AVL

AVL Team SUITE

AVL CAMEO 4™

Makes complexity easy

THE ADDED VALUE

- Time saved through automated functions providing ready-to-use results
- Clear and easy-to-use work procedures
- Improved results in less time through online modeling and optimization
- Highest utilization in the test facility due to standardized tests for multiple use cases and users

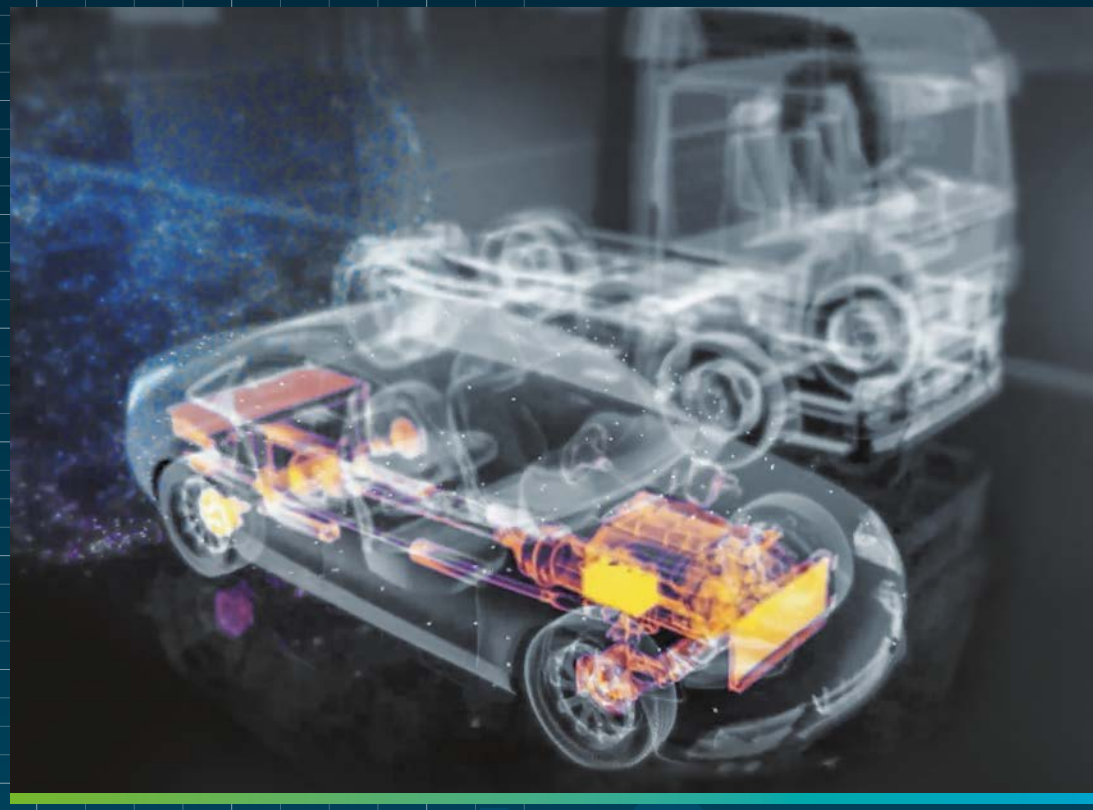
THE CHALLENGE

ECU calibration is a major task in modern powertrain development. Despite an increasing complexity of modern control units and higher degrees of freedom, time invested in calibration tasks must be reduced.

How to reach the development targets, facing…

- Increasing system complexity due to emission and fuel consumption requirements
- Increasing development costs due to testing in real driving conditions (RDE)
- Shorter development times due to frequent portfolio updates
- Broader vehicle portfolio to reach more customer groups

All over the world, new emission legislations demand full load range compliant powertrain calibration. This requires to manage multi-variant applications, various temperature and altitude conditions, influence of trip and driver, as well as vehicle load.



AVL CAMEO 4™ – Makes complexity easy

THE AVL SOLUTION

AVL CAMEO 4™ – much more than DoE! With AVL CAMEO 4™, the road for the future is set and prepared. The software offers a complete solution for powertrain testing and optimization demanded by the newest legislations, including RDE.

WHAT DOES AVL CAMEO 4™ OFFER?

Transient calibration is supported in combination with the integrated data processing platform AVL CONCERTO 5™. Enhanced usability and a new software user interface allow users a faster parametrization and execution of their tasks. AVL CAMEO 4™ offers a standardization concept to handle the data needed to deliver world-class engine calibration. A standard test in AVL CAMEO 4™ made for multiple use cases and users is easy to set up for the individual needs, also for the testbed operator themselves, leaving room for the engineering team to concentrate on innovation.

A test sequencer allows to start different test runs in an automated sequence to utilize the test facility 24 hours, 7 days a week. Furthermore, an advanced interface to AVL PUMA Open 2™ offers outstanding integration and performance of daily automated calibration work.

APPLICATIONS IN AVL CAMEO 4™

AVL CAMEO 4™ offers a wide range of applications:

- Gasoline engine calibration (e.g. charge and torque calibration, base calibration, emission calibration)
- Diesel engine calibration (e.g. torque calibration, base calibration, emission calibration)
- Exhaust aftertreatment calibration (e.g. LNT, SCR)
- Drivability calibration (e.g. power on/off, tip in/out)
- E-motor and inverter calibration
- Battery management calibration
- Fuel cell calibration
- Steering calibration
- Chassis calibration
- ADAS calibration
- Simulation model parametrization
- Vehicle concept selection and optimization

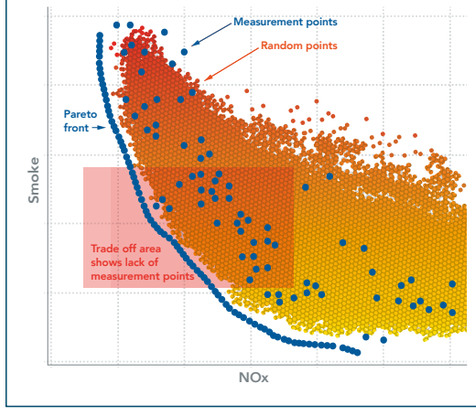
FROM TASK TO KNOWLEDGE…

Active DoE for highest development efficiency

Be faster with your calibration by using the benefits of online modeling and smart test procedures.

CONVENTIONAL DoE

With the conventional DoE approach there is a risk that a large portion of the time and effort is spent in collecting data in less interesting areas while lacking measurements close to the pareto-front where they are crucial for the calibration task.

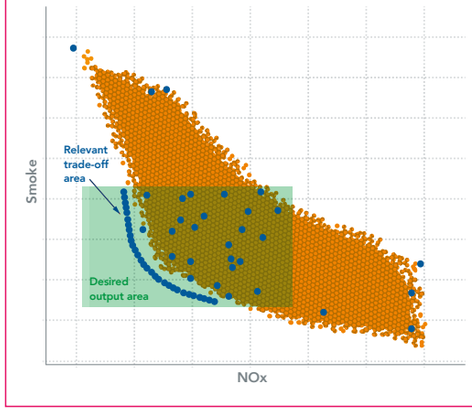


POTENTIAL RISKS

- Risk of missing the optimal result
- Risk of lacking focus in the interesting area
- Risk of unnecessary run-time and costs
- Risk of accelerated wear and drift of engine and measurement devices
- Risk of missing expert know-how

Active DoE

With Active DoE, AVL CAMEO 4™ is focusing on the area of interest by modeling the responses during the test. It uses the desired output area defined by the user to distribute the measurement points optimally including those on the pareto-front.



THE ADDED VALUE

- Maximum accuracy of the optimization result
- Focus on area of interest
- 30 % less data needed for better results
- Added protection from wear and drift
- Easy to use

Integrated testing solution for test fields

Be in full control throughout your complete test field using standardized and consistent test setup.

Onetime parametrization for easy and efficient test setup

- Direct usage of AVL PUMA Open 2™ core functionalities in AVL CAMEO 4™
- Powerful interface ready for future calibration needs

Intuitive test parametrization

Increase user acceptance and maximize first time right data quality.

- Define an easy user interface for complex tasks
- Quickly access and adapt all important settings in one single place
- Standardize frequently used tests for multiple engine types

Real-time controllers for safe and robust testing

Safely operate your engine fast and efficiently independent of your ECU calibration status.

- Fast, efficient and consistent fuel and ignition control from prototype to SOP
- Reduced DoE complexity and testing effort due to online combustion control
- Safe and stress free manual operation

POWERTRAIN DEVELOPMENT IS A TEAM SPORT

Today's requirements in powertrain development move forward every second. Complex systems, shorter times to market and a global world of opportunities challenge you to be better, more flexible and faster than your competitors.

Development tasks aren't stand-alone. And it's not (just) about how good single individuals or tools are…

… it's about how well they work together.

AVL Team SUITE™

SUCCESS BASED ON INTERPLAY

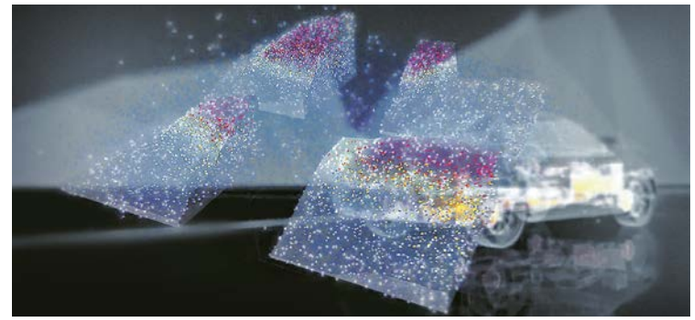
www.avl.com/meet-the-team

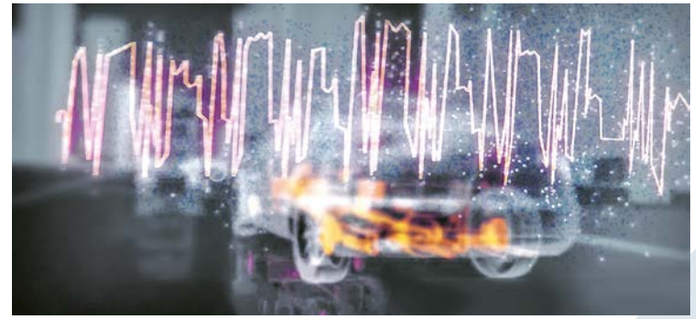
COMBINE YOUR STRONG TEAM FLEXIBLY OUT OF COMPATIBLE, COMPLEMENTARY PLAYERS TO MEET YOUR NEEDS.

- AVL PUMA Open 2™
- AVL EMCON 6™
- AVL LYNX 2™
- AVL SANTORIN MX 2™
- AVL TFMS 1™
- AVL CAMEO 4™
- AVL CRETA 5™
- AVL CONCERTO 5™
- AVL-DRIVE 4™
- AVL VSM 4™
- AVL IndiCom 2™
- AVL iGEM 2™
- AVL TESTGATE 1™
- AVL ISAC 6™

… and more joining soon

SUCCESS BASED ON INTERPLAY





… FROM KNOWLEDGE TO CALIBRATION

From data to knowledge in one click

Understand and analyze the behavior of your engine in one step.

- From data to robust models in one click
- Easy to understand task definition
- Powerful autolearning system for repetitive tasks

Easy from knowledge to calibration

Optimize calibration for different variants and legislations.

- Easy to understand task-oriented parametrization from real driving conditions
- Powerful automatic optimization resulting in directly applicable calibration
- Intuitive trade-off analysis and optimization for variant calibration

Seamless from calibration to prediction

Full control of your calibration for high efficiency and reduced costs in the calibration process.

- Reliable calibration results enhanced by integrated drive cycle prediction
- Powerful prediction and analysis of real-world driving behavior

FOR FURTHER INFORMATION PLEASE CONTACT:

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