

COMPLETE MACHINING OF COUPLINGS

VL · VSC · USC 27 · VLC



think
VERTICAL



VL 6 / VL 8 – THE EMAG STANDARD FOR THE PRECISION

The VL Series integrates turning and automation in a single machine – within the smallest possible space. It features high productivity, long-term accuracy, excellent operational safety and increased operator convenience.

VL stands for short travel times and high accelerations – ideal for the complete machining of couplings with any thread type according to API and GOST standards.

THE BENEFITS

A system with two machines that offers all the advantages of the complete machining of couplings:

- + Integrated automation, low capital outlay
- + Automatic workpiece changes in the shortest possible time
- + Short distances for machining and loading, and therefore very short part cycles
- + High degree of machine availability
- + Ideal chip flow conditions
- + Very short chip-to-chip times
- + Small footprint
- + MINERALIT® main body for longer tool service life
- + Each VL integrates the expertise of more than 8,000 vertical turning centers supplied by EMAG



COUPLING SIZES

VL 6: 2 3/8" – 4"

API / GOST

VL 8: 4 1/2" – 7"



PRECISE PRODUCTION OF COUPLINGS



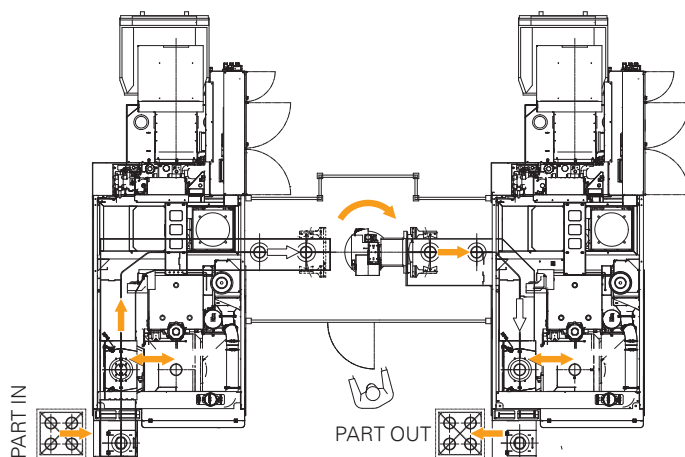
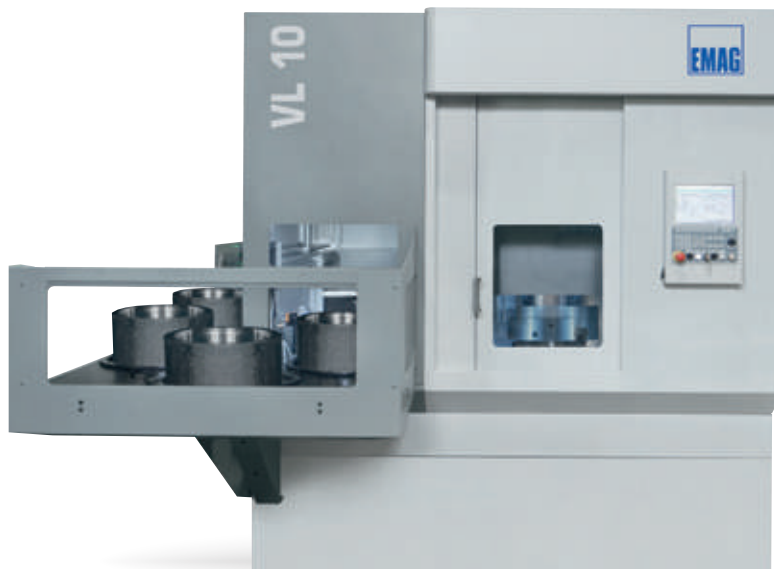
TECHNICAL DATA

VL 6 VL 8 VL 10

Nominal diameter	Inch	2 3/8 – 4	4 1/2 – 7	7 – 13 3/8
Chuck diameter	mm	315	400	630
	inch	12	15	24
Max. workpiece diameter	mm	127	200	365
	inch	5	8	14
Workpiece length, max.	mm	160	260	275
	inch	6	10	11
X-axis travel	mm	890	1,000	1,180
	inch	35	39	46
Z-axis travel	mm	495	595	905
	inch	19.5	23	35
Main spindle				
» Power rating, 40% / 100%	kW	39 / 28	48.7 / 37.7	75 / 58
	hp	52 / 38	65 / 50	100 / 77
» Torque, 40% / 100%	Nm	460 / 340	775 / 660	900 / 650
	ft-lb	339 / 251	572 / 443	664 / 480
» Max. number of revolutions	rpm	3,100	2,850	2,400
Turret tool positions	Qty	12	12	12
Rapid-traverse rate, X / Z	m/min	60 / 30	60 / 30	60 / 30
	ipm	3 / 1	3 / 1	3 / 1

Each VL machine is a manufacturing cell with integrated loading and unloading. When the part is finished, it will be moved to the finished machine area, while a new piece is loaded for machining. By placing the completed parts in the storage area, parts can be safely removed and raw parts can be loaded.

VL 10: 7" – 13 3/8"



VSC 400 CM / VSC 500 CM – VERTICAL PRODUCTION

The vertical production centers VSC 400 CM, VSC 400 DUO CM and VSC 500 CM are used for the complete machining of threaded couplings including any type of thread in the OCTG sector.

The VSC Series has a closed main machine base made of MINERALIT® polymer concrete. The DUO design has two separate, decoupled machining areas which means that their overhead slides can be programmed independently. Each machining area is fitted with a programmable EMAG disk turret in the front wall. This allows for the two spindles to be allocated identical or different machining cycles, as required. Depending on the technology and requirements, three-jaw, six-jaw or indexing chucks can be used.



ON CENTERS



TECHNICAL DATA

		VSC 400 CM / VSC 400 DUO	VSC 500 CM
Nominal diameter			
» with standard chuck	Inch	2 3/8 – 9 5/8	6 5/8 – 13 3/8
» with indexing chuck	Inch	2 3/8 – 7	4 1/2 – 8 5/8
Chuck diameter	mm inch	445 17	500 19.7
Swing diameter	mm inch	450 15	520 21
X-axis / Z-axis travel	mm inch	300 / 800 12 / 32	1,000 / 400 39 / 16
Max. workpiece diameter	mm inch	270 11	370 15
Workpiece length, max.	mm inch	320 23	340 13
Main spindle			
» Chuck diameter, max.	mm inch	380 15	- -
» Speed	rpm	3,400 / 4,000	500
Main drive unit			
» Power rating at 40% / 100% duty cycle	kW hp	60 / 57 80 / 77	67 / 51 90 / 68
» Torque at 40% / 100% duty cycle	Nm ft-lb	1,220 / 820 900 / 605	3,600 / 2,800 2,655 / 2,065
» Full power at	rpm	470	175
Feed drive			
» Rapid-traverse rate, X / Z	m/min ipm	45 / 30 1,772 / 1,181	45 / 30 1,772 / 1,181
» Feed force at 100%	kN lbf	11 / 11 / 18 / 18 2,473 / 2,473 / 4,047 / 4,047	11 / 11 2,473 / 2,473
» Ball screw dia. X / Z	mm inch	50 / 40 2 / 2	50 / 50 2 / 2



THE USC 27 COUPLING MACHINING CENTER

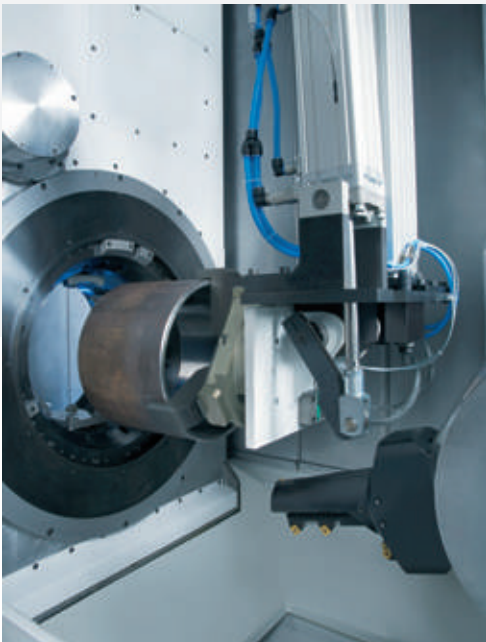
**The USC 27 center drive machine stands for efficiency in mass production.
It impresses with its simultaneous complete machining of couplings on both sides.**

The main body of the USC 27 is also made of MINERALIT[®], a high-quality polymer concrete with excellent vibration damping properties. The center drive headstock with integrated clamping system consists of three centric clamping and three compensating clamping internal jaws. It is also possible to program clamping pressure adjustments, to take place during the machining process.

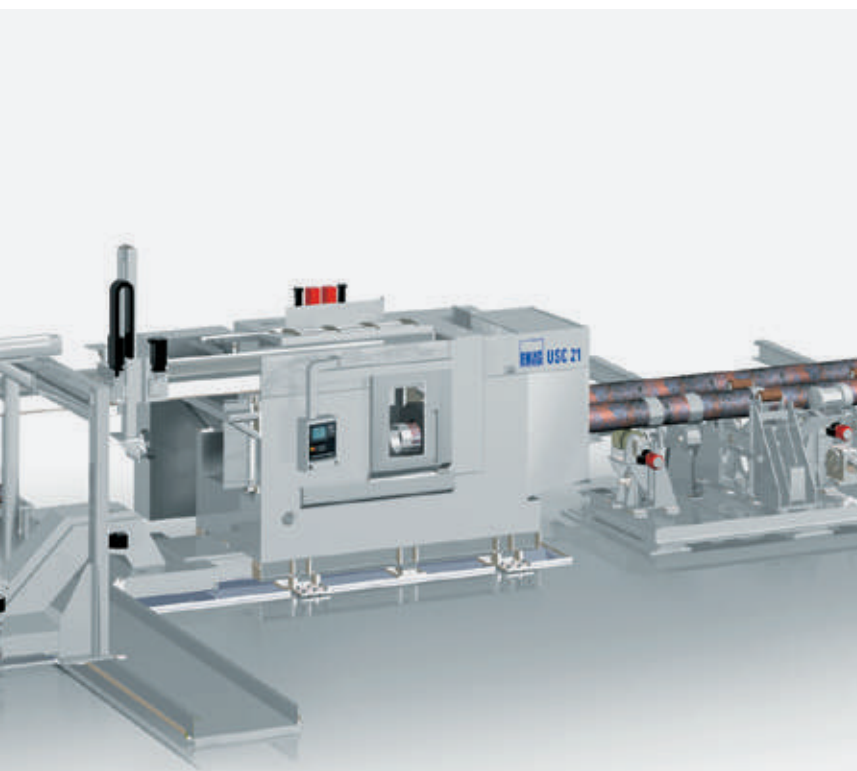


The EMAG four-position table-type turrets are mounted on the compound slides to the left and right of the center drive headstock. The high rapid-traverse rates of the compound slide units, and the automatic loading and unloading minimizes idle times.

Maintenance-free, fast-reacting, frequency-controlled three-phase motors drive the slides mounted on linear guides via high-precision ground ball screws.

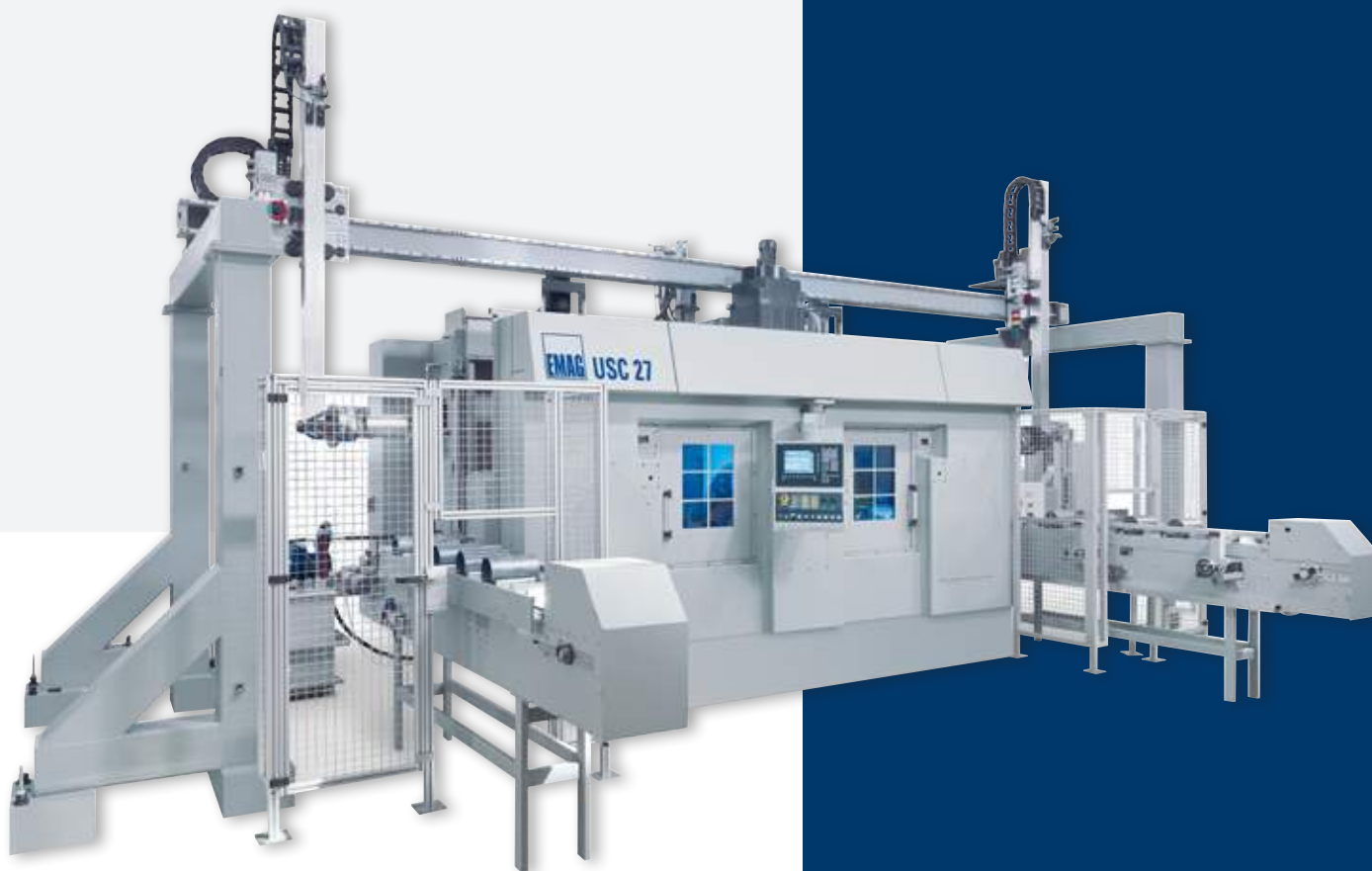


The main drive unit is a highly dynamic, maintenance-free, frequency-controlled AC induction motor flanged to the spindle unit. Power is transmitted via a gear unit.



TECHNICAL DATA

		USC 27 290	USC 27 380
Nominal diameter	Inch	4 ½ – 9 ¾	5 ½ – 13 ¾
Clamping diameter	mm inch	290 11	380 15
Workpiece length, max.	mm inch	350 14	350 14
X-axis / Z-axis travel	mm inch	300 / 800 12 / 32	300 / 800 12 / 32
Center height	mm inch	1,168 46	1,168 46
Main spindle			
» Chuck diameter, max.	mm inch	380 15	450 18
» Speed	rpm	800	500
Main drive unit			
» AC motor S1 (at 100% duty cycle)	kW hp	130 174	100 134
» Max. torque, S1 (100% duty cycle)	Nm ft-lb	4,500 3,319	5,680 4,189
» Full power at a spindle speed of	rpm	273	167
Feed drive			
» Rapid-traverse rate, X / Z	m/min ipm	30 / 30 1,181 / 1,181	30 / 30 1,181 / 1,181
» Feed force at 100%	kN lbf	14 3,147	14 3,147
» Ball screw dia. X / Z	mm inch	50 2	50 2
» Maximum power at 100% for X / Z	kW hp	7 9	7 9
» Maximum torque at 100% for X / Z	Nm ft-lb	22 16	22 16



VLC 800 CM – NEW GENERATION FOR MACHINING

The new generation of the VLC 800 CM can completely machine couplings with a maximum diameter of 24".

The machine base is made of high-quality MINERALIT® polymer concrete, a vibration damping material to guarantee maximum precision. The suspended working spindle's direct drive is optimized for the coupling range, and the vertically arranged tools guarantee the optimal downward chip flow. Various automation concepts enable efficient use in lean and highly automated production.



MACHINES AND COMPLETE MANUFACTURING SYSTEMS FROM A SINGLE SOURCE

EMAG has many years of experience in the machining of oilfield components [Oil Country Tubular Goods (OCTG)]. Today's manufacturing systems (finishing lines) for the machining of pipes, couplings, tool joints and protective caps include a large number of production processes.

In addition to CNC threading machines, these systems also include automatic mandrel testing systems, magnetic crack testing, coupling assembly systems, stations for applying thread protection caps and nipples, automatic test presses, coating systems, length measuring systems, weighing stations, embossing stations, ring marking systems, bundling systems, and, last but not least, part tracking. The experience gained from the worldwide delivery of over 300 pipe machining centers and over 400 coupling machining centers speaks for itself.

UP TO 24"



TECHNICAL DATA

Nominal diameter	
» with standard chuck	7 – 24 inch
» with indexing chuck	7 – 13 ¾ inch
Chuck diameter	800 mm 31 inch
Max. workpiece diameter	610 mm 24 inch
Swing diameter	820 mm 32 inch
Workpiece length, max.	480 mm 19 inch
X-axis / Z-axis travel	1,755 / 750 mm 69 / 29 inch
Main spindle	
» Spindle nose	Z 380
» Speed	750 rpm
Main drive unit	
» Power rating, 40% / 100% duty cycle	74 / 60 kW 99 / 80 hp
» Torque, 40% / 100% duty cycle	4,400 / 3,600 Nm 3,245 / 2,655 ft-lb
» Full power at spindle speed of	160 rpm
Feed drive	
» Rapid-traverse rate, X / Z	45 / 30 m/min 1,772 / 1,181 ipm
» Feed force X / Z	21 / 20 kN 4,720 / 4,496 hp
» Ball screw dia. X / Z	63 / 50 mm 3 / 2 inch
Disk-type turret	
» Tool connection	VDI 60
» Turret tool positions	8
» Width across flats	530 mm 21 inch
» Cutting circle	1,030 mm 41 inch



VLC 500 CM – COMPLETE COUPLING PRODUCTION

The VLC 500 CM vertical pick-up coupling machine has been developed specifically for the demanding production conditions of the oil field industry. Its focus is on accuracy and vibration damping, covering all special requirements for the production of top quality couplings.

With its modular design, the VLC 500 CM can be adapted perfectly to any machining requirement. The proven EMAG pick-up process ensures idle times are minimized with its automated loading and unloading of the machines and dynamic axes. The VLC 500 CM can be supplied as either a stand-alone machine, or as a part of a complete manufacturing line depending on the customer's requirements.

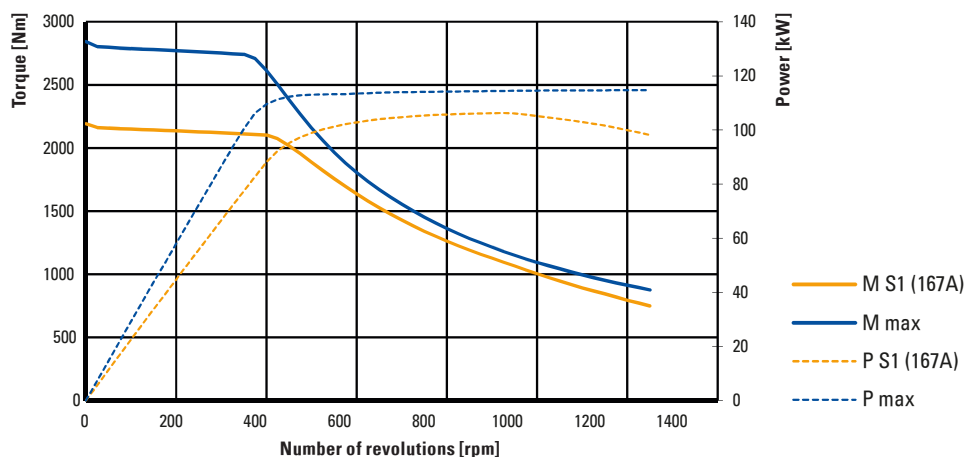
- + Tool turret with eight tool positions (Capto C8 / VDI 60) for fast machining processes, expandable up to automatic tool change system
- + Can be used as a stand-alone machine or linked with other machines
- + Powerful working spindle with up to 99 kW / 2,700 Nm
- + Optional indexing chuck
- + Highly productive machining of couplings with a diameter of 2 3/8" – 13 3/8" and a maximum length of 400 mm (16 in)
- + Production of all standard and company-specific thread types is possible



**MAXIMUM
FLEXIBILITY
THANKS TO
OPTIONAL
TOOL
CHANGE**

CHARACTERISTIC CURVES

The characteristic curves and operating points show the torque, including the reluctance moment, that can be achieved.



ON MODULAR MACHINES



THE BENEFITS

- + Small footprint (chaku-chaku or close linear arrangement) = Reduced floor space costs, several possibilities for the machine layout
- + Possibility of simple linking via central feeding and discharge belts and pick-and-place unit / changer = Flexible for future developments, lower automation costs, and shorter tooling times
- + Integrated automation = No additional costs (interfaces, etc.)
- + Reduced idle times thanks to short transport distances
- + Common parts strategy, standard spare parts warehousing = Lower maintenance costs
- + Ease of operation (extremely accessible machining area) = Quicker machine set-up
- + High energy efficiency = Reduction in energy costs

TECHNICAL DATA

Chuck diameter (cutting circle)	550 (650) mm 22 (26) inch
Workpiece weight, max.	120 kg 265 lb
Max. turning diameter	60.5 / 244.5 mm 3 / 10 inch
X-axis / Z-axis travel	1,155 / 590 mm 46 / 23 inch
Main spindle	
» Spindle flange to DIN 55 026	Size A11
» Spindle bearing	190 mm 8 inch
Main drive unit	
» Max. power, 100% duty cycle	99 / 86 kW 133 / 115 hp
» Max. torque, 100% duty cycle	2,700 / 2,000 Nm 1,991 / 1,475 ft-lb
» Full power at spindle speed of	400 rpm
» Max. number of revolutions	1,250 rpm
Feed drive	
» Rapid-traverse rate, X / Z	60 / 30 m/min 2,363 / 1,181 ipm
» Feed force, X / Y (optional) / Z	12 / 12 / 20 kN 2,698 / 2,698 / 4,496 lbf
» Ball screw dia. X / Z	50 / 50 mm 2 / 2 inch
Disk-type turret	
» Tool connection	C8 / VDI 60
» Turret tool positions	8
» Width across flats	440 mm 18 inch
» Cutting circle	1,000 mm 40 inch

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