TESTING SERVICES

Flanders Make has state-of-the-art testing and validation infrastructure. Companies can contract our services to validate their own solutions or to perform extensive tests on components and systems. In addition, we have workshops and tools available for adapting or building prototypes in all confidentiality.

DRIVETRAIN (SUB)SYSTEM TESTING



Multi-load drivetrain test cell for testing of multi-WD transmissions up to 221kW input power

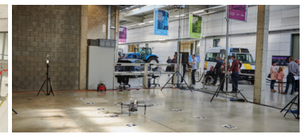
E-powertrain lab, testing of e-motor + inverter + battery pack + controller

VEHICLE TESTING

Climate chamber + shaker

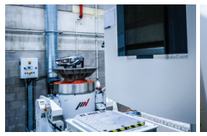
Direct access to Ford Lommel Proving ground

Rolling road, Real Driving Emissions, Wheel torque transducers, ...



Drone dome for indoor testing of Unmanned Aerial Vehicles (UAV)

COMPONENT TESTING



Shakers for durability testing (up to 2200 Hz)

Battery testers up to 200 kW

High-speed motor up to 20'000 rpm

Climate chambers

CUSTOMER REFERENCES

CNH industy
Picanol
Van De Wiele
Punch Powertrain
Dana
Bluways
Siemens
Tenneco
VDL
Triphase
Powerdale
BMW
Jaguar Land Rover
Toyota Motor Europe
Ford LPG
Aston Martin
and more ...

TESTIMONIALS

We jointly developed a model-based design tool to optimally model the energy conversion and storage in a shock absorber. We based it on our specific mechanical and electrical requirements, such as several typical road profiles and comfort requirements. The resulting model shows an efficiency of 48%. Innovations such as this, ensure that we can remain competitive in the future.

Miguel Dhaens
Engineering manager global research at Tenneco

Together, we developed a model for a cooling system and validated it in the climate chamber of Flanders Make. The thermo-hydraulic models can now be used to improve the co-design for the drive of our weaving machines and the corresponding cooling system.

Dimitri Coemelck
R&D engineer Picanol

WANT TO KNOW MORE OR EXPLORE POSSIBILITIES?
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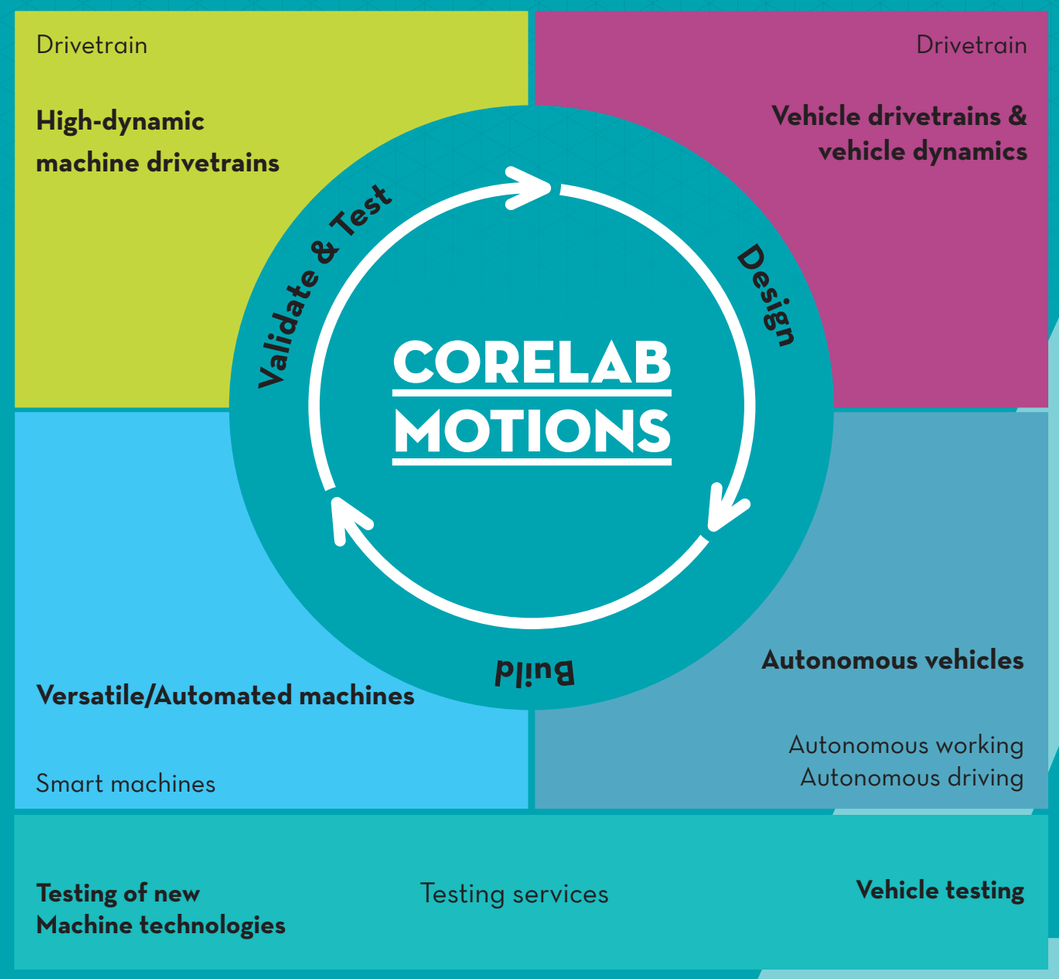
FLANDERS
MAKE
DRIVING INNOVATION IN MANUFACTURING

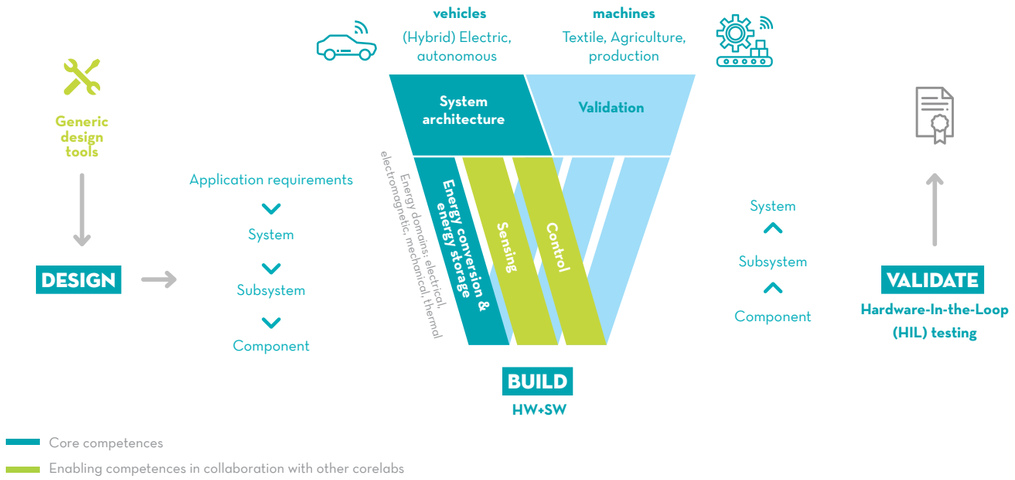
Machines and vehicles must respond to increasing demands for energy-efficiency, flexibility and performance, and must comply with stringent environmental requirements. Flanders Make helps companies to deliver innovative motion systems, for applications such as hybrid drivetrains, autonomous vehicles, production machines and utility vehicles.

We deliver new motion concepts, set the framework for new motions architectures and provide tools, designs and specifications. In addition, Flanders Make has disposal of extensive test and validation infrastructure. We develop and build prototypes and take care of system integration. That's how we help companies deliver the next generation of active motion products.



HIGH-DYNAMIC MACHINE DRIVETRAINS

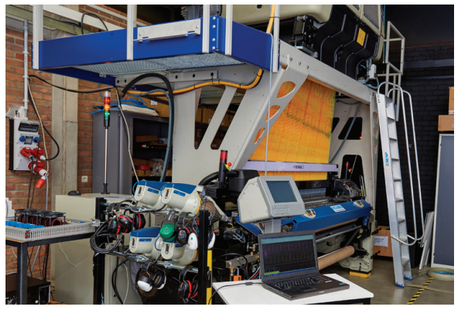
Typical application requirements: Productivity - Energy efficiency - TCO - Versatility - Reliability - (human) Interaction



HIGH-DYNAMIC MACHINE DRIVETRAINS

KEYWORDS

New motion concepts, Total cost of ownership (TCO), High performance cooling, Energy efficient lubrication, Modularity



Weaving machine + jacquard

Drivetrains for both machines and vehicles need to be developed with ever increasing demands on performance, cost and energy efficiency. A strong architectural design with proper selection of subsystems and components is a first step in the optimization of the drivetrain.

Innovative concepts on modular architecture, efficient subsystems, temporary energy storage in power electronics or newly developed components like magnetic springs, lead to lower energy consumption and reduced cost.

Building a prototype of the high-dynamic drivetrain, validating its most critical performance indicators and testing of the new subsystems and components in a real machine or relevant environment, is the second step in moving towards industrial

WHAT WE OFFER

- Support in choices of drivetrain architecture towards optimal design for energy management
- Design of system architecture and related actuation systems (electromechanical, hydraulics, lubrication, cooling,...)

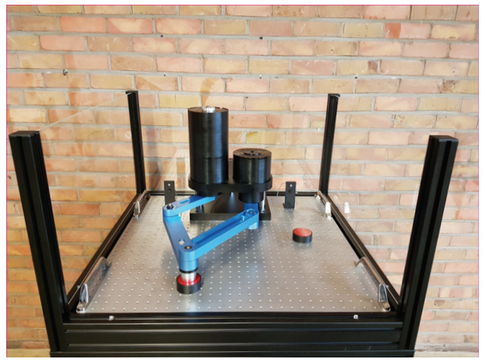
VALIDATED DIGITAL MOTION PRODUCT ARCHITECTURE

Scalable functional modules, including actuation, mechanics, control, embedded software, remote software, sensing systems, connectivity and autonomous driving technology

Realising Smart Motion Systems that are

- Reconfigurable
- Hyper reliable
- Versatile
- Functionally Safe to use

- Design of drivetrain subsystems and components
- Build of proof-of-concept prototypes
- New component testing in real machines as a step in the validation process.



SCARA robot with integrated Magnetic Spring

VEHICLE DRIVETRAINS & VEHICLE DYNAMICS

KEYWORDS

Hybridization/electrification, drivetrains, architecture, torque vectoring control, e-storage solutions, suspension

Hybridization and electrification of drivetrains powered by alternative fuels is driven by lower and cleaner emissions. New propulsion types have more operating flexibility and can work with multiple energy storage systems such as (super) capacitors, batteries, mechanical flywheels and fuel cells. The role of the combustion engine cannot be underestimated for the long operational range and high power density. The combination of an optimized architecture and optimal sized drivetrain is important to achieve an efficient and cost optimal solution for the application. Drivetrain architecture has a huge impact on the control possibilities that impacts the dynamics and efficiency of the vehicle. Architectural choices such as in-body versus In-Wheel-Motors, types of hybridization, active or passive suspension and 48V auxiliaries effects the amount of controllable actuators for vehicle dynamics and energy management. The developed drivetrains are applicable for autonomous systems and need to be designed to cope with system faults to allow fault-tolerant control and functional safety. Flanders Make has competences, models and dedicated research platforms to validate these vehicle technologies.

WHAT WE OFFER

- Support in choices of drivetrain architecture, energy management and storage
- Optimal sizing: subsystem/component
- Modelling, identification and design of drivetrains
- Building proof-of-concept drivetrains and vehicles
- Component testing in real vehicles
- Validation of vehicles dynamics and propulsion solutions

AUTONOMOUS VEHICLES

KEYWORDS

Autonomous working and driving, safe architecture, testing, validation infrastructure

Towards industry 4.0, autonomous vehicles will be found in many areas of application, such as the manufacturing industry, logistics and agriculture. These autonomous vehicles will not only drive, but also perform a working task in a flexible, safe and productive manner. To increase flexibility, collaboration with humans is often needed. To increase productivity and throughput, further collaboration with other autonomous (working) vehicles will become more and more important.

State-of-the-art solutions exist, but these are often conservative (and thereby slow) or not flexible enough for the application needs of the end user. Flanders Make applies knowledge – obtained in the automotive field – to increase the efficiency and flexibility of autonomous driving and working vehicles, while guaranteeing safety.

WHAT WE OFFER

- Architecture design for mobile robots, agricultural vehicles and AGVs in logistics.
- Implementation of a proof-of-concept autonomous driving and/or working vehicle
- Virtual and experimental validation of autonomous driving and working functions,

SMART MACHINES

KEYWORDS

Automated, Interconnected, Versatile, Reliable, Serviceable

The transition into Industry 4.0 requires manufacturing machines to be versatile, automated, energy-efficient, safe ... while the transition to service models further pushes the envelope for serviceability, reliability and lifetime. Many architectural improvements present themselves to facilitate this transition:

- Modular machines create versatility during design and operation
- Internet of things and digital twins allow predictive maintenance
- Interconnected machines allow multi-machine energy management

However, all these architectural improvements need to be designed, selected, evaluated and validated before making it to the market. Inventions such as our smart clamping device, which dramatically increases the effectiveness of a machining process, are proof that Flanders Make has the expertise and infrastructure to achieve this. Flanders Make can make the transitions happen.

WHAT WE OFFER

- Designing, selecting and evaluating novel architecture
- Minimizing your total cost of ownership and usership
- Building new machines
- Integrating and testing your components in our state-of-the-art infrastructure
- Validating architectural improvements