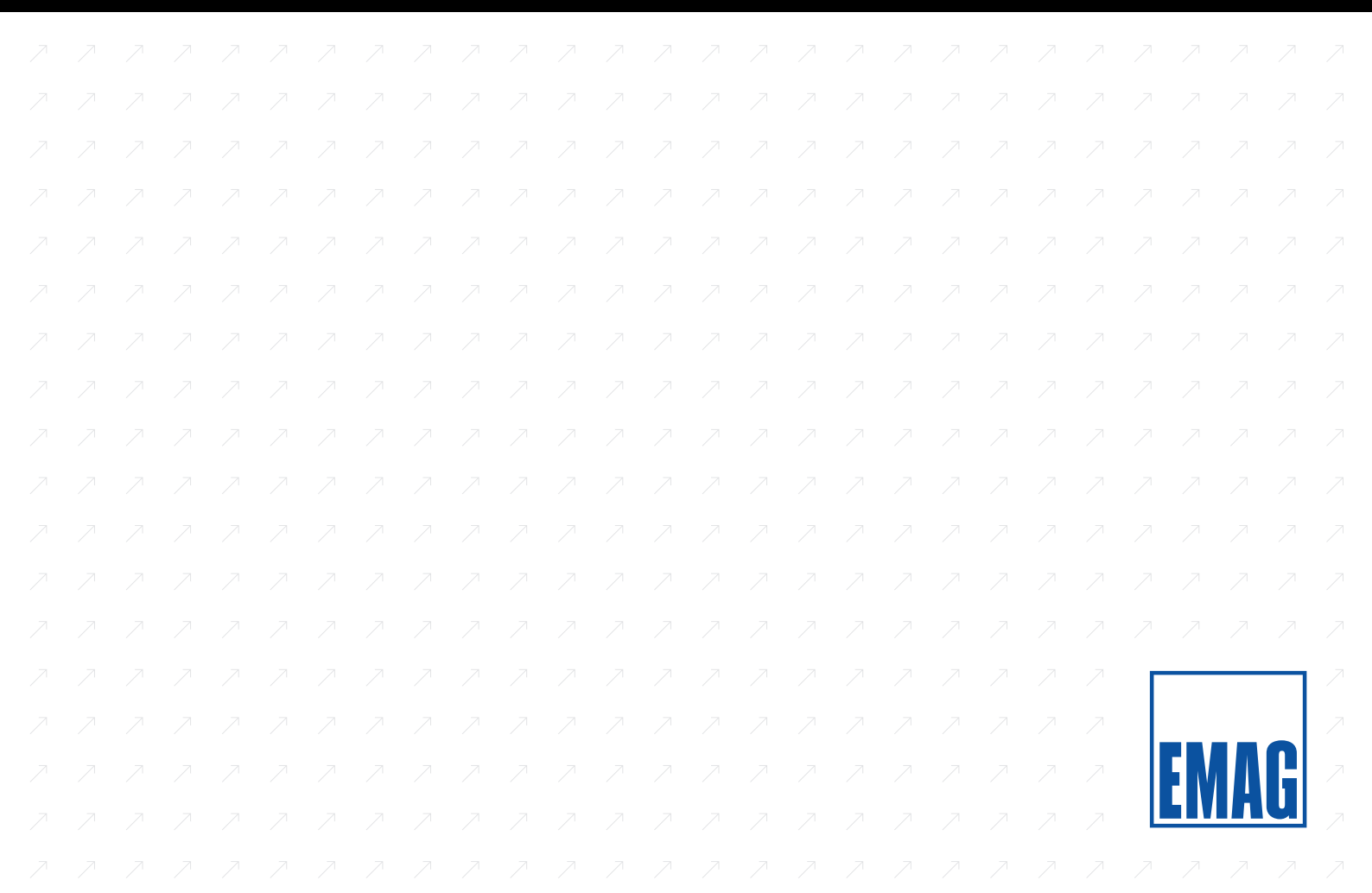
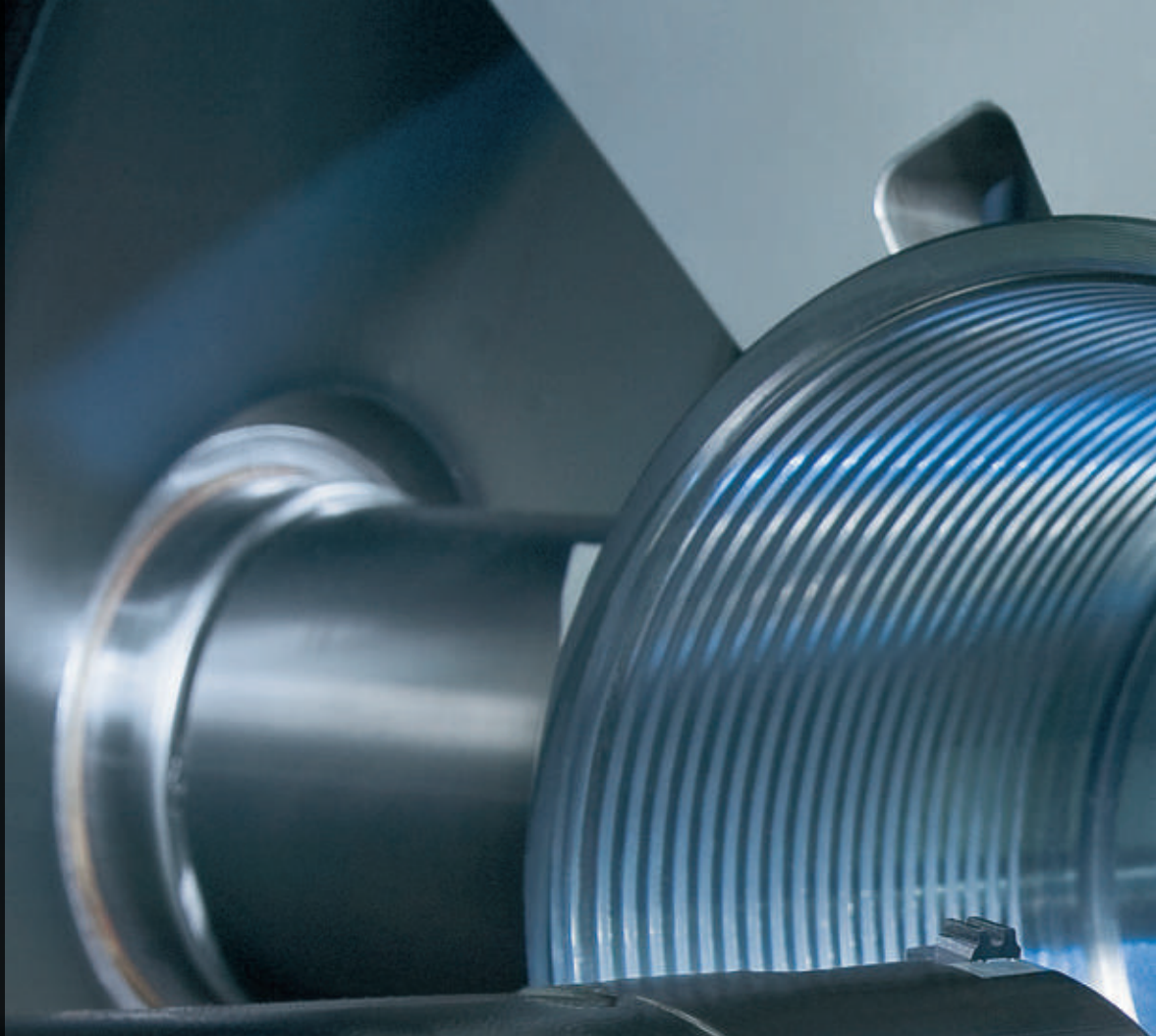


Oil Field Technology
and Vehicular Hydraulics
USC 21
USC 27



The USC 21 machine series for tube end machining and the USC 27 center drive lathe for the machining of couplings and tool joints offer customized solutions for the production of all types of thread. In fact, these state-of-the-art machine tools are capable of producing all the threads on OCTG components, whether they are international (API, GOST) or a proprietary thread.



U S C





TUBE AND COUPLING MACHINING CENTERS



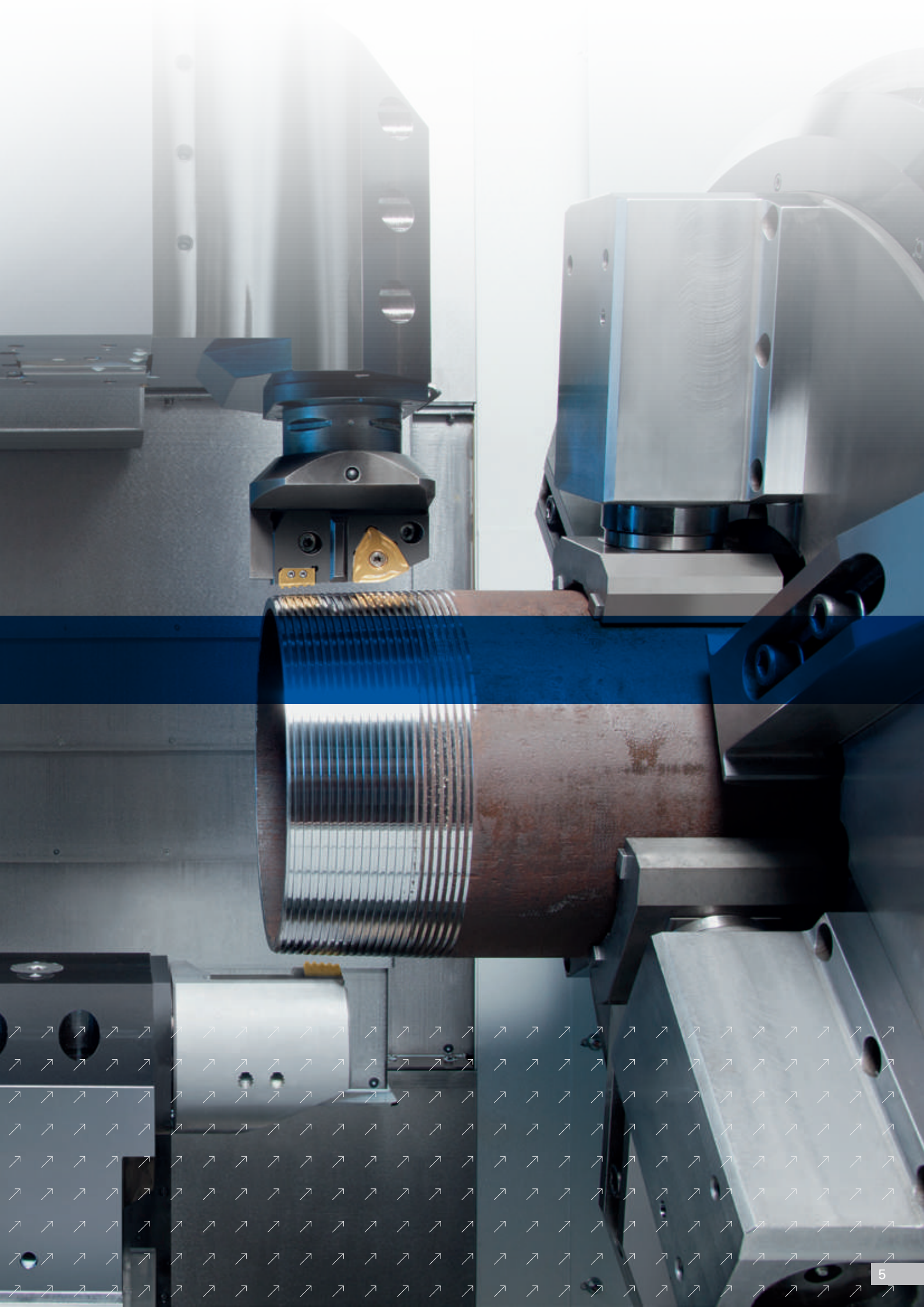
USC 21 – For the Flexible Machining of Tube Ends

The USC series' most distinctive feature is its rigid machine construction. All machine modules are very stable, right down to the MINERALIT® polymer concrete machine base. External as well as all internal machining operations can be performed on a single machine. This machine concept is designed for the complete-machining of all popular threads, API and GOST standard and of all proprietary threads, including integral joints.

The main drive of the tube machining center is an important part of the spindle unit and guarantees high power and torque ratings. The direct drive consists of a highly dynamic, frequency controlled, maintenance-free AC asynchronous spindle motor. The tubes are safely clamped in pneumatically, hydraulically or mechanically operated front- and rear-end chucks.

U S C 2 1

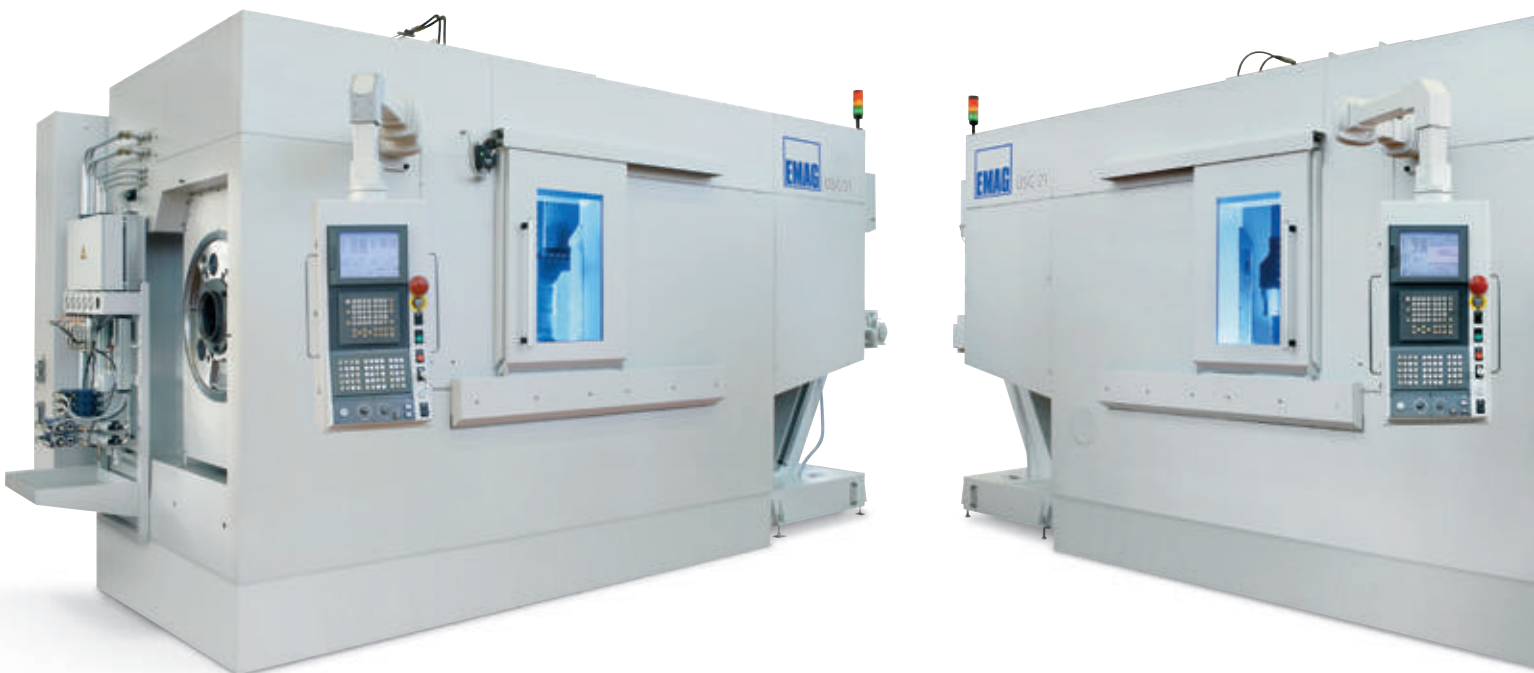




This high-precision production equipment includes two of the newest generation flat-bed turrets, each travelling on their own compound slide. Each turret features four tool stations that can be equipped with a variety of tooling systems. The change holders in the turret accommodate external and internal turning tools. The vertical design of the machine base and a generously dimensioned chip conveyor guarantee unobstructed chip flow.

- The tubes external or internal diameters are aligned using a centering attachment.
- During machining, the inside of the tube is sealed against the opening to chips and coolant.
- Fixed or detachable damping mandrels for the machining of thin-walled tubes are available as options.
- Centering attachment, damping mandrel and tube stop are mounted on separate axes on the machine base.

U S C 2 1





Machining of Tubes on USC 21

	USC 21 190	USC 21 260	USC 21 290	USC 21 450	USC 21 560
Nominal diameter	2 3/8" – 7"	2 3/8" – 9 5/8"	4 1/2" – 10 3/4"	5 1/2" – 16"	9 5/8" – 20"



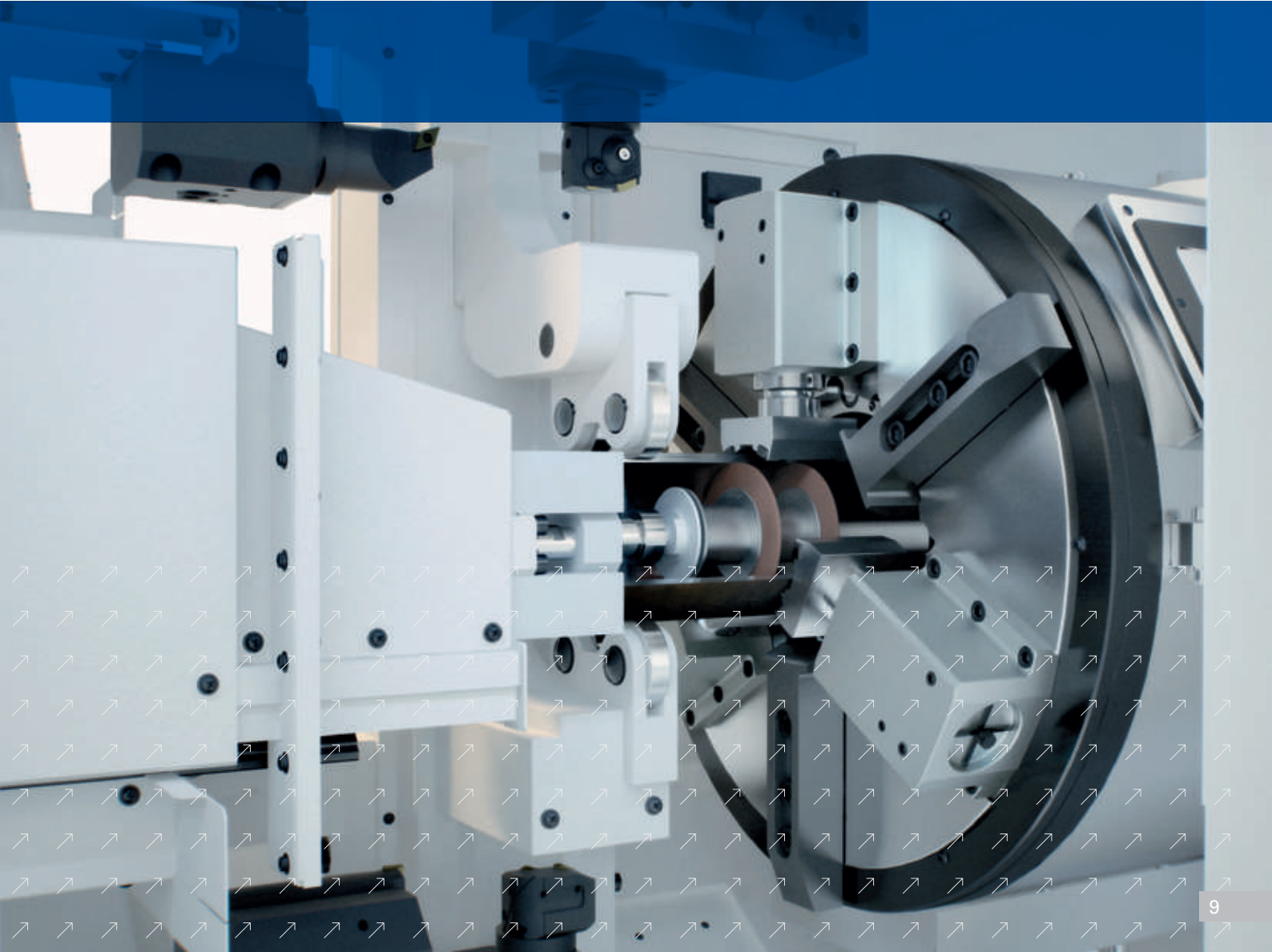
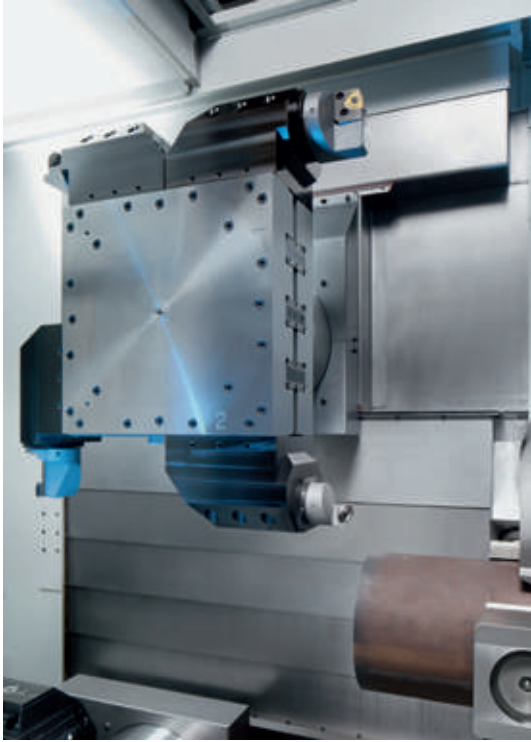
A Special Machine with a High Degree of Flexibility

The concept of the USC 21 is designed for the machining of pipe ends. It combines all the features that are responsible for quality, durability and productivity, with flexibility that covers all the applications for standard and premium threads. With the choice of five spindle sizes, all pipe diameters ranging from 2 3/8" to 20" can be machined with the best technological and customized conditions. The USC 21 series is modular and can be executed as a two-axis-, four-axis and six-axis-machine concept. Separate axes accommodate the unit for external and internal centering, the tube stop, and the setting unit for the removable plug. For integration into the

overall process there is a left and right version available, as well as varying control systems. The USCs are designed for API and GOST-threading and really show their strengths in premium connection machining. In addition, copy-plan-and bevel-processing applications are as important as the processing of hydraulic cylinders and pistons.

U S C 2 1





The USC 27 Coupling Machining Center

The center drive machine, USC 27, stands for efficiency. It impresses with its capability to simultaneously complete machine both sides of couplings and tool joints with international threads like API and GOST or threads of proprietary standard. The USC 27's machine base is made with the high-quality MINERALIT® polymer concrete, a material that has an outstanding damping quality.

The EMAG four-station flat-bed turrets are mounted on the cross slides to the right and left of the center drive headstock. The rapid traverse speeds of the cross slides and the automatic workhandling system minimize idle times. Rapid-reaction, frequency-controlled, maintenance-free AC motors and high-precision ground ball screws control the movement of the cross slides on the linear guideways.

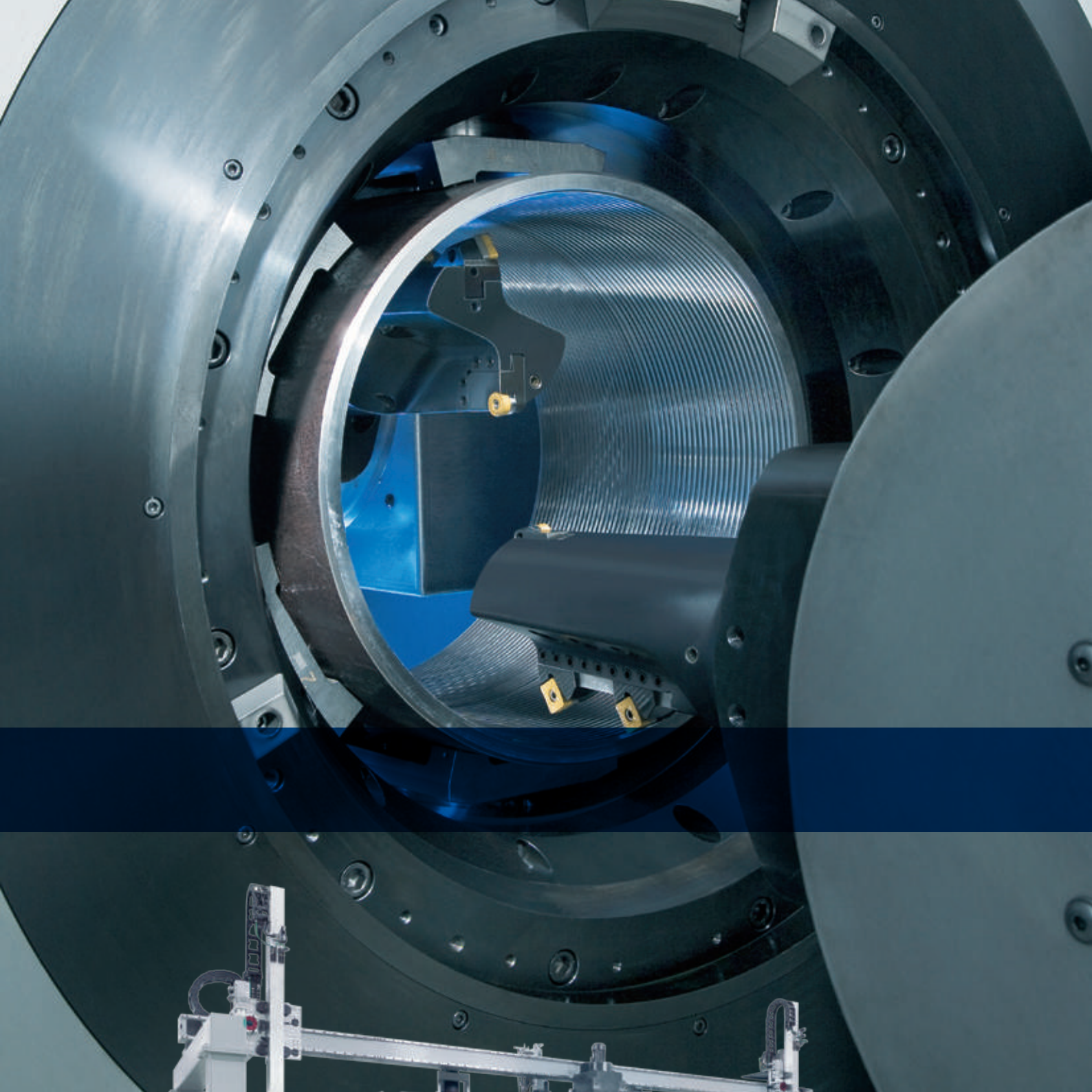
U S C 2 7

The center drive headstock with integral clamping system features three centrally clamping and three compensatory internal jaws. It is also possible to program a clamping pressure adjustment during machining. The main drive consists of a highly dynamic, frequency-controlled, maintenance-free AC asynchronous spindle motor flanged to the spindle unit.

Machining of Couplings and Tool Joints on the USC 27

	USC 27	USC 27
	290	380
Nominal Diameter	4 ½" – 9 ⅝"	5 ½" – 13 ⅜"





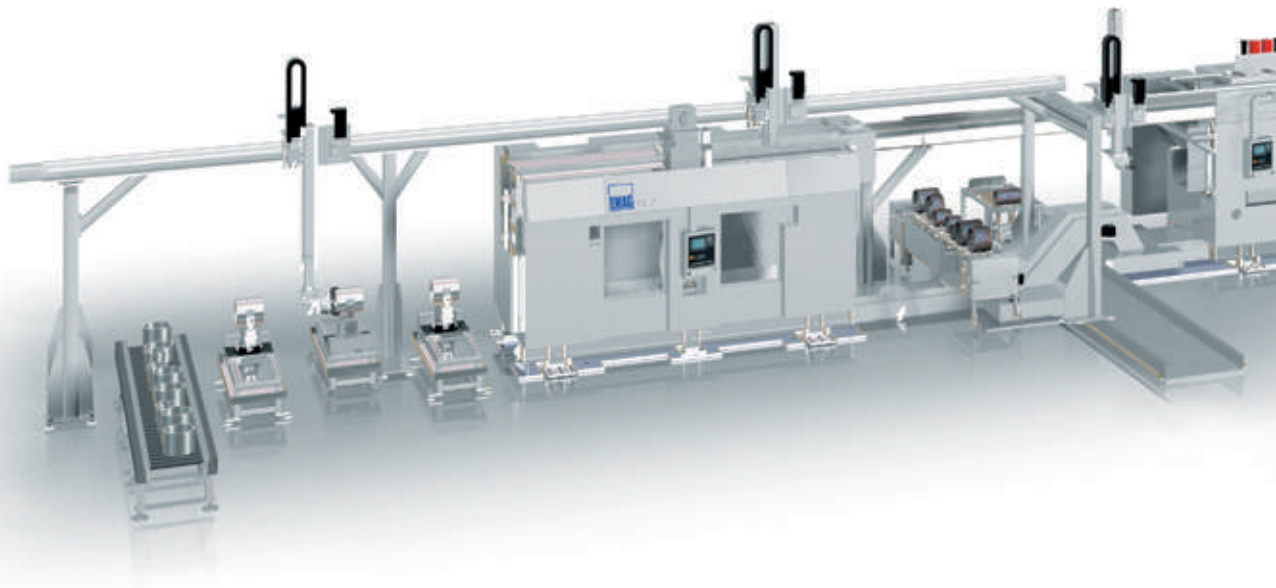
Automated Coupling Production Line with USC 21 and USC 27

With the USC 21 and USC 27, EMAG offers complete systems for the production of couplings:

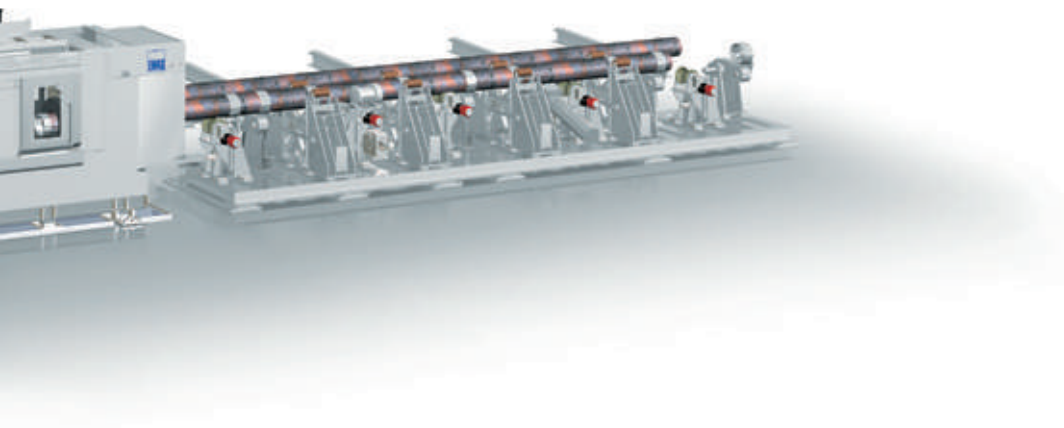
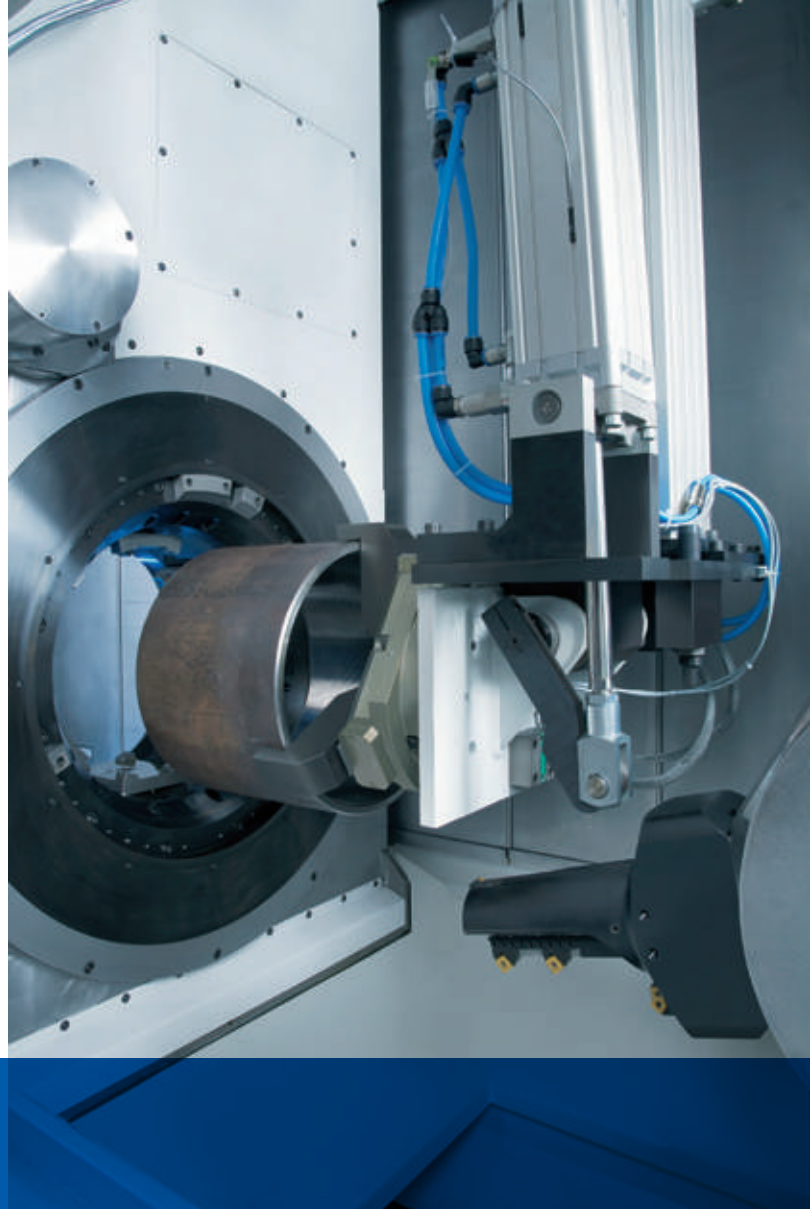
- Turnkey solutions, e.g. all technology, automation and production processes from a single source
- Centralized project management: Only one contact for the customer
- Faster start-up through optimized interfacing
- Maintenance-friendly, with the same components used on all machines
- Optimized overall process, where manufacturing systems and peripherals are an optimal match

The advantage of this system over systems that include sawing machines is the amount of money you save on saw blades. With EMAG production lines the couplings are cut with tool inserts that are inexpensive and easy to change. Also, the pre-machining of internal contours, faces and bevels in the first machining cycle reduces the overall machining time of the thread-cutting machine for the couplings. This means that it only has to complete the quality-defining finish-machining operation.

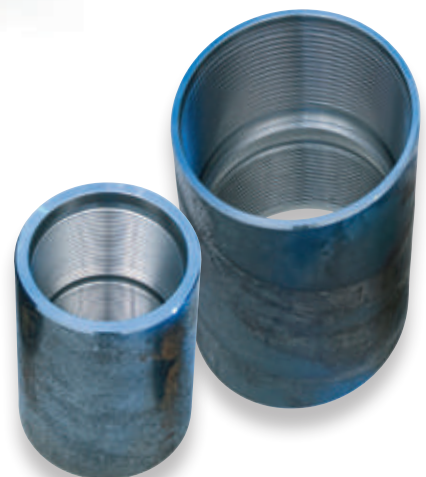
U S C 2 1
U S C 2 7



This leads to a saving in throughput time of 30 – 50%, depending on the type of coupling, the thread contour and the material.



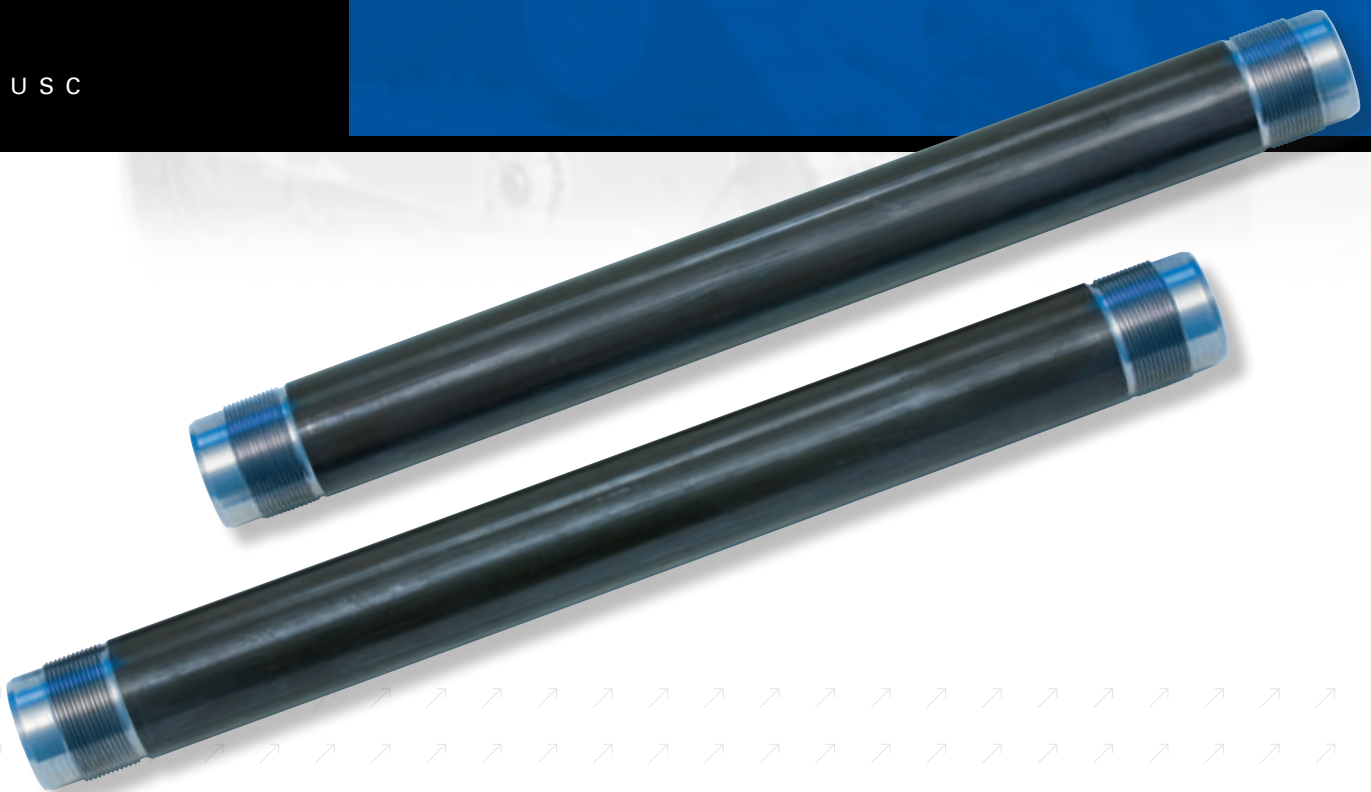
Machining of couplings with a nominal diameter of 5 1/8" to 13 3/8" on a USC 21 and a USC 27



Components for Vehicular Hydraulics made on USC Machines

The USC 21 concept is perfect for the production of vehicular hydraulic components. Everything can be done with minimal setting efforts and with the best quality and productivity levels. The flexible workhandling equipment is designed to order and can be fully automated. Transport and machine systems adapt themselves to the various workpiece dimensions without having to be reset.

U S C



Machines and Complete Manufacturing Systems from a Single Source

EMAG can look back on the many years of experience in the machining of oil field components (Oil Country Tubular Goods – OCTG). Nowadays, production plants, or finishing lines, for the machining of tubes, couplings, tool joints and caps cover a multitude of manufacturing processes. Besides CNC threading machines the machinery includes automatic mandrel testing stations, magnetic crack detectors, coupling assembly lines, thread protection and nipple assembly points, automatic test presses, coating plants, length meters, weighing stations, embossing stations, band markers, tube bundling facilities and – last but by no means least – the

component monitoring system. The experience gained with the worldwide supply and commissioning of over 300 tube machining systems and over 400 coupling machining systems speaks for itself.

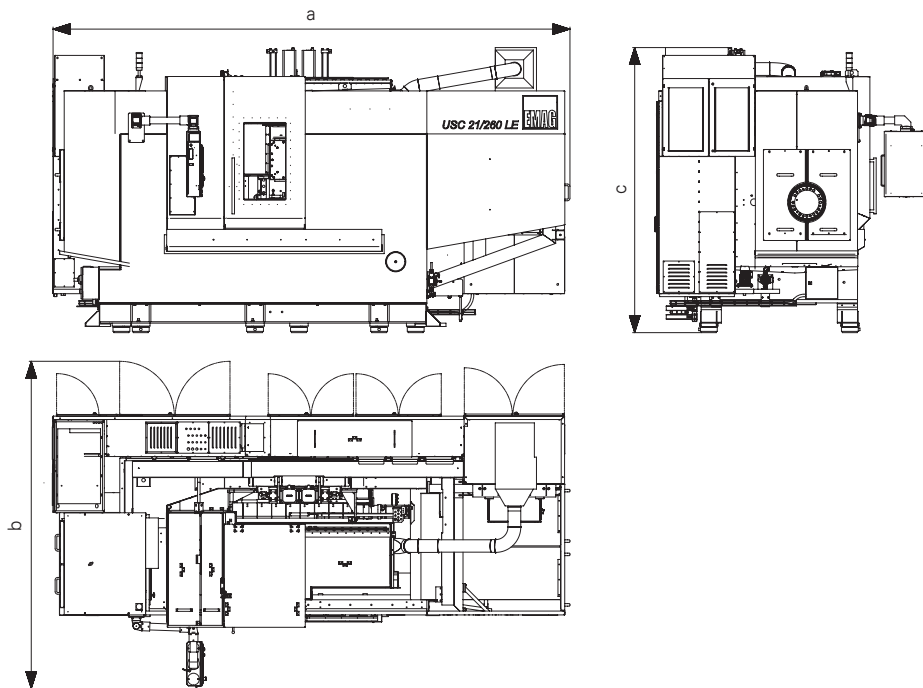


Technical Data

Capacity		USC 21 190	USC 21 260	USC 21 290	USC 21 450	USC 21 560
Clamping range	Inch	2 3/8 – 7	2 3/8 – 9 5/8	4 1/2 – 10 3/4	5 1/2 – 16	9 3/8 – 20
X-axis travel	mm	350	350	350	350	350
	in	14	14	14	14	14
Z-axis travel	mm	600	600	600	600	600
	in	24	24	24	24	24
Center height	mm	1,550	1,550	1,550	1,550	1,550
	in	61	61	61	61	61
Main Spindle						
Spindle bore	mm	190	260	290	450	560
	in	8	11	12	18	22
Spindle speed with chuck, max.	rpm	1,400	1,300	1,300	600	350
Main Drive						
AC motor S1 (at 100% duty cycle)	kW	76	76	120	120	150
	hp	102	102	161	161	201
Full power at a spindle speed of	rpm	500	500	430	230	100
Torque S1 (at 100% duty cycle)	Nm	1,450	1,450	2,665	4,980	14,325
	ft-lb	1,069	1,069	1,966	3,673	10,566
Feed Drive						
Rapid traverse speed X	m/min	30	30	30	30	30
	ipm	1,181	1,181	1,181	1,181	1,181
Rapid traverse speed Z	m/min	30	30	30	30	30
	ipm	1,181	1,181	1,181	1,181	1,181
Ball screw dia. in X and Z	mm	50	50	50	50	50
	in	2	2	2	2	2
Power rating, max, at 100%, for X and Z	kW	5.8	5.8	5.8	5.8	5.8
	hp	8	8	8	8	8
Feed force at 100%	kN	10	10	10	10	10
	lbf	2,248	2,248	2,248	2,248	2,248
Torque at 100%, for X and Z	Nm	18.5	18.5	18.5	18.5	18.5
	ft-lb	14	14	14	14	14
Table-Type Turret						
Quantity	Qty	2	2	2	2	2
Number of tools		4 – 8	4 – 8	4 – 8	4 – 8	4 – 8
Size, width across flats	mm	460	460	460	460	460
	in	19	19	19	19	19
Electrical Equipment						
Operating voltage	V	380 – 460	380 – 460	380 – 460	380 – 460	380 – 460
Control voltage, DC	V	24	24	24	24	24
Control voltage, AC	V	230	230	230	230	230
Frequency	Hz	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Power consumption	kVA	200	200	300	300	320
Nominal power	kVA	105	105	160	160	220
Supply line fuse	A	260	260	500	500	630
Electrics to VDE 0113						

Dimensions and Weights		USC 21 190	USC 21 260	USC 21 290	USC 21 450	USC 21 560
Length a	mm	6,200	6,200	6,500	6,500	6,800
	in	245	245	256	256	268
Width b	mm	3,870	3,870	3,870	3,870	3,870
	in	153	153	153	153	153
Height c	mm	3,400	3,400	3,400	3,400	3,400
	in	134	134	134	134	134
Weight	kg	28,000	28,500	28,500	29,000	31,000
	lb	61,729	62,831	62,831	63,934	68,343

Floor Plan USC 21



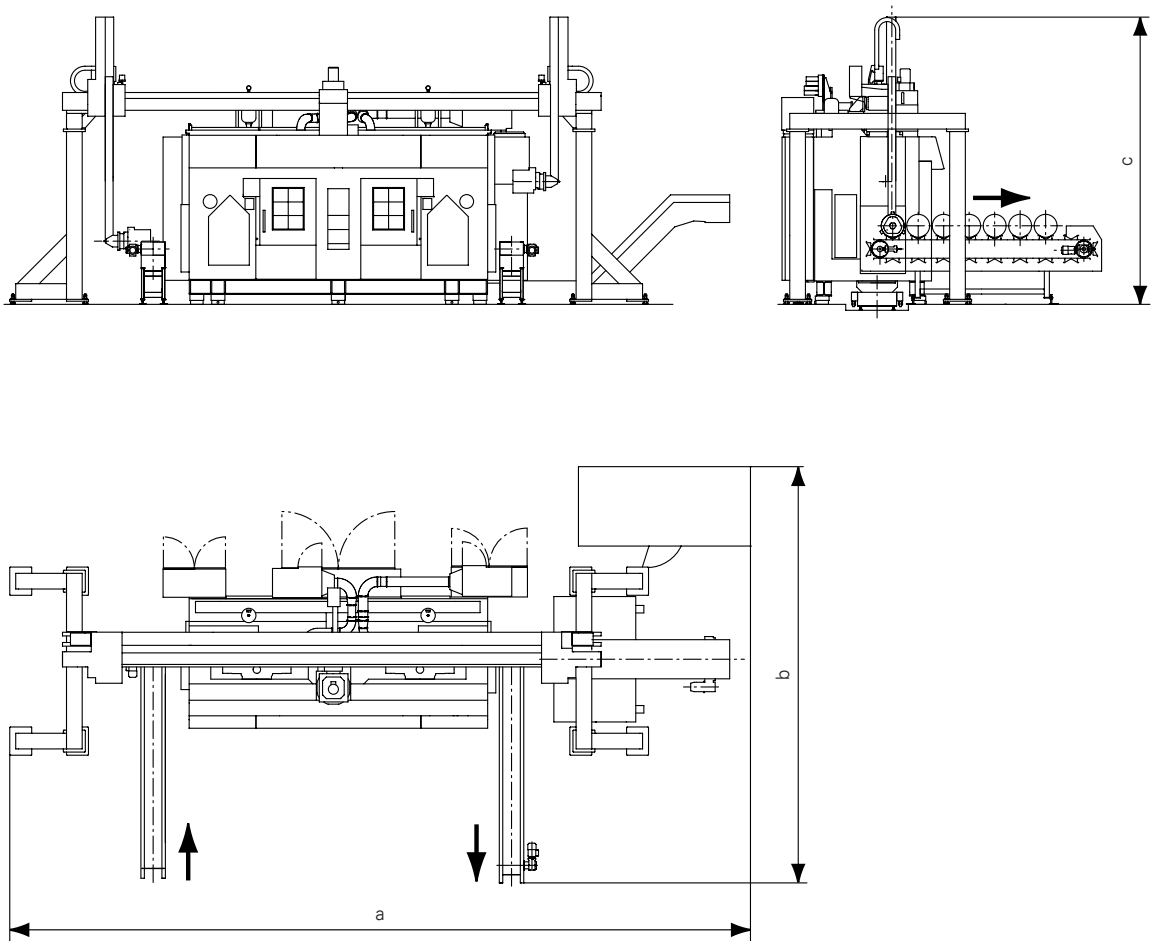
Technical Data

Capacity		USC 27 290	USC 27 380
Clamping diameter	mm in	290 12	380 15
Nominal diameter	Inch	4 ½ – 9 ⅝	5 ½ – 13 ⅜
X-axis travel	mm in	300 12	300 12
Z-axis travel	mm in	800 32	800 32
Workpiece length, max.	mm in	350 14	350 14
Center height	mm in	1,168 46	1,168 46
Main Spindle			
Chuck diameter, max.	mm in	380 15	450 18
Speed, max.	rpm	800	500
Main Drive			
AC motor S1 (at 100% duty cycle)	kW hp	130 174	100 134
Full power at a spindle speed of	rpm	273	167
Torque, max.	Nm ft-lb	4,500 3,319	7,400 5,458
Feed Drive			
Rapid traverse speed X	m/min ipm	30 1,181	30 1,181
Rapid traverse speed Z	m/min ipm	30 1,181	30 1,181
Ball screw dia. in X and Z	mm in	50 2	50 2
Power rating, max, at 100%, for X and Z	kW hp	7 9	7 9
Feed force at 100%	kN lbf	14 3,147	14 3,147
Torque at 100%, for X and Z	Nm ft-lb	22 16	22 16
Table-Type Turret			
Quantity	Qty	2	2
Size, width across flats	mm in	510 21	510 21
Electrical Equipment			
Operating voltage	V	380 – 460	380 – 460
Control voltage, DC	V	24	24
Control voltage, AC	V	230	230
Frequency	Hz	50 / 60	50 / 60
Power consumption	kVA	210	210
Supply line fuse	A	500	500
Electrics to VDE 0113			

Dimensions and Weights

		USC 27 290	USC 27 380
Length a	mm in	11,820 466	11,820 466
Width b	mm in	6,800 268	6,800 268
Height c	mm in	4,580 181	4,580 181
Weight	kg lb	29,000 63,934	29,000 63,934

Floor Plan USC 27



Subject to technical changes

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