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fives
Industry can do it



HIGH PRECISION
MACHINES

GRINDING | ULTRA PRECISION

Grinding solutions for flat surfaces

Horizontal and Vertical

ULTIMATE SURFACE GRINDING SOLUTIONS



GRINDING | ULTRA PRECISION

Fives and its dedicated Grinding | Ultra Precision teams - over 650 people globally - offer a complete range of grinding and special purpose ultra-precision machines, plus a comprehensive range of systems, grinding accessories, service and support.

Our network of Grinding | Ultra Precision facilities spans across the US, Europe, and Asia, providing extensive coverage and support worldwide.

Each location is strategically positioned to benefit from a strong network of reliable suppliers and manufacturing experts, ensuring high-quality assembly, electrical and operational capabilities.

Our Grinding | Ultra Precision team consists of highly skilled engineers and technicians with extensive experience in designing and manufacturing surface grinding machines.

Our team has the capacity to undertake projects ranging from R&D and process consultancy to complete machine design, manufacturing, and testing.

Our area of expertise includes a wide range of single & double disc machines for surface grinding.

Gardner, Giustina or Daisho grinding machines will be provided to meet the standards of each specific geographical region.



Aerospace



Air-conditioning



Automotive



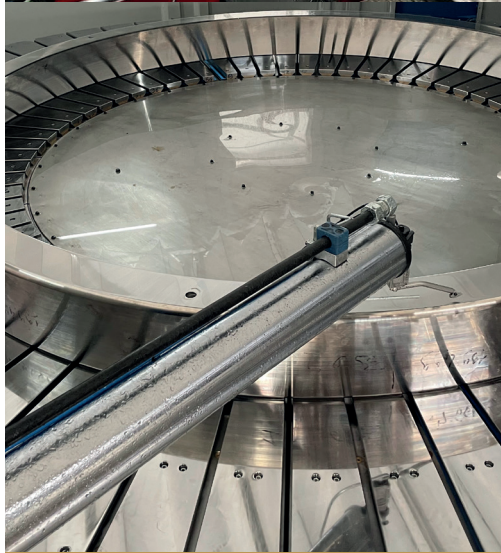
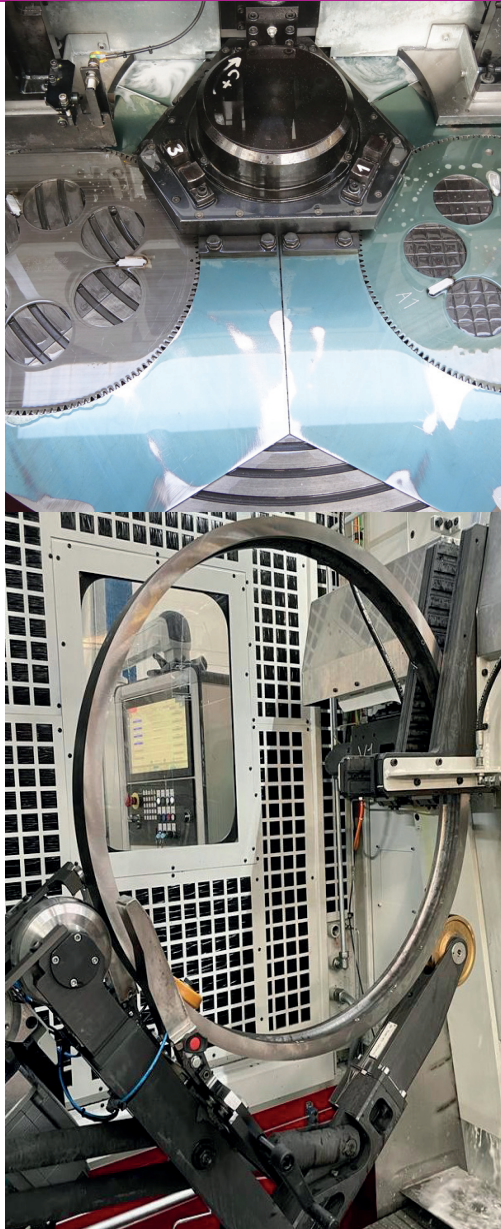
Bearings



Defense



Energy



1 VERTICAL DOUBLE DISC

2 HORIZONTAL DOUBLE DISC

3 VERTICAL SINGLE DISC



ogy

Heavy Equipment

Marine

Railroad

Transmission

Truck

AN EXTENSIVE RANGE OF SURFACE GRINDING MACHINES FOR VARIOUS TYPES OF COMPONENTS

We are continuously innovating and advancing technologies to meet the evolving needs of our customers. Our proven surface grinding machines are engineered with exceptional stiffness and high thermal stability to guarantee high precision, minimal scrap and maximum efficiency.

From small brake discs and bearings to large, heavy industry components, our precision grinding technologies ensure every component meets or exceeds your requirements.



Outer rings



Inner rings



Piston rings



Outer rings



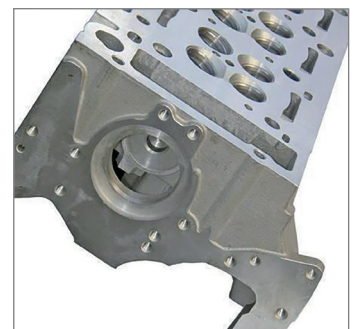
Inner rings



Slew bearing rings



Connecting rods



Cylinder block



Powder metal components



Covers



Bearings



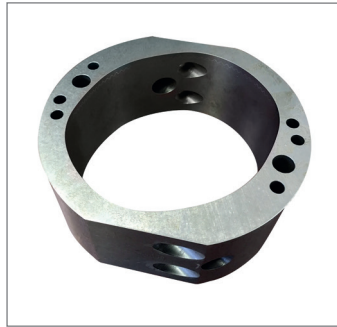
Brake discs



Brake and clutch discs



Flanges



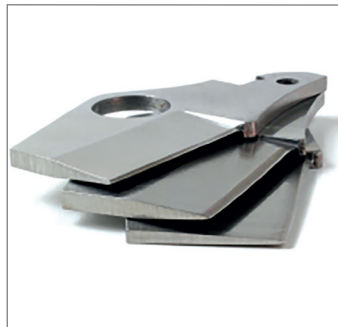
Pump housings



Motorcycle brake discs



Large bearings



Knife blades



Saw blades



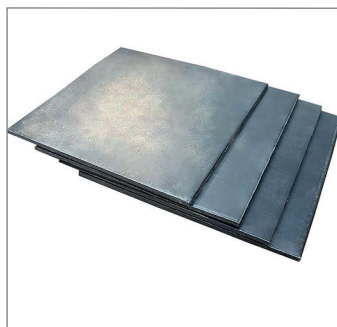
File blades



Gears



Carbide inserts



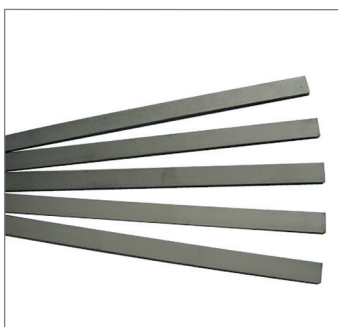
Plates



Compressor plates



Plates and rings



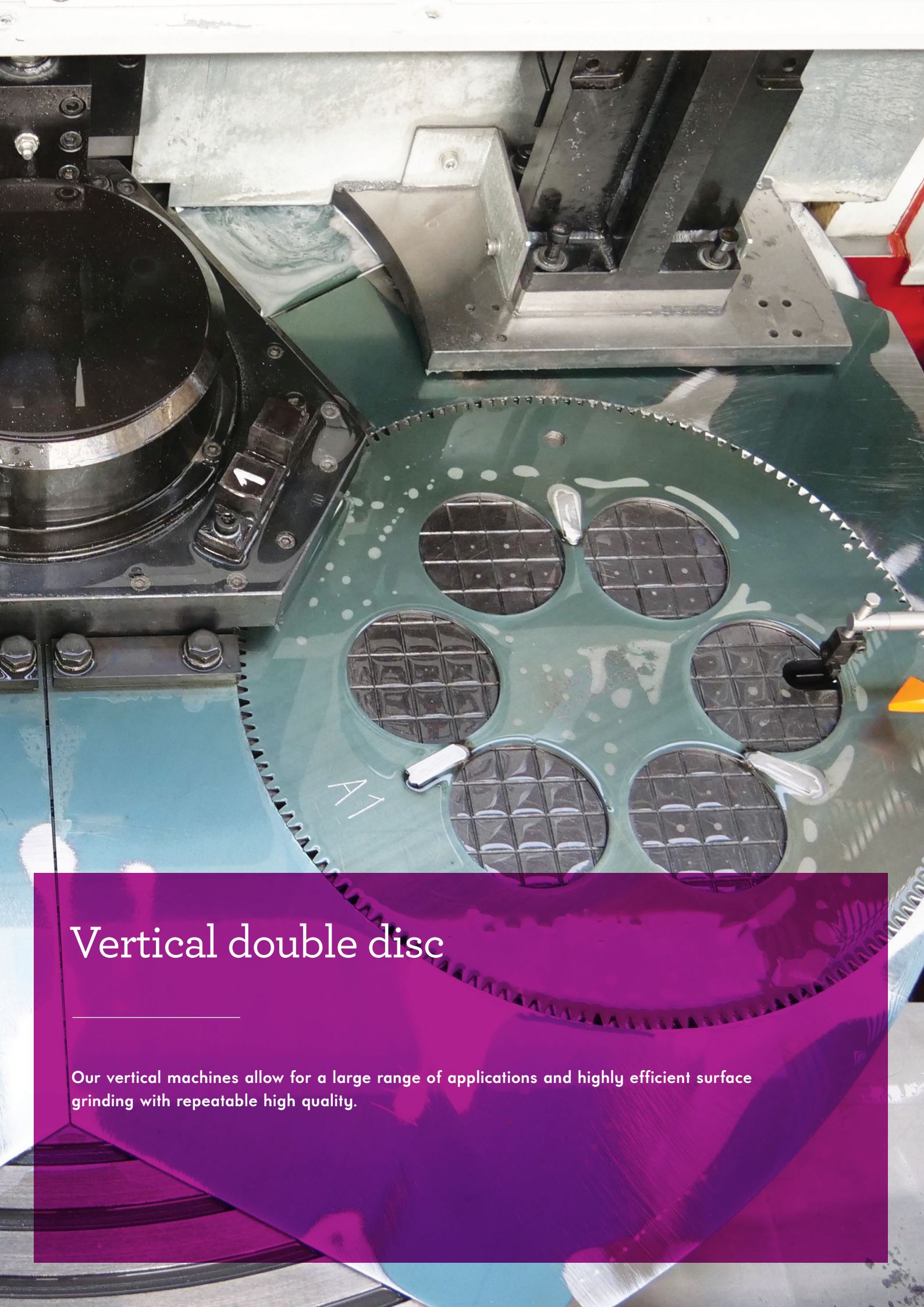
Carbide plates



Rotors-Stators



Various other components



Vertical double disc

Our vertical machines allow for a large range of applications and highly efficient surface grinding with repeatable high quality.

VDD 305 / 355 / 455 / 510 / 585 / 760

Superior machine rigidity with high flexibility

Vertical double disc grinding is designed by preparing two grinding spindles facing each other vertically. When high precision grinding is required, Fives provides a large range of CNC machines built for high production and quality standards.

Fives' vertical double disc grinding technology is second to none, and machines range in size from 305 mm wheel diameter up to 760 mm wheel diameter with spindle power as high as 45 kW.

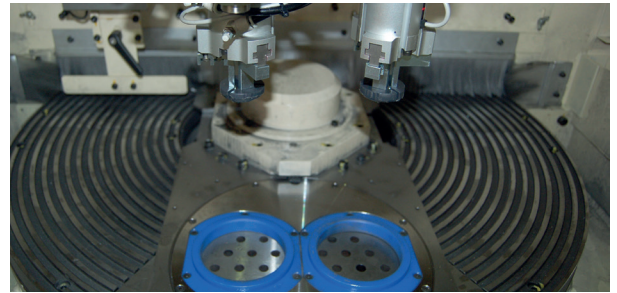
- High rigidity 3 block cast iron box type framing structure
- Main spindle and wheel mounting flange is forged as one piece
- Simple and adjustable tilting system of wheel tilting

APPLICATIONS

- Bearings
- Brake discs (standard and coated)
- Carbide plates
- Carbide inserts
- Compressor plates
- File blades
- Flanges
- Inner rings
- Knife blades
- Outer rings
- Piston rings
- Plates and rings
- Powder metal components
- Rotors-Stators
- Saw blades
- Various other components

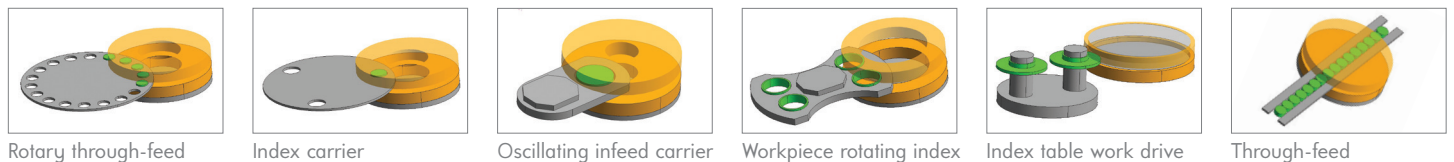


VDD585



VARIOUS WORKING METHODS

Our VDD machines are used to surface grind workpieces with different working methods that include:



| Vertical models | | | VDD305 | VDD355 | VDD455 | VDD510 | VDD585 | VDD760 |
|-----------------------------------|--------------|----|--------|--------|--------|--------|--------|--------|
| Wheelhead | | | | | | | | |
| Wheel Ø | mm | | 305 | 355 | 455 | 510 | 585 | 760 |
| Max. power grinding wheel | kW | | 7.5 | 11 | 15 | 15 | 37 | 45 |
| Grinder workpiece capacity | | | | | | | | |
| Max. OD | Infeed | mm | 80 | 120 | 180 | 180 | 300 | 400 |
| | Through-feed | mm | 25 | 40 | 50 | 60 | 120 | 240 |
| Max. thickness | | mm | 20 | 25 | 40 | 40 | 65 | 100 |
| Min. thickness | Infeed | mm | 2 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| | Through-feed | mm | 0.8 | 0.8 | 0.8 | 1 | 1 | 1 |
| Machine | | | | | | | | |
| Width | mm | | 1,550 | 1,550 | 1,550 | 1,550 | 1,900 | 2,700 |
| Depth | mm | | 1,625 | 1,625 | 1,625 | 1,625 | 2,700 | 2,700 |
| Height | mm | | 2,200 | 2,200 | 2,200 | 2,200 | 2,800 | 3,200 |
| Weight | kg | | 5,500 | 5,500 | 5,500 | 5,500 | 12,000 | 15,000 |



Horizontal double disc

Our efficient, precise and robust solutions provide flat and parallel surface grinding on both sides of the component.

HDD 355 / 380 / 610 / 760 / 800 / 915 / 1067

Compact design with high throughput

Horizontal double disc grinding is designed by preparing two grinding spindles facing each other horizontally. Enough rigidity and simple structure are adopted for precise and heavy duty grinding processes.

Fives offers a large range of CNC machines built for high production and quality standards, to process flat and parallel surfaces in various working modes.

Fives' horizontal double disc grinding technology is second to none, and machines range in size from 355 mm wheel diameter up to 1,067 mm wheel diameter with spindle power as high as 75 kW.



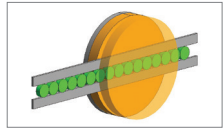
HDD1067

APPLICATIONS

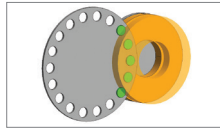
- Bearings
- Brake & clutch discs
- Compressor plates
- Connecting rods
- Covers
- Flanges
- Gears
- Motorcycle brake discs
- Magnets
- Various other components

VARIOUS WORKING METHODS

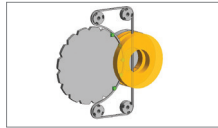
Our HDD machines are used to surface grind workpieces with different working methods that include:



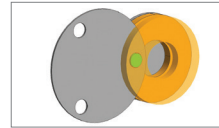
Linear through-feed



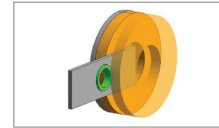
Rotary through-feed



Rotary carrier wire clamp



Index carrier



Reciprocating feeder carriage



Swing arm carriage

| Horizontal models | | | HDD355 | HDD380 | HDD610 | HDD760 | HDD800 | HDD915 | HDD1067 |
|-----------------------------------|----------------------|----|--------|--------|--------|----------------------------|----------------------------|----------------------------|----------------------------|
| Wheelhead | | | | | | | | | |
| Wheel Ø | mm | | 355 | 380 | 610 | 760 | 800 | 915 | 1,067 |
| Max. power grinding wheel | kW | | 7.5 | 11 | 22 | 75 | 75 | 75 | 75 |
| Grinder workpiece capacity | | | | | | | | | |
| Max. OD | Infeed | mm | 50 | 70 | 300 | 450 | 700 | 800 | 1,000 |
| | Through-feed | mm | 35 | 50 | NA | 200 | NA | 320 | NA |
| Max. thickness | Infeed (Std) | mm | 50 | 75 | 90 | 200 | 200 | 200 | 200 |
| | Infeed (special bed) | mm | NA | NA | NA | Δ between min. & max.: 230 | Δ between min. & max.: 230 | Δ between min. & max.: 230 | Δ between min. & max.: 230 |
| | Through-feed | mm | 25 | 25 | NA | 85 | NA | 130 | NA |
| Min. thickness | Infeed | mm | 15 | 15 | 2 | 12 | 12 | 15 | 20 |
| | Through-feed | mm | 1.5 | 1.5 | NA | 2 | NA | 2.5 | NA |
| Machine | | | | | | | | | |
| Width | mm | | 2,280 | 2,280 | 3,700 | 4,800 | 4,800 | 4,800 | 4,800 |
| Depth | mm | | 1,540 | 1,540 | 3,100 | 4,700 | 4,200 | 6,000 | 6,500 |
| Height | mm | | 1,940 | 1,940 | 2,200 | 2,500 | 2,600 | 2,900 | 2,900 |
| Weight | kg | | 4,500 | 4,500 | 7,000 | 14,500 | 15,000 | 17,000 | 17,500 |



Vertical single disc

For components that only need finishing on one side, our single disc surface grinding machines offer a full solution with tight tolerances and a small footprint.

VSD 305 / 355 / 450

Superior machine rigidity with exceptional parallelism & flatness

The VSD 305-450 models are vertical single disc grinders with an ID/OD clamping system and specially developed for the processing of sun gears. The machine can be equipped with a multi workpiece clamping feature to reduce the cycle time and enhance productivity.

- Monoblock machine basement in cast iron
- Low footprint
- CBN grinding wheel
- Automatic robot loading / unloading system
- In-process measuring system
- Customized clamping system

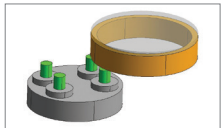
APPLICATIONS

- Covers
- Flanges
- Gears
- Powder metal components
- Bearing rollers

VARIOUS WORKING CLAMPING

Our VSD machines are used to surface grind workpieces improving the run-out during grinding process.

- 2 parts locations (part clamped on ID or OD)
- 4 parts locations (part clamped on ID or OD)



Index table work drive



VSD 585



| Model | | VSD355 | | VSD450 | |
|-----------------------------------|----|--------|------|--------|------|
| | | IT-2 | IT-4 | IT-2 | IT-4 |
| Wheelhead | | | | | |
| Wheel Ø | mm | 355 | | 455 | |
| Max. power | kW | 11 | | 15 | |
| Grinder workpiece capacity | | | | | |
| Max. workpiece OD | mm | 175 | 100 | 200 | 150 |
| Max. workpiece thickness | mm | 70 | 70 | 70 | 70 |
| Machine | | | | | |
| Width | mm | 1,400 | | 1,900 | |
| Depth | mm | 1,500 | | 2,640 | |
| Height | mm | 2,540 | | 2,540 | |
| Weight | kg | 5,500 | | 5,500 | |

A large vertical disc grinding machine. The image shows a close-up of the grinding wheel assembly, which is a long, cylindrical metal cylinder with a blue block and a black hose attached to its top. This assembly is positioned over a large, circular, polished metal rotary table. The table has several small holes and a central circular area. The background shows the curved, metallic structure of the machine's housing, with several vertical support legs visible.

Extra-large Vertical single disc

Our large vertical disc grinding machines feature a rotary table that is specifically designed to process sizable workpieces with exceptional parallelism and flatness.

XL-VSD 1000 / 1600 / 2000 / 2500 / 4000

Superior machine rigidity with exceptional parallelism & flatness

The XL-VSD 1000-4000 models are vertical single disc grinders with a magnetic rotary table and specially developed for the processing of big workpieces like large bearings, plates, hydraulics motor flanges, transmission crown gears and pump covers. The machine's multiple workpiece clamping feature helps to reduce cycle time and enhance productivity.

- Variation of table magnetism during process
- Table rotation on hydrostatic bearings
- Segmented grinding wheel
- In-process measuring system

APPLICATIONS

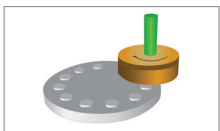
- Pump housings
- Large bearings
- Plates
- Slew bearing rings



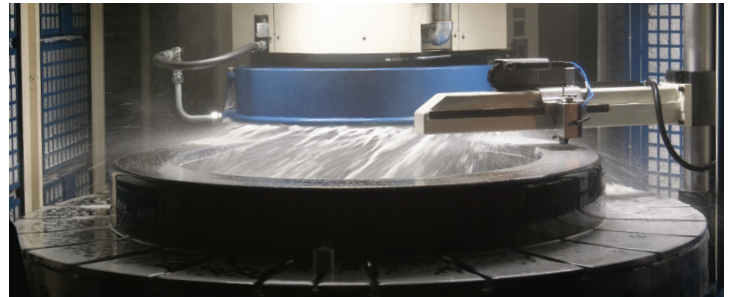
XL-VSD1000

WORKING METHODS

Our XL-VSD are used to surface grind workpieces with rotary table and plunge infeed of the grinding wheel.



Rotary table



| Model | | XL-VSD1000 | XL-VSD1600 | XL-VSD2000 | XL-VSD2500 | XL-VSD4000 |
|---------------------------|----|------------|------------|------------|------------|------------|
| Machining capacity | | | | | | |
| Max. workpiece diameter | mm | 1,000 | 1,600 | 2,000 | 2,500 | 4,000 |
| Max. workpiece thickness | mm | 500 | 710 | 710 | 710 | 710 |
| Wheelhead | | | | | | |
| Wheel Ø | mm | 762 | 762 | 915 | 1,220 | 1,220 |
| Max. power | kW | 59 | 59 | 59 | 86 | 109 |
| Machine | | | | | | |
| Width | mm | 1,700 | 2,000 | 2,400 | 2,900 | 4,900 |
| Depth | mm | 5,000 | 5,900 | 6,300 | 7,500 | 9,000 |
| Height | mm | 4,500 | 4,900 | 4,900 | 6,200 | 6,300 |
| Weight | kg | 25,700 | 26,500 | 40,000 | 76,500 | 110,000 |



GrinderCare

Our GrinderCare team provides a full range of life cycle solutions aimed to maximize your grinders performance. From extending your products life to maintaining peak efficiency, we help you maximize your grinders performance through our diverse range of services.

GRINDERCARE

Complete life cycle solutions for grinding machines around the globe:

- Extend product life
- Maintain peak efficiency
- Reduce the cost of machine ownership
- Maximize performance through a full range of services



Operation

From commissioning to maintenance, the GrinderCare team will keep your machine running for longer.

- Machine commissioning
- Warranty periods
- Spare parts
- Preventive maintenance



Optimization

Our technical support enables customers to adjust for changing requirements and continually make improvements to maximize machine capabilities.

- Customizable training
- Machine evaluations
- Technical support & consultations

Evolution

GrinderCare enables us to provide ongoing research and adjustments to the machine with the opportunity to bring new technologies into place to further enhance the machine capabilities and performance.

- Retools & refurbishment
- Remanufacturing
- Machine relocations
- Up-to-date technologies



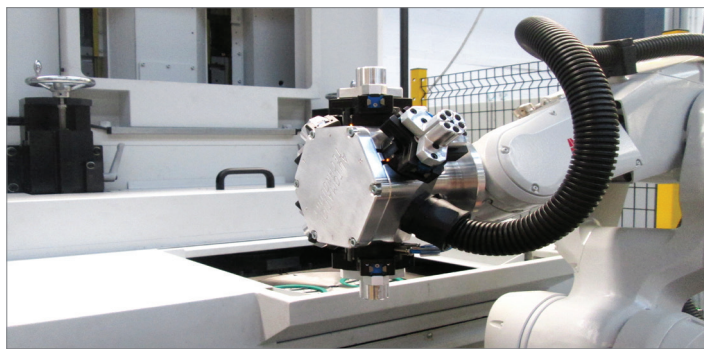
GrinderCare supports the full and maximum product life of the following brands:

- Besly
- Bryant
- Cincinnati
- Cranfield Precision
- Daisho
- Gardner
- Giustina
- Gold Crown
- Landis
- Norton
- Pratt & Whitney
- Warner Swasey

AUTOMATION & TURNKEY SOLUTIONS

Years of experience providing automation & turnkey solutions that are specifically tailored to the needs of the customer and today's production requirements.

- Market specific solutions
- Engineered in-house
- Easy implementation into your current production processes
- Eliminate all possible project management headaches
- Gaging

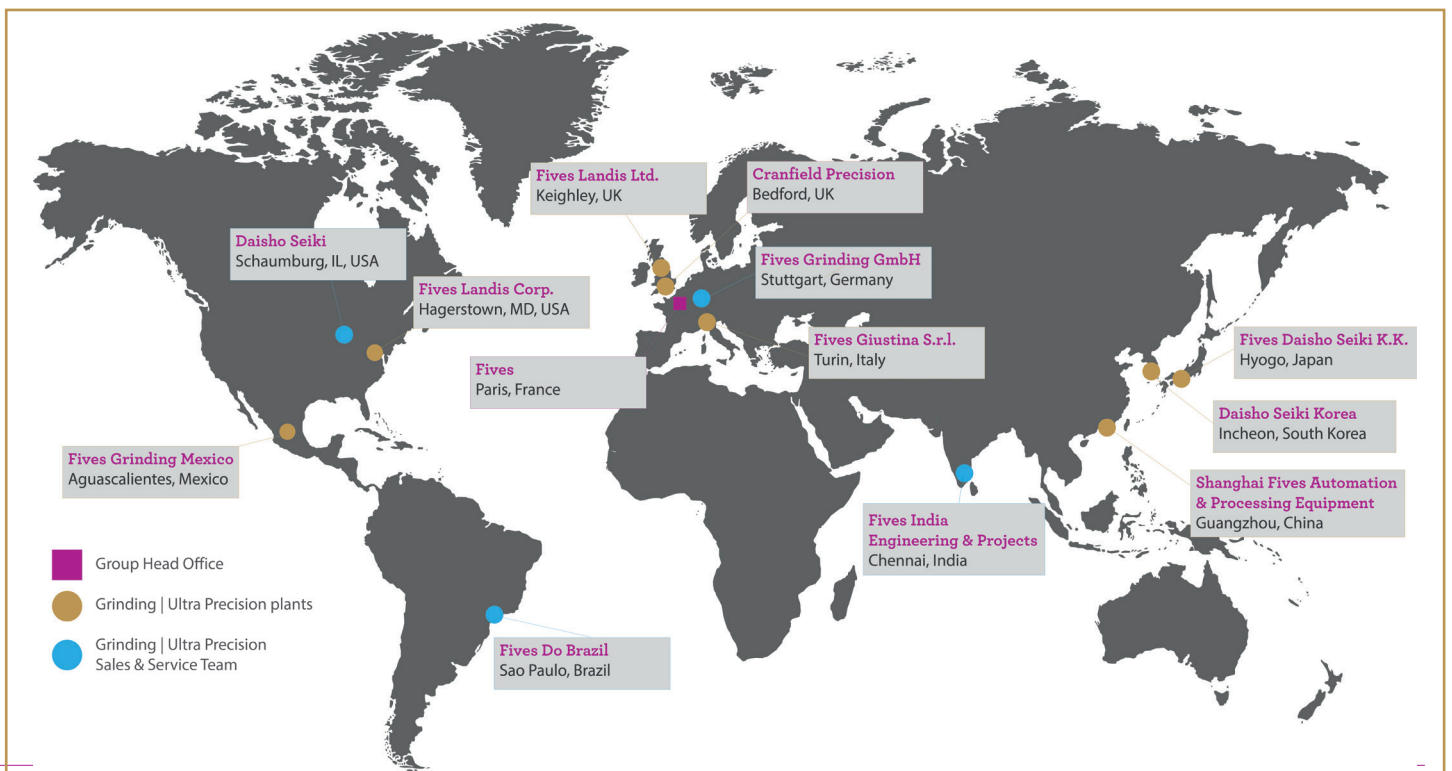


AUTOMATION - MAXIMUM FLEXIBILITY

- Loading/unloading: manual, conveyors, pushing devices, robots, portals
- Machine integration in new and existing production lines
- Automatic parts detection and adaptation to mixed part types

GLOBAL SERVICES

Providing parts and services around the world



COMMITMENT TO THE ENVIRONMENT

Our commitment is to respect and protect the environment

Fives strives to reduce their impact on the environment by optimizing multiple elements in our manufacturing process including:

- Particular care for materials selection
- Correct dimensioning of components (motors, cables, etc. ...)
- Motor drives with energy regeneration within main
- High-efficiency motors
- Cable reduction: equals less copper and plastic isolation used
- Halogen-free cables isolation
- Automatic switch off lights



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