from bottom rolls while pinched between top and bottom rolls. The bottom rolls are driven by hydraulic pistons which are the main source of the bending power.

Since the bottom rolls approach to the top roll with a slightly wider angle, less power is consumed for the same unbent flat ends, thus saving energy. The planetary guiding system therefore provides excellent pre-bend with less power.

ROLLS

The shafts and rolls on the APK machines are made of 42CrMo4 alloyed steel. The rolls are also induction hardened between 50-55 HRC and polished afterwards.

The bigger roll diameters enable the APK series have minimum flexion and hence less deformation. Beside, employment of bigger size bearings also results in longer product life.

BEARINGS

All the rolls are supported with roller bearings. The roller bearings are suitable for carrying very heavy loads. The roller bearings operate with high precision even under difficult working conditions and are long lasting.

Thanks to the use of rolling bearings, friction forces are reduced and thus energy is saved. This means that the drive force is not reduced by the frictional forces, but the whole power is used to shape the material.

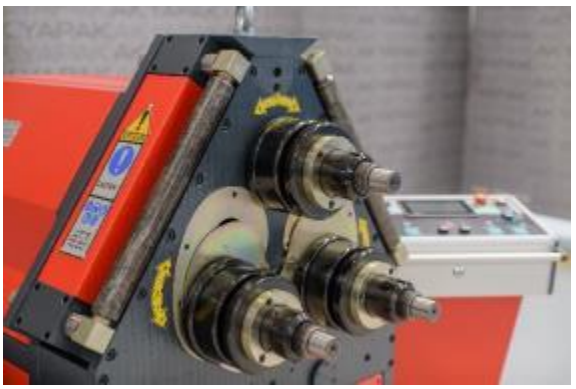
BODY STRUCTURE

The bodies of Akyapak Angle Rolls are designed to obtain a maximum strength and rigid structure and consist of certified St-52 quality steel construction. In this way, tensions that occur during bending are minimized and safer and longer machine life are achieved.

MANUAL GUIDE ROLLS

Provided as standard particularly for bending spiral, angle material and ease of bending, the manual guide rolls are adjustable manually in one direction.

*For better and easier angle bending, manual guide rolls with special angle device are provided as an optional feature.



CONTROL PANEL

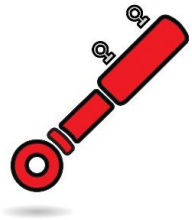
Thanks to its functional and simple design, It is possible to control the rolling of the material from all sides of the machine on the control panel. Two different control panels are offered as standard and CNC. The digital screen on the control panel, number and features of the control buttons may vary depending on the optional features selected.

CNC Control Panel

DIGITAL DISPLAY

The 7" digital display is provided as standard. The standard digital display shows positions of the bottom rolls. The upper posioning limits of the bottom rolls can also be adjusted on the display which ensures that the bottom rolls do not go beyond the maximum position.

HYDRAULIC SYSTEM



The top-notch and reliable APK hydraulic system is designed to carry out all motions of the machine with ease and accuracy. The hydraulic tank is isolated from the outside to keep the oil clean. An electric level switch is used to control the level of oil due to working in an enclosed environment. The return filter (pressure filter if necessary) ensures that the oil remains clean.

The piping system is designed to create minimal pressure loss, to be easily dismantled and to provide the best possible leak-tightness. The hydraulic protection system against overloads ensures keeping the hydraulic pressure at a safe level and provides safety.

ELECTRICAL SYSTEM

The top-notch and reliable APK electrical system is designed to carry out all motions of the machine with ease and accuracy. The power circuit and the control circuit are isolated from each other. Installation entrances of the electrical panel are isolated from the outside by adapters. A gasket is used on the cover for preventing dust entry into the electric panel. Measures have been taken against overloading.

SAFETY

Equipment is used where the operator could easily reach to stop the machine in any adverse situation during the rolling operation. These are the emergency stop button on the control panel and the security rope around the machine. In addition, electrical and hydraulic measures have been taken against overloading.

MAINTENANCE

Maintenance costs are minimized by reducing the maintenance time and preventing premature wears thanks to the long-life parts used in our machines that do not require lubrication.

PACKING AND SHIPPING

The machine is wrapped a proper material and made ready for shipment. The rolls are also lubricated with special lubricants against corrosion. Wooden pallets are attached to the base of the machines (foot parts), and nails are driven to these pallets to secure them on the transport vehicle. The machines are placed in a wooden box in accordance with ISPN 15 norms, when deemed necessary and with certain dimensions, for damage that may occur during transport. Shipments are carried out in line with international shipping and logistics standards.

CE VE INTERNATIONAL STANDARDS

All Akyapak Angle Bending Rolls are in compliance with CE regulations and meet the following international standards.

Machinery Safety Directive 2006/42/EC & Low Voltage Directive 2014/35/EU

- EN ISO 12100:2010
- EN 60204-1: 2018

SERVICE AND SPARE PARTS

With dedicated, specialized and experienced teams, Akyapak is with you even it cannot be with you to provide unparalleled technical and spare part services whether on-site or remote:

- On-site installation, training and consultancy service by qualified teams of expert
- Quick solutions without loss of time thanks to spare part stocks
- Instant error diagnosis, data analysis and support*
- Remote support with augmented reality technology through smart phone, tablet and smart glasses**

For technical service and spare part inquiries, reach us at service@akyapak.com.tr and 0850 221 58 69.

** Broadband internet connection is required for online services. The ethernet connection shall be provided by the customer to where the machine is installed.*

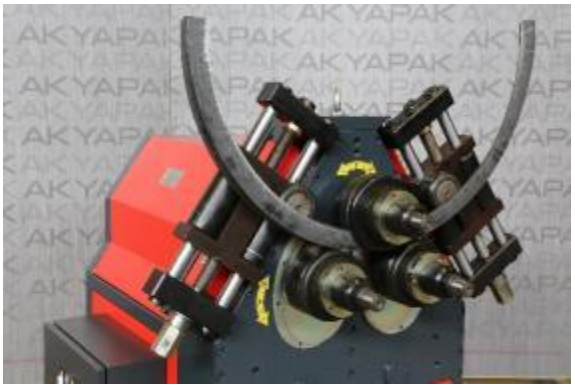
*** Remote service with wearable augmented reality AUG is optional.*

Remote service option with wearable augmented reality technology AUG

OPTIONAL FEATURES

MANUAL GUIDE ROLLS WITH SPECIAL ANGLE DEVICE

The manual guide rolls with special angle device, which is desinged for bending angles with ease, have the ability to move in 2 directions. This way, deformation is reduced to minimum and time is saved thanks to ease of operation.



HYDRAULIC GUIDE ROLLS

The guide rolls, which are hydraulically driven, are designed with the ability to move in 2 directions particularly for ease of bending of angles and spirals, and in order to reduce deformation to minimum.

DIGITAL DISPLAY FOR HYDRAULIC GUIDE ROLLS

The digital display shows the positions of the guide rolls which makes the rolling operation easier. The maximum upper position level can be limited from the control panel, so that any inappropriate movements are prevented.

DUAL SPEED

This feature includes 2 rolling speeds for bottom rolls' up and down movements: slow and fast. These speeds can be changed on the control panel. The slow speed is particularly used to achieve a better pre-bend by positioning the material accurately.

VARIABLE SPEED OF ROTATION

The variable speed of rotation of the rolls provides the operator greater control in every step and when rolling. The rotation speed is adjusted easily via potentiometer on the control panel. This way, the control necessary for satisfactory results is achieved with ease.

CONTROL SYSTEMS

Akyapak offers the perfect user experience with its internally developed AK 300 NC and AK 400 CNC software. AK 300 and 400 control systems come to the forefront with easy to use and versatility features and provide easy controlling.

AK - 300 NC (Numerical Control)

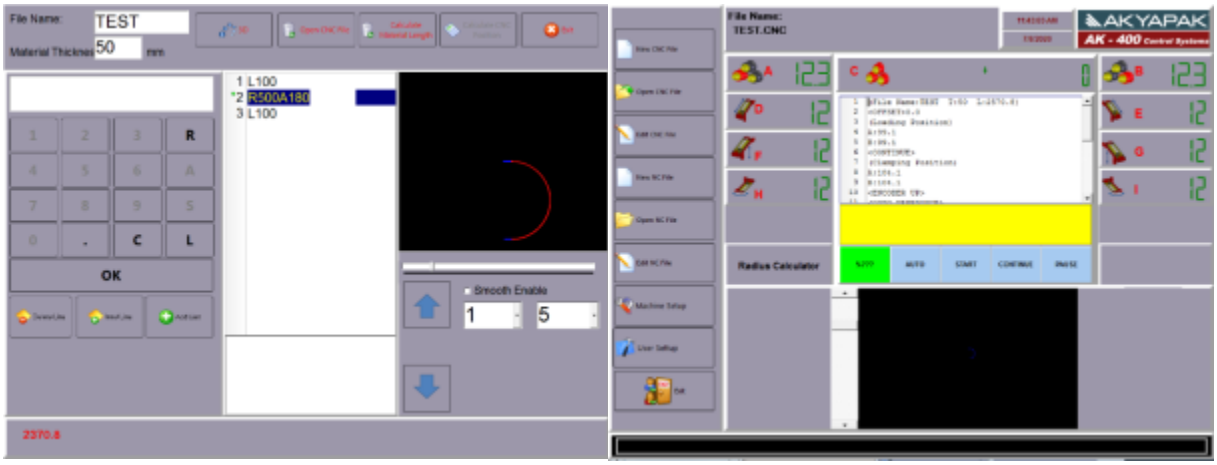
AK 300 NC is a control system developed by Akyapak. It can be programmed with two different methods and applied to main and auxiliary axes (up to 7 axes in total). AK 300 control system works with PLC infrastructure and software on industrial PC. After the first bend is recorded, hundreds of subsequent parts can be rolled to be identical to the recorded application.

Playback Programming: Playback programming is an easy method. In order to use this function, it is enough to know the bending operation. When the program is started, the machine positions the material to the reference point and waits for the operator to commence. The program firstly keeps the manual bending action made by the operator in memory and records the steps one by one, and then automatically repeats on the other parts to be rolled to fulfill the bend function. With this feature, users can easily obtain many identical parts. The great advantage of this system is that it allows changes to recorded steps.

Direct - Step by Step Programming: In this method, coordinate values are entered by the user in three main axes. The system operates automatically according to these coordinate values.

AK - 400 CNC (Computer Numerical Control)

AK 400 control system works with PLC infrastructure and software on industrial PC. In the bending of parts with more than one different radius, the bending radii and lengths on the part are defined and the system calculates the positions for the axes. These positions provide the approximate values of the desired bending radii. Afterwards, necessary corrections are made and the program is put into its final state.



The system can also be programmed using the learning method of the NC model. The user can edit on a previously created program. Also, pressure of the lower roll can be set via the display.

In this system, when changing any steps on the program, the change will be shown in a different color on the 3D part image at the bottom of the screen, allowing the operator to easily perceive the effect of the change made. This feature is available only in the AKYAPAK AK 400 CNC models and it is much more convenient to use than other existing control systems and it is very useful to manage the changes made on the steps.

The control systems have 64 GB hard disk capacity. Programs up to 64 GB can be stored and saved.

TECHNICAL SPECIFICATIONS

CAPACITY		
Max. section modulus	cm^3	80
Roll diameter	mm	315
Top shaft diameter	mm	100
Bottom shafts diameter	mm	100
Motor power	kW	11
Bending speed	m/min	5,4
SIZE		
Length	mm	1650
Height	mm	2100

Width	mm	1500
Weight	kg	2240

***** The dimensions may be changed based on the position of the hydraulic tank.
***** Data based upon steel with yield point 240 N/mm^2

CAPACITY TABLE

	Type of Profile	Size mm	Diameter min Ø	Rolls
1		50x50x6 90x90x8 100x100x10	700 1000 1400	AE* F
2		50x50x6 80x80x8 100x100x10	800 1200 1600	AE*
3		100	1200	A
4		100	1000	A
5		120	1200	A
6		40x10 100x20 120x25	400 600 1600	AF
7		60x10 100x40 200x35	400 600 1000	AF
8		30 50 60	400 500 1000	AF
9		40 60 70	400 600 800	B-1**
10		50x2 120x2 140x3	600 2000 3000	B-1**
11		60.3x3.2 114.3x3.6 114.3x4.5	400 1000 1600	B-1**
12		40x20x2 100x50x5 140x40x3	500 3000 4000	B-2**
13		50x50x2.5 90x90x4 100x100x5	500 2500 3000	B-3**
14		UNP180	800 1200	AD F
15		UNP180	800 1200	AD F
16		INP80	600 800	AD F

A: Standard rolls
B: Special rolls
D: Special rolls recommended for rolling without deformation and serial production
E: Angle device
F: Brace Rod

* A different special roll is recommended for each angle size in order to enhance operator's capability and achieve better results.

** A different set of rolls is required for each tube diameter or section size.

17		HEA120 HEB100	1000 1200	AD F

SCOPE OF SUPPLY & PRICING

- **APK 101 PROFILE BENDING MACHINE**
  - One set standard rolls
  - All-steel (St-52) construction body
  - Shafts made of special steel, hardened and ground
  - Manual lubrication
  - Guide rolls adjustable manually in one direction
  - Bottom rolls hydraulically moveable up and down
  - Digital display for bottom rolls
  - Separate and moveable control panel
  - Horizontal & vertical working position
  - The rolls are driven by a hydraulic motor + reducer and gear system