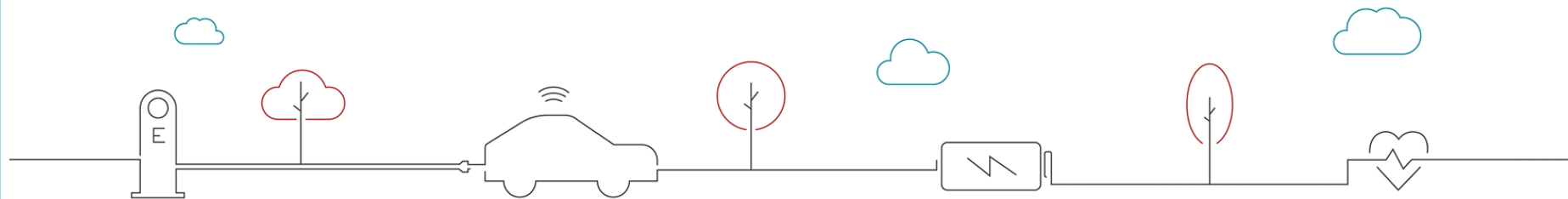


Engineering at the Heart of Mobility



Business Unit Mobility

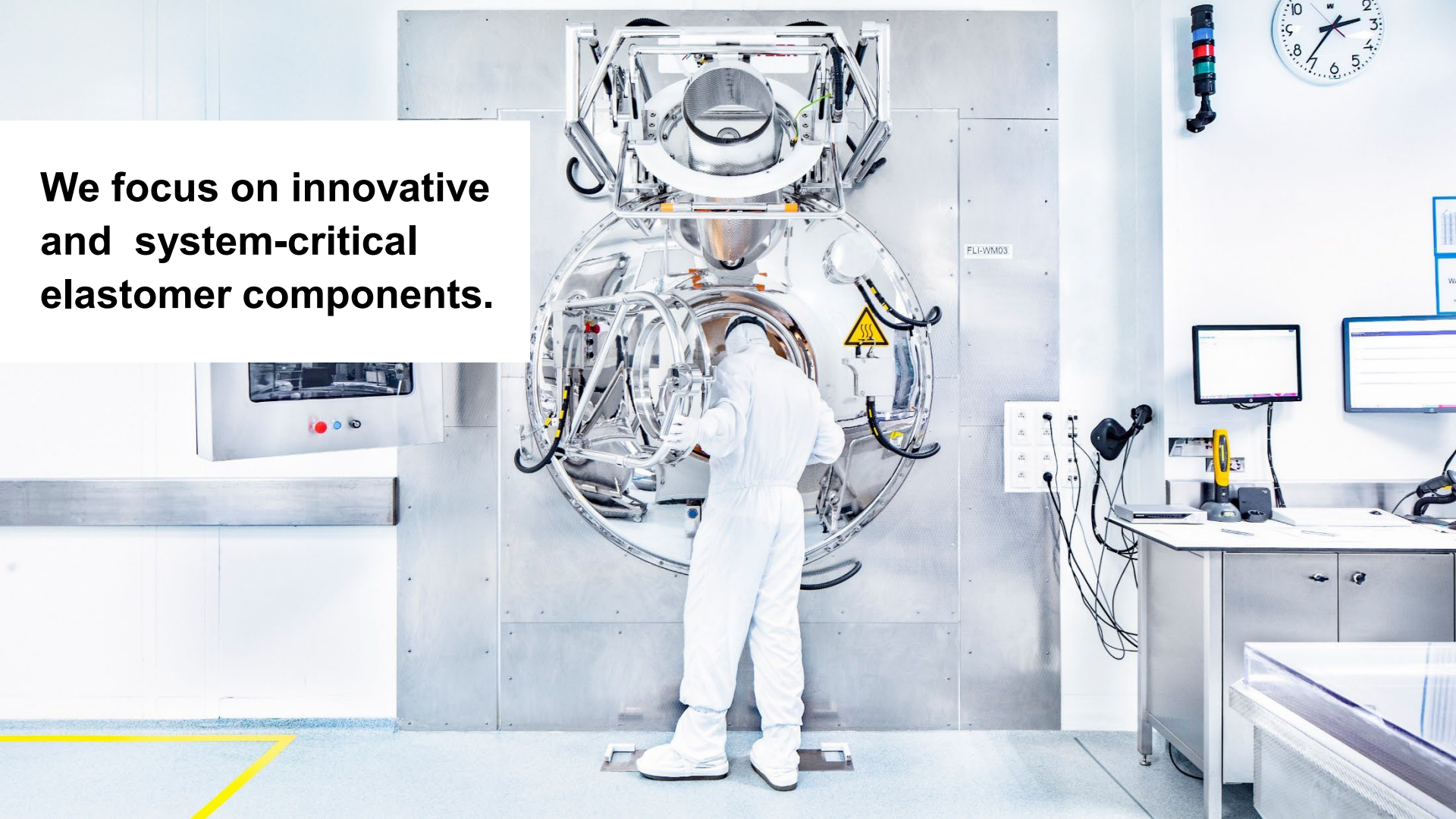
2024



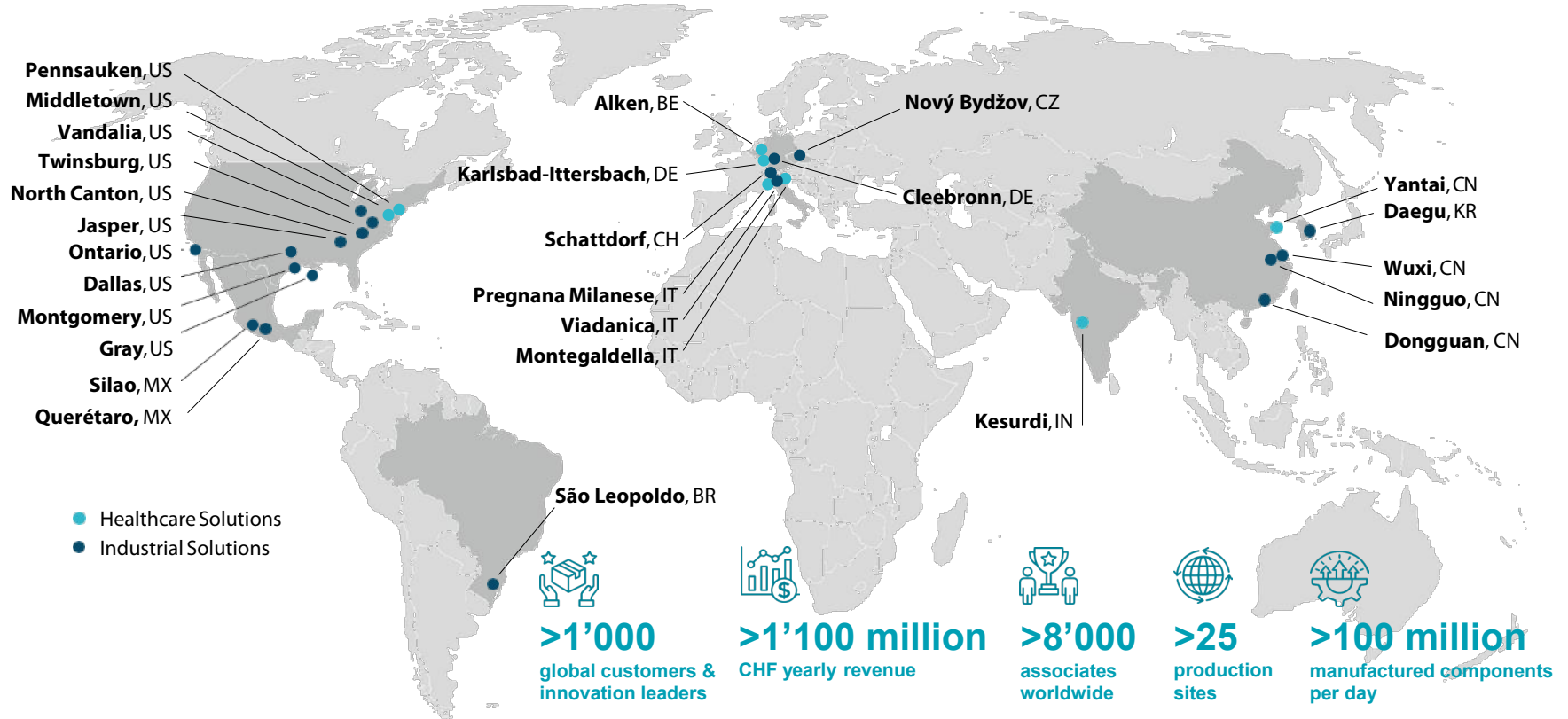
MISSION

**We materialize ideas for a
safer, smarter, and more
sustainable world.**

**We focus on innovative
and system-critical
elastomer components.**



Global presence and manufacturing footprint



Heritage and values as a base for long-term management approach



Our strategic priorities



Clear structure to increase market focus and strengthen our core competencies

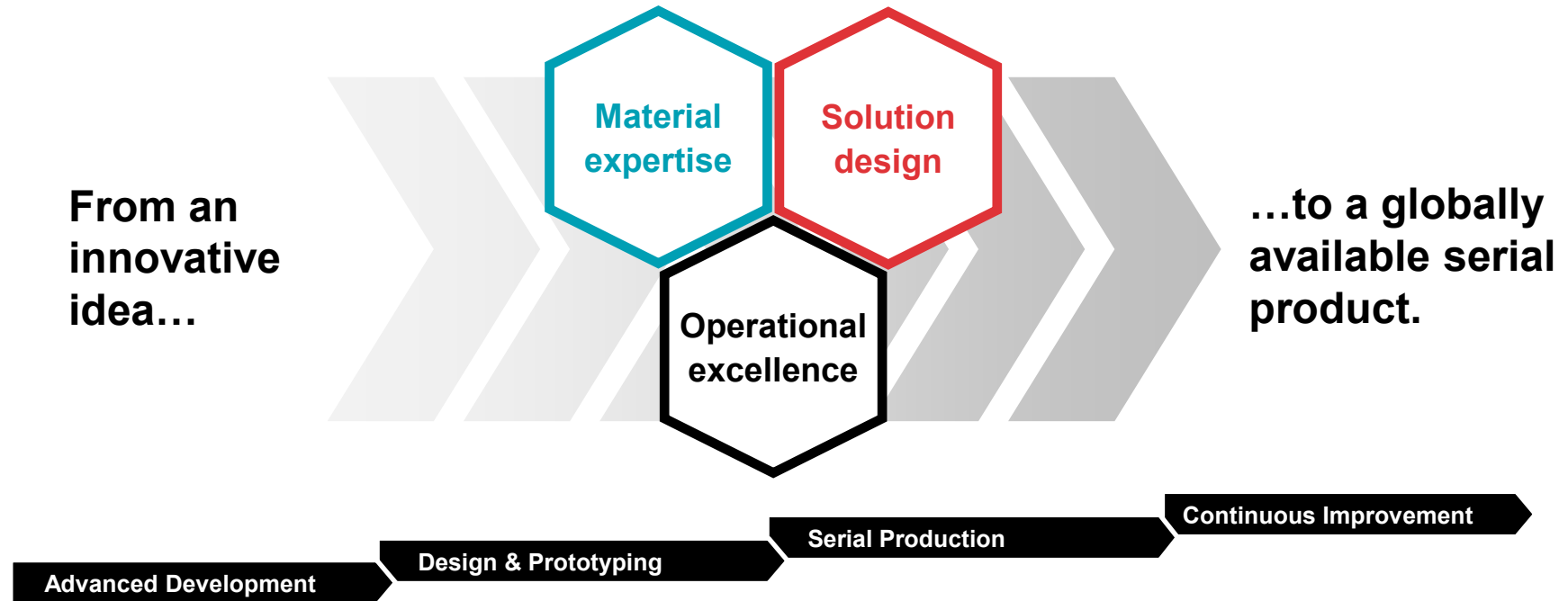


Business Areas

| | |
|--|---|
| | Technology & Innovation |
| | Sustainability & Operational Excellence |
| | Finance & Shared Services |

Group Functions

Recognized core competencies as central element for superior customer value



Sustainability standards we comply with



UN Global Compact
Membership since 2009



Global Reporting Initiative (GRI)
Sustainability reporting since 2008



Carbon Disclosure Project (CDP)
Reporting since 2013



Specific ISO certifications
14001, 50001, OHSAS 18001



Leading global ESG rating agency MSCI
awards Datwyler an "A" rating



With the gold rating, Datwyler is in the top 5% of all companies assessed by EcoVadis

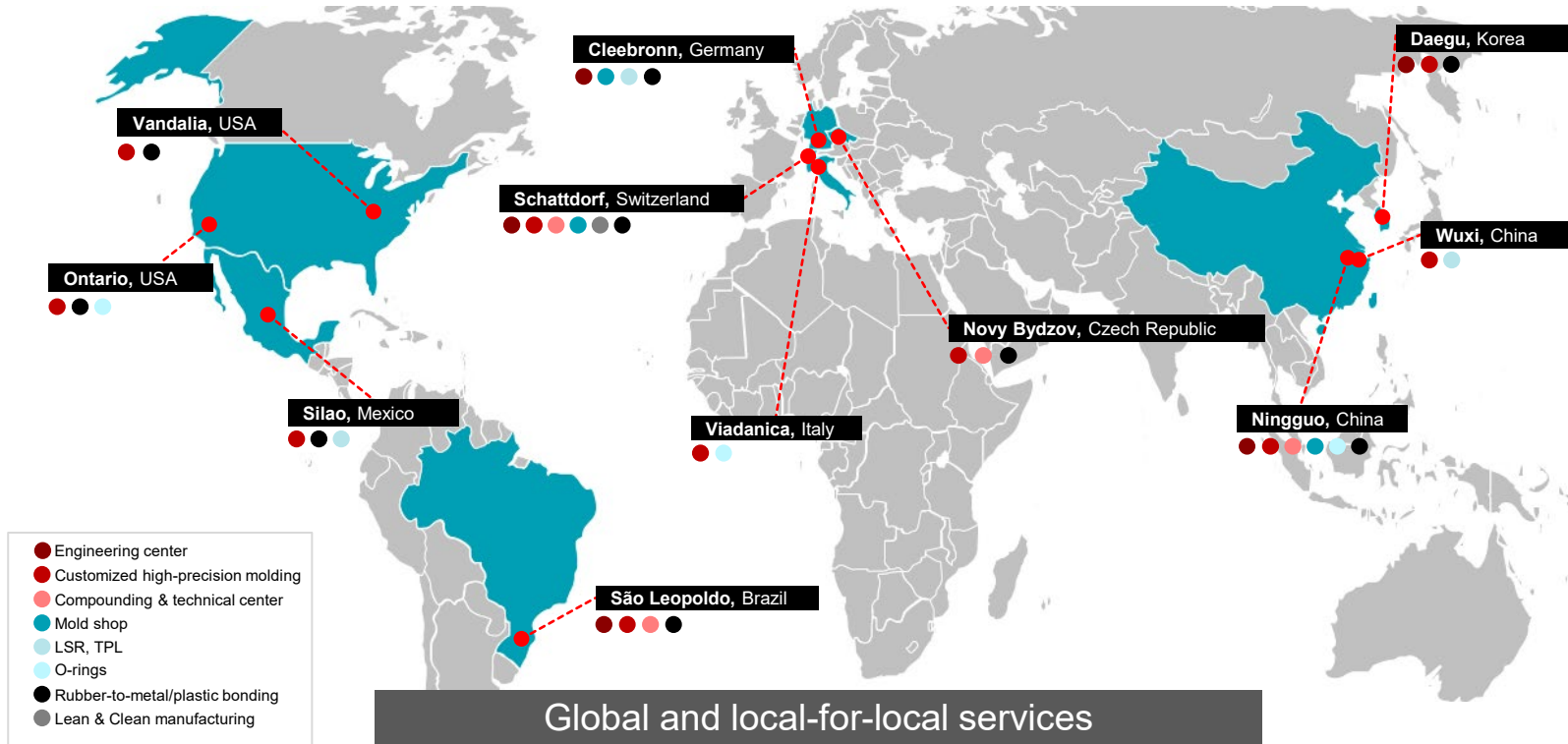


Engineering at the Heart of Mobility

**We support our partners
to promote a mobility
that is safe, intelligent,
and sustainable**

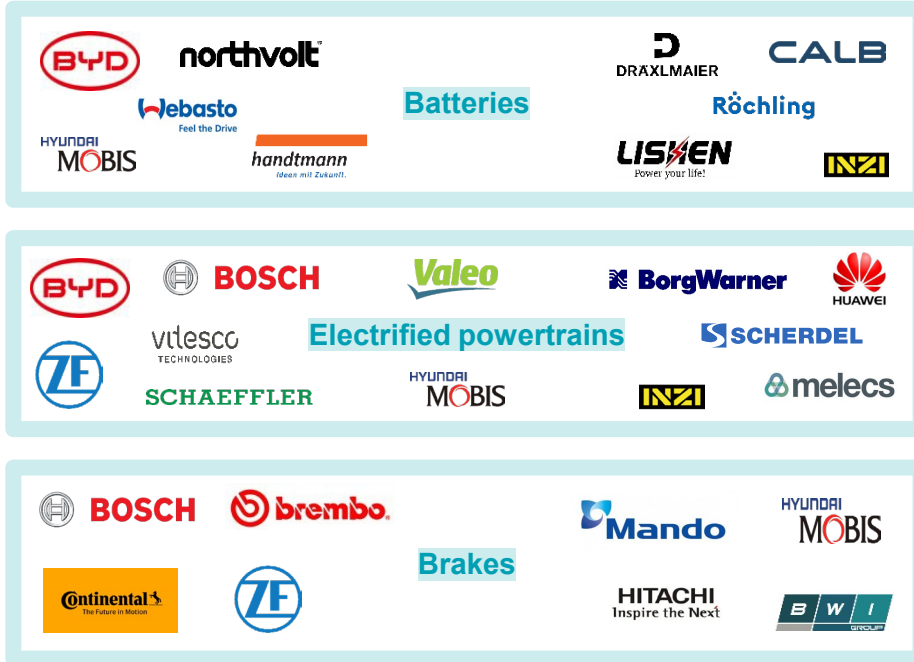
Global footprint

Engineering, materials and manufacturing mobility experts



Significantly enlarged customer base of global innovation leaders

Tier-1 and Tier-2 suppliers



Global OEM's



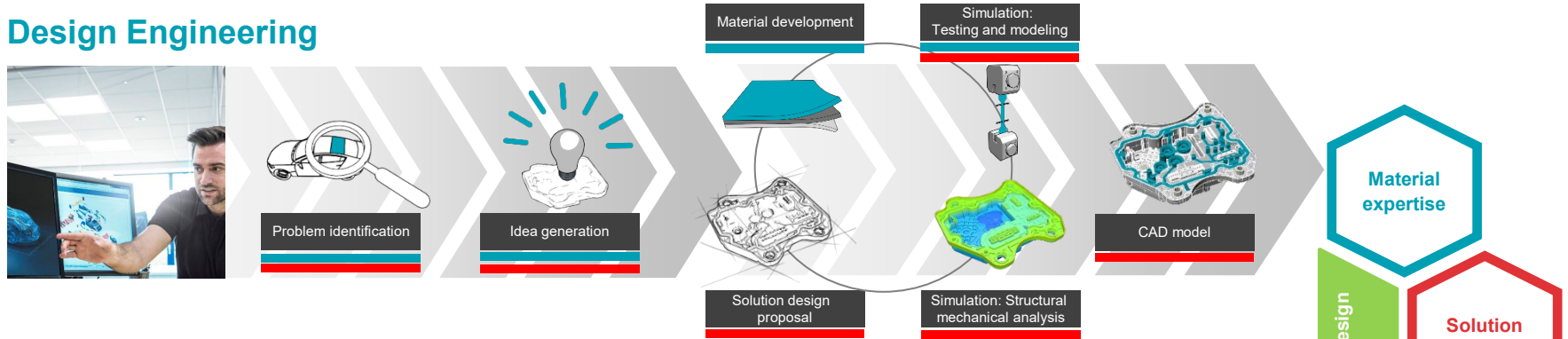


**Co-engineering
partners**

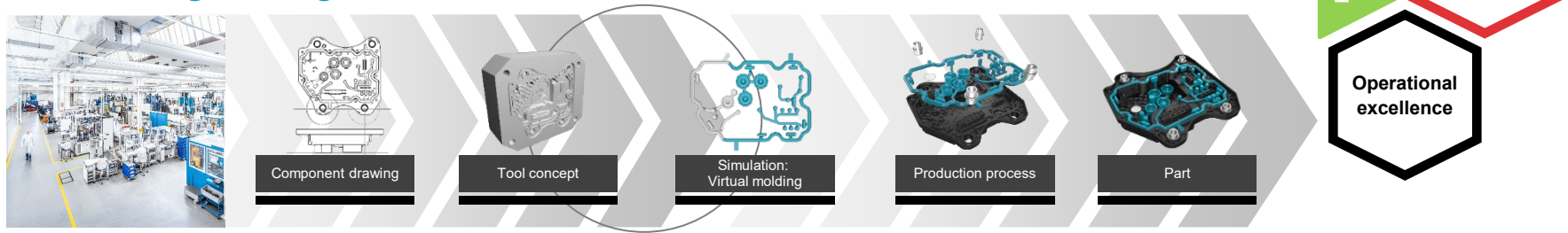
Co-engineering process

Partners for full-service and in-house solutions

Design Engineering



Process Engineering





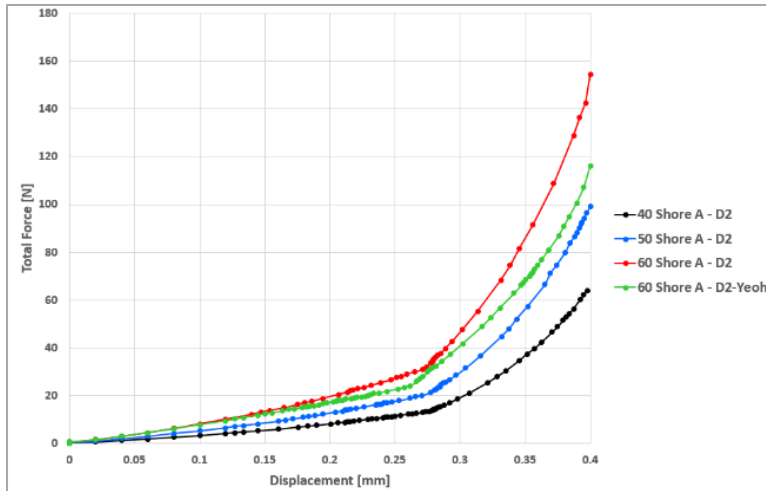
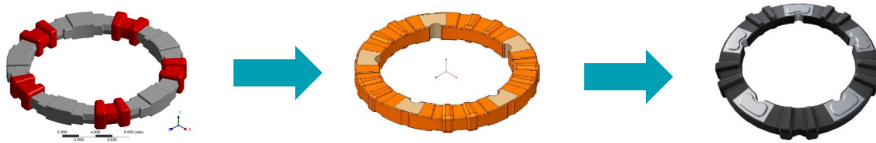
Design engineering

- From idea generation to optimal design and material solutions

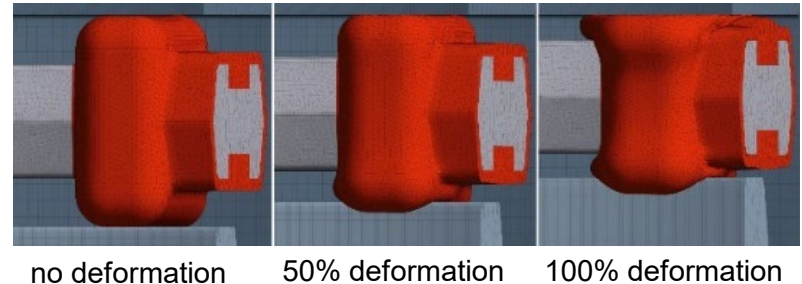
Solution design

Efficient solutions in cost and design

Example of co-engineering for a safety-critical brake application



From customer concept to Datwyler's proposal
30% cost reduction



Material development

Developers of materials & surface technologies for efficient solutions



**Raw Materials Testing
& Research**



**Rubber Compound
Formulation Expertise**



Materials Science



Mixing Process



**Failure Analyses &
Quality Control**



Surface Treatment



Chemical Compliance



Expert Network

Materials development

Current research and development activities for new mobility



Materials for battery systems

- Thermally conductive compounds (e.g.: TIMs)
- Compounds with EMI shielding
- Flame resistant compounds (UL94 V-0)



Materials for hydrogen applications

- Seals for fuel cells and electrolyzers
- Seals for auxiliary systems
- Thermoplastic based bipolar-plates



Materials for contact with special fluids

- Compounds to seal e-liquids and new types of liquids for immersion cooling
- AEM compounds



Other advanced materials and materials for printing

- Electrically conductive compounds
- Fibre reinforced materials
- Special fillers
- Materials for dynamic applications and durability
- Materials for screen printing

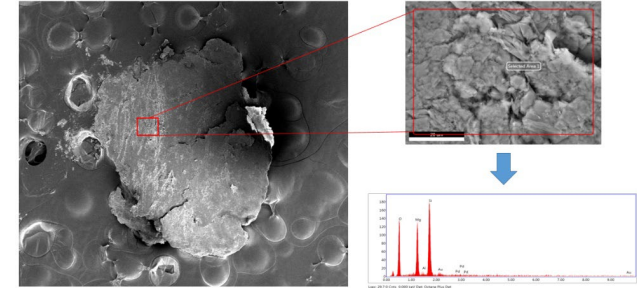


Sustainable elastomer formulations

- Compounds based on materials from renewable resources
- Functionalized cellulose fibers
- Compounds formulated around recycled materials

Surface technology and analytics

Technology and Innovation Labs delivering global customer support



Example: electron microscopy coupled with EDX-analytics

Benefits to our customers

- New surface treatments
- Focus on multicomponent parts and surface modifications
- Advanced materials development
- Co-engineering support starting from prototyping and simulation to testing and analysis
- Innovation and advanced technology development

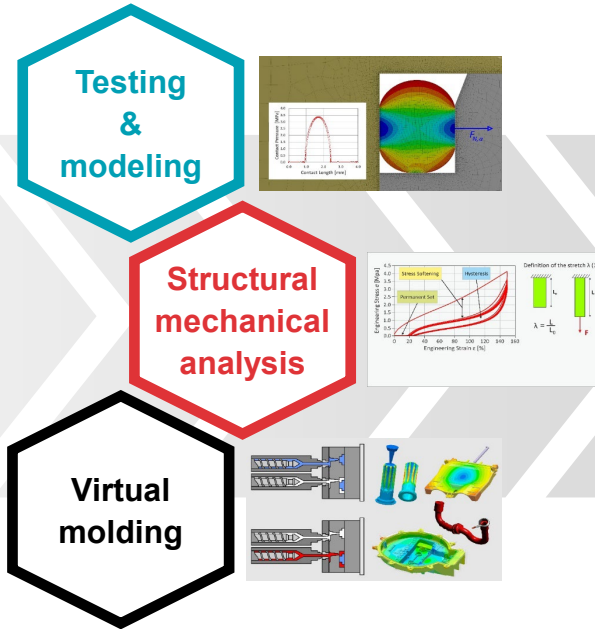
Simulation

Understanding and optimizing products and processes

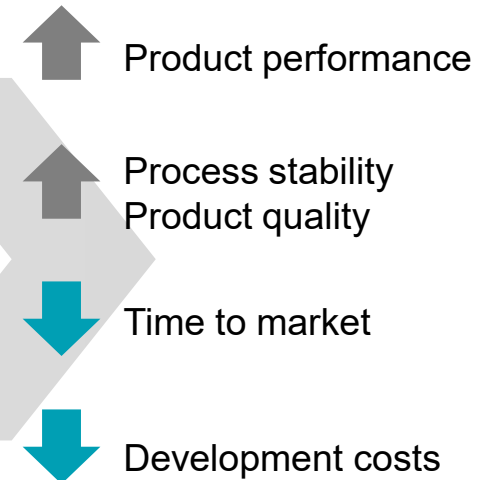
Core competencies



Simulation activities



Key benefits



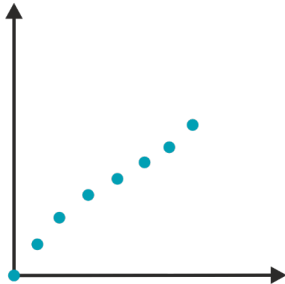
Simulation: Testing & modeling

Simulation based on own material models

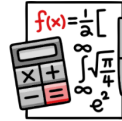
Testing



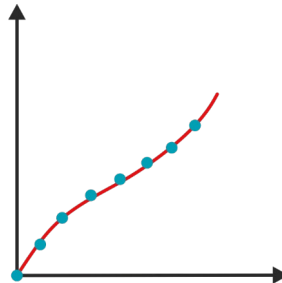
- Understanding material behavior



Modeling



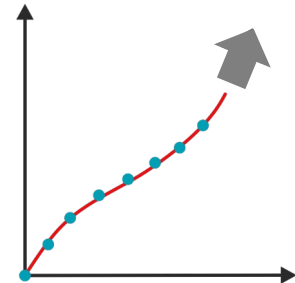
- Quantifying material characteristics



Prediction / Simulation



- Assessing the performance of products and processes

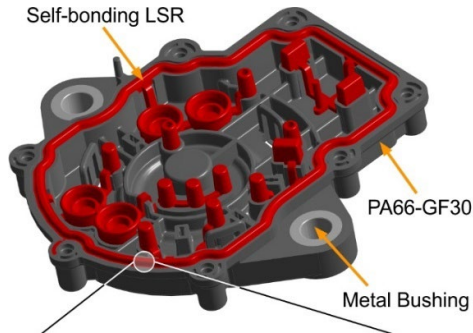


Simulation: Structural mechanical analysis

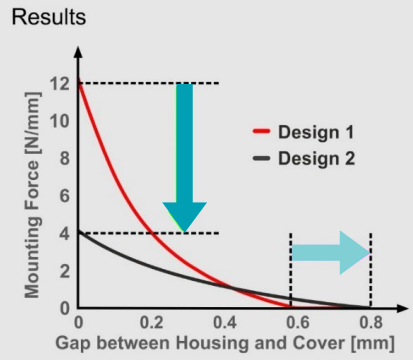
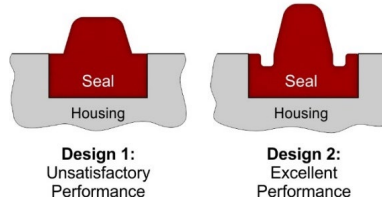
Understanding and optimizing product performance

Reduced complexity using multi-component parts (LSR seal, TPL housing, metal bushing)

Product



Optimization



Results

Introduction of grooves in design 2:

- Reduced mounting force
- Reduced creep tendency of the thermoplastic housing
- Increased seal integrity and long-term performance

Increased seal height of design 2:

- Improved compensation of design tolerances
- Increased seal integrity



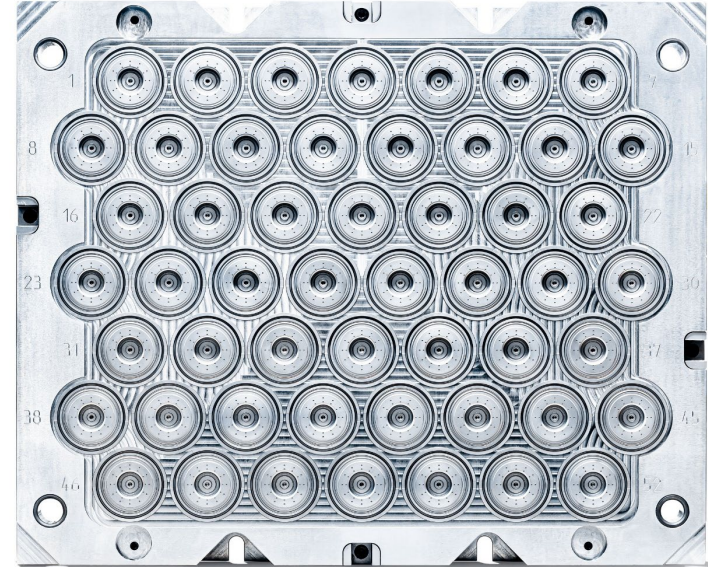
Process engineering

- From component drawing to precision tooling and optimized production process

In-house tooling

High precision for complex part geometries

- Tool competence center in Switzerland, Germany and China
- Customer-specific high precision tooling with high quality standards
- Proprietary cold runner system for elastomers and LSR



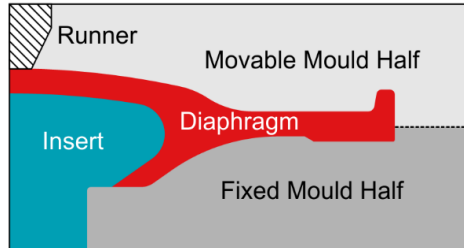
Simulation: Virtual Molding

Understanding and optimizing production processes

Processing of a rubber diaphragm

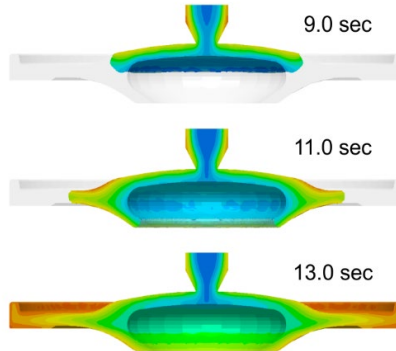
Simulation model

2D sectional view (2D) in the area of a mold cavity



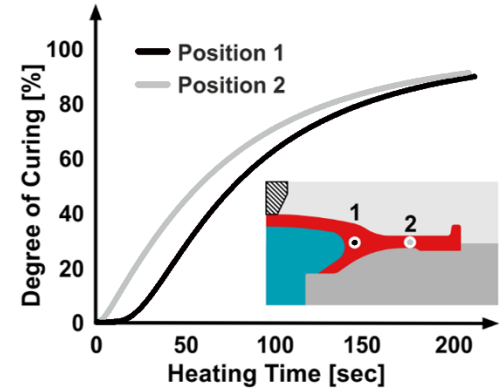
Filling simulation

Temperature distribution of the elastomer melt during injection (insert not shown)



Vulcanization reaction

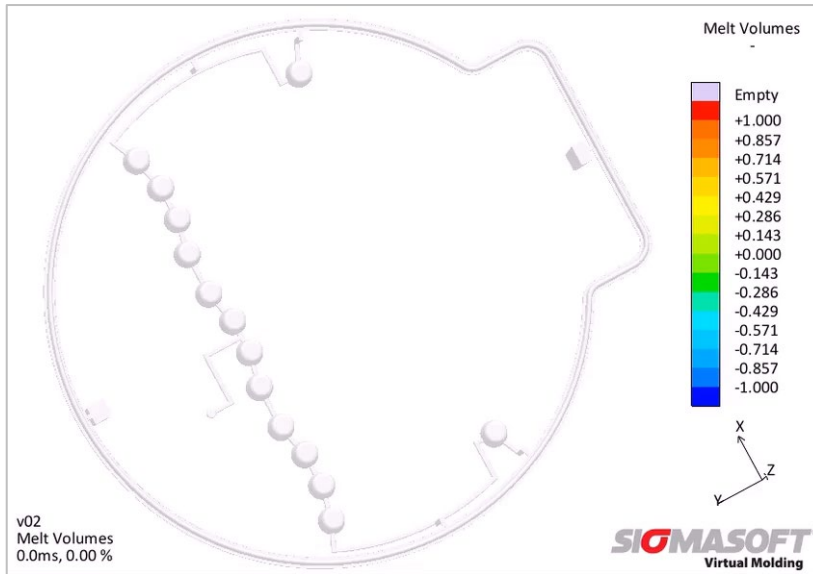
Monitoring, prediction and optimization of curing conditions / vulcanisation times



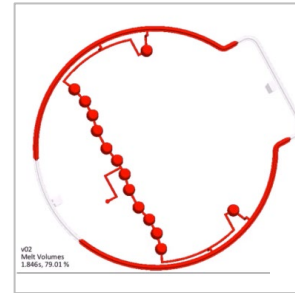
Simulation: Virtual Molding

Understanding and optimizing production processes

Video: Injection molding process of a LSR gasket



- Impact of parameters on the stability and efficiency of the process:

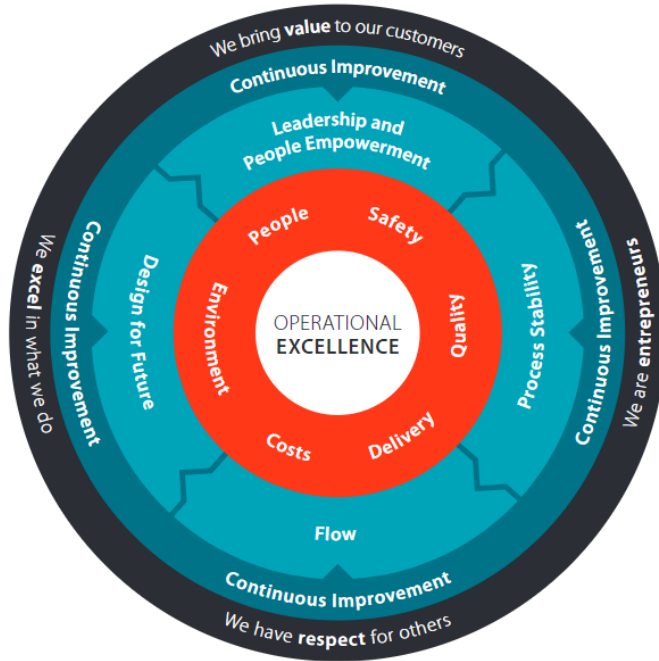


Final melt volumes

- Injection pressure
 - Injection point lay-out
 - Mold temperature
 - Transfer gates design
 - Material characteristics
-
- Systematic optimization of the process by coordinating all relevant parameters to ensure robust and efficient production

The Datwyler Production System (DPS)

We strive for operational excellence in everything we do



- One Datwyler Production System for all our sites
- Global improvement program to foster the lean culture and to achieve operational excellence

Operational Excellence

No waste in
our processes



No quality issues



Protect our environment



Safe workplace



Deliver on time



Satisfied and empowered
people



Single and multi-component processing technologies

Elastomers, liquid silicone rubber and thermoplastics

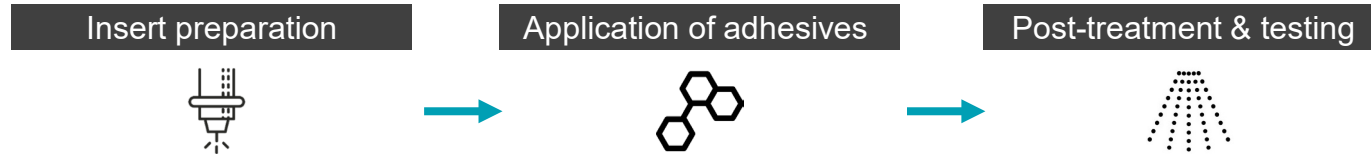
| Technologies | Elastomers | LSR | Multi-K |
|---|------------|-----|---------|
| Injection Molding with or without Cold Runner Block | x | x | x |
| Injection Transfer Molding | x | | x |
| Compression Molding | x | | x |
| Transfer Molding | x | | x |



Bonding methods for multi-component parts

Surface treatment and direct bonding

Surface treatment

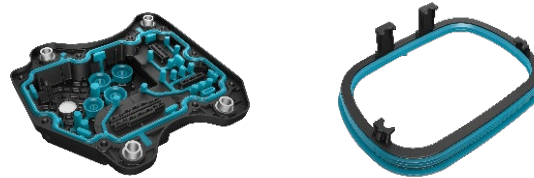


Direct bonding

Direct bonding between thermoplastics, LSR and various rubbers:

- EPDM and HNBR to PA and PPA
- FKM to PPS
- LSR to various substrates such as PA or PBT

Further combinations in development



Multi-functional O-rings

Customized material formulations, latest generation injection molding technology

Our advantages

- Customized o-rings with own material formulations
- O-rings for different environment challenges: Fluid resistance, compression set, abrasion resistance, low temperature, etc.
- Proprietary cold runner system
- Latest injection molding technology available globally



Applications

| | EPDM | NBR | FKM | VMQ | AEM | LSR | HNBR |
|------------------------------------|------|-----|-----|-----|-----|-----|------|
| Electrification | | | | | | | |
| Emission control | | | | | | | |
| Brake systems | | | | | | | |
| Steering/ Suspension | | | | | | | |
| Transmission | | | | | | | |
| Battery systems | | | | | | | |
| Thermal management | | | | | | | |
| HV connection | | | | | | | |
| Energy storage/ Fuel Management | | | | | | | |

LSR and thermoplastics

Available local-for-local with in-house tooling and cold runner system

Our advantages

- Complex part geometries and good bonding properties
- Excellent low and high temperature resistance, ozone, weather & UV ray resistance
- Outstanding electrical properties. UL94 listed LSR types
- Proprietary cold runner system
- In-house high-precision tooling

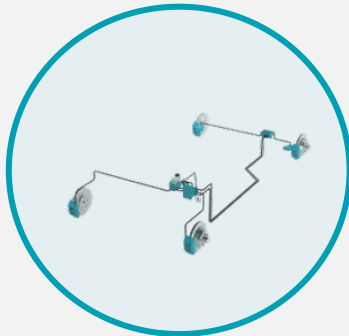
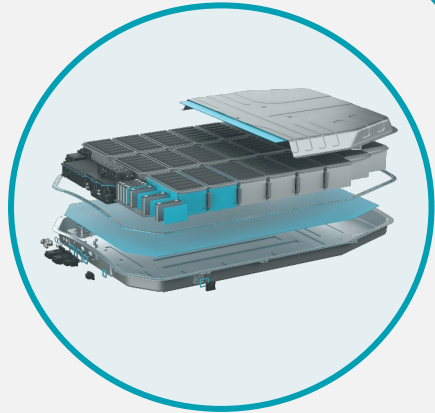
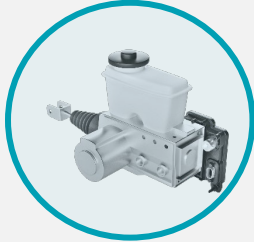
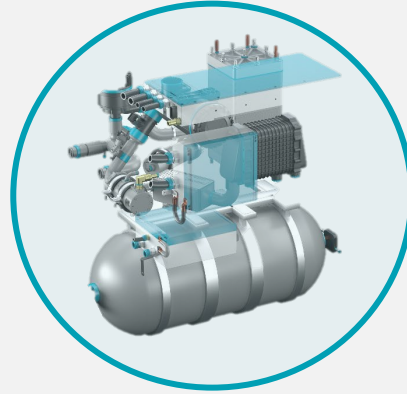
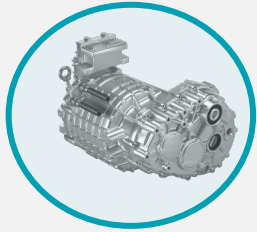


Applications



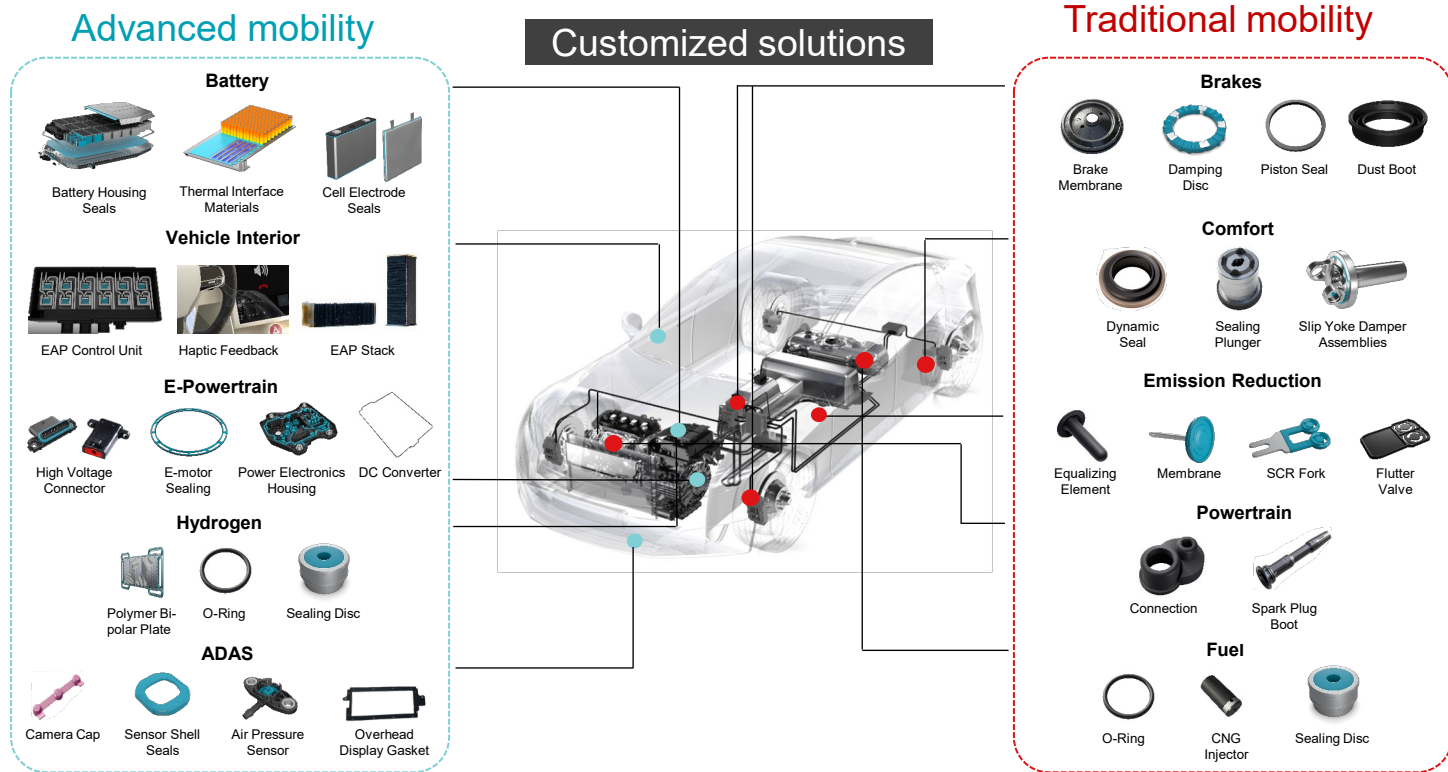
Product examples





**Component portfolio
for mobility systems**

Component portfolio for advanced and traditional systems



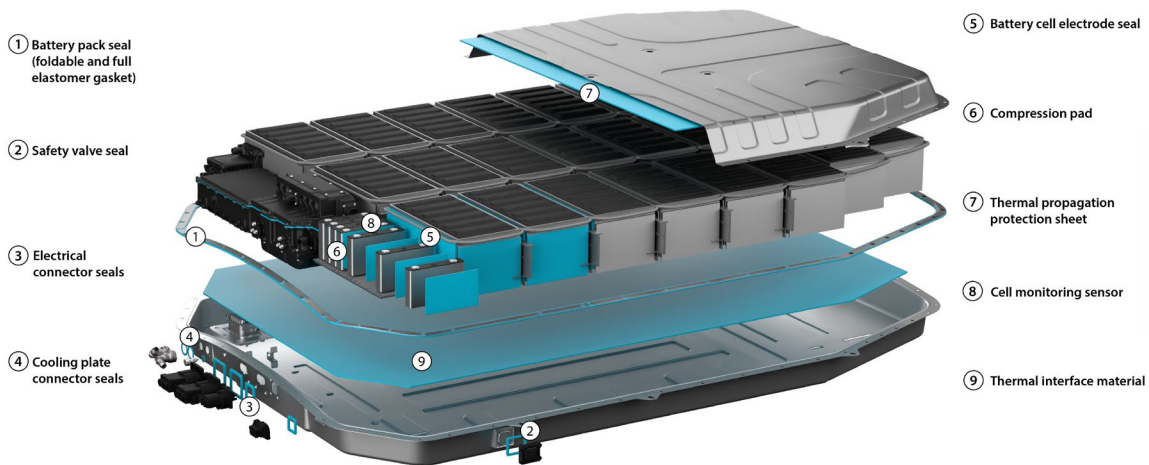


Components for advanced mobility systems

Battery systems

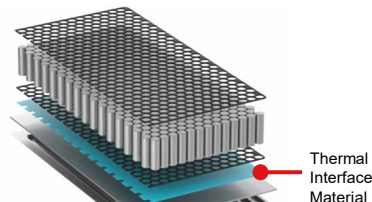
Sealing and thermal technologies for battery systems

Applications in focus



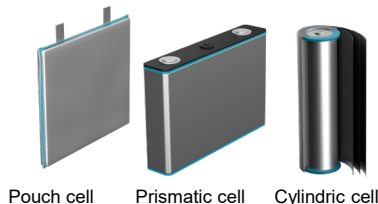
Materials

Thermally Conductive but Electrically Insulating Conventional Elastomer Compounds

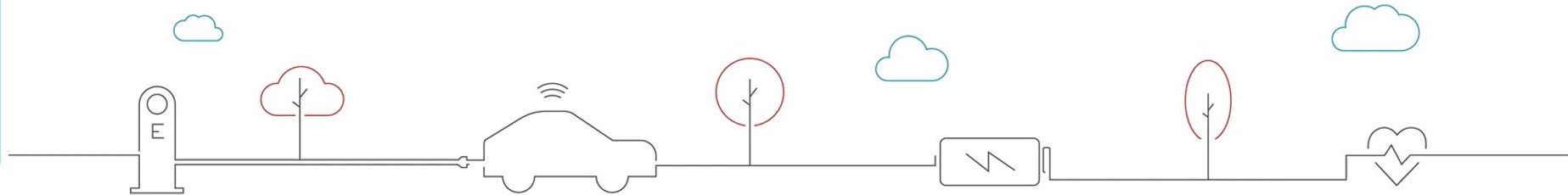


In development:

- Fire retardant materials
- Seals for immersion cooling



Engineering at the Heart of Mobility



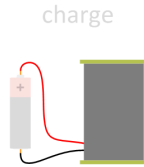
Sealing technologies for battery system

Electro active polymer (EAP) technology

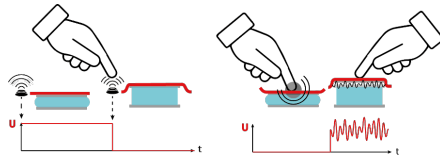
Own innovative technology for interior applications

How it works

- Move: Electrical power converted into mechanical motion in form of elastic deformation



- Sense: Mechanical pressure from finger converted into electrical signals



Technology advantages

- Customizable haptic feedback (frequency and amplitude)
- Reduced weight, complexity and packaging
- Noise free operation
- Maintenance-free service life, no mechanical parts
- Low energy consumption and energy harvesting
- Potential to combine sensor and actuator with EAP
- Operation and actuation of pumps and valves

Datwyler offering

- Proprietary EAP technology
- Own production lines
- EAP electronics support

Vehicle interior

Sensing and actuation applications

Applications



Demonstrators

Available: Demonstrators



Electronic control unit



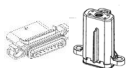
In development: Display demonstrator



E-Powertrain and ADAS

Multi-component solutions

High Voltage Connectors



High voltage
connector



2C connector
seal



High voltage
cable seal

E-Motor



E-motor
housing seal

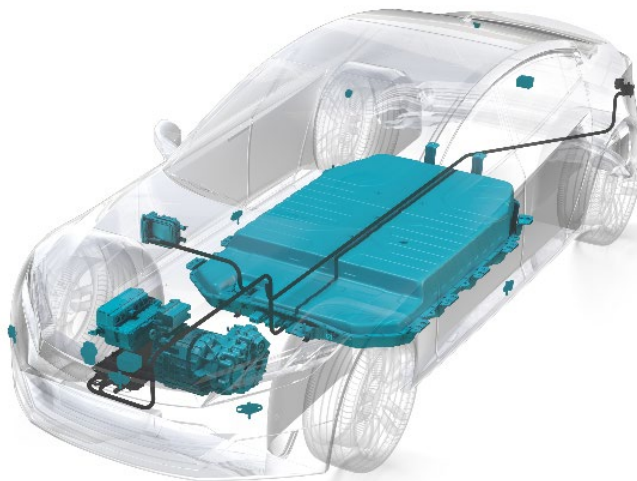


O-ring

Power Electronics



Power
electronics
housing



ADAS Electrical Components



Camera
cap



Sensor housing
& sealing

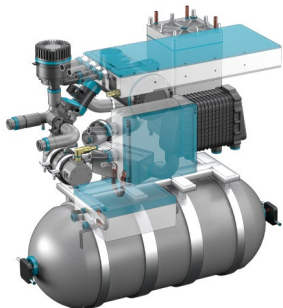


Gasket for
overhead
display

Fuel cell and hydrogen seals

Addressing specific requirements for hydrogen-based technologies

Hydrogen applications



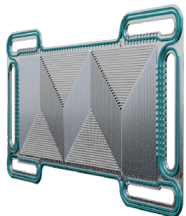
O-Ring



Sealing disc

- Elastomer parts with low permeability, good chemical resistance, high precision and cleanliness
- Long life-time and durability of auxiliary system and fuel cell stack

Fuel Cell Stack



Polymer Bi-polar plate

Gaskets for Bi-polar plate

- Development partner in material & process engineering for polymer-based Bi-polar plates
- Industrialization partner for gaskets and sealings for Bi-polar plates



Components for traditional mobility systems

Brake systems

Transition from conventional to electrical braking systems

1900...

Vacuum booster



Rolling diaphragm



Lip seal

2010

Electric parking brake



Dust boot



Shaft seal



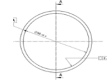
O-Ring

2015

Electrohydraulic booster



Damping disc



Flat seal



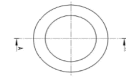
Reservoir Seal

2025

Brake-by-wire



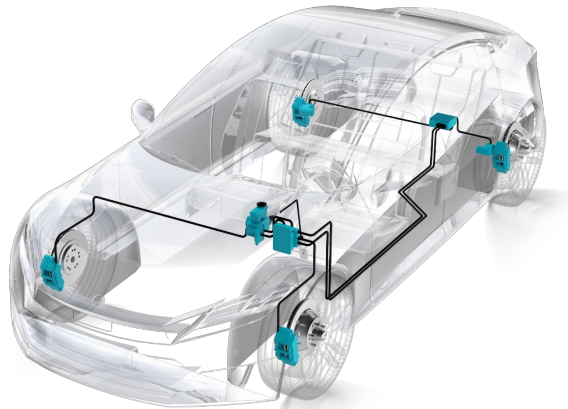
Lip seal



O-Ring



Gasket



- Established market leader for safety-critical engineered brake components
- Co-engineering partner for future electrified brake technologies

Emission reduction systems

Our contribution to meet global emission reduction goals

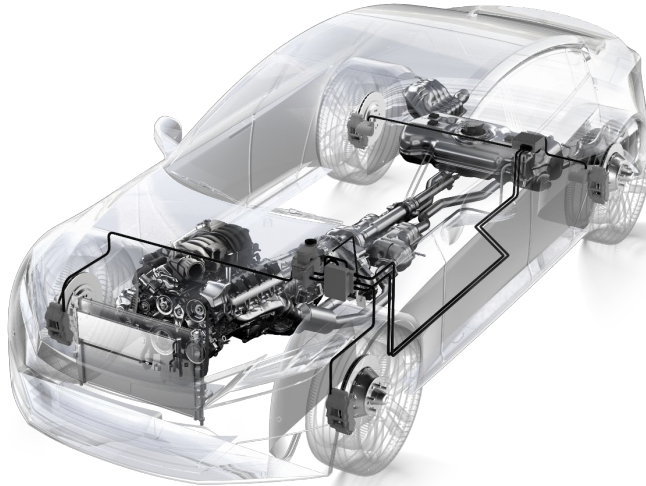
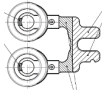
Pump membrane



Flatter valve



Fork valve



- System-critical engineered components for pumps, dosing modules, and the AdBlue® tank system



Advanced technologies

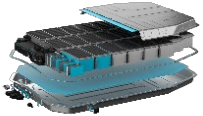
- Innovation in advanced and emerging polymer and elastomer based technologies

Global network of technology leaders



Innovative technologies for mobility applications

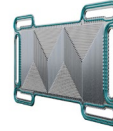
Battery applications



Development of sealing solutions, advanced materials and battery health monitoring solutions.



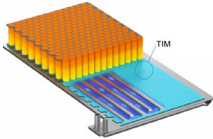
Hydrogen applications



Development of sealings solutions and material for hydrogen applications and fuel cells.



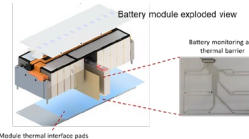
Advanced and sustainable materials



Elastomer compound with electrically & thermally conductive & insulating material, EMI shielding properties. Sustainable materials



Printed temperature sensor



Elastomer patch to measure temperature distribution in inaccessible surfaces.



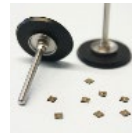
Embedded sensors



Elastomer components of complex shapes embedded with pressure and force sensors.



Traceability solutions



Elastomer components with integrated sensors/RFID open-up new applications.

Thank you!

Follow us on LinkedIn

