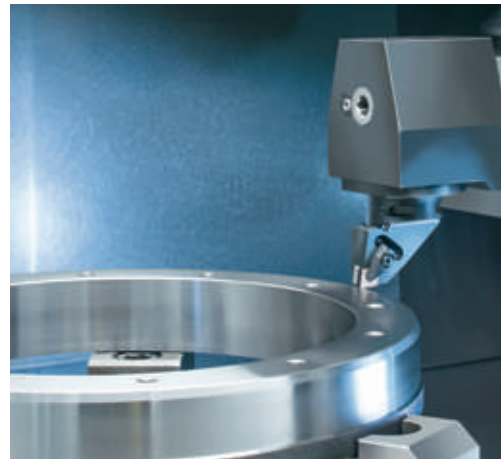


# VM / VMC SERIES



think  
VERTICAL



# VM 9 / VMC 450 VM 12 / VMC 600

## BASIC VERSION OF VERTICAL TURNING CENTERS

The vertical turning centers of the VM (Standard) and VMC (Customized) Series are designed for the highly productive manufacturing of workpiece families with a wide range of parts. A tool turret with twelve tool positions, depending on the required tool interface in a BMT or VDI version, is available for machining. For example, the turret can be equipped with driven tools to perform drilling operations.

The integrated probe ensures process reliability and guarantees a consistently high workpiece quality (first part = good part).

Workpiece diameter  
up to **24 mm**



### TECHNICAL DATA

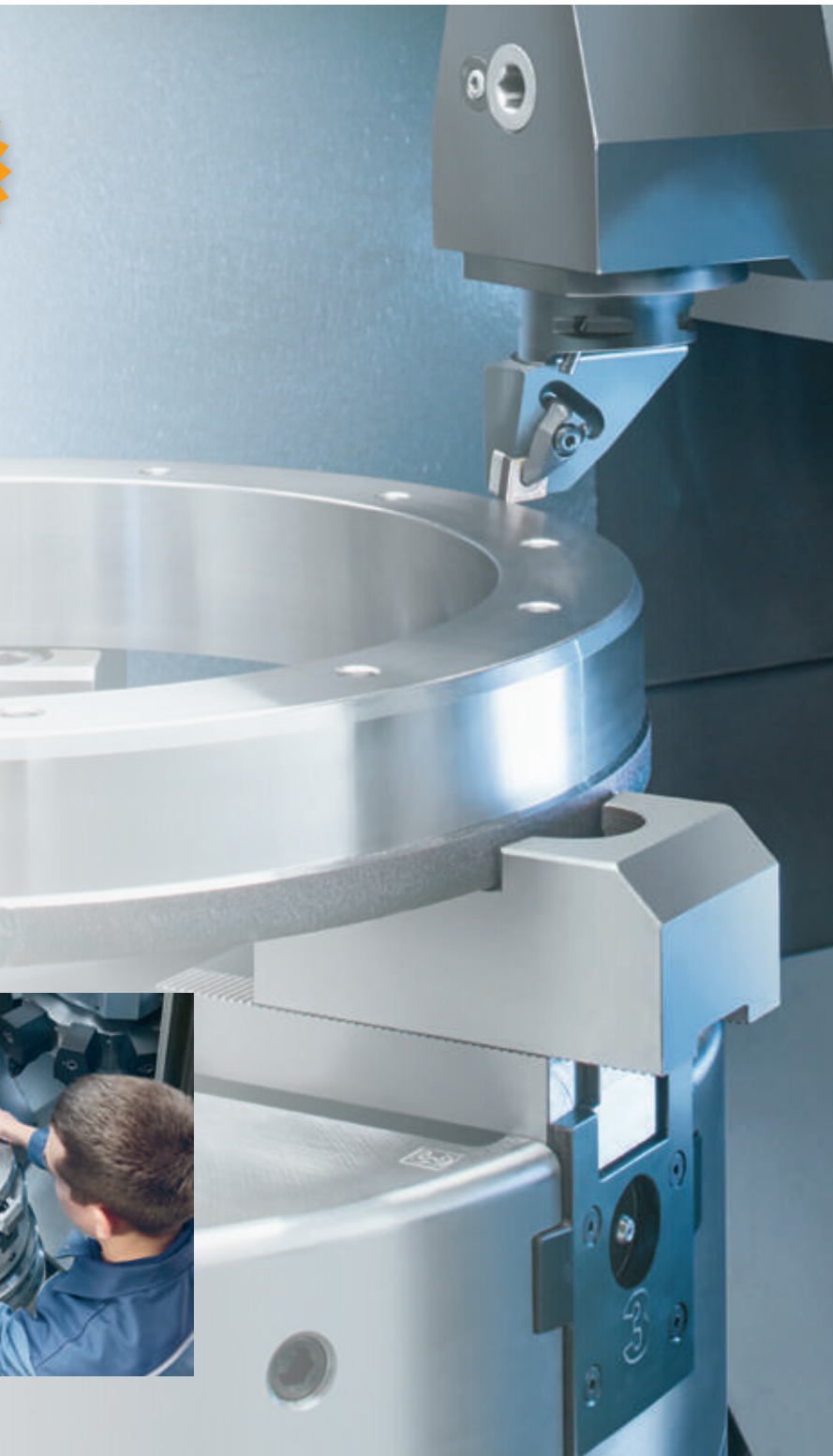
		VM 9 / VMC 450	VM 12 / VMC 600
Max. chuck diameter	mm	450	630
	inch	18	25
Swing diameter over base	mm	700	800
	inch	28	32
X-axis travel	mm	375	525
	inch	15	21
Z-axis travel	mm	500	500
	inch	20	20



Two-axis machining, milling, and drilling

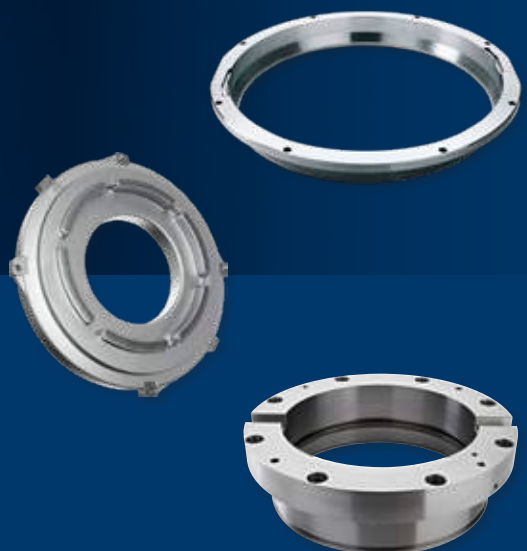






## BENEFITS

- + High vibration damping properties due to sturdy main body
- + High-quality linear guides, measuring systems and compound slides (X + Z)
- + Precise heavy-duty machining thanks to powerful workpiece spindle with integrated C-axis (direct drive)
- + Tool turret with up to 12 driven tools
- + Flexible loading and unloading concept: Manual, with crane, or automated with robot
- + Small footprint



# VM 9 ATC / VMC 450 ATC

These machines have an eight-tool turret with Capto interface and are fitted with a 12-tool magazine. The basic machine retains the benefits of the small footprint, different loading concepts, and the optimal chip flow.

The consistent design of the machine and turning processes, as well as the use of the appropriate tool magazines, allowing for the easy set-up and changing of the tools in parallel to the machining operations, really accentuates the efficiency of the machines.



Tool magazine for maximum system efficiency



## BENEFITS

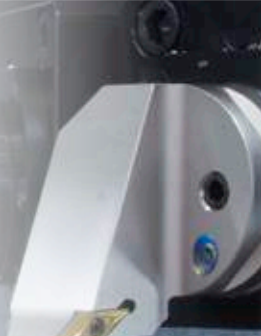
- + Vibration damping properties due to sturdy main body
- + High-quality linear guides, measuring systems and compound slides (X + Z)
- + Precise heavy-duty machining thanks to powerful workpiece spindle (direct drive)
- + Capto C6 tool turret for up to seven turning tools and one hydraulic retraction holder
- + Tool magazine for up to 12 tools
- + Flexible loading and unloading concept: Manual, with crane, or automated with robot



# VM 9 R / VMC 450-R WITH TAILSTOCK

## MACHINES FOR SPECIAL COMPONENTS

The special feature of the VM / VMC Series is its flexibility with regard to adjusting the machines for special workpieces. The user has different modules available in order to ensure the best machining results. Thus, the machines can be fitted with a tailstock, for example, in order to achieve optimal clamping and thereby to obtain the best machining quality, especially for shaft-type workpieces.



**Tailstock for optimal workpiece support**



## BENEFITS

- + Major vibration damping properties due to sturdy machine body
- + High-quality linear guides, measuring systems and compound slides (X + Z)
- + Precise heavy-duty machining thanks to powerful workpiece spindle with integrated C-axis (direct drive)
- + Soft and hard machining
- + Tool turret with up to 12 driven tools
- + Flexible loading and unloading concept: Manual, with crane, or automated with robot
- + Tailstock for maximum cutting performance with the best quality





# VMC 450-4 / VMC 450-4R

## FOUR-AXIS MACHINING FOR MAXIMUM PRODUCTIVITY

While the basic versions of the VM/VMC series vertical turning centers are already highly-productive machining centers, the systems productivity is significantly increased by the four-axis versions – the VMC 450-4 and the VMC 450-4R with tailstock. With four-axis, the machine is extended by two additional linear axes, X2 and Z2, in the form of a second tool turret. The two tool turrets, enabling four-axis simultaneous machining from both sides, are supported by the powerful main spindle. The main spindle is available in a range of versions and allows for even heavy duty machining processes, ensuring optimal material removal rates which can be almost doubled thanks to four-axis machining.

The additional tailstock, installed centrally between the turrets, provides optimal workpiece support, especially for shaft-type parts.

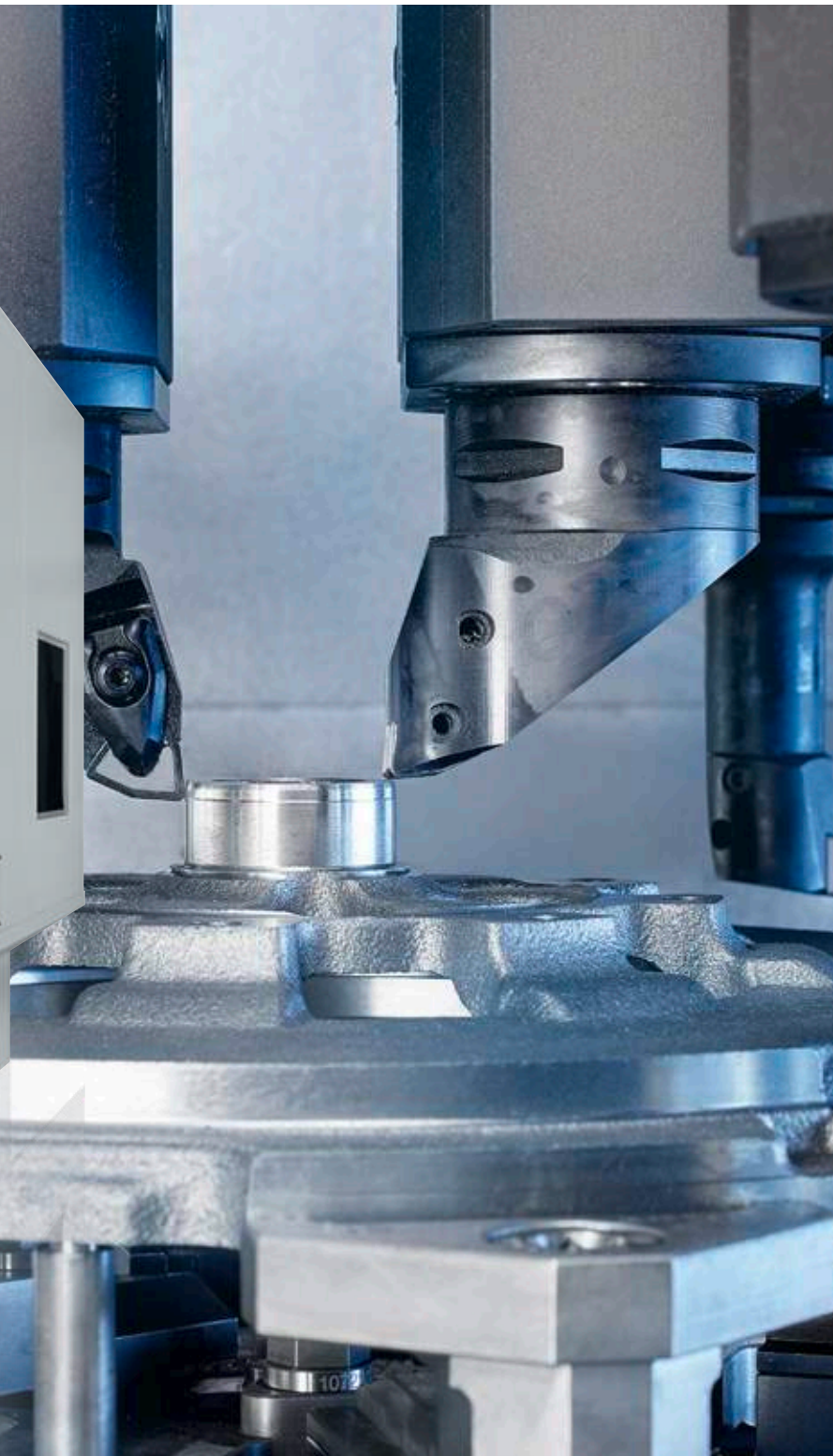


### TECHNICAL DATA

#### VMC 450-4

Max. chuck diameter	mm	630
	inch	25
Swing diameter	mm	800
	inch	31
X-axis travel	mm	395
	inch	16
Z-axis travel	mm	810
	inch	32
Y-axis travel	mm	± 25
	inch	± 1





## BENEFITS

- + Four-axis technology for maximum productivity
- + Precise heavy-duty machining thanks to powerful main and turning/milling spindle
- + Sturdy main body with top vibration damping properties
- + Short set-up time for just one clamping operation
- + Quality management thanks to integrated measuring system
- + High-quality linear guides and compound slides
- + Small footprint
- + Tailstock for optimal workpiece support





# VMC 450 MT VMC 600 MT

## INTEGRATED TURNING/MILLING SPINDLE FOR MORE MACHINING OPTIONS

Extending this machine concept even further is the VMC MT Series. This machine version has a turning/milling spindle attached to the top of the machine forming an extremely flexible production center. With this addition, the machine is focused on productivity and can be configured to suit almost any customer requirement, allowing complete machining to be performed with a wide variety of technologies. The VMC MT series includes a range of tool magazines with up to 80 tool positions available and a variety of spindle variations to compliment the range. These advantages make the VMC MT series the complete solution for a wide variety of workpieces.



## BENEFITS

- + Sturdy main body with excellent vibration damping properties
- + High-quality linear guides, measuring systems and compound slides (X + Z)
- + Precise heavy-duty machining thanks to:
  - » Powerful workpiece spindle with integrated C-axis (direct drive)
  - » Powerful turning/milling spindle with Capto C6/C8 interface
- + Tool magazine for up to 80 tools

## TECHNICAL DATA

		VMC 450 MT	VMC 600 MT
Max. chuck diameter	mm	450	630
	inch	18	25
Swing diameter	mm	700	800
	inch	28	31
X-axis travel	mm	630	780
	inch	25	31
Z-axis travel	mm	500	500
	inch	20	20
Tool magazine	Quantity	up to 80 positions	up to 80 positions





# VMC 450-5 MT

## FIVE-AXES FOR COMPLEX GEOMETRIES AND MULTITECHNOLOGY

The VMC 450-5 MT allows heavy components to be produced with angled boreholes and surfaces. This machine extends the basic VMC 450 MT by two additional axes – the indexing B-axis with integrated turning/milling spindle, and a Y-axis with an integrated main spindle. These allow for the production of extremely complex workpiece geometries, and make the VMC 450-5 MT a genuine high performance production center for chucked parts.



### TECHNICAL DATA

		VMC 450 5 MT (YB)
Max. chuck diameter	mm	630
	inch	25
Swing diameter	mm	800
	inch	31
X-axis travel	mm	780
	inch	31
Z-axis travel	mm	500
	inch	20
Y-axis travel	mm	350
	inch	14
Indexing range B	Degrees	±95
Tool magazine	Quantity	up to 80 positions



### BENEFITS

- + Rigid B-axis with integrated turning/milling spindle and additional tool holder for turning tools
- + Y-axis with integrated workpiece spindle – travel distance: 14 in
- + Complete machining with hob peeling
- + Complete machining and shortening of the process chain



# INTEGRATED QUALITY ASSURANCE

For consistent quality management and maximum component quality, the VMC and VMC MT machines already feature several complementary measuring systems. The laser measuring bridge outside the machining area monitors the wear and diameter of the tools and always ensures that the machining process is uninterrupted. A radio probe, which is available as an interchangeable system, monitors the quality of the workpieces.



## TOOL INSPECTION

- + Outside the machining area
- + Diameter check
- + Tool length
- + Inspection for fractures
- + Blade wear
- + Tip to base distance for turning tools



## WORKPIECE INSPECTION

- + High-precision two-point measurement
- + High-precision workpiece positioning with direct loading by robot

# HIGHLIGHTS

## 1 WORKPIECE SPINDLE



- + Maintenance-free direct drive with up to 3,000 rpm
- + Heavy-duty machining with torque up to 1,450 Nm
- + Maximum productivity using high performance cutting materials (CBN/ceramics)
- + Free chip flow all around the spindle
- + Ergonomic loading height

## 2 TURNING/MILLING SPINDLE



- + Maintenance-free direct drive with up to 12,000 rpm
- + Capto C6 and Capto C8 tool interfaces
- + Turning tools hydraulically clamped
- + For complete machining with the turning, drilling, milling, and gear cutting multitechnologies





## INDUSTRY 4.0 – EMAG MACHINE STATUS

Detailed data collection and analysis of tool condition using integrated laser measuring bridge



### 3 TOOL CHANGE

### 4 QUALITY ASSURANCE SYSTEMS



- + Generous tool magazine for up to 80 tools
- + Shortest chip-to-chip time due to two-way gripper
- + Tool loading parallel to the machining operation
- + Automatic RFID read-write unit for default tools
- + For automated manufacturing with maximum overall equipment effectiveness (OEE)



- + Workpiece measurement using radio probe
- + Tool measurement using laser measuring bridge
- + Tool breakage monitoring

# AUTOMATION MACHINE LOADED BY ROBOT

## FLEXIBLE LOADING AND AUTOMATION CONCEPTS

The VM / VMC Series is just as flexible and varied at loading as it is at machining. For manual loading, the machines are fitted with large front doors, which ensure optimal access to the machining area. In addition, the machines have a side door, which is also NC and considerably expands the accessibility of the machine and thereby the options on how to position it. Therefore, loading concepts with robots or with a gantry can be easily implemented, as the examples on this page demonstrate.





# COMPLETE MACHINING & POWER SKIVING

## COMPLETE MACHINING FOR MAXIMUM QUALITY AND PRODUCTIVITY

The VMC machines provide users with major benefits for the complete machining of complex components in a single clamping operation. A few of these include the large tool storage area, the use of different machining technology and the entire range of possibilities available to users of the VMC series.

Even a demanding technology, such as skiving, can be performed without any problems thanks to the optimal combination and precision when controlling the individual axes and modules. Maximum freedom with process design, tool concepts and machining technologies characterize the VMC series.



## BENEFITS OF COMPLETE MACHINING FROM MULTITECHNOLOGY

- + Considerable cost savings thanks to:
  - » Reduced personnel costs (machine supervision, set-up)
  - » Reduced investment costs
  - » Reduced logistics costs
- + Higher process reliability and quality assurance thanks to:
  - » Minimized reclamping errors
  - » Secure and robust process
  - » Flexible usage in machining different components
- + Higher equipment effectiveness (OEE)
  - » More quality products per unit of time

## BENEFITS OF SKIVING TECHNOLOGY

- + Higher quality: Pre-machining of the tip circle diameter and subsequent gear cutting in a single clamping operation
- + High productivity: Faster machining than conventional turning & gear shaping
- + Simple handling: No parts logistics between operations
- + Reduced idle times: No additional loading time
- + High flexibility: Quick, continuous machining of external and internal gears even against a plane shoulder or with indentation
- + Universal usage: Spur and helical gears are both possible



Turning

Milling

Grinding

Gear Hobbing

Power Skiving

# AT HOME ALL OVER THE WORLD.

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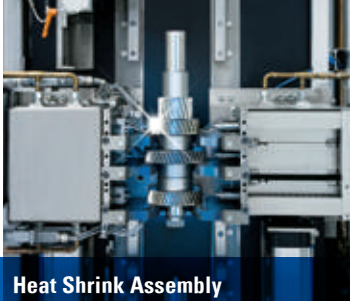
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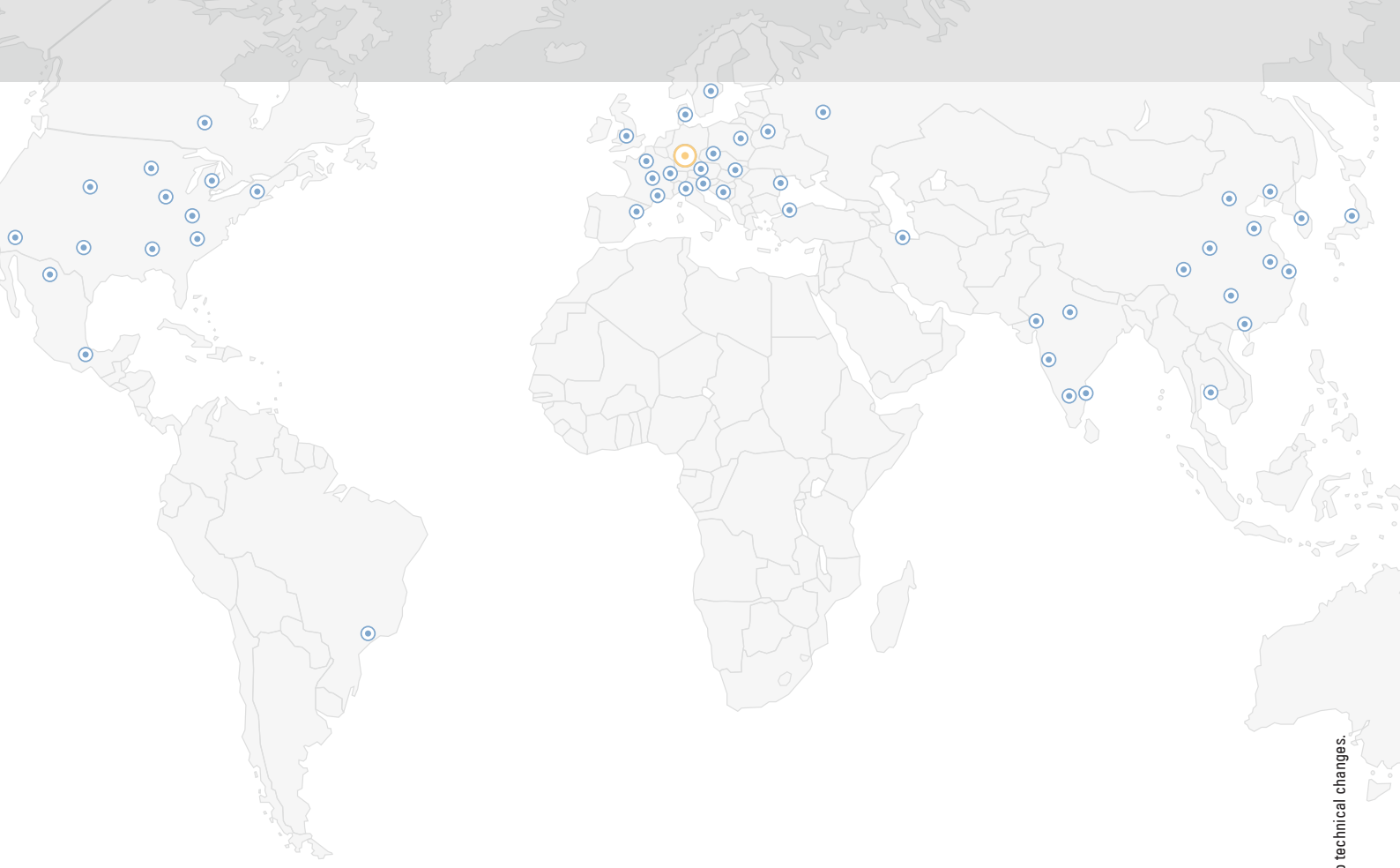
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