

MCEB  
4 roll/DIGITAL

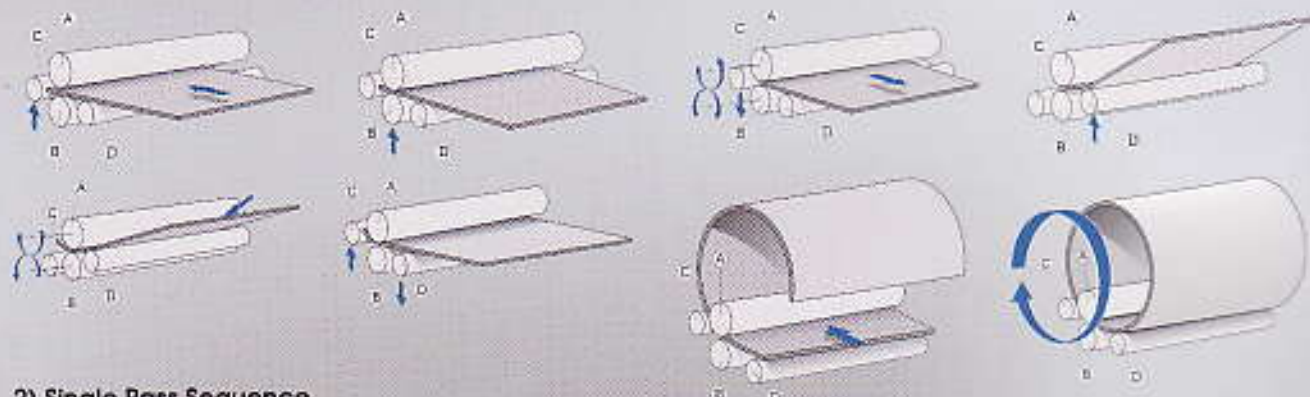
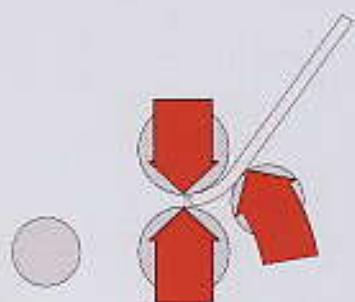
**DAVI**®

EXCELLENCE IN FORMING

[www.davi.com](http://www.davi.com)



1) **The flat end is the shortest** (excellent prebending) thanks to the two central rolls that can take the edge to the precise tangent clamp.



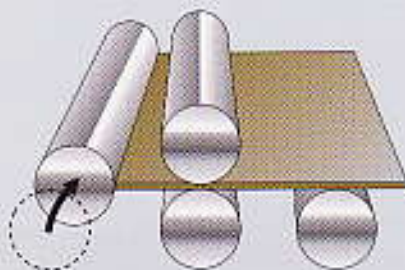
**2) Single Pass Sequence**

The entire shell could be finished in one pass only, including prebending of both edges.

ONE only side roll position, one only **automatic** squaring, and no plate handling required at all.

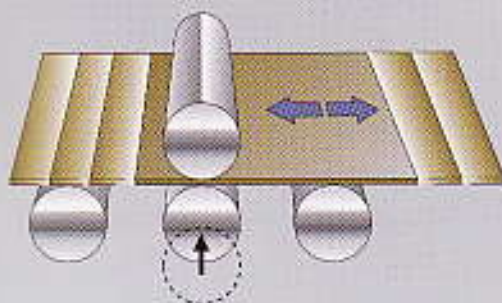
### 3) Squaring

Automatic and instantaneous, plate is squared against the back roll (a real hydraulic back-gauge).



### 4) Plate Transfer

Plate is always hydraulically pinched in between the 2 central rolls, constant and perfect positioning.



### 5) Handling Devices

Squaring, pre-bending and rolling can be made whilst keeping the plate always horizontal at the feeding: possibility to have gantry loaders and in-feed conveyors to improve productivity.



### 6) Cones

The 4 roll geometry helps to roll cones, as the bottom clamping roll can be tilted and clamps the back edge of the plate (at the large diameter of the cone), feeding faster its long development.

The "cone attachment", at the contrary, guiding the shorter edge of the plate (at the tight diameter of the cone) to slightly rotate according with the cone geometry, slows down the feeding of its shorter development.

Side rolls must be tilted to form the cone at its right geometry.

Davi 4 roll have, as standard feature, the electronic bottom clamping and side rolls tilting, up to a level substantial higher than the competition (Davi exclusive and benefit).



### 7) CNC Applications

4 roll is the most suitable machine for CNC: instant automatic squaring: reliable "start" position, ideal to be CNC programmed, as positive mechanical reference. The feeding of the plate is guaranteed by the hydraulic permanent clamp of the pinching rolls ensuring a constant, accurate and sure control of the position of the plate. Single pass bending process: the simplest to be CNC programmed.



WHY CHOOSING A 4 ROLL  
DAVI "MCB"

DAVI MCB: THE RIGHT MACHINE  
FOR ANY BENDING  
REQUIREMENT



LARGE BAR AND FLANGES ROLLING MACHINES



BOILERS AND HEAT EXCHANGERS



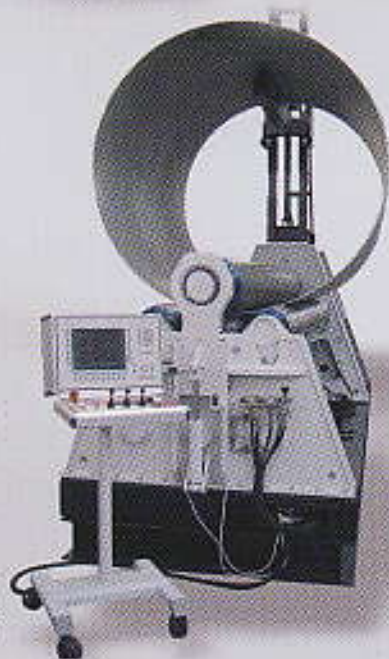
TUBE AND PIPE MANUFACTURE UP TO 12 METERS LONG



MCB ROLLING MACHINE  
6.000 X 50 MM



CONICAL SHAPES



SHELLS FOR TRUCK CARRIAGES AND LIQUID CARRIERS

## CNC DAVI "SMART-PRO"



Recommended to users that need to program as simple as possible single radius parts.

This innovative CNC, thanks to its powerful Intel Pentium® processor, is **selfprogramming, complete automatically**, through the "Computer Program Mode" any single radius shape (the multi radii parts can be programmed Teach-in or in Editor mode).

**Unlimited number of axis** can be controlled (open system);

**Multiple Serial Ports:** two USB, RS232, Ethernet, compact flash slot;

**Advanced diagnostic:** with dedicated software and comprehensive trouble-shooting guide;

**Advanced Tele-service:** technical support online in real time connecting with Davi Tele Customer Service.

## CNC DAVI "LEONARDO®"

The New Leonardo®, is the most advanced CNC available today in the plate roll industry.

Its powerful Intel Pentium® processor **self-programs itself full automatically** (through Computer Program Mode) to roll either single radius than multi-radii parts (like oval, buckets, round-square, etc.) It allows to **import .dxf files** directly from the office, and **carries a real CAD station onboard**.

Package CAD-Creator-3D installed on-board, that allows the operator to design parts and roll them automatically (CAD-CAM);

Memory capacity up to **5000 programs**;

**Unlimited number of axis** can be controlled (open system);

**Multiple Serial Ports:** two USB, RS232, Ethernet, compact flash slot;

**Advanced diagnostic:** with dedicated software and comprehensive troubleshooting guide;

**Advanced Tele-service:** technical support online in real time connecting with Davi Tele Customer Service.



**ALL DAVI CNC BENEFIT FROM THE NEW ROLL-BY-WIRE**

## WHY CHOOSING A 4 ROLL DAVI "MCB" ?

**SWINGING GUIDES DAVI "PSG"**  
(1988 Davi patent on 4 roll machines):



The PSG system is based on the side rolls movement that is "hinged" on a strong central pin, the movement is therefore a circular movement around this central hinged point, without any linear friction at all.

**Structure of the machine**

The natural external reaction of the plate during bending is "held" inside the structure.

This allows the machine to have a "compact" and less obtrusive structure, whilst at the same time maintaining its strength.

### NO DEFLECTION

Using the "PSG" system has enables the machine to "hold" the traction forces inside the structure, without any outside deflection. Strength and precision with no friction. The rolls movement is rigid and stable but at the same time "round" and fluid, the lack of friction

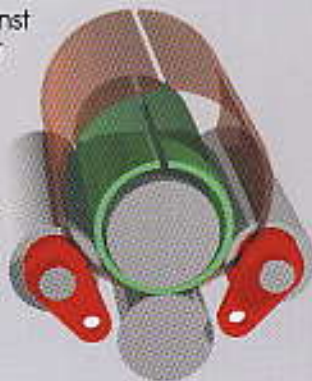


allows absolute accuracy.

Originally born from the concept of high precision planetary geardrives, that concept has today been adopted by all modern hightech rolls manufacturers (e.g. Scandinavian and German) and on practically all reputable brands of section benders.

### SMALL DIAMETER SHELLS

"Wrapped around" whilst "pressed" against the top roll, on a longer plate section than on the linear guides, reducing the natural material spring-back reopening effect. Much smaller diameter shells (and cones) are achievable (up to and even less than 1.1 times the top roll diameter), this means a 30% advantage in minimum diameter, when compared machines with linear guides.



### NO Lubrication



### DAVI SWINGING GUIDES



They completely eliminate the slipping sliding friction for side rolls movement. No need of maintenance at all. They are not damaged by the mill-scale. Premature wear due to the lack of regular maintenance is eliminated. They extend the life of the machine and increase its value through the time.

WHY CHOOSING A 4 ROLL  
DAVI "MCB"



## ADVANTAGES OF THE DAVI "PSG" SYSTEM

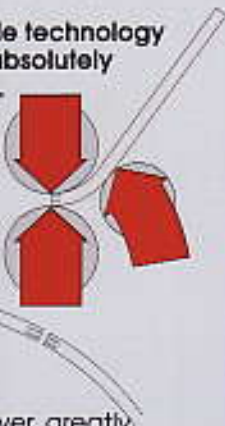
### 1) Best pre-bending (shortest flat end)

The DAVI planetary swing guide technology allows the operator to obtain absolutely the best results in pre-bending.

The side roll "rounds" the plate edge starting their stroke from a more external position, swinging up during the raising phase as it nears the top roll. The plate edge is therefore "pre-bent" and "rounded" with a higher leverage arm, getting more strength on the material to be formed, more prebending power, greatly reducing the remaining flat end.

The edge is therefore free from angles, peaks or straight line segments between bends, thanks to the longer rounded section.

The flat end remaining will be approximately 40-50% shorter than on other rolls with linear guides.

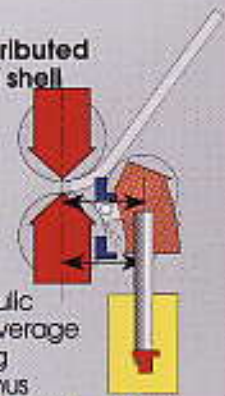


### 2) Greater Power is available (bending capacity of the machine)

Bending power increase is distributed homogeneously irrespective of shell diameters, even during pre-bending.

During the swinging movement the roll raises up with a beneficial and constant positive leverage. This geometric movement multiplies the power of the hydraulic cylinder thanks to the effect of leverage that concentrates all the bending power in the pre-bending area thus reducing the length of the flat end.

$$T_{ONS} \times L = P_{OWER}$$



### 3) Tighter diameter cones are possible

The swinging guides allow you to keep the created stress within the lower internal side of the frame. It is then possible to roll smaller diameter cones (much closer to the top roll diameter) as there is no interference from the geometry of the main frame.



## DISADVANTAGES OF THE OLD LINEAR GUIDES

### Disadvantages of the old linear guides

The linear guides (that do not "round" or "wraparound" the roll), press at a point which is closer to the clamping point:

- the bending stroke is much tighter: the pre-bending results in an edge "bend", with less power, rather than a "curved";
- the length of the flat end is double that when using the new swinging guide system!



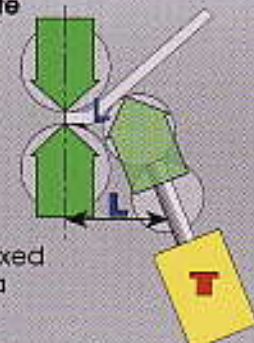
### Disadvantages of the obsolete linear guides (still employed by other manufacturers).

Less power applied on small diameters and in the pre-bending area! Due to inclined straight line geometry of the machine, the power of the cylinder is fixed (no leverage benefit allows a constant load distribution). With inclined linear guides the max load is applied where it is less useful (with the rolls at the lowest down position).

When the rolls raise the leverage reduces progressively, with lesser power reducing the forming diameters.

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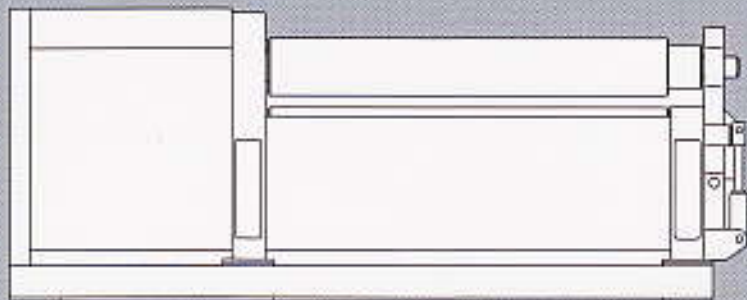
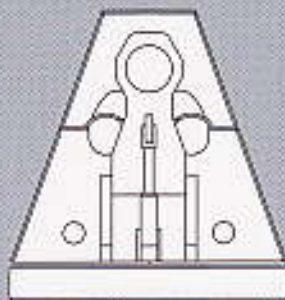
### Obsolete, previous linear guides

Linear guides for side rolls oblige a high and heavy frame to avoid it to deflect "out-board". This avoid to roll to tight cones because they can physically touch the high parts of the frame.



ADVANTAGES OF THE DAVI "PSG" SYSTEM



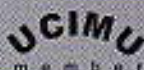


MCB	Rolls width	Rolling thickness	Prebending thickness	Top roll diameter	Bottom clamping roll diameter	Electric power
	mm	mm	mm	mm	mm	HP
2024	2050	16	13	240	230	15
2027	2050	20	16	270	250	20
2029	2050	25	20	290	270	20
2033	2050	32	26	330	310	30
2037	2050	40	36	370	340	40
2041	2050	50	42	410	370	60
2527	2550	15	12	270	250	15
2533	2550	22	18	330	300	20
2535	2550	28	25	350	330	30
2539	2550	36	32	390	360	40
2545	2550	45	38	450	410	60
3028	3100	13	10	280	260	15
3030	3100	15	12	300	280	15
3034	3100	20	16	340	310	20
3037	3100	25	22	370	340	30
3041	3100	34	30	410	380	40
3045	3100	40	35	450	410	60
3053	3100	52	45	530	490	75
3060	3100	70	58	600	550	100

\* Promau manufactures machines of all types and dimensions which, due to lack of space, cannot be published in full. Upon request, offers can be drawn up for machines of all performance levels; Promau in fact has the technical, design and production expertise to cope with any bending application.



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