

THE BENTELER ELECTRIC DRIVE SYSTEM 2.0

BENTELER 
makes it happen



A LEADING GLOBAL PARTNER FOR THE AUTOMOTIVE INDUSTRY

BENTELER offers first-class engineering and metal-processing competence combined with production excellence. From components and modules for chassis, body-in-white and engine and exhaust applications to modular e-mobility system solutions.

Such as the new **BENTELER Electric Drive System 2.0**: A series-ready platform solution for electric vehicles. And a showcase for our entire technological competence and collaborative approach to development. Together with a broad network of strategic partners we develop modular and tailor-made solutions for our customers.

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A SOLUTION THAT MAKES THE DIFFERENCE

The **BENTELER Electric Drive System 2.0** is yet another proof point of our engineering and metal-processing competence. It is **scalable for numerous vehicle segments**. It is specially **designed for e-mobility** and integrates several functions answering your needs such as

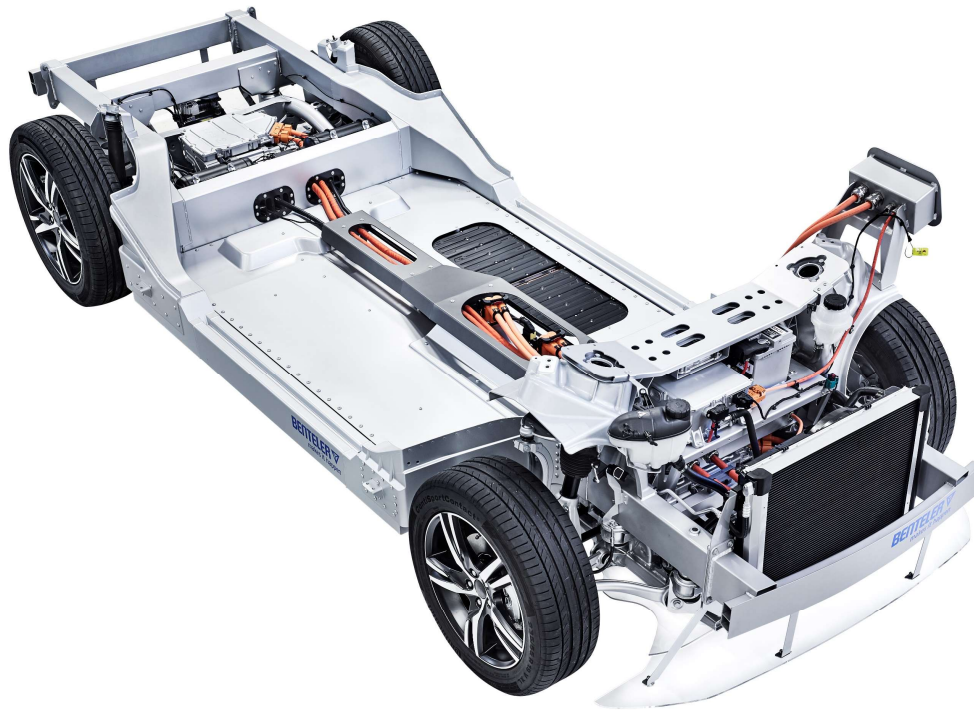
- integrated crash management,
- a flexible and scalable battery storage system with standard and customized components, and integrated thermal management,
- electrified chassis solutions,
- e-motor integration 2-wheel-drive and 4-wheel-drive,
- thermal management solutions for electronic components and
- wireless / inductive charging.

These features can be engineered as a complete solution or as individual modules. The BENTELER Electric Drive System 2.0 is **series-ready, immediately applicable and has a proven design**. The industrialization concept is **ready for immediate implementation**.

The BENTELER Electric Drive System 2.0 is a **weight-optimized, modular system solution and adjustable to any customer requirement**. Our offer will focus on engineering and program management including license models.

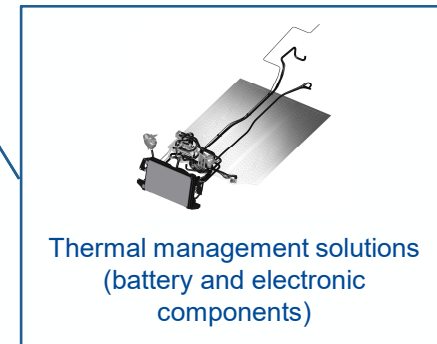
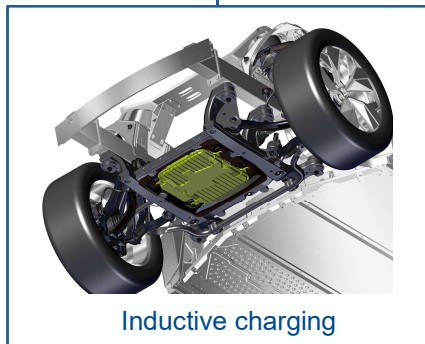
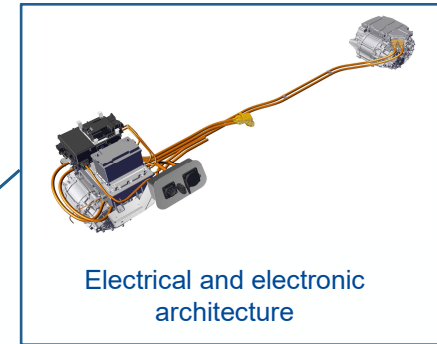
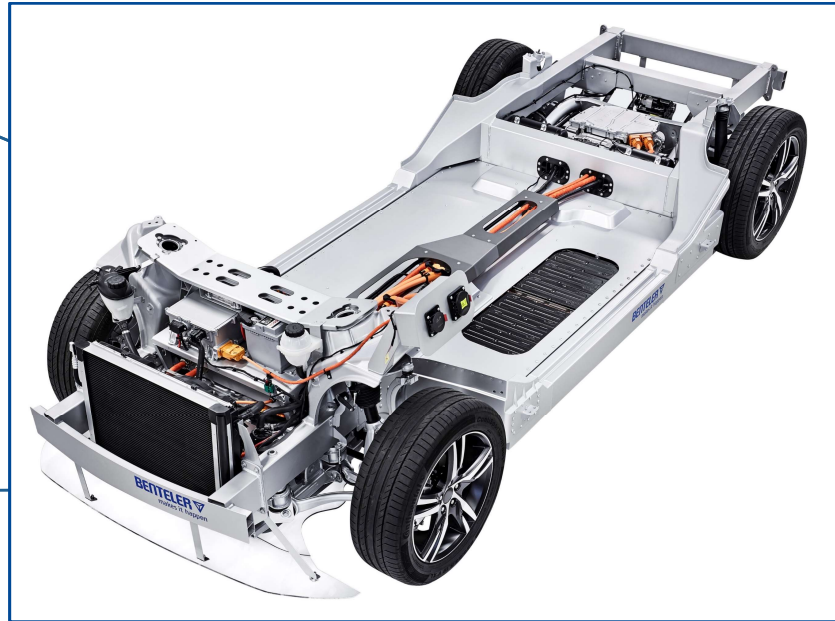
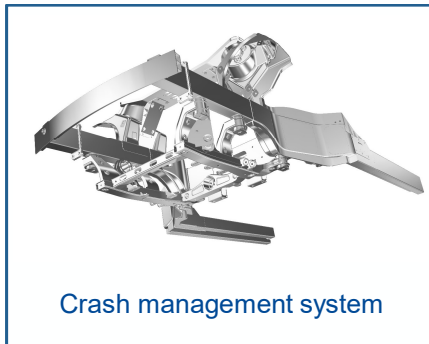
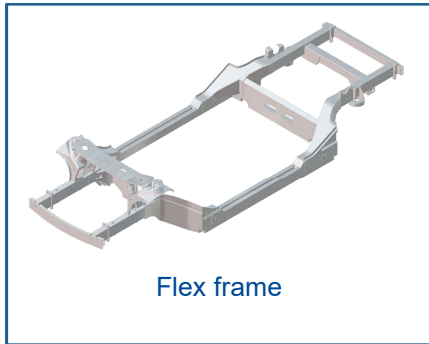
FULL SYSTEM ENGINEERING PARTNER

We engineer, simulate and validate the complete system of the BENTELER Electric Drive System 2.0 – „from bumper to bumper“



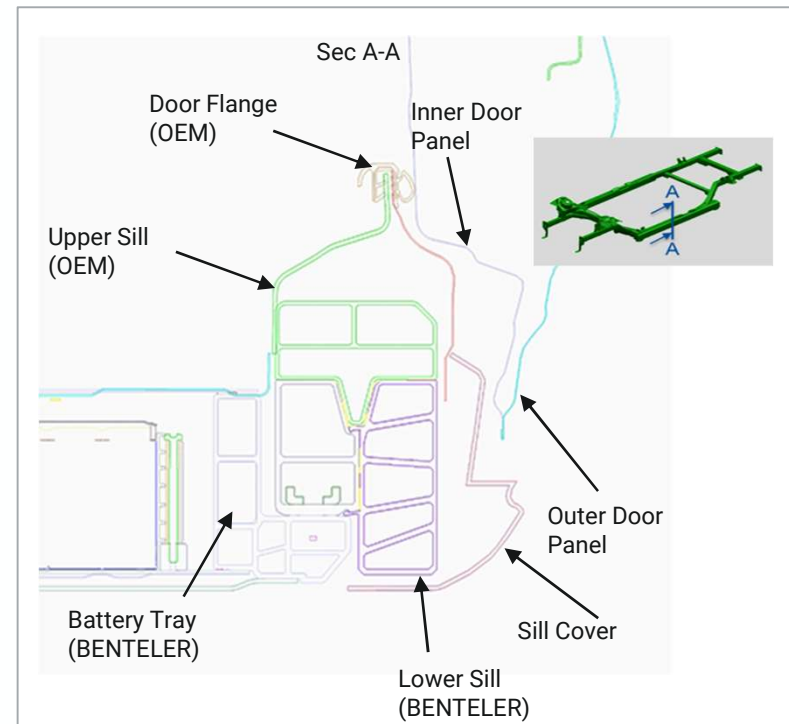
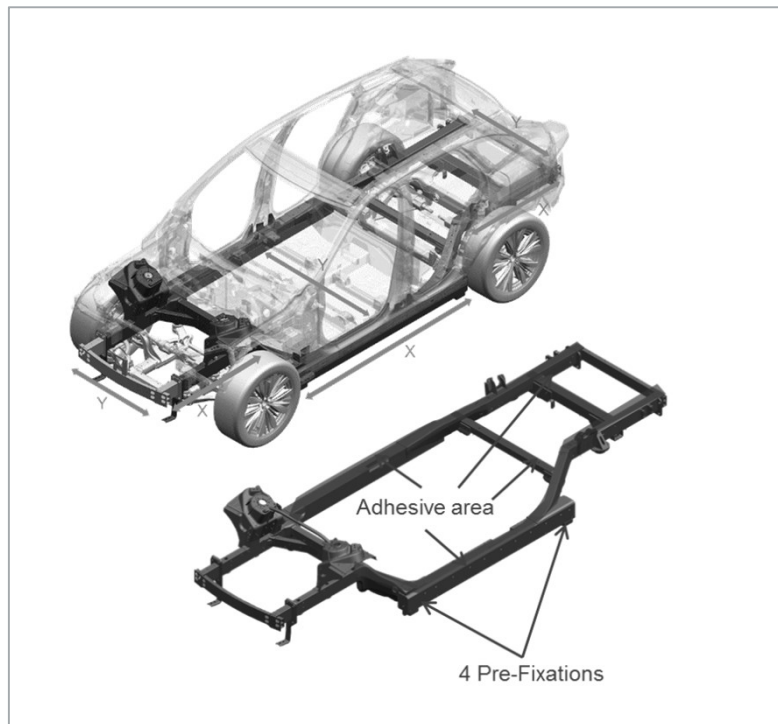
- **For all vehicle segments**
- **System integration** of e-mobility requirements
- Systems in **mono- and multi-material design**
- Flexible, scalable and **modular lightweight solutions**
- **Integration of electrical and electronic architecture** incl. e-motor (2-wheel-drive and 4-wheel-drive)

FULL SYSTEM ENGINEERING PARTNER

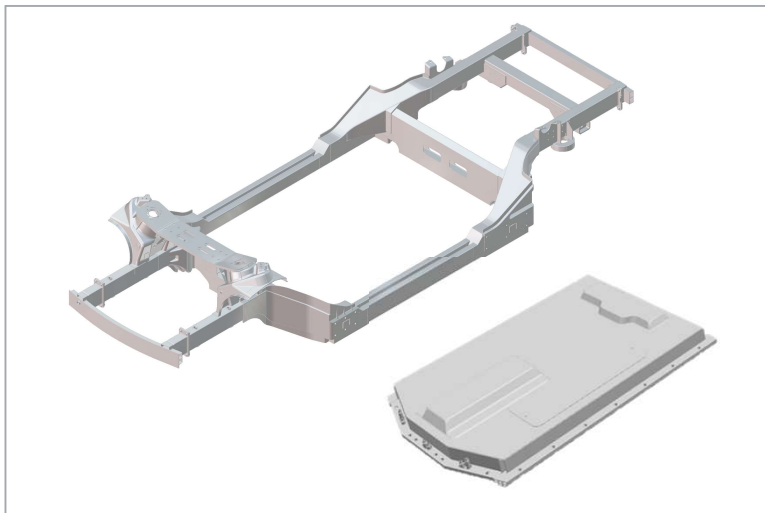


BODY ON FLEX FRAME – HIGH SCALABILITY FOR PLATFORM STRATEGIES FROM B- TO E-SEGMENT

- **Weight optimized scalable frame** by aluminum extrusion profiles
- **Flexible in length and width** for different vehicle segments and body types
- **Defined body connection** with cold joining technology
- Basis for **high torsional stiffness** and best crash performance



MODULAR BATTERY PACK SOLUTION FOR OPTIMIZED ENERGY DENSITY AND SAFETY



- Designed to **resist all crash intrusions** and to **fulfill legal directives**
- Flexible **scalable** design by **aluminum extrusion frame** structure
- **Integrated battery cooling** for best battery performance and durability
- **Battery module integration** with focus on high **battery density**

INTEGRATED CRASH MANAGEMENT FOR HIGHEST SAFETY AND LEGAL DIRECTIVES

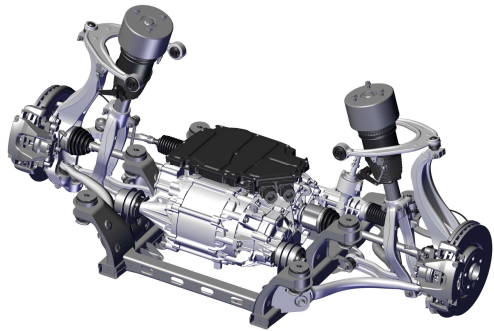


- Optimized **lightweight crash design** for battery electric vehicles
- **New energy absorption elements** to protect the battery system
- Crash management systems **achieving pole test and offset crash** requirements
- Special **qualified** aluminum and steel **materials**

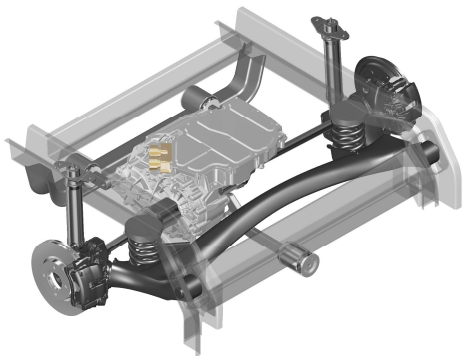
MODULAR FRONT AND REAR E-CHASSIS SOLUTIONS FOR BEST RIDE AND HANDLING

B- to C-segment

Front E-Chassis



Rear E-Chassis

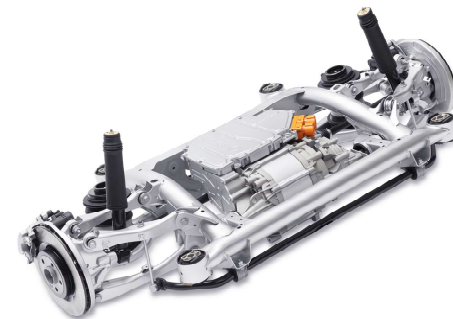


C- to E-segment

Front E-Chassis



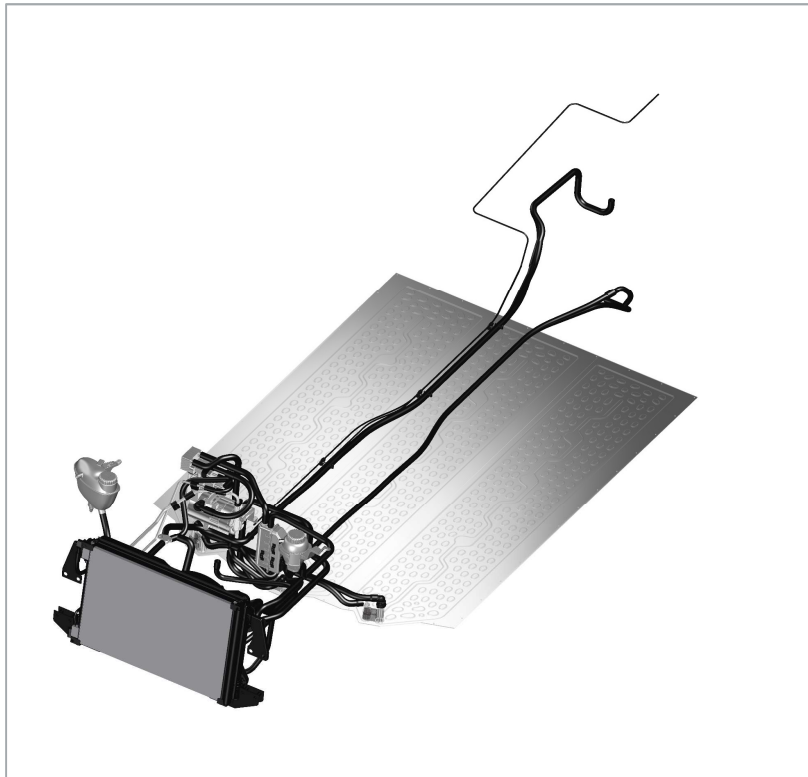
Rear E-Chassis



E-Chassis

- Front and rear suspension modules with high **integrated electrical drive units**
- **Subframes offer modularity** due to profile length among longitudinal and lateral direction
- Each subframe with **NVH (noise, vibration, harshness) - optimized** rubber bush concept
- **Insulated sub frames** with an additionally insulated electrical drive unit for best NVH behavior

THERMAL MANAGEMENT FOR EFFICIENT ENERGY UTILIZATION



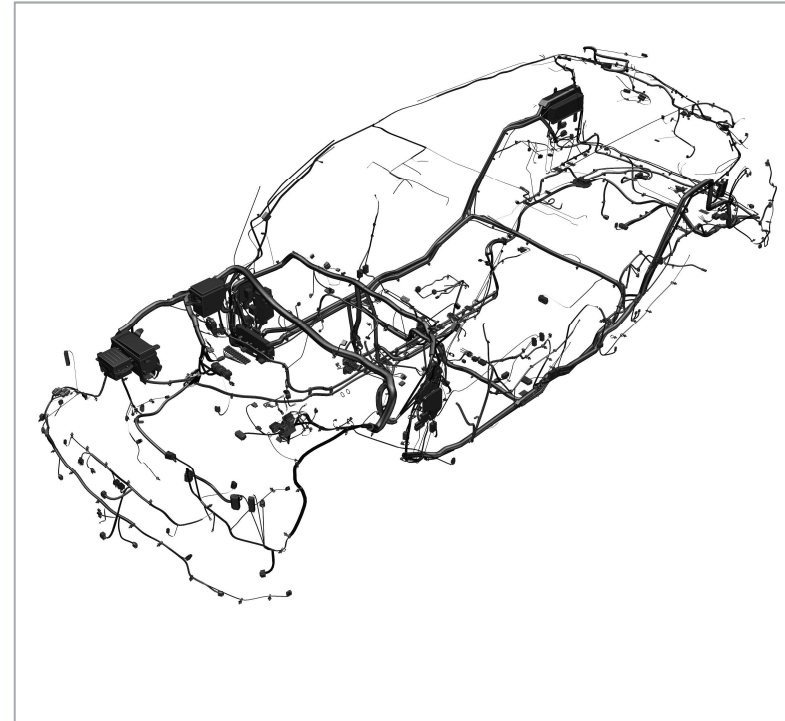
- Special battery cooling plate design for **lower weight and height**
- Secures **long life** of batteries and electronic devices
- High **integrated routing** of cooling circuits
- **Controls battery temperature** for best operating conditions

BATTERY AND CHARGING TECHNOLOGY SOLUTIONS FOR BEST ELECTRIC VEHICLE PERFORMANCE



- Qualified for **fast DC charging** process (100KW)
- Prepared for **inductive charging**
- **High energy** prismatic battery cells
- Special battery module size for **high package density**

ELECTRIC AND ELECTRONIC ARCHITECTURE – SECURITY FOR HIGH FUNCTIONALITY



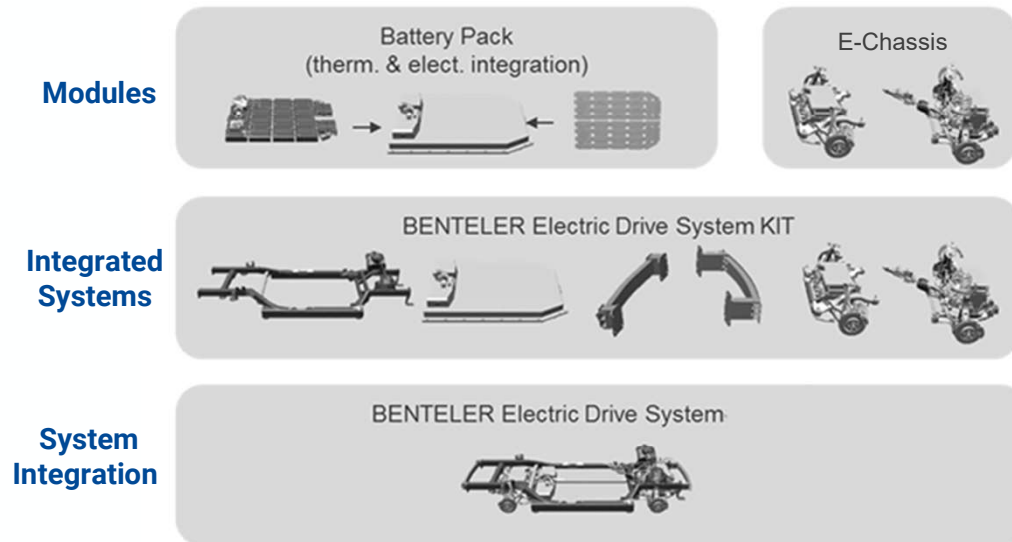
- Flexible, scalable and **high functional safety**
- Charging, power and thermal management **centrally controlled** via CAN BUS by VCU (Vehicle Control Unit)
- **Optimal, safe electric power and signal distribution** between all electrical and electronic components

VEHICLE INTEGRATION – IT IS MORE THAN THE SUM OF ALL PARTS



- Specification of all **OEM interfaces**
- High interface and **complexity reduction**
- Best **packaging of all systems**
- **Secured functionality** on vehicle level

BENTELER ELECTRIC DRIVE SYSTEM IS OPEN TO INDIVIDUAL ENGINEERING AND SOURCING STRATEGIES



- Full system engineering for **free global sourcing** of e-modules or full BENTELER Electric Drive System
- Industrialization **support** and **supplier management**
- **Direct manufacturing** in a partnership
- **Licensing** of BENTELER Electric Drive System **possible**

BENTELER SUPPORTS THE FULL VALUE CHAIN – ENGINEERING, PROTOTYPING, TESTING, PROCESS DESIGN AND PRODUCTION

- Whole **vehicle target setting** process (definition of vehicle performance, targets and requirements)
- From **concept studies** to **series build** to print **design**
- **Prototyping** and **mule car production**
- Module and **vehicle validation**
- Development of **flexible production** concepts



BENTELER – solutions that make a difference

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