Special KOVOSVIT MAS – SPH 50 lathes are used to machine axles at BONATRANS GROUP the leading European supplier of railway wheelset.

KOVOSVIT MAS
machine your future

A total of nine machines for machining railway axles have been sold to the firm Bonatrans Group a.s Czech Republic. All the tailor-made machines were handed over to Bonatrans, including machining technology. This technology was designed by engineers of the company KOVOSVIT MAS and this method of machining with minor changes and based on the use of new productive tools is used up to today.

The first machine from KOVOSVIT MAS for machining axles - SPU 40 CNC/2+2 /2500 was sold to BONATRANS under the name 'Railway Wheelsets' and was commissioned in 1997. This machine was used as the substitute for completing railway axles for the MAS series SP12 and was based on machines from the 1970s. Because of their good experience with this machine, BONATRANS again approached the suppliers of KOVOSVIT MAS for special SPH 50 CNC lathes for roughing and SPH 50D CNC for finishing railway axles.

A total of three roughing and three finishing machines were delivered to BONATRANS. Later, BONATRANS purchased two KOVOSVIT MAS special machines for deep rolling of axles – ROLLER 2800 CNC. The special ROLLER 2800 CNC machine using cold forming technology with power up to 50 kN, is designed for deep rolling of cylindrical, conical and transient surfaces of axles. The rolling support of the machine has a pair of cylindrical heads that can be tilted ± 35°. The machine is equipped with the SIEMENS 840D system. Using this operation and this machine, the roughness of the surface of the axle can be improved and the strength of the surface layers increased, i.e. increased resistance to corrosion and decreased surface cracks (and defects in the axle) with material savings of approximately 8%. This machine and technology can be used for all parts requiring exact but easy assembly and dismantling (shafts, axes, axles, seating area of bearings, etc.)

BONATRANS uses SPH 50 CNC roughing machines, to rough wagon and engine axles with tolerance for finishing of approximately 2 mm. The semi products of forgings are clamped by a special clamping device from the company FORKARDT. During the high peripheral run-out of the forgings, the depth of the cut can be up to 18 mm. With the main 100 kW drive this is no problem. When taking chips the cutting liquid becomes very hot - therefore the machine has additional large tanks for cooling the cutting liquid. CNC roughing machines have two 8-position turrets with direct tool clamping. Standard axles of Czech Railways take approximately 12 minutes to be machined, without clamping.

SPH 50D CNC finishing machines are used for machining axles after roughing and face machining on milling machines. The axle is clamped during finishing in special clamping devices with a firm pin of our own design and production. The depth of the cut is approximately 2 mm. SPH 50D CNC finishing machines have two 12-position turrets that can be equipped with driven tools. Using special driven holders machining is carried out by drilling the flange on Pendolino type axles. BONATRANS uses the clamping KM system from the company Kennametal for finishing axles - for fast replacement of tools. The finishing time for standard axles (of Czech Railways) is approximately 12 minutes without clamping.

Both types of SPH 50 machines have PROMETEC monitoring device, which monitors the collision statuses of the machine when machining. BONATRANS uses KOVOSVIT MAS machines in a three shift non-stop operation.

BASIC PARAMETERS OF SPH 50 MACHINES		SPH 50	SPH 50 D	SPH 50 DS
Number of linearly controlled axes			5 (2+2+1)	
CNC control system			SIEMENS 840 D	
Working range:				
Swing over bed	mm		760	
Swing over bed - option	mm		910	
Max. diameter of turning by right/left support	mm	530 / 530	530 / 400	530 / 400
Maximum turning length	mm	3.000	2.800	2.700
Working spindle:				
Spindle output	kW	100	60	28
Spindle torque	Nm	4400	1700	1.680
Spindle speed	min^{-1}	20 to 2.100	20 to 2.800	20 to 2.800
Dimensions of the machine				
length × width × height (including chip conveyer)	mm	8.100 × 3.435 × 2.286	8.124 × 3.435 × 2.230	8.124 × 3.435 × 2.230
Weight of the machine	kg	approximately 27.000	approximately 26.000	approximately 26.000