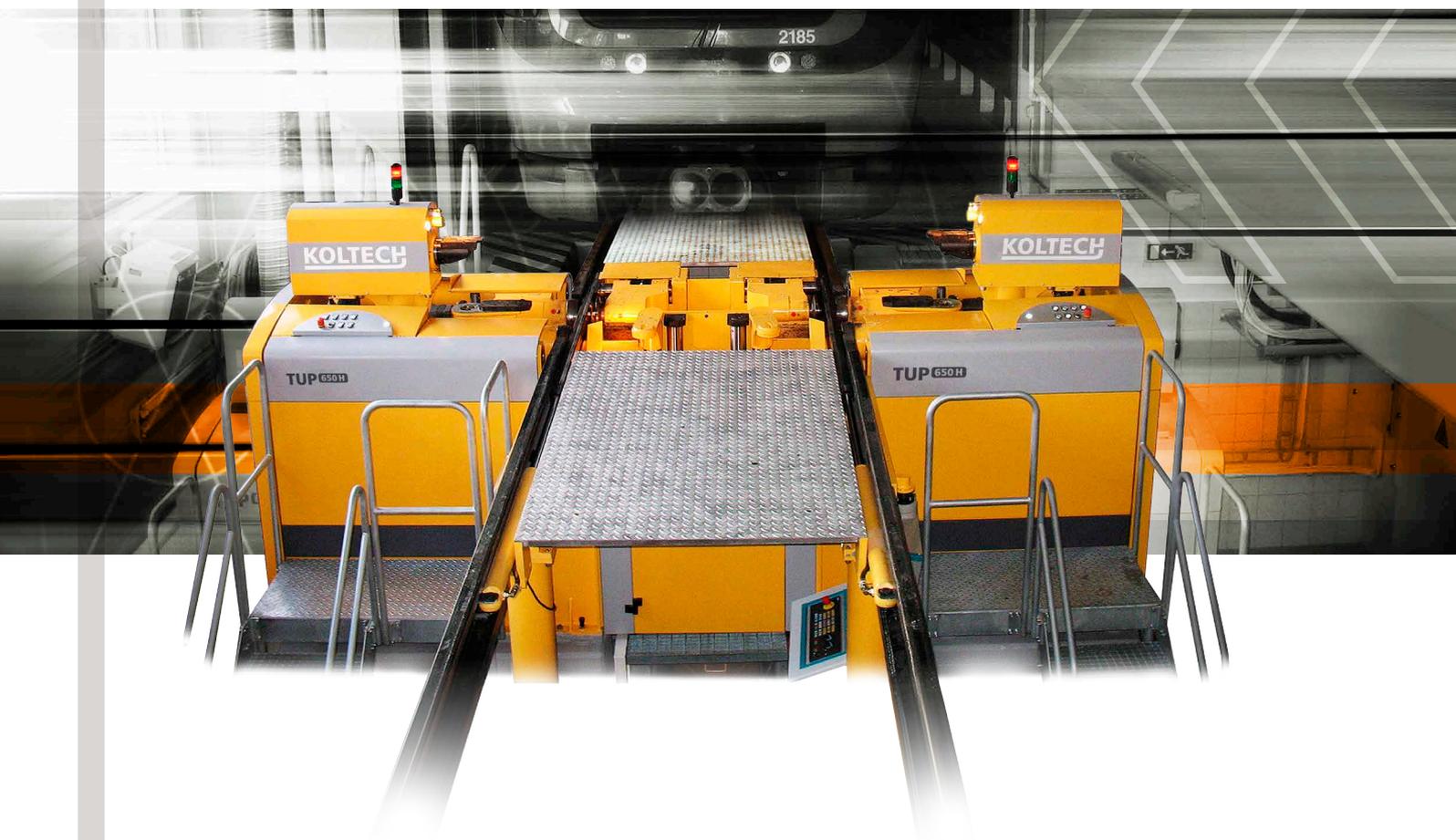


Product line of
Underfloor Wheel Lathes >>

TUP 650/H/SH



easy to learn,
easy to use,
easy to maintain...

KOLTECH

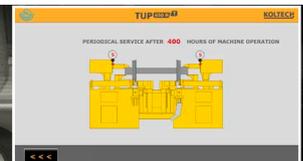
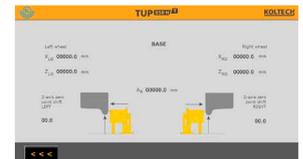
Application

The underfloor wheel lathes types **TUP650**, **TUP650H**, **TUP650SH** are designed for reconditioning of wheel profiles of all ranges of rail vehicles.

- **TUP650** lathe is designed for light rail vehicles like tramways where axle load does not exceed 10 000 daN.
- **TUP650H** lathe is for e.g. traction units of subways where axle load does not exceed 18 000 daN.
- **TUP650SH** lathe is for railway applications where axle load does not exceed 30 000 daN (with an option up to 40 000 daN).

The machining process is carried out without the necessity of dismantling the wheelsets from vehicle.

The **TUP** lathes are also able to machine individual wheelsets and bogies dismantled from vehicles as well as coupled wheelsets, active surfaces of brake discs and wheelsets of vehicles which do not have bogies.



We offer also underground wheel machining systems as Tandem Underground Wheel Lathe machine in two models:

- **TUP650H/T** for wheelsets with maximum single axle load 18 000 daN
- **TUP650SH/T** for wheelset with maximum single axle load 30 000 daN.

The tandem machines are mainly featured by the capability to machine two wheelset of a bogie at one time. The tandem machine is composed of two single underfloor wheel lathes, the one is a fixed one while the other one is movable enabling to turn the bogies with different wheelset base.

It is worth mentioning that **TUP650** is a unique machine, designed by **KOLTECH** only for the reconditioning of wheel profiles of light rail vehicles like tramways e.g. provided with: rubber inserts or having

chassis, provided with specific design features, especially related to the construction of the motor and trailer bogies.

The above features of tramways cause that **TUP650** lathe can be adapted and orientated to the final user's satisfaction but due to its simple design, easy service and flexibility of functions, it perfectly fits our range of production.

The lathes types **TUP650/H/SH**, taking into account different designs of the rail vehicles and their bogies, can be provided for three kinds of centering:

- in centres (in case of access to centre holes of axle),
 - in inner axle box supports,
 - in outer axle box supports,
- and their variations depending on a particular type of an under-floor wheel lathe.

Modern technical solutions

In the **KOLTECH**-tailored underfloor wheel lathes **TUP**, modern technical solutions are applied, worked out during years of practice in design and production of this kind of wheel lathes. Some of them are listed below:

- Application of **CNC control system SINUMERIK 840D SL, SIEMENS** manufacturer,
- Input-Output System (PLC) based **PROFIBUS** solution, thus reducing the volume of standard wiring by almost 50%,
- Connection of the machine to the external computer network and transmission of control system data to the external data base,

- Simple and efficient dialogue between the operator and the machine by means of operator's touch panel of **SIEMENS** manufacture, complying to the requirements of HMI philosophy, ensuring full control over the machine, supported by visualization of technological cycles in operation,
- Application of frictionless linear guideways with needle bearing cages for saddle and slide travels, designed especially for solutions, featured by heavy loads – the guideways are greased practically for life,
- Application of Adaptive Control function (AC) allowing the operator for reducing the rough machining time even by 30%. This function is activated manually by the pushbutton on the control panel depending on the degree of machining difficulty.



- Simple design of driving mechanisms and systems eliminate the need of the use of built up kinematic chains,
- Application of measuring heads for:
 - » positioning of saddles in relation to wheels of the same axle,
 - » measurement of wheel tread diameter,
 - » measurement of height and thickness of flange,
 - » measurement of radial and axial run out,
 - » measurement of wheel back to back distance,
 - » wear measurement and optimization of cutting depth.

Technical specification

» Geometry of wheelsets:	TUP650	TUP650H	TUP650SH
Track gauge standard or according to Customer's need	1435 mm		
Wheel tread diameter: min-max	520-1000 mm*	500-1250 mm*	600-1400 mm*
Width of wheel tyre	80-120 mm	100-145 mm	110-150 mm
Max load on single axle	10 000 daN	18 000 daN	30 000 daN/40 000 daN
» Technical parameters of machine:			
Infinitely variable cutting speed	40-110 m/min	0-130 m/min	0-120 m/m
Main drive motor power	28 kW	4x9 kW	4x15 kW
Total installed power	60 kW**	80 kW**	110 kW**
Rapid travel speed of saddles	1-4500 mm/min		
Range of working feeds	0,1-1,0 mm/rev	0,1-2,0 mm/rev	0,1-2,5 mm/rev
Max. cross-section of cutting layer per side	3 mm ²	6 mm ²	10 mm ²
» Achieved machining accuracy:			
Radial run out	≤ 0,10 mm***		
Axial run out	≤ 0,30 mm***		
Accuracy of profile representation	≤ 0,20 mm		
Difference of wheel diameters of single axle	≤ 0,10 mm***		
Difference of wheel diameters of single bogie	≤ 0,30 mm***		
Roughness of surface Ra	≤ 12 μm		
» Overall dimensions and weight:			
Height	ca 1500 mm		ca 2360 mm
Width	ca 1300 mm		ca 1530 mm
Length	ca 4400 mm		ca 4900 mm
Approx.occupied area for the machine	7000 x 6500 mm	7000 x 6500 mm	11500 x 8500 mm
Total weight	ca 10 000 kG	ca 12 000 kG	ca 20 000 kG

* In some cases a detailed analysis needed (minimum diameter depends on the bogie construction and used particular elements)

** Depends on the installed optional equipment

*** It will be increased by 0,3 mm in case of resilient wheels

- ISO 9001: 2015
- ISO 14001: 2015
- ISO 45001: 2018



Standard Equipment

- SIEMENS CNC SYSTEM SINUMERIK 840D SL and operator's touch panel,
- Main drive AC motors of SIEMENS manufacture with planetary transmissions
- Feed drive motors, infinitely variable with control units,
- Control cabinet with apparatus,
- Machining program for one wheel profile,
- Gauge and master gauge for above profile,
- Set of foundation keys and bolts,
- Saddles for turning of wheel profiles,
- Fixed and movable rails,
- Measuring heads,
- Anti slip system for driving rollers,
- Tools for final acceptance,
- Hydraulic power pack and hydraulic apparatus,
- Oil cooler,
- Swarf protecting guards and swarf chute,
- Covers, railings and balustrades,
- Holding down devices (only for TUP650H, TUP650SH),
- Software for remote service,
- Operation and Maintenance Manual,
- Diagnostics of disturbances in operation,
- Data base on machine,
- Warning and signalling system,
- Calibration wheelset,
- Data transmission system to host computer,
- Printer for printing of measured data.

Optionally the machines can be equipped with:

- toolholder for brake disc facing,
- additional machining programs,
- holding down device (only for TUP650),
- swarf disposal system (mechanical swarf conveyor, swarf crusher, two swarf bins),
- dust exhaust system,
- vehicle shunting system (rope winching device, rail shunter of other manufacture),
- device for turning the coupled wheelsets.