

KLW: SMART SOLUTIONS **FOR LOCOMOTIVE AND FREIGHT TRANSPORT**



KLW – INTERNATIONAL WHEEL BRAND

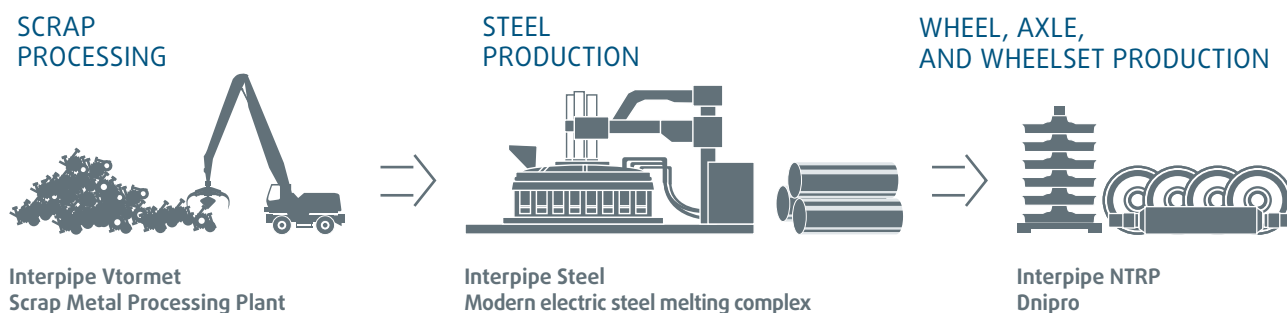
KLW IS A SINGLE BRAND OF INTERPIPE RAILWAY PRODUCTS DIVISION CONSOLIDATING SALES TO ALL STRATEGIC MARKETS.

Interpipe is a global steel pipe and railway product company and one of the largest manufacturers of solid-rolled railway wheels in the world.

The company has 80 years of experience in the production of railway wheels. KLW-branded products are manufactured at Interpipe NTRP mill (Dnipro, Ukraine).

ENTIRE PRODUCTION PROCESS IS UNDER OUR CONTROL

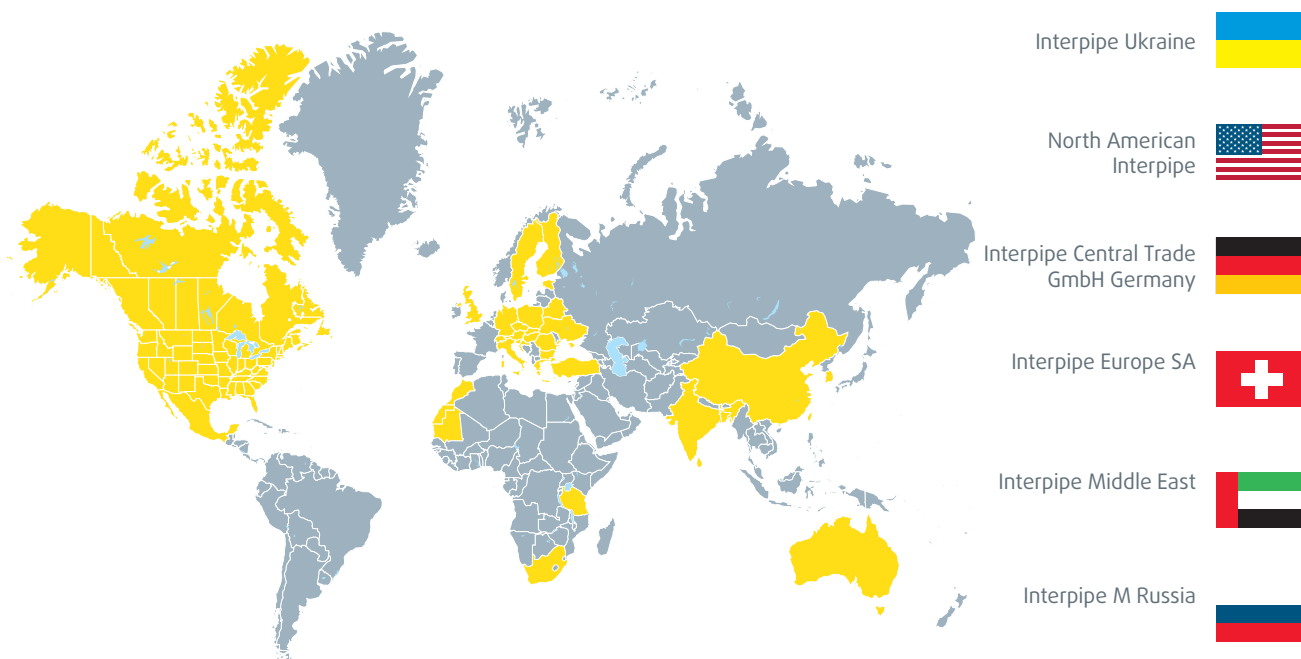
THE COMPANY'S STRUCTURE INCLUDES HIGHLY EFFICIENT METALLURGICAL MILLS. SUCH STRUCTURE ALLOWS CONTROLLING PRODUCT QUALITY AT EVERY STAGE – FROM STEEL PRODUCTION TO DELIVERY OF FINISHED PRODUCTS TO CUSTOMERS.



SELLING TO CUSTOMER GLOBALLY – KEY MARKETS

GEOGRAPHY OF THE RAILWAY PRODUCT SALES UNDER KLW BRAND COVERS MORE THAN 60 COUNTRIES WITH A NETWORK OF SALES OFFICES LOCATED AT THE KEY MARKETS.

With the development of the company, we got extensive experience in cooperation with a number of European national railway operators, railcar manufacturers, and leasing companies, including Deutsche Bahn (Germany), PKP (Poland), Touax (France), and VTG (Germany), as well as national operators and wagon manufacturers of the US, India, Australia, and the CIS.



COMMITMENT TO QUALITY CONFIRMED BY THE INTERNATIONAL CERTIFICATION

KLW IS COMMITTED TO PROVIDE THE HIGHEST QUALITY ACCORDING TO THE REQUIREMENTS OF INTERNATIONAL STANDARDS AND CUSTOMERS' SPECIFICATIONS.

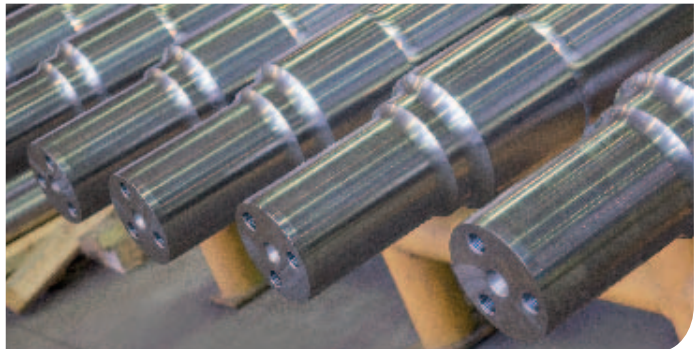
The quality management system is certified in accordance with ISO 9001, ISO/TS 22163, and AAR M-1003. The KLW railway products comply with the requirements of international and interstate standards, such as UIC 812-3 (O), DB BN 918 277, AAR M-107/M-208, GOST 10791-2011, TSI, and others.

KLW railway products correspond to individual requirements of leading railway operators in a number of European countries and other regions.



NEW PRODUCTS MEET THE REQUIREMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS

INTERPIPE NTRP STARTED TO PRODUCE RAILWAY AXLES. THE MILL GOT AN APPROVAL OF THE ASSOCIATION OF AMERICAN RAILROADS AS A MANUFACTURER OF FINISH-MACHINED RAILWAY AXLES (CLASS F).



INTERPIPE STEEL: IN-HOUSE GREENFIELD STEEL PRODUCTION

IN 2012, INTERPIPE COMMISSIONED NEW ELECTRIC STEEL MELTING COMPLEX INTERPIPE STEEL. THE CAPACITY OF THE MILL IS 1,320,000 TONS OF STEEL BILLETS ANNUALLY. TOTAL INVESTMENTS IN THE PROJECT REACHED \$700 MILLION.

INNOVATIVE DANIELI TECHNOLOGIES ON INTERPIPE STEEL

Electric arc furnace, 160 tons	Twin tank vacuum-degasser
Twin position ladle furnace	Two continuous casting machines

INTERPIPE STEEL ENSURES 100% NEEDS IN STEEL BILLETS FOR RAILWAY PRODUCTS MANUFACTURING. THE MILL HAS DEVELOPED WIDE PRODUCT PORTFOLIO OF TRANSPORT STEEL GRADES FOR CUSTOMERS OF KLV WHEELCO.

IN 2014 INTERPIPE STEEL HAS STARTED TO EXPORT STEEL BILLETS AS A FINISHED PRODUCTS. THE MAIN APPLICATIONS ARE:

- production for railway use (wheels, tyres and axles)
- production of forgings (rings, shafts, pulleys, flanges and fittings)
- tube production.



INTERPIPE NTRP: SPECIAL EQUIPMENT FOR PRODUCTION ACCORDING TO MAIN STANDARDS

THE MILL HAS BEEN MANUFACTURING RAILWAY WHEEL PRODUCTS FOR THE PAST 80 YEARS. THE PRODUCTION CAPACITY TOTALS 600,000 PIECES ANNUALLY.

FREIGHT WHEELS PRODUCTION FACILITIES AND PROCESSES:

Process	Facility
Steel mill	Electric arc furnace, ladle furnace, vacuum-degasser, steel billet continuous casting machines, special billet-cutting machines
Forging and heat treatment	Rotary-hearth furnace, MN presses, quenching machines, tempering furnaces
Wheel machining	Turning-and-boring lathes, drilling machines
Shot blasting	Pangborn shot blaster
Marking	Hilti marker, robotic marking machine
Quality control	UTS-600 machine, impact pendulum-type testing machine, universal computerized testing machine "Hydropuls Sinus 250", balancing machine, hardness testing machine
Coating	Fully automatic coating line

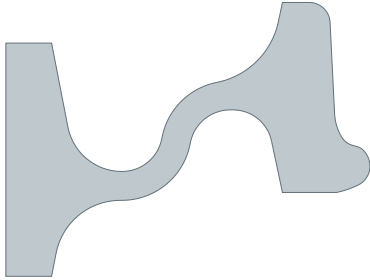
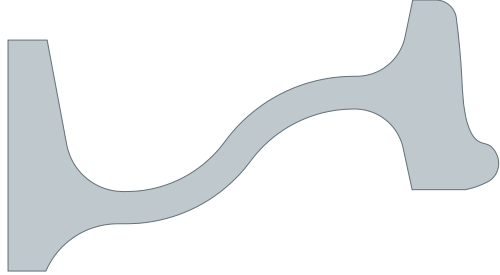
THE PRODUCT PORTFOLIO INCLUDES MORE THAN 250 TYPES OF RAILWAY WHEELS FOR LOCOMOTIVES, PASSENGER, FREIGHT WAGONS, METRO AND EMU/DMU VEHICLES.

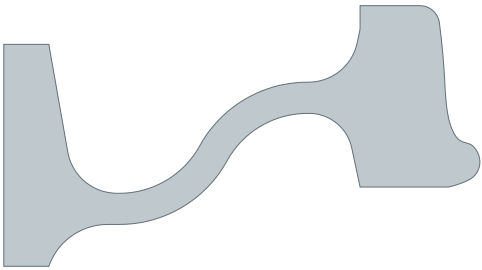
HIGH-QUALITY PRODUCTS IN ACCORDANCE WITH AAR STANDARDS

MEETING INDUSTRY REQUIREMENTS, KLW AIMS TO PROVIDE ITS CUSTOMERS WITH HIGH-QUALITY PRODUCTS AND SERVICES FOR BOTH FREIGHT AND LOCOMOTIVE VEHICLES.

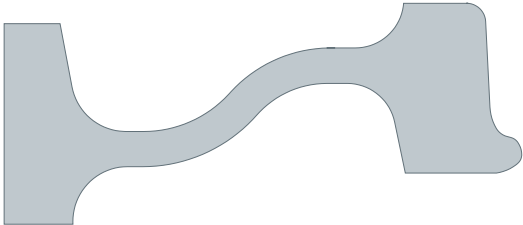
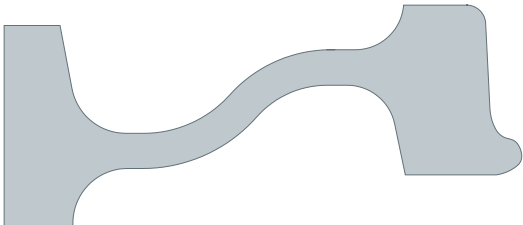
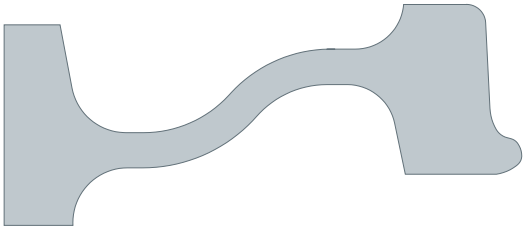
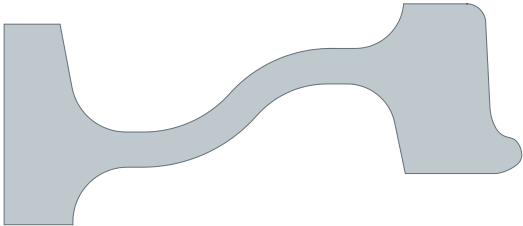
KLW ensures a high level of safety and a long life cycle of railway products in line with AAR M-107/M-108 standards. We offer wheels made of the high quality steels of A, B, C, and D grades.

WHEELS FOR FREIGHT CAR SERVICE

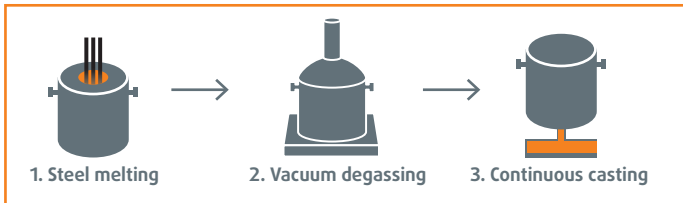
TYPE	TECHNICAL DATA	VALUE	
E-28 Drw. KP-0041-11	Axle Maximum Load Weight	65,750 lb 232 kg / 511 lb	
J-33 Drw. KP-0058-05A	Axle Maximum Load Weight	65,750 lb 292 kg / 644 lb	
P-33 Drw. KP-0022-18	Axle Maximum Load Weight	65,750 lb 348 kg / 767 lb	
H-36 Drw. KP-0055-05A	Axle Maximum Load Weight	65,750 lb 360 kg / 794 lb	
J-36 Drw. KP-0059-05A	Axle Maximum Load Weight	65,750 lb 378 kg / 833 lb	

K-36 Drw. KP-0009-16	Axle Maximum Load Weight	65,750 lb 391 kg / 862 lb	
B-38 Drw. KP-0035-11	Axle Maximum Load Weight	78,750 lb 363 kg / 800 lb	

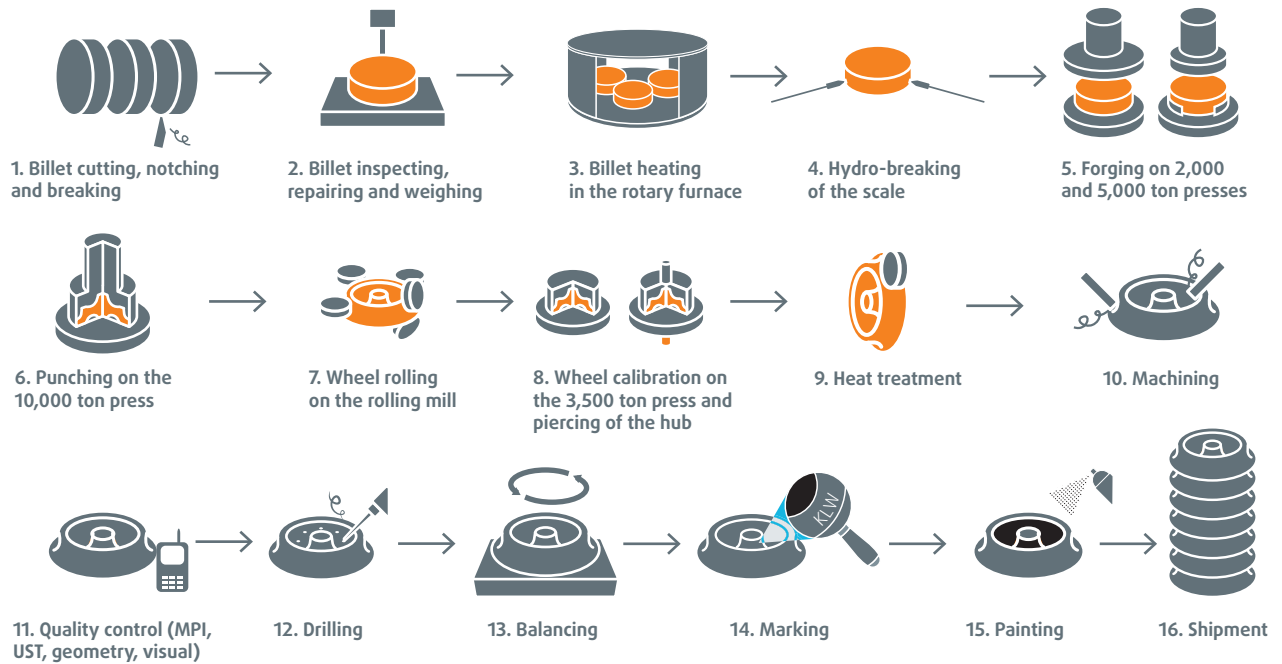
WHEELS FOR DIESEL LOCOMOTIVES

E-40 Drw. KP-0060-05A	Axle Maximum Load Weight	70,000 lb 454...467 kg / 1,000...1,030 lb	
A-41 Drw. KP-0061-05A	Axle Maximum Load Weight	70,000 lb 487...500 kg / 1,074...1,102 lb	
A-43 Drw. KP-0063-05A	Axle Maximum Load Weight	70,000 lb 530...551 kg / 1,168...1,215 lb	
D-42 Drw. KP-0062-05A	Axle Maximum Load Weight	70,000 lb 482...494 kg / 1,063...1,089 lb	

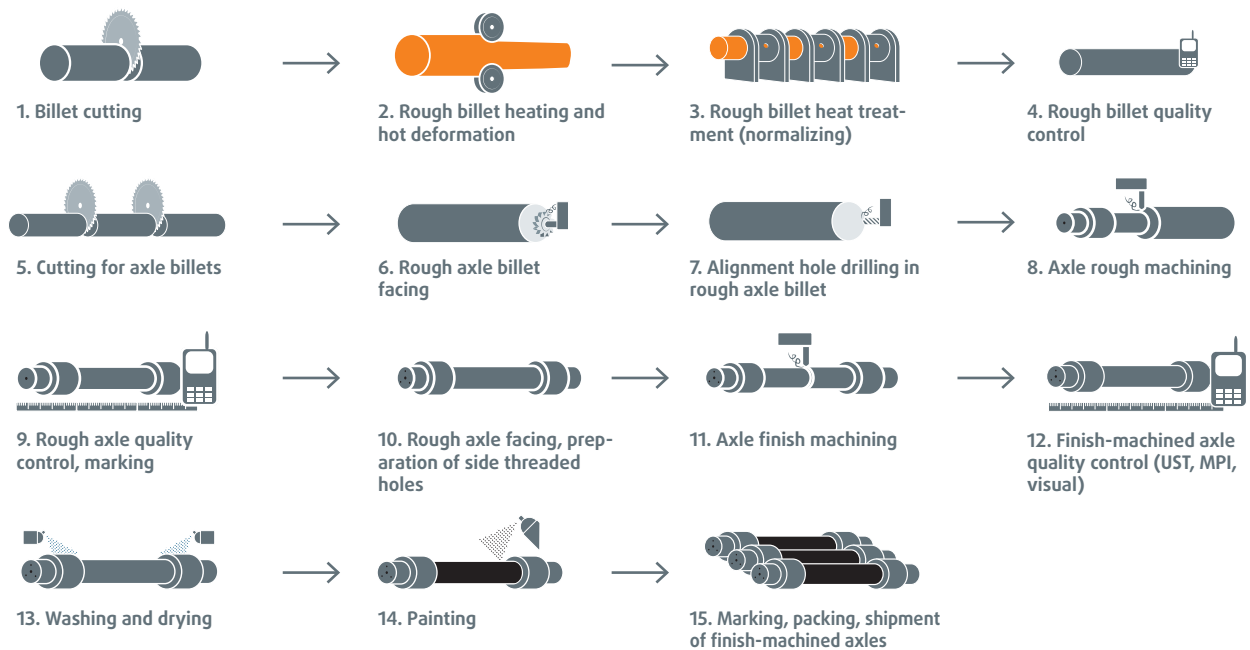
TECHNOLOGY OF KLV PRODUCTION



WHEELS



AXLES



KLW IS MOVING TO COMPLEX PRODUCTS

IN 2016, KLW SCALED UP ITS PRODUCTION FACILITIES TO CARRY OUT SPECIFIC MACHINING OPERATIONS, PROVIDE FULLY AUTOMATED WHEEL COATING, PRODUCE FINISH-MACHINED AXLES, AND ASSEMBLE WHEELSETS.

- Finish machining of bore in the wheel hub for mounting of wheels
- Various types of web drilling, especially for the installation of brake discs
- Modernization of quality control equipment
- Increased capacity for wheel finish machining
- Finish-machined axles production
- Painting line for wheels and axles using water based, alkyd, epoxy resin covers

INCREASING OF MACHINING OPERATIONS

In May 2016, a new machining line for production of the AAR wheels for NAFTA, African, Middle Eastern markets started operation. The line is equipped with:

- 4 high-efficiency turning and boring machines for finish machining
- A modernized wheel control and acceptance stand including MPI and UST units, a hardness testing machine, geometry control, and a robotic marking machine.



EXTENDING THE OFFER FOR CUSTOMERS

In 2014, K LW launched a new production area for rough machined railway axles.

Now we have a new line for the finish machining of the railway axles in accordance with TSI and AAR standards. The line includes:

- A horizontal machining center for facing and tapping for axle-boxes
- 2 CNC turning lathes for finish machining
- MPI and UST units
- A painting line.

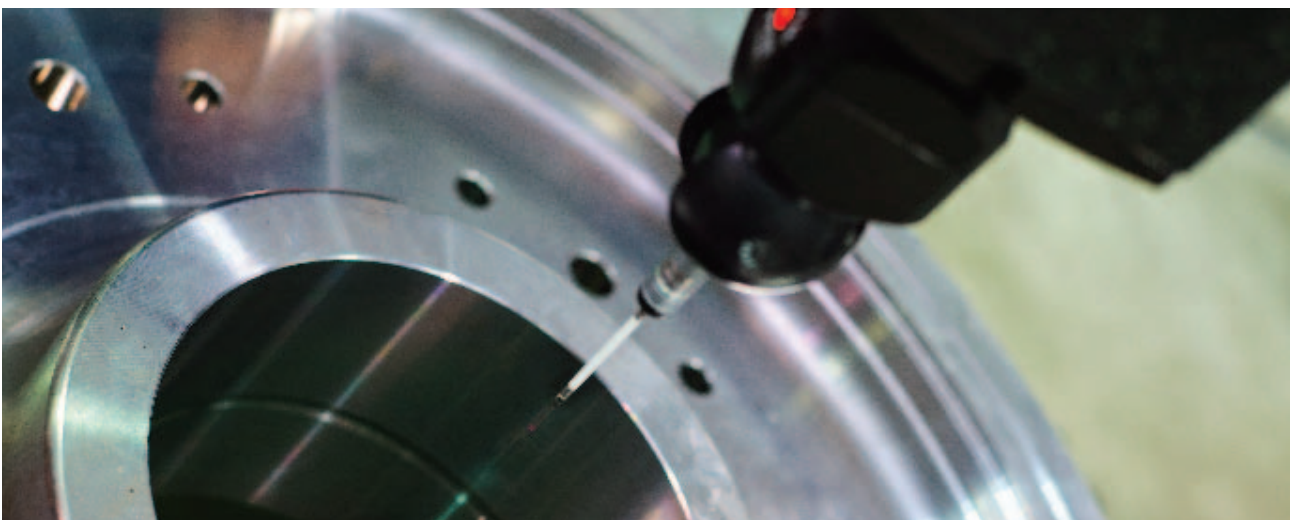


ADDITIONAL SERVICES FOR CUSTOMERS

In July 2016, K LW launched a new finishing line for machining operations not previously performed by the company. The new line consists of:

- 2 CNC machining centers for precise finish machining of a wheel bore and various types of web drilling, with capacity for up to 60,000 wheels per year, depending on their design
- A coordinate measuring machine for up-to-date 3D geometry control
- A balancing machine for determination of imbalance and balance correction
- An MPI unit for non-destructive control after finishing operations
- A painting line for water based, alkyd, epoxy resin covers.

The line enables K LW to produce a wide range of products for all rolling stock categories. The new facilities correspond in full with the requirements of car-building, car-maintenance mills and national railway operators.





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