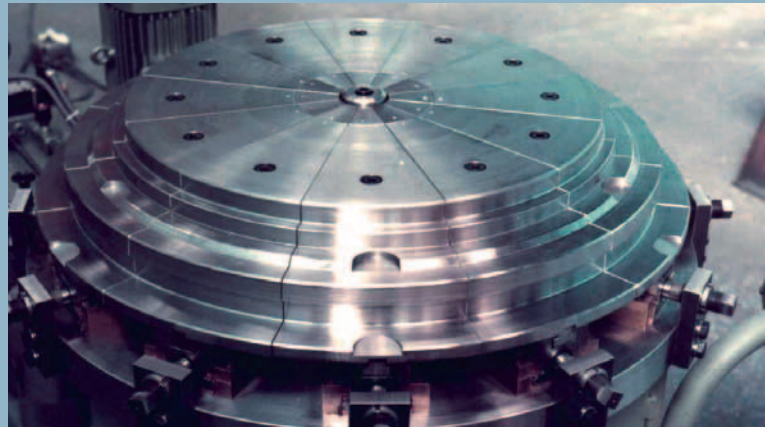
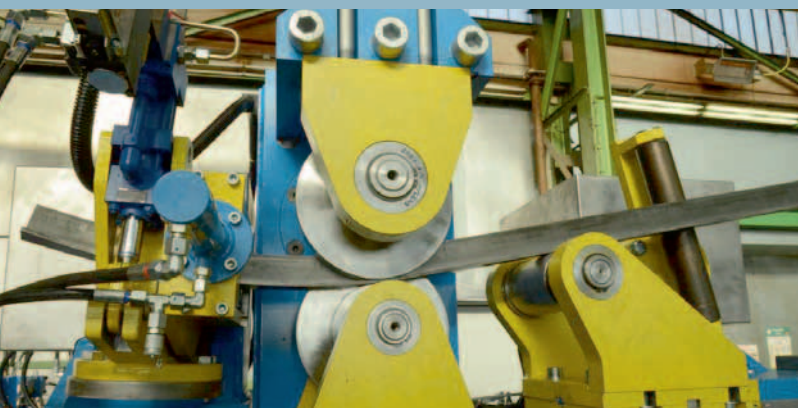


# HAEUSLER

the forming factory



HAEUSLER your experienced partner for the supply of  
MACHINES for AIRCRAFT AND AEROSPACE INDUSTRIES



80 1938-2018 years of  
INNOVATION

## MAIN ADVANTAGES OF HAEUSLER DESIGN

Equipment developed over decades of years in close partnerships with our customers to reach most efficient solutions for the different applications in the aviation industry.

100% speed compensation by rolling thin parts under low load as the rolls are electro mechanical driven.

Special deflection compensation system for top and bottom rolls which can be easily operated as hydraulic actuated and controlled from the central control panel without any manual alignment work.

The double arm supporting tables give a close support to every kind of work pieces to avoid any deforming due to dead load of the parts.

Control system tailor-made by Haeusler to cover the full need of the application without additional unused parts. This shortens the training for operator and maintenance staff.

- Pre-bending possibility
- Narrow toproll support beam for easy wing edge-bending

### Example:

- The marked parts will be manufactured by our machine
- Airplane Fuselage and Wing Edge
- Bending Machine
- Model FKB 10 000 x 6 mm CNC

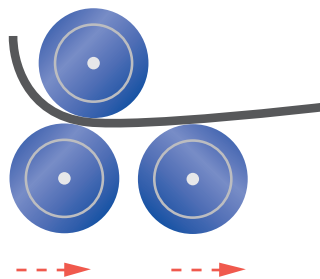




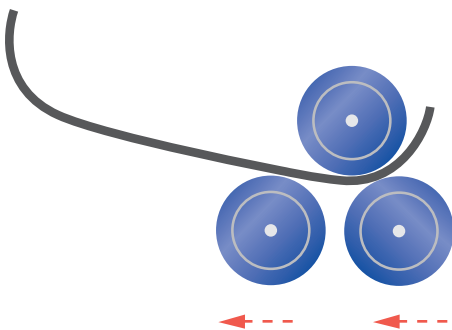
## Main features of HAEUSLER built fuselage panel and wing edge bending machines model FKB

The machine is acting according to the 3-roll bending principle. Based on the individual adjustment of the bottom rolls pre-bending and bending of sheets with symmetrical and asymmetrical roll position is suitable.

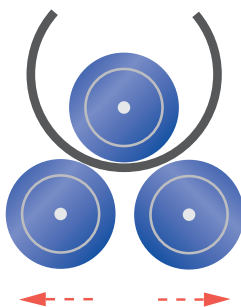
**Pre-bending of small radius and influencing of the spring back, even in case of thin sheets, based on tight and changeable bending geometry.**



■ Asymmetrically pre-bending of first plate end



■ Asymmetrically pre-bending of second plate end



■ Symmetrically roll bending of the section

Pre-bending of small radius and influencing of the spring back, even in case of thin sheets, based on tight and changeable bending geometry.

## Bending Machine Model FKB for Airplane Fuselage Panel and Wing Edges and other Complex Edge Shapes



Model FKB for wall thickness up to 15 mm.

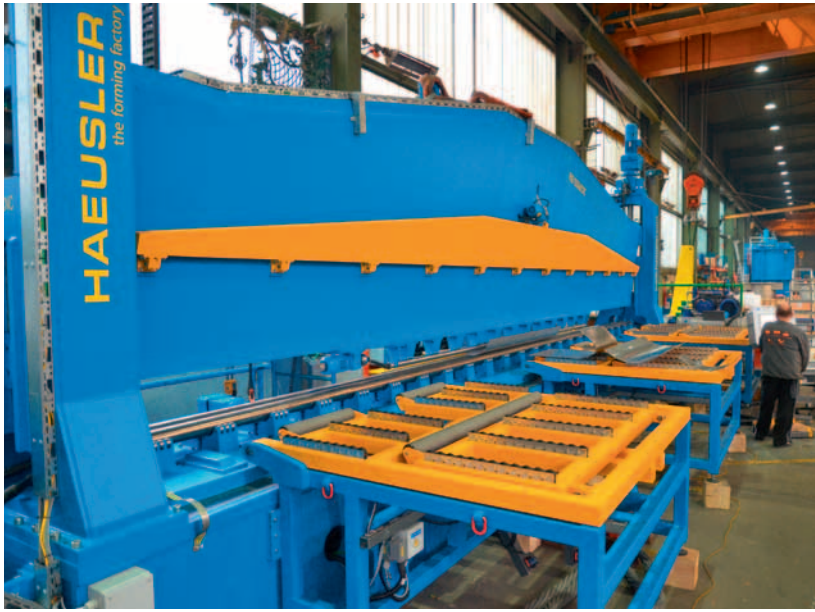


Model FKB for plate width up to 12 000 mm.

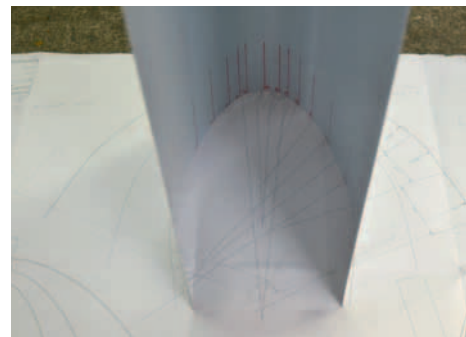




## Fuselage Panel and Wing Edge Bending Machine Model FKB



Model FKB for a max. length of 10 m.  
With quick changeable Top Roll and  
Changing Device.



Model FKB for a max. length of 6 m.

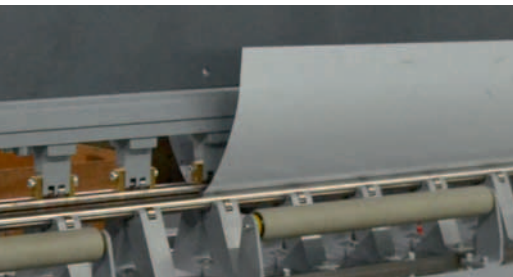


# Fuselage Panel and Wing Edge Bending Machine Model FKB



## Fields of application

- Bending of small radii at long part lengths
- Bending of complicated asymmetric geometries
- Bending of high-ductile materials with extreme springback
- Low-cost production of single pieces or small series.
- Rapid machine program changes
- Low capital costs
- Easy-to-use machine controls



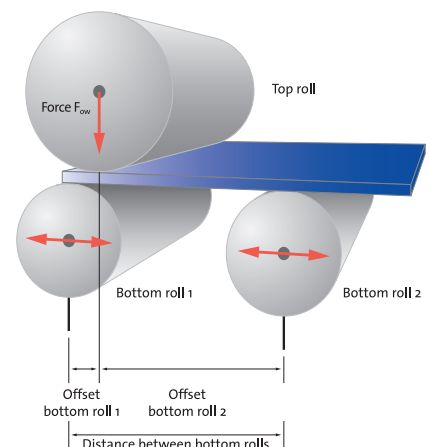
View onto the bending rollers with backup rollers and very narrow design of Top Roll Traverse.

The lateral opening in the machine column allows easy unloading of formed parts.

Model FKB for a max. length of 8 m.



6 m bending machine for heavy plates with automatic deflection compensation.





## Expander Model CM / Shrinking machines Model SM



CM Expander machines and SM shrinking machines for tolerance-specific expansion and shrinking of metallic hollow parts

Rings for rockets, launchers and satellites, our development is closely linked with the fantastic Ariane venture. No stage or back-up rocket would be complete without our equipment of rings in aluminium, stainless steel or alloy.

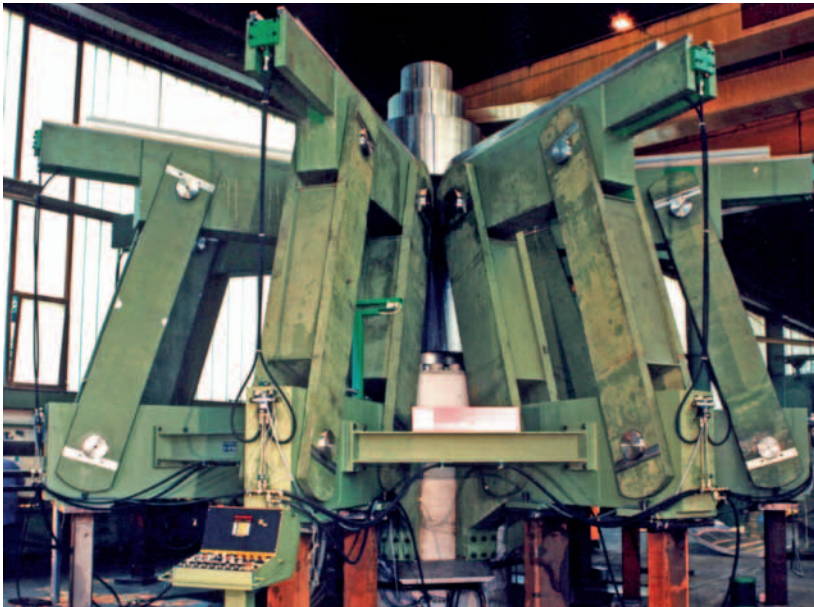
If you travel by air, in a Boeing or an Airbus, you will already have had the occasion to test the reliability of our rings!



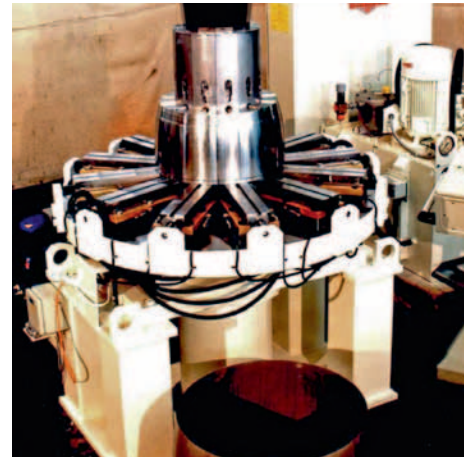
Model CM/SM Range of performance:  
Expansion force up to 200 000 kN; Diameter up to 7 500 mm;  
Other values on request







Expander Model CM for diameter range 2 000 - 7 500mm for the manufacture of components for the ARIANE rocket.



Model CM for diameter range 375 - 1 100 mm



Model CM for diameter range 100 mm - 1 200 mm.



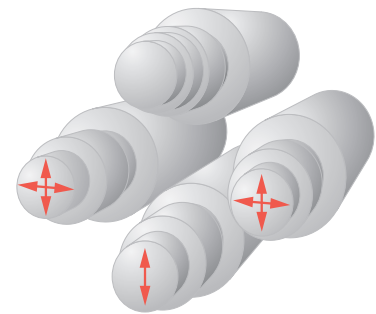
Model SM for assembling of 2 different parts/materials.



## Section Bending Model PRV – HPR

### Section Bending Machine Model PRV

HAEUSLER developed this machine for the aircraft and space industry at the beginning of this millennium. The machine has been further developed ever since and by 2013 is being operated by customers around the globe. The machine's main characteristic is the free positioning of its side rollers in 2-axis. That's especially beneficial when bending complex contours as it helps minimizing unwanted cross-section deformation. Additionally the machine is equipped with a twisting device for forming of sections in 3 directions.



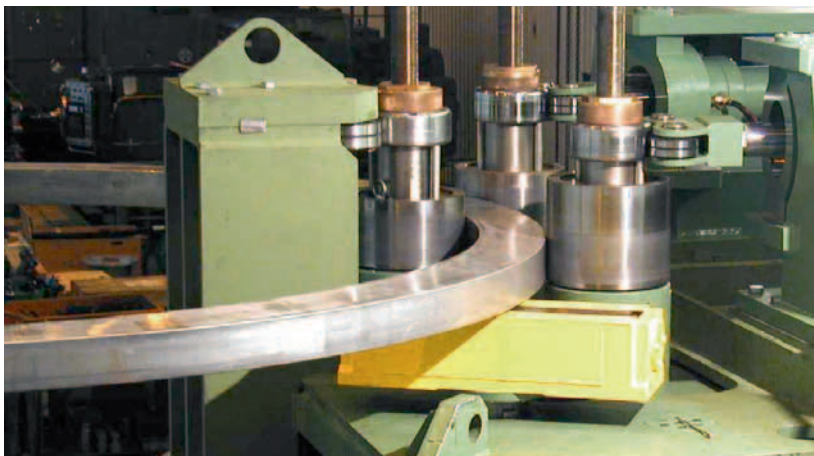
Range of performance, Section modulus up to 1700 cm<sup>3</sup>, Other values on request.

### When to use a big side roll distance

- Bending of large sections
- Bending with lower bending forces

### When to use a small side roll distance

- For maximum section guidance
- For maximum back spring control when working with high-tensile materials
- For minimal flat ends

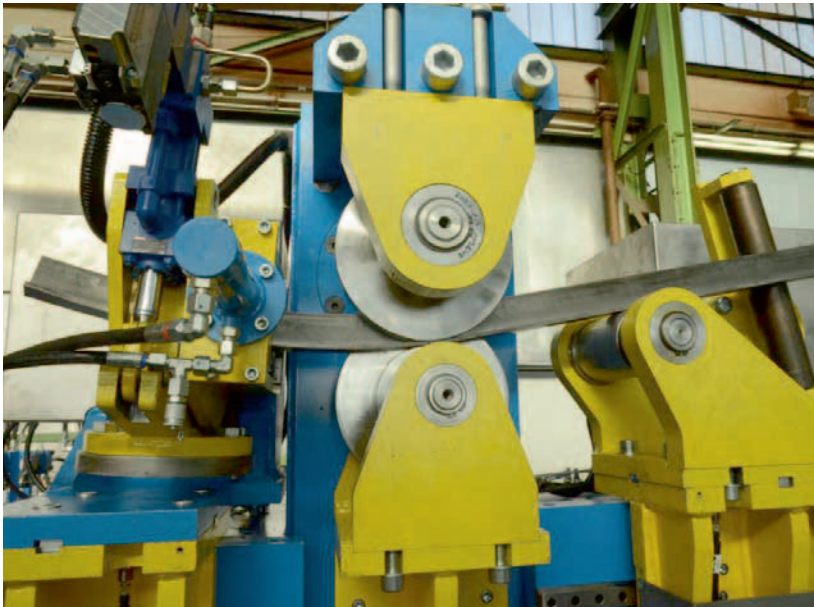


Universal section bending machine HPR.  
For Khronichev Space center Russia (two-three-stage booster).

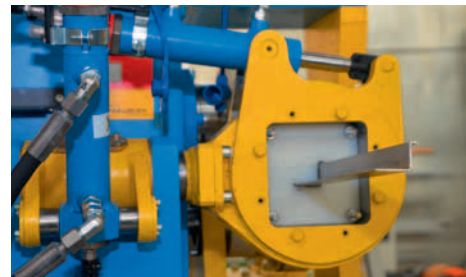




## Section Bending Machine Model PRV



Model PRV for continuous forming of sections in 2 directions.



Model PRV for continuous forming of sections in all directions.





## Why buy a „HAEUSLER“?

### Highest longevity

- Proven design with experience of decades of years in the aircraft industries and reference.
- The machines are manufactured, assembled and tested in our plants in CH and D.
- HAEUSLER machines show the longest guidance for the top roll on the market  
-> minimized surface load & highest stability.
- Rolls manufactured from heat treated, high alloyed steel for maximum resistance (Hardness 58-60 HRC).
- Use of sealed self-aligning roller bearings with statically defined conditions
- Selected suppliers (for example Bosch Rexroth, Siemens, Lincoln, SKF/FAG etc.) ensure highest quality of sub-supplied components.
- All machine drives and adjustments are electro-mechanical (Electric power efficiency).  
No oil leakage!

### Highest bending accuracy and quality

- Haeusler machines come with the most rigid and torsion resistant machine frames on the market.
- High precision sensors allow for exact setting and controlling of bending parameters.
- Haeusler machines offer an optimal bending geometry for best control of plate material springback.
- Pneumatic adjustable plate aligning device.

### Best machine availability – Preventive Maintenance

- The control system of Haeusler machines contains a dynamic maintenance scheduler that allows for preventive maintenance and thus ensures the highest machine availability.
- Easy access of all important components for quick and efficient maintenance work.
- Integrated uninterrupted power supply for the control system (UPS)
- 48 / 72 hours\* response time for at-site emergency service through our „Flying Doctors“.

### Low installation, follow up and maintenance costs

- Lowest costs for the machine foundation.
- The high quality of the Haeusler machines itself and the used components reduce the need for replacement parts to a minimum.

\* within Europe: 48h; outside of Europe 72h (possible additional time required to obtain visa not included)

## Machines for Airplane and Aerospace Industries

Wing and Fuselage Roll Bender Model FKB/HDR		
Sweden	Stratos	FKB 2 500 x 2
France	Dassault, Talence	FKB 3 000 x 3
Iran	I.P.A.S.	FKB 3 000 x 2 CNC
Iran	Iran Aircraft Industries	FKB 3 000 x 2 CNC
Turkey	TAI	FKB 3 660 x 5
Israel	Israel Aircraft Industry	FKB 3 660 x 1,6
Germany	Messerschmidt, Augsburg	FKB 4 000 x 4,8
France	Avions Hurel-Dubois	FKB 4 000 x 4
France	Dassault, Talence	FKB 4 500 x 3
Czech Republic	Strojirny Kolin s.p.	FKB 4 500 x 3
France	Dassault, Martignas	FKB 4 500 x 3
Indonesia	IPTN Indonesian Aircraft Industries	FKB 4 575 x 2,4
Turkey	TAI	FKB 6 000 x 6 CNC
Spain	Aeronauticas, Madrid	FKB 6 100 x 5
France	Aerospatiale	FKB 7 500 x 7
Russia	JSC Irkutsk	FKB 8 000 x 8 mm
Russia	Komsomolsk-on-Amur	FKB 10 000 x 6 mm CNC
Russia	Stroypodryad LLC	FKB 10 000 x 8 mm CNC
China	Shenyang Aircraft Industry	FKB 10 000 x 6 mm CNC
China	Guizhou Aircraft	FKB 6 000 x 6 mm CNC
Germany	Airbus Industry, Nordenham	FKB 10 000 x 6 CNC
Sweden	SAAB	FKB 10 000 x 6 CNC
Russia	Aviastar	FKB 10 000 x 8 mm CNC
China	Harbin Aircraft	FKB 5 000 - 600 CNC
Czech Republic	Evektor	FKB 4 500 - 400 CNC
Netherlands	Fokker Aerostructures B.V.	FKB 7 500 - 600 CNC
Brazil	Estaleiro Alianca SIA, Brasilien	HDR 6 000 - 3 700 CNC





## Section Bender Model PRV/HPR and Model SART

China	Xian Aircraft Industry Co.	PRV 9 spez.
Turkey	TAI	PRV 9 spez-CNC
China	Shaanxi Aircraft	PRV 60 CNC
China	Shanghai Aircraft	PRV 60 spez. CNC
Russia	Khrunichev	HPR 700 spez.
Russia	Khrunichev	HPR 55 spez.
Russia	Khrunichev	HPR 12 spez.
China	Shenyang Aircraft Industry	PRV 20 spec-CNC
<b>Special Machines</b>		
Germany	Dynamit Nobel	VRM-hy 400 x 3
Germany	Pfalz Flugzeugwerk GmbH	VRM-hy-vo 2 000

## Expander/Shrinker Model CM/SM

Germany	MTU, München	CM-V 400
United Kingdom	Doncasters (IEP StructuresLtd.)	CMV 1 440
Poland	Metalexport	CMV 8
Germany	Dynamit Nobel	CM-H 20
India	Kerala	CMV 820
France	Forges Dembiermont SA	CM-V 4 500
France	Aerospatiale	CMV 160
Germany	MBB, Schrobenhausen	SMH 2,5 hydr. spez.
Russia	Kulebakij	CV-R200
Russia	Kulebakij	CV-R500
Turkey	CIMTAS	CMV 150



# HAEUSLER

the forming factory



PLATE BENDING



SECTION BENDING



SPECIAL FORMING



ASSEMBLING EQUIPMENT



PRODUCTION LINES

HAEUSLER AG Duggingen  
Baselstrasse 21 | 4202 Duggingen | Switzerland

#### CONTACT

Phone +41 61 755 22 22 | Fax +41 61 755 22 00  
sales@haeusler.com | www.haeusler.com