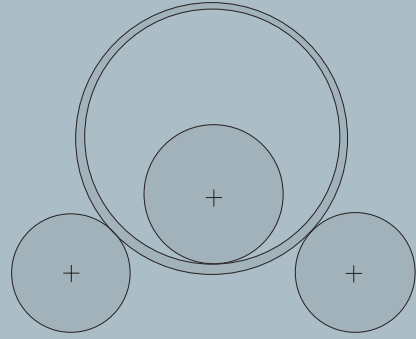


DAVI
EXCELLENCE IN FORMING



MAV
3 roll machine with Variable Axis DIGITAL

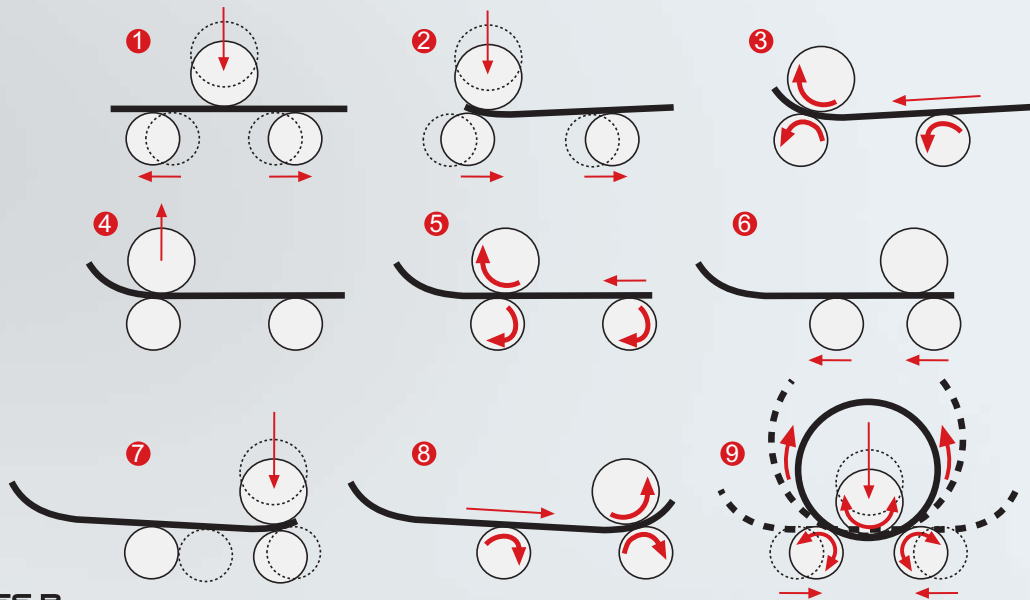
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DAVI "MAV" THREE ROLL MACHINE WITH VARIABLE AXIS

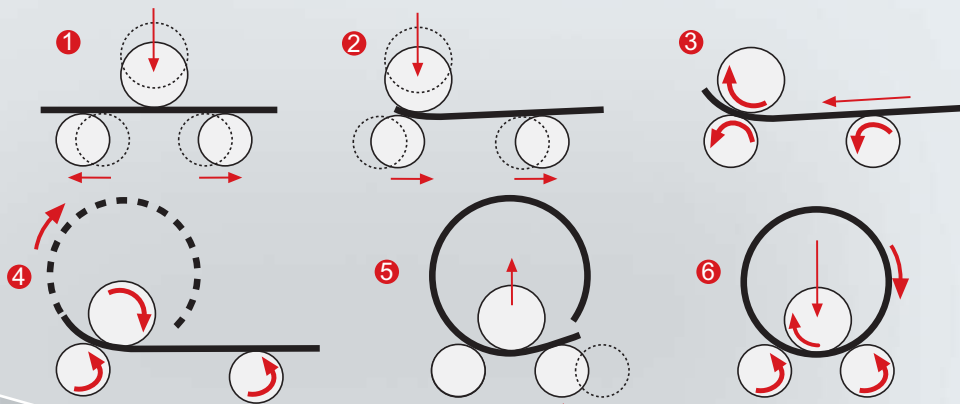


This type of rolling machine is especially suited for heavy duty jobs and is commonly known as the press-roll machine. The DAVI model is a new generation machine thus incorporating innovative design features never before employed on three roll machines. The most unique characteristic feature of this machine type is the vertical top roll movement while the lower rolls move horizontally that allows the pre-bending to be made (pre-curving of the ends). This process is similar to a press brake with the advantage of being able to handle the plate (like in traditional rolling machine) thus attaining the shortest flat end possible when compared with traditional three roll units. Thanks to the design of the rolls geometry, the plate remains horizontal at all times during the bending process. This significantly simplifies the machines operation and allows the bending process to be performed in relatively short time with only one operator. The MAV is therefore absolutely the most user-friendly, fastest and precise three roll machine available today on the market.

PROCESS A



PROCESS B



NUMERIC CONTROLS



The pace of technological development in the NC industry has transformed the process in many types of fabrication and metal working. DAVI has risen to the challenge having developed a complete range of numeric control units dedicated to the rolling process. **The SMART numeric control system represents today the ideal solution to managing complete production cycles both on automatic rolling lines** (ie. lines equipped with accessories designed to automatize the process such as gantry loader, automatic cylinder evacuation systems, vertical and lateral support systems) and on stand alone machines. Developed entirely on first class hardware the system is housed in "heavy duty" industrial strength and operator friendly designed stainless steel mobile console. The SMART numeric control system is protected against dust and mill scale frequently present in production facilities and is designed to

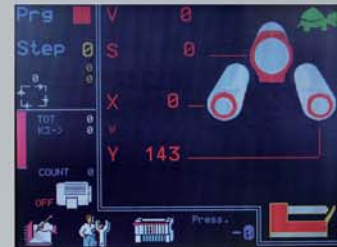
operate efficiently in the heaviest and most difficult conditions.

Designed for ease of comprehension and equipped with user friendly a graphic interface, this NC is extremely easy and intuitive. Thanks to the "Teach-in" and "Aided Program" functions an operator can create a complete working cycle in only a few minutes. Use of the SMART NC does not exclude operators from using the machine in traditional manual mode. On the contrary, the manual operation is assisted thanks to the availability to visualize the movements of each axis (including rolls rotation).

Thanks to these characteristics the SMART NC has been acclaimed as the ideal solution also for operators who use the rolling machine in traditional manual mode.

TECHNICAL CHARACTERISTICS

- 9 programmable axis (5 standard: X-Y-S-O-W)
- Huge capacity for program memory
- 24 step per program are allowable
- Illuminated graphic display on 5,7" screen
- Compact Flash cad for data porting to external PC
- Teach-in mode



NUMERIC CONTROLS AND CONTROL PANEL

CONTROL PANEL

If the MAV machine is not equipped with a numeric control system, it will be equipped with a control panel mounted on a practical and user friendly console.

A digital display is incorporated in the console to visualize the movement of all three rolls. The control panel has a speed selector and emergency pushbutton with independent joy sticks to control the movement of each axis.

The visual images located close to each control makes it extremely easy for the operator to understand the control functions.



WHY CHOOSE A THREE ROLL MACHINE
WITH VARIABLE AXIS



EXCELLENT PERFORMANCES ON THICK PLATE

The extremely compact design and the ability to form the flat end by pressing, make the DAVI MAV the ideal solution for heavy high power requirements. Specifically for very thick or special hardened alloy steel applications. For this reason this machine is also available for hot rolling applications. (optional)



THREE INDEPENDENTLY DRIVEN HYDRAULIC MOTORS

3 hydraulic motors and 3 gearboxes are mounted in the typical DAVI style. Directly coupled to the shaft which is the the correct mechanical solution, ensuring excellent plate movement through the rolls with any material which nearly eliminates the possibility of the plate slipping.

OPTIONAL ACCESSORIES

The DAVI MAV can be equipped with a complete range of accessories to perfectly match any specific need such as:

- Fixed and hinged vertical supports
- Multi roll lateral supports
- Plate loading and automatic evacuating systems
- Interchangeable rolls
- Rolls surface machining



AN EXCELLENT PRODUCT

Designed to the highest engineering standards, using many of the newest and most advanced technology, the DAVI MAV is affirmed to be the No. 1 among variable axis machines. This premier stature has been attained thanks to the compact mechanical design integrated with a highly developed dynamic fluid hydraulic system and use of only top quality well known, brand name components.

SOLID LOW FRAME DESIGN

The heavy normalized steel structure is electro-welded and ensures excellent performance in even the heaviest operational conditions. The low frame design ensures a more rigid structure and makes closed horizontal shell removal easier. Thanks to this design it is not necessary to employ pits or special foundations on medium sized units only on the largest machine models.



**HIGH PRECISION "SERVO-TRONIC" (DAVI Patent)
ELECTRONICALLY SYNCHRONIZED PARALLELISM**

ALL THREE rolls are electronically synchronized to guarantee parallelism with a precision which is nearly impossible on mechanical systems. Based on the principle of Synchronized Press Brake benders the first hydraulic system is checked to ensure that the rolls are moving at the same speed (i.e. remaining parallel). The control system is activated on the two main rolls movements: the vertical movement of the top roll and the lateral (horizontal) movement of the side rolls. An additional electronic synchronization is servo-assisted by the first and automatically balances the loads thus returning the system to an balanced load (i.e. perfectly parallel).

THE RESULTS OF THIS SYSTEM ARE:

highest possible machine precision attainable if rolls are parallel. No adjustment or mechanical setting to zero point required. Eliminates risk of machine stoppages or related faults. **Rolls can be inclined working on both ends.** This is not possible on parallel control systems of other machines.

Compensation of shells out of position the system can be used to compensate for imperfect plate positioning.

Return to horizontal position (e.g. After rolling cones)

is instantaneous and automatic. **No mechanical clutch required.**

ALL THE ROLLS CAN BE TILTED

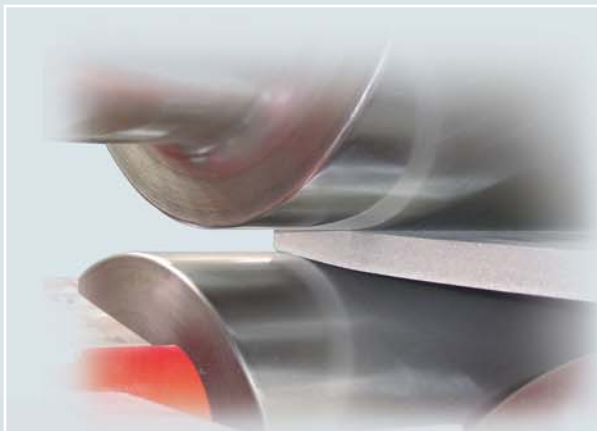
Unlike other machines, the MAV DAVI can tilt the rollers, both in front and at the rear, with a very broad angle.

This thanks to the absence of mechanical obstacles (not present on the MAV DAVI).

ALL 3 ROLLS MOTORIZED AS STANDARD

The only press-roll machine designed with all 3 rolls motorized VS. only the top roll. The latter renders the rolling process difficult when running thinner or shorter plate lengths. The flexibility parameter is therefore built into the machine design.





AS PRECISE A FLAT END AS ON A FOUR ROLL

With all three rolls motorised the bending process is very easy and precise, especially during the introduction. This feature has fully eliminated the old and obsolete mechanical brake system and has resulted in performances similar to those of a 4-roller bending machine.

AUTOMATIC SPEED CONTROL ON PERIPHERAL ANGLE

The hydraulic system has been specifically designed for rolling operations and automatically compensates for the inevitable rotary speed differences of all three rolls during the rolling process, thus eliminating the use of instable mechanical clutch mechanisms.

PROTECTION AND TOTAL SAFETY PARAMETER

A series of safety devices guarantee the total safety of the machine from overload during the rolling process. The system is managed electronically through a PLC and ensures balanced loads throughout the cycle thus protecting the machine from inadvertent operator errors.

LUBRIFICATION BY PERMANENT "PLT"

Like all DAVI machines, the MAV is also equipped with special pre-lubricated or "lifetime" lubricated components thus eliminating the need for periodic lubrication. All bearings and friction based movement related components are automatically lubricated.

ENERGY SAVING "EST" SYSTEM

For years the DAVI philosophy has been to adopt high performance components that integrate with a streamlined efficiency based product to reduce as much as possible energy which may be wasted. Focusing most of the energy on the bending cycle to be performed.

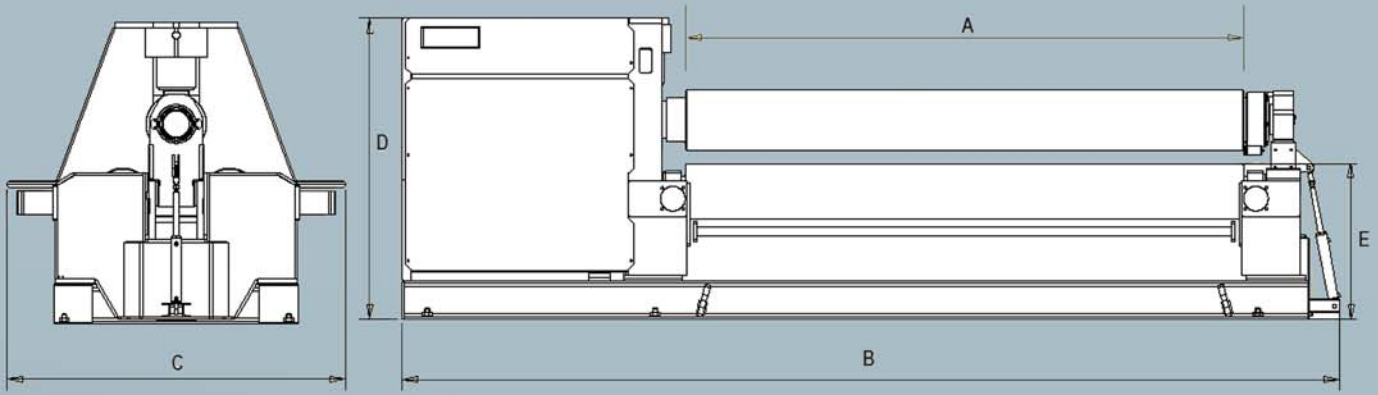


CONE ROLLING MADE SIMPLE

Cone rolling on a traditional three roll machine is notoriously difficult. With the MAV technology, cone rolling is made much simpler than on any other three roll design. This is possible thanks to the capability to position the rolls independently and adapt the inclination to the cone shape desired. The low frame design adopted by DAVI allows the smallest possible diameter cones on a three roll and enable cone evacuation after closing.



WHY CHOOSE A THREE ROLL MACHINE WITH VARIABLE AXIS



DAVI Model	Plate Width	Rolling thickness mm	Pre-bending thickness mm	Overall dimension			
	A			B	C	D	E
	mm			length mm	width mm	height mm	working height mm
MAV 2041	2.050	52	40	5.100	2.200	2.350	1.550
MAV 2050	2.050	72	64	5.500	2.450	2.750	1.800
MAV 2055	2.050	100	85	5.600	2.800	3.150	2.100
MAV 2545	2.550	46	35	5.600	2.200	2.350	1.550
MAV 2552	2.550	65	54	6.000	2.450	2.750	1.800
MAV 2557	2.550	90	72	6.100	2.800	3.150	2.100
MAV 3045	3.100	42	32	5.900	2.200	2.350	1.500
MAV 3053	3.100	60	48	6.500	2.450	2.750	1.800
MAV 3060	3.100	82	65	6.600	2.800	3.150	2.100

* Promau manufactures machines of all types and sizes which, due to lack of space, cannot be published in full. Upon request, information can be provided to meet your companies unique needs. levels; Promau in fact has the technical, design and production expertise to cope with any bending application.



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