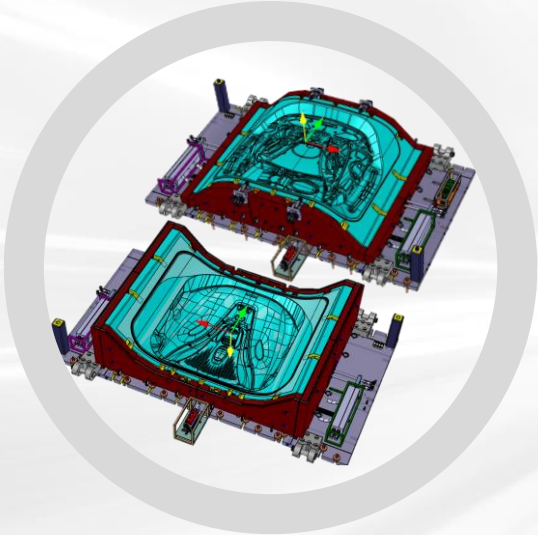
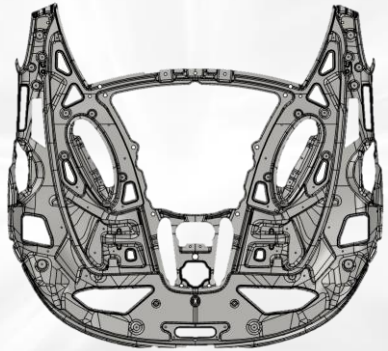
Body in white

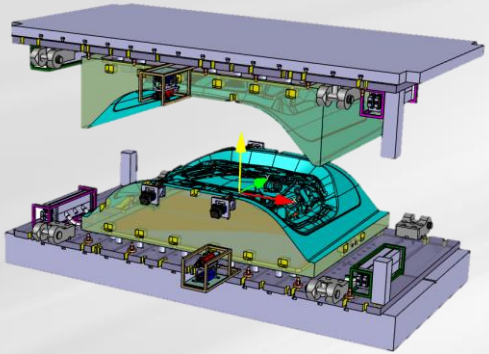
SPF

Super Plastic Forming

Super Plastic Forming is an industrial forming process promoting super plasticity to create precise and complex components.
Our production process involves stretching the aluminum alloy material at least 200% in elongation, although the deformation can exceed 1000% with some alloys.







Competitive advantage / differentiators

- Class A surface capability
- Excellent detail and a fine surface finish
- Allows for deep draw in formed components
- Lower tooling costs
- More freedom in part design
- No spring back in material post forming

Applications

- Deep-draw components
- Large and complex workpieces
- Low volume, high-end components
- Part Integration / assembly part reduction, reducing total cost
- Weight reduction
- Styling flexibility

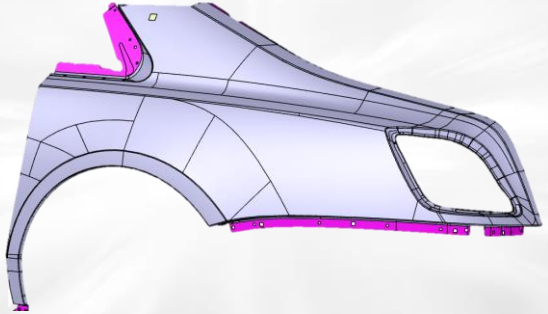
SOP

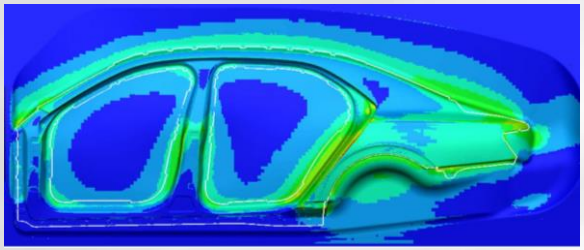
Ideation | Discovery | Concept | Development | Serial Preparation | in Production

Contact: Moritz Carey-Kleis / Moritz.Kleis@magna.com

SPF Side Panel

Side Panels are an excellent example of the use of Super Plastic Forming (SPF).
With the extended design freedom along with possible sharp radii and corners, our customers have the opportunity to create a uniquely designed component or panel that sets apart their product from the competition and promotes excitement in its design.





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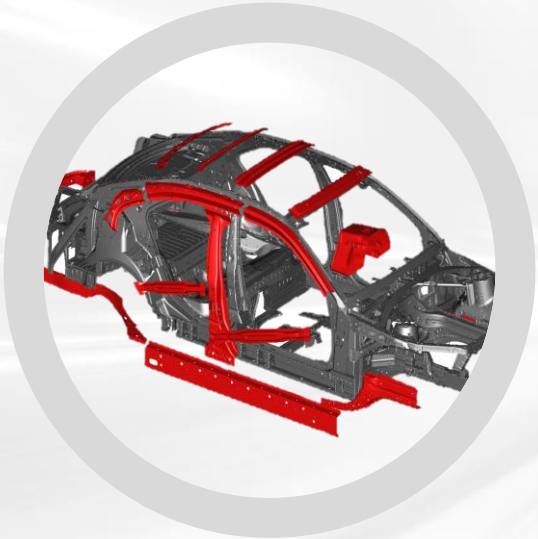
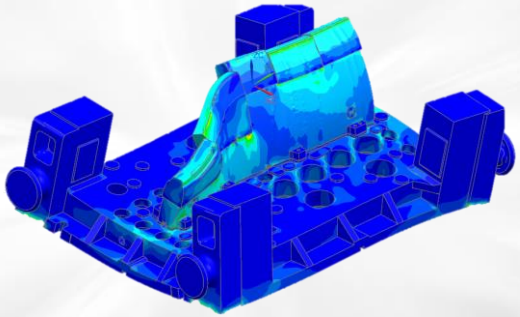
Contact: Moritz Carey-Kleis / Moritz.Kleis@magna.com

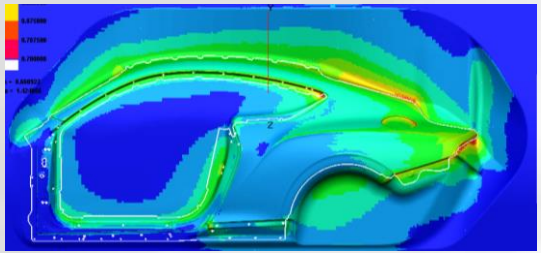
FEA

Formability & Die Structural Analysis Simulations

Formability & die structural analysis simulations at Magna's Cosma Die Technologies division supports multiple material types including steel, aluminum, UHSS, and Usibor. It also supports multiple forming processes such as progressive, transfer, and tandem operations, as well as Superplastic Forming (SPF) and hot stamping.







Competitive advantage / differentiators

- Highly experienced in all product types
- Extensive statistical based material library
- Allows for identification of structural issues in casting designs before pattern creation
- Accurate spring back predictions

Applications

- Deep-draw components
- Large and complex parts
- Class A to hot form components
- Simultaneous product engineering support

SOP

Ideation | Discovery | Concept | Development | Serial Preparation | in Production

Contact: Jim DeCock / Jim.DeCock@magna.com

Shock Heat Treatment

Magna leads the industry in the ability to form a variety of grades of steel and aluminum through innovative technologies for Class A panels and structural parts.

Lighter

Design

Competitive advantage/differentiators

- Provides same styling freedom as steel
- Higher draw depth and radii equivalent to steel
- Less design restrictions
- Makes aluminum more affordable and viable for mass-market products

Applications

- Class A panels and structural parts
  - Door outers and inners
  - Decklids and liftgates
  - Roof panels
  - Hoods
  - Fenders
  - Body side outers

SOP

Ideation | Discovery | Concept | Development | Series Preparation | in Production

Contact: Christian Juricek christian.juricek@magna.com

LITEFLEX™ Modular Approach

Lightweight Door Module

Start from scratch and reimagine a highly engineered product. Magna's advanced engineering team combined its unique, full-vehicle perspective on the door module design with an inventive mix of materials and technology to tackle the challenge of significant weight reduction.

Smarter
Lighter
New Mobility
First to Market Opportunity
Design
Magna Exclusive

Competitive advantage/differentiators

- Save manpower, space, and time to build
- Reduced assembly line steps and parts
- Fully electric; no rods or cables
- Up to 40% possible in weight savings

Applications

- Applicable to approximately 65% of the light vehicle door market
- Allows for customizable lightweighting for various market levels
- Packages into any door environment

SOP

Ideation | Discovery | Concept | Development | Series Preparation | in Production

Contact: Christian Juricek christian.juricek@magna.com

Advanced Body Structure

Aluminum Castings

Many areas of the vehicle body typically require complex, multi-component welded assemblies. These areas may benefit from the use of Magna's high pressure vacuum casting technology, known as High-Q-Cast™.

Lighter

Driving Dynamics

Competitive advantage/differentiators

- Large, thin-wall, complex castings
- Wall thickness down to 1.8 mm
- Parts can be welded and heat treated
- Near-net shape (minimal machining)
- Materials: Aural-2, Aural-5s
- Tempers: F, T5, & T7
- New alloys to remove heat treatment & straightening
- In-house presses up to 4400 ton

Applications

- Shock towers
- Rear rails
- Hinge pillars
- Tunnel
- Battery trays / enclosures
- Cradles
- Tailgates

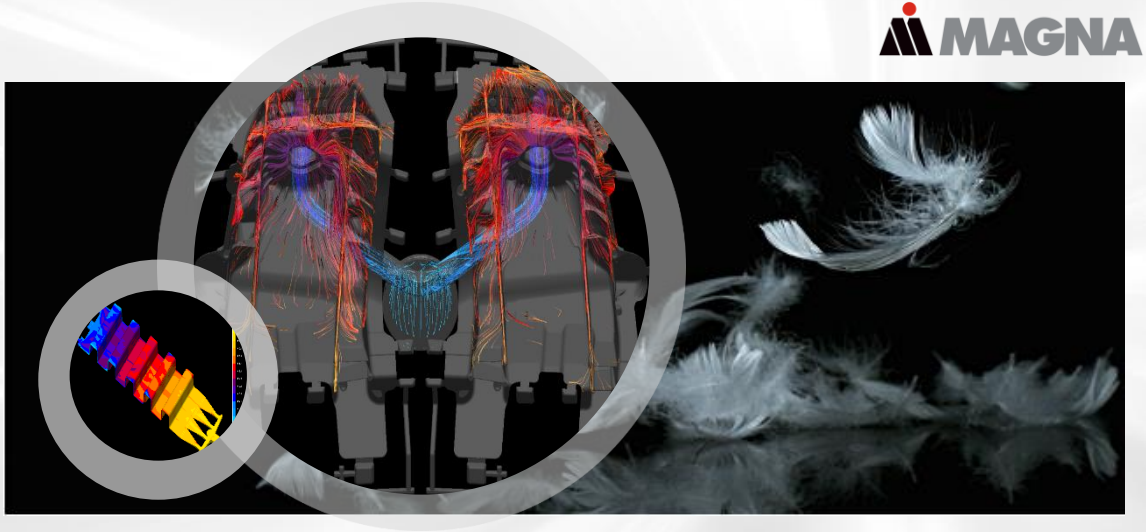
SOP

Ideation | Discovery | Concept | Development | Series Preparation | in Production

Contact: Christian Juricek christian.juricek@magna.com

Thin Wall Casting

Magna's Thin Wall Casting reduces weight on structural castings by challenging traditional manufacturing gauges to meet product performance limits.



Lighter | Exclusive@Magna | First to Market

Design | Co-Development Opportunity

Competitive advantage/differentiators

- Reduces part weight by up to 10%
- Reduce energy consumptions and costs
- Design structural parts based on their performance requirements not casting limitations – enhanced design freedom.

Applications

- Enable castings into D & C segments
- Reduce weight of almost all structural casting parts including:
  - Shock towers
  - Rails
  - Hinge pillars
  - D-posts
  - Headlamp surrounds

SOP

Ideation | Discovery | Concept | Development | Series Preparation | in Production

Contact: Christian Juricek christian.juricek@magna.com

Recycled Aluminum for Casting

Aural 5R Alloy

Magna's Aural 5R Alloy (R for recycled) is the only aluminum die cast alloy for structural applications that is created from 100% recycled materials. Aural 5R is a non-heat-treated, high-pressure die cast alloy that can be used for structural high pressure vacuum die cast automotive components.

Cleaner | Design | Industry First | Patent Pending

Magna Exclusive | First to Market Opportunity | PACE Award

Competitive advantage/differentiators

- Created from 100% recycled materials
- Requires 95% less energy to create compared to the A365 type primary structural alloys
- Self-hardening during exposure to the OEM paint shop ovens – not requiring traditional heat treatments
- 11% increase in ultimate strength and 7% increase in yield strength while achieving 10% minimum in elongation

Applications

- All structural high-pressure vacuum die cast automotive components
- Supports customers' carbon neutrality objectives

SOP

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Contact: Christian Juricek christian.juricek@magna.com


MAGNA
Forward. For all.