

IAA Commercial Vehicle 2022

Eco Innovation

Environmental impact is redefining the values of our global society, our culture and our economy.
We're making sure exceptional driving experiences don't need to come at the expense of the planet.

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eDS – electric Drive System Mid+

This eDrive with next-gen technologies provides up to 180 kW for 30 seconds and up to 4,000 Nm at the wheels. It can be applied to both hybrid and battery electric vehicles as primary and secondary drive. Next-gen technology options in the e-motor, inverter, gearbox and intelligent software strategy contribute to best-in-class efficiency, drivability and safety. Up to -24% less weight, +7% more power and -22% less volume in packaging compared to other available products in the market.



Cleaner



Smarter



Electrification



Driving Dynamics

Competitive advantage/differentiators

- Optimized and scalable to best-in-class efficiency (aiming > 95% peak efficiency)
- Best-in-class drivability, performance, and safety with TV option
- Optimized and flexible package
- Affordable cost

Applications/benefits

- C, D, E Segment, LCV's – BEVs / PHEVs
- Advanced direct stator cooling concept enabling increased continuous power performance
- Safety integrity level ASiL "D"
- Optional park lock or disconnect, and small packaged twin-clutch torque vectoring

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

eBeam – Electric Axle Drive System

Heavy Duty electric drive for frame-based vehicle usage. Structure-oriented design to support high payload and towing capability with matching power for continuous duty usage, high peak torque and robustness.



Cleaner



Electrification



Autonomy



Driving Dynamics



Design



Co-Development
Opportunity

Competitive advantage/differentiators

- **Safety**
Robust design for safe towing and hauling
- **Dynamics**
Scalable power to 225 kW_{cont} / 300 kW_{peak} and 12,000 Nm peak axle torque
- **Vehicle Integration**
Adaptable to current suspension, achieves required clearances during full suspension movement

Applications

- Battery Electric Vehicle / FuelCell
- PUP / LCV
- Primary and complementary propulsion
- Coaxial e-motor for GAWR up to 3,250 kg and Offset e-motor w/banjo axle for GAWR up to 7,850 kg

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

eBeam – Electric Axle Drive System

Heavy Duty electric drive for frame-based vehicle usage. Structure-oriented design to support high payload and towing capability with matching power for continuous duty usage, high peak torque and robustness.



Cleaner



Electrification



Autonomy



Driving Dynamics



Design



Co-Development
Opportunity

Competitive advantage/differentiators

- **Safety**
Robust design for safe towing and hauling
- **Dynamics**
Scalable power to 150 kW_{cont} / 200 kW_{peak} and 7,000 Nm peak axle torque
- **Vehicle Integration**
Adaptable to current suspension, achieves required clearances during full suspension movement

Applications

- Battery Electric Vehicle / FuelCell
- PUP / SUV / LCV
- Primary and complementary propulsion
- Coaxial e-motor for GAWR up to 3,250 kg

SOP

Ideation

Discovery

Concept

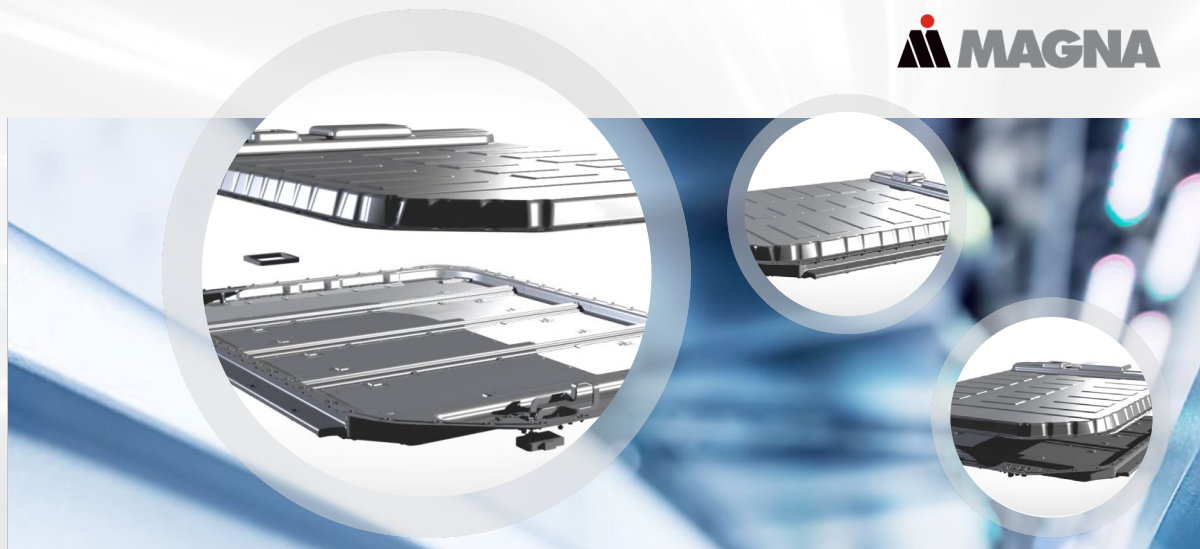
Development

Series Preparation

in Production

Battery Enclosure Overview

Magna offers the complete array of battery enclosure production and engineering solutions. The battery enclosure contributes to the structural and safety aspects of the body in white while protecting high-voltage batteries from damage and water. These complex assemblies are available in steel, aluminum, and multi-material configurations including lightweight composites.



Cleaner



Safer



Lighter



Co-Development
Opportunity



Design



Electrification

Competitive advantage/differentiators

- Two complete battery enclosure systems for fully-electric vehicles begin production in 2021, following our track record of supplying mid and full-hybrid battery enclosures.
- R&D, advanced engineering, and simulation expertise optimize design, and address technical challenges.
- Global engineering production footprint.

Applications

- ICE & EV platforms
- Complex and modular designs
- Multi-material requirements
- Scalable design to fit different vehicle segments or energy densities

SOP

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Serial Preparation

in Production

Steel Battery Enclosure

With Magna's broad expertise in engineering and various steel forming and joining capabilities, we offer the complete development and production of steel battery enclosure solutions. This includes all required safety and quality checks on a global scale.



Cleaner



Design



Electrification



Co-Development
Opportunity

Competitive advantage/differentiators

- Steel battery enclosures combine the structural advantage of higher-grade steel and the lower material cost compared to aluminum or fiber reinforced plastic.
- Large one-piece stampings offer improved leak tightness, are safety-critical, and reduce production costs.
- Due to the formability properties of steel and Magna's expertise, this can be achieved without significant reduction of battery space.

Applications

- Complex and modular designs
- Cost reduction initiatives
- ICE & EV platforms

SOP

Ideation

Discovery

Concept

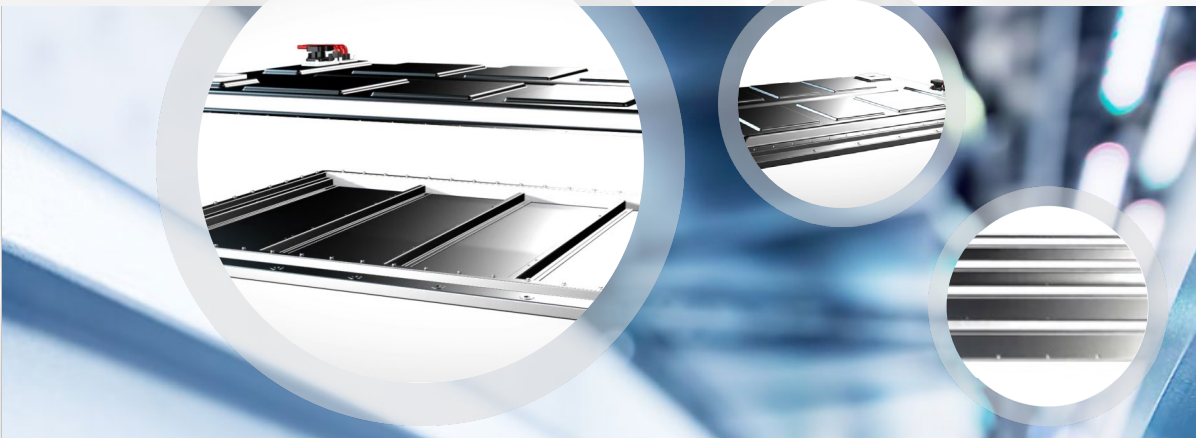
Development

Serial Preparation

In Production

Aluminum Battery Enclosure

With Magna's engineering and manufacturing capabilities for complex aluminum assemblies, we can support all customer needs regarding aluminum battery enclosures on a global scale. We offer solutions with the best possible quality from the first concept development to high volume mass production.



Cleaner



Design



Lighter



Co-Development
Opportunity



Electrification

Competitive advantage/differentiators

- Aluminum battery enclosures are mostly designed as an assembly of extrusions, castings and stampings.
- Aluminum designs offer light weighting and high-scalability to produce different enclosure sizes for different vehicles on one production line.

Applications

- Lightweight designs
- Complex and modular designs
- Large stampings
- ICE & EV platforms

SOP

Ideation

Discovery

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Development

Serial Preparation

in Production

Compressed Hydrogen Storage System

Type IV Compressed Hydrogen Storage System including valves, frames and integration components.



Competitive advantage/differentiators

- Full system supplier including vessels, valves, frames, piping, wiring harness
- Vehicle integration according to ECR95

Applications

- Working pressure: 700 bar
- Applicable for medium and heavy-duty vehicles and buses
- System suitable for use in hydrogen vehicles with fuel cell or internal combustion engine

SOP

Ideation

Discovery

Concept

Development

Series Preparation

in Production

Liquid Hydrogen Storage System

Storage system for cryogenic liquid hydrogen with a tank-in-tank technology including frames and integration components.



Cleaner



Lighter



Co-Development
Opportunity

Competitive advantage/differentiators

- Full system supplier including vessels, frames, piping, wiring harness
- Vehicle integration according to ECR95
- Maximized storage capacity

Applications

- Applicable for heavy-duty vehicles
- System suitable for use in hydrogen vehicles with fuel cell

SOP

Ideation

Discovery

Concept

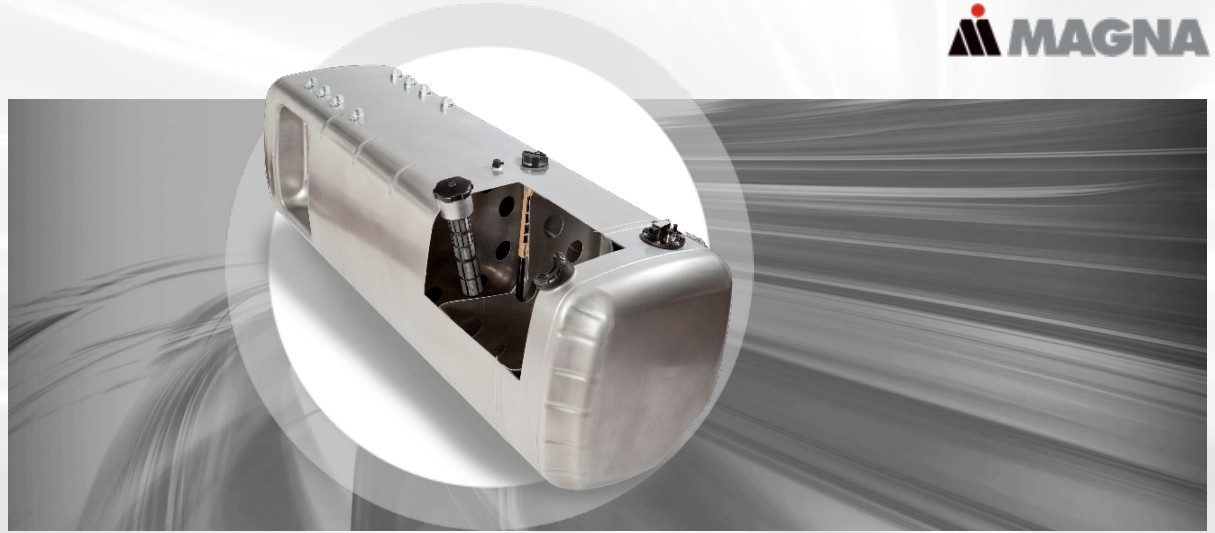
Development

Series Preparation

in Production

Combi Tank

Combination of diesel and urea tank to maximize the filling volume in the existing package.



Cleaner



Lighter



Exclusive@Magna

Competitive advantage/differentiators

- Reduction of assembled parts and assembly time
- Reduction of weight
- Maximum usage of space to increase volume

Applications

- Commercial Vehicles

SOP

Ideation

Discovery

Concept

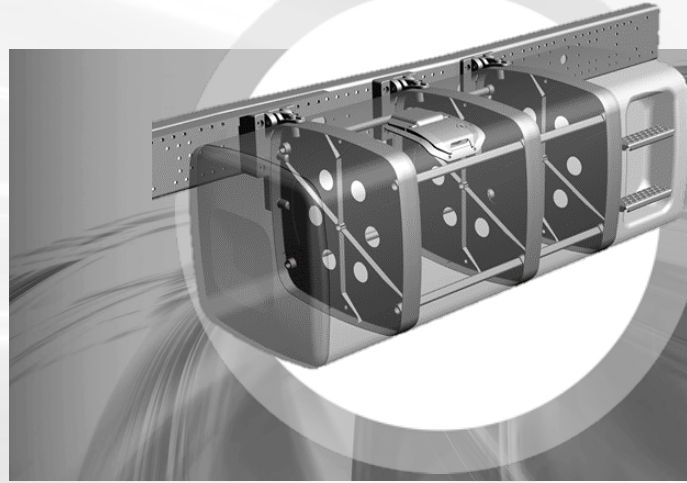
Development

Series Preparation

in Production

Integrated Tank Carrier

Direct assembly of tank to frame to maximize the volume of diesel and urea.



First to Market



Exclusive@Magna



Lighter

Competitive advantage/differentiators

- Tank is fastened directly to the truck frame
- Elimination of brackets & straps
- Better usage of installation space
- Increase of filling volume by up to 15 %

Applications

- Commercial Vehicles

SOP

Ideation

Discovery

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Development

Series Preparation

in Production

Fuel & Fuelling Supply System

Tank-in-a-tank system leads to cost savings for OEMs and a more efficient fuel supply for the truck driver.



First to Market



Exclusive@Magna



Safer

Competitive advantage/differentiators

- OEM: Cost savings by reducing the initial fueling amount at end of production line (reduction up to 65 liters)
- Truck driver: Extended range up to +200 kilometers by secured residual fuel supply in uphill and downhill driving situations

Applications

- Commercial Vehicles

SOP

Ideation

Discovery

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Development

Series Preparation

in Production

Truck Tank Components

Innovative fuel cap and filler neck designs based on customer requirements.



Cleaner



Patented



Safer



Exclusive@Magna

Competitive advantage/differentiators

- Lockable bayonet caps
- Integrated radial seals on the filler-cap/-head to ensure long-term sealing against environmental impacts, such as dirt, dust and moisture
- Truck fuel caps with unique designs

Applications

- Commercial Vehicles

SOP

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Distinction & Experience

In today's ever-changing society, the need for individualization drives automakers to higher levels of customization. Our products redefine the very concept of design and end consumer experience.

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Innovation

Magna Mezzo™ Panel

First-to-market, large-format decorated front panel using in-mold film. Integrating state-of-the-art sensors, cameras and light technologies to enable unique OEM brand distinction. Combining innovative materials and process technologies to achieve a high-quality lit surface and seamlessly integrate radar.



Magna Exclusive Patent Pending

Competitive advantage/differentiators

- Lit surface decoration possibilities including: Chrome, Paint and Film effects
- Thin molded panel with large-format in-mold film technology
- Hidden-until-lit lighting features
- Animated lighting capability
- State-of-art radar sensor functional integration
- Materials and process development supported by Covestro

Applications

- Electric vehicles
- Internal combustion vehicles
- ADAS integrated panel modules

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

Thermoplastic Swing Doors

Lightweight, integrated exterior closure system that replaces multiple steel and assembled components.



Competitive Advantage/Differentiators

- 15-25% weight savings over steel
- Improved perceived quality with painted outer panel return flanges
- Improved perceived exterior painted surface with less visible joints
- Improved perceived quality in buzz, squeak and rattle due to reduced part count
- Component integration reduces part complexity
- Reduced OEM line space through body, paint and assembly (estimated 8 station saved)
- Delivered as a fully assembled module for just-in-time sequencing
- Greater styling design flexibility
- Reduced tooling investment compared to aluminum tailgate



Smarter



Cleaner



Lighter



Design



Co-Development
Opportunity



Patented

SOP

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

ClearView™

ClearView™ is an advanced camera monitoring system that enhances driver experiences. Highlighted by safety features including a larger field of view, intuitive dynamic overlays, and improved visibility.



Smarter



Safer



Cleaner



Electrification



New Mobility



Patented



Design

Co-Development
Opportunity

Driving Dynamics

Competitive advantage/differentiators

- Complete intelligent vision system; mirrors, cameras, electronics and software
- Larger field of view that is customizable to user preference
- Dynamic overlays provide intuitive depth perception for blindzone detection - customizable to user preference
- Camera allows for digital aiming during vehicle reversing
- Ability to show multiple camera views on inside mirror display including trailer view
- Improved rear vision during low light conditions
- Multiple exterior embodiments available including camera wing only or a regulatory compliant hybrid mirror with reflective glass

SOP

Ideation

Discovery

Concept

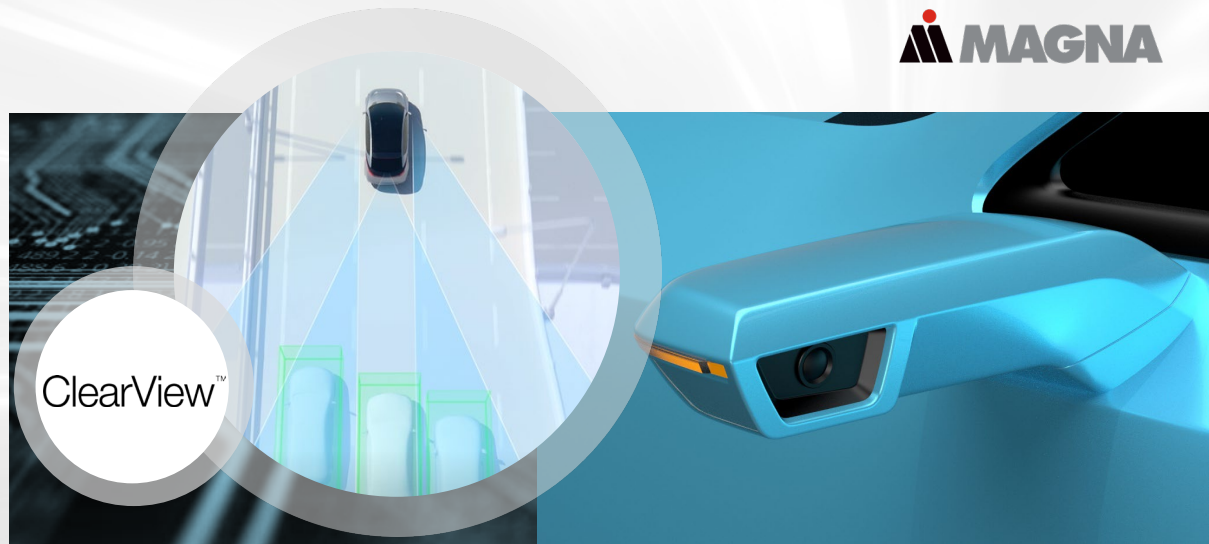
Development

Serial Preparation

in Production

ClearView™ Camera Wing

The ClearView™ camera wing integrates a camera into lightweight, aerodynamic housing. Features include a larger field of view, intuitive dynamic overlays and reduced drag.



Smarter



Safer



Cleaner



Electrification



New Mobility



Patented



Design



Co-Development
Opportunity

Competitive advantage/differentiators

- Video display is located inside the vehicle in close proximity to the A-pillar reducing driver distraction
- Camera is mounted beyond widest point of the vehicle to achieve necessary field of view
- Traditional outside mirror features remain:
 - Turn signals, powerfold, projection logo and ground illumination, surround view cameras
- Dynamic overlays provide intuitive depth perception for blindzone detection - customizable to user preference
- Camera allows for digital aiming during vehicle reversing and turning
- Improved rear vision during low light conditions

SOP

Ideation

Discovery

Concept

Development

Series Production

in Production

ClearView™ Outside Mirror

The ClearView™ outside mirror integrates a camera into a traditional mirror which is regulatory compliant. Features include a larger field of view, intuitive dynamic overlays and reduced drag.



Smarter



Safer



Cleaner



Electrification



New Mobility



Patented



Design



Co-Development
Opportunity

Competitive advantage/differentiators

- Video display is located inside the vehicle in close proximity to the exterior mirror reducing driver distraction
- Camera is mounted beyond widest point of the vehicle to achieve necessary field of view
- Traditional outside mirror features remain:
 - Turn signals, powerfold, projection logo and ground illumination, surround view cameras
- Compliant with FMVSS111 and ISO16505
- Dynamic overlays provide intuitive depth perception for blindzone detection - customizable to user preference
- Camera allows for digital aiming during vehicle reversing
- Improved rear vision during low light conditions

SOP

Ideation

Discovery

Concept

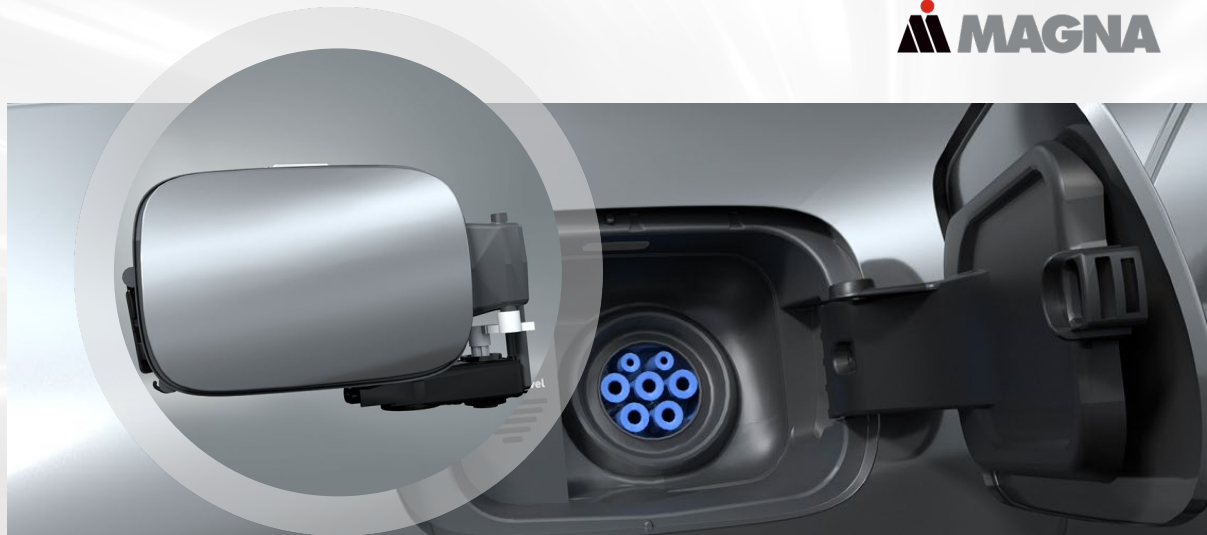
Development

Series Production

in Production

SmartAccess Power Charge Flap

Automated charging flap that allows for easy access to the vehicles charging socket improving the customers experience.



Smarter



Safer



Electrification



New Mobility



Design

Competitive advantage/differentiators

- Increased comfort and convenience for consumers of electric vehicles
- Intelligent capacitive entry solution available with false trigger protection
- Actuator & gesture opening projects in pre-development
- Available in multiple opening movements
- Available lighting, locking and HMI opening features
- New Magna's plug in system design that increases the protection and robustness of the Powered Charging System

SOP

Ideation

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Development

Series Preparation

in Production

PureSight™

Projector Portfolio

PureSight BiLED projector headlamp allows for direct fit replacement for halogen bi-function projectors enabling increased performance and cost reduced cost compared to HID projectors.



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Cleaner



Electrification



Patented



Design

Competitive advantage/differentiators

- Next Gen Bi-LED projector with HID light output level
- High lumen output achieving Good (Best) IIHS Rating
- Optical design allows for uniform transition between LB and HB

Applications

- Bi-LED module
- Low Beam module
- High Beam module

SOP

Ideation

Discovery

Concept

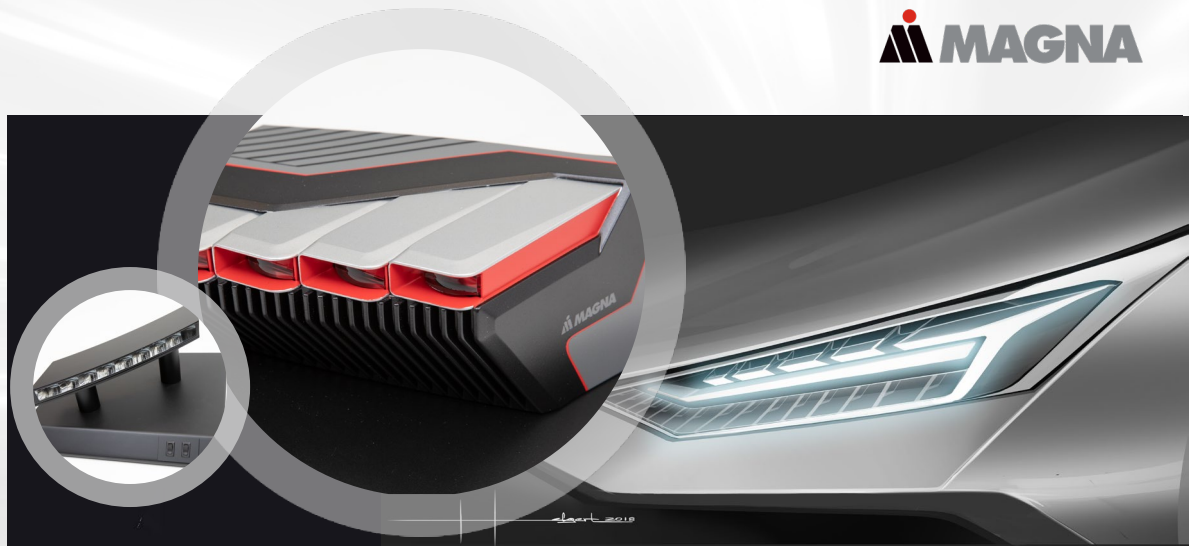
Development

Serial Preparation

Production

Ultra Slim Headlamps

Low profile reflector and projector headlamps providing high intensity and future styling aspirations.



Smarter



Safer



Design



Co-Development
Opportunity

Competitive advantage/differentiators

- Reflector below 25mm height
 - 1000 lm LB / 1500 lm HB (6LB+3HB)
- Projectors 10-15mm height
 - 800 lm LB / 1600 lm HB
- Lighting Output is scalable
- SAE and ECE designs available
- Good IIHS performance rating

Applications

- Headlamps
- Daytime Running Lamps
- Styling creativity
- Non-traditional packaging locations
- Body Lighting
- RFQ Ready

SOP

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

FlecsForm™

Advanced lighting technology that utilizes high speed direct transfer technology of mini LEDs onto flexible circuits to enable thinner, more efficient lighting solutions that enhance styling.



Smarter



Safer



Electrification



First to Market



Patented



Design

Co-Development
Opportunity

Exclusive@Magna

Competitive advantage/differentiators

- Uniform lighting in an extremely thin and flexible package
- Enables complex shapes and endless design possibilities
- Provides styling freedom for brand/series signature lighting
- Robust and cost-efficient OLED alternative light source
- Thermally efficient, low power consumption and lightweight
- Communication display capabilities
- Supports intricate animation function
- Functions – Tail, Stop, Turn, Backup
- White LED development for high lumen output (fog, DRL, low beam)
- RGB color in development
- RFQ Ready

SOP

Ideation

Discovery

Concept

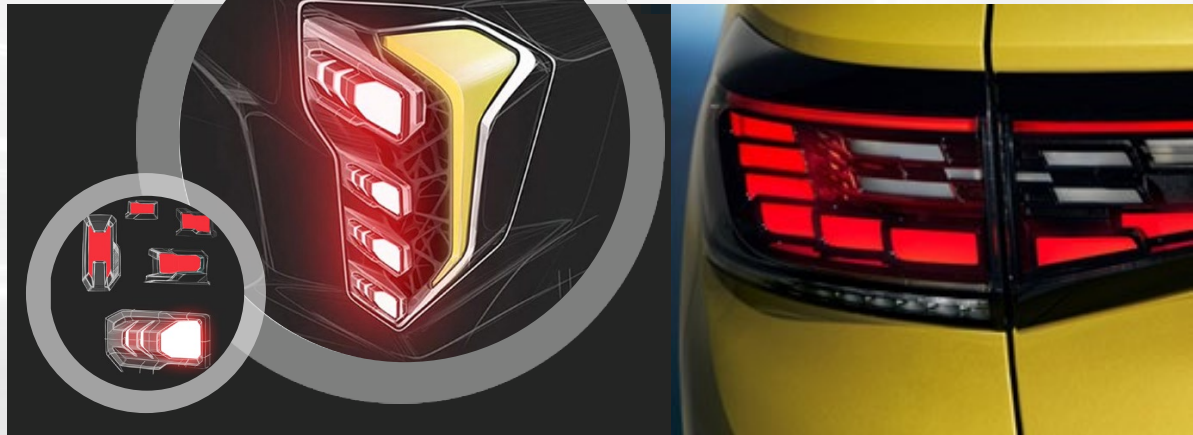
Development

Series Preparation

in Production

Surface Element Lighting

Thin homogeneous and vivid LED panels offering unique 3D styling opportunities and customizable animations.



Competitive advantage/differentiators

- Thin 3D embodiment (minimum thickness 4mm)
- High luminous intensity
- Curved surface designs are possible
- Brand differentiation with animations
- High reliability
- OLED style design language at lower cost

Applications

- Taillight
- Individual element animation
- Rear stop light (under development)
- Rear turn indicator (under development)

SOP

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New Mobility

The world is in constant flux. Mobility is changing.
With our complete vehicle competence, we quickly turn automotive concepts into reality.

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Engineering Services
Truck Design

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Engineering Services

We develop innovative solutions based on our wide range of powertrain, systems and full vehicle know-how with state-of-the-art testing facilities and highest competency.



Electrification



Autonomy



Design



Driving Dynamics

Competitive Advantage/Differentiators

- Focus on engine, hybrid and electrification
- Driving innovations (fuel cell technology,...)
- Full range of testing services:
 - Fatigue testing services
 - Multiple engine test benches including high altitude, climate test and NVH test bench
 - Multifunctional 4WD chassis dynamometer
 - On-site proving ground for functional & endurance testing

Applications

- Complete vehicle engineering from concept to SOP (commercial vehicle, LCV, special vehicle,...)
- Engine & hybrid system calibration, RDE measurements
- Strength & fatigue analysis / dynamic & acoustic simulation
- Vehicle thermal management
- Mule, prototype and demonstrator vehicle build-up
- Component & vehicle testing services

SOP

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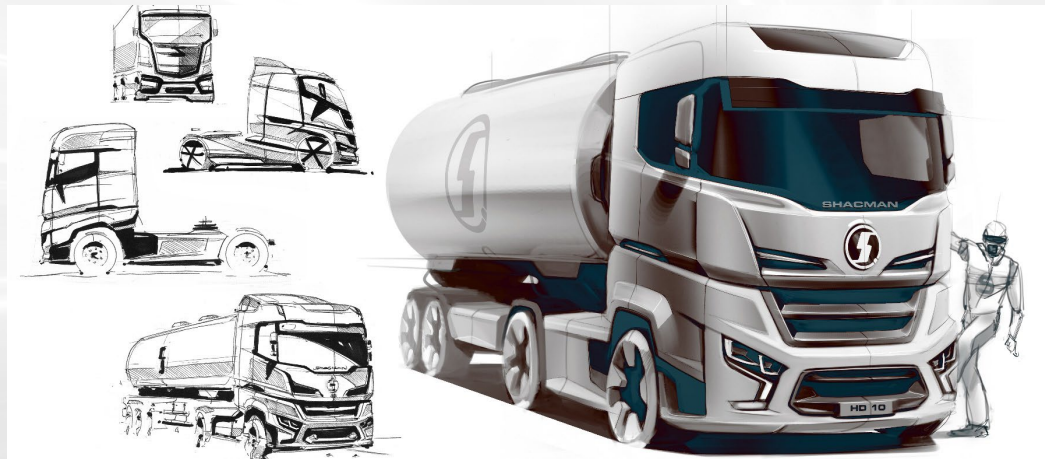
Truck Design

Years of cooperation with global truck OEM's qualifies Magna Design as a premium design supplier.

Our experienced team offers customized design packages or One-Stop-Shop solutions with a seamless range of design services.



Design



Competitive advantage/differentiators

- Global experience in design programs
- The design department is embedded in the engineering and perfectly combines high creativity and technical feasibility.
- Accuracy of style due to high diversified portfolio
- Expert knowledge in DNA Development

Applications

- Truck Design & modules Exterior / Interior
- Complete cabin line-up
- Light Commercial Vehicle Design/Styling
- Special solutions (dumper trucks, autonomous vehicles, ...)

SOP

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Series Preparation

in Production



Forward. For all.