

WMZ
WERKZEUGMASCHINEN

WMZ Spindle Technology

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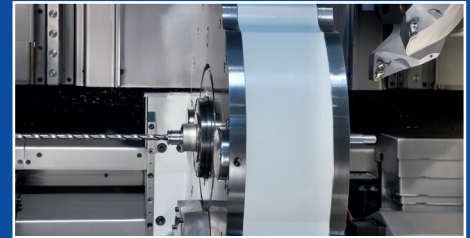
WMZ Spindle Technology

**WMZ motor spindles –
Efficiency from experience**

WMZ – Werkzeugmaschinenbau Ziegenhain GmbH



Machine tools for the flexible machining of shaft-shaped components are designed and produced within the DVS TECHNOLOGY GROUP by WMZ in Schwalmstadt-Ziegenhain/Germany. Passenger car and commercial vehicle components up to 4,500 mm long can be machined completely in a single chucking thanks to the modular system. Alongside turning, milling and drilling processes, it is also possible to cut gearing in shaft-shaped workpieces. The center drive technology further developed by WMZ makes the highly efficient machining of suitable components possible.



Machining with center drive

Alongside machine tools, WMZ develops and mass-produces high-quality motor spindles, which are used in almost all machines within the DVS TECHNOLOGY GROUP. Accordingly, the areas of application for the high-precision drive components, which are manufactured at WMZ with a wealth of experience and high quality promise, are extremely varied and challenging.



WMZ motor spindles

DVS TECHNOLOGY GROUP



The DVS TECHNOLOGY GROUP is made up of experienced machining companies focussing on the turning, gear cutting and grinding technologies. The DVS TECHNOLOGY GROUP has more than 1,000 employees worldwide and is one of the leading system suppliers for machines, tools and production solutions for the machining of vehicle power-train components before and after hardening.

The following divisions make up the DVS TECHNOLOGY GROUP:

DVS Machine Tools & Automation: Manufactures and sells high-precision machine tools, automation equipment and the associated services.

DVS Tools & Components: Develops, manufactures and sells customised machine components, tools and abrasives.

DVS Production: Series production of components for passenger cars and commercial vehicles using DVS machine tools.

DVS International Sales & Service: Local DVS Contact for Sales and Service on International Markets.



Machine Tools & Automation



Tools & Components



Production



International Sales & Service



WMZ – YOUR COMPETENT PARTNER.

Higher demands put steadily the constant advancement of material qualities of work pieces and innovations in the sector of the cutting materials in machine tools and require therefore more and more efficient motorspindles.

WMZ as a supplier of motorspindles for the most modern machine tools masters this challenge and offers you:

TECHNOLOGY COMPETENCE

- As a part of the DVS Group we have direct access to the newest machining technology
- The demands of tomorrow have already moved into our spindles today
- The characteristic of the spindles is optimally tuned to your requirements

DEVELOPING COMPETENCE

- A competitive team of highly certified engineers develop our spindle program constantly
- We develop individual solutions according to your requirements

MANUFACTURING COMPETENCE

- All key components of our motorspindles are produced at very modern DVS-machining centres
- All motorspindles pass through several tests with accordingly journals forwards to the delivery to assure highest quality of our products

SERVICE COMPETENCE

- WMZ offers a worldwide quick and competent service to the repair and servicing of our spindles



MOTORSPINDLES – YOUR ADVANTAGES

- More than 40 years in experience in the production of motorspindles
- Being a part of the DVS Technology Group ensures access to newest machining technology
- Wide spindle spectrum – for everybody the suitable spindle. If our product range does not meet your requirements, we can optimally match the characteristics of the spindle to your application.
- Optionally the housing can be designed individually by customer standards



WMZ – ALWAYS CLOSE TO ITS CUSTOMERS

- Always a sympathetic ear
- Quality at a fair price
- No varying contacts
- Worldwide on-site service
- Flexibility
- Individuality
- Low down-times by our worldwide quick and competent services of our engineers
- Inspection, overhaul and servicing by our field representatives on site or after dismantling in our company
- Current repair by our professional service engineers

DESIGN OF WMZ MOTORSPINDLES

FRONT BEARING / REAR BEARING

- The bearing will be individually designed for every application
- A special bearing-application lowers influence of heat generation at the spindle head

DRIVE

- The spindles are driven by water cooled synchronous motors with integrated temperature monitoring
- The motors generate less heat and are working highly efficient

MEASURING SYSTEM

- The use of direct measuring system leads to a very high steady-state control accuracy
- Spindles are ready for C-axis functionality

HOUSING

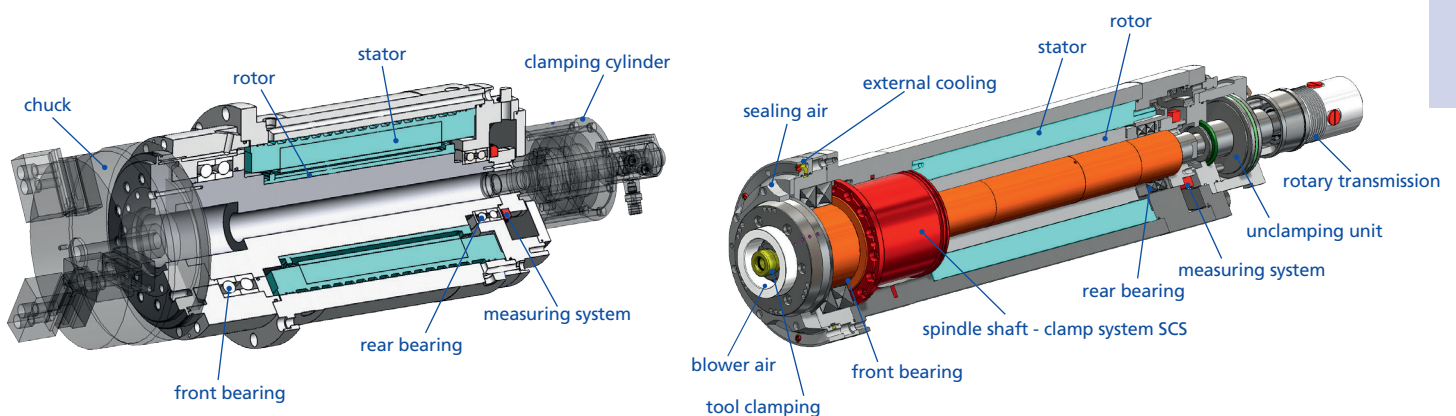
- By default WMZ motorspindles are offered as insertion spindles with round housings
- Optional it is possible to deliver customized housing-design

SEALING

- WMZ motorspindles are equipped with wearless labyrinth-air-sealing

FLUID-SUPPLY

- Distribution of coolant lubrication is done by injector-ring and optional through tool
- Tool fitting device is cleaned by air
- All connections are located at the rear



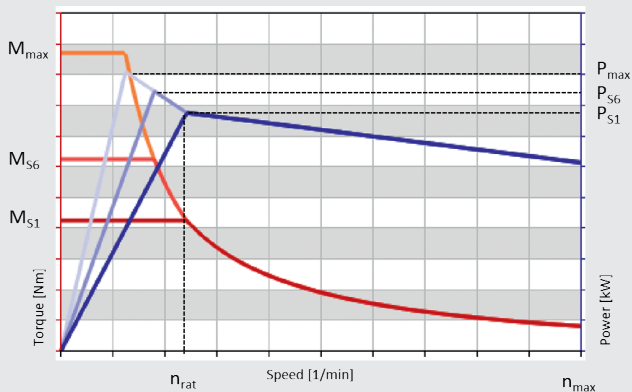
TECHNICAL DATA – TURNING SPINDLES



| Type | Power [kW] | | Speed of rotation [min ⁻¹] | | | Torque [Nm] | | |
|---------------|-----------------|-----------------------|--|-------|--------|-----------------|-----------------------|-------------------|
| | P _{S1} | P _{S6 (40%)} | rat. | max. | | M _{S1} | M _{S6 (40%)} | M _{max.} |
| TS180-XXX/24 | 24 | 30 | 4.500 | 8.000 | 12.000 | 50 | 75 | 115 |
| TS180-XXX/32 | 32 | 36 | 4.400 | 8.000 | 12.000 | 70 | 102 | 160 |
| TS180-XXX/32 | 32 | 35 | 3.400 | 4.200 | 12.000 | 90 | 130 | 200 |
| TS200-XXX/32 | 32 | 37 | 3.100 | 6.000 | 8.000 | 100 | 147 | 230 |
| TS220-XXX/29 | 29 | 41 | 2.000 | 6.000 | 8.000 | 140 | 210 | 350 |
| TS220-XXX/27 | 27 | 34 | 1.350 | 5.000 | | 194 | 292 | 484 |
| TS250-060/38 | 38 | 48 | 1.200 | 6.000 | | 300 | 384 | 450 |
| TS270-040/30 | 30 | 32 | 1.150 | 4.000 | | 250 | 370 | 575 |
| TS270-030/31 | 31 | 34 | 690 | 3.000 | | 425 | 625 | 970 |
| TS310-040/64 | 64 | 80 | 750 | 4.000 | | 820 | 1.100 | 1.650 |
| TS310-050/67 | 67 | 80 | 1.100 | 5.000 | | 585 | 795 | 1.200 |
| TS310-050/103 | 103 | 124 | 1.200 | 5.000 | | 820 | 1.100 | 1.650 |
| TS340-020/36 | 36 | 43 | 530 | 2.000 | | 650 | 964 | 1.550 |
| TS340-020/37 | 99 | 100 | 860 | 3.500 | | 1.100 | 1.300 | 1.700 |
| TS405-015/31 | 31 | 32 | 200 | 1.500 | | 1.375 | 1.600 | 2.550 |
| TS405-012/57 | 57 | 64 | 300 | 1.200 | | 1.775 | 2.570 | 3.700 |
| TS405-010/49 | 49 | 51 | 220 | 1.000 | | 2.170 | 2.800 | 4.500 |

The data apply to an intermediate circuit voltage (ICV) of 600 V. Variant ICV affects performance and rated speed.
 XXX – stands for deliverable speeds (e.g. MS220-080/22 equates max. 8.000 min⁻¹).

PERFORMANCE DIAGRAM



The above-mentioned motor spindles are only a summary of our complete product range. Further spindle types are available. Please feel free to contact us.

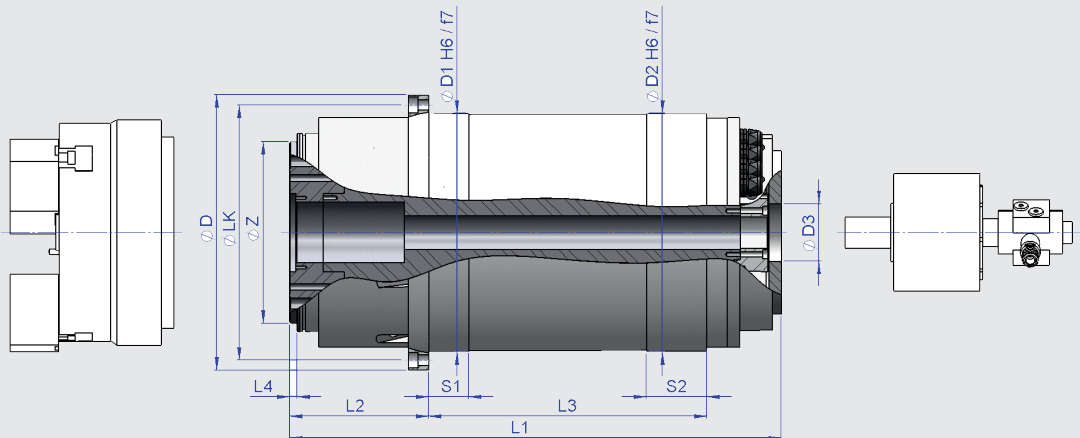
Complete clamping cylinder and pull- and pressure rods are also available.

DIMENSIONS – TURNING SPINDLES



| Type | Ø D | Ø D1 (h6) | Ø D2 (h6) | Ø LK | Z | L 1 | L 2 | L 3 | L 4 | L 5 | L 6 | Ø D3 ISO 702-4 DIN 6553 | opt. ISO 702-1 DIN 55026 | Ø D4 | Ø D5 | Ø D6 |
|---------------|-----|-----------|-----------|------|-------|-----|-----|-----|-----|-----|-----|-------------------------|--------------------------|------|------|------|
| TS180-XXX/24 | 250 | 210 | 209,5 | 230 | 6xM8 | 282 | 100 | 255 | 10 | 85 | 50 | 140 | A6 | 55 | 40 | 70 |
| TS180-XXX/32 | 250 | 210 | 209,5 | 230 | 6xM8 | 332 | 100 | 305 | 10 | 85 | 50 | 140 | A6 | 55 | 40 | 70 |
| TS180-XXX/32 | 250 | 210 | 209,5 | 230 | 6xM8 | 382 | 100 | 355 | 10 | 85 | 70 | 140 | A6 | 55 | 40 | 70 |
| TS200-XXX/32 | 270 | 230 | 229,5 | 250 | 6xM10 | 340 | 110 | 300 | 10 | 105 | 50 | 220 | A6/A8 | 80 | 50 | 80 |
| TS220-XXX/29 | 300 | 250 | 249,5 | 275 | 6xM10 | 370 | 110 | 330 | 10 | 105 | 50 | 220 | A6/A8 | 80 | 50 | 80 |
| TS220-XXX/27 | 300 | 250 | 249,5 | 275 | 6xM10 | 520 | 110 | 480 | 10 | 105 | 70 | 220 | A6/A8 | 80 | 50 | 80 |
| TS250-060/38 | 320 | 280 | 279,5 | 305 | 6xM10 | 650 | 90 | 600 | 10 | 105 | 70 | 220 | A8/A11 | 90 | 50 | 80 |
| TS270-040/30 | 350 | 300 | 299,5 | 325 | 3xM11 | 390 | 110 | 350 | 10 | 105 | 70 | 220 | A8/A11 | 80 | 50 | 80 |
| TS270-030/31 | 350 | 300 | 299,5 | 325 | 5xM11 | 540 | 110 | 500 | 10 | 105 | 70 | 220 | A8/A11 | 80 | 50 | 80 |
| TS310-040/64 | 410 | 350 | 349,5 | 380 | 6xM12 | 690 | 120 | 510 | 10 | 130 | 70 | 300 | A8/A11 | 100 | 70 | 80 |
| TS310-050/67 | 410 | 350 | 349,5 | 380 | 6xM12 | 590 | 120 | 410 | 10 | 130 | 70 | 300 | A8/A11 | 100 | 70 | 80 |
| TS310-050/103 | 410 | 350 | 349,5 | 380 | 6xM12 | 690 | 120 | 510 | 10 | 130 | 70 | 300 | A8/A11 | 100 | 70 | 80 |
| TS340-020/36 | 440 | 380 | 379,5 | 410 | 6xM12 | 680 | 170 | 570 | 10 | 190 | 70 | 380 | A15 | 140 | 70 | 100 |
| TS340-020/37 | 440 | 380 | 379,5 | 410 | 6xM12 | 930 | 170 | 820 | 10 | 190 | 70 | 380 | A15 | 140 | 70 | 100 |
| TS405-015/31 | 500 | 440 | 439,5 | 470 | 6xM16 | 625 | 250 | 500 | 10 | 240 | 70 | 380 | A15 | 150 | 100 | 180 |
| TS405-012/57 | 500 | 460 | 459,5 | 485 | 6xM16 | 725 | 250 | 600 | 10 | 240 | 70 | 380 | A15 | 150 | 100 | 180 |
| TS405-010/49 | 500 | 460 | 459,5 | 485 | 6xM16 | 825 | 250 | 700 | 10 | 240 | 70 | 380 | A15 | 150 | 100 | 180 |

MSXXX (e.g. MS 220) = external diameter of the stator



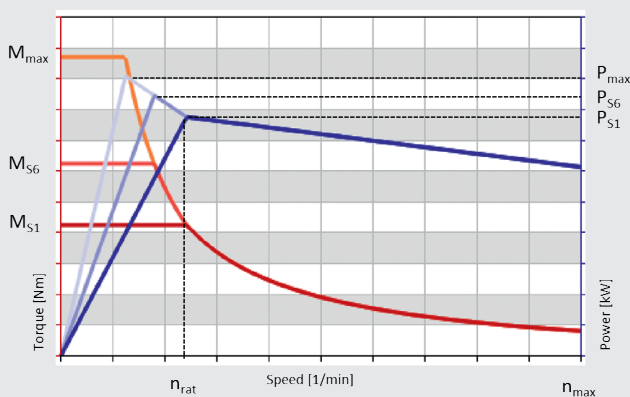
TECHNICAL DATA – MILLING SPINDLES



| Type | Power [kW] | | Speed of rotation [min ⁻¹] | | | | Torque [Nm] | | |
|---------------|----------------------|------------------------------|--|-------|--------|--------|----------------------|------------------------------|-------------------|
| | P _d S1 | P _{kb} S6 (40 %) | rat. | max. | | | M _d S1 | M _{kb} S6 (40 %) | M _{max.} |
| MS120-XXX/10 | 10 | 15 | 9.200 | 8.000 | 12.000 | 18.000 | 10 | 18 | 37 |
| MS120-XXX/16 | 16 | 19 | 7.500 | 8.000 | 12.000 | – | 20 | 29 | 45 |
| MS120-XXX/28 | 28 | 42 | 10.400 | 8.000 | 12.000 | 18.000 | 26 | 47 | 68 |
| MS180-XXX/24 | 24 | 30 | 4.500 | 8.000 | 12.000 | 15.000 | 50 | 75 | 115 |
| MS180-XXX/32 | 32 | 36 | 4.400 | 8.000 | 12.000 | 15.000 | 70 | 102 | 160 |
| MS180-XXX/32 | 32 | 35 | 3.400 | 8.000 | 12.000 | – | 90 | 130 | 200 |
| MS200-XXX/32 | 32 | 37 | 3.100 | 6.000 | 8.000 | 12.000 | 100 | 147 | 230 |
| MS200-XXX/47 | 47 | 56 | 2.200 | 5.000 | 8.000 | 12.000 | 200 | 287 | 450 |
| MS220-XXX/33 | 33 | 44 | 2.450 | 6.000 | 8.000 | 10.000 | 130 | 190 | 320 |
| MS220-060/27 | 27 | 34 | 1.350 | 6.000 | | | 194 | 292 | 484 |
| MS250-060/38 | 38 | 48 | 1.200 | 6.000 | | | 300 | 384 | 450 |
| MS270-040/30 | 30 | 32 | 1.150 | 4.000 | | | 250 | 370 | 575 |
| MS270-030/31 | 31 | 34 | 690 | 3.000 | | | 425 | 625 | 970 |
| MS310-050/67 | 67 | 80 | 1.100 | 5.000 | | | 585 | 795 | 1.000 |
| MS310-040/103 | 103 | 124 | 1.200 | 5.000 | | | 820 | 1.110 | 1.650 |
| MS340-020/36 | 36 | 43 | 530 | 2.000 | | | 650 | 964 | 1.550 |
| MS340-035/99 | 99 | 100 | 860 | 3.500 | | | 1.100 | 1.300 | 1.700 |
| MS405-015/36 | 31 | 32 | 210 | 1.500 | | | 1.375 | 1.600 | 2.560 |

The data apply to an intermediate circuit voltage (ICV) of 600 V. Variant ICV affects performance and rated speed.
 XXX – stands for deliverable speeds (e.g. MS220-080/22 equates max. 8.000 min⁻¹).

PERFORMANCE DIAGRAM



The above-mentioned motor spindles are only a summary of our complete product range. Further spindle types are available. Please feel free to contact us.

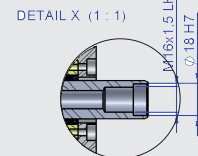
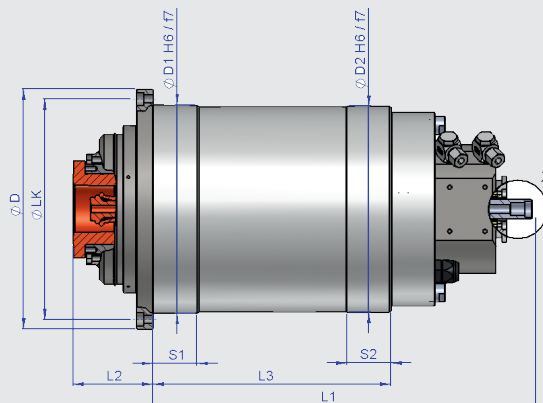
Complete clamping cylinder and pull- and pressure rods are also available.

DIMENSIONS – MILLING SPINDLES

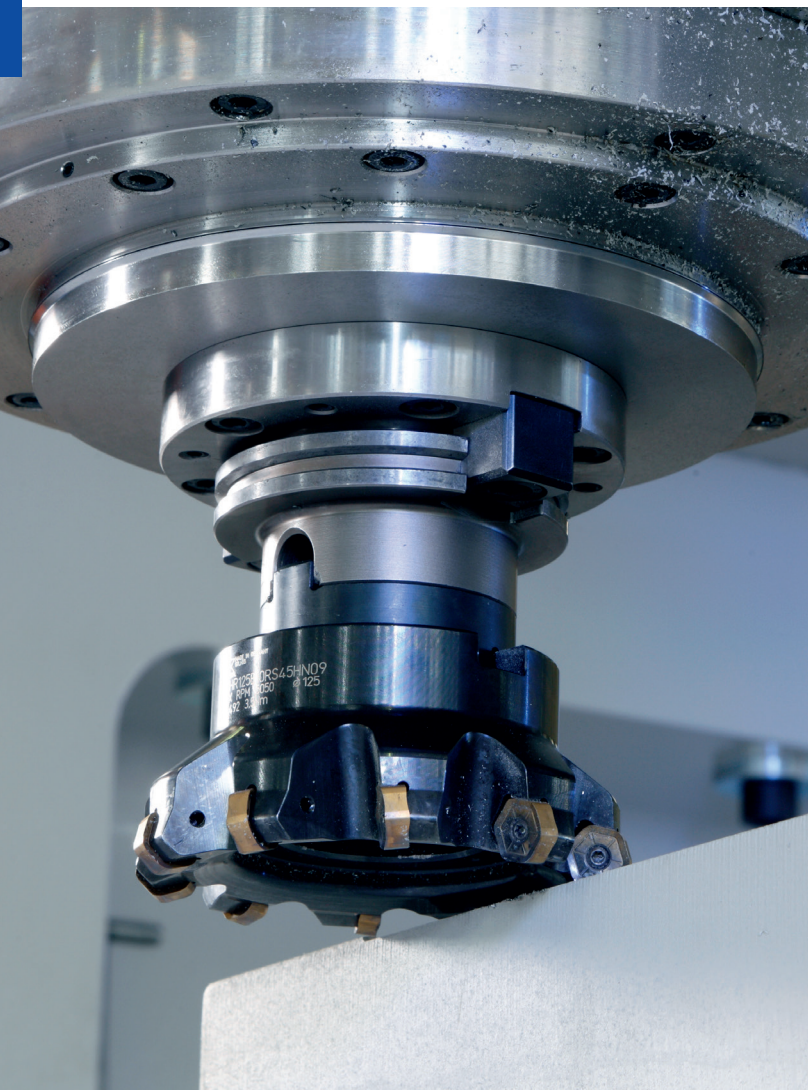


| Type | Ø D (h6) | Ø D1 (h6) | Ø D 2 | Ø LK | Z | L 1 | L 2 | L 3 | S 1 | S 2 |
|---------------|----------|-----------|-------|------|-------|-------|-----|-----|-----|-----|
| MS120-XXX/10 | 180 | 150 | 149,5 | 165 | 6xM6 | 389 | 105 | 236 | 50 | 50 |
| MS120-XXX/16 | 180 | 150 | 149,5 | 165 | 6xM6 | 448 | 105 | 286 | 50 | 50 |
| MS120-XXX/28 | 180 | 150 | 149,5 | 165 | 6xM6 | 548 | 105 | 386 | 70 | 70 |
| MS180-XXX/24 | 250 | 210 | 209,5 | 230 | 6xM8 | 282 | 100 | 255 | 50 | 50 |
| MS180-XXX/32 | 250 | 210 | 209,5 | 230 | 6xM8 | 332 | 100 | 305 | 70 | 70 |
| MS180-XXX/32 | 250 | 210 | 209,5 | 230 | 6xM8 | 382 | 100 | 355 | 70 | 70 |
| MS200-XXX/32 | 270 | 230 | 229,5 | 250 | 6xM10 | 432 | 120 | 260 | 50 | 50 |
| MS200-XXX/47 | 270 | 230 | 229,5 | 250 | 6xM10 | 582 | 120 | 410 | 70 | 70 |
| MS220-XXX/33 | 270 | 230 | 229,5 | 275 | 6xM10 | 460 | 110 | 330 | 50 | 50 |
| MS220-060/27 | 300 | 250 | 249,5 | 275 | 6xM10 | 610 | 110 | 480 | 70 | 70 |
| MS250-060/38 | 320 | 280 | 279,5 | 305 | 6xM10 | 560 | 110 | 500 | 70 | 70 |
| MS270-040/30 | 350 | 300 | 299,5 | 325 | 6xM10 | 540 | 110 | 400 | 70 | 70 |
| MS270-030/31 | 350 | 300 | 299,5 | 325 | 6xM10 | 690 | 110 | 550 | 70 | 70 |
| MS310-050/67 | 410 | 350 | 349,5 | 380 | 6xM12 | 710 | 120 | 570 | 70 | 70 |
| MS310-050/103 | 410 | 350 | 349,5 | 380 | 6xM12 | 810 | 120 | 670 | 70 | 70 |
| MS340-020/36 | 440 | 380 | 379,5 | 410 | 6xM12 | 790 | 130 | 650 | 70 | 70 |
| MS340-035/99 | 440 | 380 | 379,5 | 410 | 6xM12 | 1.040 | 130 | 900 | 70 | 70 |
| MS405-015/36 | 500 | 440 | 439,5 | 470 | 6xM16 | 650 | 130 | 520 | 70 | 70 |

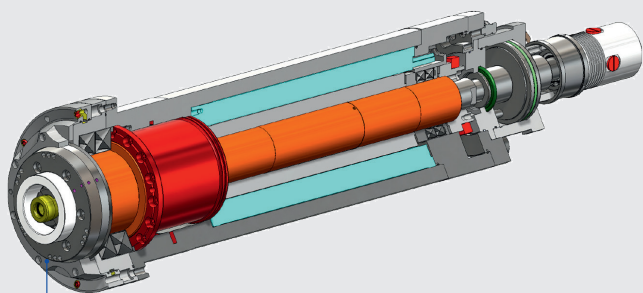
MSXXX (e.g. **MS 220**) = external diameter of the stator



TOOL FITTING / CLAMPING SYSTEM



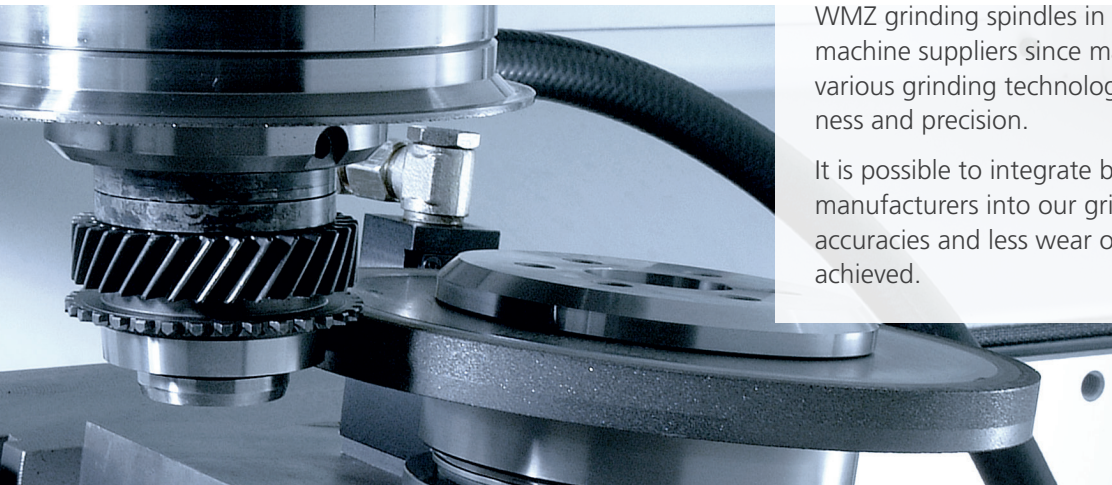
| Type | HSK | SK | BT | Capto |
|---------------|----------|-------|----------------------|------------|
| MS120-XXX/10 | 40/50/63 | 30/40 | Available on request | C4/C5 |
| MS120-XXX/16 | 40/50/63 | 30/40 | | C4/C5 |
| MS120-XXX/28 | 40/50/63 | 30/40 | | C4/C5 |
| MS180-XXX/24 | 40/50/63 | 40 | | C5/C6 |
| MS180-XXX/32 | 40/50/63 | 40 | | C5/C6 |
| MS180-XXX/32 | 40/50/63 | 40 | | C5/C6 |
| MS200-XXX/32 | 50/63 | 40/50 | | C5/C6 |
| MS200-XXX/47 | 50/63 | 40/50 | | C5/C6 |
| MS220-XXX/33 | 63/100 | 50 | | C6/C8 |
| MS220-060/27 | 63/100 | 50 | | C6/C8 |
| MS250-060/38 | 63/100 | 50 | | C6/C8 |
| MS270-040/30 | 100/125 | 50 | | C8/C10 |
| MS270-030/31 | 100/125 | 50 | | C8/C10 |
| MS310-050/67 | 100/125 | 50 | | C8/C10 |
| MS310-050/103 | 100/125 | 50 | | C8/C10 |
| MS340-020/36 | 100/125 | 50 | | C8/C8X/C10 |
| MS340-030/99 | 100/125 | 50 | | C8/C8X/C10 |
| MS405-015/36 | 100/125 | 50 | | C10 |



tool clamping

Depending on customers requirements WMZ motorspindles can be equipped with different clamping systems.

WMZ – GRINDING SPINDLES

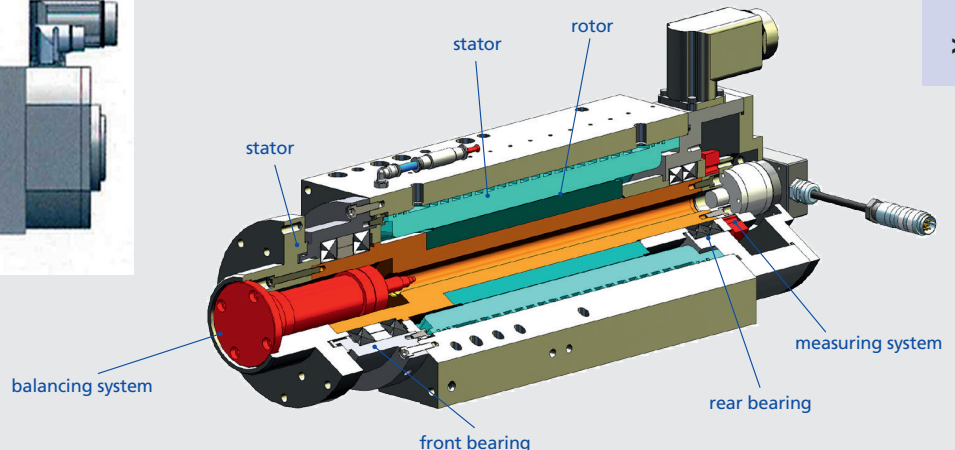
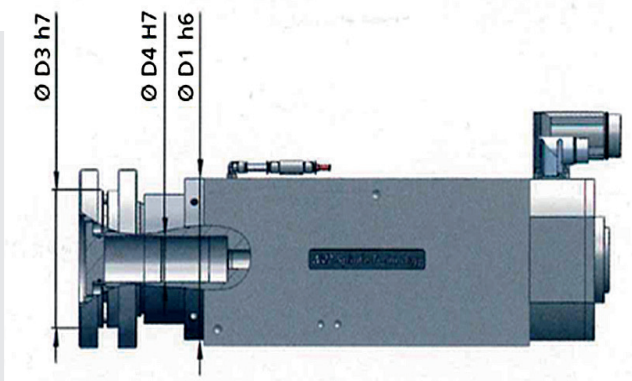


WMZ grinding spindles in use at successful grinding machine suppliers since many years. They are used for various grinding technologies and distinguish by robustness and precision.

It is possible to integrate balancing systems from leading manufacturers into our grinding spindles. Thus higher accuracies and less wear of grinding wheels can be achieved.

| Type | Power [kW] | | Speed [min ⁻¹] | | Torque [Nm] | | Dimensions [mm] | | |
|--------------|------------|----------------|----------------------------|--------|-------------|----------------|-----------------|--------------|--------------|
| | P S1 | P S6 (40 %) | rat. | max. | M S1 | M S6 (40 %) | Ø D1 (h6) | Ø D3 (h7) | Ø D4 (H7) |
| GS115-110/6 | 6 | 8 | 6.000 | 11.000 | 10 | 13 | 150 | 76 | 42 |
| GS115-090/23 | 23 | 29 | 6.000 | 9.000 | 37 | 46 | 150 | 127 | 42 |
| GS120-180/9 | 9 | 13 | 24.000 | 18.000 | 5 | 7 | 150 | 47 | 32 |
| GS205-070/17 | 17 | 22 | 1.600 | 7.000 | 100 | 128 | 230 | 102 | 60 |
| GS220-050/27 | 27 | 34 | 1.350 | 5.000 | 194 | 292 | 250 | 250 | 152 |
| GS250-042/23 | 23 | 29 | 1.500 | 4.200 | 146 | 200 | 300 | 152 | 70 |
| GS270-040/30 | 30 | 32 | 1.150 | 4.000 | 250 | 370 | 300 | 203 | 90 |

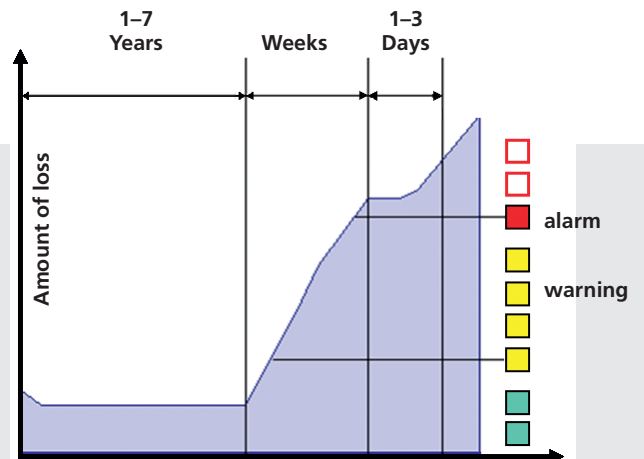
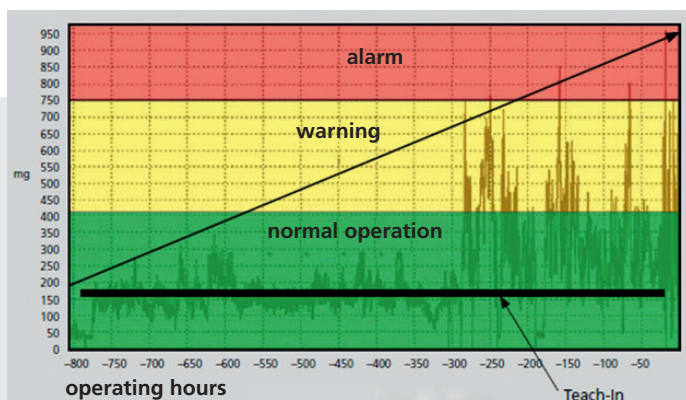
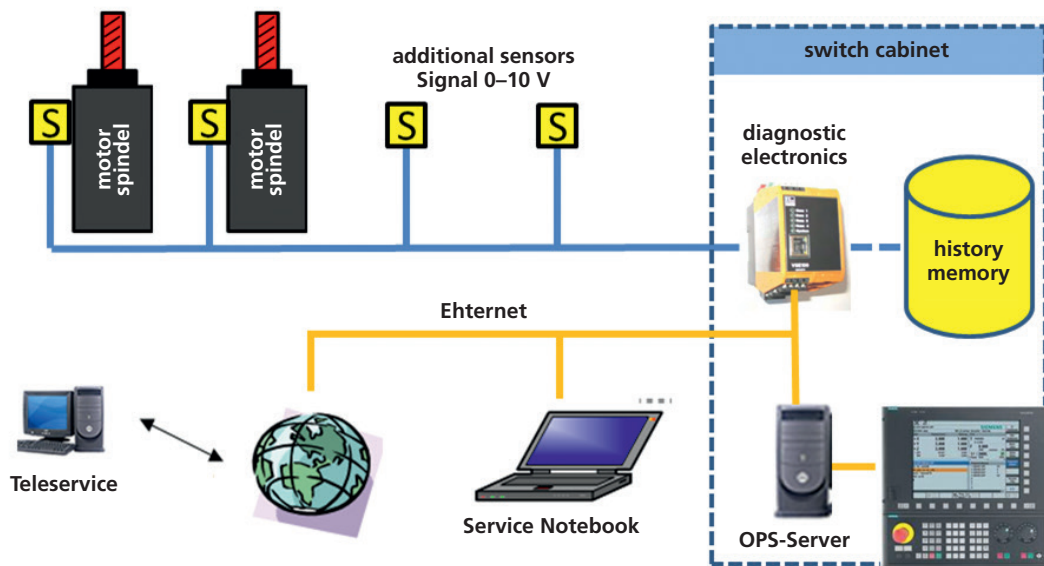
The data apply to an intermediate circuit voltage (ICV) of 600 V. Variant ICV affects performance and rated speed.
GSXXX (e. g. 220) = external diameter of the stator. Variant types and dimensions available.



SPINDLE MONITORING SYSTEM SMS (optional)

WMZ motorspindles can optionally be equipped with a permanent spindle monitoring system (SMS). Bearing defects can be detected weeks before breakdown. The measured values can be checked worldwide in real time via the internet.

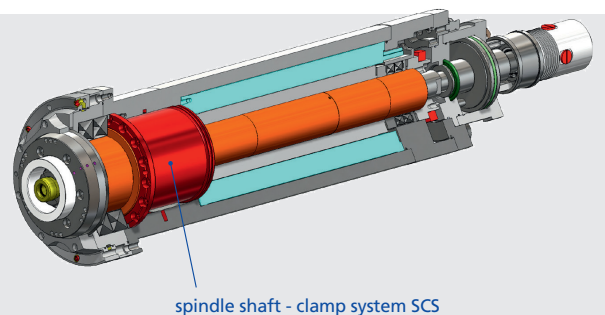
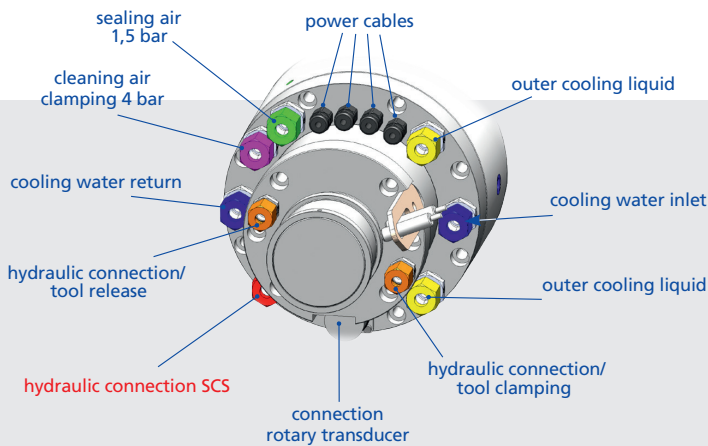
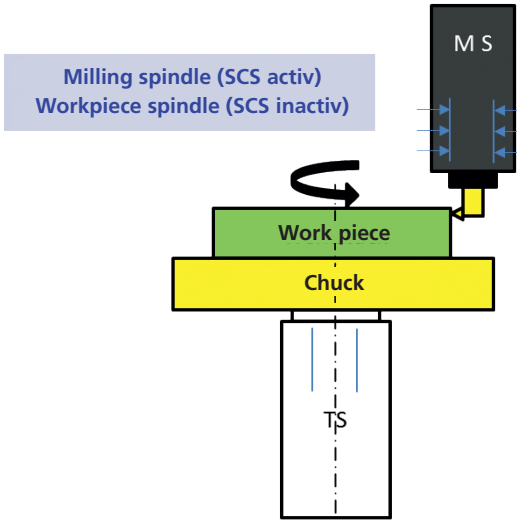
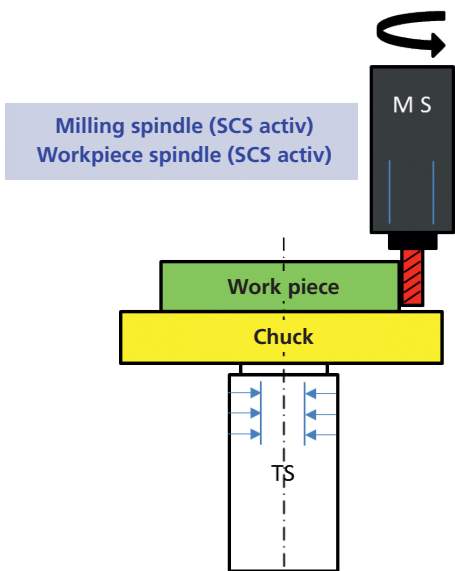
- Advantages**
- Better scheduling of upcoming reparations because of early detection
 - Optimal utilization of maintenance-intervals lead to lower revision-cost
 - Prevention against secondary damages by opportunemaintenance
 - Collision caused defects can be ascertained



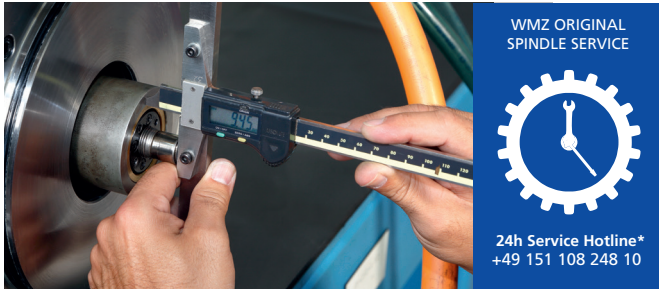
SPINDLESHAFT CLAMPING SYSTEM SCS (optional)

WMZ motorspindles can optionally be equipped with a hydraulic driven spindleshaft clamping system (SCS). That gives the possibility to fix the spindle shaft with max. 10.000 Nm in every position. This is an assumption for complete machining processes.

| Advantages | |
|------------|--|
| ■ | The use of turning tools with our milling spindles is possible |
| ■ | High accurate milling processes are possible while fixation of the workpiece by clamping of the turning spindles |
| ■ | High flexibility of the machine |
| ■ | Optimal utilization of c-axis-functionality |



PREVENTION



Machine downtimes cost time and money. You can prevent this – with our **on-site spindle inspection**. Our technicians use special measuring processes to inspect your spindles for signs of wear. If they find anything, you receive a precise fault analysis with a list of the measures to be taken and a cost estimate. Following work assignment, the more minor repairs are even carried out on site.

REPAIR



No-one knows your spindles better than we do – after all, we designed and built them. We provide fast and reliable help with **genuine spare parts**, our flexible on-site service and in the WMZ Spindle Service Center.

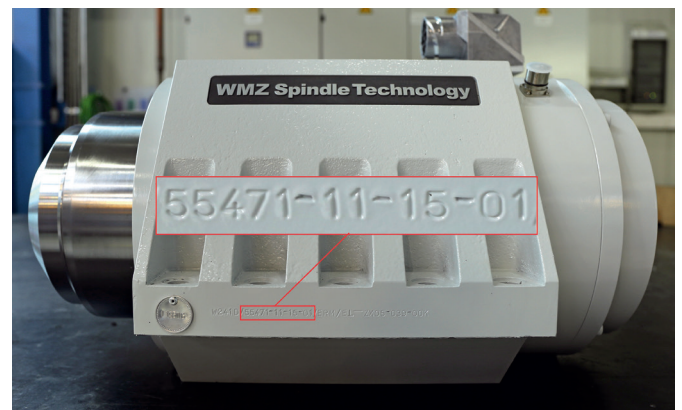
Advantages

- Repair to technically “value as new”
- Retrofitting of advanced technological developments
- Use of genuine spare parts
- Repairs of standard spindles usually within 5 working days
- 24h service hotline*

WMZ TAG-NUMBER

Every WMZ spindle is assigned an individual **WMZ TAG-number**. On the basis of this number, we can identify all the details of your spindle:

- Revision level on assembly
- Test protocols of all components
- Pre-delivery measuring protocols
- Documentation of service work
- Post-repair measuring and test protocols
- Overview of the components replaced



OPTIMIZE

Production workflows change.

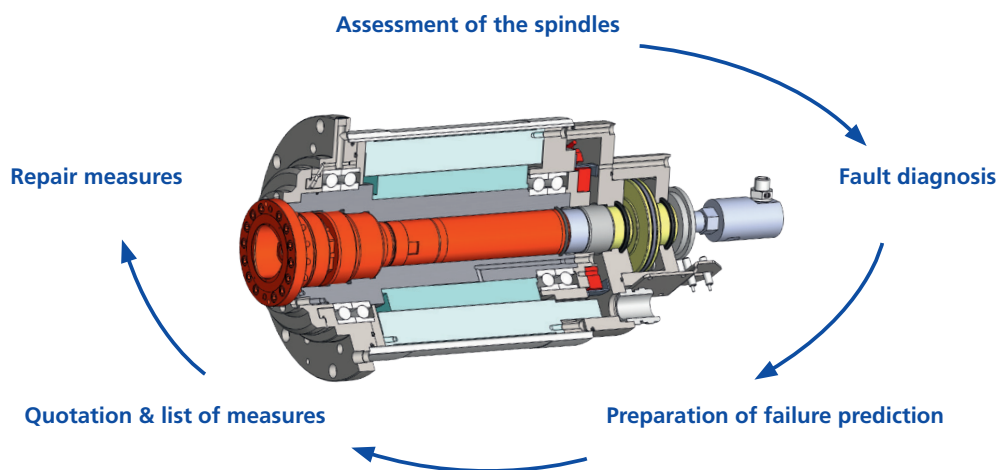
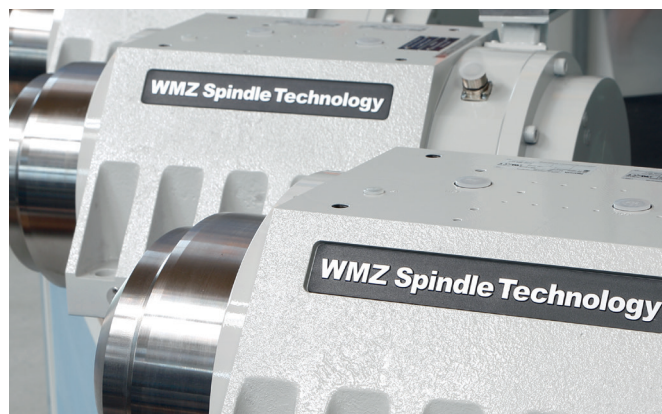
Technologies change.

Processes change.

Would you like to adapt your spindle to new processes? **Avoid** any major **risks** and talk to us first.

We can upgrade your used spindles to the latest **technical standard** and adjust them for new processes if possible.

In close cooperation with the specialist departments of our associated companies, we always look for the most productive solution for your manufacturing line.



TRAININGS

Within the context of **customised training**, we teach you about the core of your machine in terms of both **theory and practice**.

You can either come to the WMZ Spindle Service Center or book a training event on your own premises.

Experienced trainers will explain the following subjects:

- General handling of spindle units
- Carrying out minor repairs
- Spindle replacement
- How to carry out spindle maintenance yourself
- Checking the sealing air
- Checking the coolant flow
- Inspection of the tool interface
- Concentric and axial run-out as fault indicators



Mitglieder der DVS TECHNOLOGY GROUP

Members of the DVS TECHNOLOGY GROUP

DVS MACHINE TOOLS & AUTOMATION



BUDERUS Schleiftechnik GmbH | www.buderus-schleiftechnik.de
Innenrundscheifen – Außenrundscheifen – Gewindescheifen – Hartdrehen
I.D. grinding – O.D. grinding – Thread grinding – Hard turning



DISKUS WERKE Schleiftechnik GmbH | www.diskus-werke.de
Planseiten-Scheifen – Doppel-Planseiten-Scheifen – Sonderbearbeitung
Face grinding – Double face grinding – Special machining



PITTLER T&S GmbH | www.pittler.de
Vertikal-Drehbearbeitungszentren & Pick-up-Systeme – Verzahnen in der Komplettbearbeitung
Vertical turning center & Pick-up systems – Gear cutting for complete machining



PRÄWEMA Antriebstechnik GmbH | www.praewema.de
Verzahnungshonen/-scheifen – Verzahnungsfräsen – Anspitz-/Hinterlegungsfräsen
Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering



WMS Werkzeugmaschinenbau Sinsheim GmbH | www.wms-sinsheim.de
Service-Dienstleistungen – Generalüberholungen – Reparatur von Baugruppen
Maintenance – Machine Retrofit – Repairs



WMZ Werkzeugmaschinenbau Ziegenhain GmbH | www.wmz-gmbh.de
Dreh- & Kombinationsbearbeitung wellenförmiger Bauteile – Motorspindeln
Turning & Combined machining of shafts – Motor spindles

DVS TOOLS & COMPONENTS



DVS TOOLING GmbH | www.dvs-tooling.de
Werkzeuglösungen und Technologiesupport für das PRÄWEMA Verzahnungshonen
Tool solutions and technology support for PRÄWEMA gear honing



NAXOS-DISKUS Schleifmittelwerke GmbH | www.naxos-diskus.de
Konventionelle Schleifwerkzeuge – CBN & Diamantwerkzeuge
Conventional grinding tools – CBN & Diamond tools

DVS PRODUCTION



DVS Production GmbH | www.dvs-production.de
DVS Technologien in der Serienfertigung für PKW-Komponenten
DVS Technologies in mass production for passenger car components



FRÖHLICH CNC Produktion GmbH | www.cnc-froehlich.de
DVS Technologien in der Serienfertigung für Nutzfahrzeug-Komponenten
DVS Technologies in mass production for commercial vehicle components

DVS INTERNATIONAL SALES & SERVICE



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DVS Sales & Service in USA, Canada & Mexico



DVS Technology (Shenyang) Co., Ltd. | www.dvs-technology.com
DVS Sales & Service in China



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