

# Voortman V550-10



*Punching and Shearing System*



VP10 Punching Machine



Flat Bar storage area with infed system



VN 4/36 Numbering Unit

## Voortman V550-10

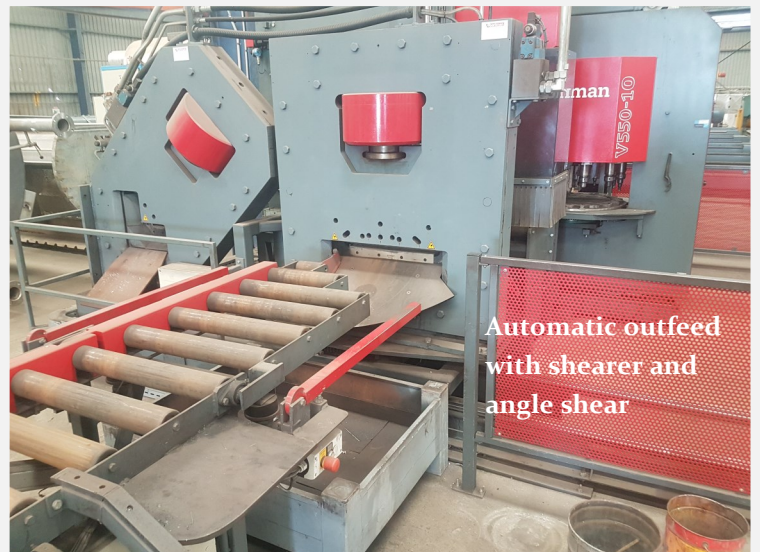
The Voortman V550-10 is a fully automated punching and shearing machine for the production of connection plates out of flat steel bars.

V550-10 includes:

- An operating range of
  - Flat Steel: 50 x 5 - 500 x 25 mm
  - Angle steel: 50 x 50 x 5—200 x 200 x 16mm
- VP 10 Punching Machine
  - 10 punches with 20 dies
- VPS 2200 Flat Steel Shear
- VN 4/36 Numbering Unit
- Computer system
  - Control software (VACAM Machine Editor)
  - Online Support
- Outfeed system with outfeed roller conveyor
- Automatic horizontal loading system.
- Vertical drill head unit (with 5 automatic changeover drill heads)
- VPH600 Horizontal punching machine
  - Punch and material thickness: 31mm/ 16mm
- VHS2400 Angle steel shear



For more information on the Voortman V550-10 please see the attached configuration details or contact



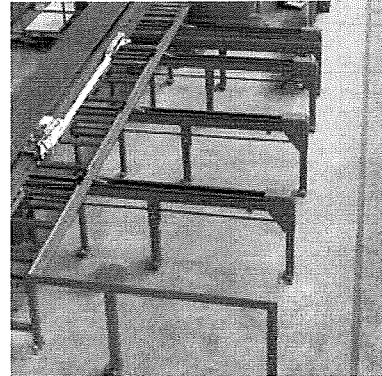
**V550-10 Punching & shearing system***Basic configuration**1 Punching & shearing**1.1 Infeed cross transports, 6 supports*

Drag-chain cross transport for automatic feeding of material to the infeed roller conveyor. During punching & shearing the next profile will be positioned automatically in front of the roller conveyor and the cross transport can be operated manually.

The cross transport is fitted with mechanical drag-dogs and the motor drive is fitted with a torque limiter. For noise reduction there are double synthetic (polyamide) strips mounted.

Specification of the cross transport:

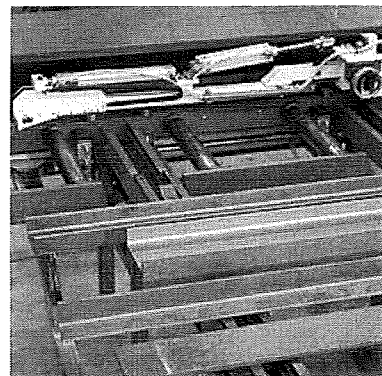
Number of driven arms	: 6 pcs
Length cross transport	: eff. 1.850 mm (excl. roller conveyor)
Capacity	: 500 kg/support
Transport capacity	: max. 750 kg



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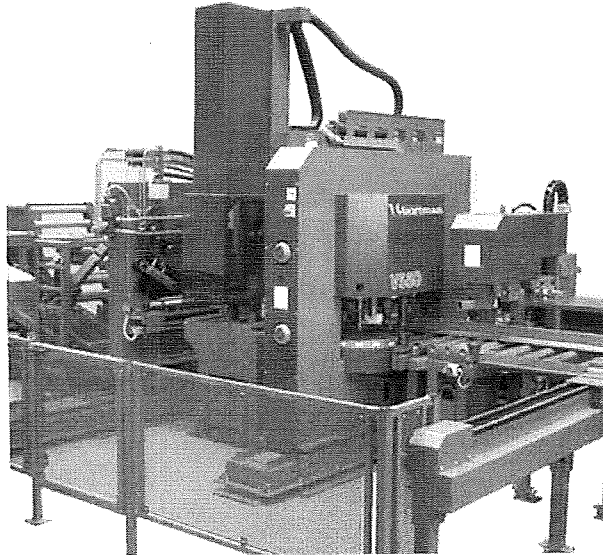
*1.2 Infeed system 12m*

- Infeed roller conveyor  
Conveyor length : Overall 12m.  
Conveyor width : Overall 520 mm.  
Conveyor rolls : heavy steel rolls,  $\varnothing$  80 mm.  
The infeed conveyor is prepared for drag-chain cross transports. Material stock supports are mounted at the position of the cross transport legs.
- Heavy toothed gear rack  
mounted on a heavy steel strip for accurate movement and guidance of the feeder truck.  
Length of the toothed bar : approx. 15m.  
Toothed gear rack : module 2,5.  
Dimension steel strip : 120 x 20 mm.
- Cable train and cable tray, length approx. 15m.
- Feeder truck  
The feeder truck is fitted with a frequency controlled drive and an electrically operated brake. The eight running wheels and two geared wheels guarantee a high positional accuracy of the truck and material.  
Speed : max. 30 metres/min.
- Pneumatic material gripper  
The feeder truck is fitted with a pneumatically operated extending material detector. Due to the detector, the feeder truck can search the material at high speed. After detection the gripper will automatically clamp the material pneumatically.  
Due to the frequency controlled drive, the feeder truck can accelerate and de-accelerate very aggressively. These speeds are only possible using a feeder truck with material clamping.  
The gripper is universal for all sizes of flats and angles. No manual intervention is required.  
Gripper capacity : 4 - 25 mm.



**V550-10 Punching & shearing system**

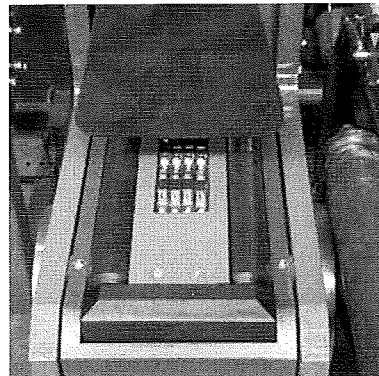
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*1.3 V550-10 punching & shearing machine**1.3.1 VN 4/36 numbering unit*

This unit offers the most effective solution for a quick numbering of parts. In this unit are assembled four code discs so this unit can print four characters in one operation. A stiff C-frame is the basis of the numbering unit.

The code discs are controlled simultaneously by frequency-controlled electro motor. The characters are placed on the outline of the numbering disc and are individually exchangeable. The code will be displayed on the colour screen.

[Click to play video ►](#)





**V550-10 Punching & shearing system**

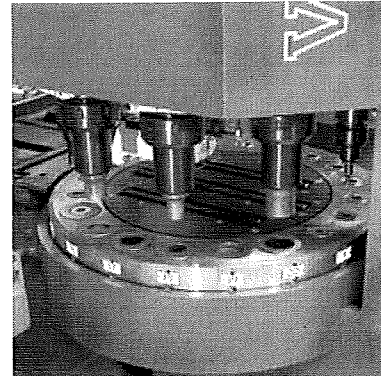
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**1.3.2 VP10 hydraulic punching machine**

A very heavy and stiff O-frame is the basis of this punching machine with 100 ton capacity, which is mounted on preloaded linear bearings and rails (Y-movement).

By using an O-frame the weight of the punching machine is reduced compared to a C-frame and due to the stiffness & rigidity the flexing is also reduced to a minimum.

Due to the reduced weight, positioning is quicker and very aggressive, and because there is almost no flexing the punching of the holes is more accurate and the tool life is extended.



The punching machine is fitted with 10 punches and 20 dies. Each punch can be used under full-power conditions (100 ton).

[Click to play video ►](#)

The punching machine is also fitted with a hydraulic clamping unit on top of the material, ensuring the manufactured products will be straight. The clamping pressure of the clamping unit is adjustable and is controlled by the control system.

The punch stroke and the stroke of the clamping unit are automatically adjusted from the control system. After the punch stroke, the punch and the clamping unit will be positioned automatically just above the material ready for the next hole. The operator does not have to adjust the stroke mechanically.

Due to the ease of access of the punch and die from the side of the punching machine and due to the quick-change system, the punching tools can be changed very quickly and easily.

Each punch has its own automatic mist- lubrication for punching, fed from a central unit so the punching tool life is extended.

On both sides of the punching unit, horizontal clamps are fitted to ensure the flat steel is positioned against the zero reference line.

It is also possible to put marking points on the material with the punching machine.

A central bin is supplied for catching the punched slugs.

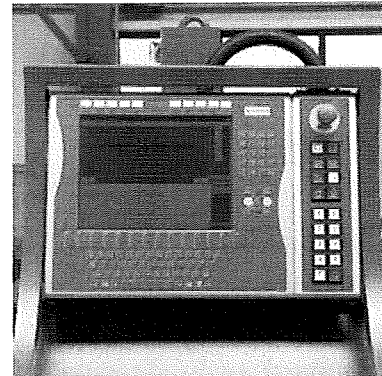
**1.3.3 Hydraulic unit 37kW**

The punching & shearing system has its own hydraulic unit for the punching machine, numbering unit, shear and the clamping units of the punching machine and the shearing unit. The hydraulic system uses only high quality components such as Voith hydraulic pumps and Rexroth for different valves. The capacity of the hydraulic pump unit is 37 kW.

**V550-10 Punching & shearing system****1.3.4 Computer system**

Pentium Computer assembled in main switch panel, consisting of:

- Industrial machine computer with Intel Core Duo 2.0 GHZ.
- ATX-motherboard, 1 GB dual channel DDR2RAM
- CD/DVD-ROM Drive, dual SATA disks 160GB in RAID-1 (mirror) configuration.
- CP-link interface for Control Panel
- PC Interface card for light bus. Communication between various modules and the control system via fibre optic cable.
- MS-Windows XP Professional [Click to play video ►](#)
- Connection with the company's network for downloading DSTV-data from the company's server. Cables and accessories for the connection with the mainframe network are not included.
- Uninterruptible Power Supply (UPS)

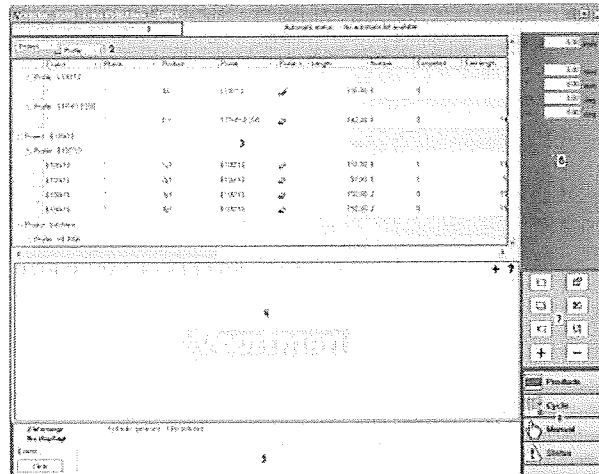


Control Panel assembled in an operator's panel, consisting of:

- Computer panel with 15" Touch-screen TFT-colour display, complete industrial flat keyboard.
- Operator panel provided with push-buttons.

**1.3.5 Control software 'VACAM Machine Edition'**

The software program VACAM Machine Edition is installed on the control system. This software runs under Windows XP-Professional and is developed by Voortman Automatisering in our own software department for the control of various CNC-controlled machines from its delivery program. Products from *DSTV-format* can be imported in a user friendly and clearly structured way. At the same time the input of products can be done manually. After the product data is imported the program carries out bar nesting (batching). During this bar nesting, the program carries out an optimization. The nested profiles are then transmitted to the machines as *NC-data*.



The infeed system is fitted with detectors enabling the automatic transport of flats and or angles one by one from the infeed cross transport (option) onto the infeed roller conveyor of the punching & shearing system. Then the selected products are automatically produced out of these trade lengths.

### Screen build-up

the figure above shows the VACAM main screen. The most important parts are indicated with a number and are explained further below.

#### 1. Menu bar with the functions:

- **Products** for import, export and rotation of products.
- **Machine** opens the tool window and the machine settings
- **Options** make backup of parameters, change language, adjust problem solver settings
- **Help** start remote help

**2. Group field.** With this function products with the same specified features are placed together so that these products can be selected for the production easily and in a clearly structured way. Grouping on Project, Phase and Profile. The products can also be sorted (upwards or downwards) by clicking the column heading.

**3. Product table.** The product data is saved in the product table. For executing a bar nesting (batch) the products are selected in the table. The operator can choose to select 1 or more products, a phase of a project or a complete project. Products which cannot be produced because the mitre angle is too large for instance, are filtered out of the selection. By means of a dialogue screen the operator can choose for an appropriate solution. During the production of the selected products the operator can put in or import new products.

**4. Product viewer** shows the selected product or the batched products. Besides several zoom functions the product can also be printed here and the dimensions can be shown in a graphical way.

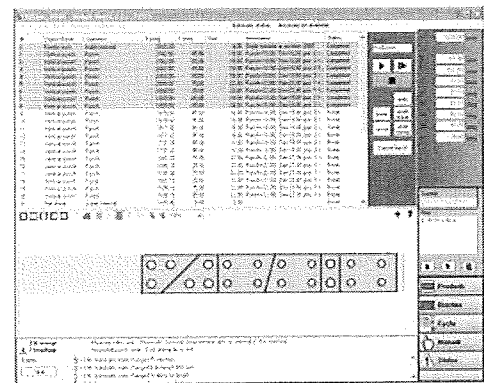
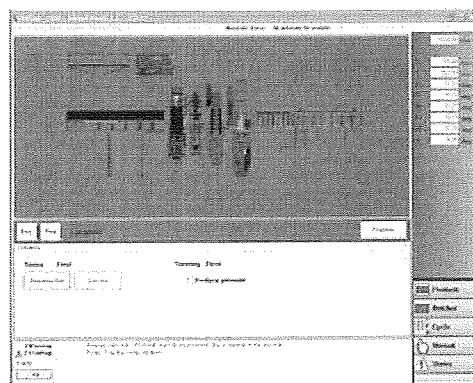
**5. Alarm-messenger.** The alarm-messenger indicates failures and warnings so that actual failures can be located quickly.

**6. Axis-information.** The condition and actual position of the axis and units is shown here. The axis and the units (punches) can be operated separately in the Manual mode.

**7. Product buttons.** These buttons are used a lot during the handling of products. Functions are: create-, copy-, import and delete product. Select and deselect for production. Open the product properties window.

**8. Tab switcher** In the menu Tab switcher the user can switch between the tabs:

- **Products:** Input, alteration, sorting and grouping of products.
- **Cycle:** the cycle screen for the control of the production. Besides starting and stopping the production the production process can be checked step by step in the cycle screen.
- **Manual:** Manual control of machine components.
- **Status:** Graphical overview of all axis, digital inputs and outputs, analog inputs and outputs and all machine warnings and errors.





**V550-10 Punching & shearing system**

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**1.3.6 Online support**

By means of a high secure NetViewer connection the machine operator can be supported online by a Voortman service engineer from his desktop. After the operator has given access to the control system the production data will be displayed on the monitor of the Voortman service engineer. The service engineer can diagnose, analyse and modify if necessary directly online the production data. At the same time a webcam will be delivered with the machine. By means of a connection via MSN the service engineer can watch the video on his monitor and communicate via MSN with the operator.

**Note:**

- To provide an appropriate online support via NetViewer the user has to provide a broadband internet connection with the control system.
- Online support is included during the guarantee period, hereafter a contract will be offered if required.

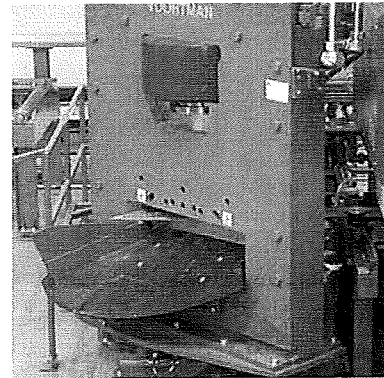
**1.4 VPS2200 flat steel shear**

The VPS2200 has a shearing capacity of 220 ton and is able to shear material with a thickness up to 25 mm.

The flat steel shear is fitted with an automatic hydraulic clamping unit. The top knife of the shear can be used on 2 sides, the bottom knife on 4 sides. The top knife has a 2,5° angle of inclination.

The flat steel shear is fitted with an automatic hydraulic clamping unit. The shear is placed on a rotating frame for mitre shearing. NC-selection of the mitre angle is automatic, mitre both sides +/- 45°. Electric motor operated mitre angle adjustment.

On the out feed side, the shear is provided with a steel slide chute. This chute guides the products into a bin (by customer) placed on the floor, this works also with mitre cutting.



[Click to play video ►](#)

**V550-10 Punching & shearing system**

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*1.5 Outfeed system**1.5.1 Outfeed roller conveyer*

The first section is manually liftable. After shearing, small products will be dropped in a bin. Long products are transported along the outfeed roller conveyor.

Liftable section of the roller conveyor:

- Operating : manual liftable
- Length : approx. 1.000 mm
- Transport rolls : 6 pieces, non driven

Horizontal part of the outfeed roller conveyor:

- Length : approx. 6.500 mm
- Roll distance : 6 x 200 mm, rest centre to centre 750 mm, the space between the rolls is covered up with steel plates.

**V550-10 Punching & shearing system**

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*Options***2 Punching & shearing****2.1 Automatic horizontal loading system**

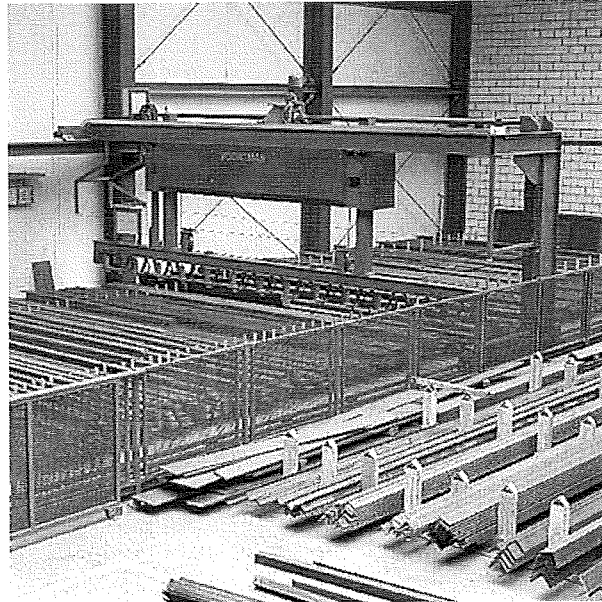
The system is suitable for automatic loading of the infeed cross transport with flat steel.

Flat steel dimensions:

Length : 6.500 mm.  
Width : 50 - 500 mm.  
Stock length : 20 m

Execution:

Flat steel will be placed side by side in a flat steel stock on the floor. Above this stock runs a crane provided with several electrically operated magnets. These magnets are mounted on a support beam and can be switched on or off, depending on the length of the flat steel. The magnetic power depends on the steel thickness and width.



[Click to play video ►](#)

Remaining pieces larger than 600 mm. are put back into the flat steel stock. Smaller pieces are dropped in a bin under the infeed conveyor. This is only possible because the feeder truck has clamped the material. The feeder truck can take back the material while moving back to the start position.

To make the transport of remaining pieces larger than 600 mm. possible, the centre distance of the first two drag chain-cross transports is reduced to 500 mm.

The hall crane can fill the flat steel stock area from above. A second possibility is to position the flat steel at a loading position and the loading crane will automatically place the material into the intended stock position programmed in the software.

Placing flat steel onto the cross transport which is not standard and available in the stock area, is made with the hall crane or manually.

The loading crane can be executed as gantry crane or as a half-portal crane (span approx. 7 metres) and is provided with 2 motor driven wheels.

Note: The construction for the crane rail support structure is made by the customer, under Voortman's control. The crane rails are included.

The movement of the loading crane depends on the number of profile dimensions which are required in the flat steel stock. The basic system has an effective length of approx. 20 metres. The construction of the flat steel stock beams on the floor is not included, the drawings of this flat steel stock area is supplied by Voortman if required.

**V550-10 Punching & shearing system**

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Operation:

In the control of the punching & shearing system the operator can select the products he wishes to produce. The products are imported from DSTV-data and will be saved in a central data base. The operator has the following selection possibilities:

- Products only.
- Several products or an entire directory of products with the same profile dimension.
- A full project, after which all products from different profile dimensions are produced automatically.

After the operator has made a selection, the control system will first select all parts of one profile and will place automatically the required material on the infeed system. After placing the first one on the infeed system the machine will start the production. When the machine is producing, the automatic loading system will place the next material on the cross transport of the infeed system and waits till the remaining piece can be removed and replaced back into stock. After removing the remaining piece automatically, the system starts again with processing the next material. During that time the remaining piece will be put back into stock and the system continues with the next task.

The control system can work with a stock-management system with the following possibilities:

- Overview of material in stock.
- Order advice (after input minimum and maximum stock).
- Registration of used material per finished project.
- Warning if the stock of a particular flat steel is not enough, after selecting a project (for example).

The software "Vacam Office Edition" will also be installed at the works preparation department. By means of a network connection the works preparator can watch online and execute several actions.

The works preparator can execute the following functions:

- Manual input of products.
- Checking the material stock and generating an order advice on basis of available stock and the products that still must be manufactured.
- View at the finished products.
- Printing several product lists and drawings.



**V550-10 Punching & shearing system**

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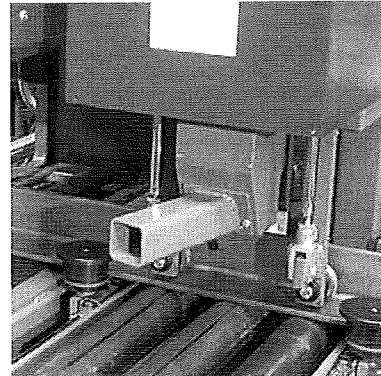
*2.2VPH600 horizontal punching machine*

This horizontal punching machine is used for punching holes in the vertical flange of angle steel.

The punching unit is placed on high-loaded linear guides (Z-movement) and is fitted with horizontal and vertical material clamps to ensure that slightly curved angles are positioned against the zero reference line.

The punch has its own automatic mist- lubrication for punching, fed from a central unit so the punching tool life is extended.

[Click to play video ►](#)



**V550-10 Punching & shearing system**

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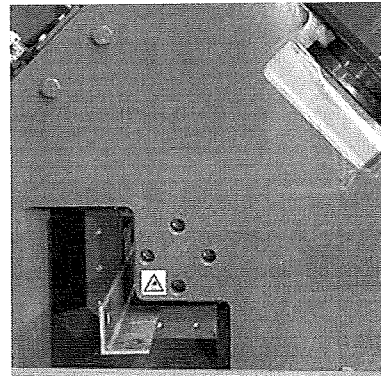
*2.3VHS2400 angle steel shear*

This angle shear with 240 ton capacity is placed on one base frame together with the flat shear and the required shear will be selected by a hydraulic cylinder. The shears are mounted on linear guides. The computer automatically carries out selection of the required shear.

With the angle shear it is possible to shear angle steel up to 200 x 200 x 16 mm.

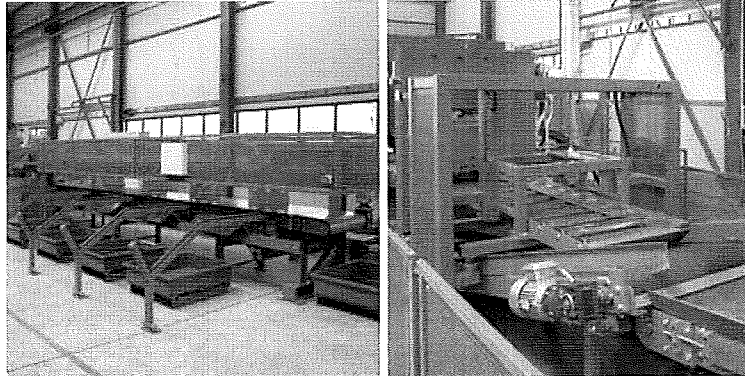
The shear is executed with a stepless controlled hydraulic clamping unit. On the out feed side, the shear is provided with a steel slide chute.

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**V550-10 Punching & shearing system**

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**2.4 Outfeed system****2.4.1 Product sorting system**[Click to play video ►](#)

The automatic product sorting system is placed in line with the punching & shearing system. The automatic outfeed operates in the following way:

- After shearing products, with a length of 25 up to 1.000 mm, they fall onto the upfeed conveyor belt. Then they are transported in length direction onto a second conveyor belt.
- Products with a length over 1.000 mm will be carried-over this belt conveyor by a motor-driven roller conveyor. This roller conveyor is automatically selected when of shearing products over 1.000 mm.
- Pushers, which are placed squarely on the conveyor will automatically push the products into bins.
- Before the production starts, the operator selects the preferred bins (nr. 1 - 5).

**Specifications product sorting system****Pneumatic liftable roller conveyor, motor-driven**

Number of transport rolls : 10 pcs  
Drive : 0,55 kW  
Length : 2,0 metres

**Up-feed conveyor belt, motor driven**

Transport speed : 30 m/min  
Drive : 0,75 kW  
Operation : automatic control by computer  
Width conveyor : 500 mm eff.  
Length conveyor : 2,4 metres

**Horizontal conveyor belt, motor driven**

Transports speed : 30 m/min  
Drive : 2,2 kW  
Operation : automatic control by computer  
Width conveyor : 500 mm eff.  
Length conveyor : 4000 mm

**Product pusher system**

Number of pushers : 2 pcs, pneumatic  
Cylinder stroke : 800 mm eff.  
Linear guides : double linear guides  
Operation : automatic control by computer  
The pushers will be placed above the conveyor.

**Product bins (bins not included)**

Number of bins : 5 pcs  
Dimensions : 800 x 800 x 500 (l x w x h)

**Support legs**

Number of beams : 3 pcs  
Length : 2 metres eff.

The profiles of the cross conveyor belt is fitted with hard wearing synthetic material.

**V550-10 Punching & shearing system**

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*2.5 Additional pair of bins for product sorting system*

An additional pair of bins for the product sorting system is added, with each pair added the frame will be extended with 1200mm.



**V550-10 Punching & shearing system***Technical specifications: Punching & shearing*

<b>Horizontal punching machine</b>		<b>VPH600 (Optional)</b>
Capacity		: 600 kN (60 t.)
Max. punch $\varnothing$ / steel thickness		: $\varnothing$ 31 mm / 16 mm
Punch diameter:	Round	: $\varnothing$ 6 - $\varnothing$ 31 mm
	Slot	: 6,5 x 12 mm - 22 x 31 mm
<b>Numbering unit</b>		<b>VN4/36</b>
Number of discs		: 4 pcs.
Characters per disc		: 36 pcs.
Character height x imprint		: 10 x 1 mm
Max code length per numbering		: 20 characters
<b>Vertical punching machine</b>		<b>VP10</b>
Total number of punches		: 10 pcs.
Capable of flat steel		: 10 pcs.
Capable of angle steel		: 10 pcs.
Number of dies		: 20 pcs.
Capacity		: 1.000 kN (100 t.)
Max. punch $\varnothing$ / steel thickness		: $\varnothing$ 57 / 15 mm - $\varnothing$ 31 / 25 mm
Hydraulic clamping		: Yes
Centring points		: Yes
Mist lubrication system		: Yes
Punch(es) 1 (up to 3):	Round	: $\varnothing$ 6 - $\varnothing$ 57 mm
	Slot	: 6,5 x 12 mm - 22 x 44 mm
Punch(es) 4 (up to 10):	Round	: $\varnothing$ 6 - $\varnothing$ 31 mm
	Slot	: 6,5 x 12 mm - 22 x 31 mm
<b>Hydraulic unit</b>		
Type		: VHA37
Engine capacity		: 37 kW
Working pressure		: 275 bar
Capacity oil tank		: 400 litres
<b>Flat steel shear</b>		<b>VPS2200</b>
Capacity		: 2.200 kN (220 t.)
Width / material thickness		: 50 - 500 mm / 5 - 25 mm
Hydraulic clamping		: Yes
Mitre shearing		: +/- 45°
<b>Angle steel shear</b>		<b>VHS2400 (Optional)</b>
Capacity		: 2.400 kN (240 t.)
Width		: 50 x 50 - 200 x 200 mm
Max material thickness		: 5 - 16 mm
Hydraulic clamping		: Yes
<b>General information</b>		
Max. material length		: 12.200 mm
Max. material weight		: 750 kg
Working height		: 940 mm (+/- 25 mm)
Operation direction		: From right to left or left to right
Power supply		: 3 x 400V AC + N + PE 50Hz
Not included		: Voltage stabilizer when needed
Ambient temperature		: 0 - 35° C max 95% relative humidity
<b>Compressed air:</b>		: ISO 8573-1 Class 4
Compressed air consumption		: 200 Litres per minute
System pressure		: 6- 8 bar
Max particle size		: 15 $\mu$ m
Max particle density		: 8 mg/m <sup>3</sup>
Max pressure dew point		: 3°C
Max water content		: 6.000 mg/m <sup>3</sup>
Max oil content		: 5 mg/m <sup>3</sup>
<b>Colour</b>		
Plates		: RAL 3003 Red
Frames		: RAL 7011 Grey

**V550-10 Punching & shearing system**

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Floor surface must be level and sufficient strong!  
Technical details and descriptions are not binding  
All mentioned capacities are based on a material strength of 400 N/mm<sup>2</sup>  
Fume-Extraction not included  
Barring changes