

**emco** group

Designed for your profit

**[ E[M]CONOMY  
means: ]**



## Outstanding series performance. **HYPERTURN 45**

High-performance universal turning center  
for complete machining

# HYPERTURN 45

## [Upper tool turret]

- 12-station tool turret
- VDI25 quick-change system
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, etc.

## [Y axis]

- Travel +40 / -30 mm
- 90° implemented in the machine construction
- Large distance between guides
- Stable and compact construction

## [Main spindle]

- Integrated, water-cooled spindle motor (ISM)
- High drive power: 15 kW
- High torque: 100 Nm
- Wide speed range: 0-7000 rpm
- Extremely dynamic
- Bar capacity  $\varnothing$  45 (51) mm

## [Compact machine design]

- Requires minimal floor space

## [Lower tool turret]

- 12-station tool turret
- VDI25 quick-change system
- 12 driven tool stations
- Servo-controlled
- Rigid tapping
- Polygonal turning, etc.

## [Counter spindle]

- Integrated, water-cooled spindle motor (ISM)
- High drive power 15 kW
- High torque: 100 Nm
- Wide speed range: 0-7000 rpm
- highly dynamic
- Bar capacity  $\varnothing$  45 mm (optional)

The new Hyperturn 45 is characterized by its dynamics and great flexibility. With two high-performance spindles, two tool turrets and a Y axis, it is designed to handle challenging production requirements with ease. Its compact dimensions and high static and dynamic rigidity provide the best possible conditions for manufacturing medium to large quantities of precision workpieces. It is particularly suited to use in general machinery and equipment engineering and also in the high-precision areas of medical technology and the jewelry industry.

## [Workpieces]

### [Control unit]

- Ergonomically designed
- Siemens Sinumerik 840 D sl or Fanuc 31i-B
- LCD color monitor



Starter pinion  
(42 Cr Mo 4)



Hip joint cup  
(Titanium alloy)



Dental contra-angle handpiece  
(Brass)



Plug  
(Steel)

### [Chip conveyor]

- Slat-band conveyor belt
- Ejection height 1200 mm
- Integrated coolant tank 200 l
- Turret pumps: 2 x 14 bar
- Flushing pumps: 2 x 3.7 bar

# [Engineering]

## Highlights

- Highly dynamic drives in all axes
- Two high-performance work spindles
- Two highly flexible, 12-station tool turrets
- Stable Y axis with 70 mm travel
- State-of-the-art control and drive technology
- User-friendly dialog control with 3D graphics
- Compact dimensions
- Made in the Heart of Europe



**Main spindle.** The 15 kW motor spindle with its integrated water cooling system provides high dynamics but low thermal displacement. A high-resolution shaft encoder provides the optimum conditions for accurate contour milling and drilling.



**Work area.** The generous work area provides space for several tools on both turrets and ensures a continuous chip flow even when few machine technicians are at work. Additional coolant pumps and a sophisticated pipe system clears the chips into the chip conveyor.



**Counter spindle.** A 15 kW, water-cooled spindle motor ensures dynamic performance and high levels of precision. The standard machine is equipped with a coolant-fed parts ejector. This places the finished workpieces in the parts catcher and at the same time clears the clamping surface from chips. Additionally, a flexible coolant pipe is mounted above the counter spindle for cleaning.



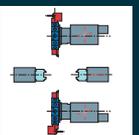
**Parts catcher.** The HYPERTURN 45's pneumatic parts catcher is controlled using M functions. When needed, it traverses to the front of the work area and travels to the spindle center. The finished part is removed from the clamping device and transferred to the catcher tray. The parts catcher then moves back to its initial position and the part is tipped into a catching box or onto a conveyor belt.



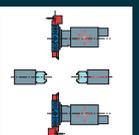
**Y axis.** The Y axis is integrated into the basic machine structure and stands at 90° to the X axis. Extremely short projections form the basis for solid turning and drilling operations and also for milling operations without interference contours.

## Versions EMCO HYPERTURN 45

Basic version of the HYPERTURN 45 SM-plus with main spindle and counter spindle and two tool turrets with driven tool positions



HYPERTURN 45 SMY-plus with additional Y axis in the upper slide system



### [Roller guides]

- In all linear axes
- Preloaded and backlash-free
- High rapid motion speeds
- No wear
- Minimal lubrication required

### [Tool turret]

- 2 x 12-position VDI25 turrets
- No alignment of the tool holder
- Can be used flexibly on both spindles
- Swivel speed adjustable with override

### [Counter spindle]

- Wide speed range
- C axis for milling
- Spindle clamp
- A2-5 spindle nose
- Full clamping system with parts ejector  $\varnothing$  45 mm
- Programmable clamping stroke monitor

### [Main spindle]

- Wide speed range
- C axis for milling
- Spindle clamp
- A2-5 spindle nose
- Hollow clamping system  $\varnothing$  45 (51) mm
- Programmable clamping stroke monitor

### [Machine base]

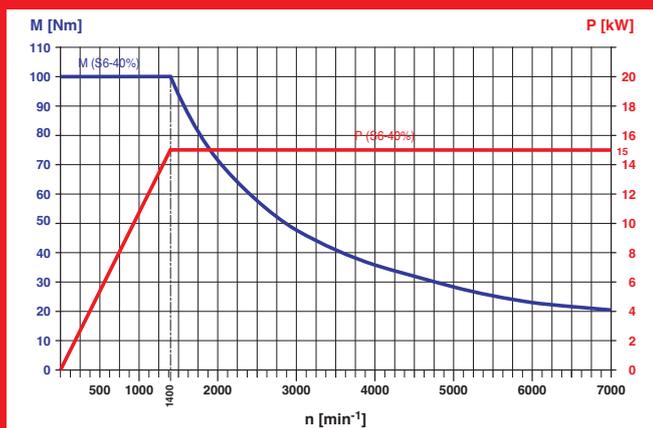
- Extremely rigid, welded-steel machine construction
- Compact design
- Very high thermostability
- Filled with vibration-absorbing material

### [Machine stand]

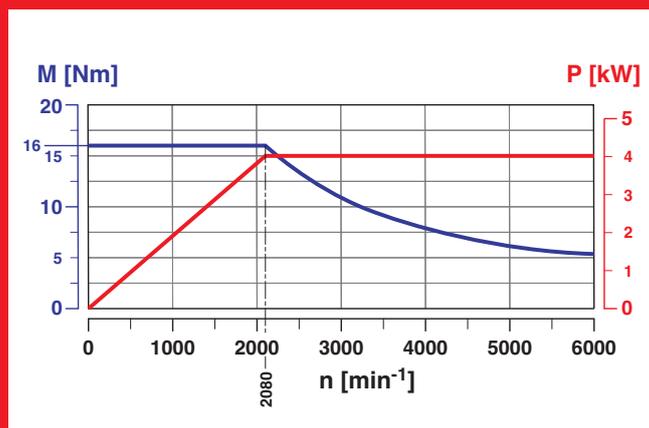
- Solid welded-steel design
- Thermally separate from the machine base
- Filled with vibration-absorbing material
- 100% sealed against coolant leaks

HYPERTURN 45 design

## Performance and torque diagram



HYPERTURN 45 main spindle/counter spindle

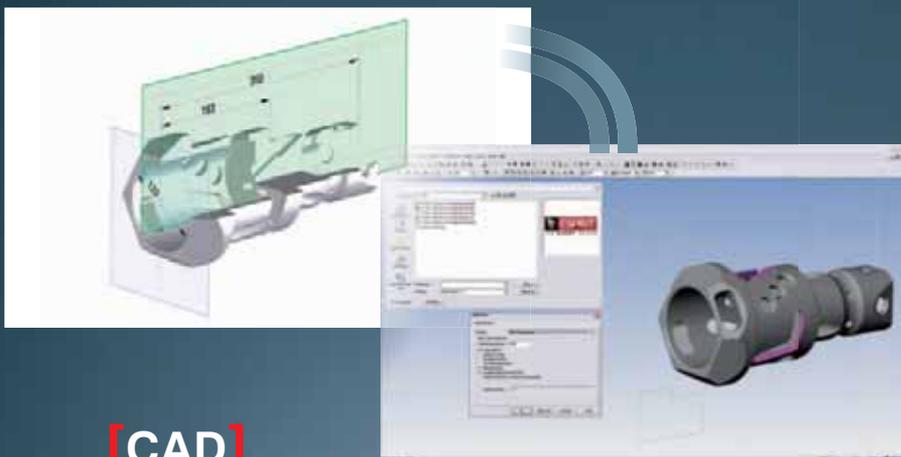


Tool turret - driven tools



The Right Choice

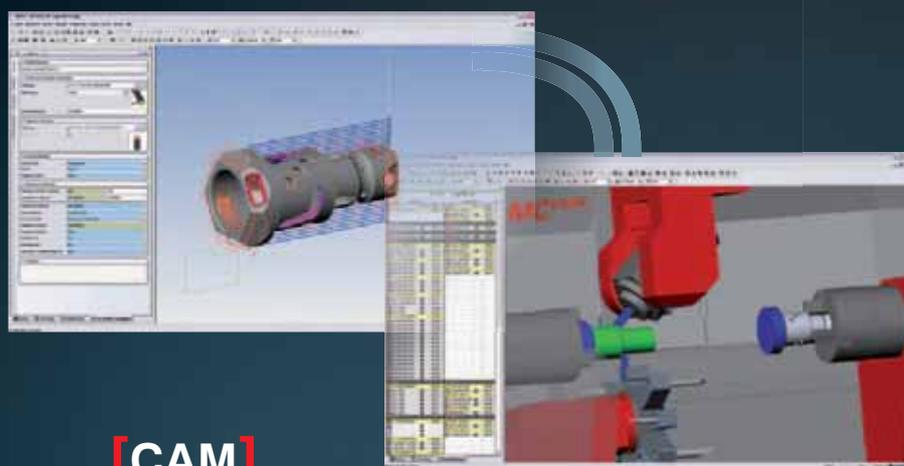
The Esprit CAM system offers high flexibility and process security, a comprehensive selection of machining cycles, maximum tool control, and cross-machine technology for your entire production facility.



## [CAD]

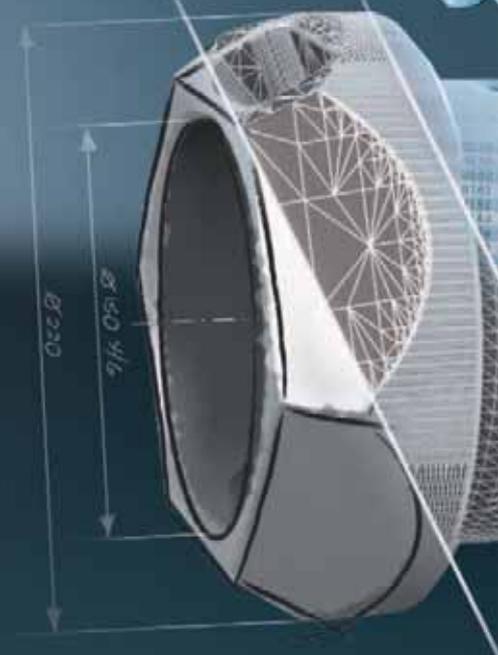
Direct CAD data import

- AutoCAD (DWG)
- Parasolid®
- Solid Edge®
- Solid Works®
- ACIS® (SAT)
- Optional interfaces: CATIA®, Pro/ENGINEER®, STEP, STL,...



## [CAM]

- 2-22 axis turning
- 2-5 axis milling
- Multi-tasking of turning and milling
- 3D machine space simulation
- Certified post-processors



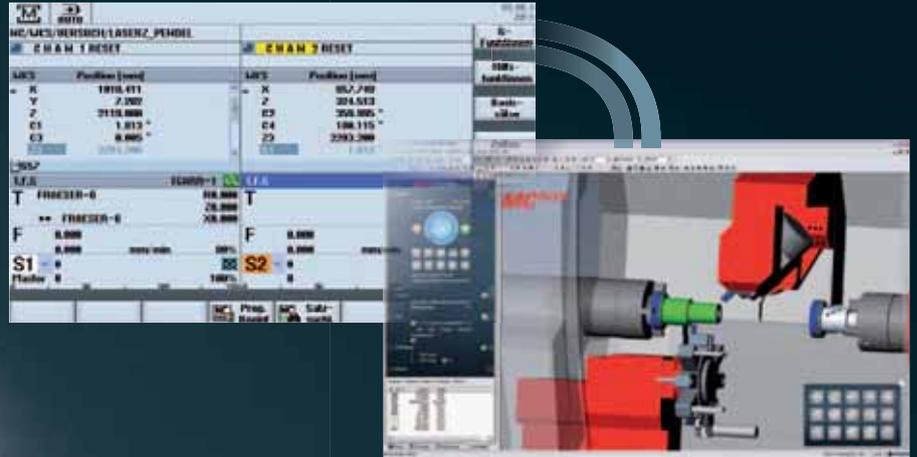
## [CAD]

# emcoCPS | Pilot

## The Virtual Machine

A 1:1 mapping of the real machine for defining and testing processes, optimizing machining sequences, and training new operators.

### [Process chain]



### [CPS]

- 1:1 simulation with collision detection
- Direct connection to CAM ESPRIT
- Process optimization
- Reverse simulation of existing NC codes
- Reduction in scrap rates
- Training on the virtual machine
- Simulation of loading systems (e.g. EMCO gantry loader)

### [CAM] [CPS] [Production]



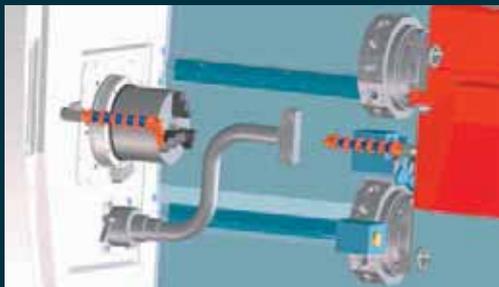
### [Production]

- Reduction in set-up costs
- Reduction in downtimes
- Reduction in repair costs

**OPTIMUM MACHINE UTILIZATION**

# [Options]

There are many accessories and options available to help further customize the HYPERTURN 45. A generous selection of tool holders allows a wide range of machining options, including those you would not immediately associate with a turning center, including deep hole drilling, intermeshing, engraving, groove slotting and many more.



## Tool gauge

The tool gauge allows tools to be measured quickly and accurately on both turrets in the work area. It is mounted manually in the holder in the work area and, after use, is replaced in a storage space in the machine housing.



## Finished part conveyor

The finished-part pick-up device places the parts on an accumulating conveyor. The conveyor is timed to prevent the parts, some of which are very complicated, from falling on top of each other.



## EMCO tool breakage monitoring system

The tool status is monitored by evaluating the load on the various axis drive motors. Excessive loads point to wear or broken tools. Too low a load indicates a tool is missing.



## Band filter system with high-pressure coolant pumps

A coolant pressure of 25/40/60/80 bar can be set as necessary. This enables coolant-fed drilling and milling tools to be used to their best advantage.



## Unloading through the counter spindle

Long, thin workpieces with diameters of up to 45 mm can be removed from the machine using the counter spindle. Parts are mostly stored on a sloping surface or, if necessary, also on a controlled conveyor to prevent any kind of damage occurring.

# Maximum output – minimum space required.

The EMCO swing loader is a universal loading system for all types of pre-formed blanks. It can be customized individually to the customer's requirements using numerous gripper and handling systems. How we do it: we standardize the components but create a customized solution. The result: a custom-tailored machine for the same price as a standard unit.



## Blank part feeding systems

Feed systems specific to particular blanks allow pre-formed workpieces to be loaded into the work spindle in the right direction, allowing manufacturing with minimal personnel requirements.



High-capacity timed conveyor system for correct directional loading of pre-formed blanks



Multiple infeed chutes for loading rotationally-symmetrical blanks; the length of the blanks determines the number of infeed chutes.



Timed conveyor system with V-supports for pre-formed shaft parts of various shapes



Multiple infeed chutes for loading rotationally symmetrical blanks. A sensor monitors the availability of blank parts for each infeed chute.



Shaft gripper for automatically loading pre-formed shafts



Fully automatic shaft loading. Feed-in via a conveyor belt, removal via the finished parts pick-up device

## Customization:

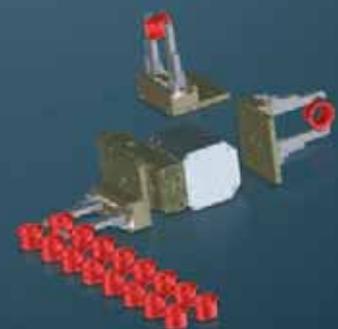
A wide range of gripper and handling systems is available.



2-finger gripper with 180° rotary module for loading vertically fed blanks



2-finger toggle lever gripper for loading shaft parts



Parallel grippers with 180° rotary module for loading shaft parts (1st and 2nd clamping cycle)

# EMCO TOP LOAD.

## The premium class.

**Quality by the meter.** The EMCO TOP LOAD series was designed to automatically load 3-meter long bar stock into EMCO machines. Loaders are available for diameters of 4 - 25 mm, 8 - 42 mm, and 10 - 65 mm. Bar stock measuring up to 42 mm in diameter can be loaded using the EMCO TOP LOAD 8-42/3200. The oil coolant-fed loading channel, lined with plastic shells, reduces vibrations to a minimum, even at high speeds. Bar stock is fed in via a servo motor which controls both the speed and feed force. A patented guidance system with several guidance rests guarantees optimum feed quality. Time-consuming conversions and channel changes are no longer necessary. The bar loader can be switched from one diameter to another in just a minute or two.

### EMCO TOP LOAD 8-42/3200

In SINGLE LEVEL mode. Bar stock is laid on a slanted feed track (350 mm) and falls into the guide channel one by one.



# The EMCO short bar loaders. Universal, high-performance.

**Short and to the point.** Faced by ever-increasing pressure on floorspace for machines, EMCO has developed the most compact short loaders on the market: The EMCO LM1200 is the perfect solution for automatic feeding and loading of cut-to-length bars. The key advantages are a small footprint and rapid loading times resulting from shorter strokes.

**The technology.** The loader in our LM series can be used immediately as a "plug-and-play" solution. Their extremely small footprint enables processes to be automated even if space is tight. In contrast to the EMCO COMPACT LOADs, the loaders in the LM series are fitted with their own control units, which also enables the loaders to be used together with other machines. The controls are perfectly coordinated with the machine interfaces, which are identical on all three models. All loaders offer comprehensive cycle support and are optimally aligned to the spindle lengths in the individual machines. Changing over to different bar diameters requires only minimum effort and the loaders can also be used to load individual workpieces.



**EMCO LM1200**  
Compatible with the machines EMCOTURN E 65,  
MAXXTURN 65, HYPERTURN 45, HYPERTURN 65.



Infeed of profile bar stock using a chain feeding system (option)

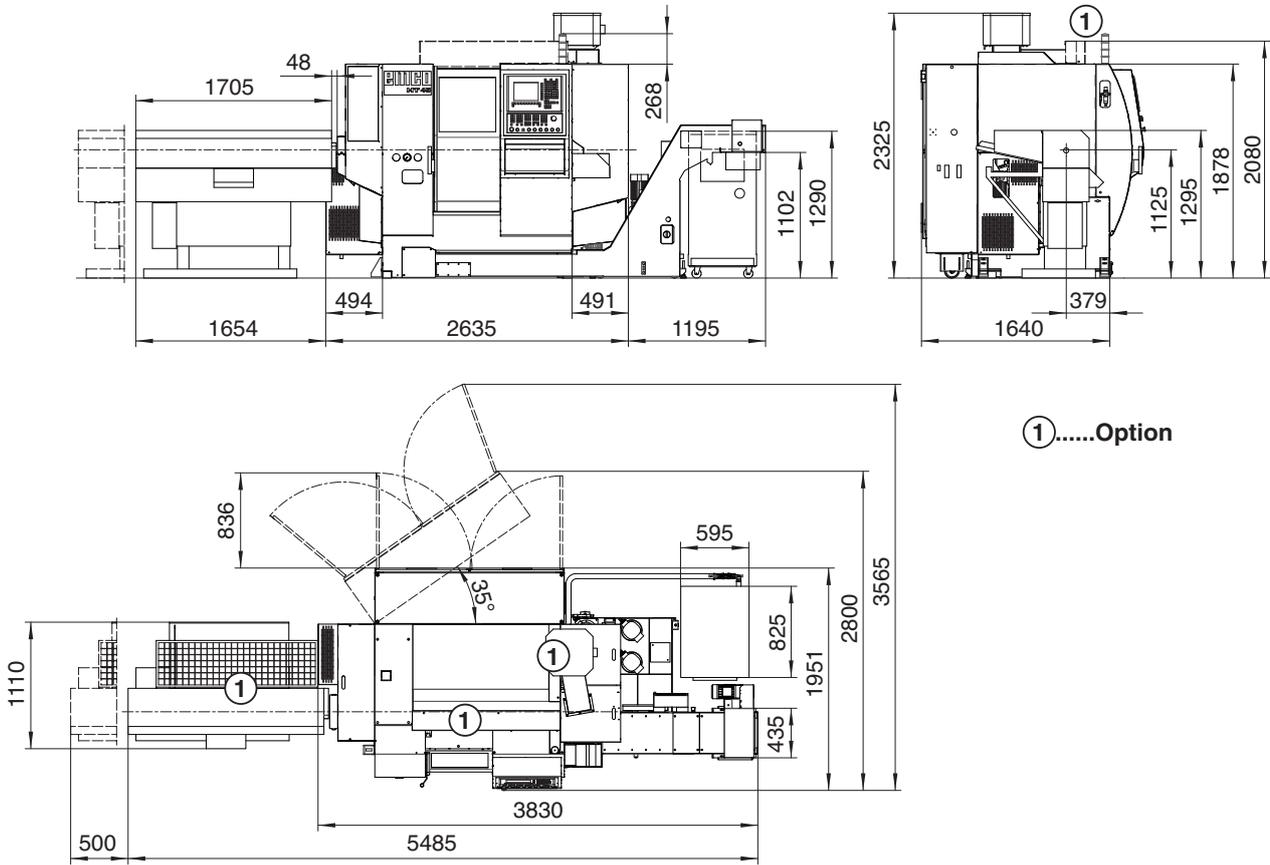
## The benefits

- Smaller footprint
- Easy to use
- Short feed times
- Fast, straightforward changeover
- Option to load individual workpieces
- Central diameter adjustment
- Dedicated control
- Ergonomic EMCO design

Technical data	LM1200
Bar diameter	Ø 8 – 95 mm
Max. bar length	1200 mm
Min. bar length	150 mm
Material support	approx. 550 mm
Feed rate	0 – 60 m/min
Bar change time	approx. 12 sec.
Dimensions (L x W)	1700 x 1100 mm
Weight	approx. 535 kg

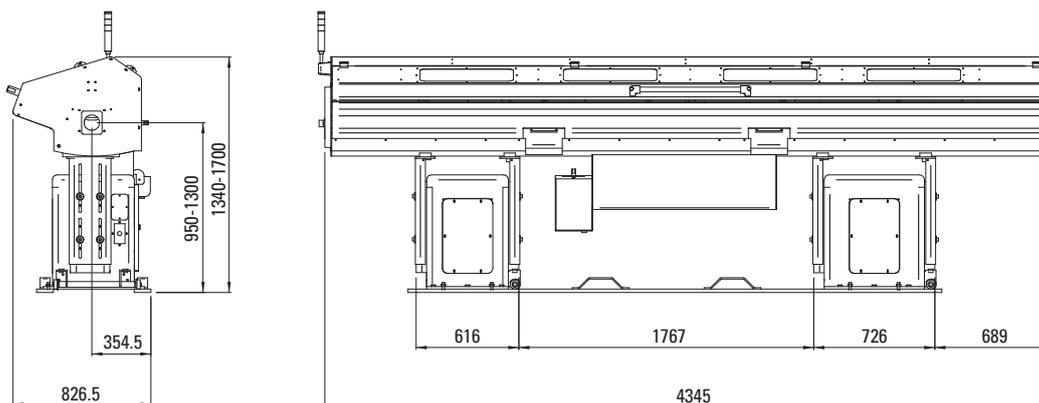
# [Installation plans]

## Machine layout HYPERTURN 45 with EMCO LM1200



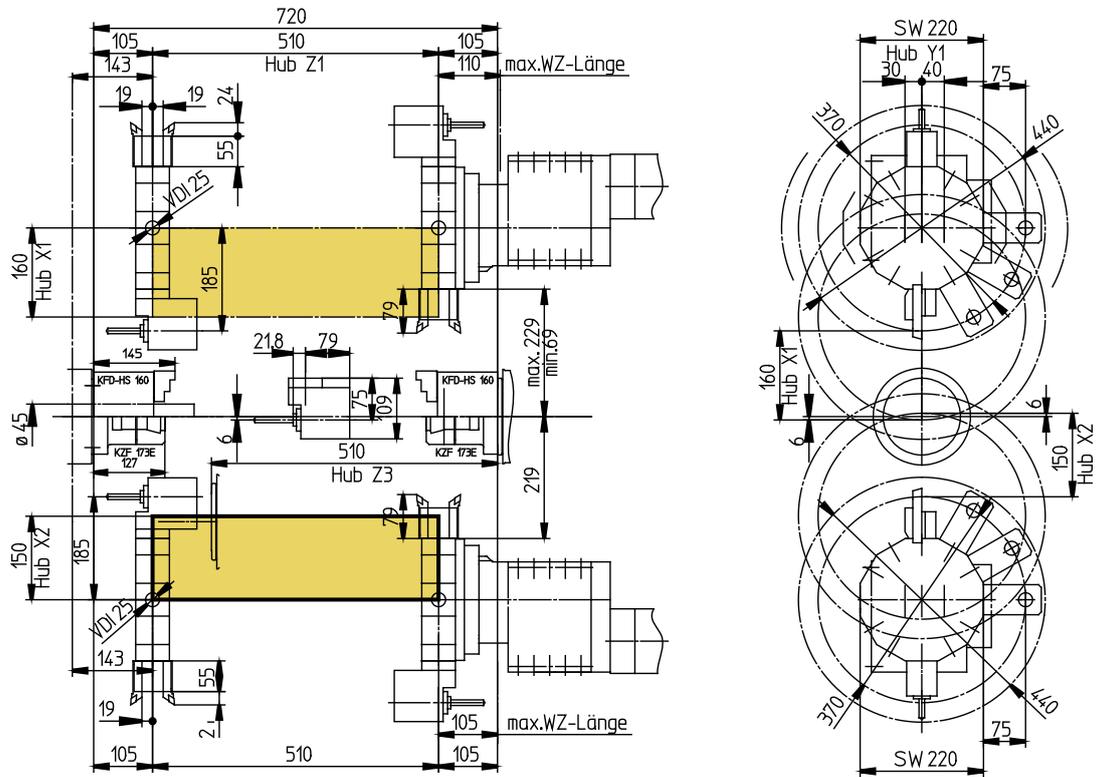
Indications in millimeters

## Machine layout EMCO TOP LOAD 8-42/3200



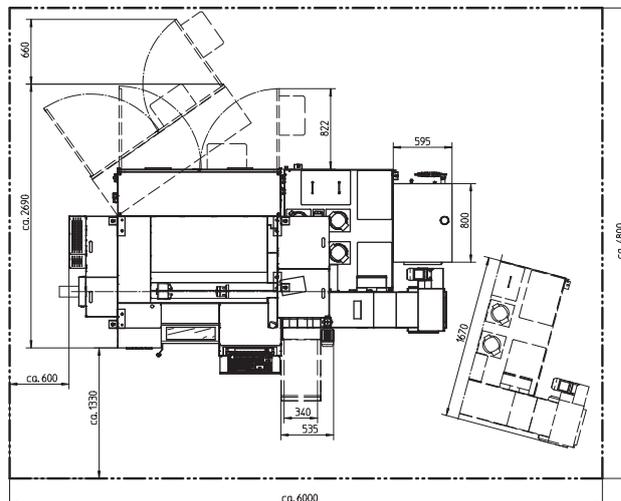
Indications in millimeters

## HYPERTURN 45 SMY-plus work area layout



Indications in millimeters

## Machine layout HT45 with Swing loader



Indications in millimeters

# Quality components



## [Machine bases and slides]

When matching components, we place great value on high stability, good damping characteristics, and a thermoneutral design. We achieve high stability through a shorter force flow, thermal stability through symmetry, and dampening through the materials and interfaces selected.



[www.emco-magdeburg.de](http://www.emco-magdeburg.de)

## [Headstocks]

The design and manufacture of headstocks are two of EMCO's core competencies. During engineering, the focus is on precision, robustness, high rigidity, precise rotational characteristics, and a long service life.



[www.emco-magdeburg.de](http://www.emco-magdeburg.de)

## [Tool turret]

Rapid-indexing turrets with adjustable swivel speeds and milling drives represent the current state of the art. The backlash-free milling drive is not only ideal for milling and drilling, but also for rigid tapping, hobbing, and polygonal turning.



[www.sauter-feinmechanik.com](http://www.sauter-feinmechanik.com)

## [Tool holder]

Innovative, fully developed tool holder systems form the basis for cost-effective machining. High changeover accuracy and stability result in short setup and cycle times.



[www.wto.de](http://www.wto.de)

## [Clamping cylinder / chuck]

Hydraulically activated clamping cylinders and chucks guarantee the precise, safe clamping of work pieces. Programmable sensors are used for stroke monitoring. There is no need for time-consuming adjustments of contactless limit switches.



[www.roehm.biz](http://www.roehm.biz)

## [Hydraulic systems]

Compact dimensions, quiet operation, and high energy efficiency - just some of the advantages of the hydraulic assemblies used by EMCO. Monitored pressure switches prevent the need for time-consuming manual pressure adjustments.



[www.hawe.de](http://www.hawe.de)

## [Ball screws and roller guides]

Highly precise and generously dimensioned guide rails and ball screws with optimal pretensioning form the basis for the machining of precision parts.



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

## [Chip conveyor]

Slat band conveyors allow for flexible implementation and the safe removal of chips. A monitored overload clutch prevents damage from improper use.



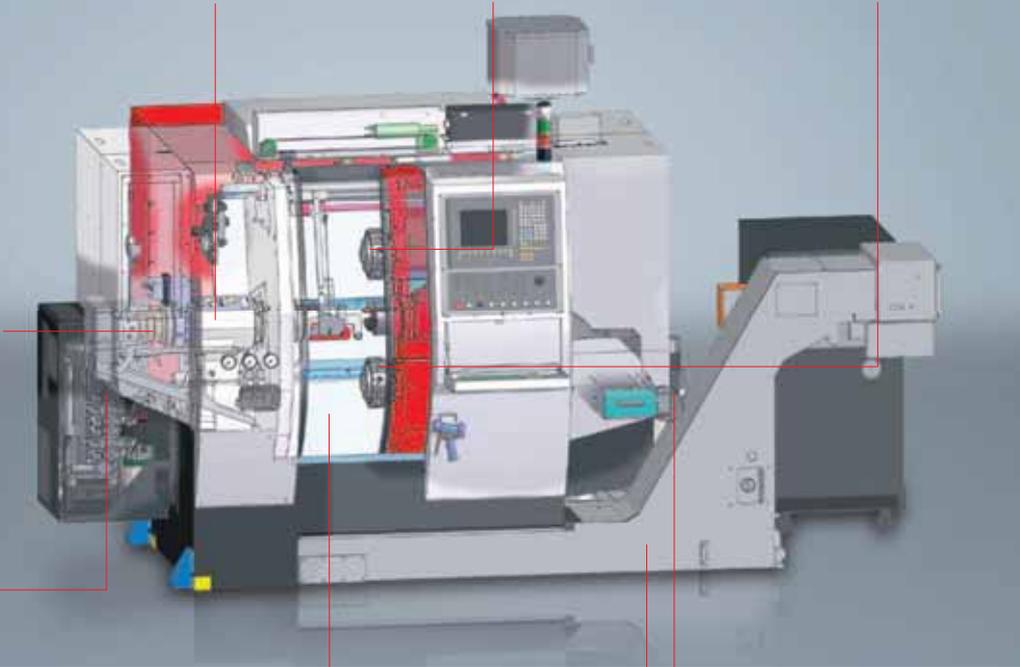
[www.knollmb.de](http://www.knollmb.de)

## [Coolant pumps]

Low-maintenance immersion pumps for pressures of up to 25 bar and flow rates of up to 1500 l/min provide optimum conditions for machining and enable reliable chip transportation.



[www.grundfos.at](http://www.grundfos.at)



# Minimum use of resources for maximum profit.

**E[M]COLOGY**  
Designed for Efficiency

At EMCO, we take a consistent, responsible approach to the use of resources in machine tools in order to safeguard long-term investments. From the development of our machines through to their construction and manufacture, we place a strong focus on the sensible and sparing use of raw materials and energy. This enables us to achieve parallel savings in two areas:

1. Reduction in the basic power consumption of machine tools, e.g. assemblies are switched on and off as required and the installed connected loads are kept to a minimum.
2. Reduction in variable consumption: This can be seen in the lighter axes, energy recovery system, increased rate of good parts, and the shorter process chain enabled by complete machining.

Through these measures, which are constantly being refined and further optimized, EMCO truly demonstrates that its slogan of „Designed for your Profit“ is not just an empty promise: EMCO products help save the environment and provide intelligent customer savings without compromising on quality and flexibility.



## [Regenerative drive system]

Kinetic energy is converted into electrical energy and fed back into the grid.  
**Savings of up to 10%**



## [Compact hydraulics unit with pressure accumulator]

Thanks to its accumulator charging system, the pump only runs when required. If the pressure accumulator is full, the pump switches over to closed loop circulation.  
**Savings of up to 90%**



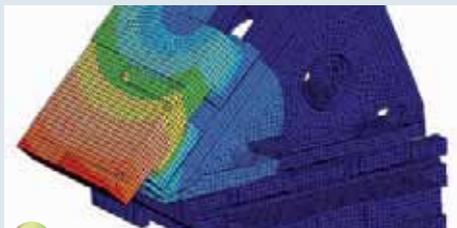
## [Roller guides]

Extremely low friction losses thanks to rolling friction. Highly dynamic performance with minimal lubricant consumption.  
**Savings of up to 50%**



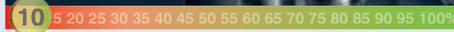
## [Structurally optimized mechanics]

FEM analysis is used to optimize the relevant components in terms of their rigidity while simultaneously reducing their weight.  
**Savings of up to 10%**



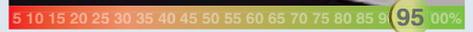
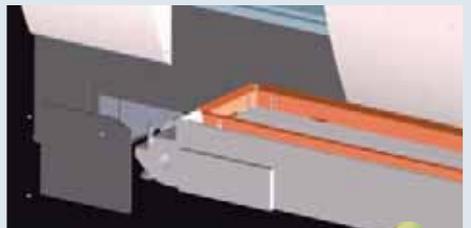
## [Highly efficient motors]

The use of energy-efficient motors (IE2) in the coolant preparation area guarantee highly cost-effective operation.  
**Savings of up to 10%**



## [Synchronized chip conveyor]

Programmable interval times enable optimal use of the chip conveyor independently of the machining process.  
**Savings of up to 95%**



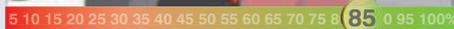
## [Intelligent standby concepts]

Reduced consumption by automatically switching off ancillary units and machine space/screen illumination after a defined period of inactivity on the control panel.  
**Savings of up to 50%**



## [Virtual machine]

Significant reduction in the setup and running-in times on the machine through the use of highly developed simulation and programming software.  
**Savings of up to 85%**



## [Intelligent energy management]

Intuitive data entry screens for activating the individual energy-saving functions.  
**Savings of up to 70%**



# [Technical data]

**emco** group

Designed for your profit

## HYPERTURN 45

Working area	
Swing over bed	Ø 430 mm (16.9")
Swing over cross slide	Ø 300 mm (11.8")
Distance from main spindle to counter spindle	720 mm (28.3")
Max. turning diameter	Ø 300 mm (11.8")
Max. part length	480 mm (18.9")
Max. bar capacity	Ø 45 (51) mm (1.8"(2.0"))
Travel	
Slide travel in X / X2	160 / 150 mm (6.3" / 5.9")
Slide travel in Z / Z2 / Z3	510 / 510 / 510 mm (20.1 / 20.1 / 20.1")
Travel in Y	+40 / -30 mm (+1.6" / -1.2")
Main spindle	
Speed range	0 – 7000 rpm
Max. torque on the spindle	100 Nm (73.7 ft·lbs)
Spindle nose DIN 55026	A2-5
Spindle bearing (inner diameter at front)	Ø 85 mm (3.3")
Spindle bore	Ø 53 mm (2.1")
Counter spindle	
Speed range	0 – 7000 rpm
Max. torque on the spindle	100 Nm (73.7 ft·lbs)
Spindle nose DIN 55026	A2-5
Spindle bearing (inner diameter at front)	Ø 85 mm (3.3")
Spindle bore	Ø 53 mm (2.1")
C axis	
Resolution	0.001°
Rapid motion speed	1000 rpm
Spindle indexing (disc brake)	0.01°
Drive power	
Main spindle	15 kW (20.1 hp)
Counter spindle	15 kW (20.1 hp)
Tool turrets 1+2	
Number of tool positions	2 x 12
Tool holding shaft in accordance with VDI (DIN 69880)	VDI 25
Tool cross section for square tools	16 x 16 mm (0.6" x 0.6")

Tool turrets 1+2	
Shank diameter for boring bars	Ø 25 mm (1.0")
Revolver switch time	0.2 sec
Driven tools 1+2	
Speed range	0 – 6000 rpm
Torque	16 Nm (11.9 ft·lbs)
Drive performance	4 kW (5.3 hp)
Number of driven tools	2 x 12
Feed drives	
Rapid motion speed X / Y / Z	30 / 15 / 45 m/min 1181 / 590.5 / 1771 ipm
Feed force in the X axes / Y axis	4000 N (900 lbs)
Feed force in the Z axis	5000 N (1124 lbs)
Feed force in the Z axis counter spindle	6000 N (1350 lbs)
Position variation Ps (VDI 3441) X / Y / Z	3 / 3 / 3 µm
Coolant system	
Tank volume	300 l (80 gal)
Pump power standard	0.62 (1.1) kW (0.82(1.46 hp))
Pump capacity at 3.5 bar / 1 bar	12.5 / 58 l/min (3.3 / 15.3 gal/min)
Pump capacity at 10 bar / 5 bar (optional)	15 / 40 l/min (3.9 / 10.4 gal/min)
Power consumption	
Connected load	30 kVA
Supply pressure	6 bar (87.0 PSI)
Dimensions/weight	
Height of center above floor	1126 mm (44.3")
Machine height	1985 mm (78.1")
Space occupied BxT (not including chip conveyor and coolant)	2650 x 1950 mm (104.3 x 76.8")
Total weight of machine	4200 kg (9259.4 lb)
Safety devices	
	CE compliant



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[www.emco-world.com](http://www.emco-world.com)