

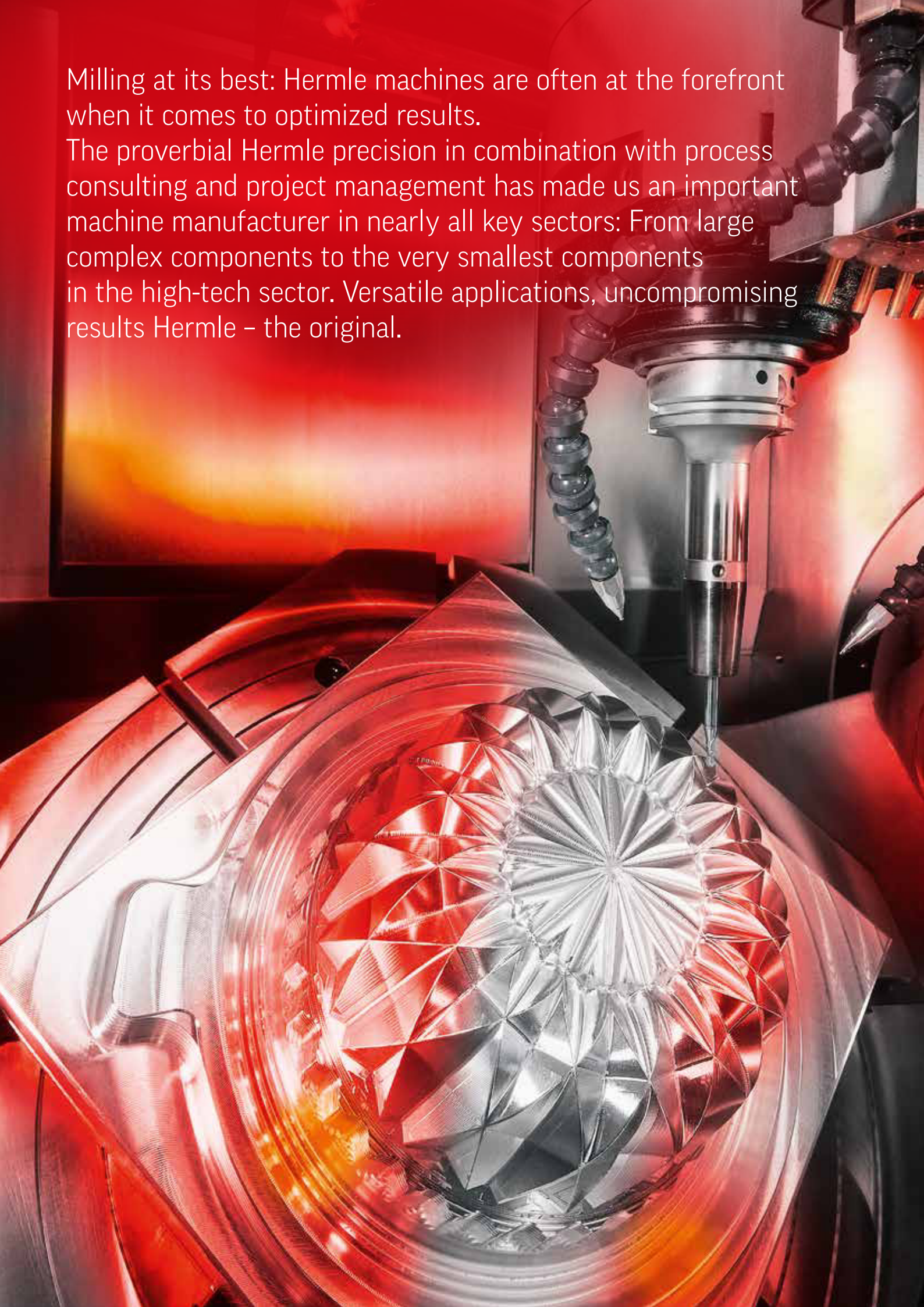
# C 32

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



Milling at its best: Hermle machines are often at the forefront when it comes to optimized results.

The proverbial Hermle precision in combination with process consulting and project management has made us an important machine manufacturer in nearly all key sectors: From large complex components to the very smallest components in the high-tech sector. Versatile applications, uncompromising results Hermle – the original.





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# 01 Industry sectors

Hermle is at home in all sectors. For us, ensuring the highest precision and reliable machining is always paramount. Our machines are made for daily operation, whether as linked linear segments in production or as stand-alone workshop machinery.

*Precision mechanics*



*Medical engineering*



*Tool technology*





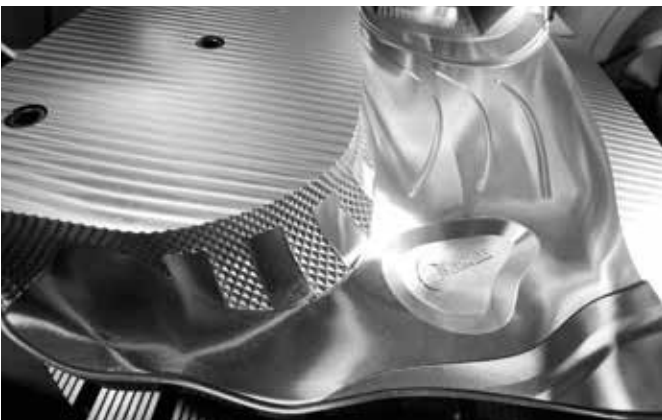
*Aerospace industry*



*Machine construction*



*Tools and mould construction*



*Subcontractor industry*



# 02

## The machine

The C 32: a highly dynamic machining centre designed consistently for 5-axis/5-side machining.

Features galore to ensure high-precision, economical parts production. Numerous automation solutions extend the application range many times over.



### TECHNICAL DATA

**Traverse path X-Y-Z:** 650 - 650 - 500 mm

**Speed:** 15000 / 18000 / 25000 / 42000 rpm

**Rapid linear traverse X-Y-Z (dynamic):**  
45 (60) - 45 (60) - 40 (60) m/min

**Linear acceleration X-Y-Z (dynamic):**  
6 (10) m/s<sup>2</sup>

**Control unit:** TNC 640 / S 840 D sl

**Rigid clamping table:** 900 x 665 mm  
**Max. table load:** 1500 kg

#### NC swivelling rotary tables:

<b>Table with worm:</b>	Ø 320 mm / 450 x 360 mm	Ø 650 x 540 mm
<b>Swivelling range:</b>	+/- 130°	+/- 130°
<b>A axis speed:</b>	25 rpm	25 rpm
<b>C axis speed:</b>	40 rpm	30 rpm
<b>Max. table load:</b>	300 kg	600 kg

<b>Tables with torque:</b>	Ø 320 mm	Ø 650 x 540 mm
<b>Swivelling range:</b>	+/- 130°	+/- 130°
<b>A axis speed:</b>	25/55* rpm	25 rpm
<b>C axis speed:</b>	80 rpm	65 rpm
<b>Max. table loading:</b>	200 kg	600/1000* kg

\*with tandem drive



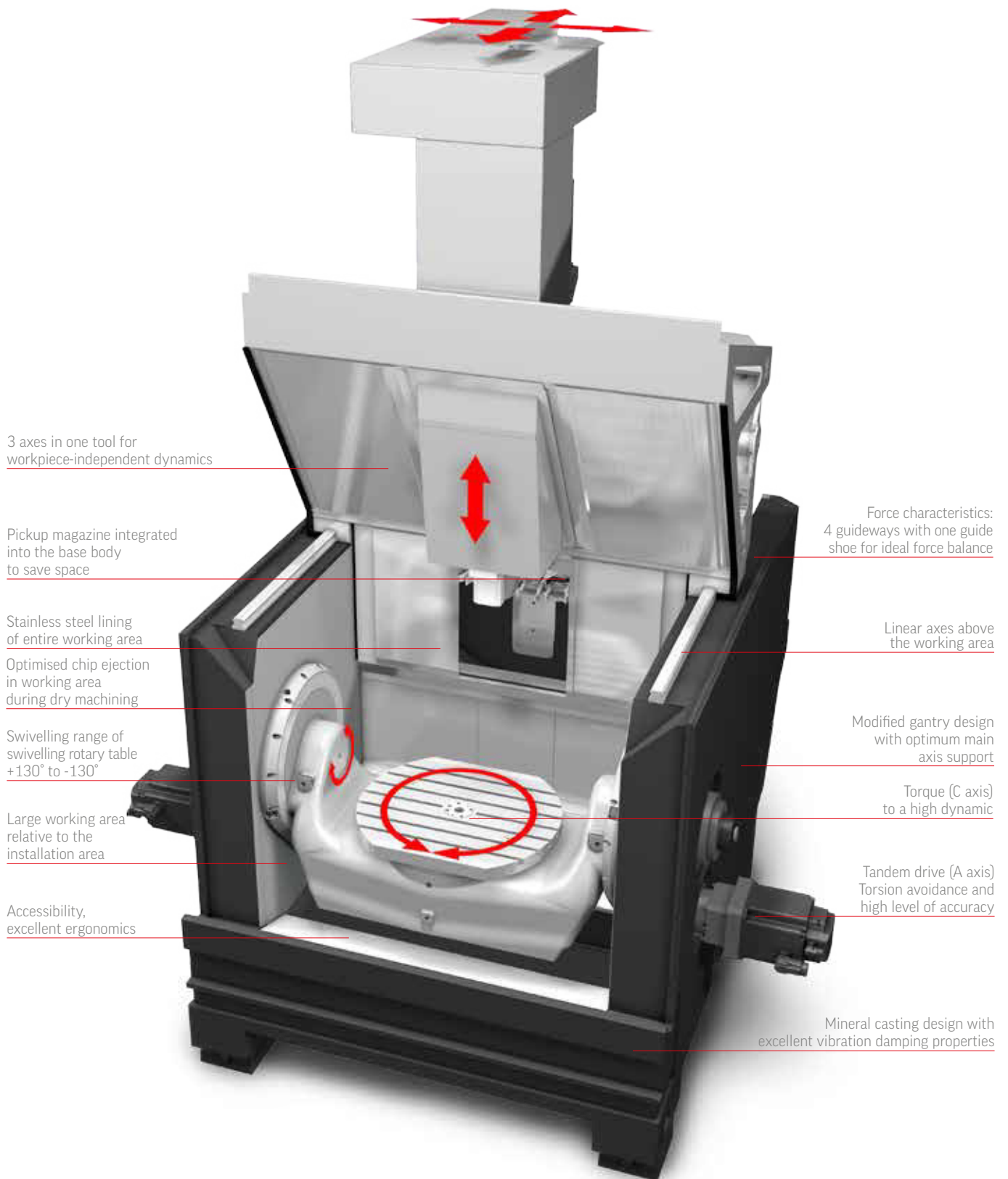
made in Germany



02.1

# New dimensions in dynamics





3 axes in one tool for workpiece-independent dynamics

Pickup magazine integrated into the base body to save space

Stainless steel lining of entire working area

Optimised chip ejection in working area during dry machining

Swivelling range of swivelling rotary table +130° to -130°

Large working area relative to the installation area

Accessibility, excellent ergonomics

Force characteristics: 4 guideways with one guide shoe for ideal force balance

Linear axes above the working area

Modified gantry design with optimum main axis support

Torque (C axis) to a high dynamic

Tandem drive (A axis) Torsion avoidance and high level of accuracy

Mineral casting design with excellent vibration damping properties

# 02.2

## The workpiece

Many important points must be observed in order to guarantee that every workpiece is machined perfectly. For this reason, Hermle has been working on perfecting and optimising the machining process for many years. This is the reason that the C 32 is now equipped with:

- The largest working area relative to the installation area.
- The largest swivelling range of workpieces in the working area.
- Utilisation of the entire traverse range.
- A large collision circle between the table flanges.

### THE WORKPIECE DIMENSION

- Unlimited crane top loading to above the table centre
- When loading the crane the spindle moves to the magazine – this means the working area is completely clear and accessible
- Extensive automation solutions for optimum workpiece handling



*3-axis*

*650 x 650 x 500 mm*

*max. 1500 kg*



*5-axis*

*Ø 650 x 420 mm*

*max. 1000 kg*

*Collision circle: Ø 840 mm*

*Vertical table clearance: 600/635 mm*





*3-axis machining*

*5-axis machining*



# 02.3 Ergonomics

Built for daily use: the Hermle C 32 can be ergonomically adapted for every machine operator for optimum ease of use, simple operation and uncomplicated maintenance.

## HIGHLIGHTS

- Ergonomic control panel:
  - Adjustable height +/- 100 mm
  - Tilting screen 5 - 35°
  - 19" screen
  - Control panel pivotable from the tool loading point to the working area
- Optimum loading height
- Crane loading
- Minimum interval between table and operator
- Large door opening
- Lockable fluid box

Screen pivotable  
by up to 30 °C



Practical,  
slide-in tray



Control panel  
+/-100 mm  
height adjustable



*Door opening 758 mm*

*Vertical table clearance 600/635 mm*

*Loading height 950 mm*

*Control panel, pivotable*



# 02.4

## Table variants

Hermle's swivelling rotary table has revolutionised the concept of 5-axis machining. The C 32 also relies on 5-axis operation and takes full advantage of its advantages. These include worm gears on the entry-level machining table and torque drive on the highly dynamic version. All tables are manufactured exclusively and entirely at our plant in Gosheim.

Uncompromised perfection: this drive design accesses the gear on the table housing directly and so completely eliminates shaft torsion on the table. This is the only way to achieve the highest precision for both one-sided and tandem drives.



### TECHNICAL DATA

*High degree of freedom in working area*

- *Very high table loading (up to 1000 kg with the highest accuracy)*
- *No accumulation of chip on the swivelling rotary table (swivel table)*
- *Swivelling axis A and rotary axis C are located within the workpiece (U-shape)*
- *Torsion prevented by tandem drive*
- *Wide flange spacing results in a very large collision circle in the working area*
- *High swivelling range for undercuts*

#### Worm table

- *Generously dimensioned worm gear*
- *Low torsion attachment*
- *Direct, absolute measuring system*

#### Torque table

- *High dynamics on the A and C axes*
- *No wear*
- *Direct, absolute measuring system*

Made in Germany – made in Gosheim: The C 32 table variants stand for the highest quality and optimum material usage from the cast housing to the installed gearbox and torque motors. At our main plant in Gosheim, these machining tables are laying the foundations for the precision, accuracy and quality of the machined surfaces.

Hermle's swivelling rotary table are equipped with cutting-edge drive technology for high dynamic during 5-axis machining as the slowest axis determines the speed of 5-axis simultaneous milling.

With high-performance drive technology in the rotary axes (A axis / C axis), loads of up to 1000 kg can be positioned quickly and above all with great precision.

## DRIVE TECHNOLOGY

- Central load on the machining table
- Drive directly on table housing = low torsion A axis
- Direct, absolute measuring system
- Good maintenance accessibility
- A axis integrated in machine bed

### One-sided drive

- Mechanical drive on right of table housing



### Tandem drive

- Mechanical tandem drive to left and right of table housing



# Rigid clamping table

Clamping surface: 900 x 665 mm

Equipped with the rigid clamping table, the machine can deal with clamping weights of up to 1500 kg - ideal for 3-axis machining of large, bulky and heavy workpieces.

T grooves: parallel 10 / 14 H7



# Swivelling rotary table

Drive type C axis: worm

The swivelling rotary table "Worm" almost comes up to the standards of the torque table, apart from the dynamics. It is an ideal introduction to the world of 5-axis technology.



Zero-point clamping systems/pallet clamping systems

Clamping surface:	Ø 650 x 540 mm
T grooves:	parallel 7 / 14 H7
Swivelling range:	+/- 130°
Drive type rotary axis C:	worm
Speed rotary axis C:	30 rpm
Speed swivelling axis A (one-sided drive):	25 rpm
Max. table load (one-sided drive):	600 kg



# Swivelling rotary table

Drive type C axis: worm



Clamping surface .  $\varnothing$  450 x 360 mm



Secondary clamping plates . 760 x 370 mm



System table with table plate .  $\varnothing$  320 mm  
( $\varnothing$  450 x 360 mm)



Zero-point clamping systems/pallet clamping systems



Installation clamping device . SK 50



Installation clamping device . HSK 100



Clamping surface:	$\varnothing$ 320 mm
T grooves:	star 4 / 14 H7
Swivelling range:	+/- 130°
Drive type - rotary C axis:	worm
Speed rotary axis C:	40 rpm
Speed swivelling axis A (one-sided drive):	25 rpm
Max. table load (one-sided drive):	300 kg
Secondary clamping plates (optional)	
T grooves:	parallel 5 / 14 H7

# Swivelling rotary table

Drive type C axis: Torque



The "Torque" swivelling rotary table provides the ideal conditions for highly dynamic 5-axis and simultaneous 5-axis machining.



Clamping surface:	Ø 320 mm
T grooves:	star 4 / 14 H7
Swivelling range:	+/- 130°
Drive type rotary axis C:	Torque
Speed rotary axis C:	80 rpm
Speed swivelling axis A (one-sided drive):	25 rpm
(tandem drive):	55 rpm
Max. table load (one-sided drive):	200 kg
(tandem drive):	200 kg
Secondary clamping plates (optional)	
T grooves:	parallel 5 / 14 H7



Secondary clamping plates . 760 x 370 mm



System table with table plate . Ø 320 mm



Zero-point clamping systems /  
pallet clamping systems



Clamping surface:	Ø 650 x 540 mm
T grooves:	parallel 7 / 14 H7
Swivelling range:	+/- 130°
Drive type rotary axis C:	Torque
Speed rotary axis C:	65 rpm
Speed swivelling axis A (one-sided drive):	25 rpm
(tandem drive):	25 rpm
Max. table load (one-sided drive):	600 kg
(tandem drive):	1000 kg



Zero-point clamping systems /  
pallet clamping systems



# 02.5

## Tool spindles



The C 32 can be equipped with two-piece or compact spindles. All tool spindles can be replaced quickly and easily in case of failure.

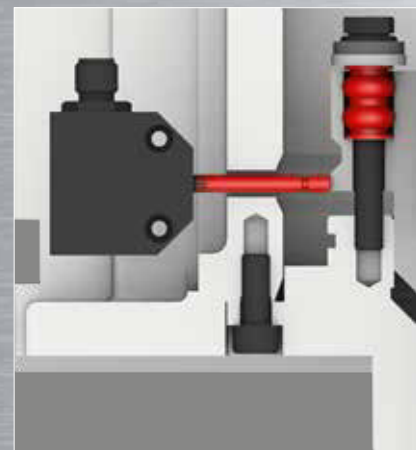
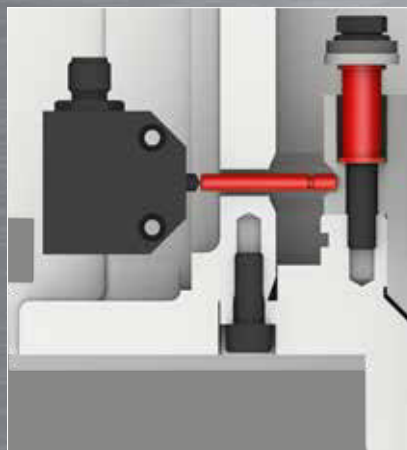
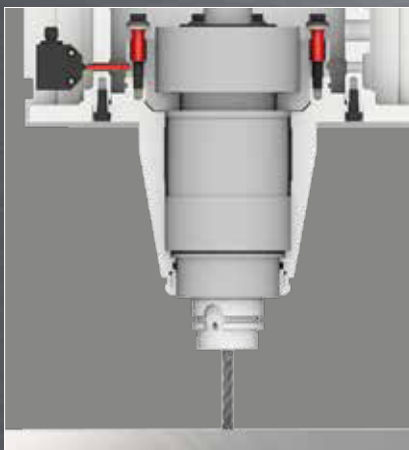
With the different speed ranges and tool holding fixtures the tool spindles are suitable for a wide variety of machining tasks. Like the machining tables, all tool spindles are manufactured exclusively and entirely at our plant in Gosheim.

### TECHNICAL DATA

- High-tech spindles for demanding milling processes
- Slim-end tool spindle for machining deep cavities
- Few projecting edges (prevention of collision)
- Two-part tool spindle (faster, easier replacement)
- Collision protection (collision sleeves) prevents damage in 50% of collisions

#### *Collision protection with collision inquiry*

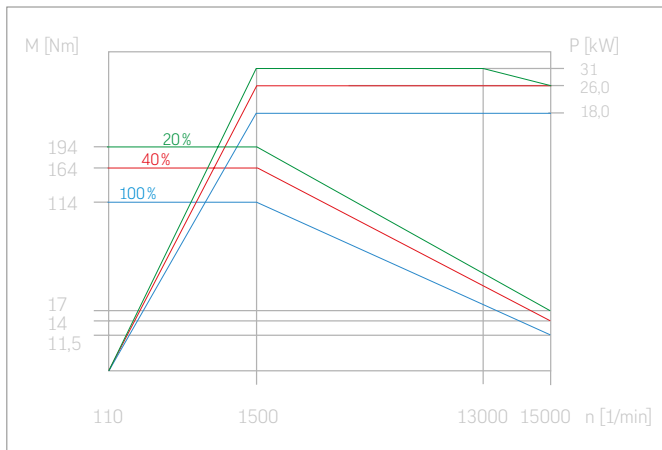
*Each tool spindle has several collision sleeves which compensate collision energy in the Z direction.*





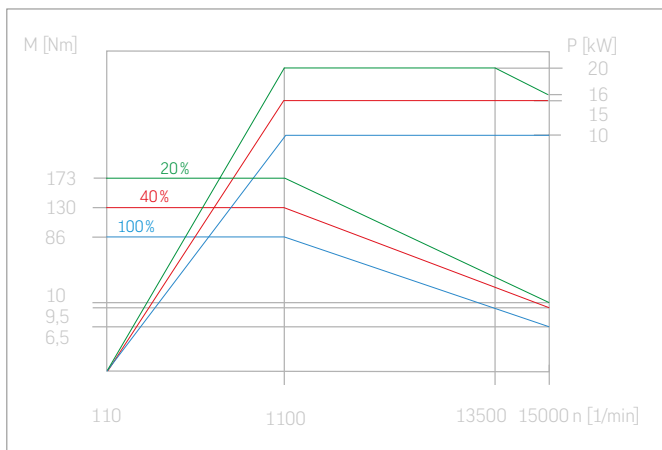


## Tool spindle 15000 rpm



**Maximum spindle speed:** 15000 rpm  
**Main power 20% c.d.f.:** 31 kW  
**Torque 20% c.d.f.:** 194 Nm  
**Tool holding fixture:** HSK A 63  
**Tool spindle:** two-piece  
**Collision protection:** collision sleeves

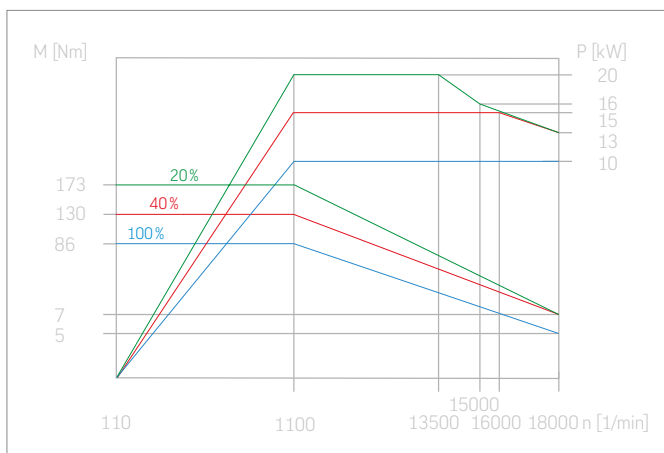
## Tool spindle 15000 rpm



**Maximum spindle speed:** 15000 rpm  
**Main power 20% c.d.f.:** 20 kW  
**Torque 20% c.d.f.:** 173 Nm  
**Tool holding fixture:** SK 40  
**Tool spindle:** two-piece  
**Collision protection:** collision sleeves

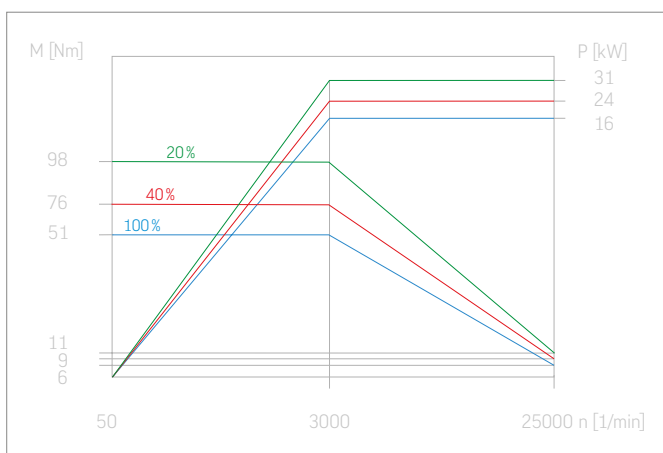


## Tool spindle 18000 rpm



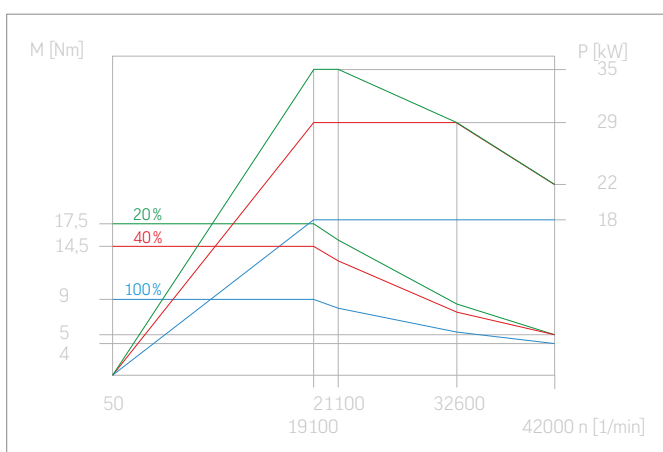
**Maximum spindle speed:** 18000 rpm  
**Main power 20% c.d.f.:** 20 kW  
**Torque 20% c.d.f.:** 173 Nm  
**Tool holding fixture:** HSK A 63  
**Tool spindle:** two-piece  
**Collision protection:** collision sleeves

## Tool spindle 25000 rpm



**Maximum spindle speed:** 25000 rpm  
**Main power 20% c.d.f.:** 31 kW  
**Torque 20% c.d.f.:** 98 Nm  
**Tool holding fixture:** HSK A 63  
**Tool spindle:** compact

## Tool spindle 42000 rpm



**Maximum spindle speed:** 42000 rpm  
**Main power 20% c.d.f.:** 35 kW  
**Torque 20% c.d.f.:** 17.5 Nm  
**Tool holding fixture:** HSK E 40  
**Tool spindle:** compact

# 02.7

## The tool magazine

The C 32's tool magazine holds up to 36 tools in the standard version and is integrated into the machine bed to save space. It can be filled from the side by swivelling the control panel to the loading point.



### TECHNICAL DATA

*Pick-up magazine*

*Integration into the machine bed*

*Excellent accessibility*

*Control panel pivotable to the loading point*

*Covers for tool holding fixture*

*Tool changer (pick-up)*

<i>Interface:</i>	<i>SK 40 / HSK A 63</i>	<i>HSK E 40</i>
<i>Magazine pockets:</i>	<i>36</i>	<i>36</i>
<i>Max. tool weight:</i>	<i>8 kg</i>	<i>2.5 kg</i>
<i>Max. tool diameter:</i>	<i>Ø 80 with corresponding adjacent pocket allocation Ø 125 mm</i>	
<i>Max. tool length:</i>	<i>300 mm</i>	<i>300 mm</i>
<i>Max. magazine load:</i>	<i>144 kg</i>	<i>90 kg</i>
<i>Chip-to-chip time:</i>	<i>approx. 4.5 s</i>	<i>approx. 4.5 s</i>



### Additional magazine ZM 50 / ZM 88 k



Magazine pockets: 50 / 88  
Max. tool weight: 8 kg  
SK 40 / HSK A 63: 2.5 kg  
HSK E 40: 2.5 kg  
Max. tool diameter:  $\varnothing 80$ ,  
with corresponding adjacent  
pocket allocation  $\varnothing 125$  mm  
Max. tool length: 300 mm

### Additional magazine single



Magazine pockets: 192  
Max. tool weight: 8 kg  
Max. tool diameter:  $\varnothing 80$ ,  
with corresponding adjacent  
pocket allocation  $\varnothing 125$  mm  
Max. tool length: 300 mm

### Additional magazine double



Magazine pockets: 462  
Max. tool weight: 8 kg  
Max. tool diameter:  $\varnothing 80$ ,  
with corresponding adjacent  
pocket allocation  $\varnothing 125$  mm  
Max. tool length: 300 mm

# 02.8

## Control unit

The C 32 can be equipped with two types of control unit. All control units provide diverse program functions. Hermle simplifies programming and operation still further with comprehensive extra features.

### Heidenhain

#### Heidenhain TNC 640

- Dynamic Efficiency – Active Chatter Control (ACC), Adaptive Feed Control (AFC), trochoidal milling
- Dynamic Precision – Cross Talk Compensation (CTC), Active Vibration Damping (AVD), Load Adaptive Control (LAC)
- 19" TFT colour flat screen
- Keyboard unit with full keyboard, integrated trackball, USB and Ethernet interfaces
- Fully digital with HSCI interface and EnDat interface
- Programming in Heidenhain plain text or per DIN/ISO
- Standard drilling and milling cycles
- Touch probe system cycles
- Free contour programming
- Special functions for fast 3D machining
- Automatic calculation of cutting data
- Pallet management
- Software option Kinematic Opt (Measurement cycle for improving accuracy of rotational and swivelling operations)



For further advantages and detailed technical data, please see the Heidenhain brochures.

### Siemens

#### Siemens S 840 D sl

- 19" TFT colour flat screen
- Keyboard unit with full keyboard, additional panel with integrated trackball, key-operated switch and buttons, USB and Ethernet interfaces
- Complete and flexible diagnostics and service concept
- All inverter and control components are connected with each other by the Drive-Cliq-Interface
- Including shell transformation, 5-axis transformation, process-oriented measuring, 3D tool radius compensation and Spline-Interpolation
- Incl. software option Kinematic Opt (Measurement cycle for improving accuracy of rotational and swivelling operations)
- Tool management for all machines HOTS
- Operating Interface OPERATE with ShopMill
- SINUMERIK MDynamics incl. Advanced Surface
- High Speed Settings - CYCLE832



For further advantages and detailed technical data, please see the Siemens brochures.



# 02.8

## Control unit

### Hermle control tools



**Hermle "Tool Management Control"**  
Simple, Hermle tool management for Heidenhain controls.



**Hermle "Operate-Tool-System"**  
Simple, Hermle tool management for the Siemens S 840 D sl.



**Hermle "Automation Control System"**  
Simple, Hermle order management software.



**Hermle "Wear Diagnosis System"**  
Machine status is continually monitored by the Hermle wear diagnosis system. It facilitates rapid machine diagnostics and status-oriented detection of maintenance tasks.



**Hermle "Information-Monitoring-Software"**  
The "Information-Monitoring-Software" is used to display the live status of machines and send events via e-mail.

### Hermle setups

#### Standard

##### Standard

- Standard setting.
- Switches back to the standard setting after a different setup has been used.

#### Heavy Duty Machining

##### Heavy duty machining

- For roughing in conjunction with high milling power.
- Greater machining performance possible thanks to reduced machine vibration (depending on the tool and the selected technology data).

#### High Production

##### Production

- Quicker machining with programs which have many cycle calls or subprograms.







# 02.9

## The details

The C 32 is built using an elegant cassette panel construction. This high-tech building block concept is used throughout from the standard machine to the flexible manufacturing system. The machining centre can be transported without any disassembly and set up without a foundation. Furthermore, all units are arranged for easy maintenance and servicing.

### HIGHLIGHTS

*Comprehensive fluid technology*

*Optimised chip management*

*Diverse cooling lubricant units*

*Scraper belt conveyor*

*Hinged belt conveyor*

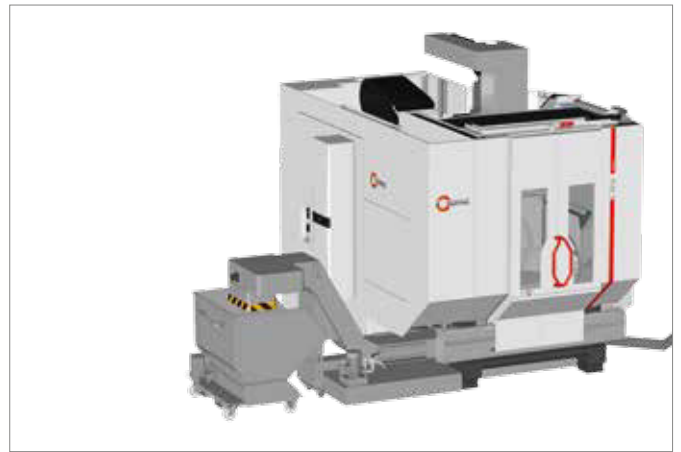
*We provide the correct method of chip removal from the working area for all kinds of chip*



Space-saving chip conveyor arrangement



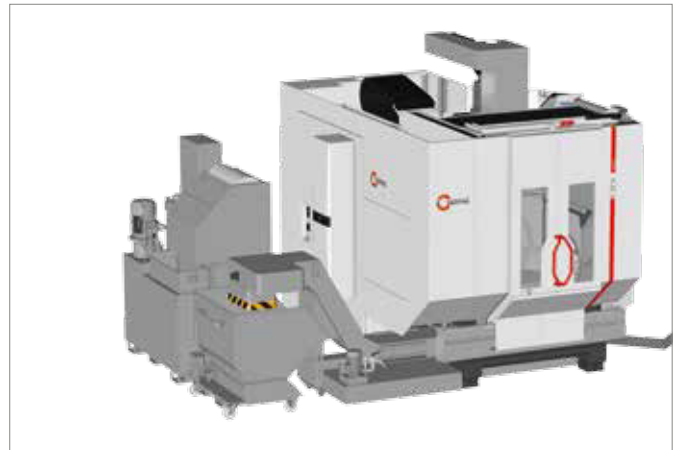
Chip drawer



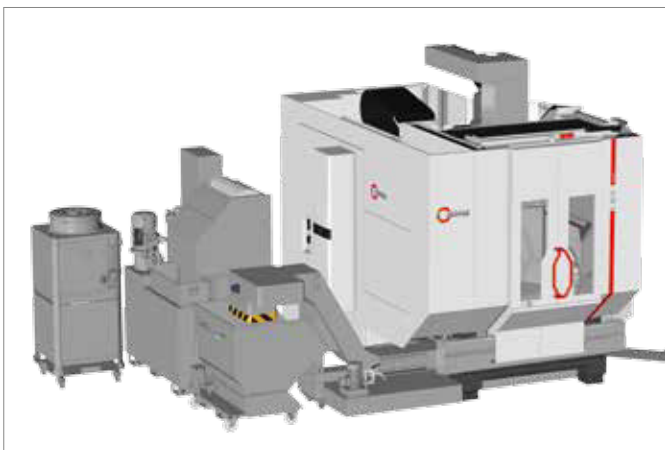
Chip conveyor



Chip conveyor with internal cooling lubricant supply ICS 40



Chip conveyor with internal cooling lubricant supply ICS 80



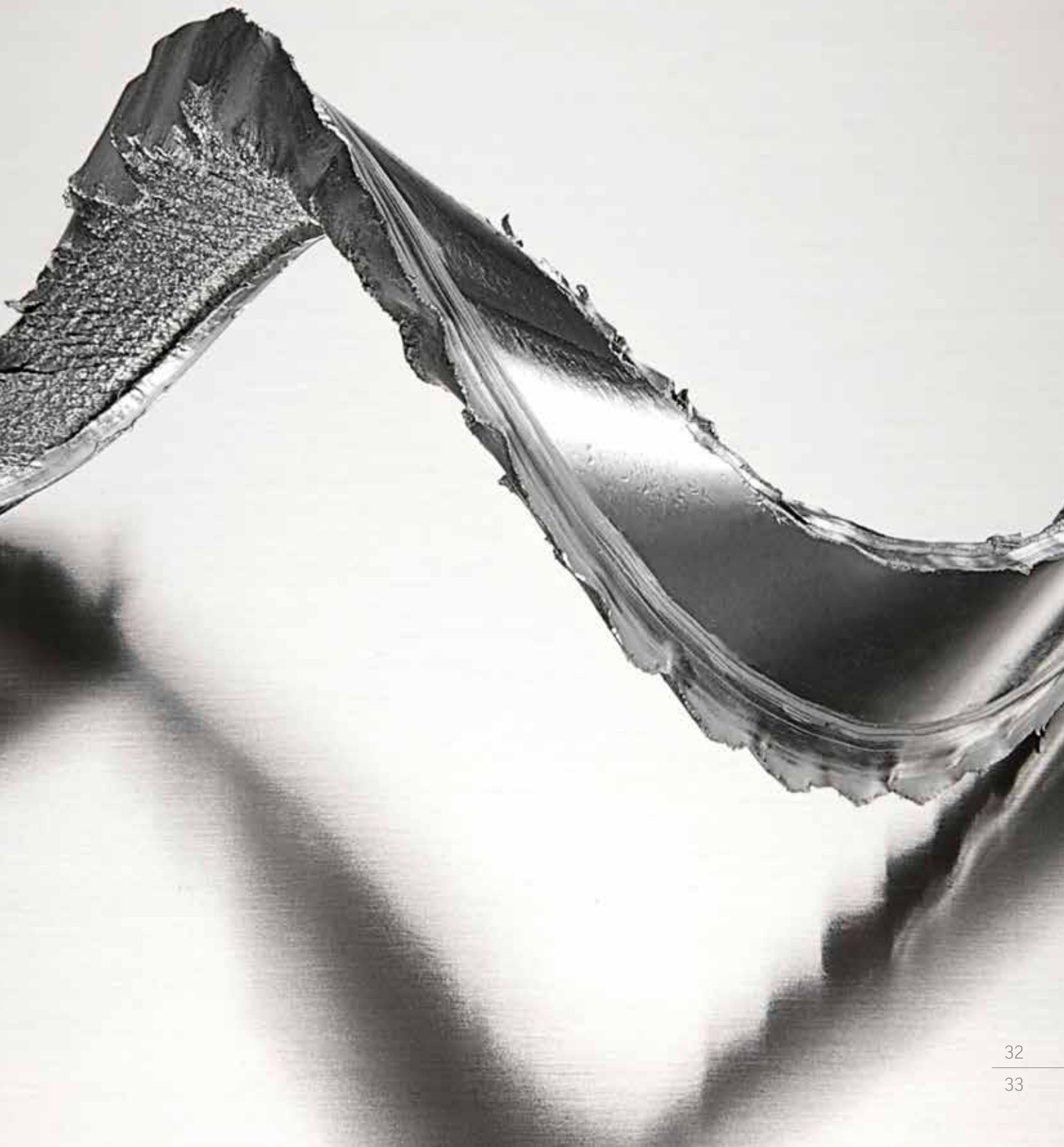
Chip conveyor with internal cooling lubricant supply ICS 80 and recooling unit

03

Technical data . C 32







# 03.1

## Technical data . C 32

<b>Working area</b>	Traverse	X axis	650 mm
	Traverse	Y axis	650 mm
	Traverse	Z axis	500 mm
	Rapid linear traverse (dynamic)	X-Y-Z	45 - 45 - 40 m/min (60 - 60 - 60 m/min)
	Linear acceleration (dynamic)	X-Y-Z	6 (10) m/s <sup>2</sup>
	Linear feed force	X-Y-Z	8500 N
	Max. vertical table clearance		600/635 mm
	Max. workpiece diameter		Ø 650 mm
	Max. workpiece height		420 mm
	Collision circle (A axis) in 0° position		Ø 840 mm
<b>Main spindle drive</b>	Speed	15000 rpm	HSK A 63 ○
	Main power/Torque	20% c.d.f.	31 kW / 194 Nm
	Speed	15000 rpm	SK 40 ○
	Main power/Torque	20% c.d.f.	20 kW / 173 Nm
	Speed	18000 rpm	HSK A 63 ●
	Main power/Torque	20% c.d.f.	20 kW / 173 Nm
	Speed	25000 rpm	HSK A 63 ○
	Main power/Torque	20% c.d.f.	31 kW / 98 Nm
	Speed	42000 rpm	HSK E 40 ○
	Main power/Torque	20% c.d.f.	35 kW / 17,5 Nm
<b>Control unit</b>	Heidenhain		TNC 640 ●
	Siemens		Sinumerik 840 D sl ○
<b>Tool changer (pick-up)</b>	Interface	SK 40 / HSK A 63	HSK E 40
	Magazine pockets	36 items	36 items ●
	Chip-to-chip time	approx. 4.5 s	approx. 4.5 s
	Max. tool length	300 mm	300 mm
	Max. tool diameter with corresponding adjacent pocket allocation	Ø 80 mm Ø 125 mm	Ø 80 mm Ø 125 mm
	Max. magazine load	144 kg	90 kg
	<b>Extension of tool storage capacity</b>	Additional magazine ZM 50	
Additional magazine ZM 88 k			Additional 88 pockets ○
Additional magazine single ZM 192			Additional 192 pockets ○
Additional magazine double ZM 462			Additional 462 pockets ○
Interface		SK 40 / HSK A 63	HSK E 40
Maximum tool diameter with corresponding adjacent pocket allocation		Ø 80 mm Ø 125 mm	Ø 80 mm Ø 125 mm
Max. tool weight		8 kg	2.5 kg

**Table variants\***

Swivelling rotary table	Ø 650		Ø 650
Clamping surface	Ø 650 x 540 mm		Ø 650 x 540 mm
Swivelling range	+/- 130°		+/- 130°
C axis drive mode	Worm		Torque
Swivelling axis A speed			
One-sided drive	25 rpm		25 rpm
Tandem drive	-		25 rpm
Rotary axis C speed	30 rpm		65 rpm
Max. table load			
One-sided drive	600 kg		600 kg
Tandem drive	-		1000 kg
T grooves parallel	7 / 14 H7		7 / 14 H7
Swivelling rotary table	Ø 320	Ø 320	Rigid clamping table
Clamping surface	Ø 320 mm	Ø 320 mm	900 x 665 mm
Swivelling range	+/- 130°	+/- 130°	-
C axis drive mode	Worm	Torque	-
Swivelling axis A speed			
with one-sided drive	25 rpm	25 rpm	-
Tandem drive	-	55 rpm	-
Rotary axis C speed	40 rpm	80 rpm	-
Max. table load			1500 kg
One-sided drive	300 kg	200 kg	-
Tandem drive	-	200 kg	-
T grooves parallel	-	-	10 / 14 H7
T grooves star-shaped	4 / 14 H7	4 / 14 H7	-
Clamping surface	Ø 450 x 360 mm	-	-
Secondary clamping plates	760 x 370 mm	760 x 370 mm	-
T grooves parallel	5 / 14 H7	5 / 14 H7	-

\*All machining tables available on demand

- Included in standard delivery
- Available upon request

<b>Positional uncertainty</b>	P in X-Y-Z axes according to VDI/DGQ 3441 (calculated at a constant ambient temperature of 20 °C +/-1 °C. Our products are subject to the German Export Law and require authorization since the attainable precision may be less/greater than 6 µm.)	0.008 mm	●
<b>Chip drawer</b>	Removable chip drawer		●
<b>Chip conveyor</b>	Scraper belt or hinge conveyor ejection height ejection height chip cart	at least 940 mm 450 l	○ ○
<b>External cooling lubricant supply</b>	With chip drawer and cooling lubricant tank Cooling lubricant tank capacity	375 l	●
<b>Internal cooling lubricant supply with paper band filter</b>	Capacity of standard tank	100 l	100 l ○
	Capacity of cooling lubricant tank	570 l	1100 l
	Pressure (manually adjustable up to)	max. 40 bar / 26 l/min	max. 80 bar / 30 l/min
	Mains connection (ICS)	-	400 V / 50 Hz
	Power consumption (ICS)	-	16.5 kVA
<b>Hydraulics</b>	Operating pressure	120 bar	●
<b>Central lubrication</b>	Minimum grease lubrication quantity		●
<b>Connected loads (machine)</b>	Mains connection	400 V / 50 Hz	
	Power consumption	45 kVA	
	Compressed air	6 bar	
<b>Weight</b>	(Standard version without optional extras, attachments, workpieces and cooling lubricant)	about 11.0 t	

- Included in standard delivery
- Available upon request

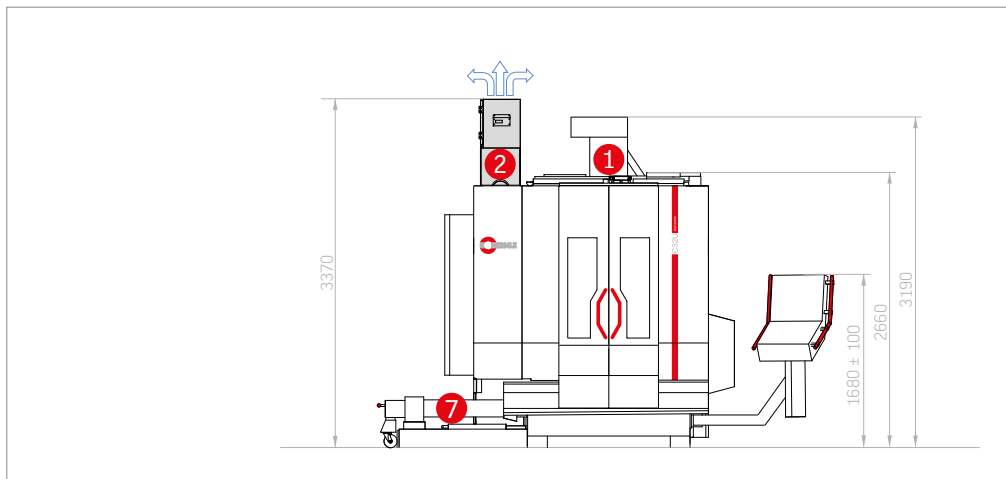




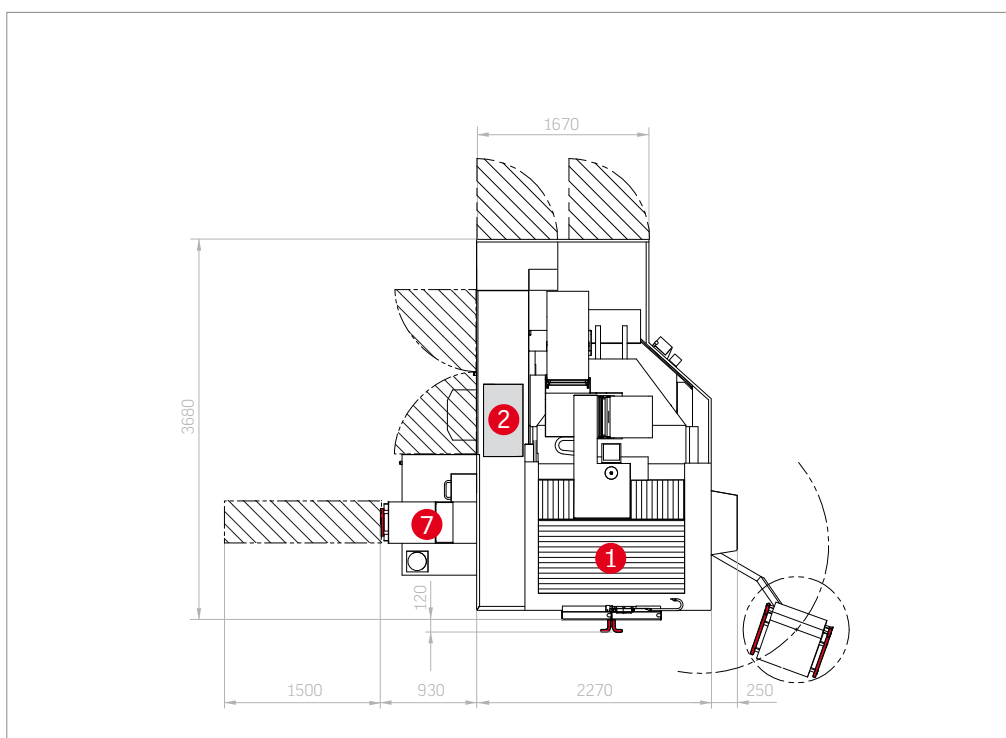
# 03.2 Options

The C 32 is prepared for anything: numerous optional extras make machining even more efficient and powerful in real applications and enable you to optimise your work with the machining centre still further.

C 32 standard machine dimensions



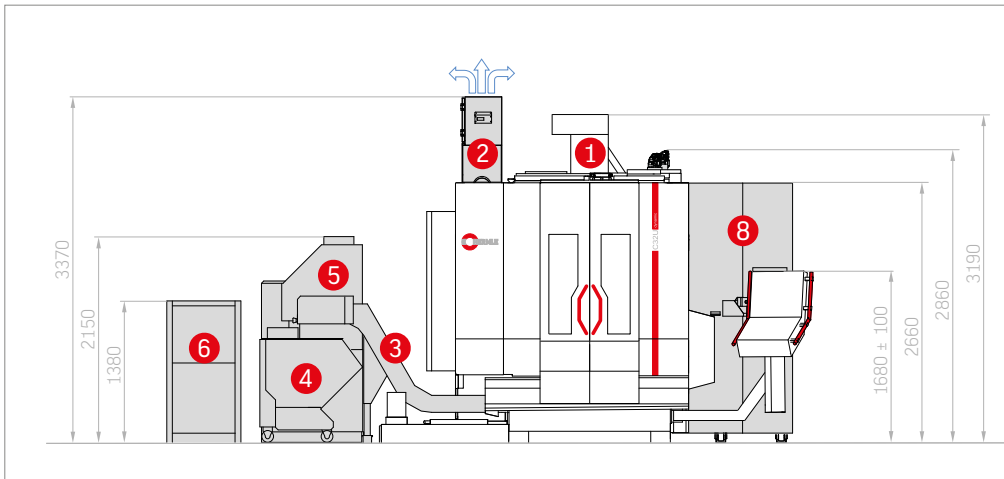
- 1 Machining center
- 2 Emulsion mist extraction
- 7 Chip drawer



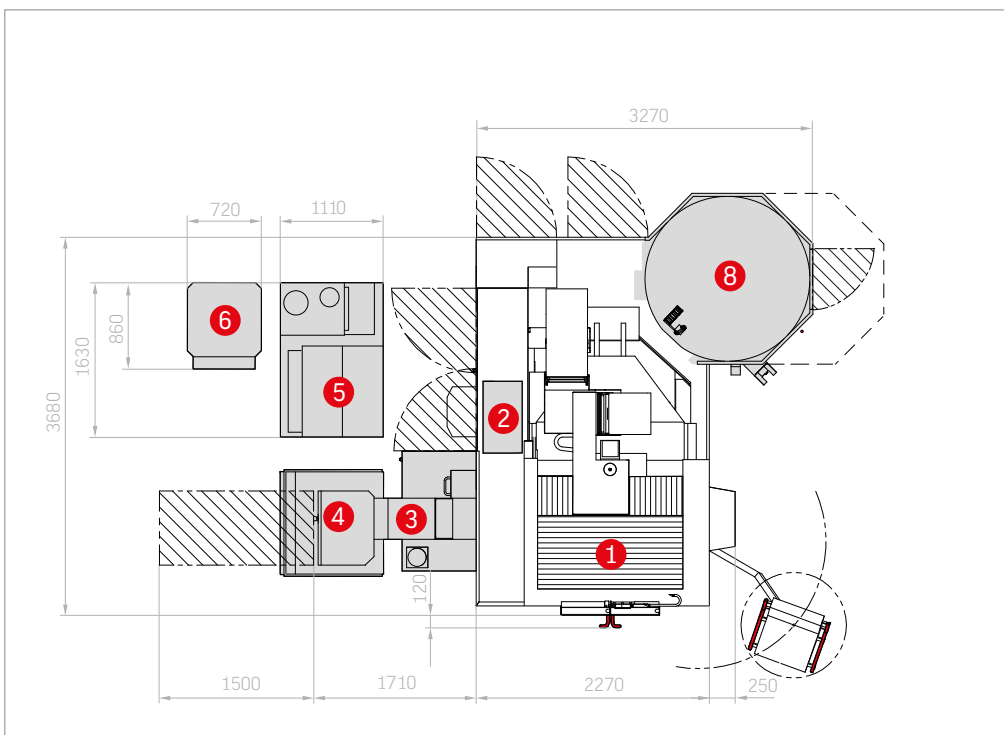
## Options

- Air blowing device
- Automatic cabin door
- Automatic cabin top
- Height-adjustable control panel
- Bed flushing
- BDE signal
- Blow air through spindle centre
- Electr. hand-held control module
- Electr. heat compensation
- Emulsion mist extraction system
- Precision packages
- Graphite machining packages
- Internal cooling lubricant supply
- Touch probe including preparation
- Pallet clamping system
- Pallet storage
- Pallet changer
- Production cabin
- Rotating transparent window
- Recooling unit for ICS
- Chip conveyor
- Chip drawer
- Coolant nozzle
- Chip cart
- Sealing air for scales
- Signal lamp
- Laminated safety glass panes
- Preparation of touch probe
- Tool breakage monitoring / measurement
- Additional magazine

### C 32 dimensions . Additional magazine ZM 50 / ZM 88 k



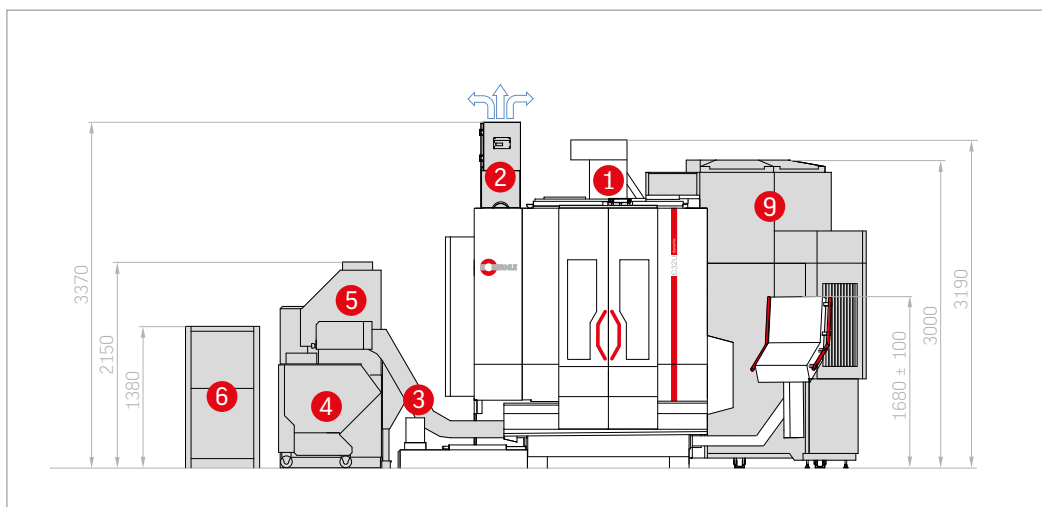
- 1 Machining center
- 2 Emulsion mist extraction
- 3 Chip conveyor
- 4 Chip cart
- 5 Internal cooling lubricant supply
- 6 Recooling unit for ICS
- 8 Additional magazine ZM 50 / ZM 88 k



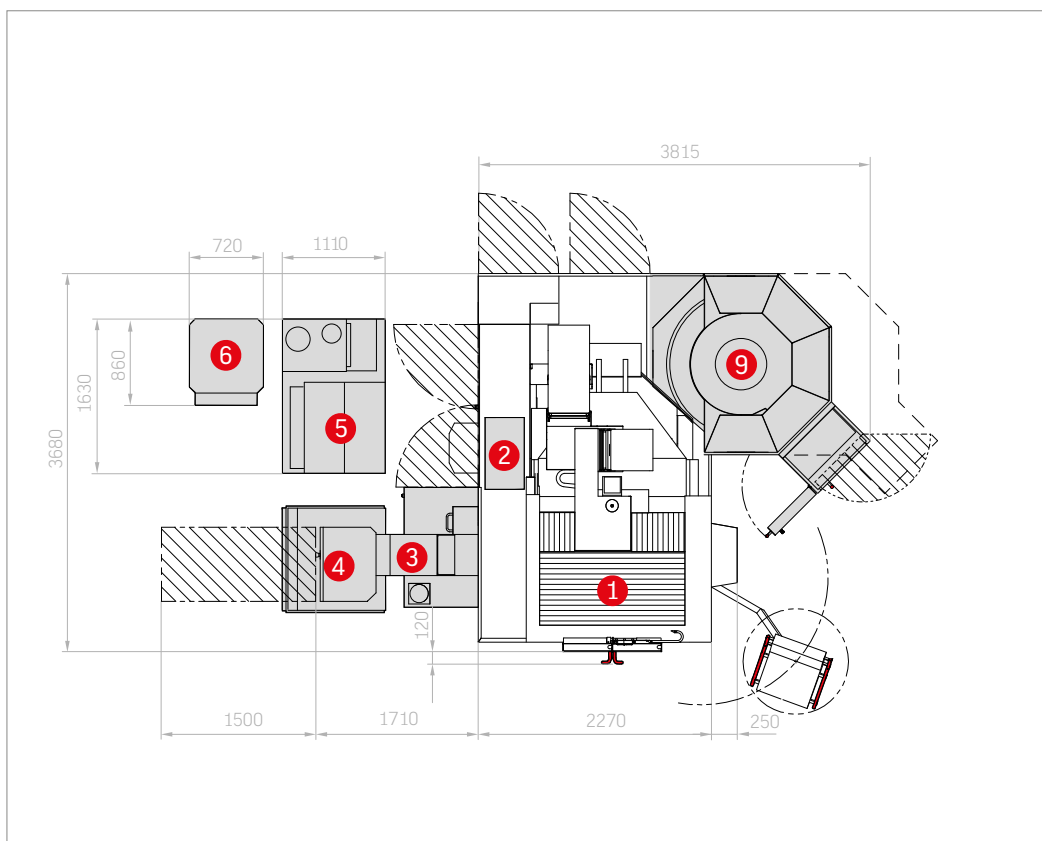
## Options

- Air blowing device
- Automatic cabin door
- Automatic cabin top
- Height-adjustable control panel
- Bed flushing
- BDE signal
- Blow air through spindle centre
- Electr. hand-held control module
- Electr. heat compensation
- Emulsion mist extraction system
- Precision packages
- Graphite machining packages
- Internal cooling lubricant supply
- Touch probe including preparation
- Pallet clamping system
- Pallet storage
- Pallet changer
- Production cabin
- Rotating transparent window
- Recooling unit for ICS
- Chip conveyor
- Chip drawer
- Coolant nozzle
- Chip cart
- Sealing air for scales
- Signal lamp
- Laminated safety glass panes
- Preparation of touch probe measurement
- Additional magazine

## C 32 dimensions . Additional magazine single

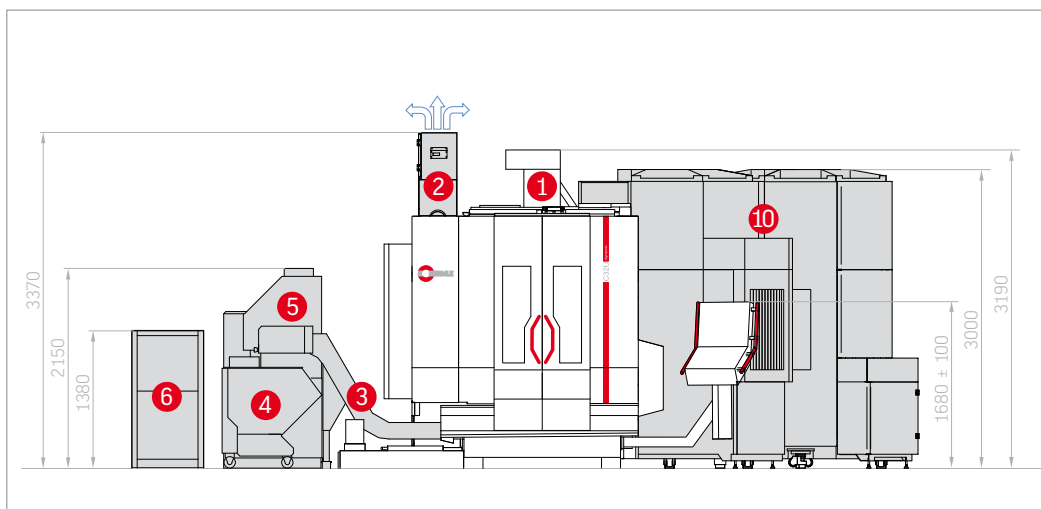


- 1 Machining center
- 2 Emulsion mist extraction
- 3 Chip conveyor
- 4 Chip cart
- 5 Internal cooling lubricant supply
- 6 Recooling unit for ICS
- 9 Additional magazine single

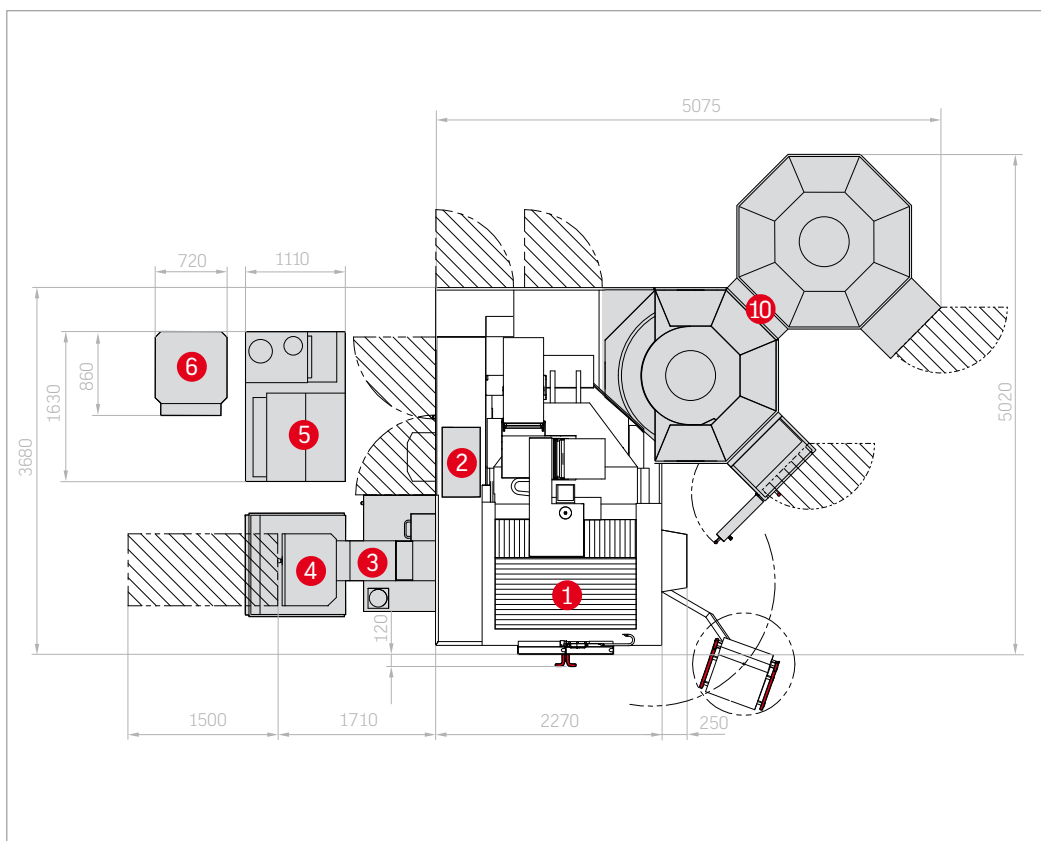




C 32 dimensions . Additional magazine double



- 1 Machining center
- 2 Emulsion mist extraction
- 3 Chip conveyor
- 4 Chip cart
- 5 Internal cooling lubricant supply
- 6 Recooling unit for ICS
- 10 Additional magazine double

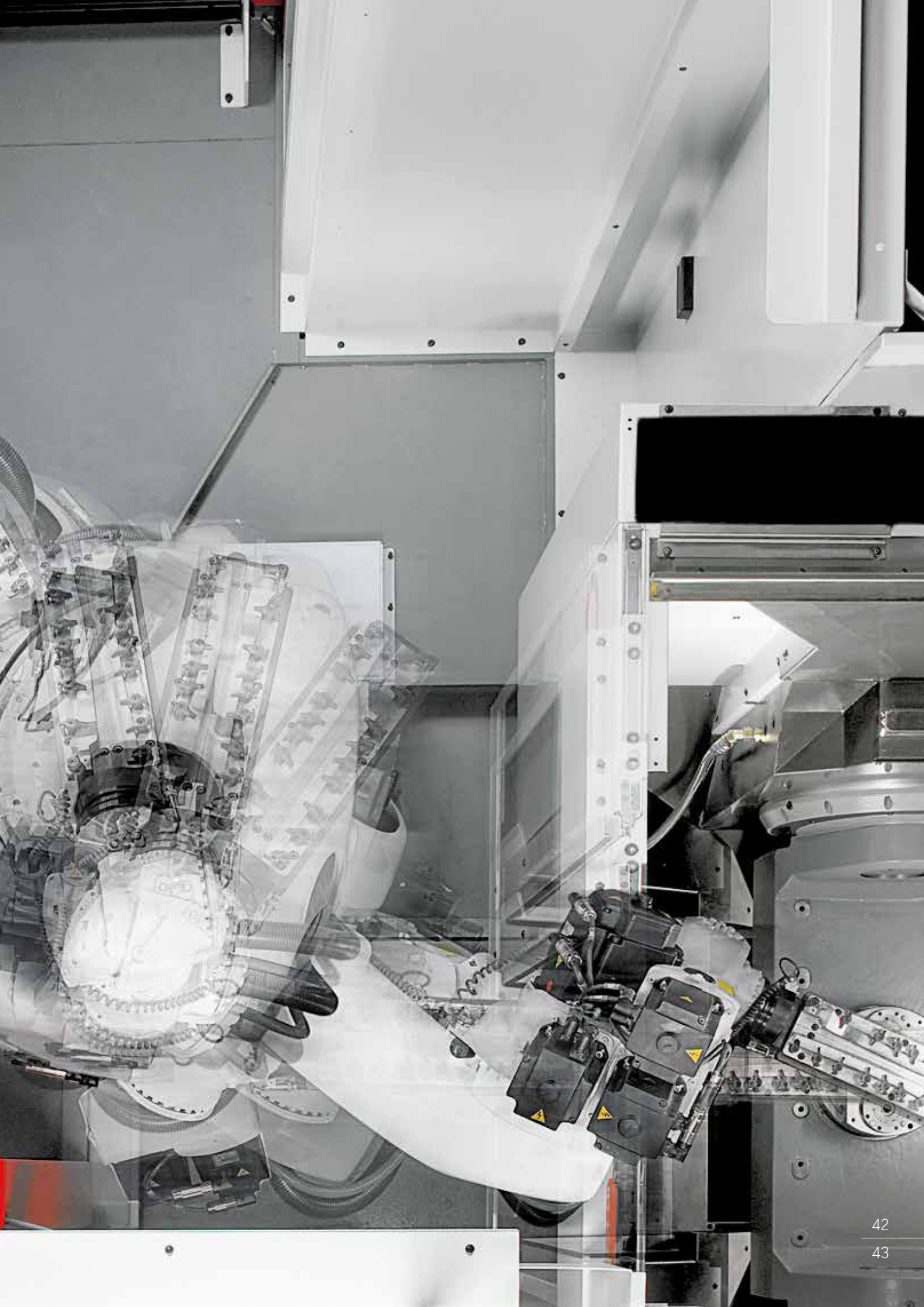


04

# Automation







# 04.1 Automation . C 32



Everybody is talking about automation, but it's much more than just a trend. We ourselves have changed from being a machine manufacturer to a process provider because we believe that the decisive criterion for automated efficiency is integration of the entire environment. In keeping with this philosophy, we are continuing what began with economical pallet changing and intelligent handling systems with highly advanced robot solutions. Therefore, we have long been capable of converting machines into flexible manufacturing cells.



Robot system with pallet racks



Robot system with pallet racks



Robot system with pallet racks

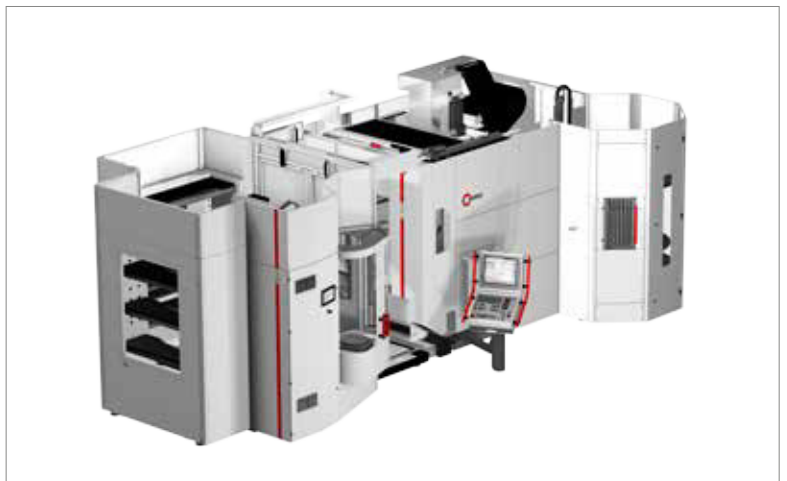




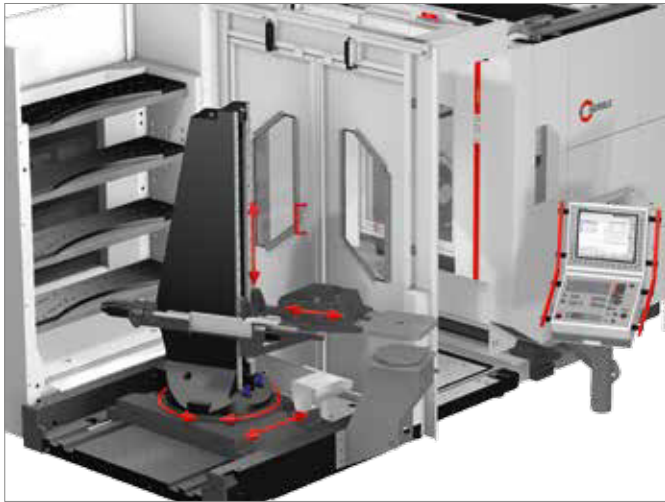
# 04.1 Automation . C 32

The new HS flex handling system is an automation solution providing cost-effective entry into machining centre automation. The HS flex handling system is an automation solution providing cost-effective entry into machining centre automation. The front-sided adaptation ensures a space-saving layout with direct connection to the machining centre. The large intermediate space provides direct access to the working area for manual operator activities. In automatic mode, a double door blocks operator access; and in setup mode, access to the handling system. The customisable pallet storage modul offers numerous combination options for a large range of parts. A second pallet storage modul can be additionally integrated in the handling system, thus enhancing the storage of parts significantly.

The Hermle Automation-Control-System (HACS), which is operated via an integrated touch panel, provides an ideal platform for intuitive operation and control of the handling system.



HS flex with two pallet storage moduls and setup station, adapted on a machining centre C 32 U.



Function and movement concept of the handling system. Compact design and space-saving arrangement with optimum access for the machine operator.

## YOUR ADVANTAGES

- Automation solution for enhanced storage of pallets
- Optimised, operator-friendly access to the machining centre
- Large configurable pallet storage modul
- Additional, configurable pallet storage modul
- Lateral setup station (optionally rotatable)
- Touch pad with integrated operating software HACS
- No floor anchorage required
- Easy and quick installation and commissioning

### Technical Data. HS flex

Pallet storage modul (storage modul 1 or 2)	20x pallet storage	12x pallet storage	9x pallet storage	8x pallet storage	6x pallet storage
Storage capacity per modul	20 units	12 units	9 units	8 units	6 units
Pallet dimensions	240 x 320 mm	240 x 320 mm 320 x 320 mm 400 x 320 mm 400 x 400 mm	240 x 320 mm 320 x 320 mm 400 x 320 mm 400 x 400 mm	240 x 320 mm 320 x 320 mm 400 x 320 mm 400 x 400 mm 500 x 400 mm	240 x 320 mm 320 x 320 mm 400 x 320 mm 400 x 400 mm 500 x 400 mm
Max. workpiece height*					
Interfacial storage level	260 mm	260 mm	485 mm	260 mm	485 mm
Sovereign storage level	625 mm	625 mm	625 mm	625 mm	625 mm
Max. transport weight** (incl. Pallet)					
Single taper	300 kg	300 kg	300 kg	300 kg	300 kg
Double taper	-	450 kg	450 kg	450 kg	450 kg
Pallet weight min.	20 kg				
Pallet change time	50 s				

\* Please note the max workable workpiece height

\*\* Please note the max permitted table load



# 04.2 All components. From a single source.

Hermle - milling at its best. We stand for

- Machining centres and automation solutions from a single source.
- High system expertise during planning, installation and maintenance.
- 3-, 4- and 5-axis machining centres for which we ourselves manufacture and install all components including table units, main spindles and entire sheet metal enclosures.
- Automation solutions from pallet changing systems and pallet storage, tool magazines and flexible manufacturing systems to custom turnkey solutions.

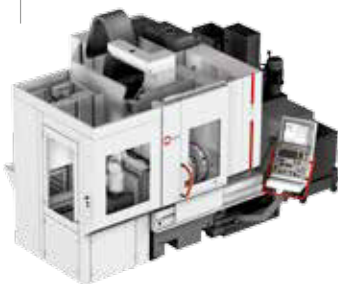
*Handling system HS flex*



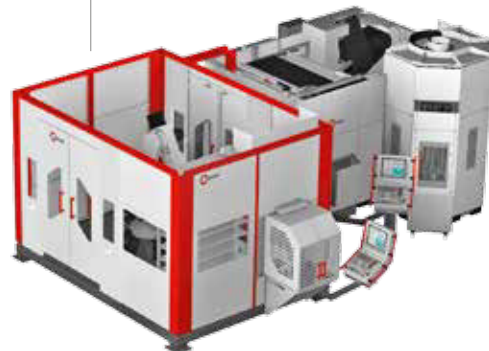
*IH systems*



*RS 05 robot system*



*RS 2 robot system*



*RS 3 robot system*



*RLS 800*





*Basic system plus 2 machines . 90°*



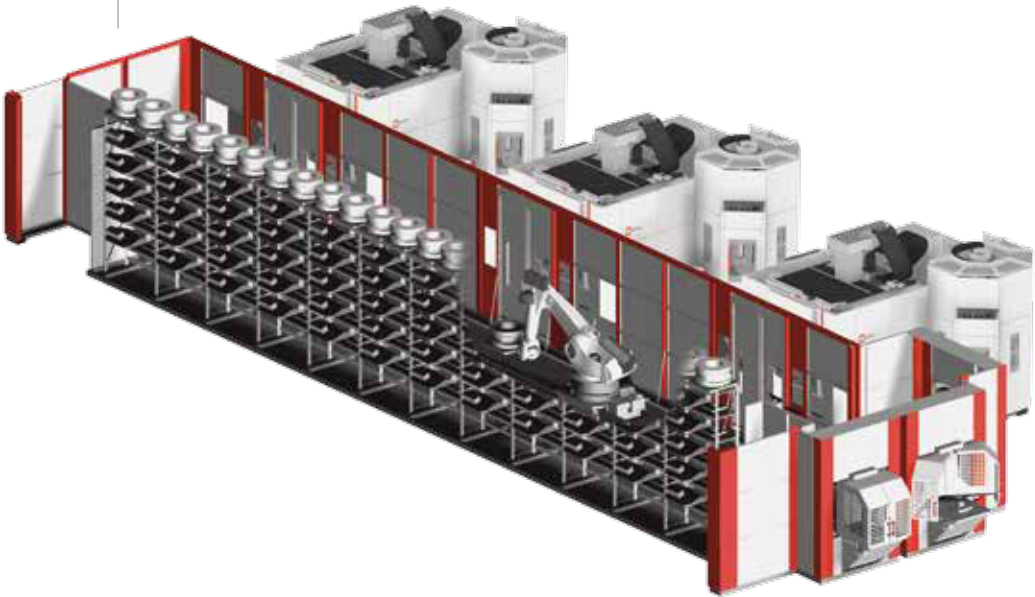
*Basic system plus 2 machines . 180°*



*Basic system plus 3 machines*



*RS Linear robot system*



# 05 Precision



PRECISION IN EVERY DIMENSION: Hermle has a thorough understanding of the requirements for manufacturing high-precision machining centres for processing smaller and larger workpieces of up to 2.5 t in weight. For this reason, "The Original" only uses German machines for production and materials from European suppliers.

Furthermore, the entire machining production department is fully air conditioned and kept clean by a central chip disposal system.

Hermle machining centres have also been thoroughly tested by intensive endurance tests and in manufacture-oriented machining processes in our own machining manufacturing department. Our meticulous manufacturing processes allow Hermle to set new precision standards which undercut those demanded by the DIN/ISO 10791 standard in every way.

At Hermle, we distinguish between positioning precision (accuracy with which a certain position within the working area can be pinpointed on one axis) and geometric precision.

The latter is significant for the precision of the entire machine – it encompasses the following factors:

- Positioning of linear and rotary axes.
- Straightness and angular deviation of the linear axes.
- Rectangularity and parallel alignment of all axes to one other.
- Concentricity and axial run-out of the swivelling rotary table.
- Concentricity of the working spindle.

The precision of Hermle machining centres originates during mechanical production and is not produced by subsequent electronic compensation. This further improves the precision of the individual axes (precision package 1 and 2).



## PRECISION LEVELS

### Hermle standard:

X-Y-Z: Positional uncertainty  $P \leq 8 \mu$   
A: Positional uncertainty  $P \leq 10'' / 8''$   
C: Positional uncertainty  $P \leq 8''$

### Hermle improved precision\*:

X-Y-Z: Positional uncertainty  $P \leq 5 \mu$   
A: Positional uncertainty  $P \leq 6''$   
C: Positional uncertainty  $P \leq 6''$

\*To achieve improved precision, components must be selected with care. Tolerances must also be taken into account whilst the machine is still being constructed. Hermle also recommends the HSK A 63 tool holding fixture, electric heat compensation, an ICS recooling unit and two-sided A-axis drive.

Test and operating conditions are as follows: air conditioned room ( $+20^\circ\text{C}$ ,  $\pm 2^\circ\text{C}$ ) and temperature fluctuation of only  $0.5^\circ\text{C}$  in one hour or max.  $2^\circ\text{C}$  within 24 hours.

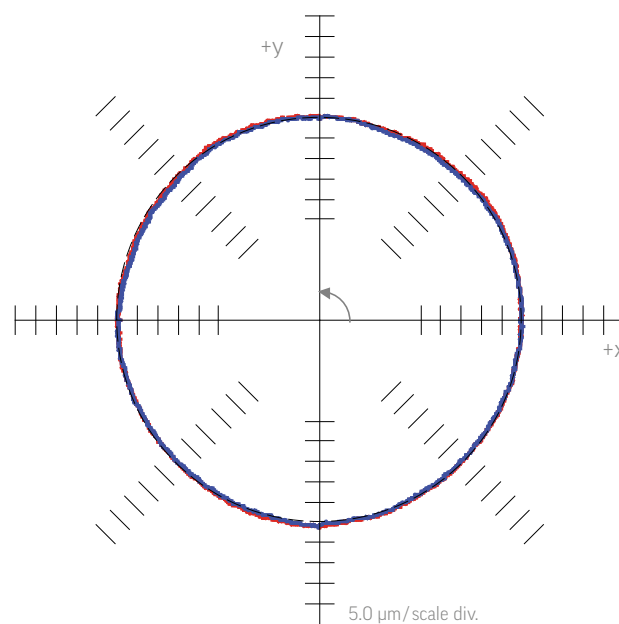
## IMPROVED PRECISION PACKAGES

### Precision package 1 (linear axes X, Y, and Z)

- Straightness optimisation
- Geometry adjustment and optimisation
- Straightness measurement
- X, Y, Z positioning accuracy: Positional uncertainty  $\leq 5 \mu$
- Laser measurement according to VDI/DGQ 3441 or ISO 230-2

### Precision package 2 (rotary axes A and C)

- Table geometry
- Axial run-out bearings
- C-axis bearing
- Adjustment of complete table
- Position of A and C axes relative to basic geometry
- Positional uncertainty A  $6''$
- Positional uncertainty C  $6''$
- Laser measurement according to VDI/DGQ 3441 or ISO 230-2



Run 1

Run 2



# 06

## Energy efficiency

Both manufacturer and customer benefit from efficient production processes. Therefore, Hermle has focused on integrated resource sustainability and energy efficiency for many years. We can rightly claim pioneer status in the "bluecompetence" initiative founded by the VDW (German Machine Tool Builders Association).

From development to low-energy manufacturing (with a high level of in-house production) to the operation of CNC machining centres - Hermle has stood for a principle of sustainable environmental protection combined with economic considerations for many years.

Energy recovery is just one of the advantages enjoyed by our customers.

BLUECOMPETENCE

Machine Tools



## *EFFICIENT MANUFACTURING*

*We use energy efficient manufacturing methods not because it is the current trend or because it is required of us, but on principle. And we always have.*

*Low energy component manufacture*

- Mineral casting technology*
- Lightweight construction*

*Virtual machine optimisation / machine development*

*Reduction of transport energy consumption*

- High levels of in-house production*
- Just one production plant*
- Locally sourced components and materials*
- No material tourism*

*High-quality, high-efficiency components*

- Ball screws*
- Guideways*
- Antifriction bearing etc.*

## *EFFICIENT OPERATION*

*Our machining centres are energy efficient both during their manufacture and during operation.*

*Energy recovery has been standard at Hermle for over 20 years*

*High quality servo axes*

*Ideal drive design for the respective application*

*Demand-based cooling technology both for dimensioning and in application*

*De-energize system:  
Up to 80% less energy consumption in stand-by mode*

*Very long machine service life*



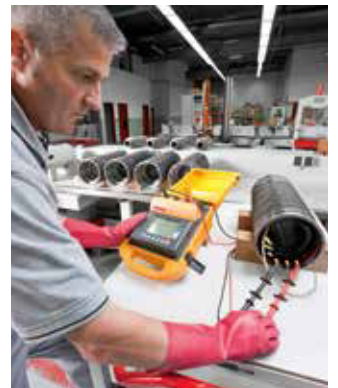
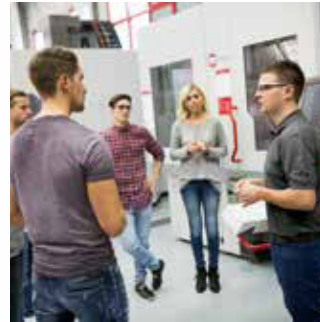
# 07 Services

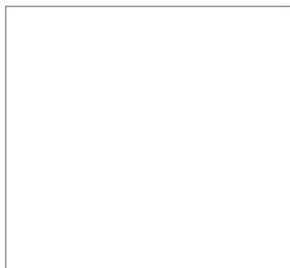
The perfection we insist on for the development and production of our machines is also mirrored by our service department. Our service team provides more than just spare parts and rapid response support within hours. At Hermle, we see ourselves as a comprehensive service provider which provides customers with numerous benefits.

Alongside standard services, these include:

- Our superior, cost-effective, practical and flexible training programmes carried out by sales representatives directly at the customers' premises.
- Our continual pursuit of optimisation and perfection. Our motto – those who stop improving today will not make the grade tomorrow.
- Intensive expert consultation on milling in general, programming and handling of our products.
- Our application technicians who are experts in machining processes and who are quick to assist and advise our customers.







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