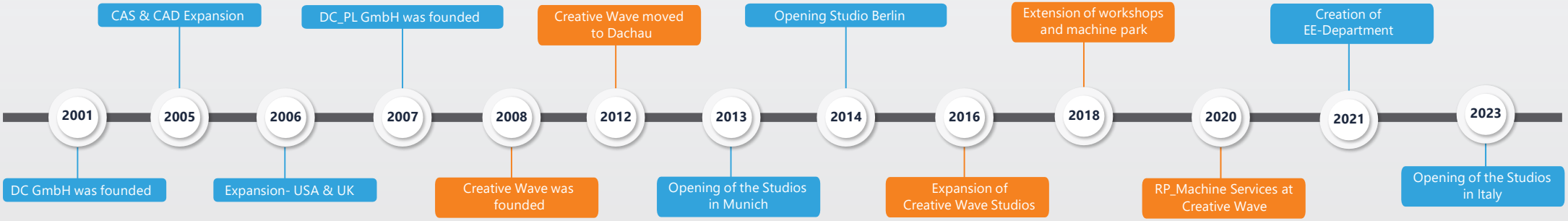
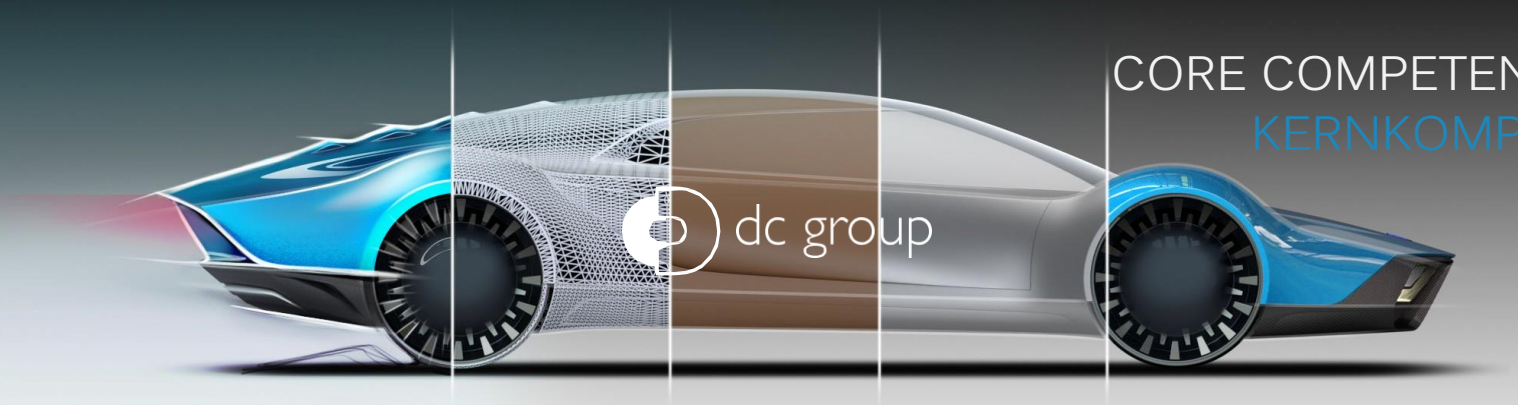

dc group
we build the future

HISTORY

dc group



Today we proudly look back on our history and how the Design Consulting Group expanded through the years.



CORE COMPETENCES
KERNKOMPETENZEN

dc-pl GmbH

LABOR LEASING

Arbeitnehmerüberlassung

design consulting

RECRUITING & CAS

Personalvermittlung & CAS

design consulting

Prototypes

Prototypen & Modellbau

design consulting
IT

EE-Engineering

CAD/CAS Engineering

Design Consulting ist ein etabliertes Dienstleistungsunternehmen im Bereich Automotive Design und Engineering. Unsere Kompetenzen sind die vollständige Umsetzung von Designprojekten von der Idee bis zum Prototypen, als auch die Vermittlung von professionellen Mitarbeitern im Bereich Design und Ingenieurswesen.

Die DC Group mit weltweiten Standorten in Deutschland, UK, USA und Partnern in Asien beschäftigt ca. 340 Mitarbeiter und hat sich als ein bedeutender Partner der Automobilindustrie profiliert. Unsere Stärke ist die jahrelange Erfahrung als Dienstleistungspartner der großen Automobilmarken im Bereich Design- und Fahrzeugentwicklung.

Wir vermitteln CAD/CAS/VR Designer, als auch Clay, Hart Modellbauer und Geschäftsbereich Elektronik für die Umsetzung von Automotive Design Projekten und bieten ebenso die komplette Umsetzung von Projekten wie zum Beispiel Show cars oder Design Prototypen an.

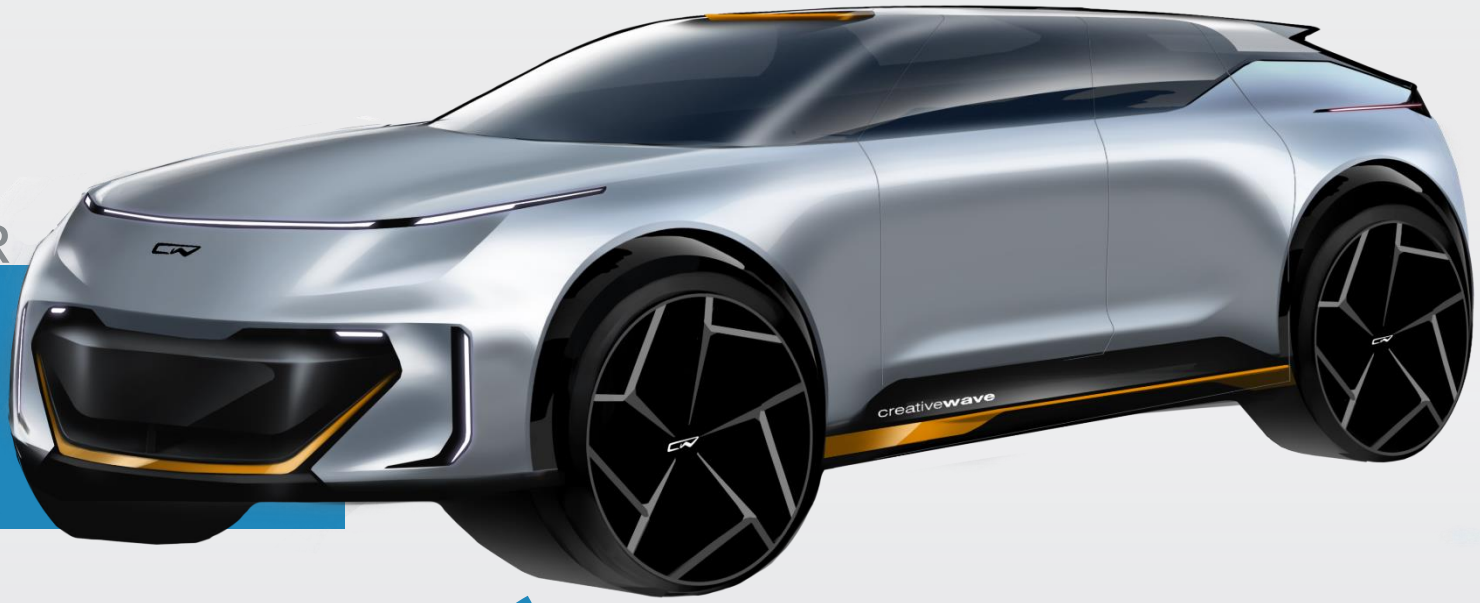
Design Consulting is an established service company for automotive design and engineering. Our competencies are the complete realization of design projects from the idea to the prototype, as well as the placement of professional employees for design and engineering.

The DC Group, with worldwide locations in Germany, UK, USA and partners in Asia, employs around 340 people and has established itself as a major partner to the automotive industry. Our strength lies in our many years of experience as a service partner for the big automotive brands in the field of design and vehicle development.

We provide CAD/CAS/VR designers, as well as clay-, hard modelers and business unit electronics for the implementation of automotive design projects. We also offer the complete implementation of projects such as show cars or prototypes.

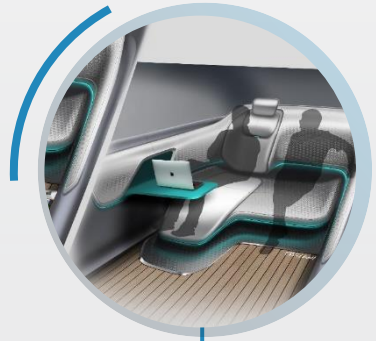
INTERIOR / EXTERIOR

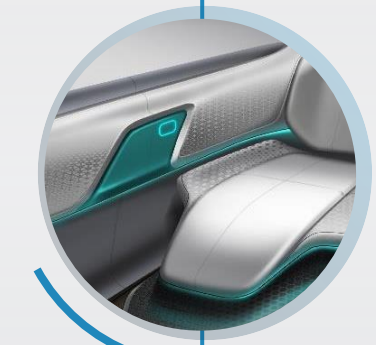
1 DESIGN DEPARTMENT





INTERIOR DESIGN









TRIM WORKSHOP

SATTLEREI DES VERTRAUENS

Experienced craftsmen trim design prototypes according to our clients' requirements. We always work with approved suppliers and high-quality materials. We can also develop new materials and production techniques based on our clients' ideas.







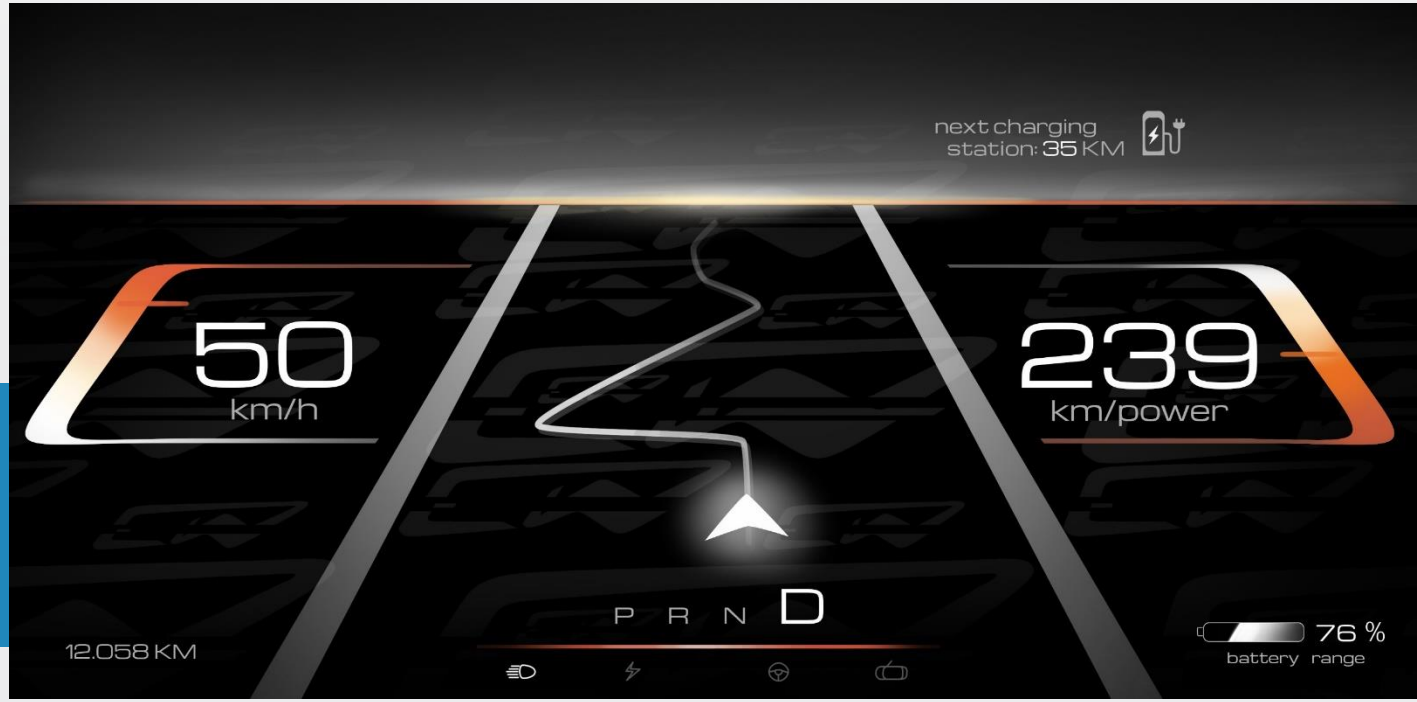


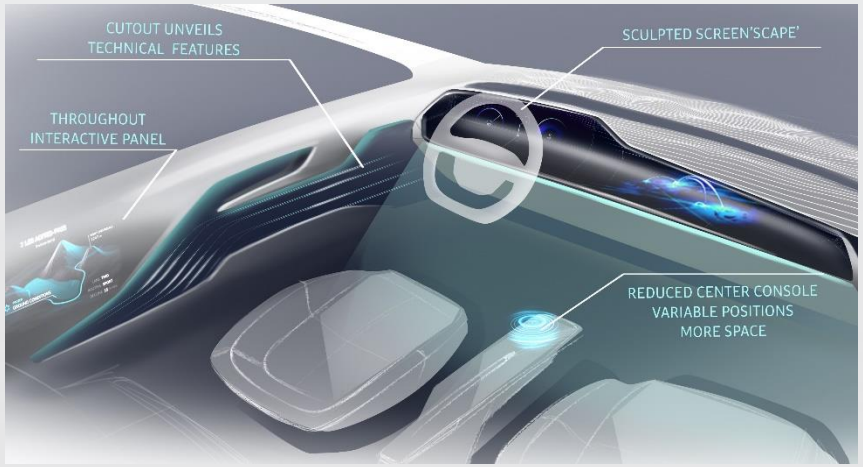
2 UX/UI DESIGN DEPARTMENT

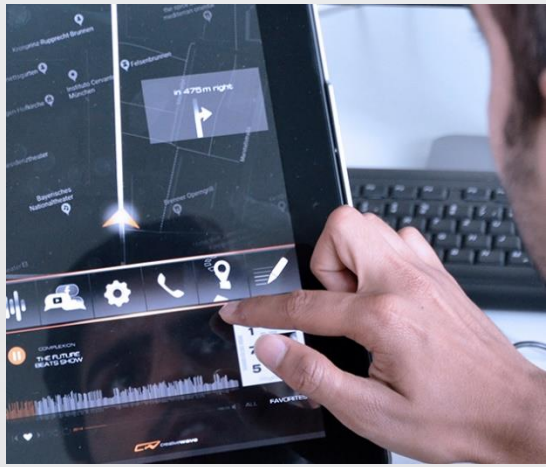
INTERACTIVE EXPERIENCES

Cluster and screen car display design and interactive functions.

Microsoft Google Maps androidauto Apple CarPlay







UI/UX

REFERENCES

MACK – Electric Truck – New Release

Focus: Scalable HMI iconography, UX standards, system documentation, and governance for MACK's electric truck platform.

Iconography Development

- Designed and systematized a scalable icon suite for the electric truck platform.
- Ensured brand alignment, legibility, regulatory compliance, and adaptability across models.
- Developed symbol variants and illumination-ready assets for different vehicle configurations.

Virtual UX Guide

- Created a digital UX guideline covering interaction principles, hierarchy, typography, color, motion, and accessibility.
- Established consistent HMI standards across UX, engineering, and industrial design teams.

HMI Contact Sheets & System Documentation

- Led the development of structured HMI contact sheets as a central cross-functional documentation tool.
- Defined component wireframes, interaction states, and functional diagrams for implementation clarity.
- Integrated HMI symbols into high-fidelity Alias renders and built benchmarking, illumination, and asset-governance frameworks.

Contact Sheets Guide

- Authored a documentation framework for naming conventions, export standards, and version control.
- Improved traceability and collaboration across UX, engineering, and suppliers.

Selected HMI Components

Stalks	EPB	Inductive Charger	Seat Controls
CMS	ETAS / ETB	LCS	SSB
12V Power	Hazard Button	RC-ECS	Versa Bunk
Bendix-Lytx Camera	IC Telltales	Rocker Switches	XDCP / XECM / XLCP

UI/UX

REFERENCES

Volvo P6700 Truck Platform

Focus: UI/UX & HMI Development — Production Integration & System Expansion.

HMI Contact Sheets & Component Integration

- Developed HMI contact sheets for interior components across P4279, P6700, P6705, and BEV platforms
- Documented symbol placement, component integration, and illumination logic for production alignment
- Created rocker switch visualizations including wiring documentation, surface renders, and defined illumination zones

Iconography Development

- Contributed to symbol development and finalization within Volvo's Blue Documentation framework
- Refined iconography to meet brand standards, regulatory requirements, and end-user clarity
- Supported cross-platform symbol consistency across vehicle variants

Central Screen (SID) Experience

- Designed and implemented the SID start-up animation to reinforce brand identity and system feedback clarity
- Developed layout proposals for the SID launcher, optimizing hierarchy and usability within technical constraints

End User Functions (XECM / EUF)

- Defined and visualized end-user functional logic within HMI documentation
- Ensured clear system feedback, state transitions, and driver-facing communication standards

Driver Assistance Animations

- Designed graphical line animations for the backup camera system
- Developed static and dynamic trailer backup visualizations, including left and right guidance states
- Strengthened spatial orientation and safety-focused feedback

Safety & Regulatory Graphics

- Updated safety decals including typography, layout structure, and symbol clarity
- Improved compliance, readability, and visual consistency with Volvo standards

3 VR DEPARTMENT

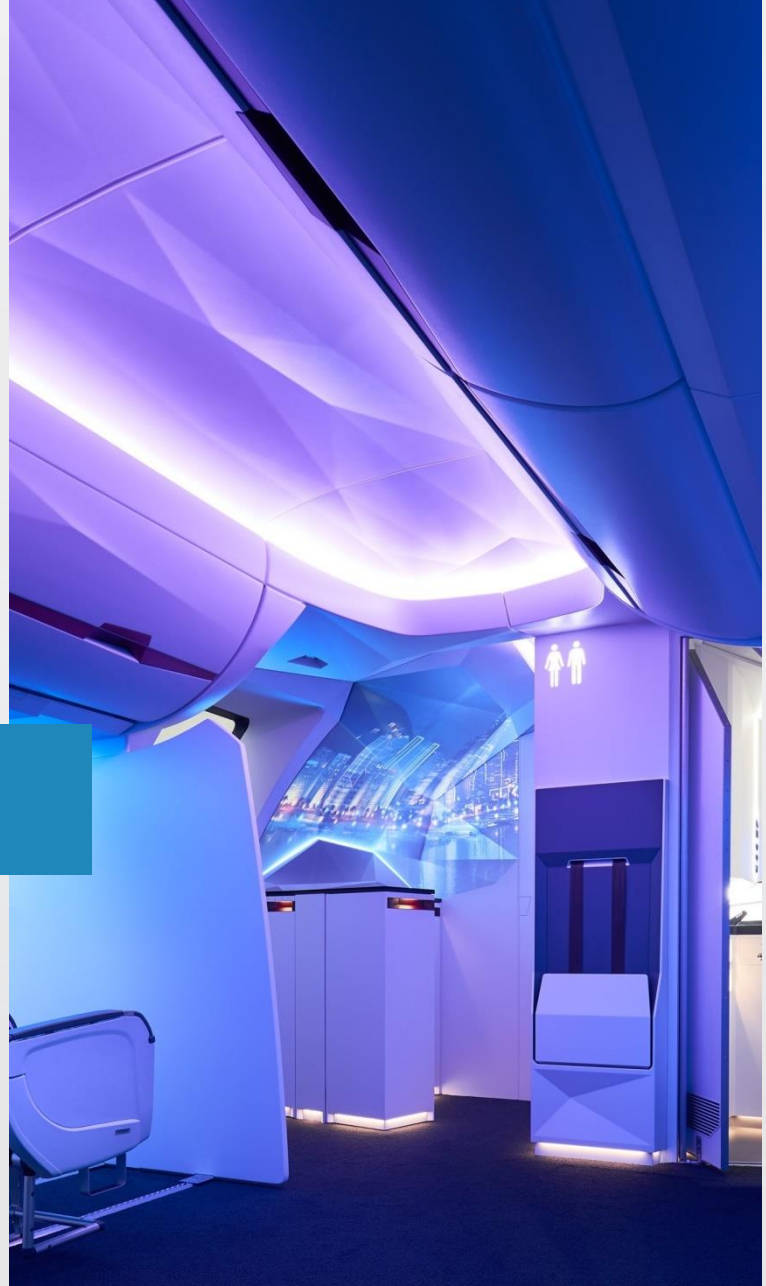
3D VISIONS AND REALISTIC PREVIEWS



DIEHL AIRCABIN

AIRCRAFT INTERIOR

2019. Aircraft Interior Concept by Diehl Aircabin in Laupheim Alias
Model and Visualization supported by DC Group







5 CAS DESIGN / A-CLASS CAD ENGINEERING SERVICES



CAS / A-Class

Wir entwickeln hochwertige digitale Flächenmodelle für Automotive- und Produktdesign. Unsere CAS Modeller unterstützen von der Konzeptphase bis zur präzisen Ausarbeitung komplexer Oberflächen – mit Fokus auf Design, Flächenqualität und Umsetzbarkeit.

We create high-quality digital surface models for automotive and product design. Our CAS / A-Class modelers support projects from concept phase to the precise refinement of complex surfaces, with a focus on design intent, surface quality and feasibility.

CAD

Wir bieten präzise CAD Dienstleistungen für die technische Ausarbeitung und Optimierung digitaler Produktdaten. Unsere CAD Spezialisten unterstützen bei der Erstellung, Bearbeitung und Weiterentwicklung von 3D-Daten – effizient, strukturiert und vertraulich.

We provide precise CAD services for the technical development and optimization of digital product data. Our CAD specialists support the creation, modification and further development of 3D data – efficiently, systematically and confidentially.

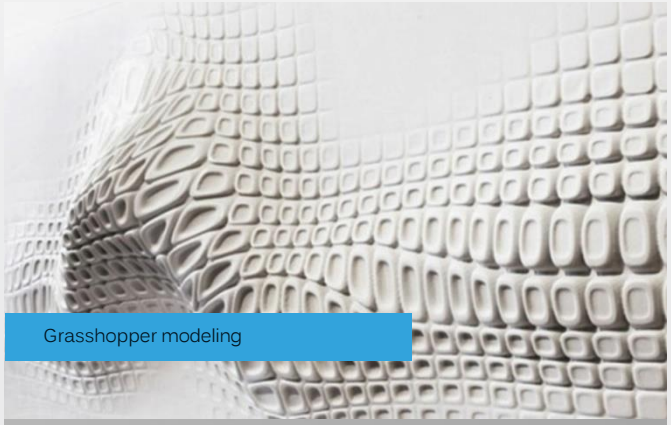
Autodesk - Alias

Rhinoceros®

ICEM Surf

CATIA V5

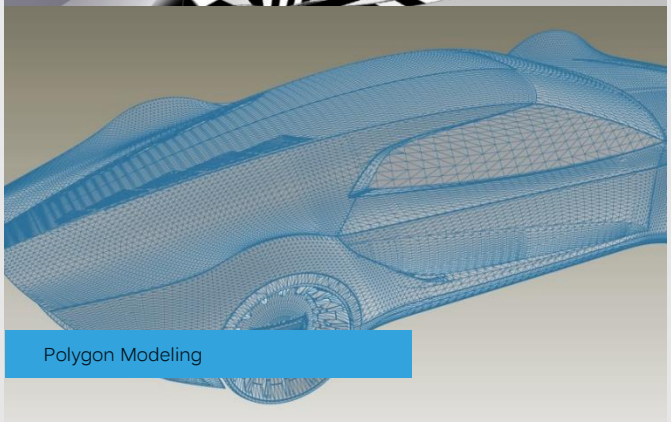
CATIA 3D EXPERIENCE



Grasshopper modeling



Design & Class-A Surfacing



Polygon Modeling

CAS / A-Class

REFERENCES



Volvo Trucks
North America

2021 - 2025
12 - 25 People
CAS Exterior & Interior
A-Class Interior



Volvo Trucks
Sweden

2022 - 2024
8 People
A-Class
CAS services



Scout Motors Inc.
North America

Since 2023
7 People
CAS Exterior & Interior
A-Class Interior



Mack Trucks
North America

2021 - 2025
10 People
CAS services
A-Class Interior



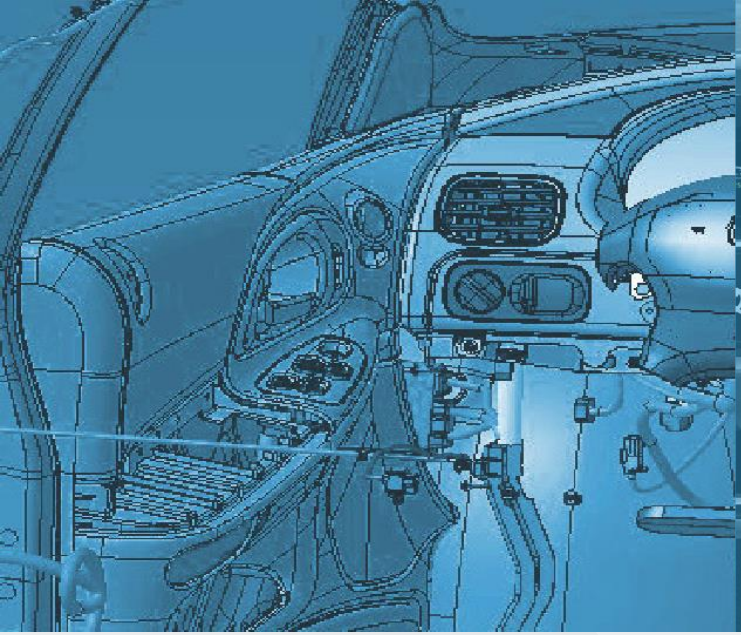
Singer Porsche
North America

2023 - 2024
1-2 People
CAS services



Daimler Trucks
North America

Since 2023
4 - 8 People
CAS services







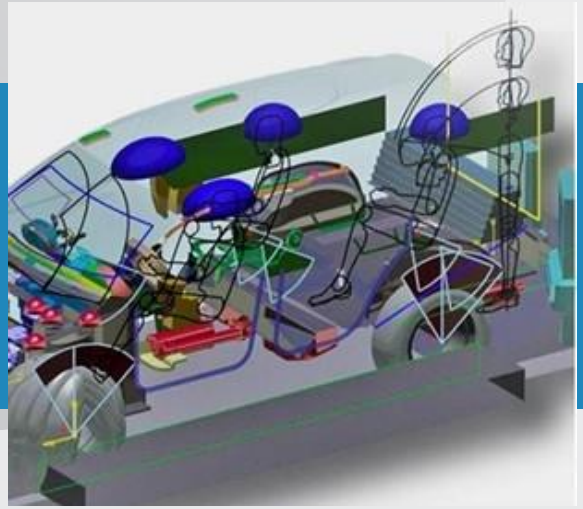
CAD
CONSTRUCTION

CAD
DATAFEEDING

CAD
ANALYSIS

Das Konstruieren von technischen Bauteilen und die Umsetzung und Vor- bereitung zur Serienfertigung sind Aufgaben der CATIA Ingenieure. Mit Versiertheit und Fachwissen begleiten sie die Projekte und entwickeln technische Lösungen unter den Designoberflächen.

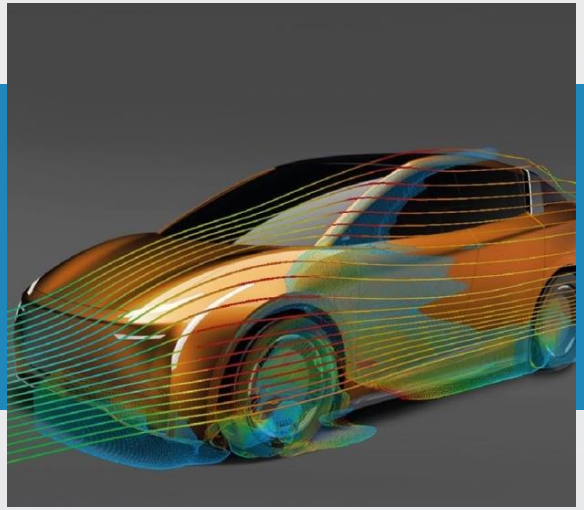
The construction of technical parts and the preparation of the products for serial production or prototyping is the responsibility of the CATIA engineers. With technical know-how and skills, they support the projects and construct the technical solutions underneath design surfaces.



PACKAGE
DEVELOPMENT



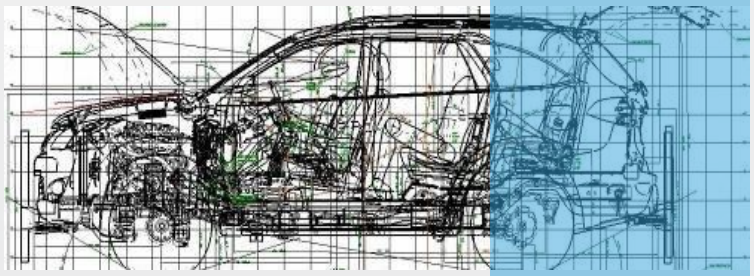
PLATFORM
ANALYSIS

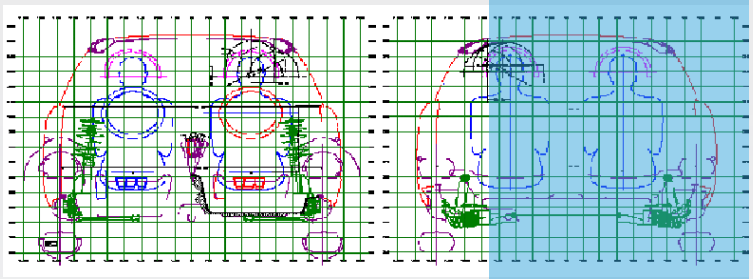


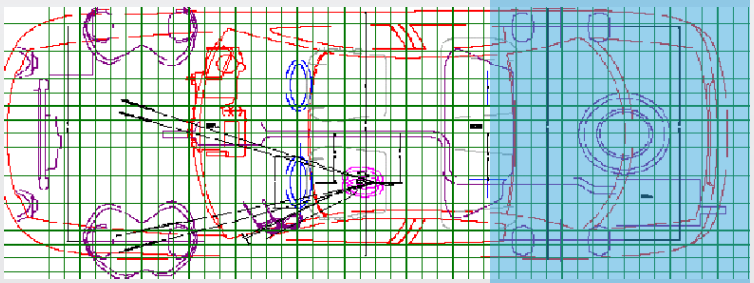
AERODYNAMIC
SIMULATION

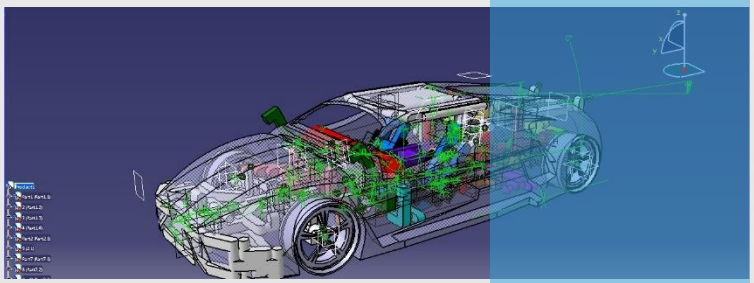
ENGINEERING
FEASIBILITY

- Engineering support for styling
- Ergonomic definition
- Packing of mechanical parts
- Legislative verifications
- Engineering styling feasibility
- Master sections
- Modularity concept definition







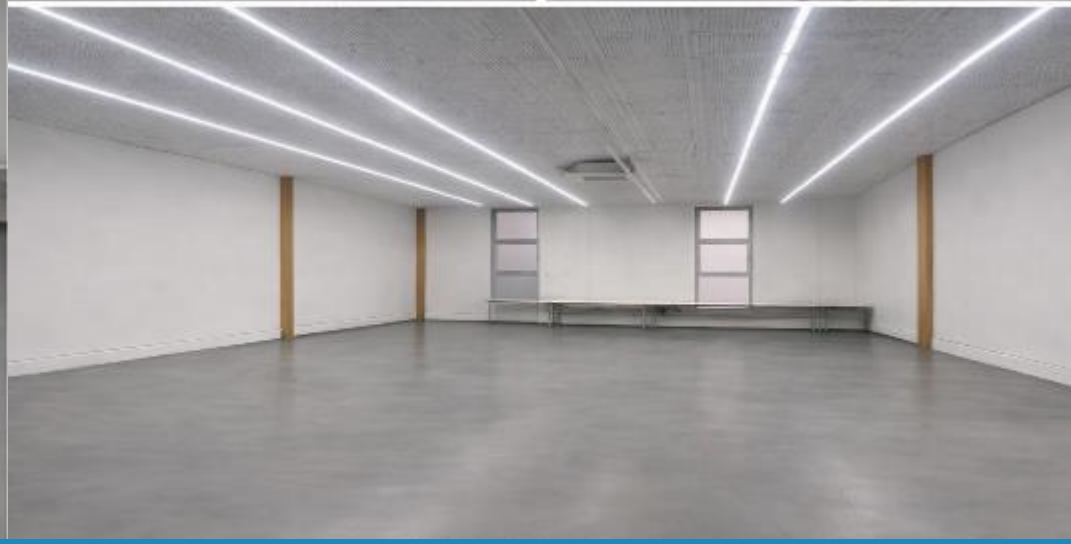


6 MODEL MAKING STUDIO









The studios are TISAX-certified and enable the construction of drivable 1:1 scale models.

Die Studios sind TISAX-zertifiziert und ermöglichen den Aufbau fahrbarer Modelle im Maßstab 1:1.

CLAY MODELING
CLAY MODELLBAU

Claymodelle sind ein wichtiger Referenzpunkt im laufenden Designprozess. Bei der Entwicklung eines neuen Fahrzeugs gibt es kein anderes Material und keine andere Technik, die besser geeignet sind, Designideen direkt in 3D weiterzuentwickeln. Unser erfahrenes und hochspezialisiertes Clay-Modeling-Team arbeitet Hand in Hand mit Designern und Ingenieuren, um den ersten realistischen und greifbaren Eindruck eines neuen Designs zu schaffen.

Clay models are an essential reference point in the design process. When developing a new vehicle, no other material or technique is better suited to refining design ideas directly in 3D. Our experienced and highly specialized clay modeling team works hand in hand with designers and engineers to create the first realistic, tangible impression of a new design.



MODELLBAU
HARD MODELING

- Detail studio
- High-end finishing





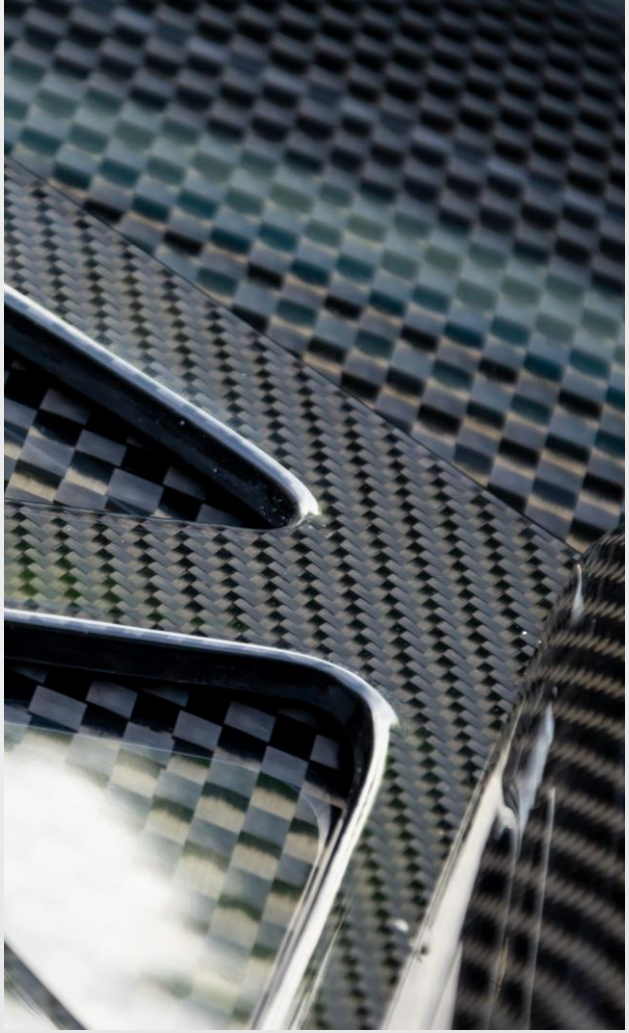


PROTOTYPING & CNC MILLING

A variety of techniques such as 3D printing in different materials (rubber, transparent and rigid materials), CNC milling, and lamination processes (carbon fiber, glass fiber) are used to build design prototypes.

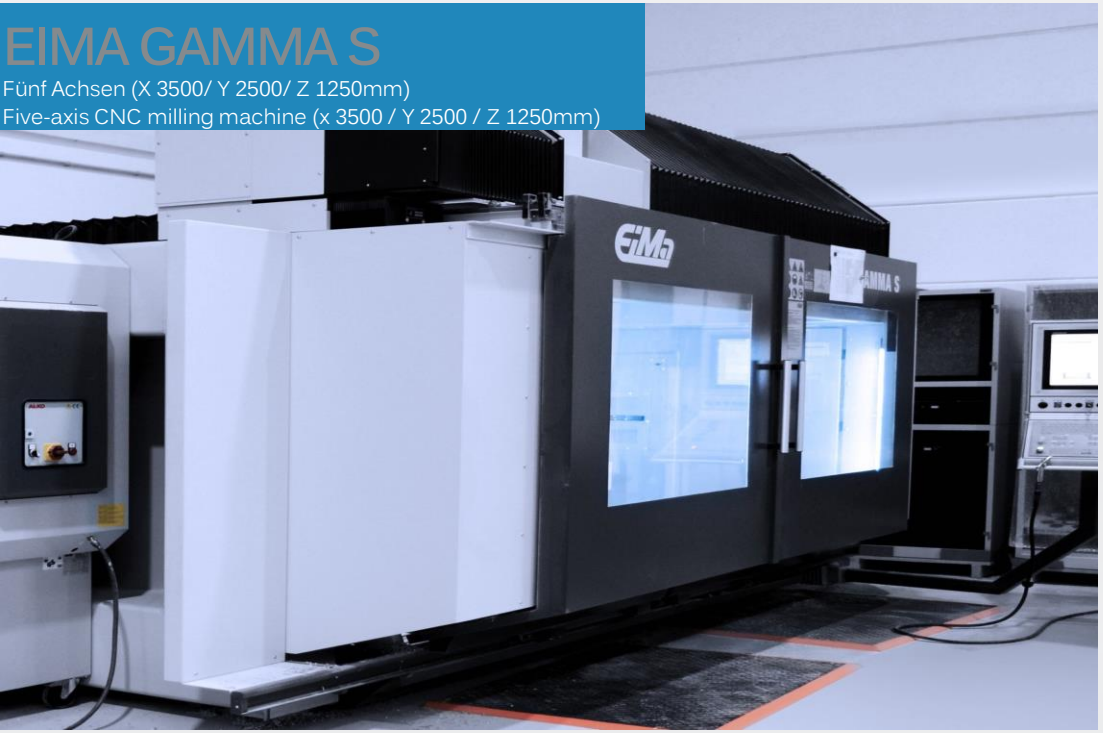
Verschiedene Techniken, wie etwa 3D-gedruckte Bauteile aus unterschiedlichen Materialien (Gummi, transparentes Material, Hartmaterial), CNC-Fräsen oder Laminierverfahren, werden angewendet, um Designprototypen zu erstellen.





EIMA GAMMA S

Fünf Achsen (X 3500/ Y 2500/ Z 1250mm)
Five-axis CNC milling machine (x 3500 / Y 2500 / Z 1250mm)



KOLB STUDIO LINE M

Fünf Achsen CNC Fräse (X 12000 / Y 1600 / Z 2500mm)
Full-size milling machine (1:1 scale)



FIDA G 996 RT

Fünf Achsen CNC Fräse (X 850 / Y 950 / Z 600mm)
mit Drehtisch / with turning table



ZIMMERMANN Z 25

Full-size milling machine. Fräsmaschine (1:1 scale)
Fünf Achsen CNC Fräse (X 7000 / Y 3500 / Z 200mm)



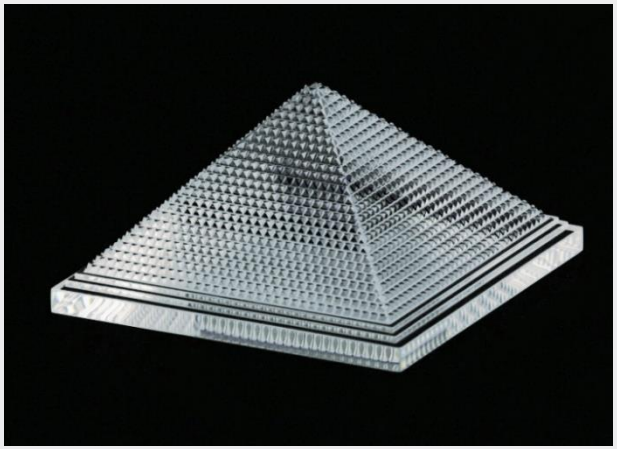
7 LIGHT DEPARTMENT

Light technology development from the ideation to the real component.

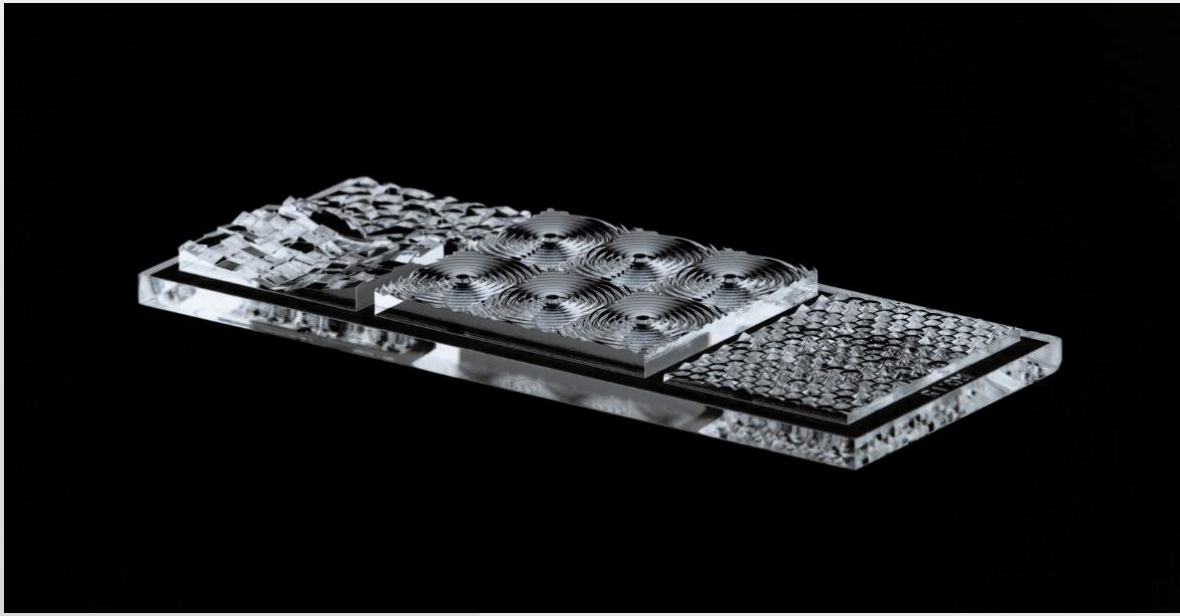


HIGH QUALITY TRANSPARENT RAPID PROTOTYPING LIGHTS

Extreme transparency, precision and outstanding surface quality control. Our capabilities allow us to achieve excellent surface quality across different materials using our 3D printing technologies, for both prototypes and production-quality parts.







DYNAMIC LIGHT EFFECTS

Testing of various light signatures on an Audi LED Matrix unit.

- Control of various lighting elements
- RGB(W) LED strips
- 5V / 12V / 24V LED elements
- Ambient lighting
- Headlamps and rear lamps
- Indicators
- Set up animations (e.g. dynamic indicators or fading/moving ambient lights)
- Animation synchronization
- Add our DMX-to-CAN converter to create your ideal lighting scenario
- ... and many more!





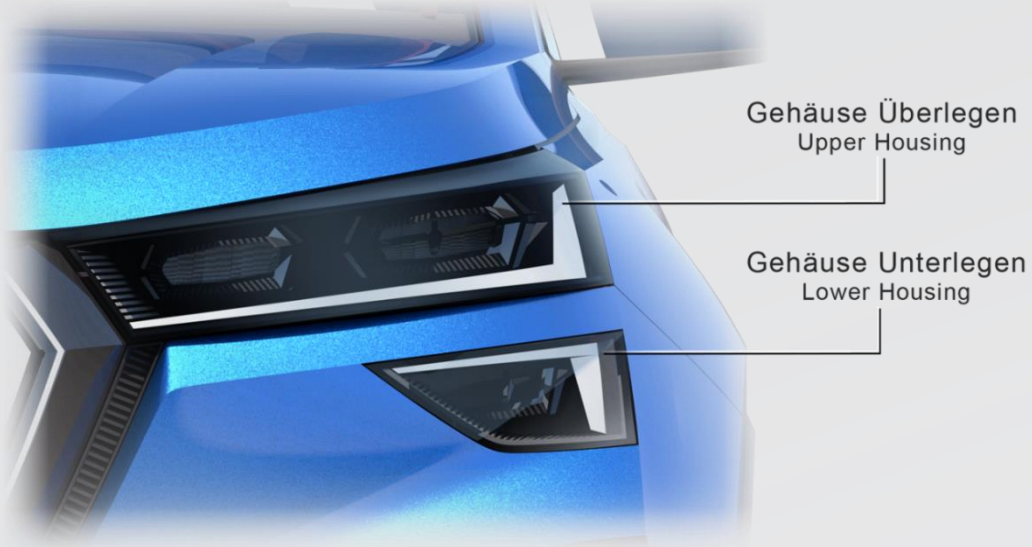


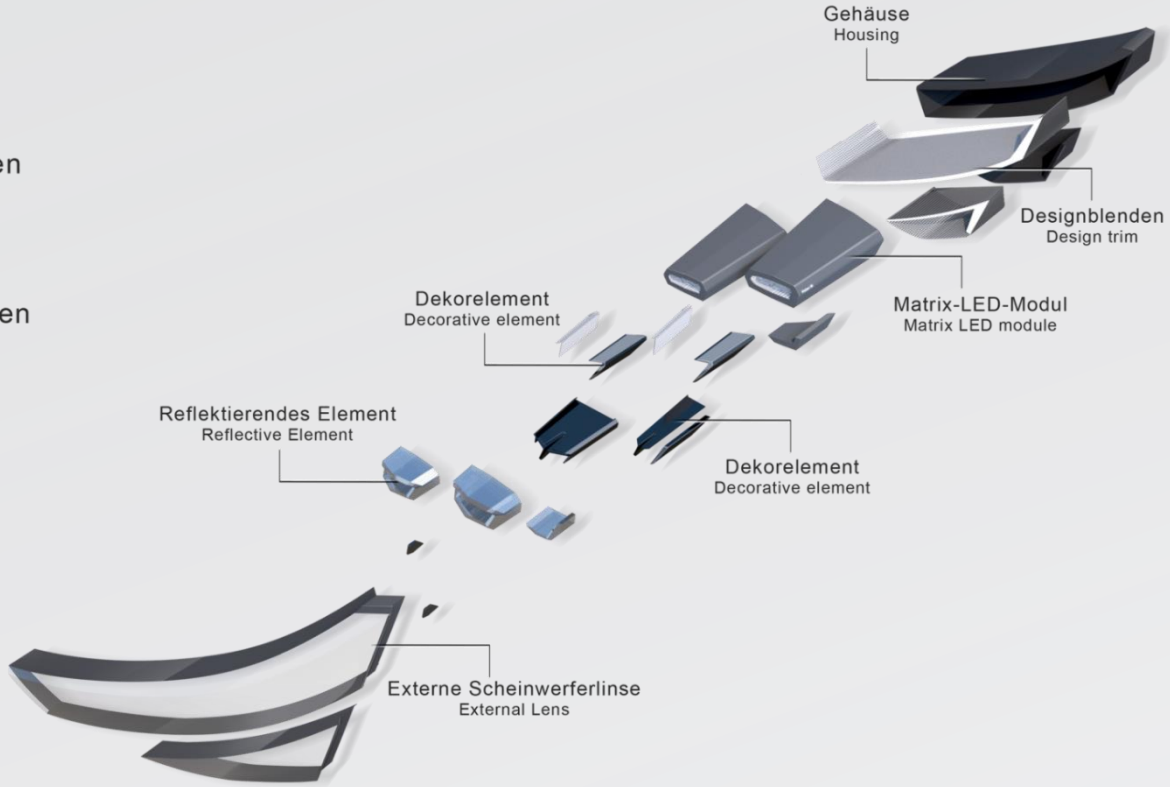
DESIGN DEVELOPMENT & VISUALIZATION

CONCEPTS PROPOSALS, TECHNOLOGY
APPLICATION AND RENDERING

SKODA VISION IN CONCEPT

Digitaler Matrix LED-Scheinwerfer





LACKIEREREI
PAINT BOOTH

"COLOR UNVEILS THE BEAUTY"

Unsere Lackiererei verfügt über eine professionelle 3,5 m x 6 m große Lackierkabine. Die hauseigene BASF Mischanlage erfüllt so gut wie jeden Farbwunsch.

Our professional 3.5 m x 6 m paint booth, combined with our in-house BASF mixing station, enables us to provide our clients with virtually any color and finish they require.

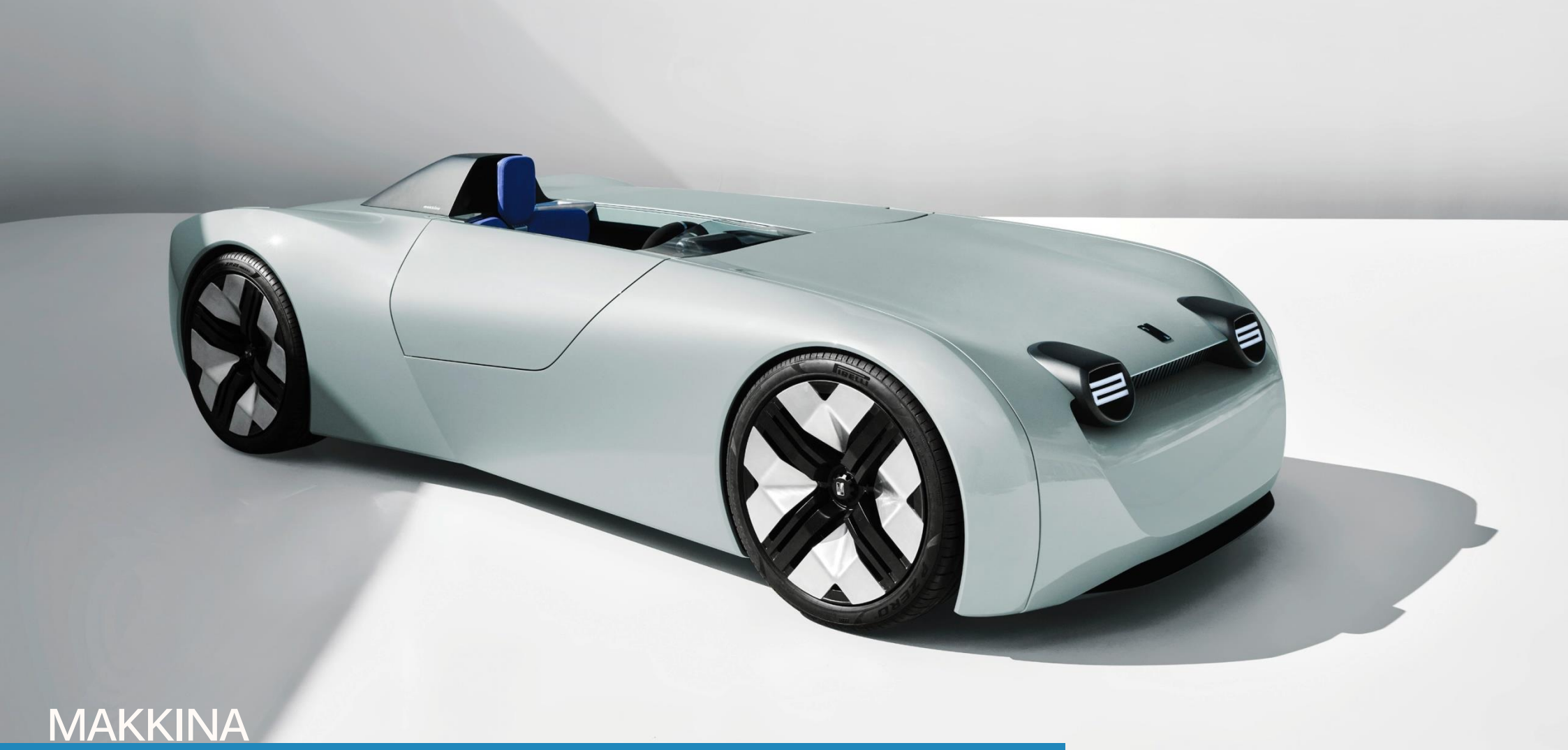


REFERENZ

PROJEKTE

REFERENCE PROJECTS





MAKKINA

Designed to pay homage to the classic automotive era, this masterpiece captures the essence of elegance and innovation. Encompassing not only its sleek bodywork but also its iconic interior, every detail has been meticulously crafted to perfection. This automotive masterpiece, artfully crafted in the esteemed Creative Wave Studios, represents a remarkable fusion of timeless aesthetics and engineering brilliance.

MAKKINA

Devoted to automotive design









MAKKINA

Devoted to automotive design





MINI x DEUS EX MACHINA

At IAA 2025, we were proud to present two stunning vehicles that we built together with MINI and DEUS EX MACHINA: the MACHINA and the SKEG.

MINI JCW F66
THE MACHINA







MINI JCW F66
THE MACHINA







MINI JCW J01
THE SKEG







MINI JCW J01
THE SKEG









Bugatti Mistral Brouillard

For the 2025 Concours d'Elegance in Pebble Beach, we created an outstanding one-off vehicle: the Bugatti Mistral Brouillard.

Bugatti Brouillard Exterior





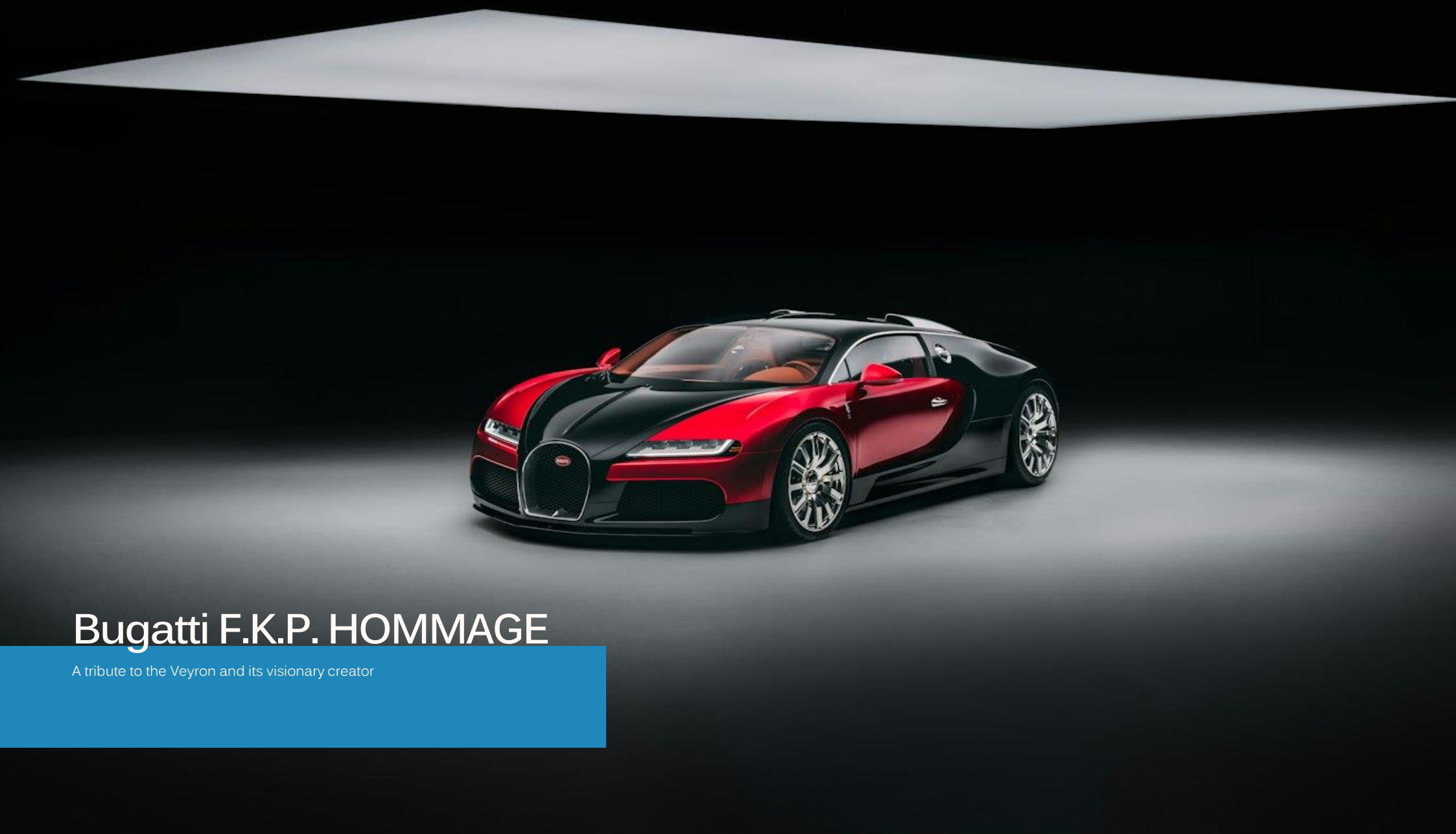


Bugatti Brouillard Interior









Bugatti F.K.P. HOMMAGE

A tribute to the Veyron and its visionary creator

Bugatti HOMMAGE
Exterior







Bugatti HOMMAGE Interior







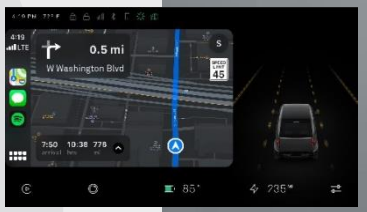


CANOO

In December 2021, we delivered two fully functional show cars to CANOO in Los Angeles, California. The vehicles were fully drivable and equipped with functional interfaces created using Unreal Engine.

CANOO




0.5 mi
W Washington Blvd
45


65%
235mi
6:30PM
32°
OPEN CHARGE PORT
STOP CHARGING


ADVENTURE RACK

CANOO







CANOO









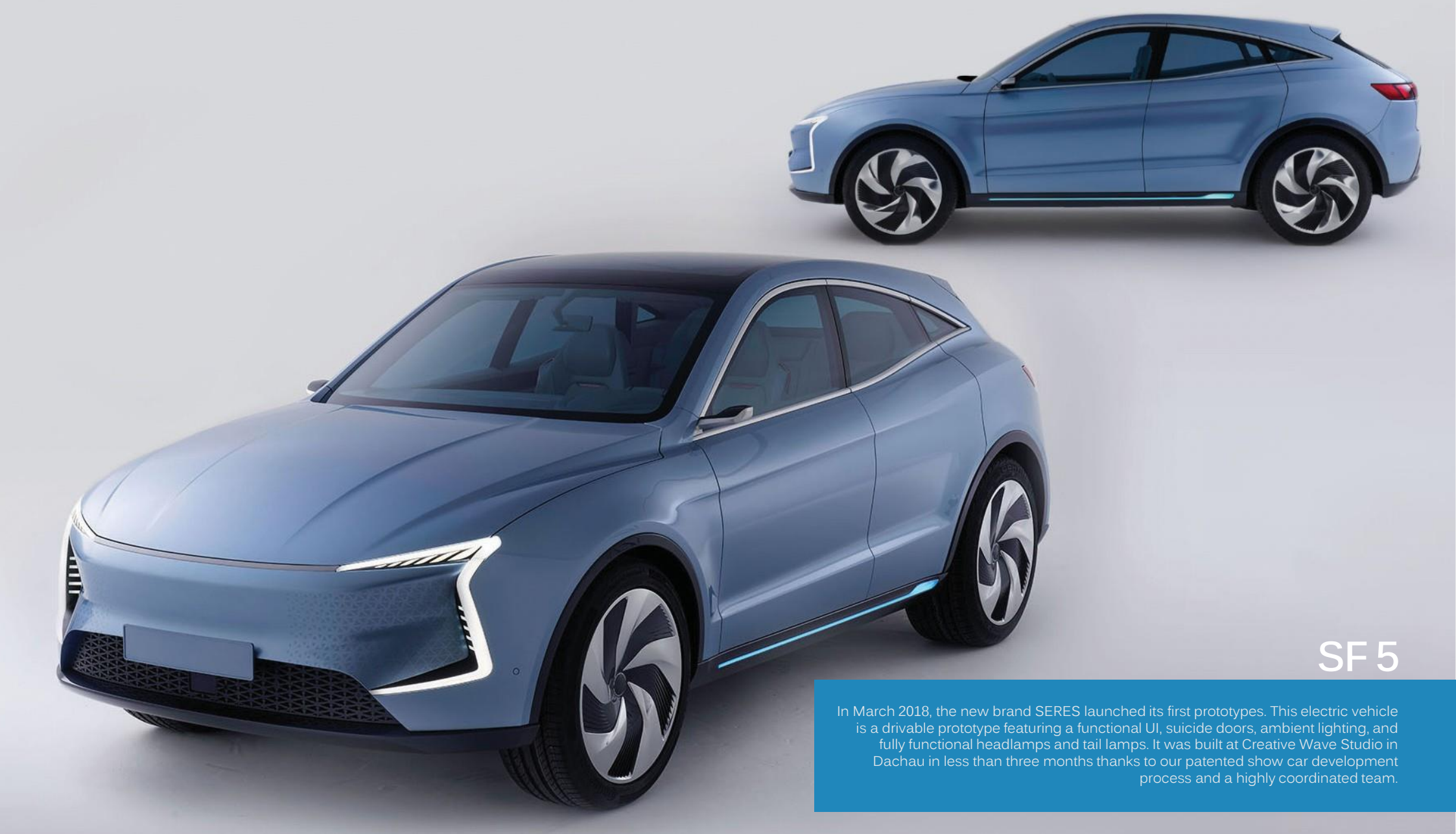
SKODA VISION IN

In February 2020, we were proud to support the launch of the ŠKODA VISION IN show car at Auto Expo in New Delhi. The concept car won the award for Best Concept Car at the show.



HONGQI S9

In September 2019, we built this hybrid hypercar show car with 1,400 hp for our Chinese clients. The vehicle was fully functional and featured gullwing doors, a user interface, exterior lighting, and ambient interior lighting.



SF 5

In March 2018, the new brand SERES launched its first prototypes. This electric vehicle is a drivable prototype featuring a functional UI, suicide doors, ambient lighting, and fully functional headlamps and tail lamps. It was built at Creative Wave Studio in Dachau in less than three months thanks to our patented show car development process and a highly coordinated team.



NIO ES 8

In April 2017, NIO launched its first realistic prototype. The seven-seater is a powerful off-road vehicle with an electric powertrain and served as a preview of the brand's first production model. The prototype vehicle was built entirely at our modeling company, Creative Wave GmbH, in Dachau near Munich.

LUCID AIR

CONCEPT CAR









BMW-RIVALWORKS

Gaming Chair 2021



GRAMMER PURE

Furniture innovation for GRAMMER



YACHT JUBILEE OCEANCO

The luxury yacht was designed by Igor Lobanov and the 3D model was created by the DC Group. In 2017 the yacht was launched as the largest yacht ever built in the Netherlands.





YACHT JUBILEE
OCEANCO





YACHT JUBILEE
OCEANCO



PERSONALAGENTUR

RECRUTING AGENCY



dc-pl

Design Consulting provides qualified professionals such as CAD modelers, CATIA engineers, automotive and product designers, color & trim designers, graphic designers and clay modelers to the industry. This can be arranged either through labor leasing contracts or freelance placements. Thanks to our experience and our global recruiting network, we maintain an extensive database of highly qualified professionals across all areas of automotive design.

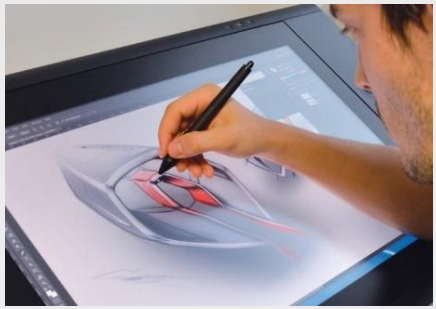
DC-Personal-Leasing has a license according to §1 AÜG granted by the Regionaldirektion Bayern for placing professionals with labor leasing

Design Consulting vermittelt Fachpersonal, wie z.B. CAD Modelleure, CATIA Ingenieure, Automotive oder Produktdesigner, Color & Trim und Grafik Design- er sowie auch Clay Modelleure an die Industrie weiter. Dies kann im Rahmen des Arbeitnehmerüberlassungsgesetzes geschehen oder auch im Rahmen der Vermittlung von freiberuflichen Fachkräften. Wir verfügen über ein weit gefächertes Archiv an erfahrenen hoch qualifizierten Mitarbeitern aus ver- schiedensten Bereichen und vermitteln seit Jahren erfolgreich und schnell an zufriedene Kunden aus der Industrie.

DC Personal Leasing GmbH ist im Besitz einer Erlaubnis zur gewerbsmäßigen Arbeitnehmerüberlassung nach §1 AÜG, ausgestellt durch die Regionaldirek- tion Bayern. Seit 1. Januar 2008 sind wir Mitglied im Bundesverband Zeitarbeit Personal-Dienstleistungen e.V.













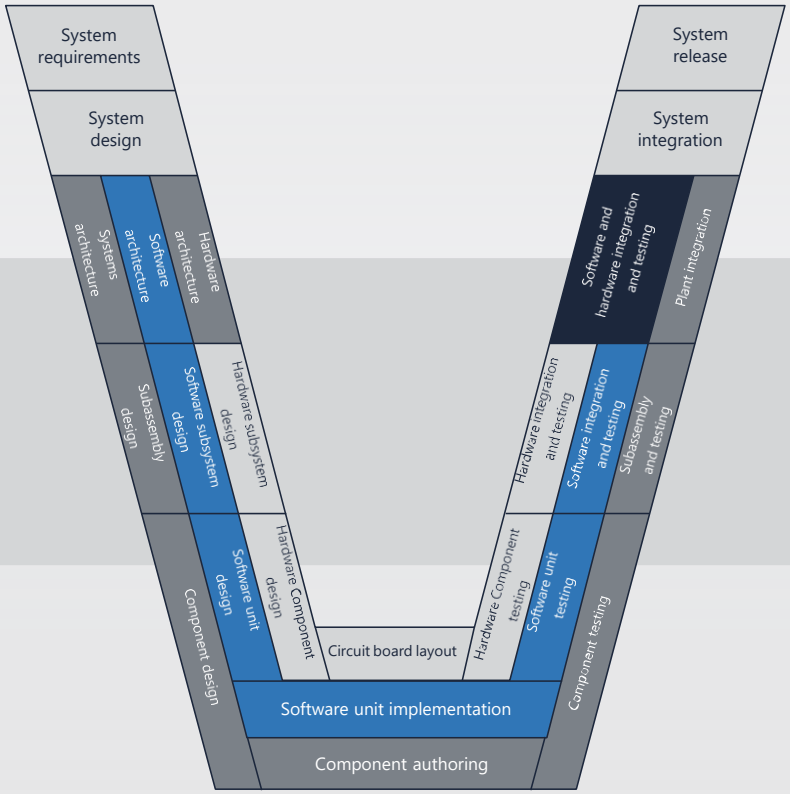


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- **DC Group Transport Business Unit**
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- R&D: ADAS solutions
- Setting and development Wiring Harness system
- EE Architecture (Electrical schemes-Diagram)

ELECTRICAL & ELECTRONICS SKILLS



Key competencies include:

- Requirements analysis, definition, verification;
- Analog/Digital design;
- Software development for embedded systems, web and mobile applications; Basic Software (BSW) configuration;
- Model In the Loop (MIL), Software in the Loop (SIL) and Hardware In the Loop (HIL); Integration and ECU flashing;
- Diagnostic activities, definition and execution of test checklists;
- Testing automation;
- Calibration
- Fleet activities
- Plant support for in-vehicle software failure analysis, EOL tests execution, ECU reprogramming;
- Digital Mockup Engineering;
- Machine learning, signal processing, computer vision, sensor fusion;
- Platform for control and supervision;
- Hardware/Software prototyping with dSpace and National Instruments CRIO/SBRIO platforms;
- Automotive SPICE, ISO-26262, Automotive Cyber Security

APPLIED FOR

- Cluster, Body, Infotainment
- Engine and transmission
- ADAS
- Hybrid and Electric



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PROJECT MANAGEMENT WITH THE AGILE METHODOLOGY: SCRUM

We use agile methodologies to provide the best solutions for our customers' needs.
It is possible to adapt easily to customer requests, for example, change requests and bug fixes.

Tools: Atlassian **Jira** or alternatively **Tuleap**;

Frameworks:
Scrum for new developments and change requests;
Kanban for bug fixes

Product backlog: prioritized list of work that needs to be done in the project;

Sprint review: the team reviews the work completed and not completed;

User story: is a natural language description of a goal and it is the smallest unit of work;

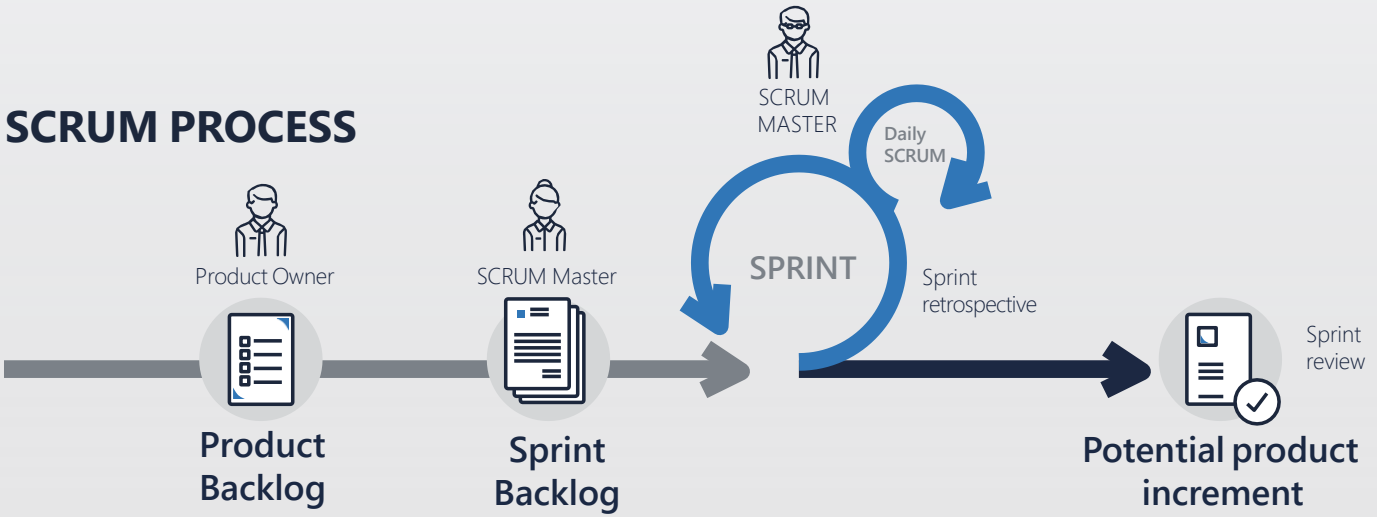
Epic: a big work that has one common objective and it is not detailed;

Daily scrum: each day, the team holds a meeting of fifteen minutes to identify the impediments;

Sprint retrospective: the team reviews what went well during the sprint, what did not, and what can be improved to increase productivity.

Sprint: (or iteration) is a short time-boxed period;

SCRUM PROCESS





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AUTOMOTIVE SOFTWARE FACTORY

Automotive Software Factory

The ASF (Automotive Software Factory) is specialized in:

- Project Management with AGILE methodologies
- Software development of embedded systems for several ECUs (Electronic Control Units), using both the MBD (Model Based Design) technique compliant with the AUTOSAR (**AUT**omotive **O**pen **S**ystem **AR**chitecture) standard and ISO 26262 (for safety components) and handwritten C/C++ code;
- Software integration of several software components on the ECUs;
- Validation & verification of both hardware and software. Hardware integration of real or simulated hardware (ECUs, sensors and actuators). Three steps of V&V: Model In the Loop (MIL), Software In the Loop (SIL) and Hardware In the Loop (HIL);

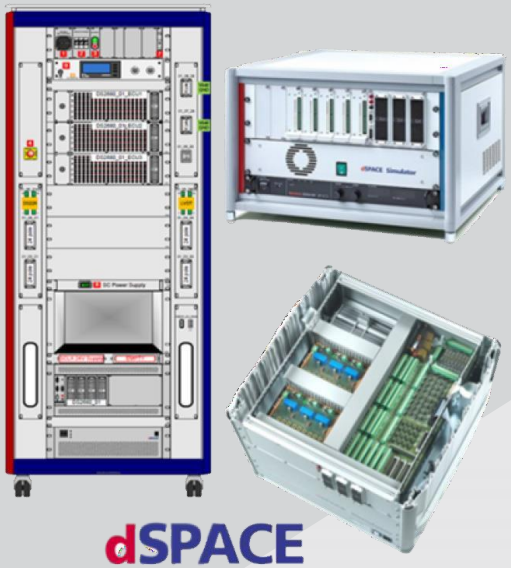
Process based on the V-model and compliant with the model **Automotive SPICE (ASPICE) capability level 2**

VALIDATION & VERIFICATION HIL

To test complex embedded systems, HIL (Hardware In the Loop) real-time simulation technique is applied, closing in a control loop both simulated and real components. This makes it possible to perform additional tests that are almost impossible in real life due to the peculiarities of test conditions (i.e. fault injection in a safety-critical component);

- One of the main activities is to configure our simulators for ECUs;
- The best automotive simulators are used, exploiting all their capabilities:
- **dSPACE**
  - SCALEXIO FULLSIZE;
  - MidSize:
  - EcoLine.
- **National Instruments**
  - CompactRIO.
  - NI PXI
- **ECUs tested: ECM, BCM, IPC and TCM.**





NATIONAL INSTRUMENTS Alliance Partner

dSPACE

EXAMPLE: HIL IPC VALIDATION IN DETAILS

- **LabVIEW/TestStand:** development of a real-time model used for the mapping of CAN messages and the management of the conditioning of the signals and deployment on the **NI CompactRIO;**
- **TestLink** (for the ECU validation):
  - Creation of test cases based on vehicle function requirements (including fault injection tests);
  - Verification of project specifications of the ECU.
- **TestStand:** to run test cases and to automatically verify the results (for example: check popups, telltales, chimes, image areas and colors);
- **CANalyzer:** diagnosis and verification of the structure of messages transmitted over the CAN network;
- **Redmine:** reporting of anomalies detected on the software version.





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TELEMATICS ACTIVITIES

Telematics Development

- Connectivity functionality development (C++, .NET)
- Implementation and testing of Client-Server communication methods
- Development of functional tests in simulated mode (in Linux environment)
- Functional tests in real mode (real Connection Box)
- Development of test scenarios in Python.
- Data analysis and processing (Vector Tool)

Testing activity

- Creation and configuration of simulators HIL
- System design on PXI-NI platform
- Integration of HW / SW components for I / O (Python script, HW dedicated to control and actuation)
- Definitions of content and features under trial. Implementation of interfaces in Labview
- Implementation of test sets in TestStand

F.O.T.A.

Firmware Over The Air Management

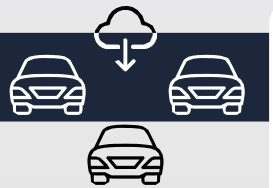
- FOTA campaigns creation and management
- Issue investigation and log analysis

Test Automation Agent development:

- Development of an application in Python to receive requests from a server and perform different types of tests on the telematic unit (PC&M)
- Writing tests in Typescript to stress test the PC&M

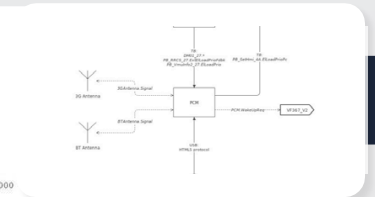
For vehicle fleets:

- Can Logger application management
- Data analysis and processing, Remote Control Specifications and VF Analysis



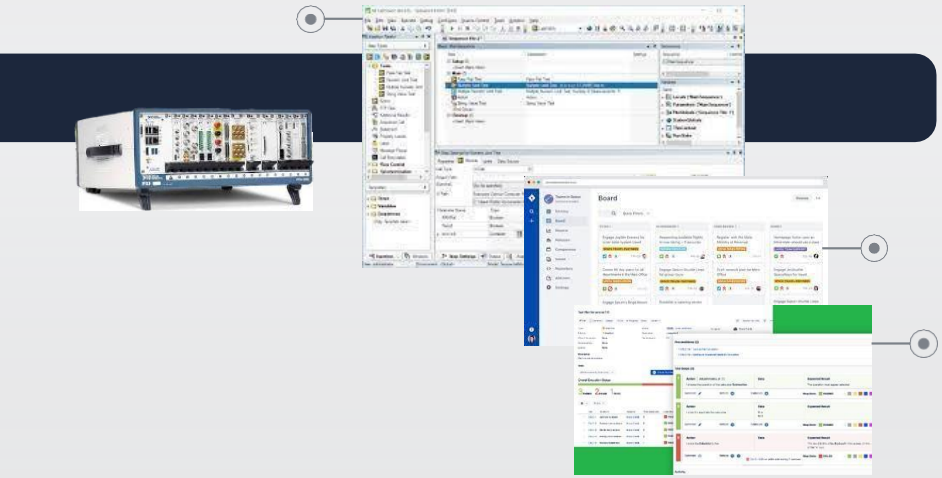








TESTING




Infotainment
LTE
Telematics
CLOUD
Diagnostics
LTE
Connected Infotainment
Connected Telematics
Connected Diagnostics



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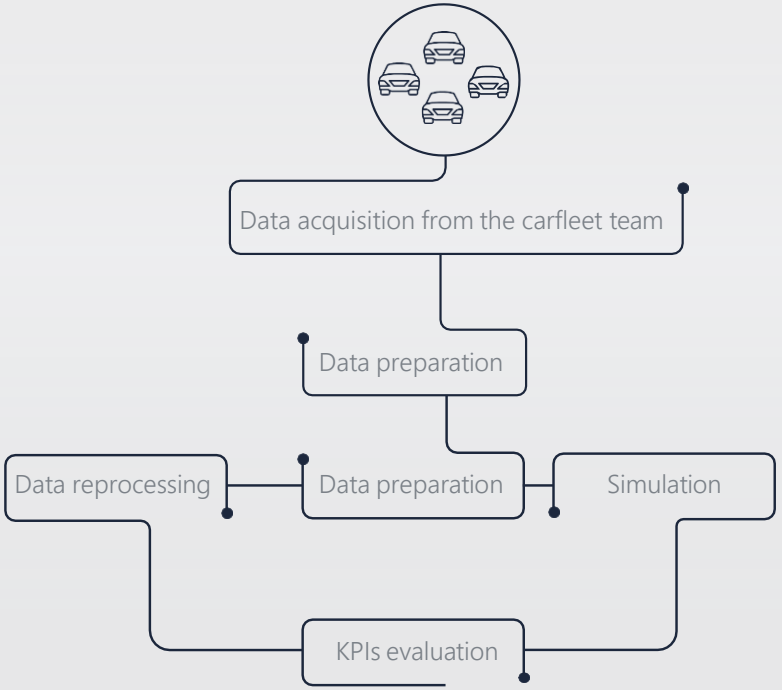
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ADAS ACTIVITIES EXAPLES

Data Management, Simulation, Sensor Reprocessing

- Development and integration of data management software for validation of SAE Level 3 automated driving feature and functional software.
- Development of application software to create and maintain a database for:
  - Real world data logged on car networks
  - Automated labelling of logged data
  - Simulation scenario extraction
  - Generation of ground truth information from logged data
  - Data quality Analysis
  - Infrastructure simulation for:
    - Simulation scenarios design for validation campaigns
    - Open loop simulation with data logged in real world experimental vehicles,
    - Closed loop simulation of a complete vehicle model driving through simulated scenarios



FuSa & Cybersecurity Overview & Compliance Framework

DC Offers Functional Safety (FuSa) and Cybersecurity solutions designed to address current and future challenges. Our deep expertise in Safety & Security is not limited to the automotive sector; we apply principles of pragmatic rigor and proven methodologies to ensure compliance in adjacent industries. We manage the entire test lifecycle, from requirements validation to component and vehicle-level Penetration Testing.

Key Compliance Standards:

FuSa:

IEC 61508

ISO 26262

ISO 25119

MIL-STD-882

Regulation 2023/1230/EU

Cyber:

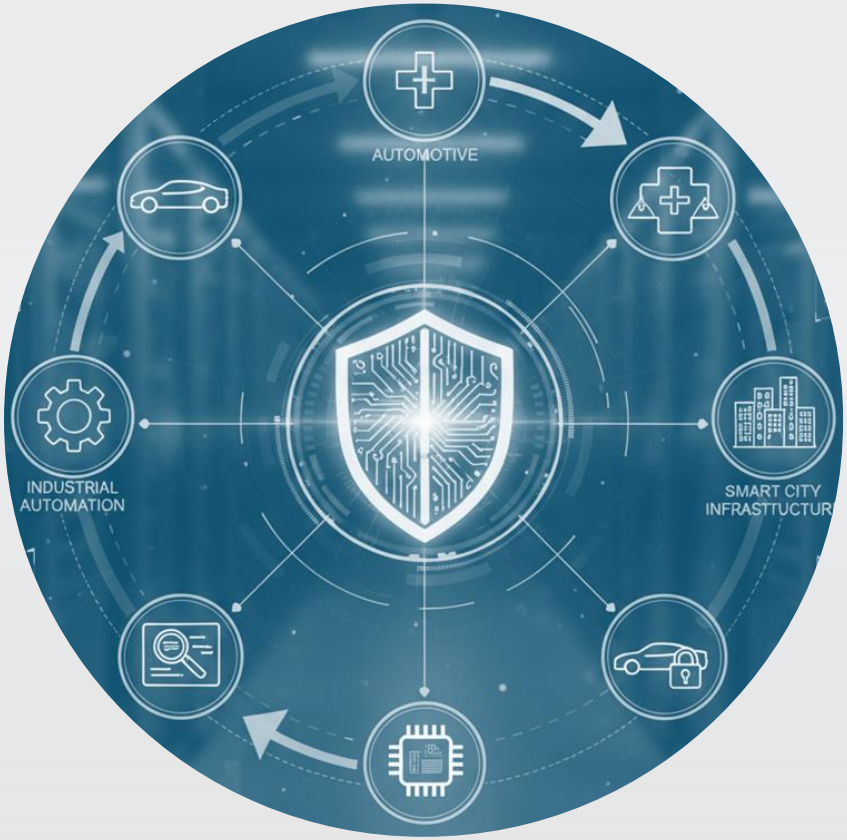
ISO 27001

ISO 21434 - UNECE R155

IEC 62443-4-2

ISO/DIS 24882

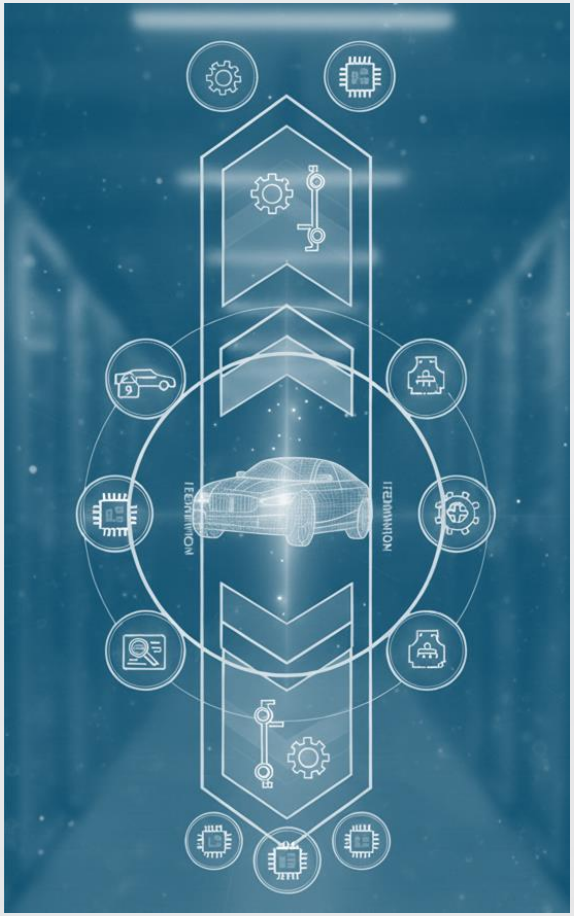
Cyber Resilience Act



Functional Safety – Full Vehicle Lifecycle

DC supports customers through the entire Full Vehicle Safety Lifecycle foundation, taking on technical and process work packages for the entire vehicle. We cover critical domains including Body, Vehicle Controls, Powertrain, Chassis, and EE. We provide functional safety process implementation, starting with a review of existing work products and the creation of necessary documentation to close any identified gaps.

- Expertise in delivering all required Work Products (WP) (ISO 26262 Parts 3, 4, 6, and 8) in accelerated timelines.
- Support spans from Item definition up to SW requirements development.
- Specialization in optimizing and accelerating end-to-end workflow (from Concept to Validation).
- We provide in-depth technical review to rigorously align safety artifacts (such as TSC and SWR) with SW implementation.



Cybersecurity Overiview

- DC's specialized focus in Cybersecurity is centered on the Embedded domain (Automotive, IoT, OT), providing solutions that guarantee compliance with vital standards like ISO 21434 and regulations such as UNECE R155. We are experts in the design and audit of Secure Architectures, defining systems that are inherently "secure & safe by design" in line with industry standards. We implement a risk-based approach for cybersecurity, and we support the entire Secure Software Development Life Cycle (SDLC), ensuring security is prioritized in every phase. Furthermore, we offer comprehensive Vulnerability Assessment & Penetration Testing (VA/PT) services.
- Security Domain by Activities :
- 1. Architecture & Design
- 2. Testing & Validation



Cybersecurity – Embedded Domain Focus

- Architecture & Design
- Expertise in secure architecture design and audit, defining systems as inherently "secure & safe by design".
- Implementation of a risk-based approach for cybersecurity.
- Definition of the security architecture, including Security Zoning, API-Endpoints, and Network Granularity.
- Active support for the Secure Software Development Life Cycle (SDLC), ensuring security is a priority from design to production.
- Testing & Validation
- Provision of comprehensive Vulnerability Assessment & Penetration Testing (VA/PT) services, managing the entire test lifecycle.
- Testing methodologies compliant with ISO 21434 (e.g., for Fuzzing test on vehicle and component-level interfaces).
- Specific validation areas include: Head Unit software testing, Connectivity Validation (mobile apps, Bluetooth, Wi-Fi, USB), and CAN/ETH Security Verification.



Capability under development: SYS, Controls & SW

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System Engineering

Gathering and analyzing stakeholder requirements
System requirements management and traceability
Functiona Safety
Cibersecurity
System architecture design
On-board FOTA management service

Controls Engineering

Physics & data driven modeling approach
Observer-based virtual sensors
Use caseson ICE (airpath, after treatment, etc) and EV (energy mngt, electricmachines, BMS)

Software Development

AUTOSAR integration
Full-stack components implementation
Flashing & Update Bootloader
Diagnostics (UDS, J1939)
Memory management
Cryptography
V2X (ISO-15118-20)

Domains

ICE, Transmissions | Electric Motor, BMS, On-Board Charger | Infotainment| KeyLesscontrol unit | Head unit | Telematics | vehicle integration, verification and validation

Programming languages and toolchains

C/C++ | Java | Python| React Native | Mathworks| Vector AUTOSAR | Vector CAN mgm| Atlassian | Polarion, Doors, JAMA, Confluence , Jira , Xray | Versioning tools | Jenkins | Da Vinci Classic I Altia



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Wiring Harness System



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GENERAL BACKGROUND - DEVELOPMENT ACTIVITIES FLOW-CHART

Pre-contract Phase → **Development Phase**

OEM REQUIREMENTS ANALYSIS

BENCHMARKING ANALYSIS

TARGET COSTING

Project Requirements Setting

CONTENTS AND FIRST DRAFT LAY-OUT

ARCHITECTURE STUDY

SYSTEM DEFINITION AND SPECIFICATION

Project Definition

Suppliers Management

ELECTRICAL SCHEMES

FORMBOARD

SET-UP LAY-OUT CABLES PACKAGE

CABLES INSTALLATION, LAY-OUT, ELECTRICAL LIBRARY

COMPONENTS INSTALLATION

CAN-LIN-NET TESTING

PART LIST

DMU LAY-OUT APPROVAL

Project Realisation

Suppliers Management

PROTOTYPES

SUPPLIER QUALIFICATION

PILOT PHASE PRE-SERIES

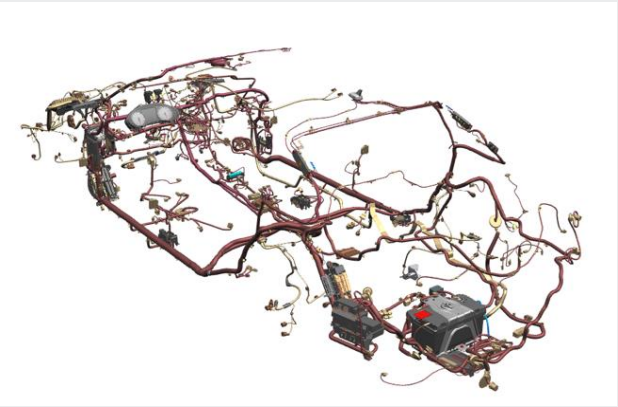
SOP

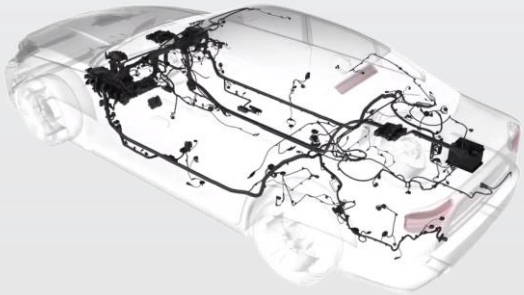
Project Validation

Wiring Harness System









Wiring Harness Team means :

- Project Chief
- DRE / HLI
- CAD Wiring
- CAD Components
- BoM - Quality

Consolidate Harness Engineering Role for OEMs and Codesign Partners

Expand presence at all R&D and manufacturing sites to support customers wherever they need it

Increasing the skills of the various local teams through the business support and international presence of our eventual industry partners managed by us.

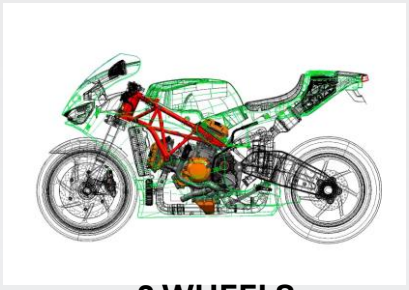
Develop a network of trusted skills through the mix of young engineers trained with senior experts (also from other locations).

Wiring Harness System

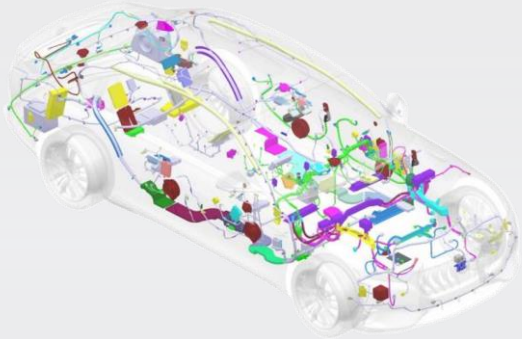


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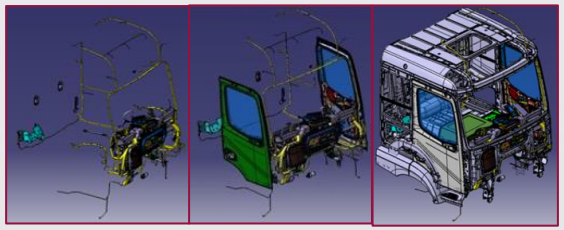
Low Voltage and High Voltage Components activities



2 WHEELS



4 WHEELS



6 WHEELS

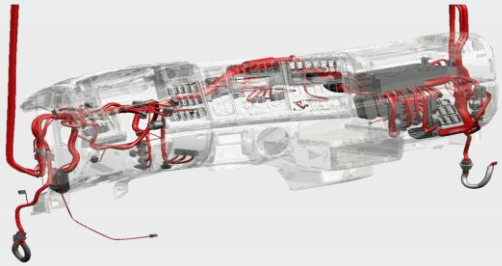
COMPONENTS AND W/H INSTALLATION

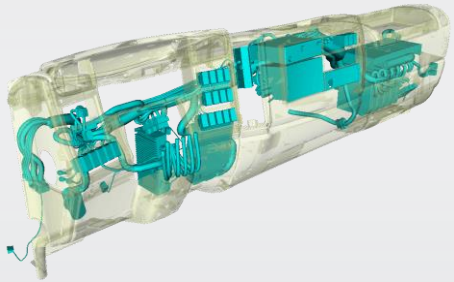
- Layout and installation study (3D) set-up plan according to the customer standard (2D)
- Updating of supplier product card-profile (functional specification and requirements)
- Service-ability analysis

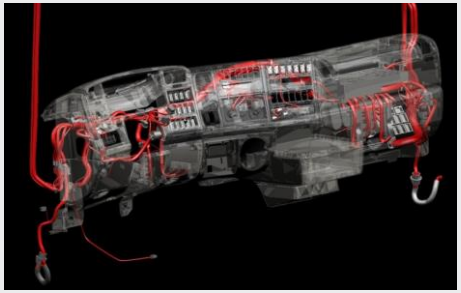
E/E & HV COMPONENTS DEVELOPMENT

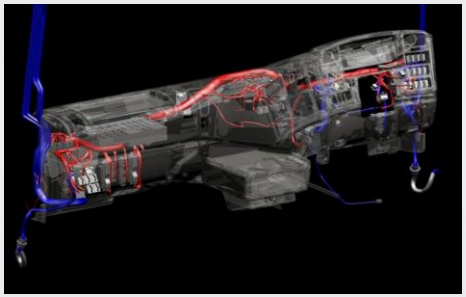
- Definition of supplier product card-profile (functional specifications and requirements)
- 3D-2D Drawings

Wiring Harness System

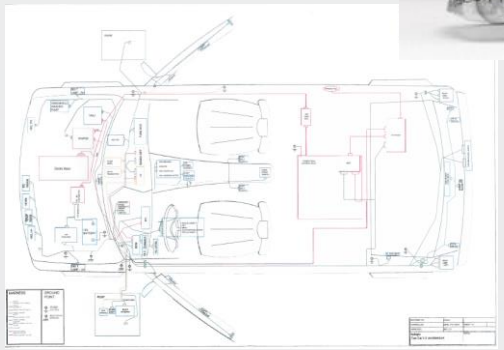


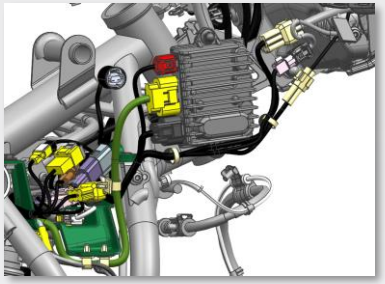


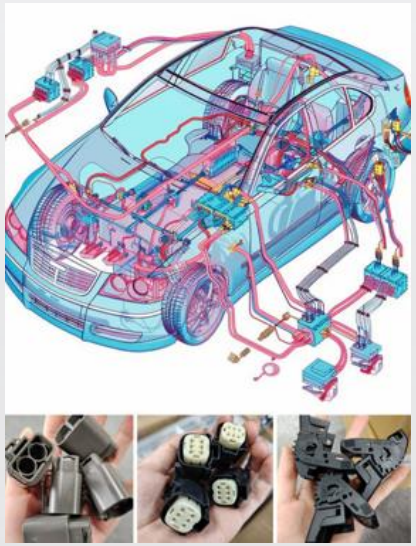


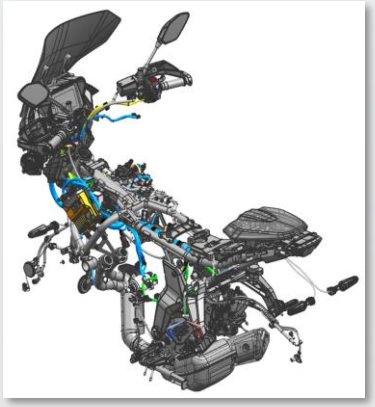












Analysis and lay out study with electrical wiring harness contents to improve the high number of codes and optimize the "modularity" to better manage the cutting and sectioning of cables; maximum integration with architecture team and electrical diagrams with choice of wiring accessory components

Wiring Harness System

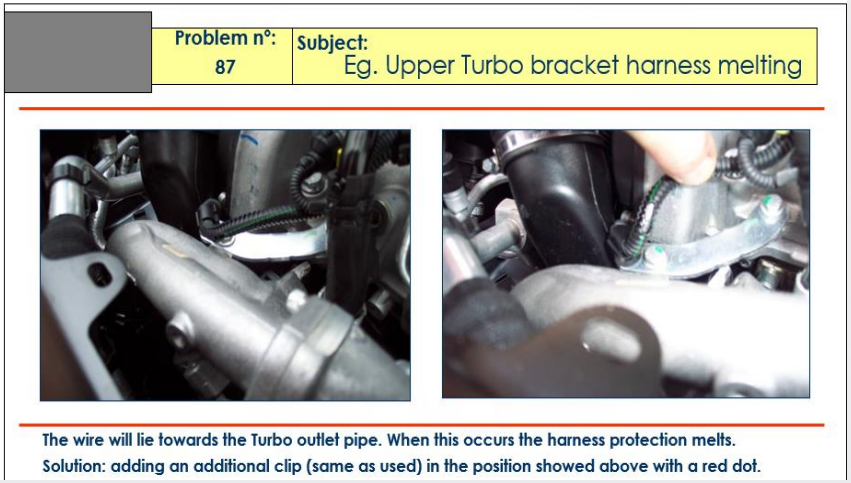


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DMU analysis and participation in PMU activity with direct support in plant in the various stages of vehicle preparation for electrical wiring harness assembly

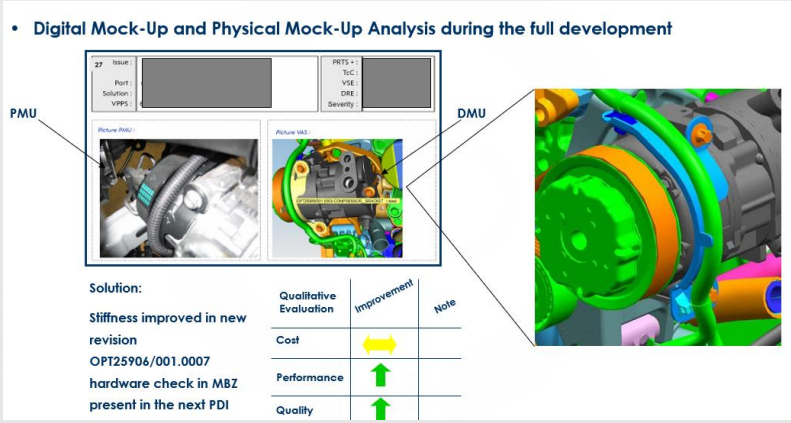
Quality improvement activities with the creation of construction drawings for wiring system accessories, up to the creation of prototype elements with 3D printers

- **Problem Solving and Quality Management**

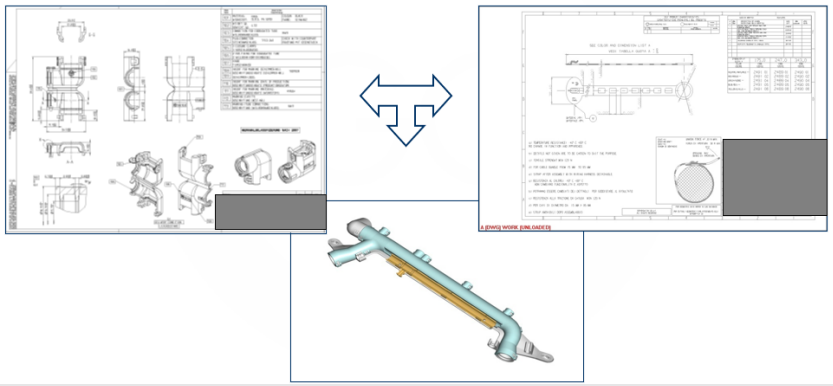




- **Digital Mock-Up and Physical Mock-Up Analysis during the full development**



- **Analysis, definition of solutions for prototype parts of fastening elements with production of components with 3D printers available (channels,brackets,cableguide…)**





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Wiring Harness System

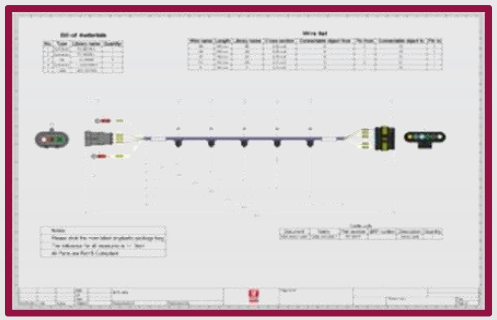


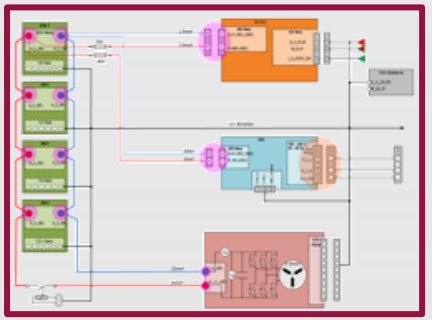
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System Architecture Design

- ELECTRICAL ARCHITECTURE
- FUSES STRATEGY
- SCHEMATIC TOOLS







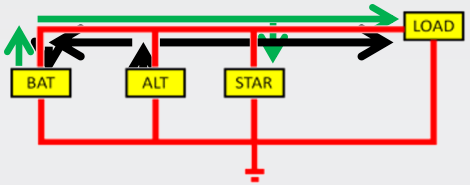
Wiring Harness System



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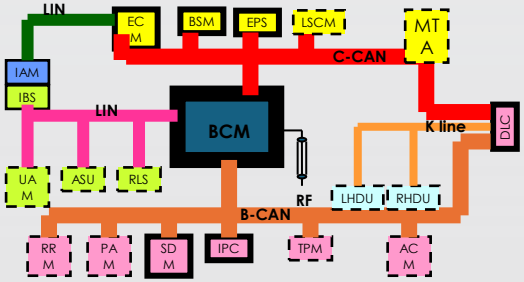
System Architecture Design

POWER DISTRIBUTION
Architecture



Power line
Current during engine ON phase
Cranking current

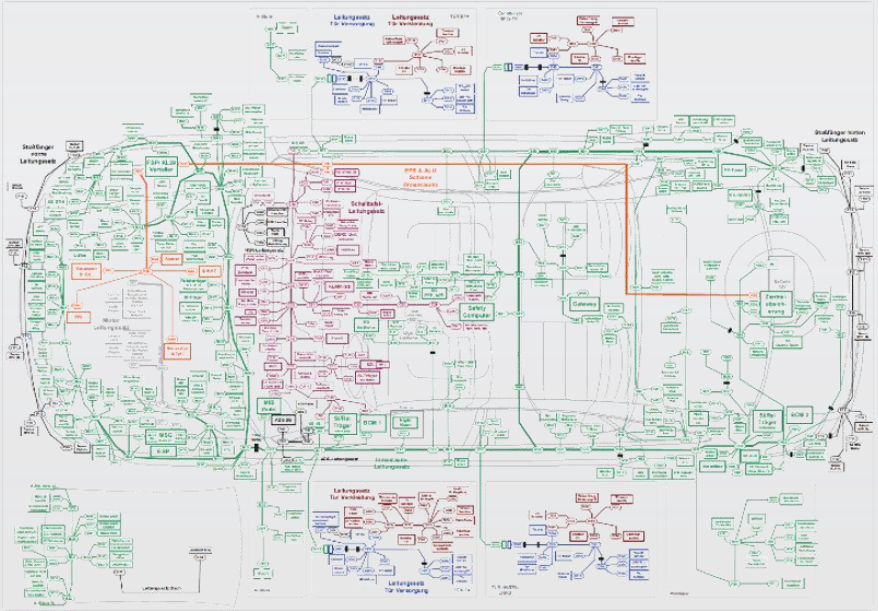
NETWORK Architecutre



12V Systems

48V Systems

High Voltage Systems



Wiring Harness System



dc group

Electrical mobility

Mild hybrid

Hybrid electric vehicle (HEV)

Plug-in Hybrid Electric Vehicle (PHEV)

Battery electric vehicle (BEV)

High Voltage

Diagnostic checks

- Components

❖ CAN –BMS test
➢ EV-Battery test bench.
➢ Insulation test
➢ Charging test (CCS1, CCS2, GB/T)

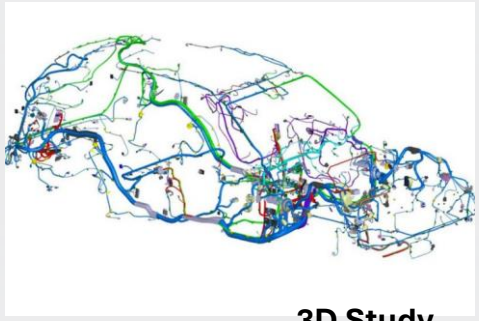
❖ Injector test bench
❖ Car alarm test bench

- Vehicles

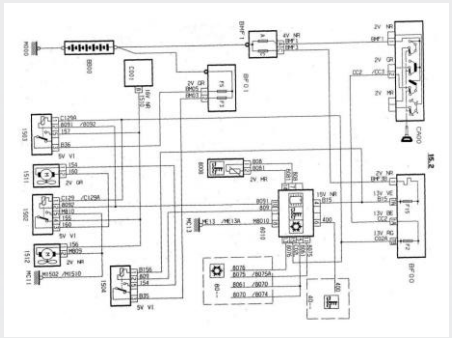
➢ Lab-Car CAN simulation
➢ Brakes EOL test bench
➢ Diagnostic check

See specific presentation “Test&Homologation"

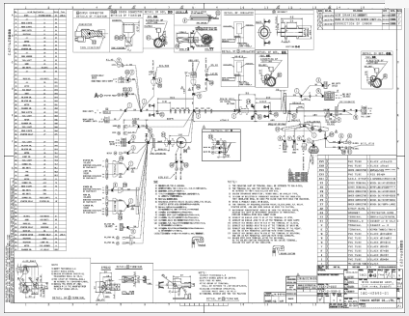
Wiring Harness System



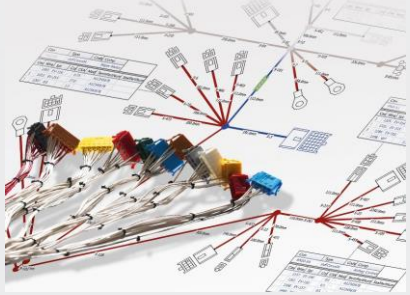
3D Study



Schematics and Wire List



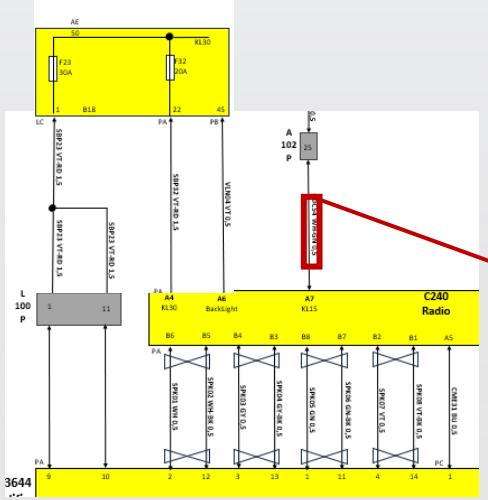




2D Drawing

Architectural Study

Manufacturing and assembly support





VLN04 VT 0,5

Caliber / Gauge

Color

Signal

Code	English	Spanish
VT	Violeta	Violeta
GN	green	Verde
BK	Black	Negro
BR	Brown	Marron
BU	Blue	Azul
GY	Grey	Gris
OG	Orange	Naranja
PK	Pink	Rosa
RD	Red	Rojo
WH	White	Blanco
YE	Yellow	Amarillo







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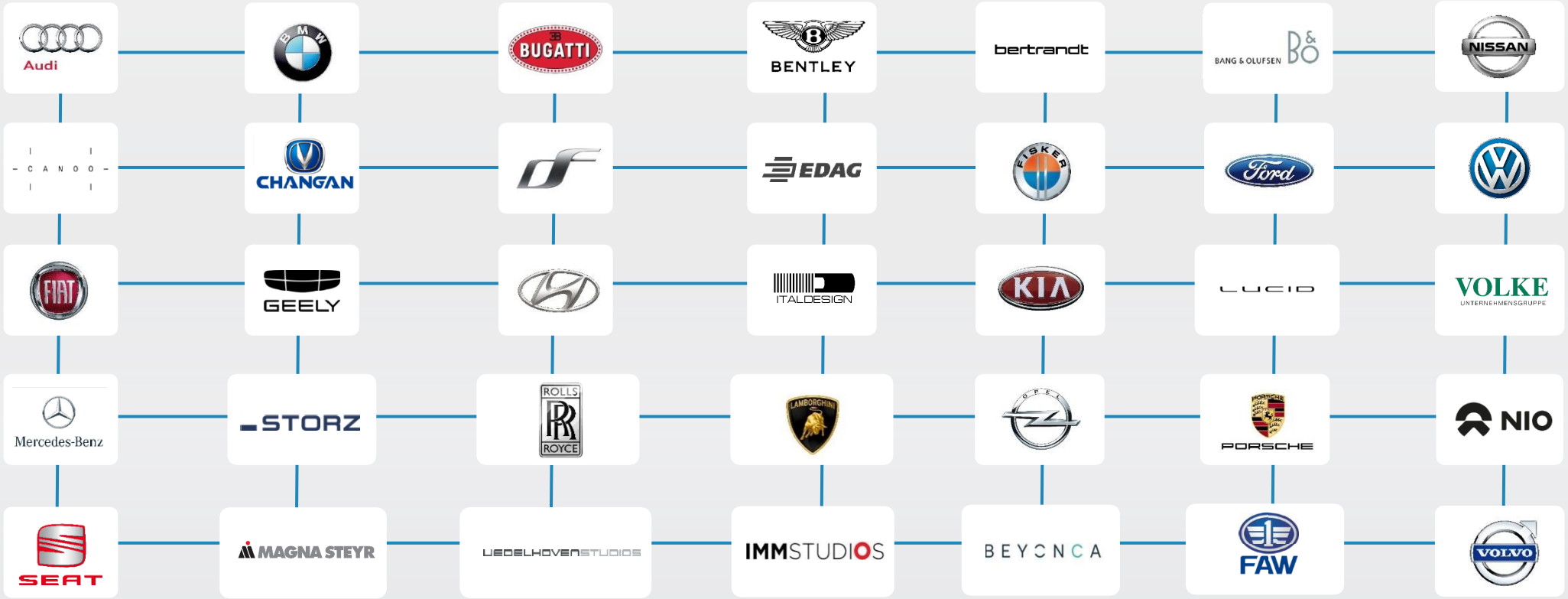
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Die verschiedenen Bereiche werden von unseren Geschäftsführern betreut. Um das beste Endergebnis zu erreichen, arbeiten wir stets eng miteinander zusammen.

Our directors are in charge of the different departments in our company and work closely together to achieve the best result.



CLIENTS

KUNDEN

Our clients are established companies from the automotive and product industries.

Renommierte Unternehmen aus der Automobil- und Produktindustrie zählen seit vielen Jahren zu unseren Kunden.

THANK YOU !

design consulting

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