



KLW: SMART SOLUTIONS FOR FREIGHT WAGONS AND LOCOMOTIVES UNDER AAR STANDARDS



KLW – INTERNATIONAL WHEEL BRAND

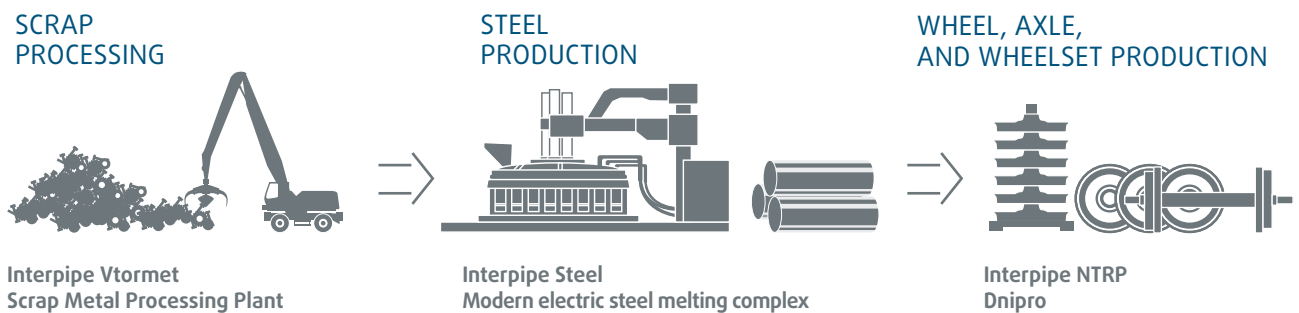
KLW IS A SINGLE BRAND OF INTERPIPE RAILWAY PRODUCTS DIVISION CONSOLIDATING SALES TO ALL STRATEGIC MARKETS.

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

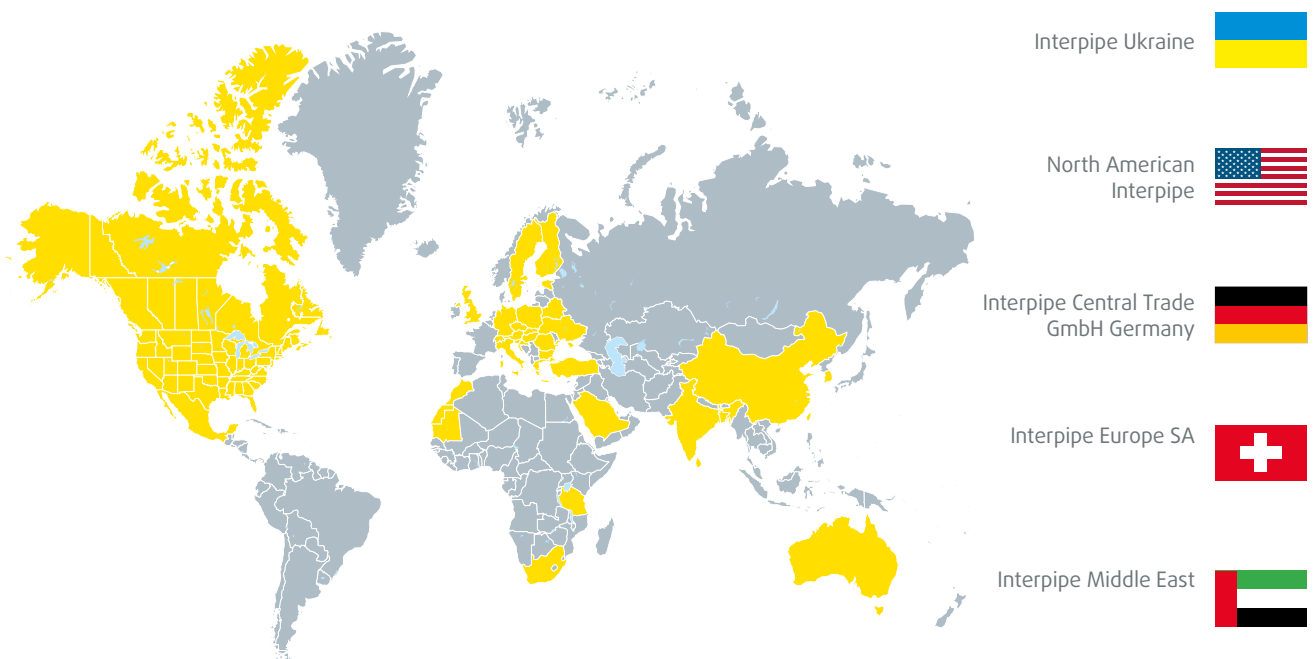
THE COMPANY’S STRUCTURE INCLUDES HIGHLY EFFICIENT METALLURGICAL MILLS. SUCH STRUCTURE ALLOWS CONTROLLING PRODUCT QUALITY AT EVERY STAGE – FROM STEEL PRODUCTION TO DELIVERY OF FINISHED PRODUCTS TO CUSTOMERS.



SELLING TO CUSTOMERS 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.

KLW has an extensive experience in cooperation with the number of European, Asian and MENA 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, Saudi Arabia, 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, and TSI.

KLW railway products correspond to individual requirements of leading railway operators in Europe, Asia, and MENA.



KLW AXLES MEET THE AAR REQUIREMENTS

SINCE 2014, INTERPIPE NTRP PRODUCES RAILWAY AXLES UNDER KLW BRAND. THE MILL IS APPROVED BY THE ASSOCIATION OF AMERICAN RAILROADS AS A MANUFACTURER OF CLASS F FINISH-MACHINED RAILWAY AXLES.



RELIABLE STEEL GRADES FOR HEAVY HAUL

IN-HOUSE STEEL PRODUCTION ENSURES HIGH QUALITY OF BILLETS INCREASING SAFETY CHARACTERISTICS AND GUARANTEES LONGER LIFE CYCLE OF WHEELS AND HIGHER FLEXIBILITY IN THEIR MANUFACTURING.

KLW mastered and certified wheels of high quality steel grades "A", "B", "C" and "D" that have a special chemical composition and carry heat treatment, which provides mechanical properties of strength and ductility according to the standard AAR M 107/208.



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

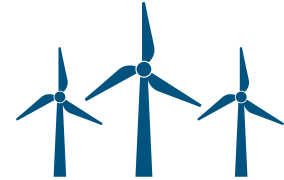
<130 kg/ton of steel (Scope 1)

<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 ON 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.



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.

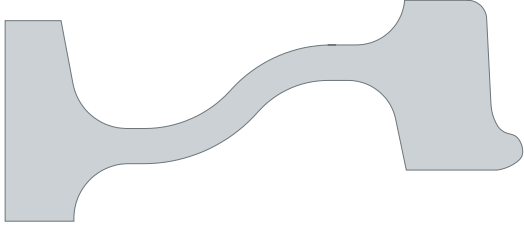
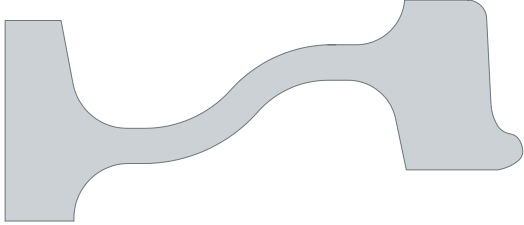
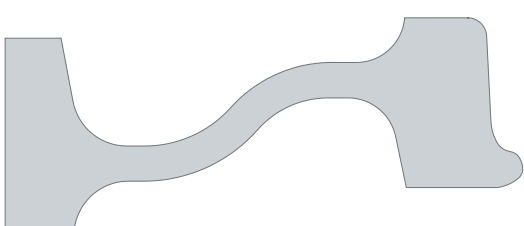
KLW ensures a high level of safety and a long life cycle of railway products in line with AAR M-107/M-108 standards. We offer wheels made of the high quality steels of A, B, C, and D grades.

WHEELS FOR FREIGHT CAR SERVICE

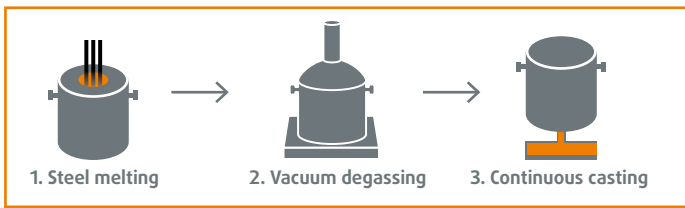
TYPE	TECHNICAL DATA	VALUE	
E-28 Drw. KP-0041-11	Axle Maximum Load Weight	65,750 lb 232 kg / 511 lb	
J-33 Drw. KP-0058-05A	Axle Maximum Load Weight	65,750 lb 292 kg / 644 lb	
P-33 Drw. KP-0022-18	Axle Maximum Load Weight	65,750 lb 348 kg / 767 lb	
H-36 Drw. KP-0055-05A	Axle Maximum Load Weight	65,750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

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

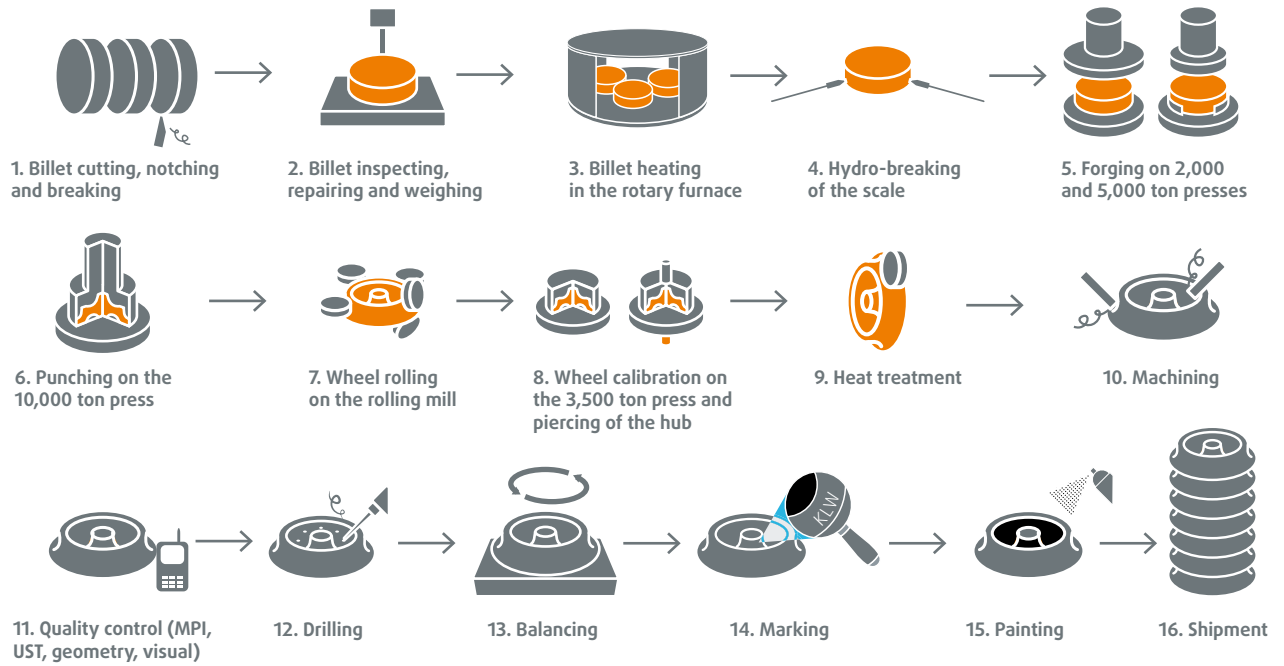
WHEELS FOR DIESEL LOCOMOTIVES

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

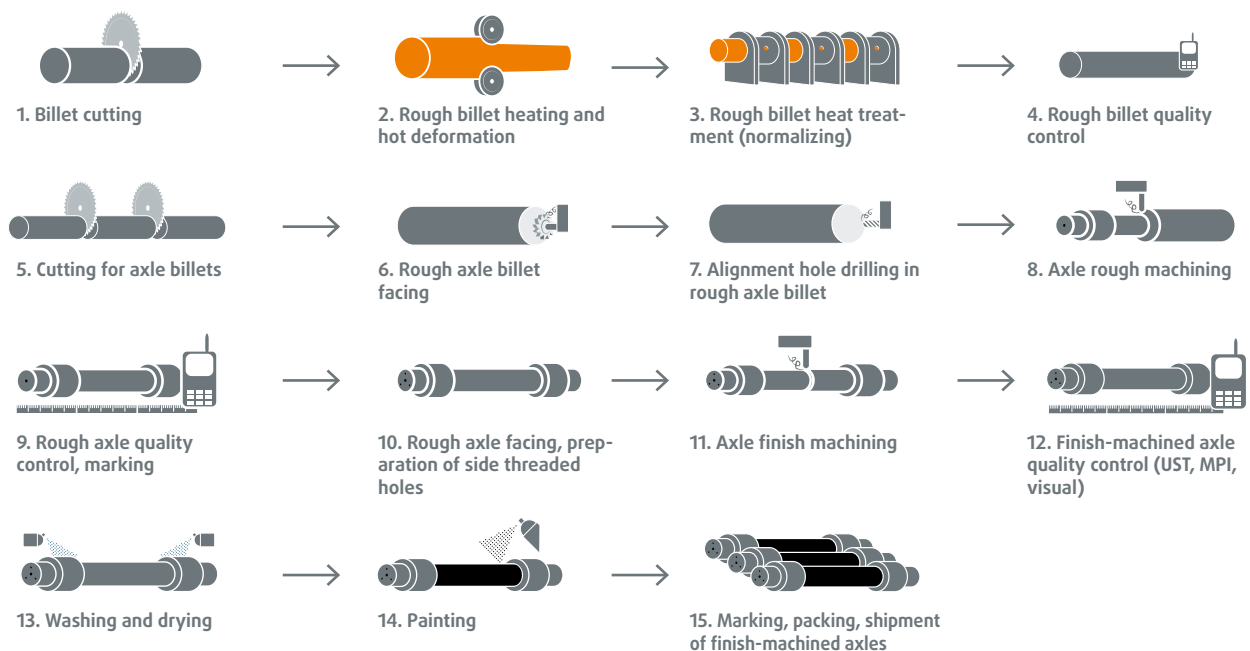
TECHNOLOGY OF KLV PRODUCTION



WHEELS



AXLES



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

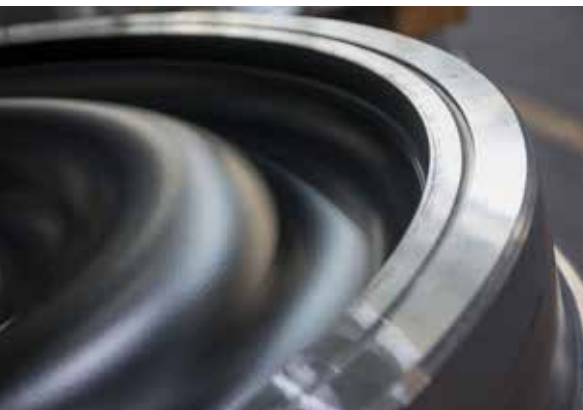
Invested into wheel and wheelset production in the last 10 years

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



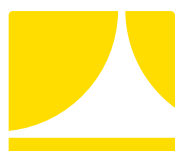
EXPANDING THE OFFER FOR CUSTOMERS

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





KLW

An Interpipe Brand

www.klw.biz

KLW WHEELCO SA

Via San Salvatore 13 - P.O.
Box 745 CH-6902 Paradiso - Lugano, Switzerland
Tel.: +41 91 261 39 10
Fax: +41 91 261 39 19
E-mail: info@klw-wheelco.ch

Interpipe Central Trade GmbH

Corneliusstrasse 34,
60325 Frankfurt am Main, Germany
Tel.: +49 69 505025850

2022