



ABOUT AVL

Passion and Results.

With more than 10,400 employees, AVL List GmbH is the world's largest independent company for the development, simulation and testing of all types of powertrain systems (hybrid, combustion engine, transmission, electric drive, batteries, fuel cell and control technology). The company

was founded in 1948 with the headquarters in Graz, Austria. It provides industry-leading technologies and services based on the highest quality and innovation standards to help customers reduce complexity and add value.

AVL is the world's largest independent company for the development, simulation, and testing of powertrain systems for passenger cars, commercial vehicles, construction, large engines, and their integration into the vehicle.

The company has decades of experience in the development and optimization of powertrain systems for all industries. As a global technology leader, AVL provides complete and integrated development environments, measurement and test systems as well as state-of-the-art simulation methods.

As a pioneer in the field of innovative solutions, such as diverse electrification strategies for powertrains, AVL is increasingly taking on new tasks in the field of autonomous driving, especially on the basis of subjective human sensations.

In the competition of technologies – internal combustion engine, battery/electric drive and fuel cell – and their combinations, AVL is working intensively and with the same priorities.

AVL has digitized the vehicle development process with state-of-the-art and highly scalable IT, software and technology platforms, and creates new customer solutions in the areas of big data, artificial intelligence, simulation and embedded systems in an agile and integrated development environment.

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OUR HISTORY

How it all began.

1948

A team of diesel engine experts headed by Prof. Dr. Hans List sets up the "Ingenieurbüro List" (IBL)

1951

IBL becomes AVL ("Anstalt für Verbrennungskraftmaschinen List")

1952

Central research premises were established in Kleiststraße with funds from the Marshall Plan

1960

AVL expands its business to include engine instrumentation systems

1979

Helmut List, son of the company's founder Hans List, is appointed CEO

1969

The first fully automatic digital testbed is installed at AVL headquarters

1985

Operating a real engine in a virtual vehicle becomes a reality with AVL's highly dynamic testbed

1987

AVL launches its newest division, Advanced Simulation Technologies

1993

AVL is the first and only company worldwide to supply engine testbeds that can simulate the dynamic requirements of racing engines

1998

Testbed technology of the future: The worlds of numeric simulation and testbed technology are merging

2002

AVL acquires engine testing center MTC AB in Sweden and opens its very own test track near headquarters



2003

AVL takes over the engine developer Dr. Schrick in Germany

2008

The new subsidiary "AVL Software and Functions GmbH" is established in Regensburg, Germany

2010

AVL opens a battery laboratory at AVL Shanghai Tech Center in China

2014

AVL acquires a majority share in qpunkt, which specializes in thermal management, fluid dynamics and acoustics

2015

AVL introduces its second technical center in China, the "AVL Tianjin Technical Center"

2016

AVL partners with Greenlight Innovation Corp., a global leader in supplying testing and manufacturing equipment for hydrogen fuel cells, electrolyzers, batteries and energy storage systems

2017

AVL and TU Graz jointly open the world's most advanced competence center for R&D on new transmission systems

2018

AVL launches its new ADAS Competence Center and doubles its testing capacity with the new Battery Test Lab at the headquarters in Graz

FACTS AND FIGURES

The numbers speak for themselves.

COMPANY

Founded in 1948
Headquarters in Graz, Austria
Privately owned by Prof. Helmut List

EXPORT

96 %

Export Quota

INNOVATION

1,500

Granted Patents

GLOBAL FOOTPRINT

45 Affiliates
>40 Tech and Engineering Centers

> 70

Years of Experience

STAFF

More than 10,400 employees
worldwide (4,150 based in Graz)

65 %

Engineers and Scientists

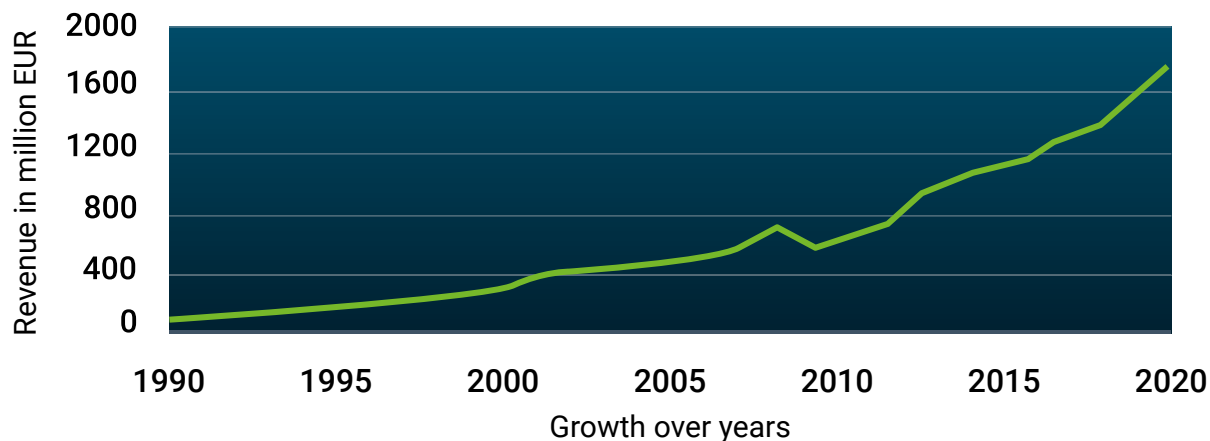
COMPANY REVENUE

1995 //

0.15 Billion Euro

2018 //

1.75 Billion Euro



EXECUTIVE BOARD

Who sits at the helm of the different departments.



Helmut O. List
Chairman and CEO



Chief Financial Officer
Yorck Schmidt



Executive Vice President Global
Business Development, Sales
and International Operations
Off-Road and High Power Systems
Marko Deken



Executive Vice President
Business Development and
Global Operations
Commercial Vehicles On-Road
Rolf Dreisbach



Executive Vice President
Engineering and Technology
Powertrain Systems
Robert Fischer



Executive Vice President Global
Business Development, Sales
and International Operations
Passenger Cars and Powertrain
Systems
Uwe Dieter Grebe



Executive Vice President Test
Systems and Global Operations
Instrumentation and Test Systems
Urs Gerspach



Executive Vice President
Global Business Development,
Sales and International
Hannes Schmäser



Executive Vice President Software
Products, Emission and Services
Instrumentation and Test Systems
Jens Poggenburg

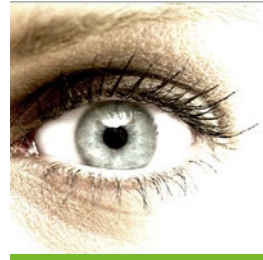
AVL VALUES AND PHILOSOPHY

Our code of conduct.

Our business activities are based on the following central values:

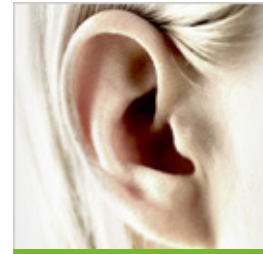
PIONEERING SPIRIT

Turning visions of the future into reality with courage and expertise. We have cultivated the ability to recognize important breakthrough targets early on and reach them ahead of the market. Because only the courageous look beyond the horizon and make discoveries that lead to outstanding innovations.



CUSTOMER ORIENTATION

Our success can only be measured by that of our customers. True understanding of a customer and their needs, combined with experience and a global view, allows us to create innovative solutions. Expertly conceived, uniquely tailored and efficiently carried out – a shared success.



PROBLEM-SOLVING CAPABILITY

It's a demanding world. Focused research, cutting-edge technological developments and clear product orientation are fundamental requirements for global competitiveness. With multi-disciplinary teams, we offer expertise, creativity, innovative thinking and effective project management to support professional solutions.



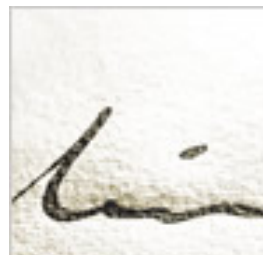
RESPONSIBILITY

Modern mobility represents progress only when its goal, its form and its requirements respect nature. Our work at AVL reflects a deep understanding of the responsibility we share for our society, for mankind and for the world's achievements. We want to ensure that our world is one we can live in – now and in the future.



INDEPENDENCE

AVL is a company with personality. Embodied in Helmut List and reflected in our work. A personality rooted in a life-long pursuit of knowledge, characterized by a deep sense of responsibility and expressed in the company's independent status.



CORPORATE SOCIAL RESPONSIBILITY

(CSR)

As an internationally competitive company, we are in a position to help solve social, cultural and environmental issues, especially regarding environmental protection, sustainability and global emissions. Our understanding of sustainability is closely linked to our corporate values. We are also an active member of respACT, the leading corporate platform for Corporate Social Responsibility (CSR) and sustainable development in Austria.

Protecting the environment is a major focus for AVL. A considerable proportion of our services and products aim to reduce environmental pollution. We are also committed to acting sustainably and to optimising all internal processes in such a way that there is no or only minimal impact on the environment. In addition to the self-evident compliance with all legal requirements and the use of environmentally friendly facilities and machines – as far as economically justifiable – we also show continuous improvement in site-related environmental protection. The environmental management system is defined at the highest management level. After a maximum of one year, the management will review the degree of implementation of the environmental policy.

Our products, services and processes ensure the efficient use of energy and raw materials as well as the minimization of waste and residual materials throughout the product life cycle. We do not use materials and processes that pose a risk to the environment and health.

To this end, we regularly review and monitor the ecological performance of our company and prepare regular reports in which we pay particular attention to the assessment of potential risks of existing and future products, services and processes.

ENERGY AND SUSTAINABILITY

The sustainable use of resources and the ambitious targets for reducing greenhouse gas emissions in the transport sector will have a drastic impact on the required electrification and the powertrain mix of the future. We help our customers find the right energy scenario and development options. AVL's sustainable design and development reduces the CO₂ footprint of the powertrain in all lifecycle stages, while at the same time keeping affordability for the end consumer in mind.



respACT
austrian business council
for sustainable development



AVL CULTURAL FOUNDATION

The AVL Cultural Foundation was born out of AVL CEO Professor Helmut List's vision to bring art into AVL's corporate culture.



Intended as a way to give back to society, the AVL Cultural Foundation grew out of AVL projects looking to combine art and science. In the autumn of 2007, Kathryn and Helmut List launched the foundation to further explore the relationship between these two fields – through commissioned projects, collaborations and cultural funding. In doing so, the Cultural Foundation is bridging the gap between arts, science and technology, and explores the differences and similarities between them.

Creative and innovative thinking is also a big part of the foundation's work, with international collaborations across a wide selection of fields and disciplines. This in turn creates new challenges and perspectives for both the audience and the practitioners to explore.

Find out more:
www.avlcf.com

OUR KEY BUSINESSES

Driving future mobility.

We offer cutting-edge solutions across a wide range of topics and applications.

ELECTRIFICATION

AVL has the expertise to help customers make the choice that's right for them – from mild and plug-in hybrid to battery and fuel cell electric vehicles. We offer development support, testing and validation solutions, simulation tools and the know-how to transform our customer's technical landscape across all industries.

AUTONOMOUS DRIVING/ADAS

The future of mobility will be highly automated and autonomous. Approaching the automated driving future, AVL covers everything from system design, tailored control and software development to calibration, testing and validation. Our expertise and tools deliver a new level of comfort and safety in autonomous driving.

ZERO-IMPACT EMISSION

Realizing the vision of clean mobility needs a synergistic cooperation of disciplines, fields and experience. Our holistic approach delivers the right strategies and solutions for our customers. This not only ensures compliance with emission legislations, but methods that are realistic, deliver performance and efficiency, and are cost effective. From hybrid to renewable energy and biofuel strategies, right up to the latest battery and fuel cell technologies, we are helping OEMs realize a future of clean mobility.

DATA INTELLIGENCE

Our data intelligence services support the complete vehicle development process from concept phase to after-sales management – on a global and local level. Starting at the concept phase, an enormous amount of data is generated during the development, production and in-use phases of a vehicle. Throughout these steps, we gather new and valuable insights from this data, make them available to development engineers and boost development efficiency by reusing data to save time and reduce costs.

OUR PORTFOLIO

Mastering speed and complexity.

As a global organization, AVL offers affordable and legislation-conform solutions that drive the mobility trends of the future in close collaboration with our customers. We provide complete and integrated development environments, measurement and test systems as well as state-of-the-art simulation methods. In the race of technologies – internal combustion engine, battery/electric drive and fuel cell systems – and their combinations, we are working intensively and with the same priorities for all industries. Pioneering innovative solutions, we take on new tasks in the field of autonomous driving (connectivity, ADAS, CCAD, etc.) especially on the basis of subjective human sensations (driveability, performance attributes, etc).

We offer valuable solutions, consulting, expertise and services in the following fields:

POWERTRAIN ENGINEERING

With over 70 years of experience, we design and develop all elements of powertrain systems – ICE-based, battery-electric and fuel cell-based – and integrate them into the vehicle. Our cutting-edge solutions and engineering know-how range from 2 wheeler, passenger cars and commercial vehicles – including truck and bus – to construction equipment, agricultural machinery, marine and stationary applications. We complement our portfolio with solutions for driver assistance systems and autonomous driving. The unique synergy of AVL Powertrain Engineering, AVL Instrumentation and Test Systems and AVL Advanced Simulation Technologies enables the development of highly flexible, mature and application-specific solutions. We are a global partner for the automotive and non-road industry world-wide, transforming entire industries.





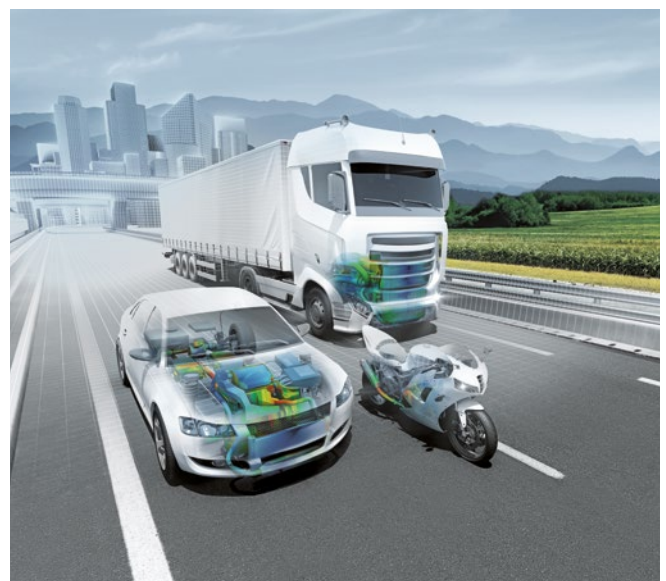
INSTRUMENTATION AND TEST SYSTEMS

OEMs face an increasingly diverse set of challenges: from stricter CO₂ and emission regulations to the globalization of markets, suppliers and products. Not to forget the precarious balancing act of handling the increased complexity of new powertrain concepts while keeping development efforts to a minimum. At AVL, we provide the right tools and methods to master those challenges successfully and reduce time to market. Our portfolio offers the most advanced and accurate simulation and testing solutions for every step in the powertrain development process – from the first concept study all the way through to series production. We seamlessly integrate the latest simulation technology into our testing efforts, and incorporate ideas and methods that have been developed with leading universities, OEMs and Tier1s. This helps our customers push key tasks to the early stages of the development process, thus saving time, increasing quality and keeping costs under control – the foundation for efficient development operations in the new age of the connected vehicle.



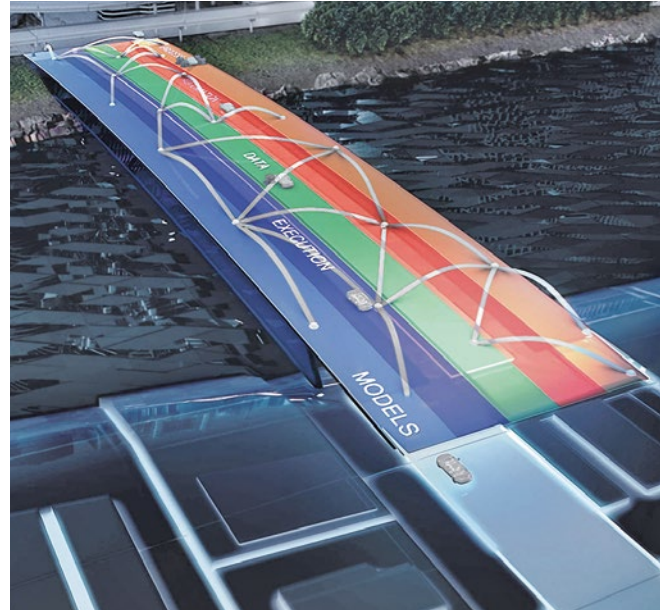
ADVANCED SIMULATION TECHNOLOGIES

Ever more stringent global emission regulations and powertrain electrification are the main drivers behind rapid changes in powertrain and vehicle development. They strongly impact the way OEMs apply and combine simulation and testing tools to reach increasingly challenging engineering targets. The great flexibility provided by the multitude of technologies makes simulation an indispensable tool in generating knowledge and making decisions in all phases of the powertrain and vehicle development process. Virtual prototyping is key to optimize designs and product performance faster and more effectively. Simulation is a core competence of AVL, with our Advanced Simulation Technologies business unit offering solutions for a multitude of applications. We provide high-definition insights into the behavior and interactions of components, systems and entire vehicles.



INTEGRATED AND OPEN DEVELOPMENT PLATFORM (IODP)

Current development topics, such as alternative power-trains, autonomous driving or integral safety, demand interdisciplinary cooperation with a consistent focus on the overall product. Ultimately, it is not the individual system that determines market success, but the overall performance that the vehicle delivers to the end customer every day. In practice, however, there is often a lack of decisive connections between individual results, making reliable, holistic decisions therefore almost impossible. Most OEMs only partially seize the opportunity to integrate simulation and the testbed, or even to connect individual testbed systems. Different applications and data formats further complicate cross-department analyses. Our Integrated and Open Development Platform provides the answer to these challenges, by establishing a holistic system development with extensive integration across all areas and phases.



AVL CUSTOMER SERVICES

Our primary objective at AVL Customer Services is to support our customers in achieving optimal Return-on-Invest (ROI) on their AVL testing technology. To achieve this, we offer a comprehensive portfolio of services and innovative solutions that support test lab efficiency across the entire product life cycle. Our Standard Services, for example, address the typical use cases FIX-MAINTAIN-USE-OPTIMIZE for ensure a reliable test equipment operation. Skills Management and Applications Services support our customers with expert know-how for safe usage of the systems and optimal setup of test procedures. Our Digital Services are web-based applications which transfer convenient, data-driven solutions into the industrial environment, enable transparent test lab operation and highlight productivity improvement potentials. Finally, our Service Programs – dedicated contracts managed by our experts – allow our customers to fully concentrate on their core competencies by making sure their specific customer objectives (e.g. in terms of equipment availability, testing efficiency, measurement data quality) are met for them.



OUR MARKET SEGMENTS

Value creation across all applications.



PASSENGER CARS



AGRICULTURE



2 AND 3 WHEELERS



COMMERCIAL VEHICLE



RACING



LOCOMOTIVE



CONSTRUCTION



MARINE



POWER PLANTS

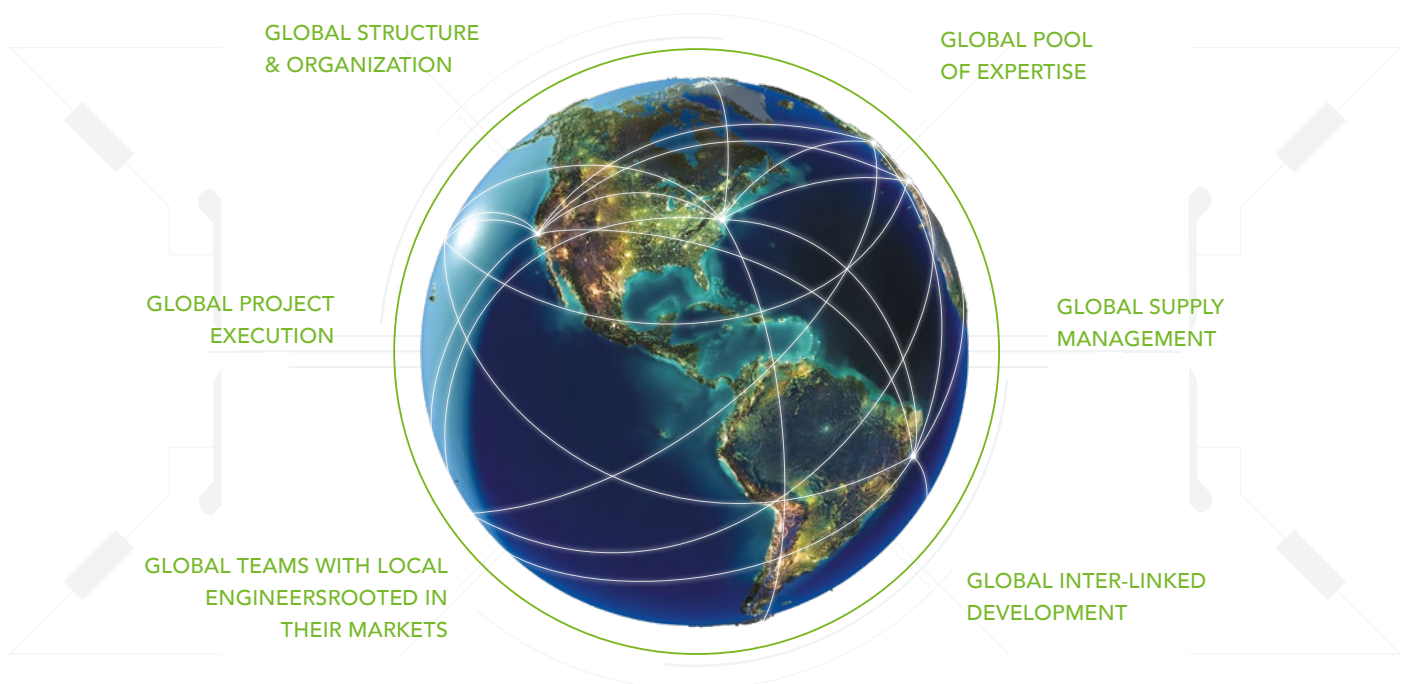
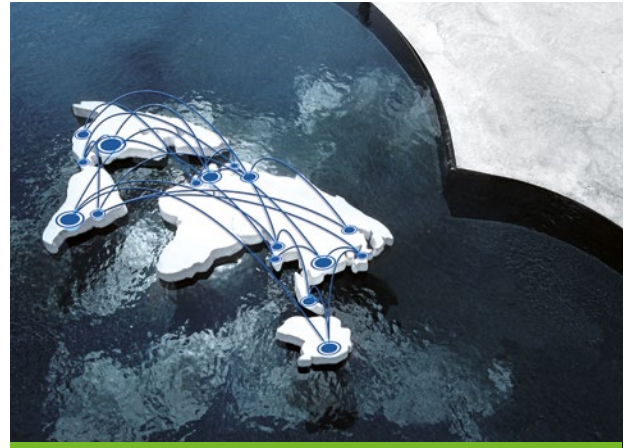
OUR GLOBAL FOOTPRINT

Our worldwide network of experts.

With more than 10,400 employees, AVL has a global network of experts collaborating closely with customers and partners. We work with other industry specialists, academic institutions and communities to create new, innovative solutions and technologies, and we bring our global expertise to our customers to help them overcome their challenges.

Active with 106 locations in 28 countries, we offer harmonized processes, full integration, consistent systems and updates as well as onsite support throughout our global operations. And although we act globally, we have a deep understanding of local differences regarding culture, markets and legislative requirements.

Contact your nearest office:
www.avl.com/avl-worldwide



OUR TECH AND ENGINEERING CENTERS

Our customized solutions across the globe.

With more than 40 state-of-the-art Tech and Engineering Centers across the globe, we offer our customers a variety of solutions that are not only cutting-edge, but increase efficiency. AVL's Tech Centers rely on a modular concept that makes it easy to customize the testing infrastructure according to future powertrain trends, local market needs and legislation requirements. Our full-service solutions and toolchains are based on more than 70 years of development experience, thus ensuring highest quality and robust results throughout the entire development process.

NORTH AMERICA/ CANADA

- Plymouth/USA
- Lake Forest/USA
- Ann Arbor/USA
- Vancouver/CAN

EUROPE

- HQ Graz/AUT
- Steyr/AUT
- Hart bei Graz/AUT
- Paris/FRA
- Reggio Emilia/ITA
- Budapest/HUN
- Istanbul/TUR
- Stuttgart/GER
- Munich/GER
- Ingolstadt/GER
- Regensburg/GER
- Remscheid/GER
- Neuenstadt/GER
- Basildon/UK
- Coventry/UK
- Södertälje/SWE
- Haninge/SWE
- Gothenburg/SWE
- Zagreb/HR
- Warsaw/POL
- Moscow/RUS

ASIA

- Delhi-Gurgaon/IND
- Shanghai/CHN
- Tianjin/CHN
- Seoul/KOR
- Tokyo/JPN
- Moscow/RUS

SOUTH AMERICA

- Sao Paulo/BRA

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