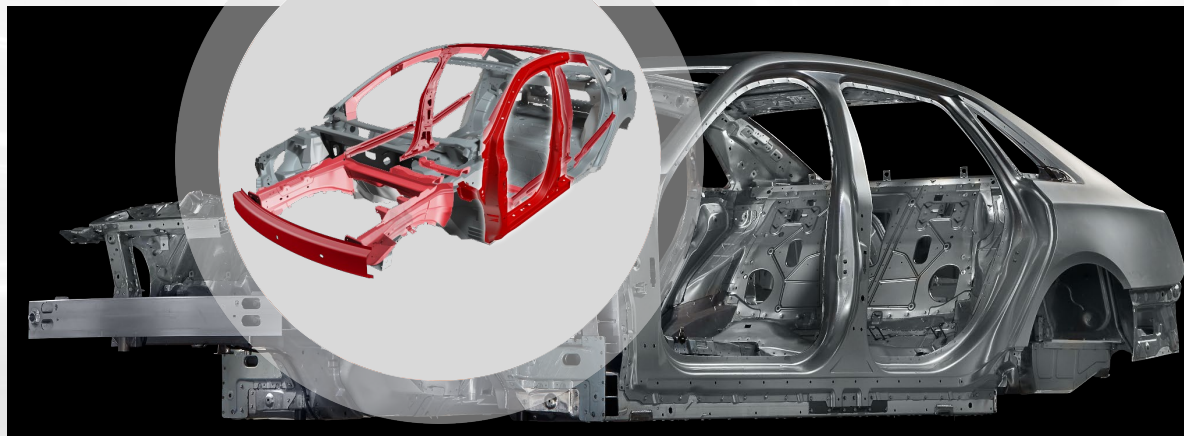


Magna @ Renault 2023

Body & Chassis

Body Structure Innovation

Cosma manufactures multiple variations of material and process solutions for safety intensive body structure components.



Safer



Lighter

Competitive advantage/differentiators

- Multiple solutions offered including tailor tempered, cold stamped TRIP 1200/500, patch welded, tailor rolled, and multi gage
- Improved crash performance with minimum intrusion
- Reduced mass and spring back
- The B-Pillar shown is a hot stamped tailored tempered & tailored rolled part produced in Clinton, TN

Applications

- B-Pillars
- Door Rings
- Rails
- Bumpers
- A / B Pillars

Ideation

Discovery

Concept

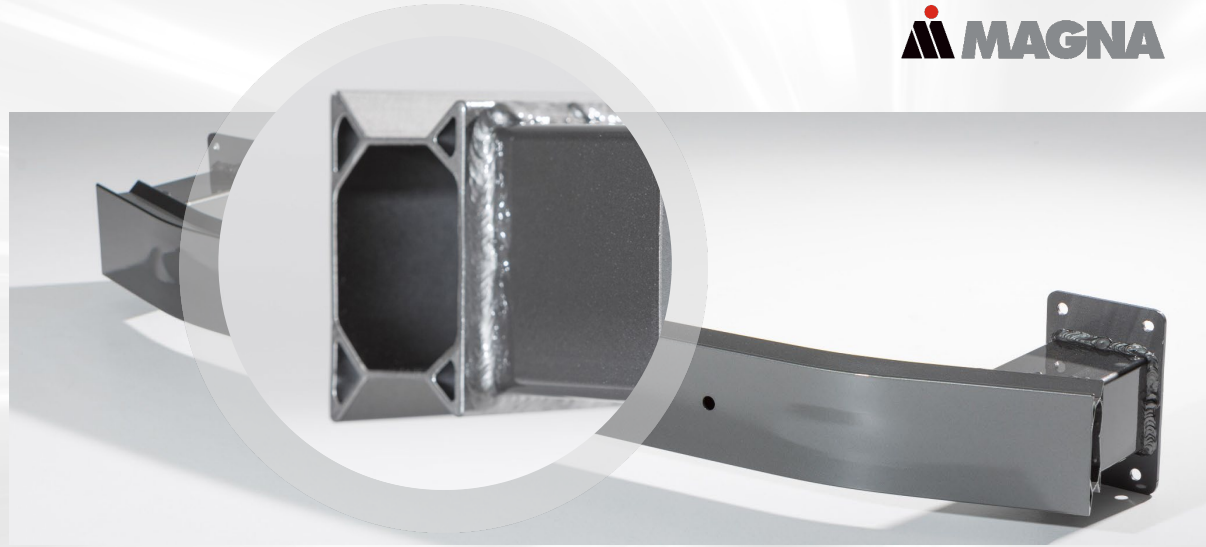
Development

Series Preparation

in Production

5-Cell Bumper

Magna offers bumper beam design solutions and multi-technology manufacturing processes that include stamping, roll forming, hydroforming, hot stamping and extruding. The 5-Cell bumper showcases a patent pending five cell innovation design that allows for improved crash performance & reduced packing environment.



Safer



Lighter



Patented

Competitive advantage/differentiators

- The multi-void cross section has better stability and performance than other traditional aluminum sections
- 15% lighter than traditional aluminum sections
- Efficient cross section meets performance criteria even when designed in tight packaging environment

Applications

- Tight packing environments
- Lightweight applications

Ideation

Discovery

Concept

Development

Serial Preparation

in Production

Chassis Structures

Magna develops and produces both steel & aluminum chassis structure systems using advanced materials and processes. Global market leader for Cradles & Subframes with more than 110 nameplates of 12 OEM customers.



Safer



Lighter



Driving Dynamics

Competitive advantage/differentiators

- Lightweight designs utilizing aluminum castings, aluminum extrusions and advanced welding technologies
- One-piece aluminum cast cradles
- In-house use of hydroforming, aluminum extrusions, and 6XXX aluminum cross members
- Modular design approach to accommodate regional requirements (e.g., crash, insurance)

Applications

- Front cradles / subframes
- Rear cradles / subframes
- Ladder frames
- Steel, aluminum & multi-material cradles

Ideation

Discovery

Concept

Development

Series Preparation

in Production

BEV Specific Cradle – Front and Rear

As a pioneering force in the realm of cradle manufacturing, Magna stands at the forefront of cradles tailored for Battery Electric Vehicles (BEVs). Our solutions seek to provide lightweight and cost-effective answers, boasting extensive integration of functions. Furthermore, our designs aim to enhance the overall vehicle's safety and performance, meeting or exceeding stringent crash and vehicle dynamics requirements.



Safer



Smarter



Lighter



Affordable

Competitive advantage/differentiators

- Reduce number of single parts and welding
- Improve crash behavior of cradle
- Evaluate different materials (AHSS, aluminum, hybrid) and processes (HPDC, extrusions, LWB,...) to find the best cost to weight ratio

Applications

- Cradles with BEV specific requirements

Ideation

Discovery

Concept

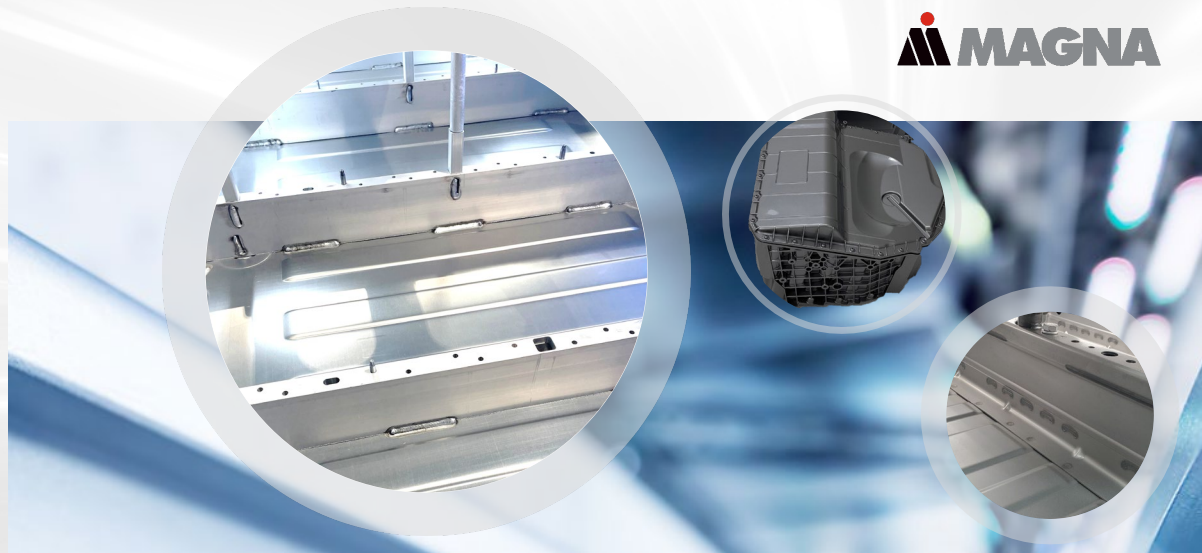
Development

Serial Preparation

in Production

Battery Enclosure Efficiencies

Magna offers the complete array of battery enclosure production and engineering solutions. Advanced forming and integration projects are underway within Magna, focusing on steep walls and tight corners as well as functional integrations of the complete battery system, eliminating redundancies to allow for greater space optimization.



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

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

Ideation

Discovery

Concept

Development

Series 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
- Optimized battery space utilization due to formability properties of steel

Applications

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

Ideation

Discovery

Concept

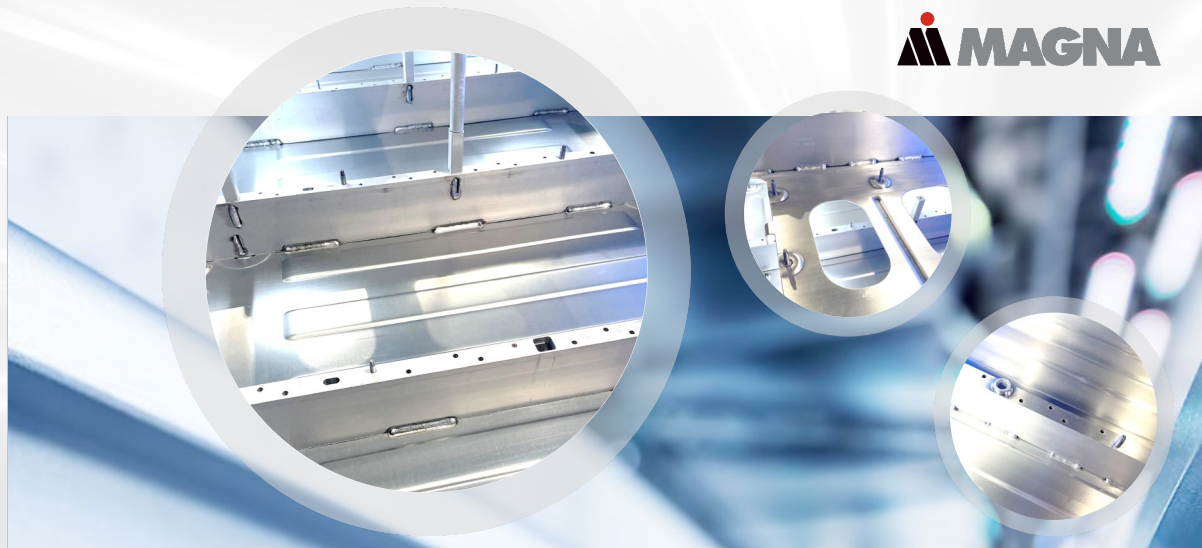
Development

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



Electrification



Co-Development
Opportunity

Competitive advantage/differentiators

- 20% lighter than comparable steel designs
- Aluminum designs offer light weighting and high-scalability to produce different enclosure sizes for different vehicles on one production line
- Designed as an assembly of extrusions, castings, and stampings

Applications

- Lightweight designs
- Complex and modular designs
- Hybrid & EV platforms

Ideation

Discovery

Concept

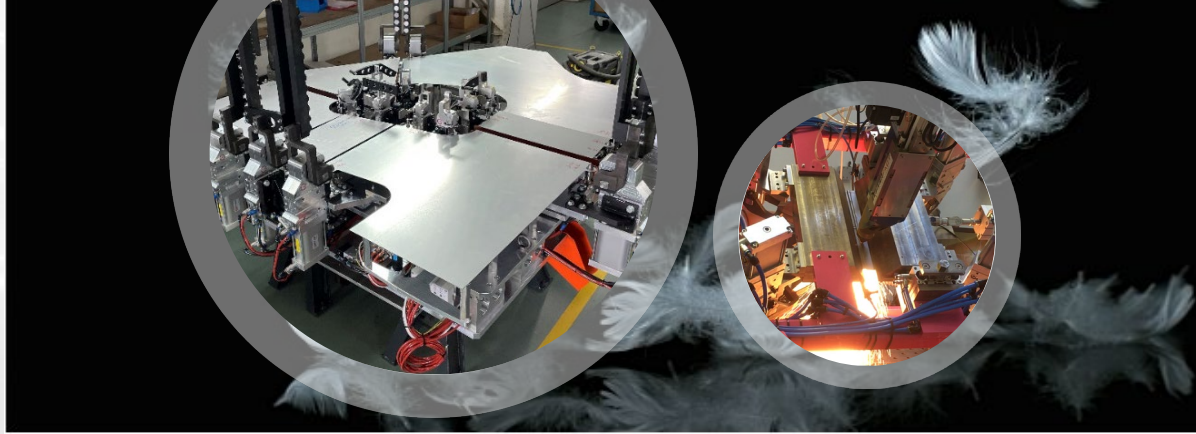
Development

Serial Preparation

In Production

Door Ring Laser Welded Blanks

Magna's laser welded blanks for door rings combines state of the art forming, cutting, and welding technologies to offer lightweight, complex solutions. Utilizing laser cutting and welding in one fixture, Magna is elevating the industry standard process by reducing manufacturing costs while offering tighter tolerances.



Lighter



Patent Pending



Co-Development
Opportunity

Competitive advantage/differentiators

- Increased performance and weight saving
- Reduce manufacturing cost
- All processes in one set up to eliminate part tolerances
- No fine blanking required
- Designed with different material types and gauges

Applications

- Multi-gauge components & multi-material components
- Hot stamped components with Magna developed LWB technology
- Cold stamped components

Ideation

Discovery

Concept

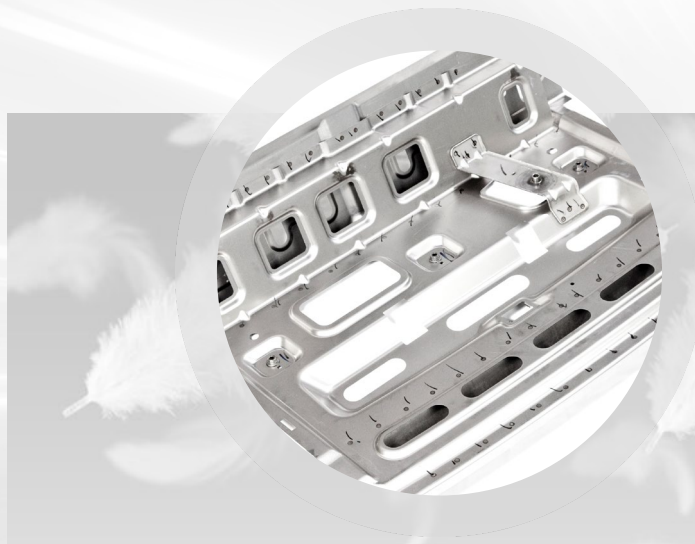
Development

Serial Preparation

in Production

Ultra High Strength Steels

Ultra-high strength steels (UHSS) are advanced high-strength steels (AHSS) offering significantly higher minimum tensile strengths without compromising elongation and ductility. Magna's team of engineers has established an evaluation process to understand performance and improve manufacturability.



Cleaner



Lighter



Design



Safer

Competitive advantage/differentiators

- Increased strength compared to conventional steels
- Weight reduction by 35-40% compared to conventional steels
- CO2 emissions (life cycle) reduction up to 15% compared to conventional steels
- Recyclable
- Easy and affordable to repair
- Global material evaluation, documentation & approval process
- Material knowledge from coupon level to component level

Applications

- Underbody assemblies
- Bumpers
- A-pillars
- B-pillars
- Side-impact beams
- Reinforcements

Ideation

Discovery

Concept

Development

Serial Preparation

in Production



Forward. For all.