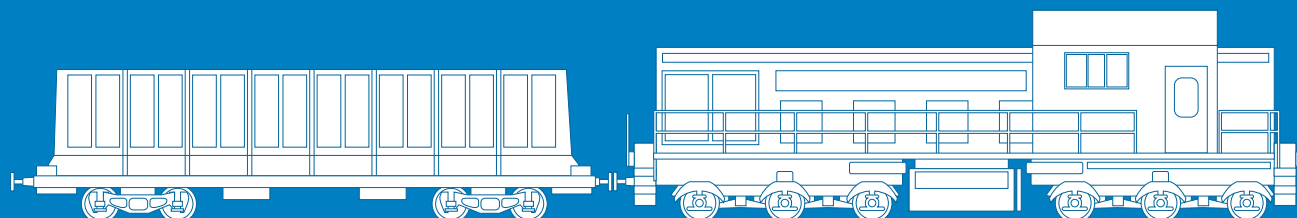




KLW: COMMITTED TO FREIGHT TRANSPORT



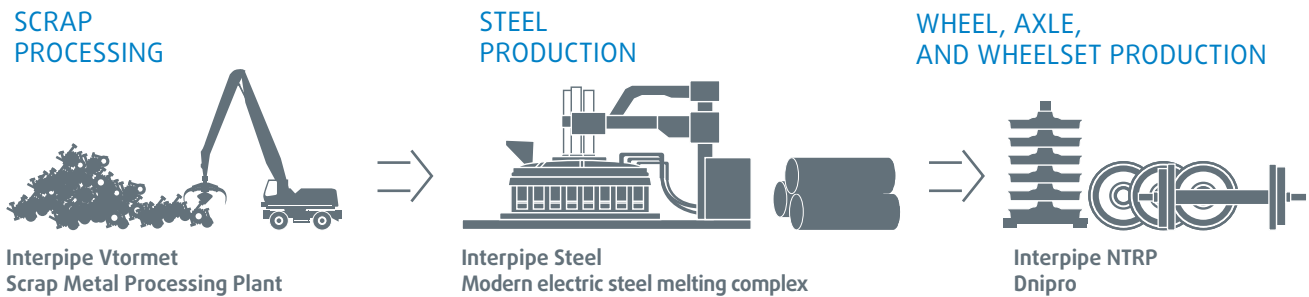
KLW – INTERNATIONAL WHEEL BRAND

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 90 years of experience in railway wheel production. KLW-branded wheels and wheelsets 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.



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 customer-related norms used are EN 13260, EN 13261, EN 13262, DB BN 918 277, AAR M-107/M-208, GOST 10791-2011, Indian Railway standard, TSI, and others. KLW complies with all requirements demanded by its clients.

KLW railway products correspond to individual requirements of leading railway operators, including Deutsche Bahn (Germany), Railtrack (The United Kingdom), PKP (Poland), SZ (Slovenia) and BDZ (Bulgaria).



SELLING TO CUSTOMERS FROM 60 COUNTRIES

EUROPE IS ONE OF THE KEY MARKETS FOR KLW. WE SUPPLY RAILWAY PRODUCTS THROUGH SALES COMPANIES IN UKRAINE, SWITZERLAND AND GERMANY.



Interpipe
Ukraine, Dnipro



Interpipe Central Trade
GmbH Germany, Frankfurt



KLW WHEELCO SA,
Lugano

KLW IS A RELIABLE PARTNER OF RAILWAY OPERATORS, WAGON BUILDERS AND WAGON KEEPERS

NUMBER OF THE EUROPEAN NATIONAL RAILWAY OPERATORS AND COMPANIES HAVE A LONG-TERM PARTNERSHIP WITH KLW, INCLUDING: AUSTRIA, BULGARIA, CZECH REPUBLIC, DENMARK, FINLAND, FRANCE, GERMANY, GREECE, NORWAY, SWEDEN, SWITZERLAND, SLOVENIA, AND POLAND.



INTERPIPE STEEL: IN-HOUSE GREEN STEEL PRODUCTION

INTERPIPE COMPANY NEEDS FOR STEEL BILLETS IS 100% COVERED BY OWN FACILITIES – INTERPIPE STEEL PLANT. INTERPIPE STEEL – IS AN INNOVATIVE EAF COMPLEX, LAUNCHED IN 2012 WITH BEST AVAILABLE TECHNOLOGIES FROM DANIELI.

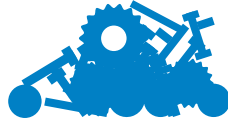
A few years before the European Green Deal emerged, Interpipe made the largest environmental investment in the Ukrainian industry, investing \$1 billion into the construction of the innovative electric steel-making complex Interpipe Steel. It enabled Interpipe to achieve one of the lowest greenhouse gas emission intensity in the global steel industry – lower than 200 kg per ton of steel billets – that reflects low carbon nature of Interpipe production.



LOW CARBON FOOTPRINT

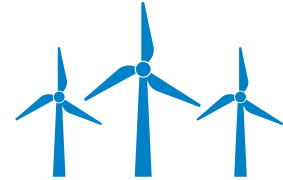
<130 kg/ton of steel (Scope 1)

<230 kg/ton of steel (Scope 2)



RECYCLING DEVELOPMENT

96% of steel produced from scrap



CLEAN ENERGY USAGE

Over 65% of energy comes from environmentally sustainable sources

INNOVATIVE DANIELI TECHNOLOGIES AT INTERPIPE STEEL ENABLES TO PRODUCE 1,320,000 TONS OF STEEL BILLET ANNUALLY

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

INTERPIPE STEEL IS THE LARGEST “GREEN” INVESTMENT INTO UKRAINIAN STEEL INDUSTRY DURING THE LAST 30 YEARS

State-of-the-art gas collection and purification system allows the efficient collection of gas and dust, generated during the steel-melting process

Completely closed circulating water supply system of the mill, without any industrial wastewater discharge

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.



INTERPIPE NTRP: SPECIAL EQUIPMENT FOR PRODUCTION ACCORDING TO MAIN STANDARDS

THE MILL HAS BEEN MANUFACTURING RAILWAY WHEEL PRODUCTS FOR NEARLY 90 YEARS. THE PRODUCTION CAPACITIES ARE CONTINUOUSLY DEVELOPING IN LINE WITH THE WORLD-CLASS STANDARDS.

FREIGHT WHEELS, AXLES AND WHEELSETS 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
Axle production	CNC horizontal machining center, 2 CNC lathes for finish machining, fully automatic painting line, MPI and UST units, turning-milling machine for axle ends machining, grinding machine for high-precision dimensions
Wheelset assembling	Hydraulic press for wheelset assembling, customized painting line, isolated site for axle boxes mounting, full-cycle quality control

THE PRODUCTS PORTFOLIO INCLUDES MORE THAN 250 TYPES OF RAILWAY WHEELS, WHEELSETS AND TYRES FOR FREIGHT AND PASSENGER WAGONS, LOCOMOTIVES, URBAN RAIL TRANSIT AND HIGH-SPEED RAIL.



WHEELSET TECHNICAL DATA

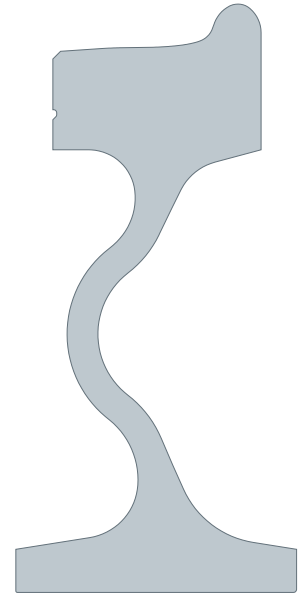
MEETING INDUSTRY CHALLENGES, KLW AIMS TO PROVIDE ITS CUSTOMERS WITH HIGH-QUALITY PRODUCTS AND SERVICES FOR FREIGHT TRANSPORT.

ULT SF

Ø 920, 25 t

Alternatives: ULT 25, BA 314, BA 303

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-005-17	Wheelset Maximum Load Maximum Speed Wheelset Weight	25 t 120 km/h 1110 kg
WHEEL Drwg N° KP-0028-17 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0018-16	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	ESFA EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

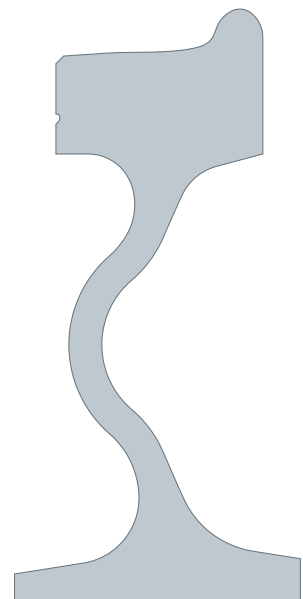


ULT 25

Ø 920, 25 t

Alternatives: BA 314, BA 303, ULT SF

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-001-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	25t 120 km/h 1076 kg
WHEEL Drwg N° KP-0050-16 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0007-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 302 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

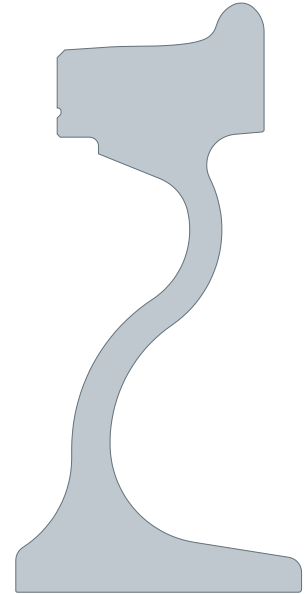


BA 314

Ø 920, 25 t

Alternatives: ULT 25, BA 303, ULT SF

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-001-15	Wheelset Maximum Load Maximum Speed Wheelset Weight	25 t 120 km/h 1070 kg
WHEEL Drwg N° KP-0021-15 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Standard
AXLE Drwg N° OC-0007-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 302 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

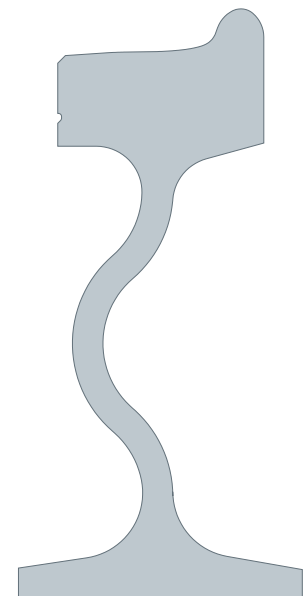


BA 303

Ø 920, 25 t

Alternatives: ULT 25, BA 314, ULT SF

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-001-16	Wheelset Maximum Load Maximum Speed Wheelset Weight	25 t 120 km/h 1052 kg
WHEEL Drwg N° KP-0021-15 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Standard
AXLE Drwg N° OC-0007-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 302 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

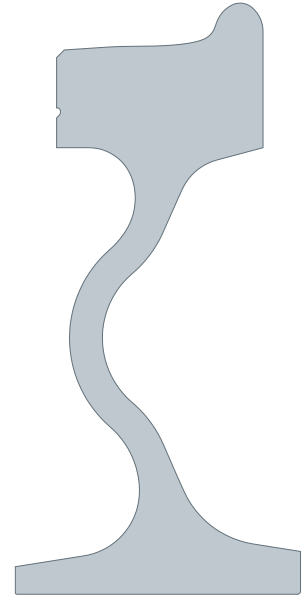


ULT 23

Ø 920, 23.5 t

Alternatives: BA 004

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-006-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	23.5 t 120 km/h 1070 kg
WHEEL Drwg N° KP-0050-16 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0006-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 002 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

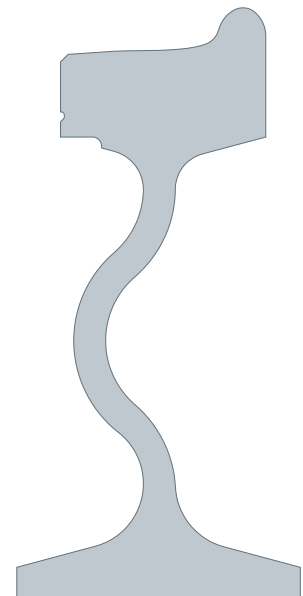


BA 004

Ø 920, 22.5 t

Alternatives: ULT 23

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-002-15	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1028 kg
WHEEL Drwg N° KP-0016-03C CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Standard
AXLE Drwg N° OC-0006-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 002 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

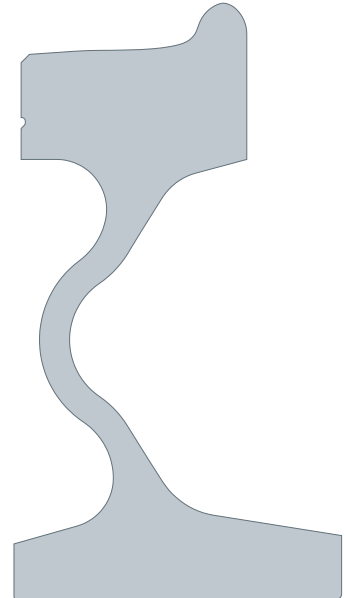


BA 382

Ø 840, 20 t

Alternatives: 9073, BA 381

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-003-17	Wheelset Maximum Load Maximum Speed Wheelset Weight	20 t 120 km/h 992 kg
WHEEL Drwg N° KP-0030-16 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 840 / Ø 760 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0006-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 002 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

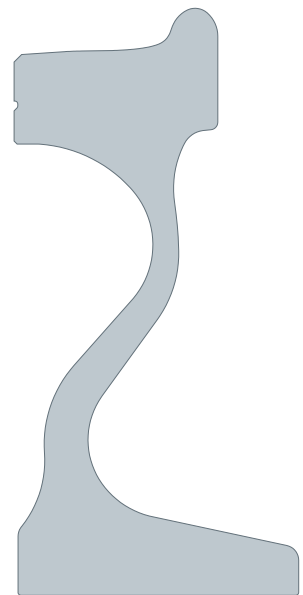


9073

Ø 840, 20 t

Alternatives: BA 382, BA 381

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-007-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	20 t 120 km/h 965 kg
WHEEL Drwg N° KP-0086-15 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 840 / Ø 769 30 mm EN 13715 YES Standard
AXLE Drwg N° OC-0008-18	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	9073 EA1N Category 2 2200 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

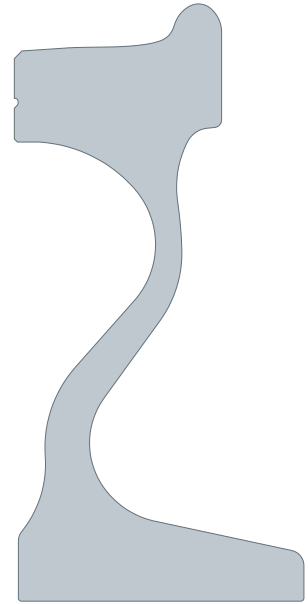


IBE 23

Ø 920, 22.5 t

Spain Gauge 1668 mm

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-008-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1124 kg
WHEEL Drwg N° KP-0008-18 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Standard
AXLE Drwg N° 130.92.32.00.01	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	Spanish Axle EA1N Category 2 2350 mm 2170 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

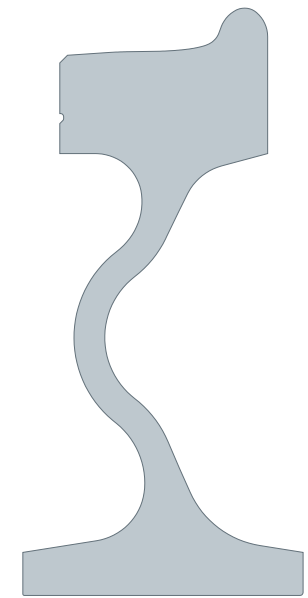


ULT 90

Ø 920, 22.5 t. UIC Gauge 1435 mm

Alternatives: KLW 90, 9090

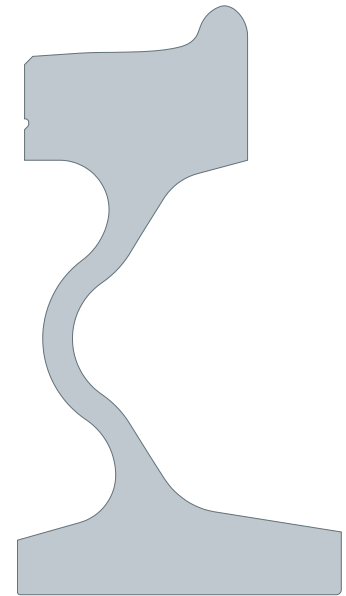
COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-015-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1133 kg
WHEEL Drwg N° KP-0028-17 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0014-17	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	KLW 90 EA1N Category 2 2350 mm 2170 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



BA 375

Ø 730 / Ø 760, 16 t / 18 t
UIC / Spain Gauge

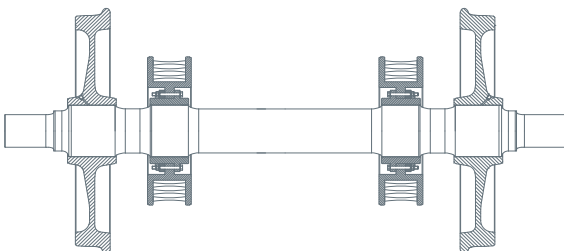
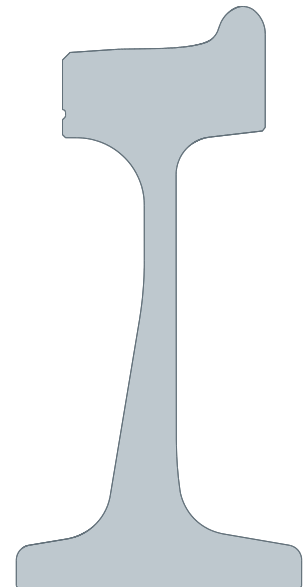
COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-009-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	16 t / 18 t 120 km/h 775 kg / 861 kg
WHEEL Drwg N° KP-0015-15 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 730 / Ø 760 / Ø 680 35 mm EN 13715 YES Standard
AXLE Drwg N°90.00.01.A	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 188 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CH) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



R61

Ø 920
Brake Disc

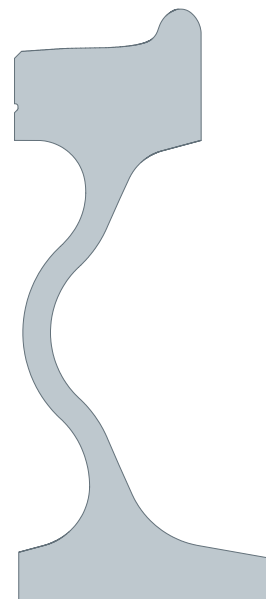
COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-001-15	Wheelset Maximum Load Maximum Speed Wheelset Weight	25 t 120 km/h 1362 kg
WHEEL Drwg N° KP-0023-17 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 NO Standard
AXLE Drwg N° 130.92.62.00.01	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	with Brake Disc EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



ULT 1000

Ø 1000, 22.5 t
UIC / Spain Gauge

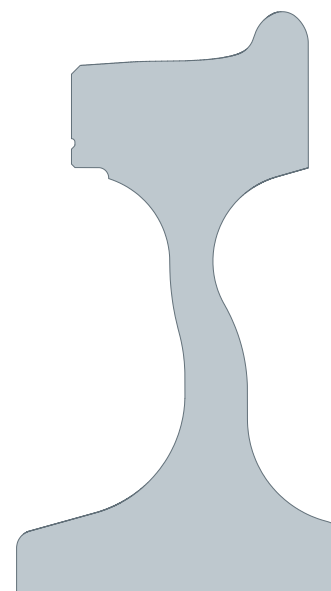
COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-012-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1224 kg
WHEEL Drwg N° KP-0066-16 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 1000 / Ø 920 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N°130.92.32.00.01	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	Spanish Axle EA1N Category 2 2350 mm 2170 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



813 A

Ø 813,
22.5 t

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-011-18	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1051 kg
WHEEL Drwg N° KP-0017-16CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 813 / Ø 722 35 mm EN 13715 NO Standard
AXLE Drwg N° OC-0006-14R	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 002 EA1N Category 2 2180 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	TSI	NO

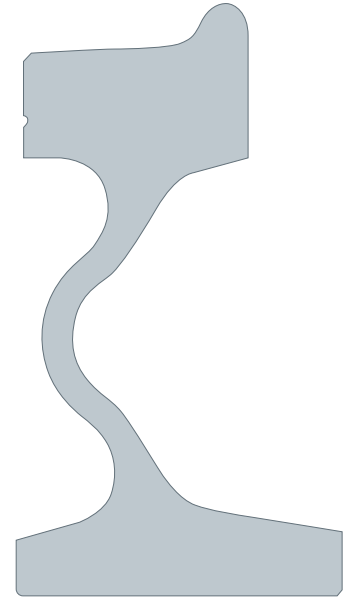


ULT 70

Ø 730/760, 18 t

Alternatives: BA 375

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-001-20	Wheelset Maximum Load Maximum Speed Wheelset Weight	18 t 120 km/h 775/851 kg
WHEEL Drwg N° KP-0035-19	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 730 (760) / Ø 695 15/30 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0009-18	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 188 EA1N Category 2 2156 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation including Appendix C (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



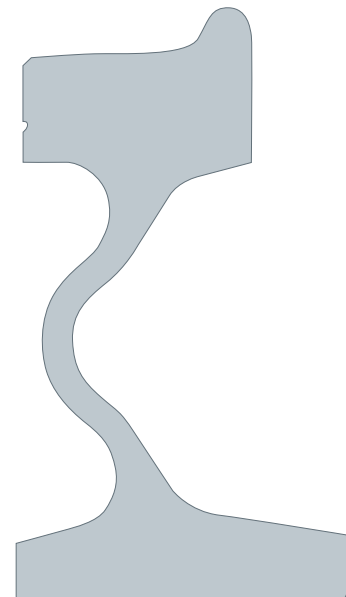
ULT SP

Ø 920, 22.5 t

Spain Gauge 1668 mm

Alternatives: BA 375, BA 379

COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-002-19	Wheelset Maximum Load Maximum Speed Wheelset Weight	22.5 t 120 km/h 1115 kg
WHEEL Drwg N° KP-0025-19 CV	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 920 / Ø 840 35 mm EN 13715 YES Advanced: Low deflection and stresses with K blocks
AXLE Drwg N° OC-0016-16	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	SPG EA1N Category 2 2350 mm 2170 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES – Acc. to Commission regulation including Appendix C (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)

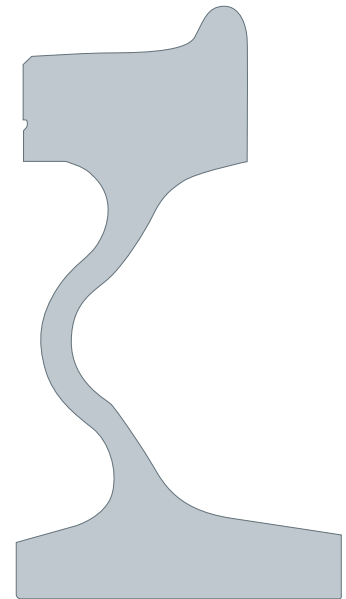


BA 381

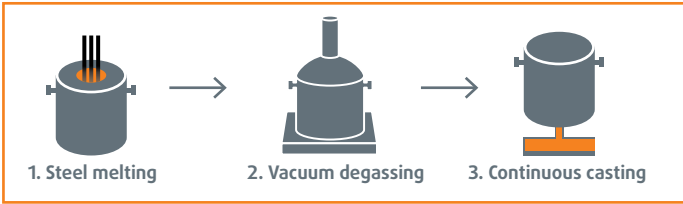
Ø 840, 20 t

Alternatives: 9073, BA 382

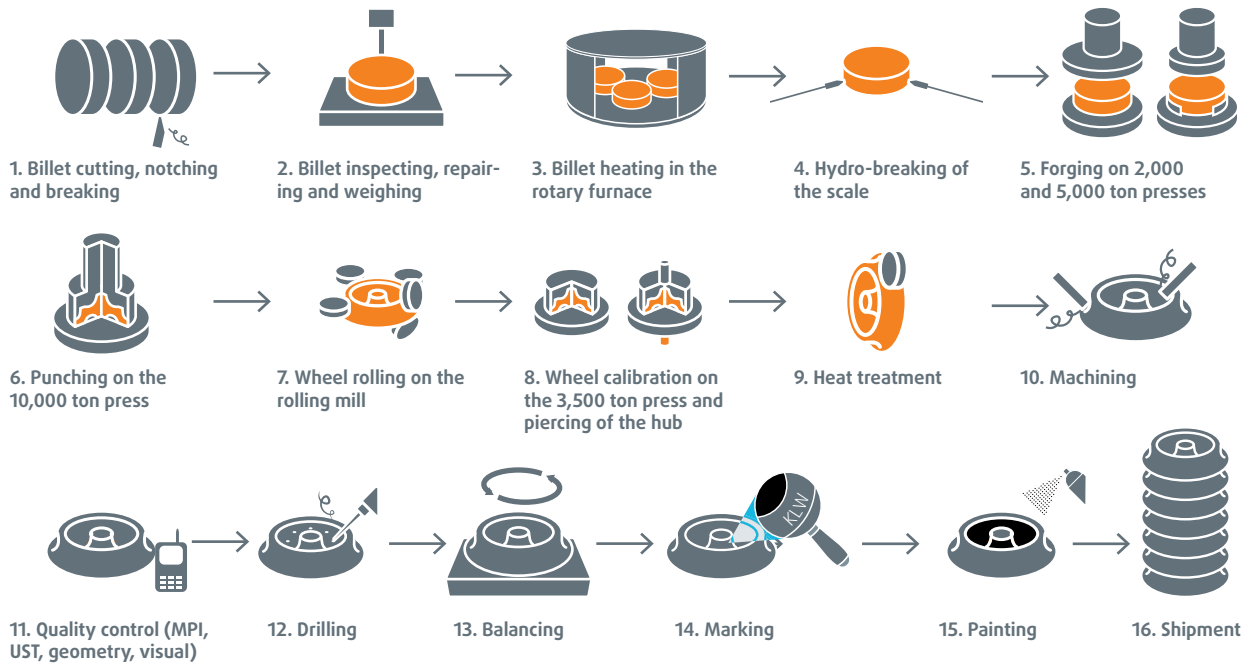
COMPONENT	TECHNICAL DATA	
WHEELSET Drwg N° WS-002-17	Wheelset Maximum Load Maximum Speed Wheelset Weight	20 t 120 km/h 965 kg
WHEEL Drwg N° KP-0029-16	Wheel Steel Grade Nominal Diameter / Worn Diameter Wear Range Tread Profile Low Stress Wheel Braking Level Performance Acc. to UIC 510-5	ER7 Category 2 Ø 840 / Ø 760 35 mm EN 13715 YES Standard
AXLE Drwg N° Fwg825.02.001.01	Axle Type Axle Steel Grade Axle Length Distance Between Axle Boxes	BA 088 EA1N Category 2 2251 mm 2000 mm
NORMS		
WHEELSET: EN 13260 AXLE: EN 13261 WHEEL: EN 13262	CE Certificate TSI	Module (CB/CD) YES - Acc. to Commission regulation including Appendix C (EU) N° 321/2013 amended by N° 1236/2013 (EU) 2015/924 (TSI RST WAG)



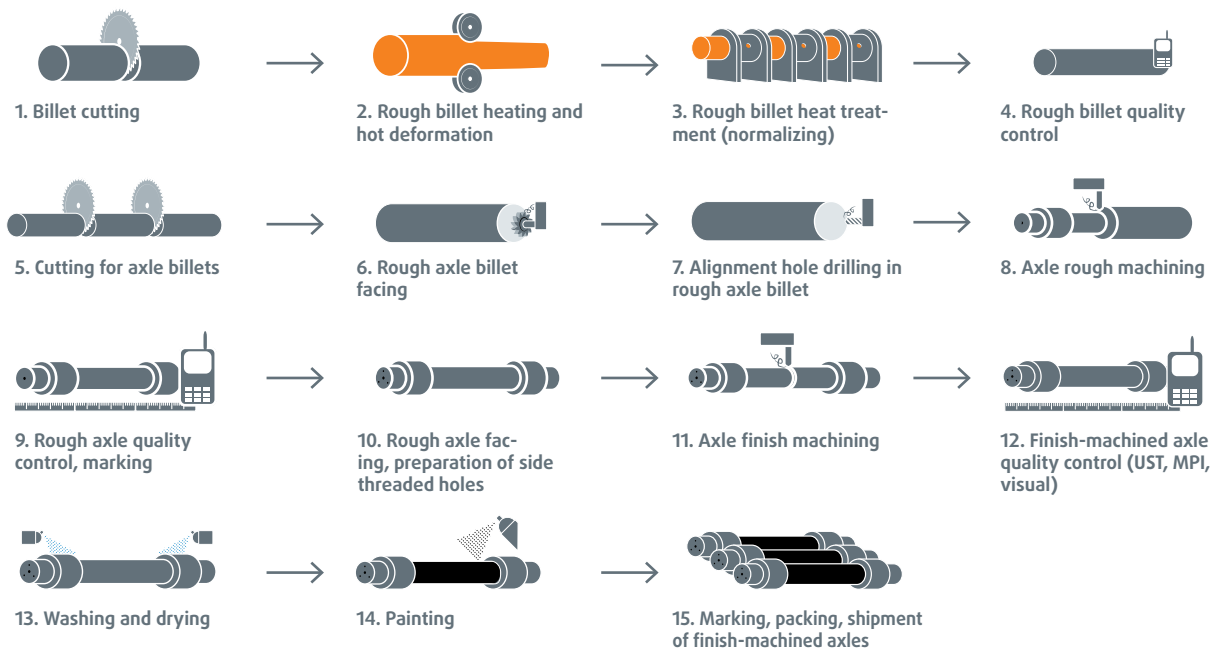
TECHNOLOGY OF KLV PRODUCTION



WHEELS



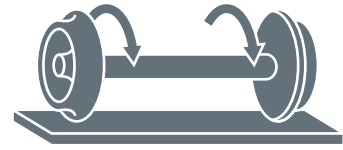
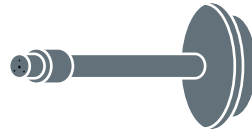
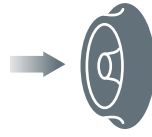
AXLES



WHEELSETS

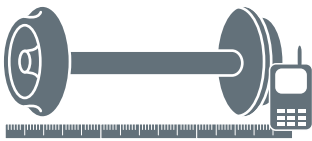


1. Finish wheel hub boring

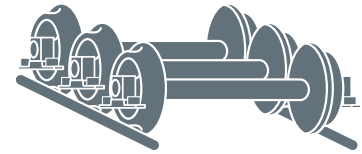


2. Wheelset assembling,
wheels pressing

3. Determination of
imbalance of wheelset



4. Geometry control, internal
resistance control



5. Mounting of bearings
and axle-boxes

6. Quality control,
packing, shipment



KLW FOR FUTURE OF GLOBAL MOBILITY

DURING LAST 5 YEARS KLW SCALED UP ITS PRODUCTION FACILITIES TO INCREASE WHEEL FINISH-MACHINING CAPACITIES, PRODUCE FINISH-MACHINED AXLES AND READY-TO-MOUNT WHEELSETS WITH AXLE-BOXES.

38.2 mln USD

Invested into wheel and wheelset production in the last 10 years

ADVANCED OPERATIONS FOR WHEEL FINISHING AND HIGH-QUALITY CONTROL

Since July 2016, KLW has been performing machining operations that had not been previously offered by the company. The line consists of:

- 2 CNC machining centers for precise finish machining of a wheel bore and various types of web drilling, with the capacity of 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 KLW 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.



CONTINUOUS DEVELOPMENT OF PRODUCTION CAPACITIES

Since May 2016, a new machining line to increase production of full-profile machined wheels for European, American and Middle Eastern markets is in full 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



In 2019, K LW completed the next stage of the strategic development program and scaled-up output of finish-machined wheels increasing wheel production for freight wagons as well as suburban diesel and electric trains, locomotives and high-speed transport.

A new wheel finish machining line includes:

- An automatic full-profile wheel machining line that includes 3 Hegenscheidt CNC lathes and a robotic arm for loading and unloading wheels
- Enhanced capacities for non-destructive testing including imbalance and geometry measurement

Precise machining operations were extended by:

- Two high-precision CNC machines for finish machining of wheel hub bore and drilling and milling of wheels and wheel centers



EXPANDING THE OFFER FOR CUSTOMERS

Since 2014, K LW has been manufacturing railway axles owing to the implementation of a major investment program.

The production site is fully equipped with a line for finish machining of railway axles in compliance with European and American standards. The line includes:

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



GLOBAL MOBILITY WITH KLV WHEELSETS

CONTINUOUS DEVELOPMENT IS A MAJOR TRAIT OF KLV PRODUCTION FACILITIES. THE COMPANY IS CONSTANTLY IMPROVING ITS MANUFACTURING CAPACITY TO OFFER THE CUSTOMER THE WORLD-CLASS PRODUCTS, SUPERVISING ALL OF ITS PRODUCTION STAGES – FROM STEEL MELTING TO WHEELSET ASSEMBLING.

In 2021-2022, the company launched a new production shop designed for in-house wheelset assembling in order to double the capacity of wheelsets production, and scaled-up a full-machined axles production.

New wheelset assembly line includes:

- Italian hydraulic press for wheelset assembling
- Customized painting line
- Isolated site for axle boxes mounting
- Full-cycle quality control

Enhanced capacities for axle finish-machining include:

- Turning-milling machine for axle ends machining
- Grinding machine for high-precision dimensions







KLW

An Interpipe Brand

www.klw.biz

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