# **Special Solutions**



» Cutting Tools» Angle Heads» Live Tools





### BLUECOMPETENCE Alliance Member

Partner of the Engineering Industry Sustainability Initiative



We do Specials!

### mimatic Special Solutions

- » Cutting Tools
- » Angle Heads
- » Live Tools

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### Milling Tools in Shaft, Bell or Combination Design

### **General / Features**



#### «Special Solutions»

**Milling Tools** in shaft, bell or combination design for countersinking, drilling, etc.

### HIGHLIGHT Complete Solution

Cutting tools with carbide inserts + Angle heads/Live tools = Responsibility from a single source.

mimatic special tools are customized solutions to improve the efficiency/quality in machining of high-quality components!

#### **Combination Tools**

- Milling
- Threading
- Countersinking
- Drilling
- Chamfering
- Slot milling

#### **Bell Tools**

- Milling
- Threading
- Countersinking
- Drilling
- Chamfering
- Slot milling

### Special Solutions, Based on Proven Carbide Interfaces

- Polygon: PolyMILL
- Quadrogon: PolySAW and mimatic STC
- Classic: TriMILL

#### **Milling Trials**

- in the customer's factory
- at mimatic
- Testing in specialist institutes



### Milling Tools in Shaft, Bell or Combination Design



**mimatic Gear Milling Cutters** with carbide form inserts



in Shaft, Bell or Combination Design







### Quick Change Holder mimatic mi in monoblock design with Quadrogon interface for PolySAW and DeepMILL

Right image: 3x **DeepMILL** on Quadrogon interface for slot milling.



**Complete Solution** Cutting tools with carbide inserts + Angle heads/Live tools = Responsibility from a single source.

You can find videos on YouTube and **www.mimatic.de** 





in Shaft, Bell or Combination Design





**Bell Tool** for outer contour milling

### **Bell Cutter**

Shank: HSK 63

No. of cutting edges: 4

Application: Milling of external thread G1" and G11/4"

Workpiece: Fitting, Tapware



in Shaft, Bell or Combination Design





#### **Thread Bell Cutter**

Shank: HSK 63 Processing time: 1,75 sec

No. of cutting edges: 4

Application: Milling of external threads M14x1,5

Workpiece: Common rail distribution panel for the diesel injection

### **Thread Bell Cutter**

Shank: HSK 63

No. of cutting edges: 5

Application: Milling of external threads M14x1,5

#### Workpiece:

Common rail distribution panel for the diesel injection. Extremely small outer diameter, because of the interfering contour at the Workpiece.



### Milling Tools in Shaft, Bell or Combination Design



#### **Disc Milling Cutter**

Shank: HSK 100 Processing time: 1,75 sec

No. of cutting edges: 48 - 3x16 Cutting rows

Application: Profile slot milling

Workpiece: Headrest poles

### TrioCUT



### Drill Thread Milling with Chamfering and End Face Machining

Shank: Weldon dia. 16 mm

No. of cutting edges: 2 interchangeable carbide inserts

Application: Hole dia. 11,45 mm without predrilling Chamfer 45°, dia. 13,8 mm and end face thread G ¼

Workpiece: Angle seat valve



in Shaft, Bell or Combination Design



### mimaticMi



### **Special Cutting Insert**

Shank: HSK 63

No. of cutting edges: 1

Application: End face grooves (dia. adjustable)

Workpiece: Housing

mimatic mi Monoblock Tool as a bell tool for countersinking of contours

Shank: mi 50

No. of cutting edges: 4

Application: External contour machining and chamfering of a trunnion

Workpiece: Housing



in Shaft, Bell or Combination Design



#### **Combination Tool**

Special tool combined with PolyMILL cutter

Shank: HSK 63

No. of cutting edges: 15+3

Application: Milling of Grooves

Workpiece: Pump housing

#### mimatic STC Special Tool

Shank: HSK 100

Milling dia.: 50 mm No. of cutting edges: 5x35

Application: Milling of locating slots

Workpiece: Engine block

You can find videos on YouTube and **www.mimatic.de** 





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in Shaft, Bell or Combination Design



### TriMILL



### TriMILL



### **Combination Tool**

Shank: ABS 50

No. of cutting edges: 6+3

Application: Undercut- and thread milling

Workpiece: Pump housing

#### **TriMILL Special Tool**

Shank: Milling arbor holder

No. of cutting edges: 2x4

Application: Simultaneous milling of 2 slots

Workpiece: Circlip grooves in conrod

### **TriMILL Special Tool**

Shank: Special holder

No. of cutting edges: 4

Application: Thread whirling

Workpiece: Drive shaft of an electric motor



in Shaft, Bell or Combination Design



#### **TriMILL Special Tool**

Shank: Weldon dia. 16 mm

No. of cutting edges: 3

Application: Backward milling from an undercut

**Combination Tool** for drilling and threading

Shank: Weldon dia. 25 mm

No. of cutting edges: 7

Application: Drilling into solid material and thread milling



in Shaft, Bell or Combination Design





#### **TriMILL Twin Disc Milling Cutter**

Shank: Milling arbor holder, dia. 22 mm

Milling dia.: 147 mm

No. of cutting edges: 2x6

Application: Usage in a saw blade holder for flange machining

Workpiece: Housing

### **Slot Milling Cutter**

Shank: Milling arbor holder, dia. 40 mm

No. of cutting edges: 4

Application: Simultaneous milling of annulus slot and undercut

Workpiece: Brake body



# mimatic Milling Tools

### Interfaces When Compared





### Advantages

- Very good concentricity by self centering on the 3- and 4-point polygon
- Transfer of higher cutting forces
- High stability through closed circular ring
- High resistance against breakage during interrupted cut

Transmission zones

Special tools with standard interface for carbide inserts are usually the cheaper solution, flexible and individually.



### **General / Features**



#### «Special Solutions» Angle Heads for Machining Centers

### HIGHLIGHT Complete Solution

Angle heads/Live tools + Cutting tools with carbide inserts = Responsibility from a single source.

mimatic special tools are customized solutions to improve the efficiency/quality in machining of high-quality components!

#### Machining Center: Angle Heads

- Plunge milling in cavities of larger components
- Multi spindle solutions
- Saw blade holder
- Complete solutions with cutting tools

#### Support Solutions to Increase the Stiffness, Strength and Precision

- 3-point support (adapted to the situation of the spindle)
- Active / passive hydraulic clamping
- Mechanical clampings: machine side

#### **Torque Supports**

- With locking mechanism to secure the position of substitute
- Sprung with precision positioning
- Adaptation to the spindle

### **Collision Checks**

- CAD / 3D
- Machine situation
- complex and large components





Angle Head, adjustable on DMG Machining Center









### Angle Head 360° adjustable

Shank: HSK 63 Tool holder: ER32 n1 (max.): 6500 rpm Transmission: 1:1 M (max.): 70 Nm

Right image: **mimatic Standard Angle Head** in the tool magazine of a DMG machining center





**mimatic Standard Angle Head** on Hermle machining center

HERMLE





Angle Head on a WFL machining center

Shank: HSK 100 with prisms support Tool holder: mi 50 n1 (max.): 6500 rpm Transmission: 1:1 M (max.): 70 Nm Tool length: 450 mm





Shank: SK 50 Tool holder: ER32 n1 (max.): 6000 rpm Transmission: 1:1 M (max.): 70 Nm



<image>

#### **mimatic** Tool Systems

## **Angle Heads**





Angle Head with 3-Point Support and Special Cutting Tool on a Grob machining center

Usage: Automotive

#### **Complete Solution**

Angle Head/Live Tool + Milling Tool with carbide inserts = Responsibility from a single source.



Angle Heads for an automobile manufacturer

Shank: HSK 63 Fixed angle: 50° n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 30 Nm

#### **Complete Solution**

Angle Head/Live Tool + Milling Tool with carbide inserts = Responsibility from a single source.









**Angle Head** for Grob machining centers

Shank: HSK 100 Tool holder: Milling arbor, dia. 32 mm n1 (max.): 6000 rpm Transmission: 2:1 M (max.): 150 Nm



### Angle Head with 3-Point Support

Workpiece: Brake carrier for trucks

mimatic Service: Collision check



### **Heavy Cutting**



#### Angle Head with Plunge Cutter

for the machining of pump housings

Transmission: 1:1,58

Finish milling: Vc = 350 m/min; Vfz = 0,18 mm Processing time ca. 18 sek.

Rough milling: Vc = 350 m/min; Vfz = 0,3 mm Processing time ca. 20 sek.

**Complete Solution** Angle Head/Live Tool + Milling Tool with carbide inserts = Responsibility from a single source.



**Angle Heads** with mimatic cutting tools are more than 10 years in use.

Preventive maintenance is carried out in intervals of several years.





Support Solution to Increase the System Stiffness



### Angle Head with 3-Point Support

for the machining of engine blocks

Shank: HSK 50 Tool holder: Special dia. 6 mm n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 30 Nm

### **DMG MORI**

Interference contour analysis on engine block machining





Support Solution to Increase the System Stiffness





Angle Head with different support points

Angle Head Clamping/Support over mechanical levers

Angle Head on DMG machining center

Shank: HSK 100 Workpiece: Cylinder head

- Active hydraulic clamping by angle head at 4 points
- Control by hydraulic oil passing by the machine
- Machine- and angle head spindles are 100% axialforce-balanced

**DMG MORI** 



Support Solution to Increase the System Stiffness





with many support points on Heller machining center

Shank: HSK 100 Tool holder: Milling arbor dia. 16 n1 (max.): 6000 rpm Transmission: 1:1 M (max.): 30 Nm Tool length: 300 mm



HELLER

**Angle Head with Fixed Angle 53,17°** on Heller MC25 machining center

Shank: HSK 63 Tool holder: Special n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 30 Nm





### **Massive and Long Solutions**



Up to 400 kg total weight Up to 1200 mm length





### Angle Head on Gidding & Lewis machining center

Shank: Prism Tool holder: mi 50 n1 (max.): 6500 rpm Transmission: 1:1 M (max.): 70 Nm Tool length: 450 mm





### **Slim and Long Solutions**

#### Special Angle Head 90°

flanged on special machine



#### **Special Angle Head**



### Special Angle Head 90°

for Heller machining center





Oil mist lubrication for continuous operation.

Note: Angle heads and live tools with permanent grease lubrication are suitable for interval operation!

Diameter in the workspace: 29 mm Rated speed: 15000 rpm



**Complete Solution** Angle Head/Live Tool + Milling Tool with carbide inserts = Responsibility from a single source. Tool holder: ER11 n1 (max.): 6000 rpm Transmission: 1:1,5 M (max.): 1,5 Nm Special feature: belt drive



You can find videos on YouTube and www.mimatic.de







### Twin Angle Head 90°

for ANGER machining center

Tool holder: Weldon dia. 5/6 mm n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 20 Nm / spindle Extras: sealing air Workpiece: Pump housing



Angle Head on Scharmann machining center

Tool holder: SK 50 mimatic capto C5 n1 (max.): 4000 rpm Transmission: 1:1 M (max.): 100 Nm









Shank: SK 50 n1 (max.): 2800 rpm n2 (max.): 1120 rpm Transmission (n1/n2): 2,5:1 M (max.): 300 Nm



### Angle Head

- with mimatic Capto C6 drive (in)
- with mimatic Capto C4 drive (out)







#### **Angle Head**

Aluminium construction on Heckert machining center

Shank: HSK 100 Transmission: 1,5:1





### Multi Spindle Technology





### Angle Head as 4 Spindle Unit

for drilling and threading with length compensation on Deckel DC 40

Shank: SK 45 mimatic Capto C5 n (max.): 6000 rpm Transmission i1: 1:1 for M5 Transmission i2: 1:1 for M4 M (max.): 2,5 Nm / spindle



### Multi Spindle Technology





on Heller machining center

Shank: HSK 50 n1 (max.): 6000 rpm n2 (max.): 3000 rpm Transmission (n1/n2): 2:1 M (max.): 6 Nm / spindle



### Angle Head as 3 Spindle Unit

Shank: SK 40 n1 (max.): 2000 rpm Transmission: 1:4 M (max.): 10 Nm / spindle





### Multi Spindle Technology





#### Angle Head as 2 Spindle Unit

with **mimatic mi** quick change interface, size 25

n1 (max.): 6500 rpm n2 (max.): 6500 rpm Transmission: 1:1 M (max.): 10 Nm / spindle

Right figure: **Angle Head as 4 Spindle Unit** with tap drill quick change interfaces

n1 (max.): 6500 rpm n2 (max.): 6500 rpm Transmission: 1:1 M (max.): 40 Nm / spindle



Angle Head mit Fixed Angle 10,808°







### Multi Spindle Technology



### Angle Head as 7 Spindle Unit

on DMG machining center

Shank: SK 50 n1 (max.): 4500 rpm n2 (max.): 4500 rpm Transmission: 1:1 M (max.): 20 Nm / spindle

### **DMG MORI**

Angle Head Multi Spindle Unit on machine spindle

n1 (max.): 4500 rpm n2 (max.): 4500 rpm Transmission: 1:1 M (max.): 40 Nm / spindle







### Multi Spindle Technology



### Angle Head as 6 Spindle Unit

on Mazak Integrex machining center





### Multi Spindle Technology



#### Various Multi Spindle Units in Mazak machining center magazine

### 2 Spindle Unit

n1 (max.): 6500 rpm n2 (max.): 6500 rpm Transmission: 1:1 M (max.): 40 Nm / spindle

#### 4 Spindle Unit

n1 (max.): 6500 rpm n2 (max.): 6500 rpm Transmission: 1:1 M (max.): 20 Nm / spindle






# **Angle Heads**

### Multi Spindle Technology



### Multi Spindle Unit

on Anger machining center

#### **4 Spindle Unit**

n1 (max.): 4000 rpm n2 (max.): 14000 rpm Transmission: 1:3,5 M (max.): 15 Nm / spindle



Angle Head as 4 Spindle Unit with mimatic mi quick change interface

### mimaticMi





# Angle Heads



Angular Gear in a Magazine



# **Angle Heads**



#### Angle Head "Lower Floor Unit"

for woodworking machines

Shank: SK 30 n2 (max.): 12000 rpm Transmission: 1:1,25



The surface of the snowboard is machined with the saw blade holder, to improve the adhesion of the sliding surface.



The angle head has a support to increase the stability.





### **General / Features**



#### «Special Solutions» Live Tools for CNC Lathes

#### HIGHLIGHT Complete Solution

Live tools/Angle heads + Cutting tools with carbide inserts = Responsibility from a single source.

mimatic special tools are customized solutions to improve the efficiency/quality in machining of high-quality components!

#### **CNC Lathes: Live Tools**

for milling, drilling, threading, countersinking and chamfering

- Multi spindle solutions
- Saw blade holders
- Fixed angle
- Complete solutions with cutting tools

#### Interface competence

- Fast + flexible, modular
- Heavy machining, stiff, modular
- Own drive

#### **Collision check**

- CAD / 3D
- Machine situation, swing circles
- complex large components





### Live Tools as 4 Spindle Unit

with pitch point dia. ca. 40 mm

Shank: VDI 40 n1 (max.): 5000 rpm n2 (max.): 10000 rpm Transmission: 1:2 M (max.): 2 Nm / spindle









Live Tools (+ Adjustable Angle Unit) on turret







### Live Tools With Twin Spindles

with special cutters on Hessapp

n1 (max.): 6000 rpm n2 (max.): 6000 rpm Transmission: 1:1 M (max.): 100 Nm





### Multi Spindle Technology





#### Live Tool with CDI on EMAG

n1 (max.): 5000 rpm n2 (max.): 2000 rpm by 10% E Transmission: 1:4 M (max.): 5 Nm



Live Tools as 2, 3 and 4 Spindle Units with mimatic mi quick change interface

**2 Spindle Unit** n1 (max.): 6000 rpm n2 (max.): 3000 rpm Transmission: 2:1 M (max.): 25 Nm / spindle

**3 Spindle Unit** n1 (max.): 6000 rpm n2 (max.): 3000 rpm Transmission: 2:1 M (max.): 30 Nm / spindle

#### 4 Spindle Unit

n1 (max.): 3250 rpm n2 (max.): 6500 rpm Transmission: 1:2 M (max.): 30 Nm / spindle









with 2 different Weldon holders

**Live Tool as 3 Spindle Unit** with special interface and screw-on flange



#### **mimatic** Tool Systems

# **Live Tools**



#### Live Tool Saw Blade Holder

Shank: VDI 40 Tool holder: Milling arbor dia. 22 mm n1 (max.): 6500 rpm Transmission: 2,66:1 M (max.): 20 Nm/spindle Cooling supply: EK 50 bar Extras: 22,62° adjusted

Workpiece: Circlip ring slots in conrod



**Complete Solution** Live tools/Angle heads + Cutting tools with carbide inserts = Responsibility from a single source.







### **Innovative Solutions**





Complete solution in the workspace of a machine tool

### **Complete Solution**

Cutting tools with carbide inserts

- + Angle heads / Live tools
- = Responsibility from a single source.



### **Innovative Solutions**



#### Live Tool DIN 5480

with adjusting unit + **PolyMILL** 

#### **Complete Solution**

Live tools/Angle heads

- + Cutting tools with carbide inserts
- = Responsibility from a single source.

#### Live Tool With Fixed Angle 75°

Shank: VDI 40 Tool holder: HydroFlex n1 (max.): 6000 rpm n2 (max.): 12000 rpm Transmission: 1:2 M (max.): 20 Nm





### Multi Spindle Technology





#### Image top left

n1 (max.): 8000 rpm n2 (max.): 8000 rpm Transmission: 1:1 M (max.): 10 Nm / spindle

#### Image right below

n1 (max.): 8000 rpm n2 (max.): 8000 rpm Transmission: 1:1 M (max.): 10 Nm / spindle



Live Tool as 5 Spindle Unit on Licon

Shank: D78 Tool holder: 6 x HSK 40 n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 10 Nm / spindle Coolant supply: MMS Extras: sealing air





### Multi Spindle Technology





Live Tool as 5 Spindle Unit on Licon

Shank: D78 Tool holder: 5 x HSK 32 n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 5 Nm / spindle Coolant supply: MMS Extras: sealing air



Live Tool as 6 Spindle Unit on Licon

Shank: D78 Tool holder: 5 x HSK 32 n1 (max.): 8000 rpm Transmission: 1:1 M (max.): 5 Nm / spindle Coolant supply: MMS Extras: sealing air

Licon MT



### **Innovative Solutions**



### mimatic Tool for Turn Cut Milling

with PolySAW in right-hand design.

Suitable in bar-laden lathes up to 50 mm bar diameter.

#### **Complete Solution**

- Live tools/Angle heads
- + Cutting tools with carbide inserts
- = Responsibility from a single source.

Situation in a machine with main and sub spindle, two turrets and mimatic turn cut milling tool in left-hand design.

You can find videos on YouTube and **www.mimatic.de** 



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### **Slim and Long Solutions**

### Lower Floor Milling Unit

for Mori Seiki



Shank: BMT 40 Tool holder: ER 11 n1 (max.): 3750 rpm n2 (max.): 7500 rpm Transmission: 1:2 M (max.): 10 Nm Plunge depth: 102 mm Plunge dia.: 54 mm

## **DMG MORI**

**Special Angle Head** for Mori Seiki



Shank: BMT110 Tool holder: ER 32 n1 (max.): 6500 rpm Transmission: 1:1 M (max.): 20 Nm Coolant pressure: IK 70 bar Length: 868 mm Plunge depth: 614 mm Plunge dia.: 150 mm





# **Tool Interface for CNC Lathes**





Developed in cooperation by:









Development and standardization project, sponsored by:



Bundesministerium für Bildung und Forschung



### **Innovative Solutions**



Innovation power and interface expertise from mimatic tool systems are demonstrated in the development of a new turret interface for CNC lathes.



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# CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH certifies that



mimatic GmbH Westendstraße 3 D-87488 Betzigau

has established and applies a Quality Management System for

Development, Design, Production, Sales and Service of Driven Toolholders, Cutting Tools, Clamping Systems and Special Tools.

An audit was performed, Report No. **70006182** Proof has been furnished that the requirements according to

ISO 9001:2008

are fulfilled. The certificate is valid until **2014-02-06** Certificate Registration No. **12 100 15724 TMS** 

h. Meg

Munich, 2013-02-26



QMS-TGA-ZM-07-92

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# We do Specials!

- Circular- and Thread Milling Tools
- Reamers with Polygonal Interface •
- Driven Toolholders for CNC Machining Centers
- Driven Toolholders for CNC Turning Machines
  - Multi-Spindle Technology
- Modular Quick Change Toolholders mimatic® mi
  - Static Toolholders for CNC Turning Machines
    - Precision Chucks
    - Special Cutting Tools ■



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