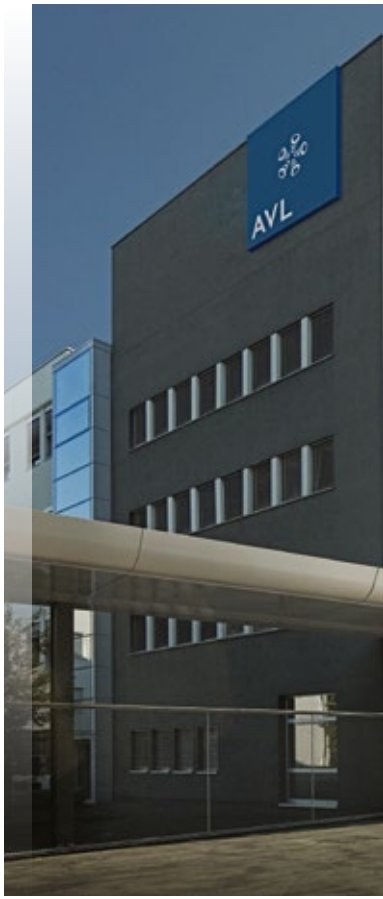
AVL M.O.V.E 2

One platform. Global RDE compliance.

M.O.V.E 2



"We are driven by a passion to examine the science, mechanics and philosophy of movement. To help create a world that is climate-neutral and one that makes safe, comfortable, green mobility a reality for everyone.

Prof. Helmut O. List
Chairman and CEO, AVL List GmbH

AVL at a Glance:

- Founded in 1948
- Global sales and service network
- 11% of turnover invested in inhouse R&D
- 2,300 granted patents in force
- ISO-certified quality management system

AVL M.O.V.E 2 is next evolution in Real Driving Emission (RDE) testing. A complete transformation of AVL's renowned system, to meet the challenges of tomorrow's regulations and testing environments.

FUTURE-SAFE

Enables quick adaptation to evolving regulations, safeguarding investments and reducing upgrade costs.

COST EFFICIENT AND SCALABLE

AVL M.O.V.E 2 reuse devices, upgrade selectively, and automate workflows for regulation-compliant, multi-vehicle RDE testing—without full system replacements.

ROBUST, VERSATILE INSTALLATION

Ensures safe, quick, and adaptable installations across diverse vehicle platforms, enhancing testing efficiency.

COMPREHENSIVE PROCESS AUTOMATION

Fully automated RDE testing minimizes manual intervention, reduces errors, and streamlines compliance management.

GASEOUS

GAS ADVANCED
Accurate measurement of NO/NO_2, CO/CO_2, and N_2O using trusted analyser technology. Combines reference-grade NDUV and NDIR analyzers, now with a new low NOx NDUV for enhanced precision and minimal drift.

FT
Compact and lightweight FTIR-based device for multi-component measurement of NO/NO_2, CO/CO_2, NH_3, N_2O, CH_4, H_2O, HCHO, and more. Proven equivalency to reference analyzers.

NH3
High-precision gas analysis based on laser spectroscopy, featuring a highly sensitive photodetector and temperature stabilization for maximum accuracy.

FID iS+
Measures THC and CH_4 (NMHC/NMOG) using a heated 2C-FID analyzer optimized for mobile use. Based on reference principle aligned with global regulations.

GAS iX ADVANCED
Combines the capabilities of GAS ADVANCED and FID iS+ in a single unit—ideal for heavy-duty applications where modularity isn't required. Measures NO/NO_2, CO/CO_2, N_2O, THC, and CH_4 (NMHC/NMOG).

PARTICLES

PN ADVANCED
Simultaneous measurement of 10 nm and 23 nm particles in parallel using advanced diffusion charger technology—no operating fluid required.

PN 2
Measurement of 10 nm or 23 nm particles with one device using full-flow CPC based on AVL APC technology. Delivers lab-grade accuracy in a mobile-optimized design.

PM PEMS
Real-time measurement of soot and particulate matter using photo-acoustic and gravimetric methods—recognized as the reference device for U.S. HDIUT testing.

FUEL & EXHAUST FLOW

EFM
High-accuracy exhaust flow measurement based on the differential pressure principle. Features a separated tube and control box for flexible installation and fast data acquisition for dynamic conditions.

PLUtron/FuelTron
Fuel flow meter for close-to-engine applications and the testing of components, engine, and vehicles.

E-POWER

X-Meter
Compact and flexible system for voltage and current measurement – instantly calculates electrical power and energy flow across up to 10 different loads and sources.

INTEGRATION

SYSTEM CONTROL ADVANCED
Integrated control, automation, and datalogging in one rugged, MIL-standard device—offering direct access to OBD and vehicle CAN for seamless, automated testing.

POWER
Centralized power and communication via the EBOX reduces installation effort and supports various battery types. The new AMEX+ delivers robust, portable energy with integrated Li-Ion technology.

CONCERTO MDT
Powerful data evaluation and reporting aligned with global RDE regulations. Automates submission document creation and sets the industry standard as the trusted reference tool.

QUALITY STATION
Automated quality checks and calibration for M.O.V.E devices—powered by System Control for seamless automation, data logging, and report generation.

Euro 7

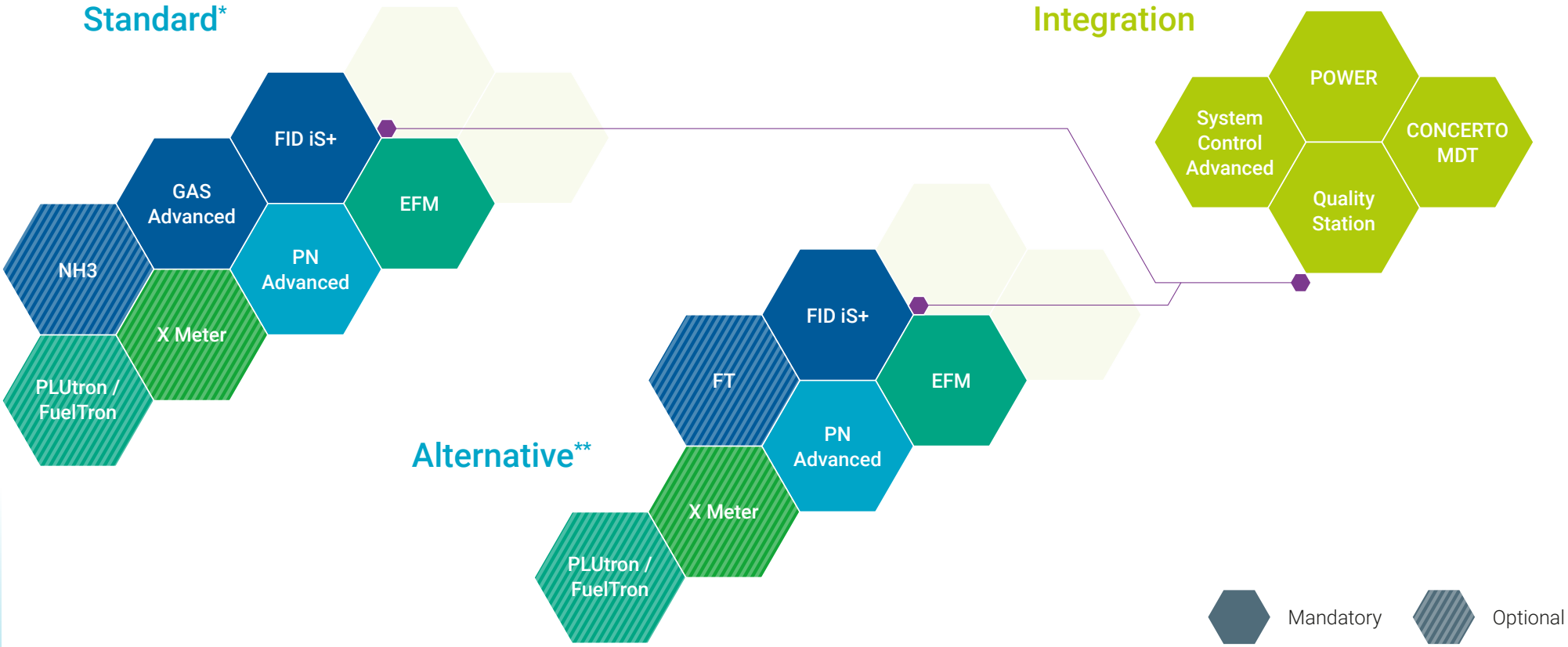
Light Duty

EURO 7 introduces tighter emission controls for light-duty vehicles, including stricter particle number limits that now count particles as small as 10 nm, and a Real Driving Emission (RDE) limit for THC and NOx (Diesel) or NMHC (Patrol). Furthermore, Onboard Monitoring (OBM) of NOx and NH3 using OBD sensors is required.

AVL M.O.V.E 2 rises to the challenge. Designed as a modular and extendable system, it adapts effortlessly to different testing needs. At its core is the **System Control Advanced,** orchestrating a seamless experience – from installation to operation – thanks to **flexible power and mounting options.**

- New PN 10
- New THC+NOx and NMHC

- Accurate measurement of both 23 nm and 10 nm particle
- RDE testing simplified and fully automated



With **PN Advanced,** measuring both 10 nm and 23 nm particles happens in parallel, eliminating the need for multiple instruments. **GAS Advanced** ensures accurate results at lowest concentrations. The built in NDIR does not have any interference of N2O on CO for correct readings.

The **FID iS+** brings robust THC and NMHC measurement directly onboard the vehicle, combining mobility with precision. For NOx OBD sensor validation, the **NH_3 PEMS** offers a smart, cost-effective solution – tackling the challenge of NH_3 interference of OBD Sensors head-on.

Concerto MDT, AVL's validated data evaluation tool, supports one-click reporting aligned with global regulations, making it ideal for the increased documentation and audit-readiness demanded by Euro 7.

* includes everything required for the specific emission regulation and application, offering the most practical configuration in terms of usability

** includes multi-component analyzers or add-ons for standard analyzers to expand measurement capabilities for future regulations and applications

Euro 7

Heavy Duty

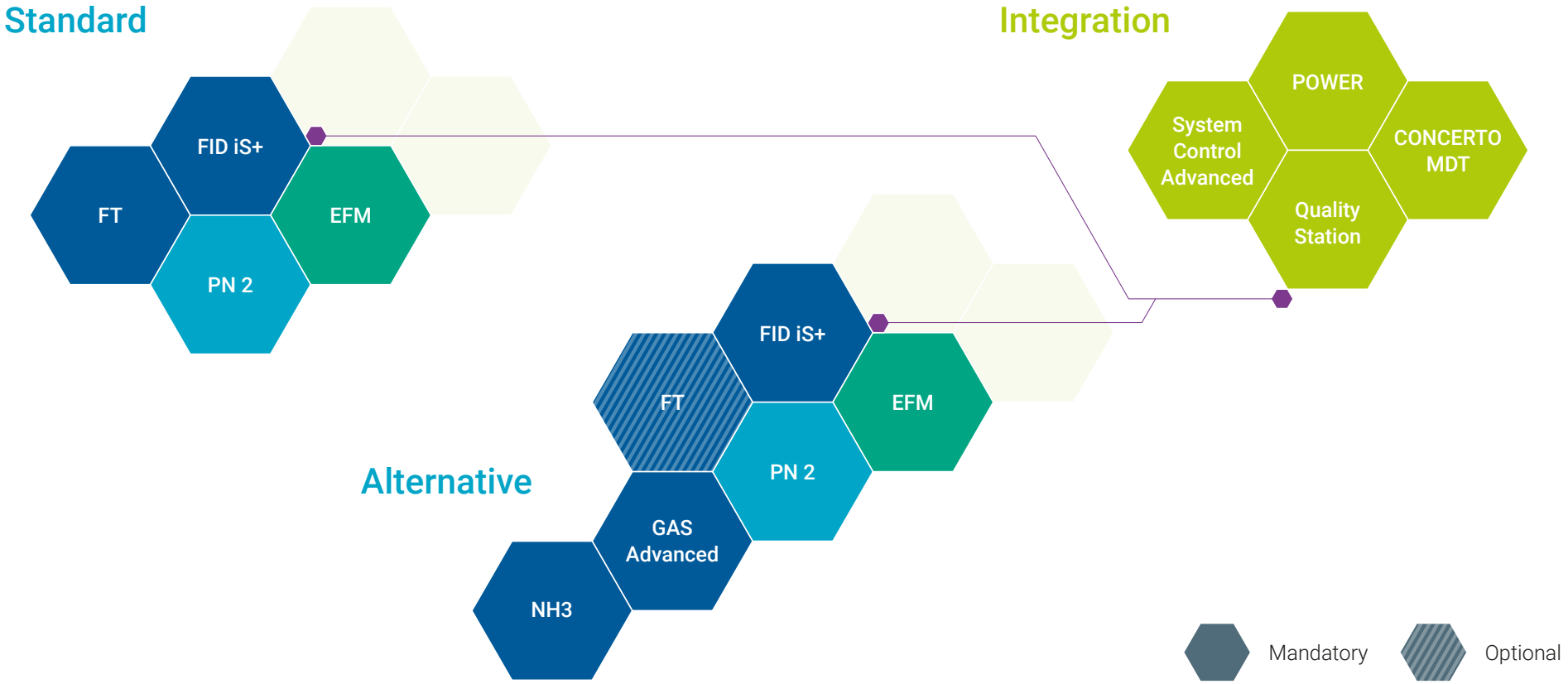
Euro 7 HD RDE introduces stricter limits, including new components like PN10 nm, NH_3, N_2O, CH_4, and NMOG, while reducing existing thresholds by around 50% and removing conformity factors. This raises the demand for highly accurate PEMS devices to ensure compliance.

Onboard Monitoring (OBM) of NOx, NH_3, and PM via OBD sensors adds another layer of complexity, requiring precise and reliable measurement under real-world condition.

AVL M.O.V.E 2's comprehensive system approach, built around the **System Control Advanced,** includes multi-component and especially for the low measurement range optimized analyzers & sensors to ensure accurate measurements across all required pollutants.

- **New limits for PN10, NH_3, N_2O, CH_4 and NMOG**
- **Conformity Factor Reduction**

- **Advanced measurement module for more than 20 components**
- **Highly accurate PN 10 and 23 nm measurement with one device**



The **PN 2,** based on a full flow Condensation Particle Counter (CPC) provides highest sensitivity for 10 and 23 nm particle measurement within one device.

The **FID iS+** uses a heated 2C-FID. It is a robust and compact solution for THC/ MNHC measurement based on the reference principle. It is required for the determination of NMOG in case of a higher bio-fuel content.

Additionally, **Concerto MDT,** AVL's validated data evaluation tool, supports one-click reporting aligned with global regulations, making it ideal for the increased documentation and audit-readiness demanded by Euro 7.

China 7

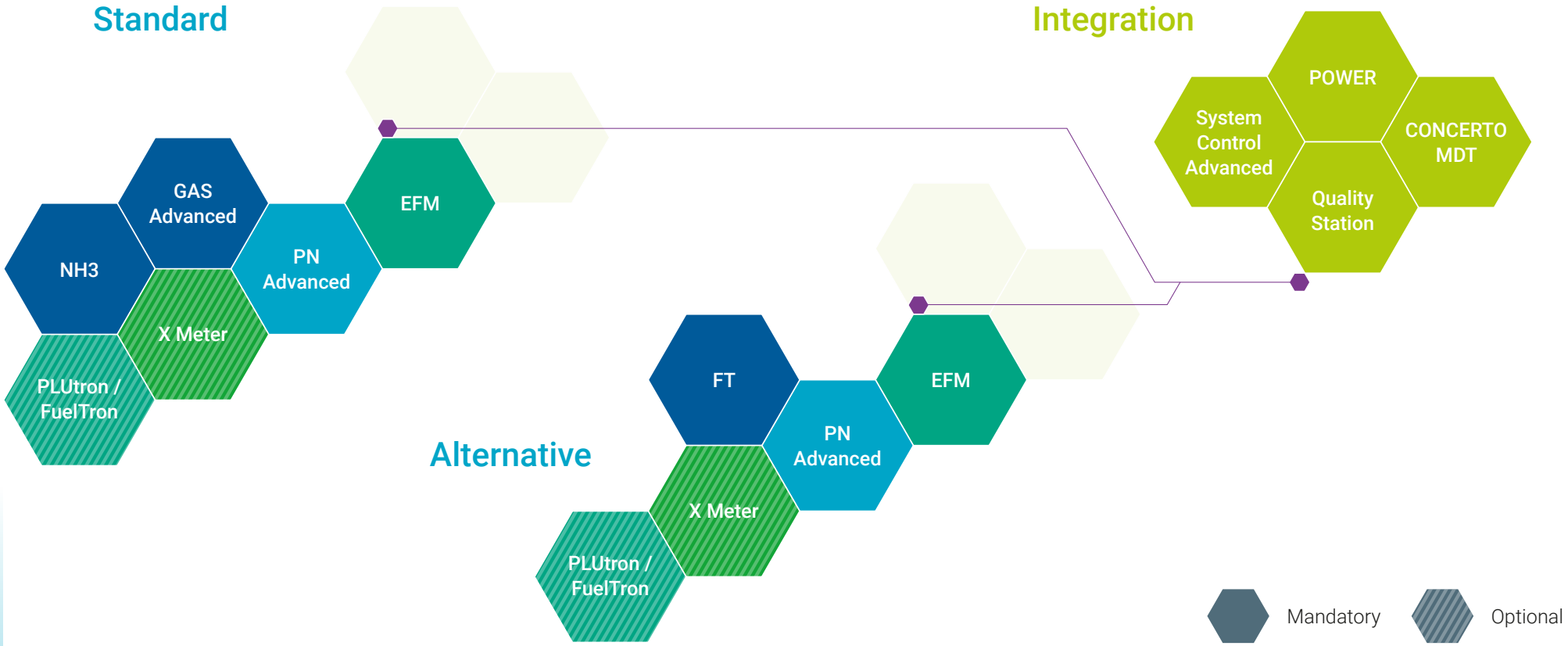
Light Duty

China 7 aims for **tighter emission controls** for light duty vehicles, including stricter particle number limits that now count particles as small as 10 nm and monitoring of NH_3. In addition, the ambient conditions, including maximum altitude are extended for RDE testing. Further limits might follow in near future.

AVL M.O.V.E 2 is a versatile and modular system. For cost effectiveness, existing systems can be re-used and extended with e. g. NH_3 or a module measuring up to 20 gaseous components in parallel. PN PEMS in the field can be upgraded to support 10 nm in addition to 23 nm particles.

- **New PN 10 nm**
- **New NH_3 monitoring**
- **Extended ambient conditions**

- **Measurement of both 23 nm and 10 nm particles**
- **Existing systems can be extended for NH_3 monitoring**
- **RDE testing simplified and fully automated**



The **PN Advanced** is capable of measuring both, 23 nm and 10 nm particles in parallel, eliminating the need for multiple instruments.

The **GAS Advanced** is especially optimized for the Low NOx range to ensure highest accuracy and low-est drift. The NH_3 PEMS is a compact and accurate extension for measuring NH_3.

System Control Advanced ensures guided, automated workflows for RDE, minimizing operator errors and ensuring compliance.

Additionally, **Concerto MDT,** AVL's validated data evaluation tool, supports one-click reporting aligned with global regulations, making it ideal for the increased documentation and audit-readiness demanded by China 7.

China 7

Heavy Duty

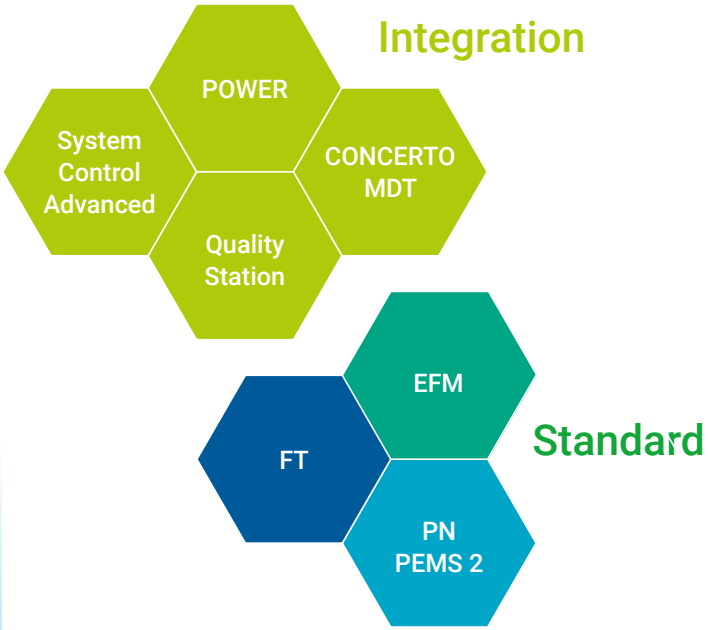
China 7 HD RDE introduces a bunch of new limits includ-ing PM 10 nm (instead of 23 nm), NH_3, N_2O and CH4 in addition to the existing limits for standard components. Furthermore, the conformity factors are reduced which goes hand in hand with a limit reduction. This means that beside of measuring all the components a high accuracy of the PEMS devices is the key.

AVL M.O.V.E 2's comprehensive system approach, built around the **System Control Advanced,** includes multi-component and especially for the low measure-ment range optimized analyzers & sensors to ensure accurate measurements across all required pollutants.

- **New limits for PN10, NH_3, CH_4 and N_2O**
- **Extended ambient conditions**

- **Multi-component analyzer for measuring all gaseous concentrations**
- **Measurement of both 10 nm and 23 nm particles with one device**
- **RDE testing simplified and fully automated**

CHINA 7 HD

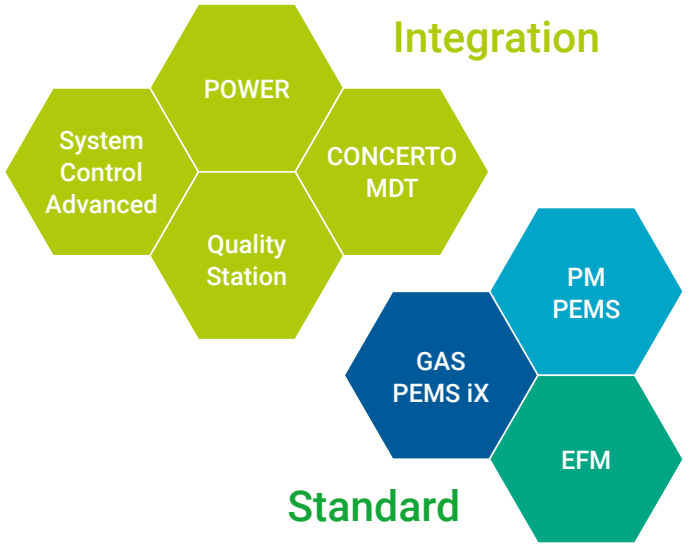


The new lightweight **M.O.V.E FT** can measure more than 20 components with its multi-component analyzer and is therefore the perfect tool for China 7 Heavy Duty.

The **PN 2,** based on a full flow Condensation Particle Counter (CPC) provides highest sensitivity for 10 and 23 nm particle measurement within one device.

Additionally, **Concerto MDT,** AVL's validated data evaluation tool, supports one-click reporting aligned with global regulations, making it ideal for the increased documentation and audit-readiness demanded by Euro 7.

USA HDIUT

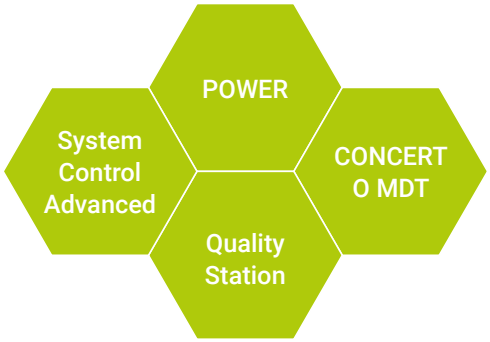


INTEGRATION and Workflow Automation

- Different requirements
- Different combinations of devices
- Efficiency and compliance

- Simplified integration of modules and their combination to a system Workflow automation
- Efficient and flexible mechanical and electrical installation
- Compliance with regulation

An RDE testing system consists of different modules and sensors and their combinations, depending on the application and regulation. Efficiency of installation and operation and compliance with the regulation is key.



The AVL M.O.V.E system is designed to handle the full testing workflow—from preparation and installation to quality checks, data evaluation, and secure, revision-proof storage.

At its core is the **System Control Advanced,** the central hub for control, data logging, and workflow automation. It connects seamlessly with various modules and sensors via Ethernet and provides access to OBD and vehicle CAN.

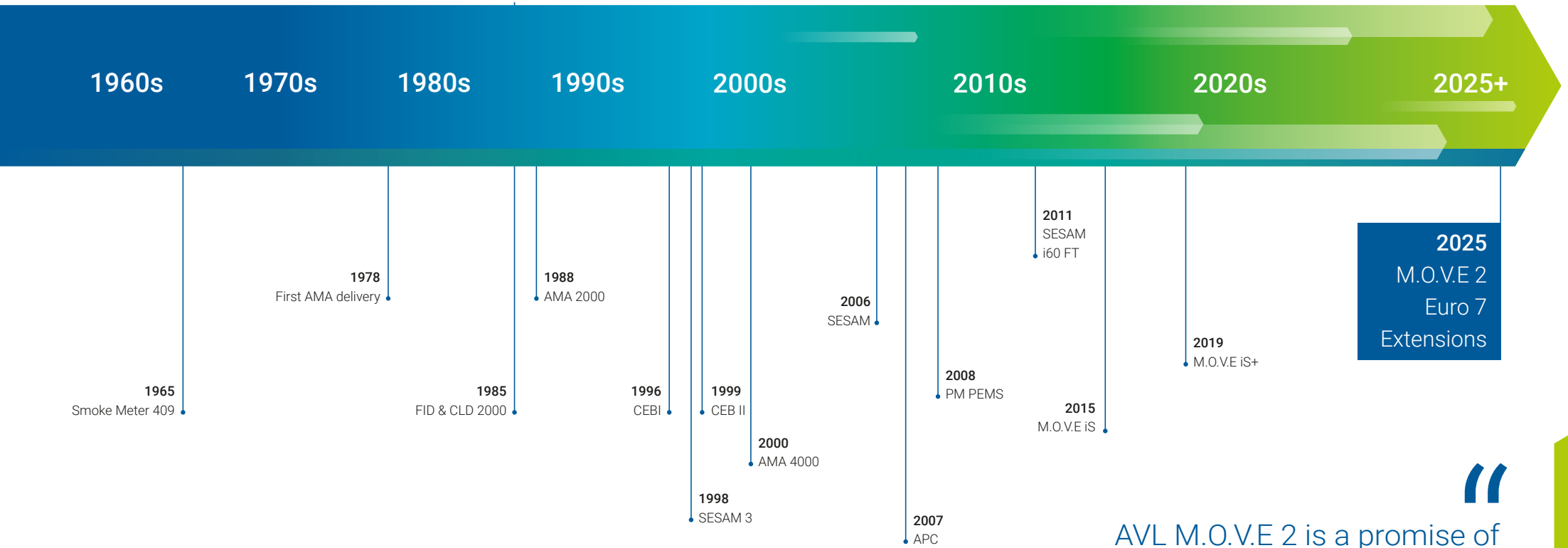
To ensure measurement reliability, the **Quality Station** enables fully automated checks of emission devices, saving time and improving consistency—fully operated through System Control Advanced.

Power distribution is streamlined with **M.O.V.E Power**, built around the **AVL E-Box**. It supports multiple battery types and allows hot-swapping without power interruption. The **AMEX+** adds mobile flexibility with four integrated Li-Ion batteries and an LCD terminal for real-time status updates.

M.O.V.E Mounting offers flexible installation options for passenger cars, trucks, and NRMM—whether on a tow bar or in the trunk.

For data evaluation, **Concerto MDT** delivers one-click, regulation-aligned reporting, making it ideal for the documentation and audit-readiness required by global RDE regulations.

AVL History in Tailpipe Emissions Measurement



AVL M.O.V.E 2 is a promise of precision, adaptability, and readiness for the future of RDE compliance.

Reimagining Motion

For a greener, safer, better world of mobility.

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