EXEON

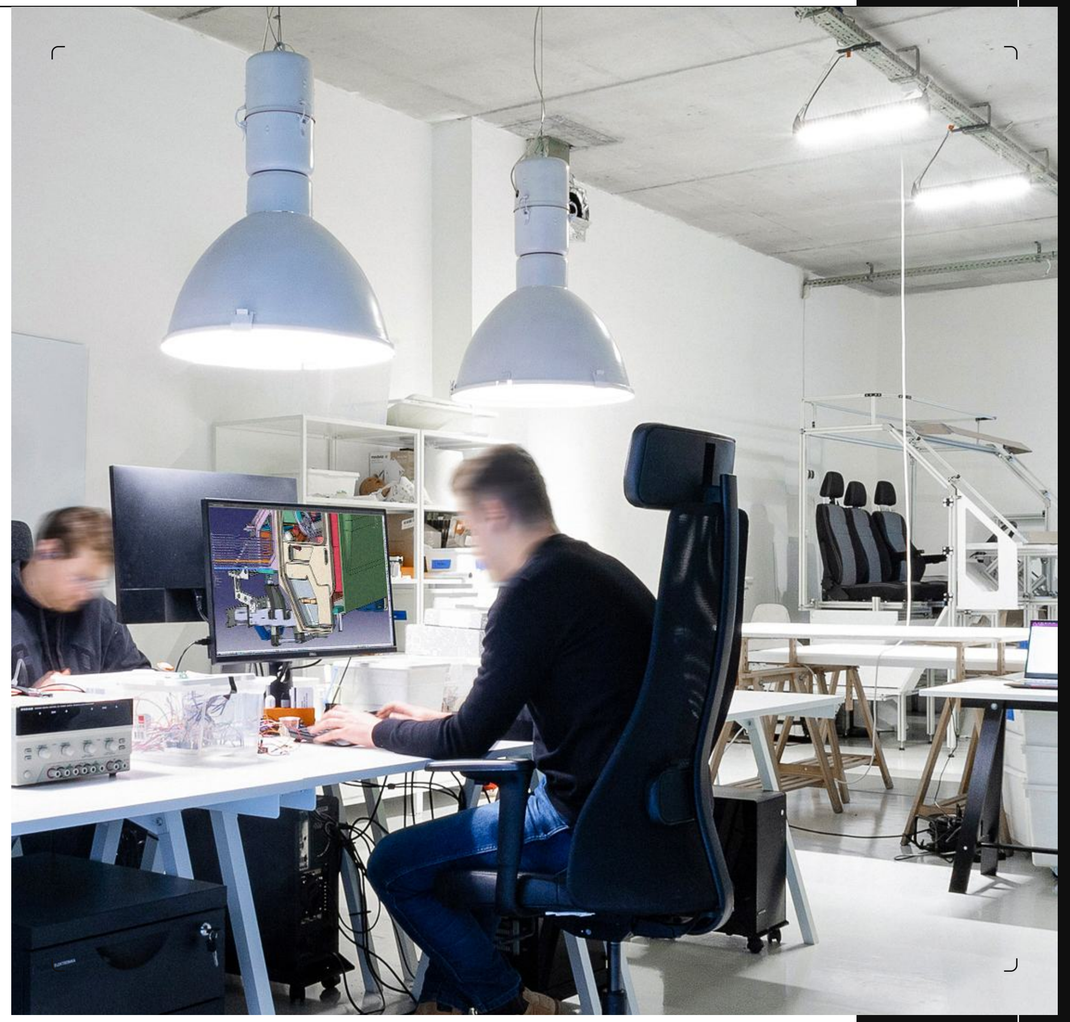
2024

web > exeon.co

VEHICLE ENGINEERING SERVICES

COMPANY PROFILE

- Design & Engineering services provider
- Expertise: design, engineering, development of modern means of transport
- Capabilities: style, design, engineering, CAx, prototyping
- Human Resources: 30+ designers and engineers
- Turn over: ca 1 mln € per year
- Tools: all popular CAx environments i.e. Catia V5/6, Siemens NX, Autodesk Inventor, VR & AR, prototype lab
- Location Krakow, Poland
- Clients: all size vehicle manufacturers, start up companies, OEM innovation labs, tier 1 & 2 suppliers



EXEON FOUNDERS

Michal Kracik

- Graduated from ASP Krakow School of Design with PhD, Fulbright fellow, postdoc at MIT
- 16 years of experience in advanced product design R&D worked for IT, NASA
- Design Director at EXEON and professor at ASP Krakow School of Design

Mike Wujczak

- Graduated from Wroclaw University of Science and Technology with degree Master of Science Engineering
- 17 years of experience in automotive R&D
- Worked for BMW, Edag , Tata Motors, Valeo
- Occupied positions: CAD Engineer, Package Engineer, CAD Supervisor, Project Leader, Chief Engineer, Engineering Manager

ENGINEERING DIVISION HISTORY

2014-2018

- Worked mainly for tier 1 suppliers like Valeo , Tenneco, Bosch in various projects for leading automakers: BMW, VW, Audi, Renault, DAF, Skoda, Hyundai & others;
- Winning first direct project for OEM Sikorsky Helicopters branch in Poland;
- Building capabilities for more complex projects aiming for full vehicle projects

2018

- Customer profile extended to companies and start-ups working on the completely new vehicles from the scratch;
- First project of a complete vehicle signed

2019-2020

- Another 3 complex transportation projects started: LEV, autonomous shuttle mini bus, delivery e-van;

2021-2023

- Opening prototyping lab
- Another projects started including electric & autonomous water transportation and electric scooter
- First designed vehicle prototypes go for road testing
- First project went into production
  — https://ewave yachts.com/

ENGINEERING CAPABILITIES

- Fields of engineering covered : mechanical, electrical, mechatronics
- Capable to lead or support the entire project lifecycle and scope:
  a. Goal & requirements formation
  b. Conceptual design & engineering
  c. Engineering calculations & simulations
  d. Regulatory compliance assurance
  e. Technical development
  f. CAD modeling
  g. Detail design
  h. Documentation for production
- Follows DFA & DFM methodologies & quality tools, i.e. DFMEA
- Project management including Agile methodology
- Market research for suppliers offer
- Close collaboration with suppliers and manufacturers

TOOLS, METHODS & TECHNOLOGIES

CAx tools & methods

- Catia V5 & V6
- Siemens NX
- Creo
- Autodesk Inventor
- Inventor Nastran
- Fusion 360
- Implementing client's standard and methodology or using own standards

Prototyping

- VR & AR tools
- Physical mock-ups
- Clay modeling
- 3D print
- Vacuum casting
- PCB and wiring harness
- Integrating and launching prototypes

Cooperation models

- Time & material
- Fixed scope & price
- Recurring work package
- Of-site service at client's premises

TOOLS, METHODS & TECHNOLOGIES

Materials

- Steel: carbon, stainless, high strenght
- Aluminum & other non-ferrous metals
- Thermoplastics
- Duroplastics
- Synthetic rubbers, silicons, polyurethanes
- Soft materials: foams, sponges, expanded polymers
- Fabrics & wools
- Epoxy resins
- Fiber reinforced composites

Technologies

- Thermoplastics injection moulding
- Thermoforming
- Reaction injection moulding
- Laminates
- CF forging
- Sheetmetal bending and stamping
- CNC machining
- Die casting
- Extrusion

Joining methods

- Adhesive bonding
- Adhesive tapes
- Hook & loop fasteners
- Ultrasonic welding
- Bolting
- Welding
- Spot welding
- Riveting
- Press fitting

VEHICLE ENGINEERING SCOPE

Vehicle types

- Personal mobility vehicles: electric scooters & e bikes
- Light Electric Vehicles: two --, three and four wheelers, including tilting ones
- Commercial vehicles: m ini & s huttle buses, light e trucks
- Driverless & autonomous vehicles
- Future mobility concepts
- Purpose build vehicles i.e. ambulance, deliveries, sharing, taxi
- Crossover” vehicles blend characteristics between two or more different kinds of vehicles to meet the specific needs or fit better to evolving market demand

Vehicle development phase & production volume

- Concept vehicle
- Prototype vehicle
- Low & mid volume production vehicles
- Series production vehicle

Other means of e-transport

- Railway, water e-transport, trailers

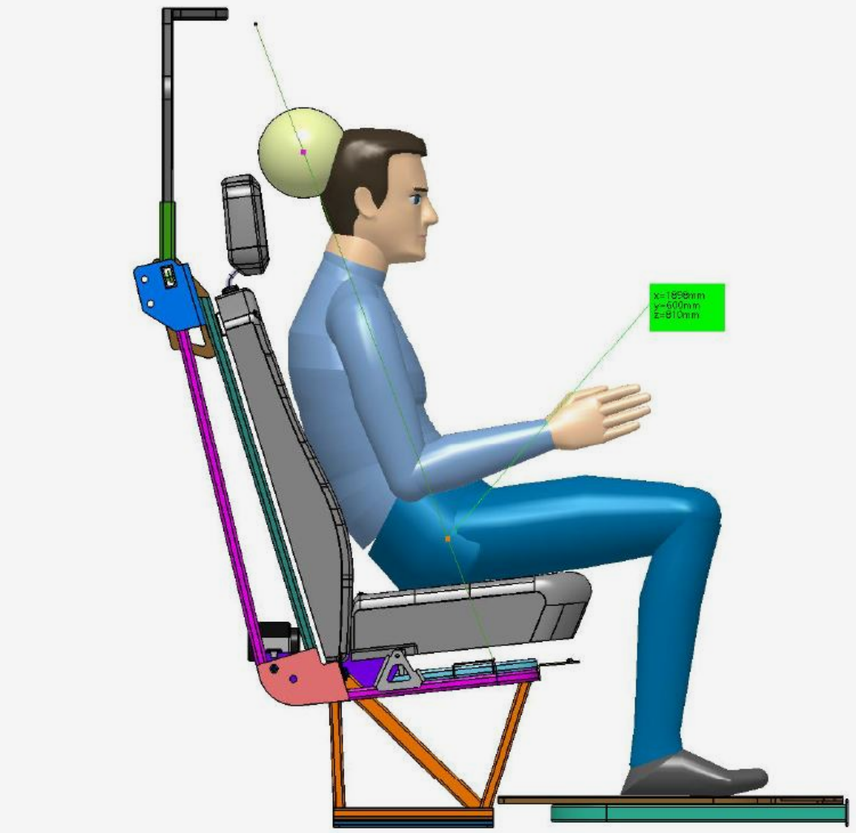
VEHICLE ENGINEERING SCOPE

Mechanical package vehicle architecture

- Defining the architectural / functional constraints for styling
- Defining arrangement and placement of systems,
- Modules and components
- Ensuring the regulatory compliance

Occupant package

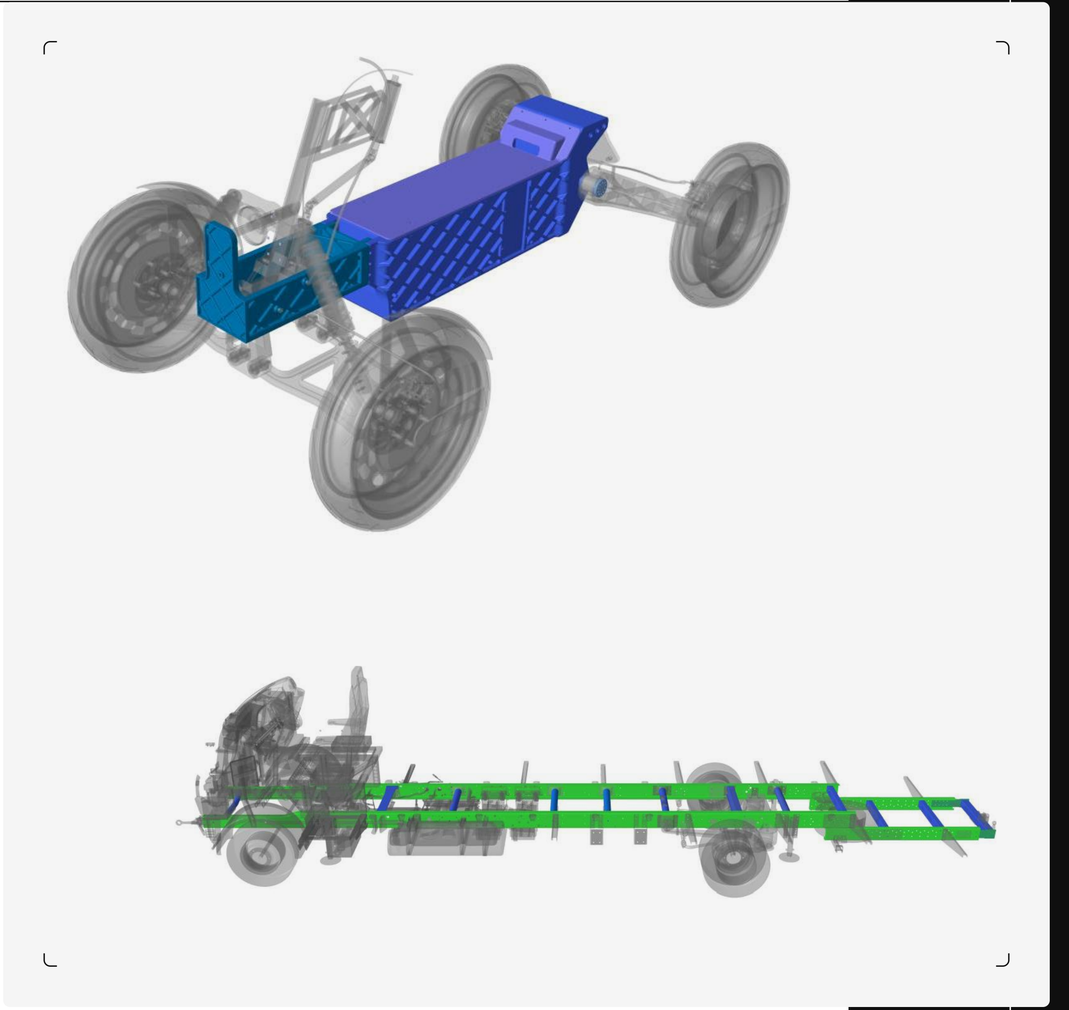
- Driving position
- Visibility
- 2nd & 3rd seats row arrangement
- Seat & posture comfort
- Storage and luggage



VEHICLE ENGINEERING SCOPE

Chassis for EV

- Skateboard type platform development
- LEV chassis development
- Monocoque structures development
- Space frames design
- Under body frames design
- Suspension subframes design
- Chassis retrofitting from ICU to E-drive



VEHICLE ENGINEERING SCOPE

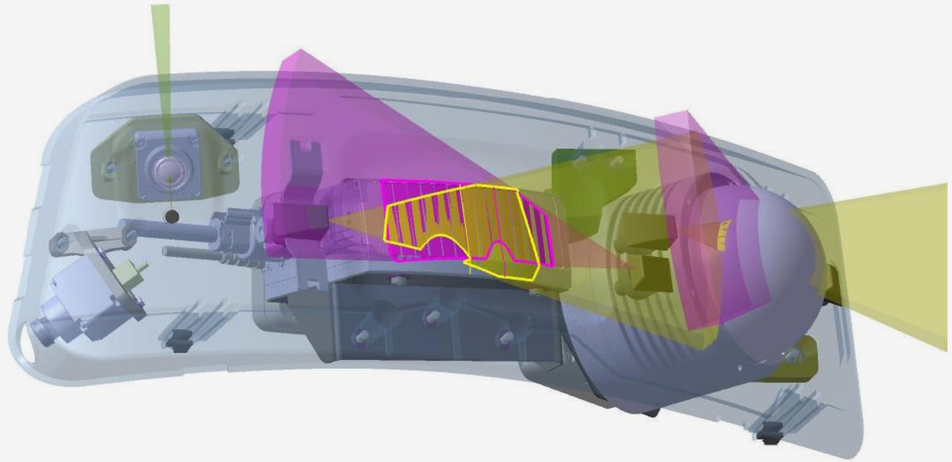
Body & Glazing

- A Class surfaces modeling
- Styling feasibility analysis
- BiW & Greenhouse development
- Body Panels & Fairings design
- Grills, Bumpers, Spoilers design
- Stamped sheet metal components, SMC and injection molding components design for mass production vehicle
- RIM, RTM, thermoformed components design for mid and low production volume vehicles
- Laminated & hardened windows design
- Thermoplastic wind shield s design

VEHICLE ENGINEERING SCOPE

ADAS & Autonomy Sensors

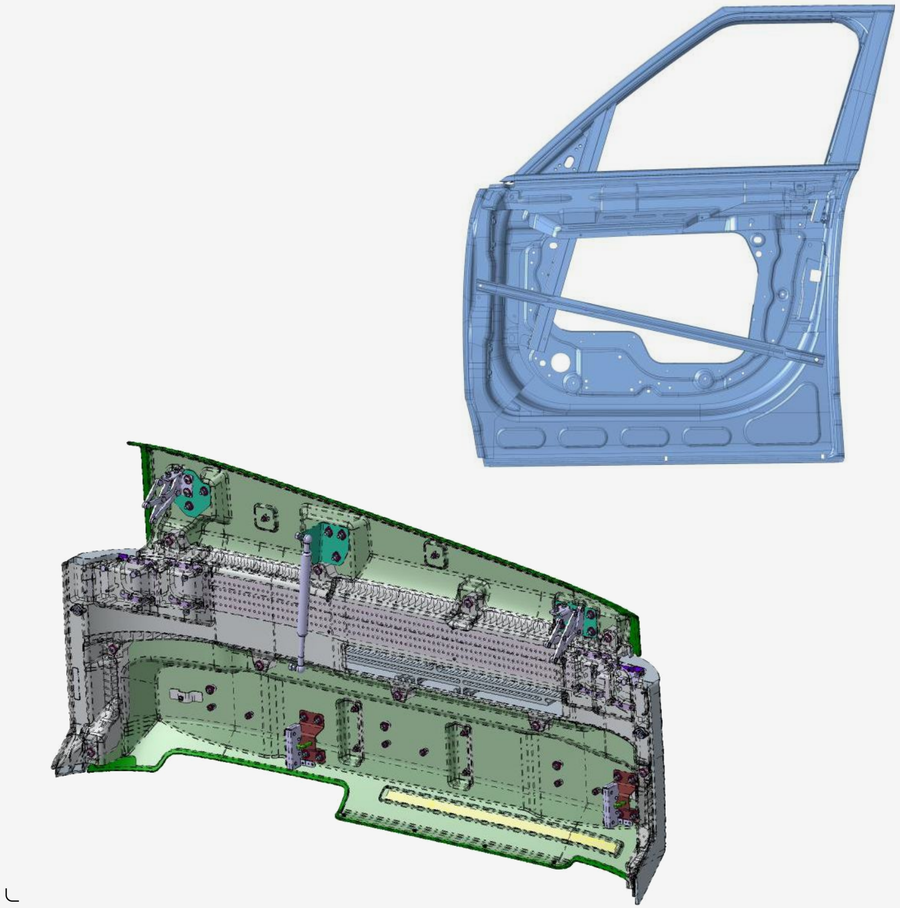
- Sensors package
- Sensor cleaning systems development
- Of-the market modules selection and integration



VEHICLE ENGINEERING SCOPE

Doors, Hatches, Access Points

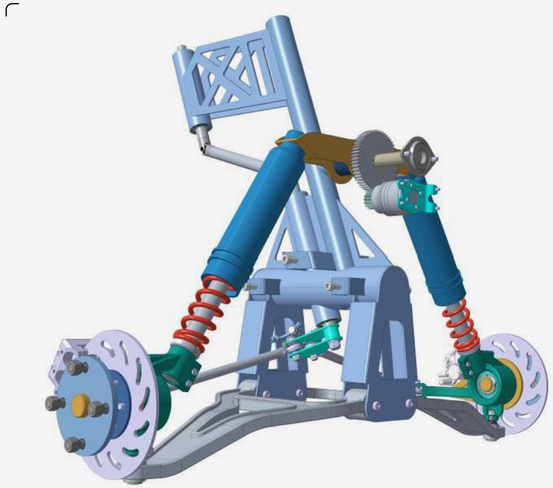
- Development of all kinds of closures: hood, hatches, sunroof, charging socket lids, others
- Of-the market modules integration, i.e. bus sliding doors
- Hinges, Sealings, Locks Development and integration

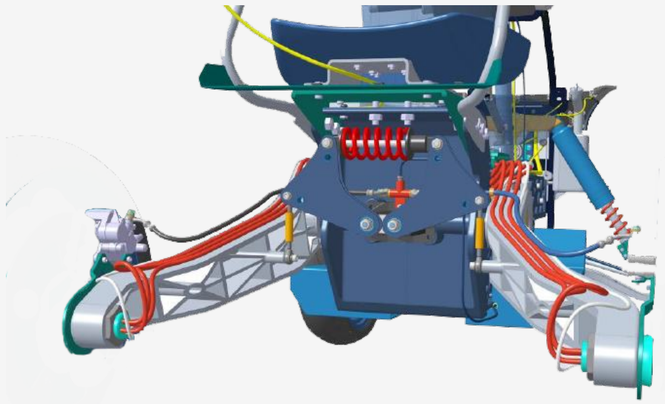


VEHICLE ENGINEERING SCOPE

Steering & Suspension

- 3 or 4 wheeler LEV cross functional tilting, steering & front suspension system development
- LEV rear suspensions development
- Special systems development
- Components design
- Off-the market modules and components adaptation

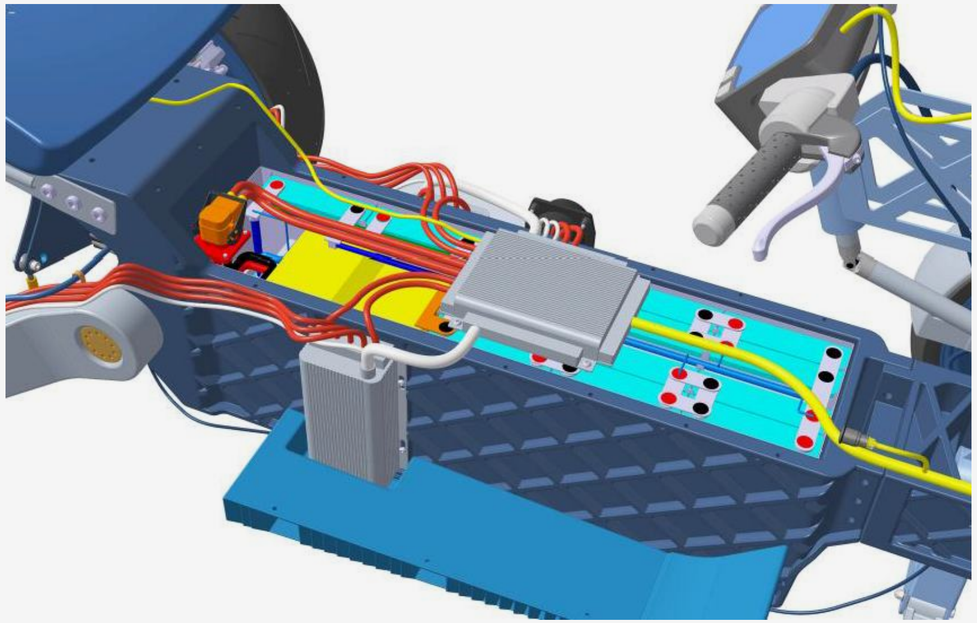




VEHICLE ENGINEERING SCOPE

Battery Pack

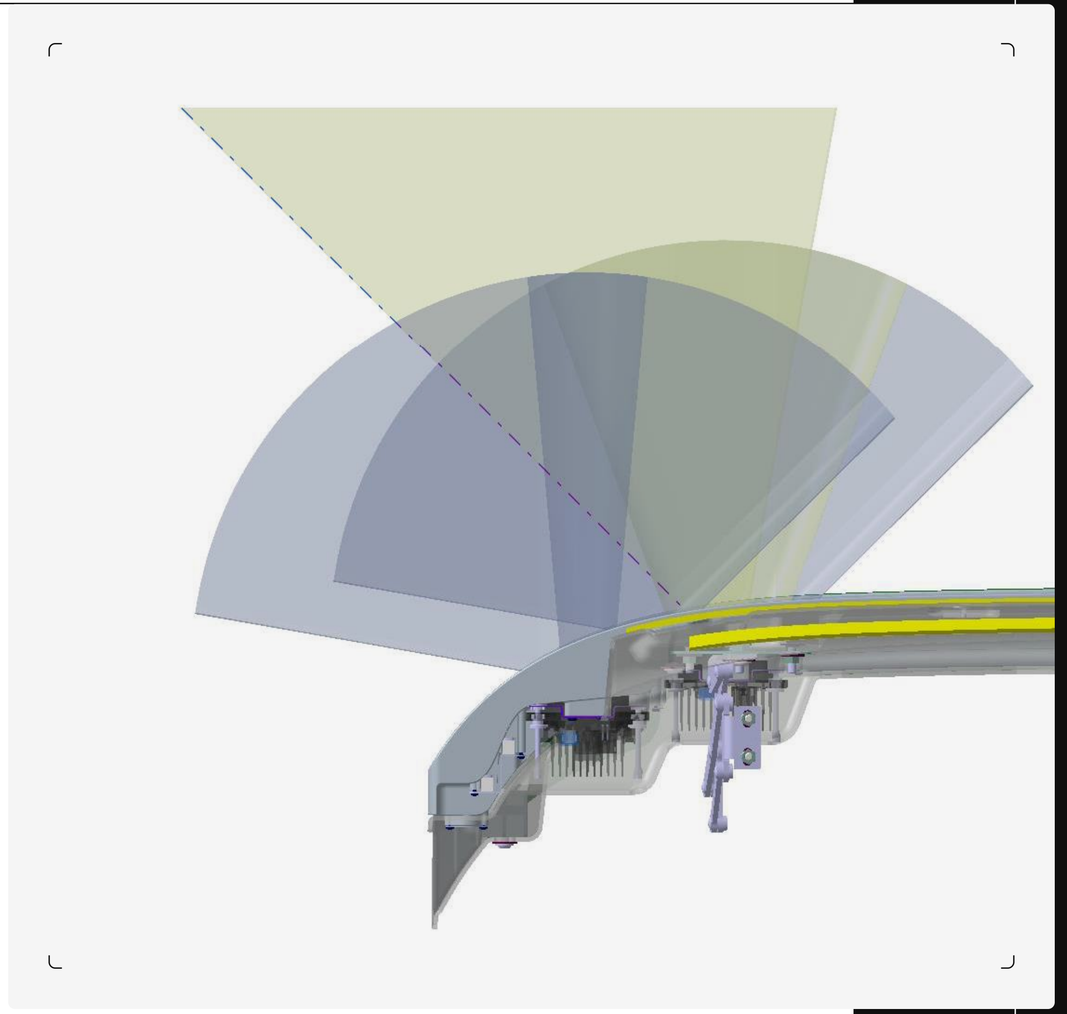
- Of-the market modules selection integration
- In-vehicle package
- Battery pack structural components development
- Electric & Electronics
- Computers and control units package
- Computers and control units protection and sealings development
- LV & HV lines routings
- Embedded software development



VEHICLE ENGINEERING SCOPE

Lighting

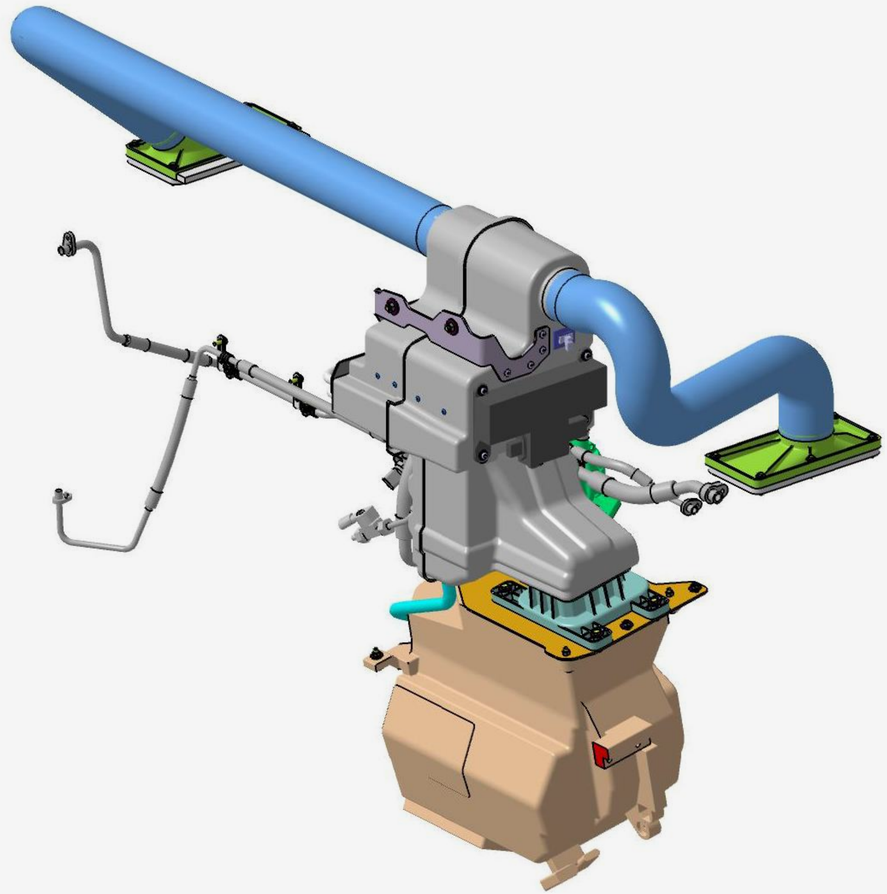
- Light sources package acc to legal requirements:
  headlamps, rear lamps, da y lights , grill and hatch strip lights
- Of-the market modules selection and integration
- Components for special lighting effects development and design



VEHICLE ENGINEERING SCOPE

HVAC

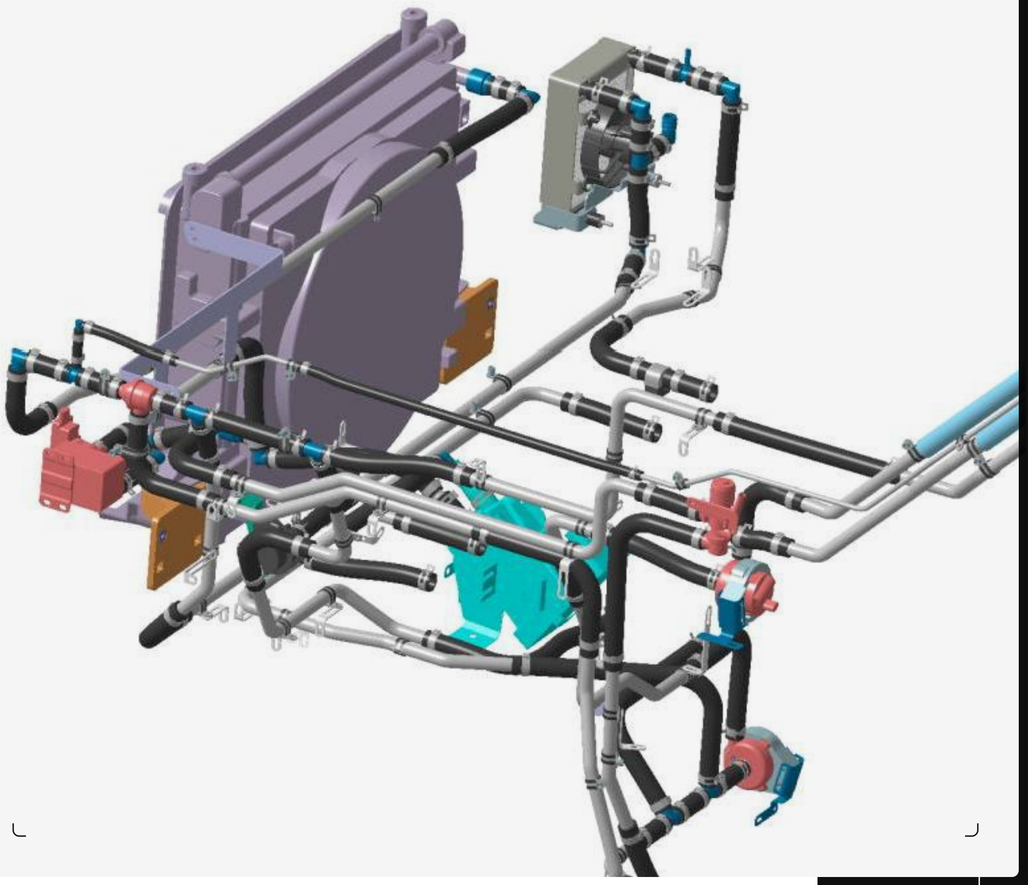
- In-vehicle package
- Of-the market modules integration & retrofitting
- Heat exchangers and heaters selection and package
- Manifolds and air passages design
- Lines and Tubes routings



VEHICLE ENGINEERING SCOPE

Thermal Management System

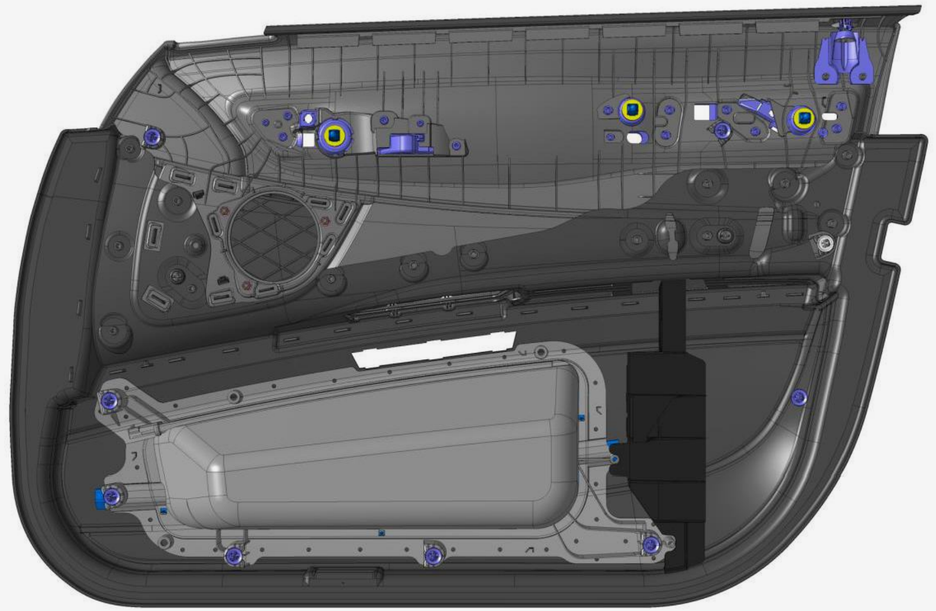
- Developing TMS principles & scenarios
- Heat exchangers selection and package
- Special valves development
- Tubes routings & fixing points
- Degas valves placement



VEHICLE ENGINEERING SCOPE

Interior Trims

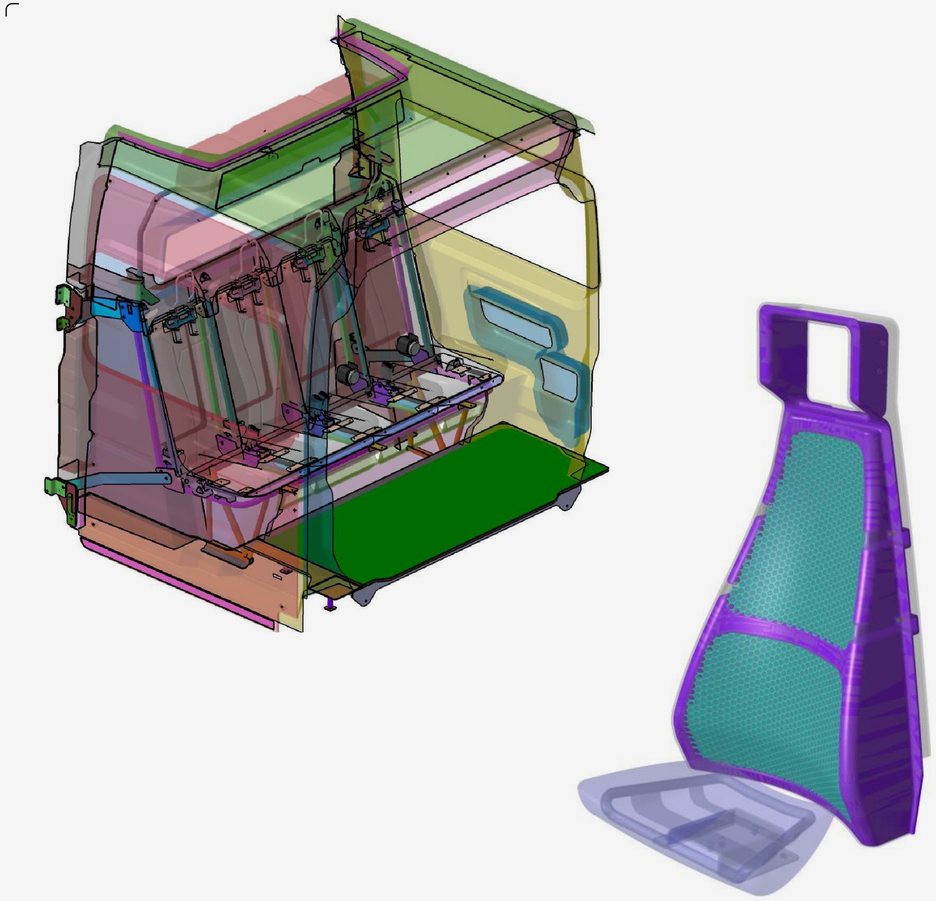
- Styling feasibility analysis
- A Class surfaces modelling
- Concept, development & detail design
- Soft & Hard parts design
- Sandwich parts design
- Instrumental Panel, Central Console, Door Lining, Headliner & other components design
- Decorative elements design including lighting effects
- HMI: Cluster & IVI components design
- Injection Molding components design for mass production vehicle
- RIM, RTM, thermoformed components design for mid and low production volume vehicles



VEHICLE ENGINEERING SCOPE

Seating

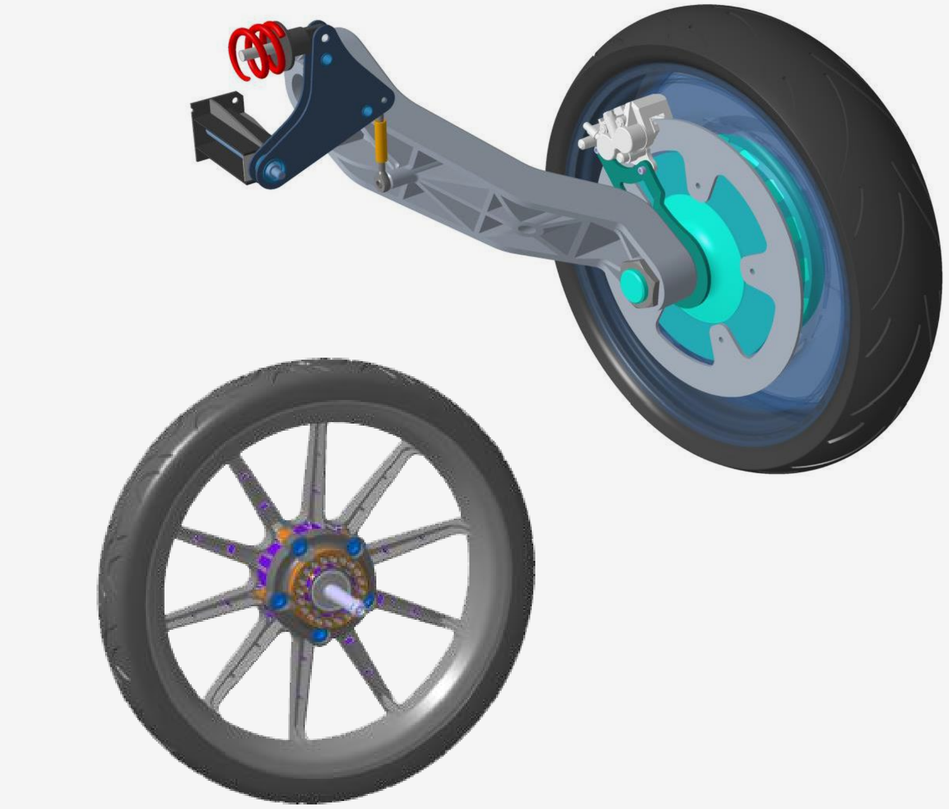
- Soft & hard parts design
- Structural parts & mechanism design
- Seat belt integration
- Legal requirements assurance



VEHICLE ENGINEERING SCOPE

Wheels

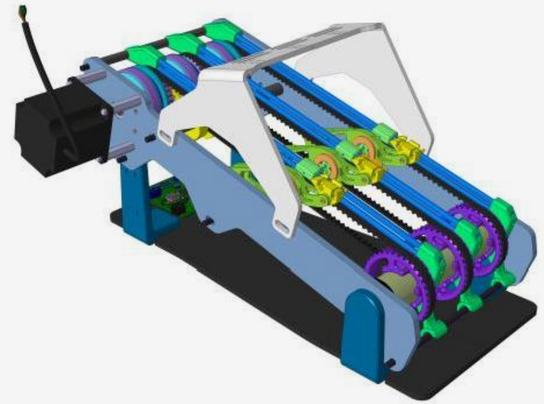
- Driven & non-driven wheels development inc. in hub motor integration
- Rims design
- Hub with bearings design
- Brake discs integration
- Sensors integration

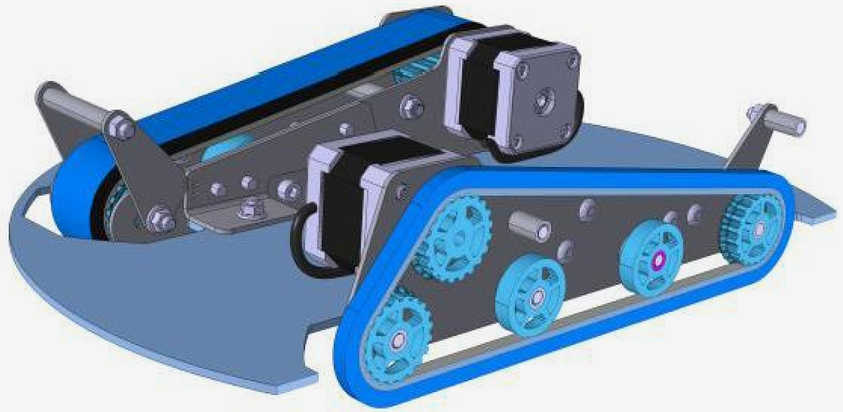


EXTENDED ENGINEERING SCOPE

Turn key project of complete devices and products for different industries

- Space Exploration
- Medical
- Healthcare
- Sport & Leisure
- Gaming
- Home Appliance & others





EXTENDED ENGINEERING SCOPE

Capabilities

- Mechanism design
- Electronics & Embedded Software development
- Electro-mechanical modules design
- Mechatronic modules design
- Prototyping & Testing