

# SPECIAL CLAMPING

FOR RAIL AND SWITCH PARTS



**30** EXCELLENCE  
**RAIL**  
YEARS

INTELLIGENT SOLUTIONS

MAGNETIC  
HYDRAULIC  
MECHANICAL  
ELECTRICAL



CERTIFIED  
PREMIUM

IN

MACHINING

NS FOR

HEAVY MILLING

PRODUCER OF  
CLAMPING TECHNOLOGY





## SAV - DEVELOPMENT PROCESS

### THE KEY TO MUTUAL SUCCESS:

#### Research and development / Customer and work piece orientation

New markets, quick innovation cycles, compatibility and drive for unique selling propositions drive the necessity for customer oriented solutions:

#### 1. Inquiries, technical clearance and validation:

- Machining operations
- Specification of performance parameters
- Definition of quality criteria
- Verification of clamping datum and surfaces
- Table adaptation and energy supply

#### 2. Feasibility / Layout / Proposal

- Review of the different operation principles
- Magnetic – hydraulic – mechanical – vacuum, or combinations
- Verification of achievability, function and calculation

#### 3. Simulation and calculation

- Tool and interfering contour review
- FEM-calculation, mechanical, magnetic and thermal, static and dynamic

#### 4. Modeling and Engineering

- Engineering on 25 interconnected CAD-workstations in mainly 3D
- Design in Solid Works, Catia, NesCad, Auto-CAD, Mechanical-Desktop and Euklid

#### 5. Design release and detailed design

- Production release after presentation to customer
- Information exchange over IGES, DXF, DWG, STEP, VDA, PARASOLID, UNIGRAPHIC, CATIA EXPORTET, CATIA-MODELL, VRML, STL

#### 6. Manufacturing

- Manufacturing and quality control in exclusively German production facilities
- Linked to manufacturing

#### 7. Tests, optimization and commissioning

- Proven and optimized product quality before shipment, for minimum down time at installation and best productivity.

#### 8. Shipment, commissioning, installation and training

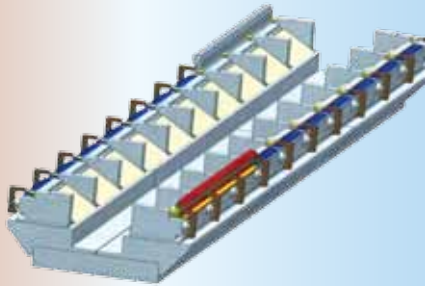
- Responsible for function and precision until the first samples

#### 9. After sales service

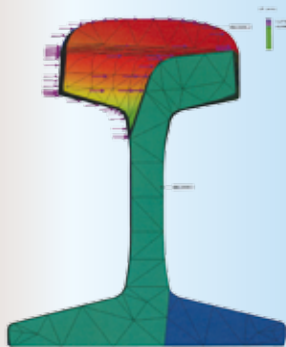
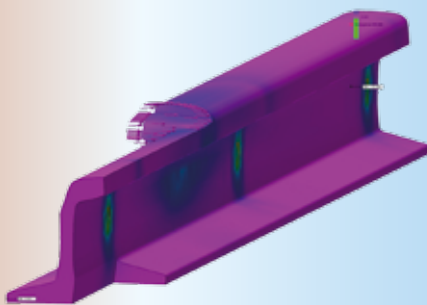
- Preventive maintenance, repair and spare parts service

*Customer oriented success from the very beginning.*

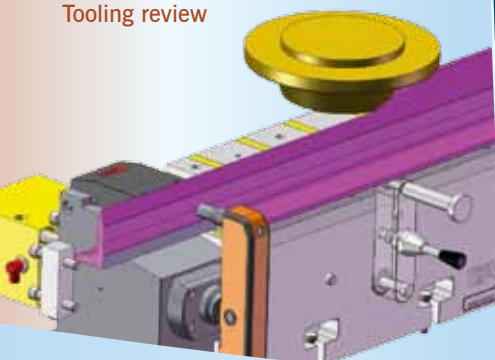
Conceptual design



Distortion analysis



Tooling review

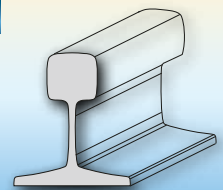


## RAIL PROFILES

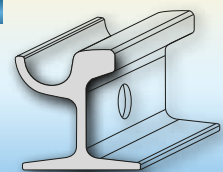
### FLAT BOTTOM RAIL (Vignol) main railways



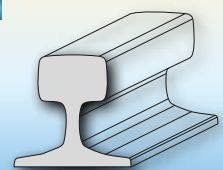
For explanation of icons see back page



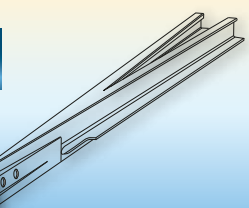
### GROOVED RAIL tramways



### SPECIAL PROFILES Crane Rails



### FROG VEE BLOCK main railway



## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RSS

### RAIL STANDARD



#### RSS1

Clamping at Web + Foot

#### Applications:

For heavy chip removal of gauge line, feet and fish-plate area of rail.  
In the first stage the double acting magnetic system aligns in transverse direction. After this the main magnet in the base is activated.

#### Nominal holding force:

195 N/cm<sup>2</sup> on inducible surfaces

#### Execution:

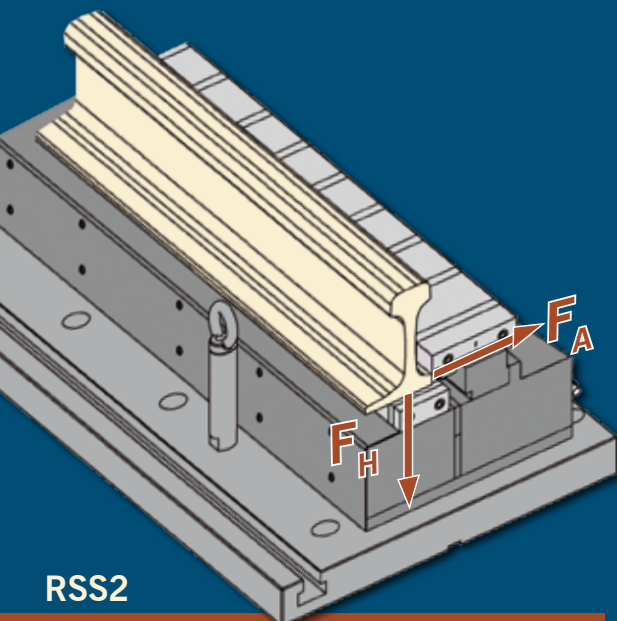
- Double magnet, high energy system
- Holding forces in the physically maximum range
- Magnetic system with deep acting field. Bridges also large air gaps up to 10 mm.
- Solid mono block design
- Compact design, suitable for tongue rails, flat bottom rails and guard rails

#### Design:

- Electro Permanent Magnetic System
- Mono block
- Full metallic surface, Isolation from brass
- Execution with pole plate or optionally with exchangeable pole bars / pole extensions.

#### Operation:

- tooling of gauge line of rail head
- With type RSS1 the milling of gauge line and feet, the drilling of webs and feet of, flat bottom rail, grooved rail and guard rails.
- With type RSS2 additionally the possibility to machine tongue rail, U-shaped guard rail and blade guard rails



#### RSS2

Clamping at Web + Foot transverse





## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RTC

### RAIL TWINCOMPACT

#### Applications:

For heavy milling of gauge line, feet and fish plate area of rail.

The first stage the double acting magnetic system aligns in transverse direction. After this the main magnet in the base is activated.

#### Nominal holding force:

195 N/cm<sup>2</sup> on inducible surfaces

#### Execution:

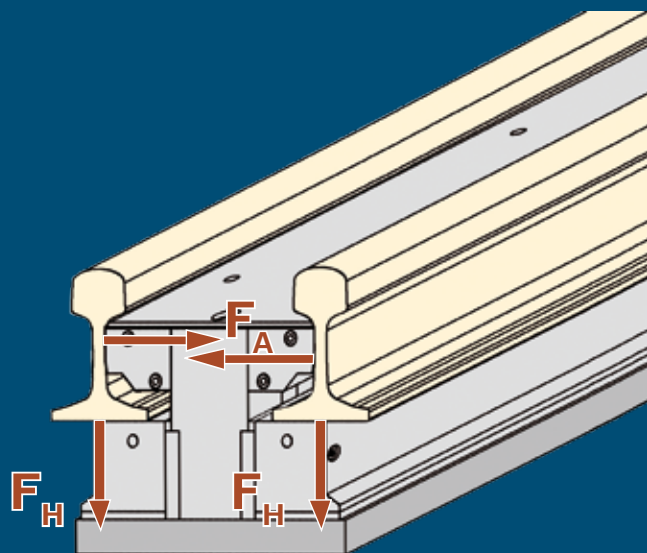
- Double magnet, high energy system
- Holding forces in the physically maximum range
- Magnetic system with deep acting field.  
Bridges also large air gaps up to 10 mm.
- Solid mono block design
- Compact design, suitable for C Type and Gantry milling machines

#### Operation:

Milling of gauge line and feet.

#### Homogeneous force transmission

- $F_A$  (horizontal force)  
for transverse aligning of work pieces
- $F_H$  (vertical force)  
in second step by base magnet



Clamping foot and web

## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RBK

### RAIL TWIN COMPACT

#### Applications:

- For heavy milling of head and block sections.
- Combination of hydraulic and magnetic clamping
- Positioning and centering using hydraulic clamps (centric and floating)
- Form fit using automatic orientation hydraulic clamps
- Force fit using additional high energy magnets

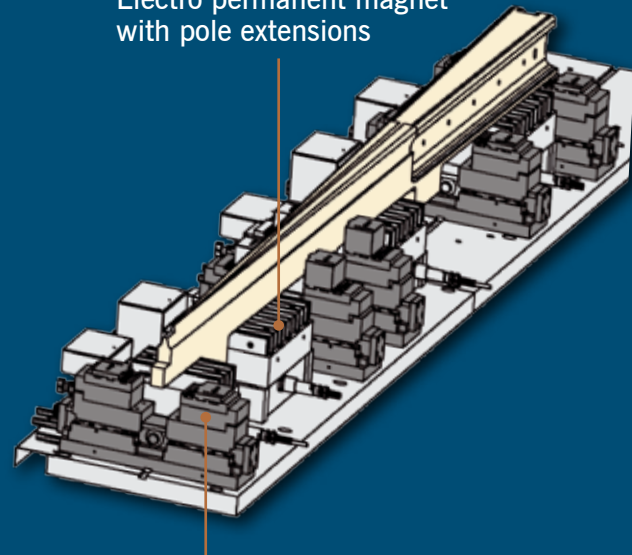
#### Execution:

- Clamping and damping using high energy magnets
- Centering and clamping of thin parts using centering and floating hydraulic clamps
- Workpiece: block sections

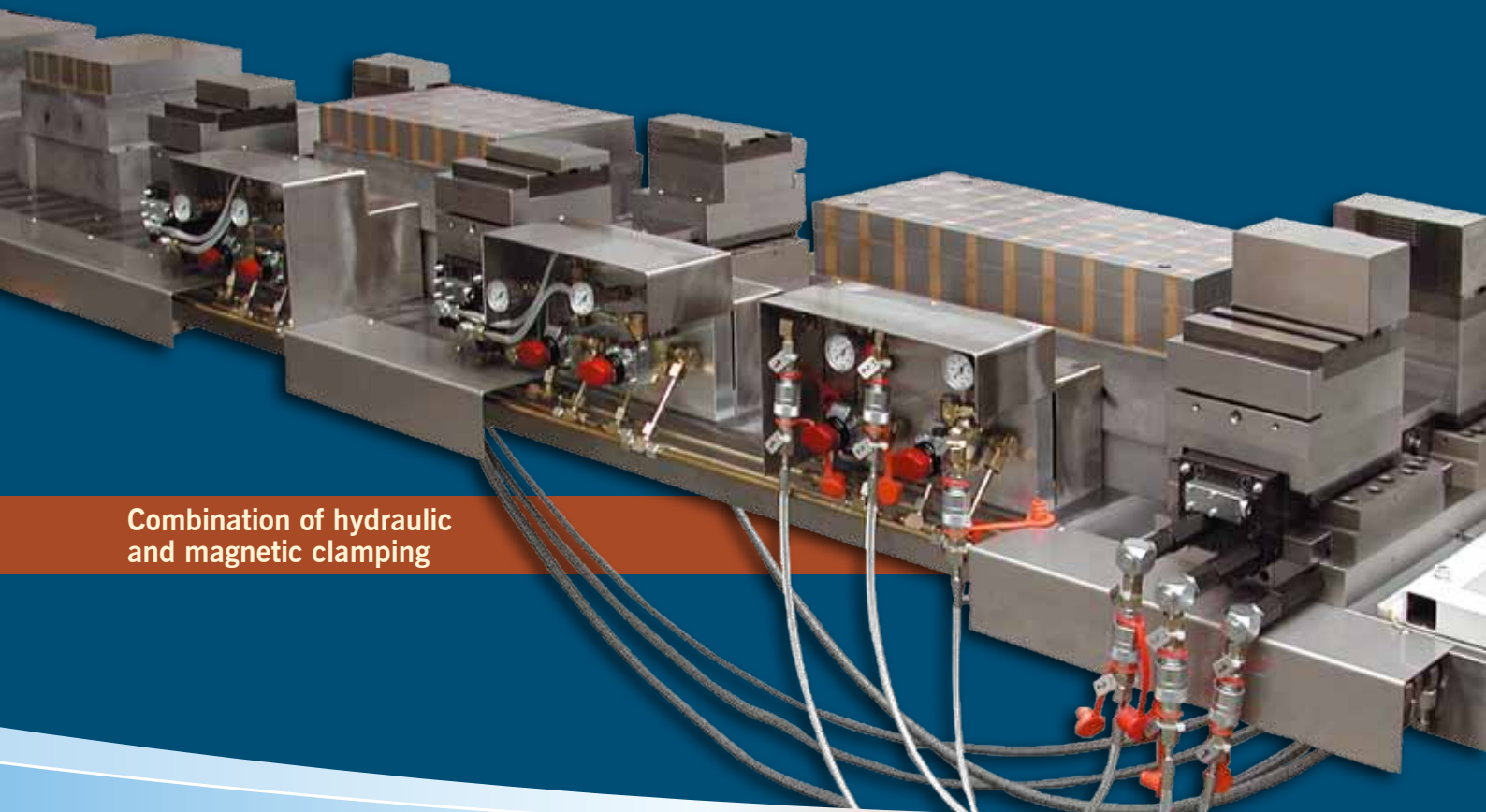
#### Operation:

- Heavy milling

Electro permanent magnet  
with pole extensions

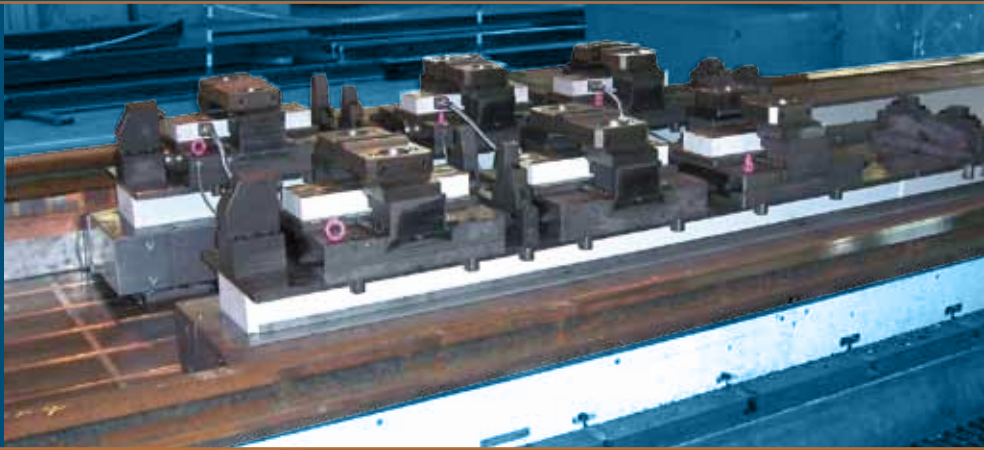


Settable Hydraulic clamps  
(floating / centric)

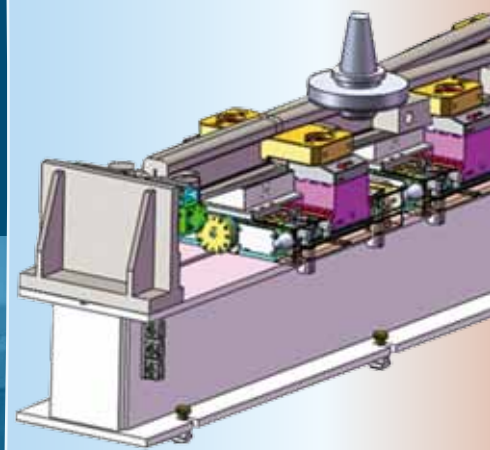


Combination of hydraulic  
and magnetic clamping

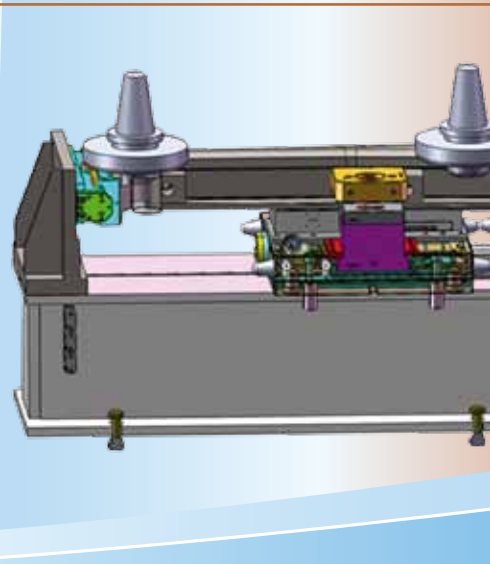
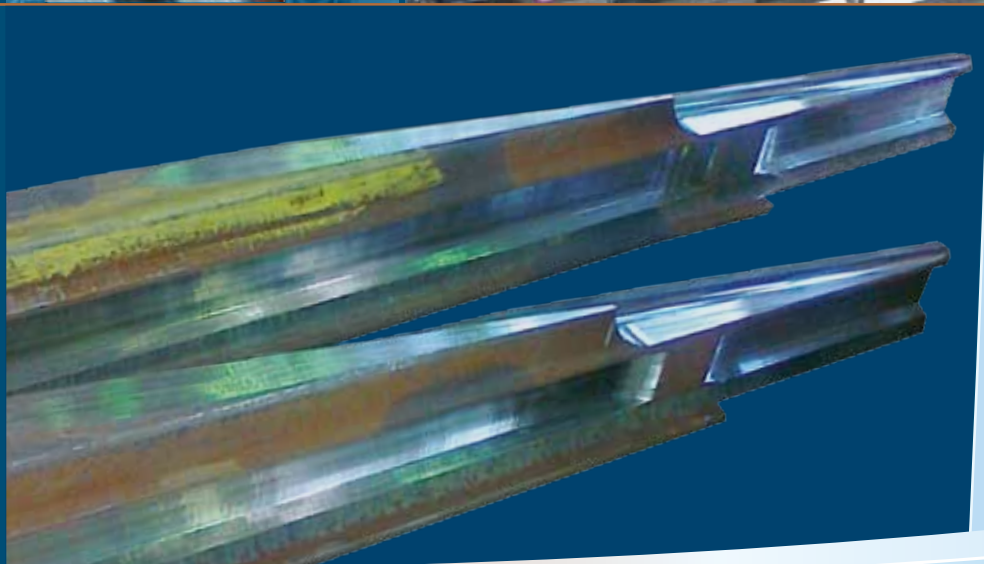




Operation examples block sections:  
Individual solutions for different parts  
and requirements



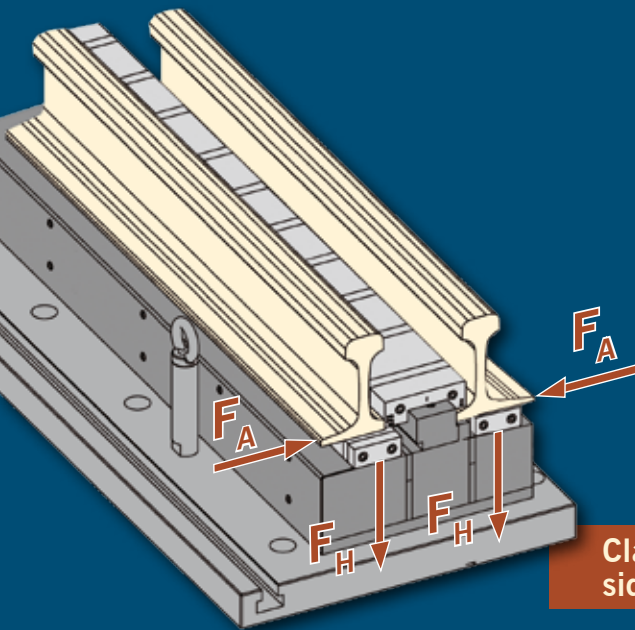
- Hydraulic clamping fixtures in special execution with high cantilever
- Yaws with quick exchange system
- Magnetic system for foot clamping



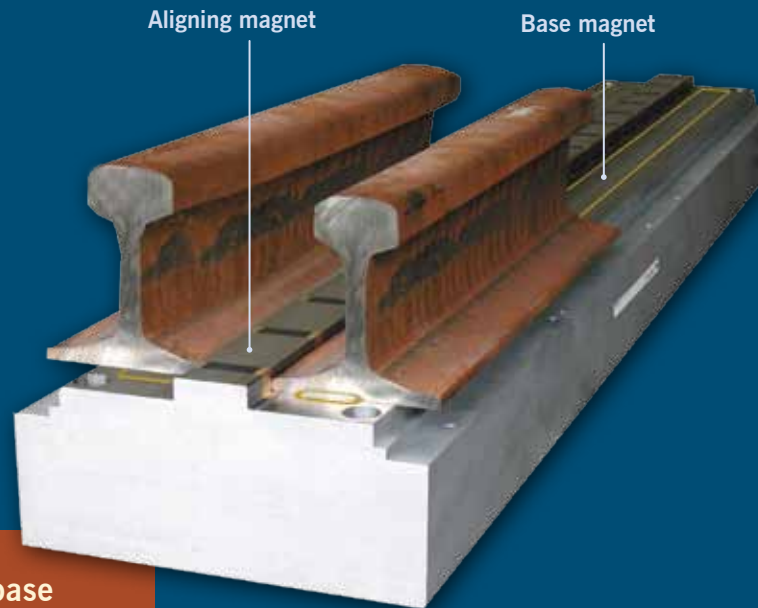
## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RTF

### RAIL TWINFOOT



Clamping from  
side stop and base



#### Homogeneous force transmission

- $F_A$  (horizontal force)  
for transverse aligning of work pieces
- $F_H$  (vertical force)  
in second step by base magnet

#### Execution:

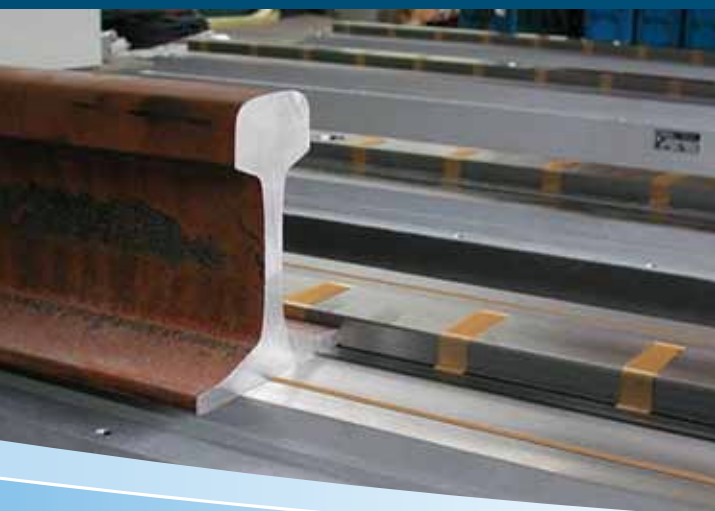
- Double magnet, high energy system with  $195 \text{ N/cm}^2$  on inducible surfaces
- Holding forces in the physically maximum range
- Magnetic system with deep acting field. Bridges also large air gaps up to 10 mm.
- Solid mono block design
- Brass pole gaps – low wear
- Compact design, suitable for tongue rail, flat bottom rail and guard rail

#### Design:

- Enhanced high energy magnetic system
- Magnetic active aligning, using 120 mm transversal pole pitch at the foot from the side
- Base clamping with longitudinal pole arrangement

#### Operation:

- Milling of gauge line and feet,  
Drilling of web and foot







## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RSH

### RAIL STANDARD AND HYDRAULIC CLAMPS

#### Applications:

- For heavy cutting of gauge line, feet and fish plate area of flat bottom rail
- In the first stage, the double acting magnetic system aligns in transverse direction. Afterwards main magnet in the base becomes activated.
- Additional hydraulic clamps for stable setup

#### Nominal holding force:

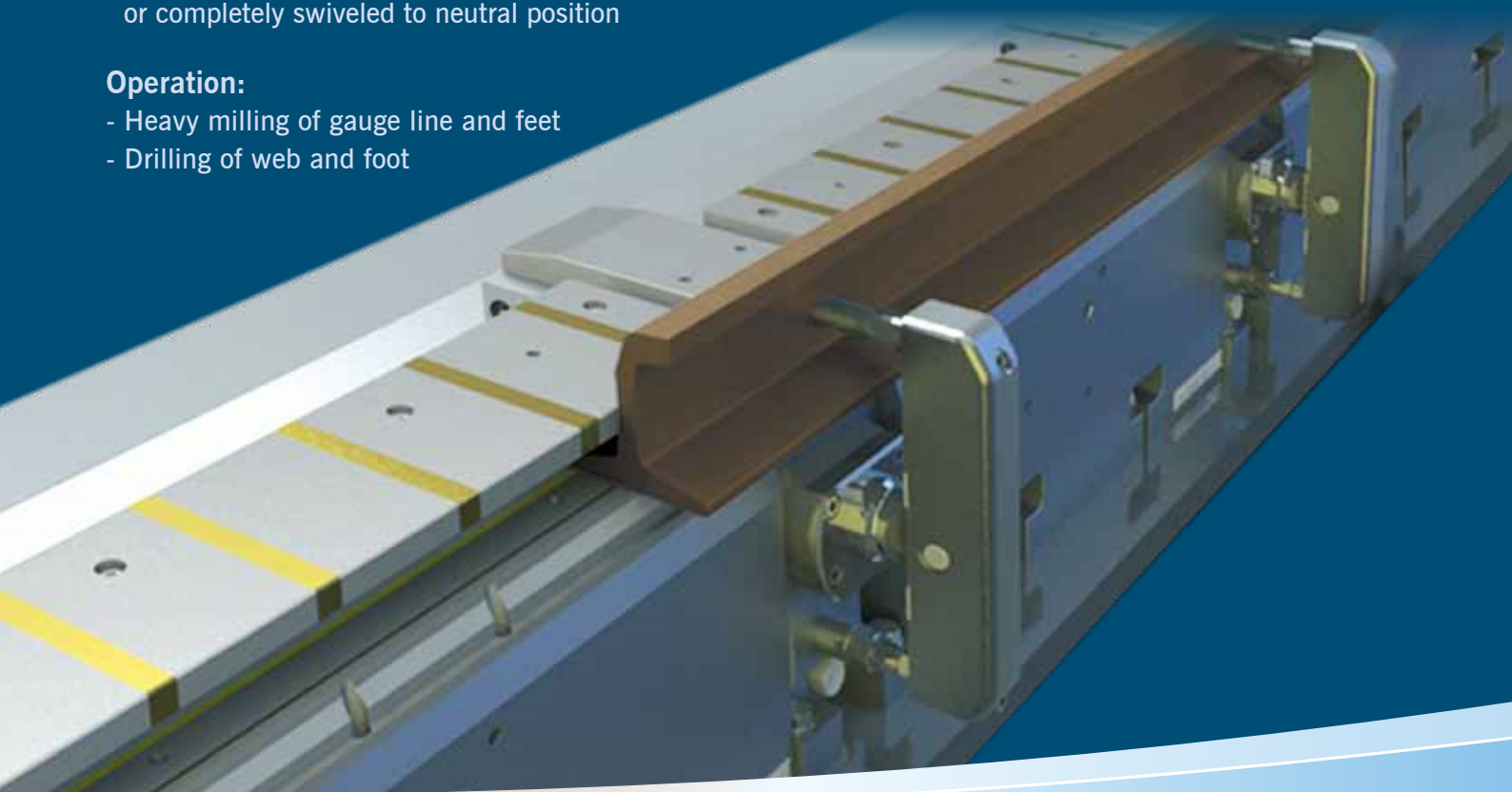
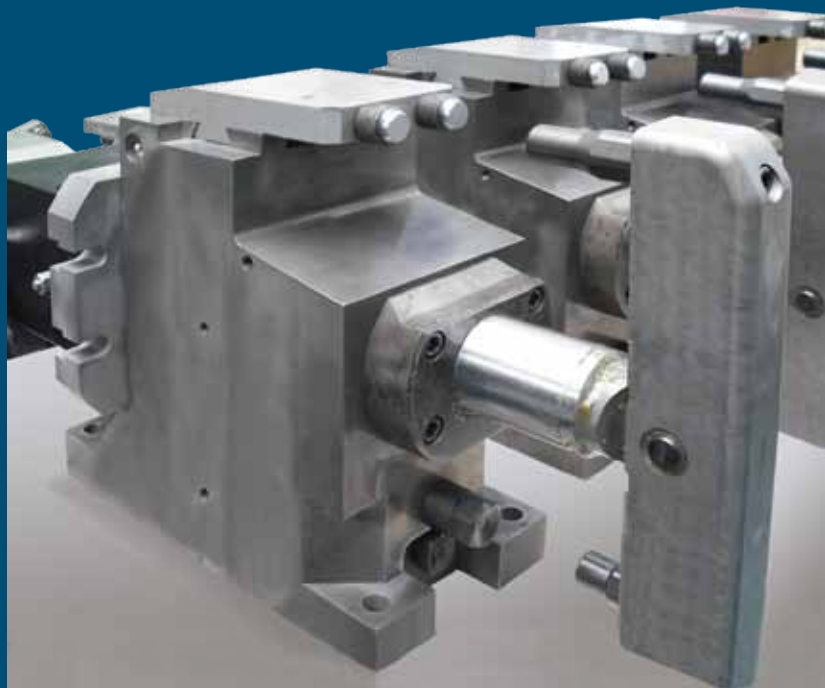
195 N/cm<sup>2</sup> on inducible surfaces

#### Execution:

- Enhanced high energy magnetic system
- Magnetic active aligning from the side on the web of rail using 120 mm transversal pole pitch for extreme heavy milling
- Base clamping with longitudinal pole design
- Pole beams / bars and side stops with quick exchange system for removal
- Hydraulic clamps either at the web, the foot or completely swiveled to neutral position

#### Operation:

- Heavy milling of gauge line and feet
- Drilling of web and foot



## SAV - RAIL CLAMPING TECHNOLOGY

SAV 243.77-RSA

### COMBINATION FIXTURES MAGNETIC HYDRAULIC ELECTRO ACTUATION

#### Applications:

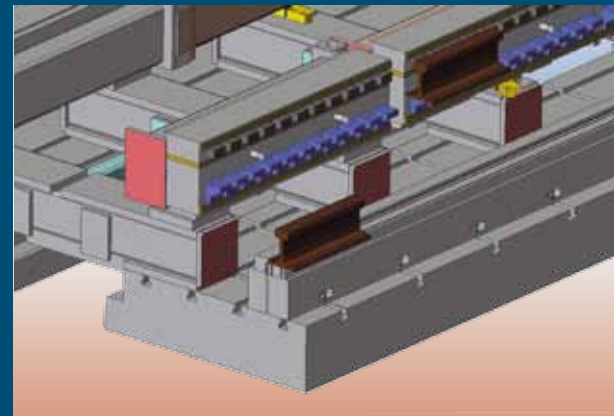
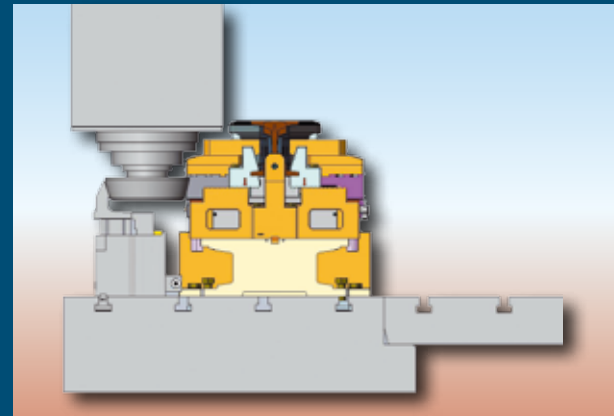
- Fully automatic multiple clamping fixtures for heart and block sections, point blades and yaw blades.

#### Execution:

- Designed for heavy milling
- Combination of magnetic, hydraulic and electro actuation principles
- Control by wireless touch screen

#### Operation:

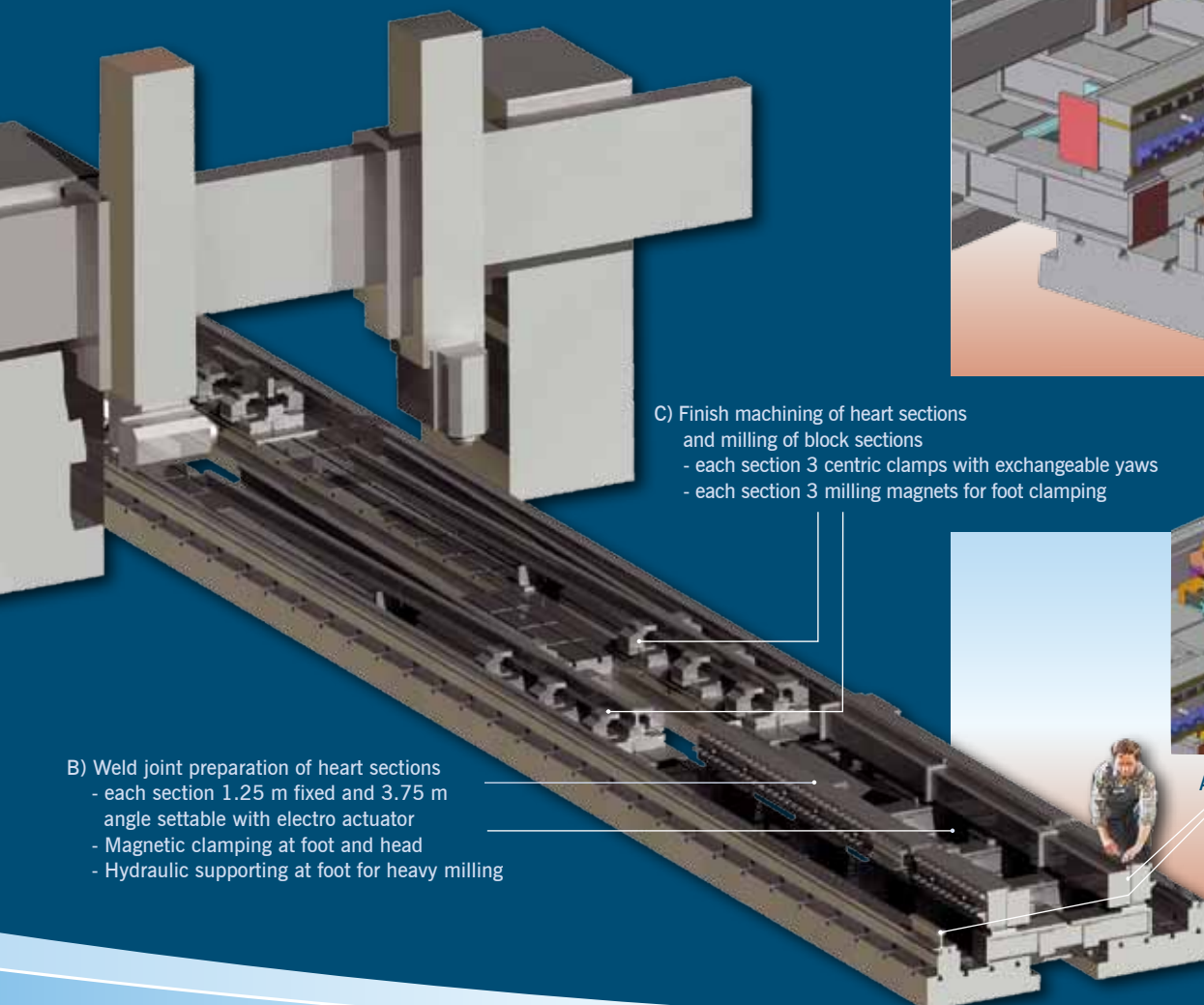
- Heavy milling of half rail profile
- Milling of gauge line and feet
- Finish machining of heart sections



- C) Finish machining of heart sections and milling of block sections
- each section 3 centric clamps with exchangeable yaws
  - each section 3 milling magnets for foot clamping

- B) Weld joint preparation of heart sections
- each section 1.25 m fixed and 3.75 m angle settable with electro actuator
  - Magnetic clamping at foot and head
  - Hydraulic supporting at foot for heavy milling

- A) Milling of point and yaw blades
- Each section 24 m magnetic clamping
  - Side stop and base operate separately





## SAV - RAIL CLAMPING TECHNOLOGY

## SAV 243.77-RSA

### RAIL SPECIAL APPLICATIONS



#### A) Milling of point and yaw blades in 24 m length

- Enhanced high energy magnetic system
- Exchangeable pole beams
- Pole blocks for head support
- Head, foot and drilling operation



#### B) Weld joint preparation of heart sections of 2 x 5 m length

- Electrical angle setting
- High energy system for heavy machining (half of rail section)
- Hydraulic supports in special execution for supporting rail foot.



#### C) Finish machining of heart sections

- Hydraulic vices in special execution with high cantilever
- Yaws with quick exchange system
- Magnetic system for clamping at the foot

## SAV - CONTROLS



Control cabinet with cable remote

Designed with standard control and power modules

### Features:

- Short circuit proof
- Solid state control and power pcb's
- Additional potentially free relays for magnet connecting
- Extended diagnostics
- Mass short monitoring
- Very compact design
- Factory settings
- Individually programmable
- Short demagnetizing cycles
- High demagnetizing quality for single magnetic systems
- Automatic mains frequency adaption
- Functional design and control support

### Execution:

- Stationary or mobile on customer specification
- With cable or wireless remote with touch screen
- For control of magnets, hydraulics and electro actuators
- With machine integrated emergency stop function
- Specific section release function for machine release, executed over interface plug.
- Individually designed intuitive programming and control
- With central master computer on request

Control cabinet – system – 9 m length with air conditioning and control panel





## SAV - CONTROLS

Control panel IP54 with PLC and Air Conditioning



Stationary touch screen



- CE conform
- In compliance with Machine Guide Line 2006/42/EG
- Low voltage Guide Line 2006/95/EG
- EMC Guide Line 2004/108/EG
- ROH conform
- Quality Assurance according DIN EN ISO-9001



Portable remote control with touch screen and charging station



## SAV - RAIL HANDLING

SAV 531.99

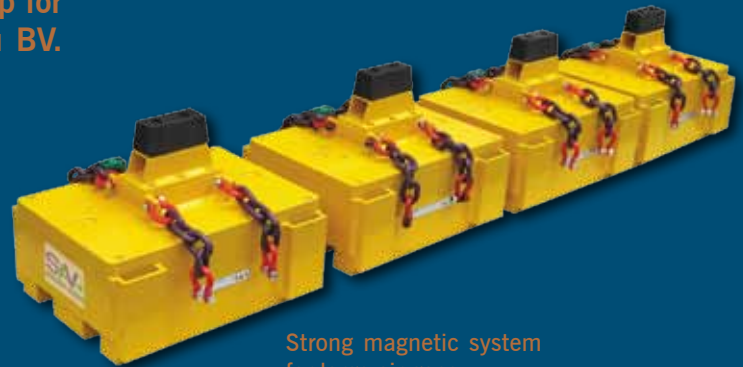
The technology centre in the SAV-Group for Magnetic Lifting is SAV Walker Hagou BV.

### Applications:

- Magnetic lifting and handling for Rail
- Principally all rail profiles / flat bottom/ tongue rail/guard rail and special profiles can be handled and transported.
- Length of rail for handling from 12 up to 100 m

### Execution:

- Use of **Electromagnetic systems** (with special controls and additional battery backup) in modular design and multiple setup for transport of rail.
- Use of **Electro-Permanent systems** for separation and order picking



Strong magnetic system  
for large air gaps,  
Execution for outdoor use





## SAV - RAIL BRAKES

The technology centre in the SAV-Group for magnetic rail brakes is SAV Walker Hagou BV

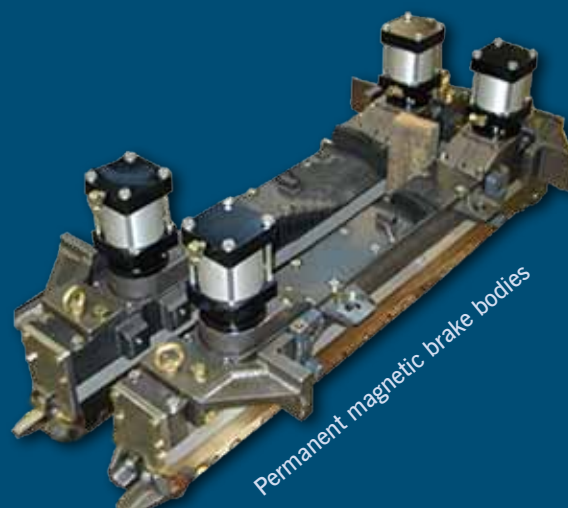
### Applications:

- Pneumatic actuated permanent magnetic emergency brake for rail vehicles.

### Capabilities:

- Licensed and certified manufacturer of emergency rail brakes
- Manufacturing know-how of complex dynamic magnetic systems
- Development of new innovative magnetic rail brakes for rail vehicles

### Certificates:



Bogie with mounted magnetic brake



Train type: IRM of Dutch Railways



## SAV - SERVICE AND SUPPORT



- ➔ Worldwide service support
- ➔ Installation / Assembly
- ➔ Commissioning
- ➔ Process support for operators
- ➔ After sales and technical support by our own highly qualified staff, Technicians, Mechatronic specialists and Engineers.





## DIE SAV-GROUP

### SAV - MANUFACTURING AND TECHNOLOGY CENTERS

#### Germany – Headquarters

Main competence center for sales and development



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#### Poland

Sales and Marketing – Poland



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#### SAV FRANCE

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#### SAV Walker Hagou B.V.

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Netherlands  
Tel.: +31 - 497 - 38 38 35



#### China

Manufacturing, Sales, Service and Marketing – Asia

#### SAV-China

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China  
Tel.: +86 - 0751 - 8838208



## SAV - PRODUCT RANGE



### **CATALOGUE I: SAV-MAGNETIC WORKHOLDING**

Permanent, electro, electropermanent magnets, combinations, demagnetizing systems, sine tables, auxiliaries



### **CATALOGUE II: SAV-STATIONARY WORKHOLDING**

Machine vices, vacuum clamping, clamping supports, stationary chucks and fixtures



### **CATALOGUE III: SAV-ROTARY WORKHOLDING**

Manual and power chucks, lever chucks, finger chucks, console chucks, column chucks



### **CATALOGUE IV: SAV-AUTOMATION AND HANDLING SOLUTIONS**

Pallet changers, interlinking of machine tools, deburring units, tool changers, loading robots



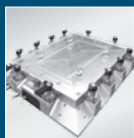
### **CATALOGUE V: SAV-STANDARD PARTS**

Semi finished products, positioning and clamping elements, control, guiding and actuation elements



### **CATALOGUE VI: SAV-MAGNETIC LIFTING**

Magnetic heavy lifting equipment, permanent lifters, Battery lifters, handling tools



### **CATALOGUE VII: SAV-SPECIAL SOLUTIONS**

Customized solutions in technologies; magnetic, hydraulic, mechanical and vacuum clamping. Stationary and rotary



### **CATALOGUE VIII: SAV-SMALL MAGNETS**

Flat, bar and pot magnets, magnetic materials and organisation magnets



### **CATALOGUE IX: SAV-DRESSING AND CIRCULAR GRINDING**

Circular grinding and dressing tools, indexers



### **CATALOGUE X: SAV-QUICK MOULD CHANGE (QMC)**

Clamping and quick exchange systems for injection molding machines and presses.



## EXPLANATION OF USED ICONS



### FLAT BOTTOM RAIL

NP46; S49; UIC54; S54; UIC60 and other different types



### TONGUE RAIL

Zu2-49, ZuUIC-54, Zu1-54, Zu1-60



### GROOVED RAIL

RiPh37A, VICRI60, 75C1 and other different types



### BLADE GUARD RAIL

Ri1-49, Ri1-54



### BLOCK SECTION

customized



### FULL WEB RAIL

Vo1-54, Vo1-49, Vo60E2-40, Vo1-60



### GUARD RAIL

UIC-33, RISBB



### CRANE RAILS

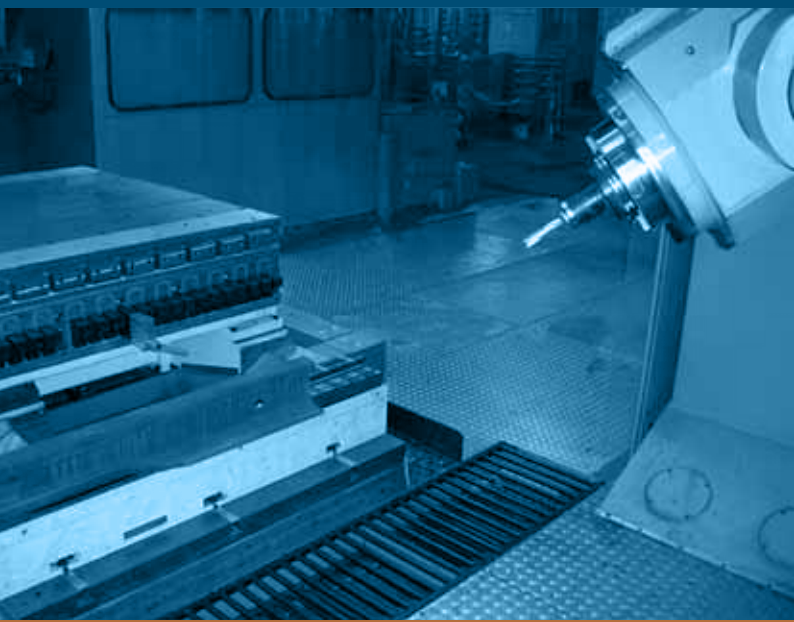
KSA all types, CR, PRI85R

Subject to further technical developments  
We cannot be liable for printing errors or mistakes  
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**ADVICE**  
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