

Automotive Lightweight Procurement Symposium 2014 Oct 5 th – 7 th In Duesseldorf



SYMPOSIUM FOCUS

- MAGNESIUM
- ALUMINIUM
- CARBON FIBER
- HIGH STRENGTH STEEL
- COMPOSITES

AluMag[®]

Europe ■ India ■ Americas ■ Asia

THE MARKET DEVELOPER

Sponsored by Reed Exhibitions Deutschland GmbH

ALUMINIUM 2014
7-9 Oct 2014 | Messe Düsseldorf
10th World Trade Fair & Conference
www.aluminium-messe.com

Visions become reality.

Organised by Reed Exhibitions

Partners GDA GESAMTVERBAND DER ALUMINIUMINDUSTRIE e.V. European aluminium association

AluMag®

Europe ■ India ■ Americas ■ Asia
THE MARKET DEVELOPER

AluMag is "The Market Developer" that successfully penetrates new markets, creates business and localize leading supplier for your company. AluMag access any promising markets and open doors for your business – regardless of region, market, application, material, process or product. AluMag makes you successful – worldwide!

AluMag® offers the four following services - worldwide:



Market Research

- Aluminium Extrusion Customer database
- Foundry & Tool Maker Database
- Automotive Application, Material & Process Analyses
- Various Industrial Application Research & Analyses

AluMag as your provider of automotive research and forecasting studies, offers you and your business, the market intelligence you need to realize the best strategic decisions



Material - Process - Application Trend Analysis

Large variety of market access, local & global:

- business database with 6,970+ companies and 18.700+ contacts
- 150+ satisfied customers worldwide
- Arranged 20+ roadshows/events since 2008



Extrusion Application

Your Benefits:

- Learn about your [potential] clients and competitors
- Obtain an inside view of the market
- Identify opportunities and threats
- Minimize risk and optimize profits
- Position your company successfully
- Based on data off the shelf, secondary re-search and interviews, AluMag generates validated researches

Are you:

- looking for specific data, information and outlook about product, material, customer, supplier, technologies, ...
- want to discuss your project, increase sales, access new markets, ...
- interested to participate in one of our roadshows / events or organize your customized showcase ...
- looking to localize, expand into new markets, countries, tie-up targets, ...

please contact your AluMag Team to receive a quote or proposal



Market Development

- Analysis & Development of Market Opportunities
- Accelerate Market Penetration
- Manage New Product Launches
- Establish a Sales Force
- Sales on Demand

AluMag guides and supports your organization globally through the different market development phases until we have successfully launched, implemented or executed your project.



Map of activity - SAMPLES

Manage and integrate each aspect of your organization by initiating, planning, controlling, executing and closing out a new project. AluMag offers liaison management services as an addition to our customer's staff by bringing in the resources that define us.



JATCO Head Quarters - Meeting in Japan

Your Benefits

- Analysis and development of Markets
- Realize opportunities
- Accelerate market penetration
- Establish a Sales Force
- Provide Warehousing and distribution services
- Manage New Product Launches
- Sales on Demand



Roadshows / Events

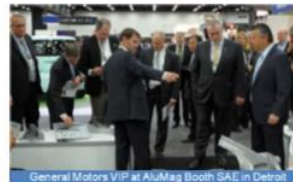
- Organization of Technical & Commercial Roadshows
- Oversea Commercial & Technical Events
- Host In-House Events & Presentation
- Common Technology Booth at Leading Exhibitions

AluMag roadshows, tech-meetings and symposia are the first class events used by exhibitors and guest as a unique benchmark platform.



Daimler Gindelfingen as Roadshow Location

The AluMag think tank events are bringing in decision makers and executives in EUROPE, ASIA and NAFTA.



General Motors VIP at AluMag booth SAE in Detroit

Upcoming Events:

- 2014 Nov. Five OEM Tech-Meetings in Japan and optional one day in S.Korea
- 2015 Mar. Multi Material Lightweight Technology Roadshow across Europe
- 2015 Apr. Common Tech-Booth at the SAE World Congress in Detroit, USA
- 2015 Jul. Automotive Lightweight Procurement Symposium in Beijing, China



Strategic Localization

- Warehousing & Distribution Service
- Supplier & Tie-up Localization
- Identification & Trade-off of new Technology
- Foreign Market Business Cases and whose Realization

AluMag has the global expertise to search, identify, evaluate and validate potential strategic business opportunities for expansions and partnerships that will assist your business growth plans regionally and globally



On-Site Greenfield Planning Meeting

Services for:

- Search, develop and present potential acquisition candidates for regional and global business expansions
- Localization of new manufacturing / service sites for business expansions
- Identification of new technology supplier development related to products, processes and materials
- Search, develop and present potential business partners / suppliers to support regional and/or global supply programs
- Evaluate potential competitor profiles for new or existing business in non-presence geographies
- Evaluate new emerging technologies and processes for business expansions

CONTACTS & PROJECT TEAM



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**Automotive Lightweight Procurement Symposium
2014 Oct 5 th – 7 th In Duesseldorf**



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Introduction

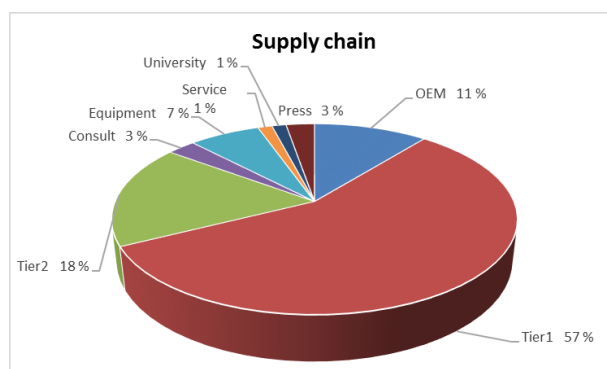
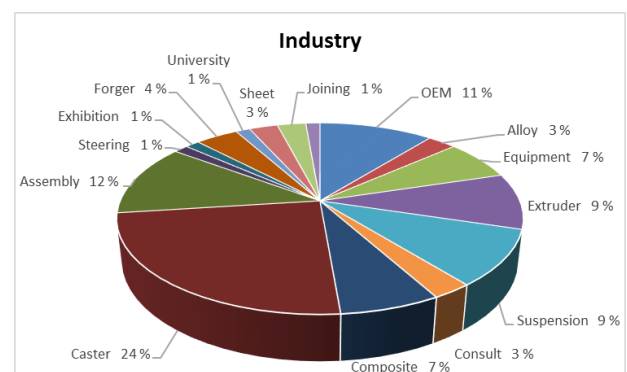
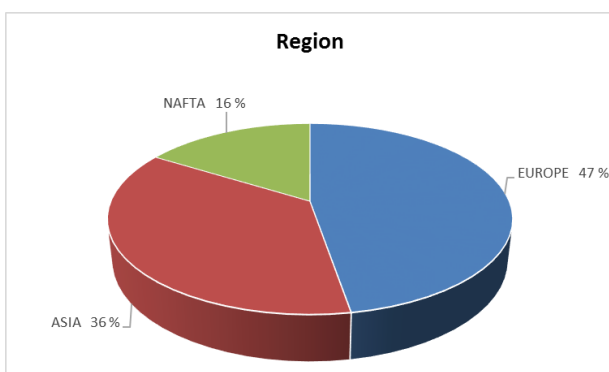
The 'Automotive Lightweight Procurement Symposium' in 2014 from October the 5th – 7th at the Hilton Hotel in Duesseldorf, Germany is the first unique and cutting edge event that brings together the procurement and supply side of lightweight materials and their advanced processes (aluminium, carbon, composites, high strength steel, magnesium as well as thermoplastics) in accompany with cost balance or reduction. Localization, material technology and cost benchmarking as well as 2025 market outlook are some of the topics to be presented at the AluMag symposium.

Designed is the event for executives who are part of the lightweight supply chain and engineering as well as technical sales managers seeking an understanding of the synergy of cost- / weight reduction programs.

The symposium is limited to 120 visitors to ensure a friendly executive atmosphere for knowledge development and exchange of experience.

For 2015, the "Automotive Lightweight Procurement Symposium" China, Beijing is planned in July from 6th to 7th.

Registration statistics:



Company Speechs by:

<u>AluMag Automotive GmbH</u>	<u>9</u>
<u>Audi AG</u>	<u>16,17</u>
<u>Berylls Strategy Advisors GmbH</u>	<u>20</u>
<u>Beijing Antaike Information Development Co. Ltd.</u>	<u>30</u>
<u>Grunewald GmbH & Co.KG</u>	<u>46</u>
<u>MITSUBISHI RAYON CO. LTD.</u>	<u>66</u>
<u>RIFTEC GmbH</u>	<u>86</u>
<u>Daimler AG</u>	<u>94</u>
<u>ThyssenKrupp System Engineering GmbH</u>	<u>110</u>
<u>Citius Capital S.A. de C.V.</u>	<u>124</u>
<u>Georg Fischer Automotive AG</u>	<u>142</u>
<u>MAGNA STEYR Fahrzeugtechnik AG & Co.KG</u>	<u>158</u>
<u>F.tech R&D North America Inc.</u>	<u>174</u>
<u>Rheinfelden Alloys GmbH & Co. KG</u>	<u>196</u>

Agenda

Sunday The 5th Of October In The Hilton Hotel Duesseldorf

06:00pm - 10:00pm Pre-registration & Reception

Monday The 6th Of October In The Hilton Hotel Duesseldorf

08:30am – 09:15am Registration and morning coffee / tea

09:15am – 09:30am **Welcome: Mr. Jost Gaertner** – Managing Partner – AluMag Automotive GmbH

09:30am – 10:25am **Opening Keynote: Mr. Arne Lakeit** – I/PG Vice President Manufacturing Engineering & Process Planning – Audi AG

Mr. Thomas Heußer – I/PG-A3W Head of Technology Development
Production – Materials – Processes – Audi AG

Structural Light weighting – New Materials & Advanced Processes

10:25am – 11:00am Break for Refreshments – Coffee – Tea – Networking – Technology Exhibition

11:00am – 11:40am **Paper 1: Mr. Christian Kleinhans** – Managing Partner – Berylls Strategy Advisors GmbH

Outlook Of The Global BIW Lightweighting 2025: Needs – Markets - Collaboration

11:45am – 12:25pm **Paper 2: Ms. Hui Xiong** – Chief Analyst – Beijing Antaika Information

Market Trends & Development Of Aluminium In China: Production – Price Building – Products

12:25pm – 01:45pm Break for Refreshments – Coffee – Tea – Networking – Technology Exhibition

01:45pm – 02:25pm **Paper 3: Dr. Joachim Gundlach** – Sales Manager
Grunewald GmbH & Co.KG

International Foundry Challenge – Suitable Production Of Thin Walled Aluminum Prototype & Small Series Castings For Body In White Applications

02:30pm – 03:10pm **Paper 4: Mr. Kouichi Akiyama** – Research Director Composite Materials Dev. Center Mitsubishi Rayon Co., LTD

Development Of PCM (Prepreg Compression Molding) Technology

03:15pm – 03:45pm **Paper 5: Dr. Axel Meyer** – CEO – Riftec GmbH

Light weighting Technology Selection Based On A Material And Process Benchmark - An Aluminium Extrusion Case Study Successfully Transferred Into Series Production

03:45pm – 04:15pm Break for Refreshments – Coffee – Tea – Networking – Technology Exhibition

04:15pm – 04:55pm **Paper 6: Dr. Markus Hermle** – Manager CAE Interior Safety &

Durability at Mercedes-Benz Cars – Daimler AG

Lightweight Design – Challenges in Development Process

05:00pm – 05:55pm **Closing Keynote: Dr. Achim Agostini** – Head of Division Lightweight Solutions
ThyssenKrupp System Engineering GmbH

Lightweight Solutions by ThyssenKrupp System Engineering: Process & Equipment – parts production for aluminum – magnesium –composites – steel hybrid material

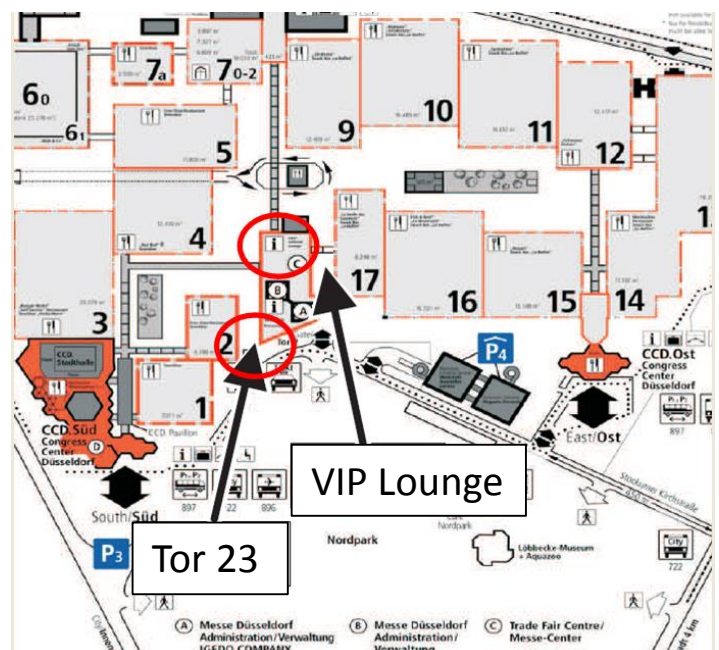
05:55pm – 06:00pm Summary: Mr. Jost Gaertner – Managing Partner – AluMag Automotive GmbH

06:00pm - 10:00pm Reception

Agenda

Tuesday The 7th Of October In Hilton Hotel Duesseldorf / Aluminium & Composite Europe Exhibitions

- 08:15am – 08:55am **Paper 1: Mr. Dario Villarreal** – Managing Partner – Citius Capital S.A. de C.V.
Site Selection in Mexico: Doing it right!
- 09:00am – 09:40am **Mr. Klaus Decking** – Head Of Market Communication Sales Support & Business Development & New Markets Sales – both Georg Fischer AG
Cost Comparison Of Iron, Aluminium, Magnesium vs. Composite Solutions
- 09:45am – 10:25am **Paper 3: Dr. Wolfgang Zitz** – Vice President Magna Steyr Operation – Magna Steyr Fahrzeugtechnik AG & Co KG
Lightweight Body Solutions By Magna Steyr
- 10:25am – 11:00am Break for Refreshments – Coffee – Tea – Networking – Technology Exhibition
- 11:00am – 11:40am **Paper 4: Dr. Bing Liu** – Director & COO – F.tech R&D North America Inc.
Dr. Xin Zhang – Assistant Manager of Design Group – F.tech R&D North America Inc..
Competitive Development Based On Lightweight & Cost Balance
- 11:45am – 12:25pm **Paper 5: Dr. Claudio Mus** – President – Rheinfelden Alloys GmbH & Co. KG
Design Approach & Process Methodologies: How To Improve Aluminum Alloys Advantages In High Performance Components
- 12:30pm – 12:35pm **Summary: Mr. Jost Gaertner** – Managing Partner – AluMag Automotive GmbH
- 12:45pm – 01:00pm Shuttle Transfer to the Exit 23 / Tor 23 of the Exhibition Duesseldorf. 150 meters walk to the VIP Area
- 01:00pm – 01:40pm Reception With Snacks & Finger Food
- 01:40pm – 05:30pm Individual Or Guided Visit At The 2014 Aluminium 2014 & Composite Europe Exhibitions In Duesseldorf
- 05:45pm – 06:15pm Shuttle Transfer from Exit 23 / Tor 23 to :
**Hilton Hotel
Duesseldorf Main Station
Duesseldorf Airport**



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BHARAT FORGE



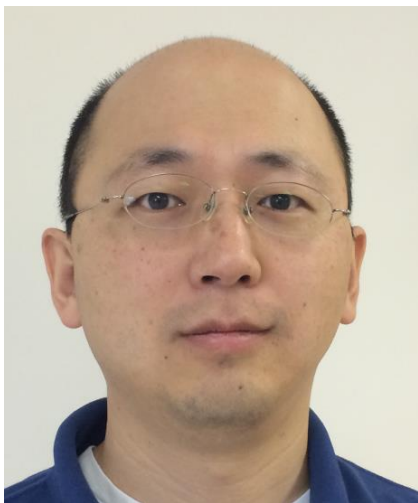
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<http://www.ftech.co.jp>

TITLE

Competitive Development Based On Lightweight & Cost Balance

ABSTRACT

Facing environment protection and government tighter CAFÉ regulation, OEMs try to make lighter vehicle to increase fuel economy and less emission. F.tech is a global tier-1 chassis supplier; dedicates lightweight chassis design/manufacture to our customers. In F.tech, Optimization simulation goes through whole design process. Topology is applied to build concept structure to seek the best load path based on the design space in the early stage; shape and gauge optimization are applied to improve performance and reduce weight in the later stage. In this presentation, optimization-driven design for weight reduction is discussed, it also will be explained how F.tech meets the challenge of lightweight chassis development to meet the customer's requirements by a highly efficient way.



Dr. Xin ZHANG
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TITLE

Competitive Development Based On Lightweight & Cost Balance

ABSTRACT

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Competitive Development Based On Lightweight & Cost Balance

Dusseldorf, Germany
10/07/2014

Agenda

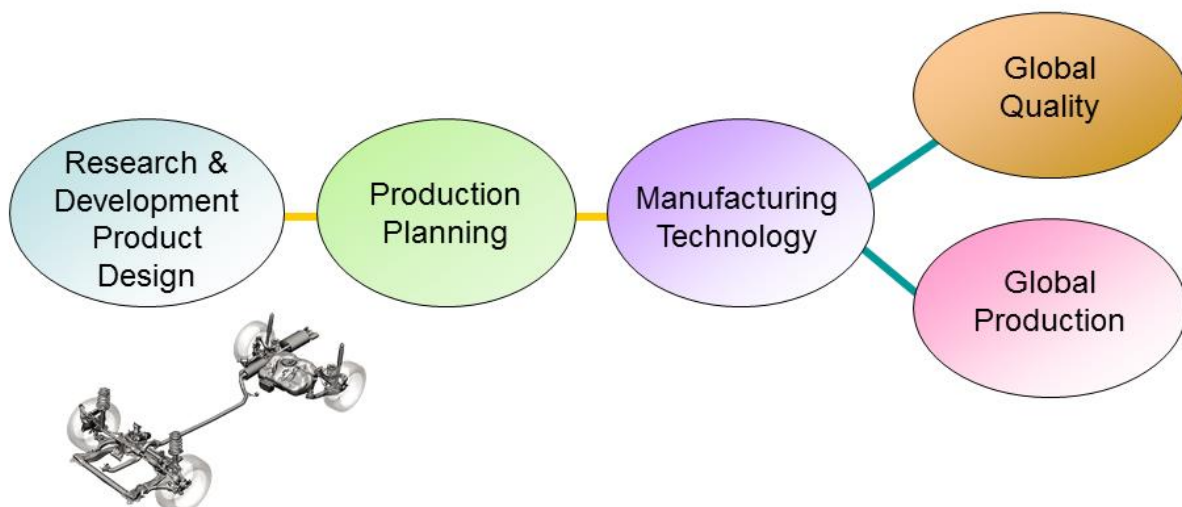
- **F.tech Group Introduction**
- **F.tech Lightweight Challenges**
 - **Market Trend and Our Approach**
 - **Aluminum Application - FSW/Bulging**
 - **HSS Application with Optimization Design**
- **Summary**

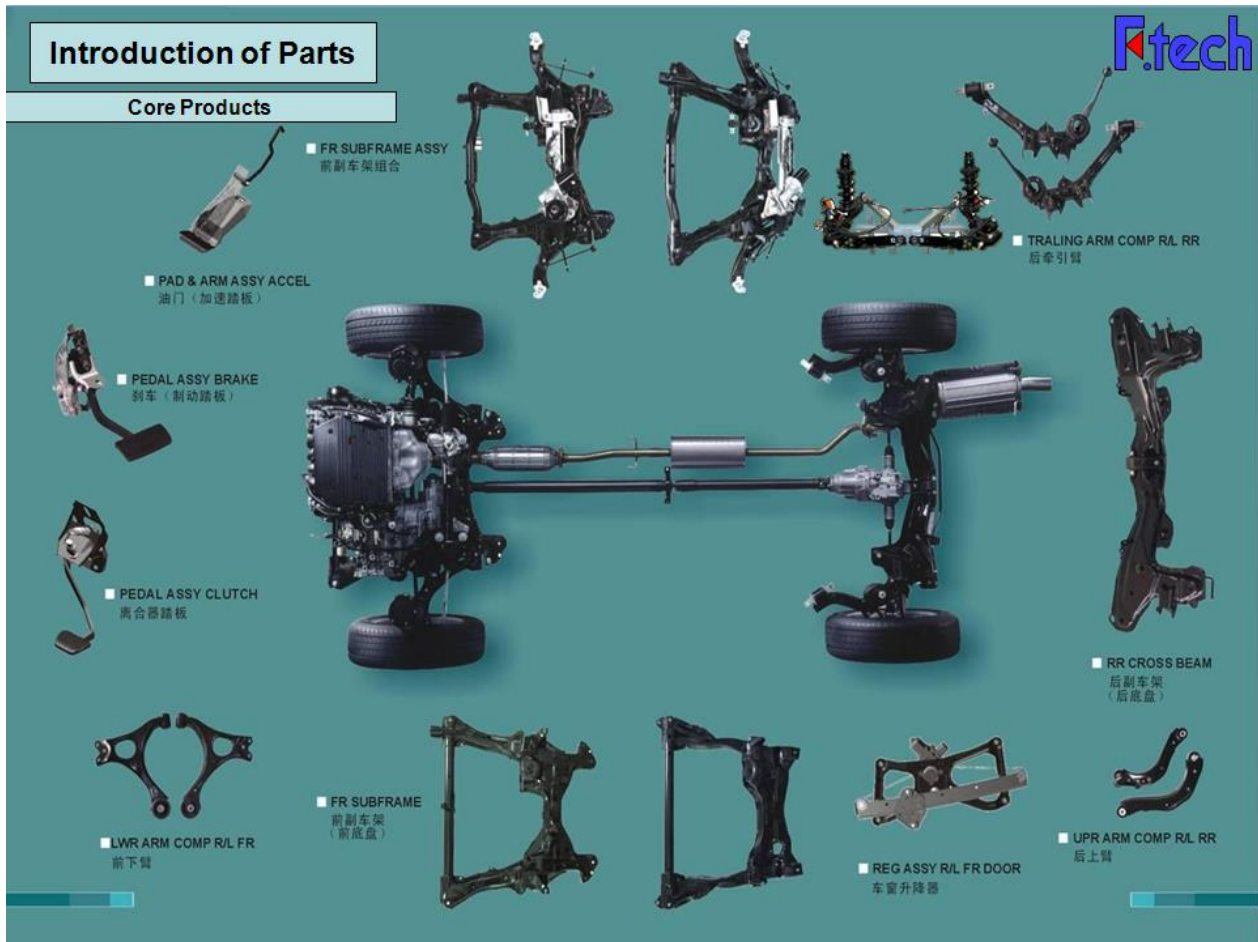
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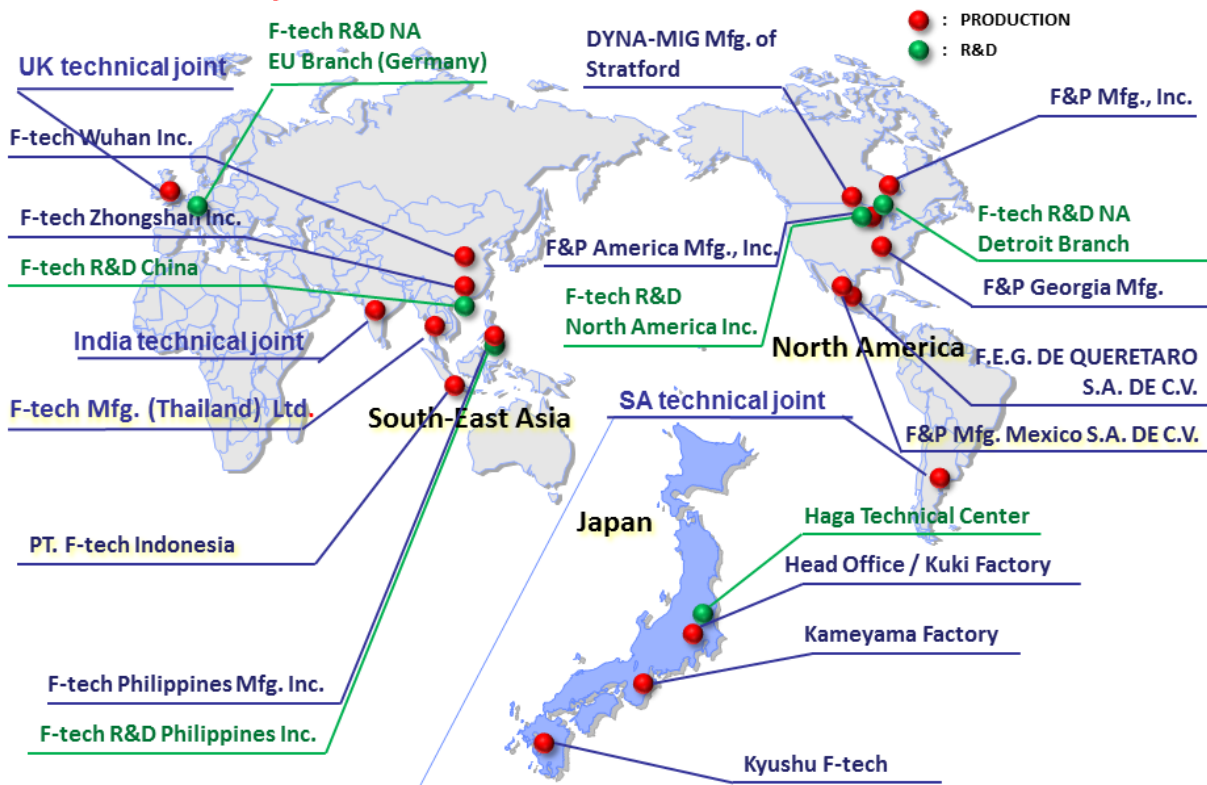
F.tech Inc Group

- Fully independent global Tier I chassis system supplier
- Fully integrated global system from Product Design and Development through Product Manufacturing





F.tech Group Global Network



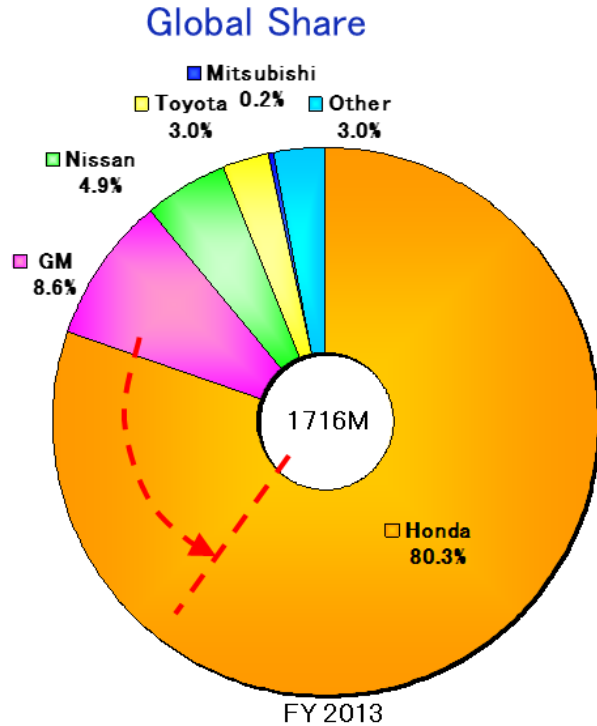
F.tech Group Global Customer Base



Goal to increase minor share to over 40%



Top priority focused on growing other business



Production Process and Capability



Stamping



Hydroforming



tube processing



Laser cutting



AI DC+Hot bulge



Steel+DC w/ FWS

Most production facilities set up full manufacturing capacities and capabilities



Welding

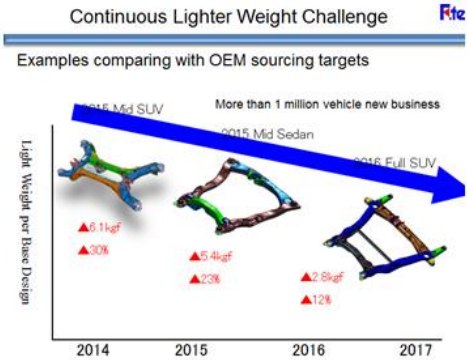
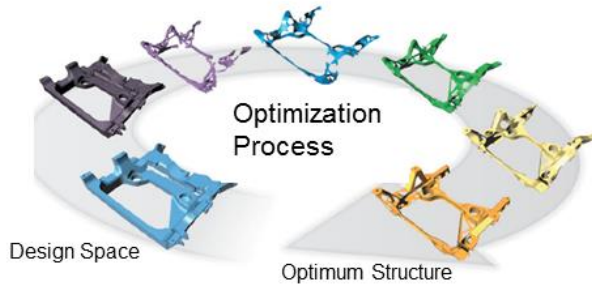


Assembly

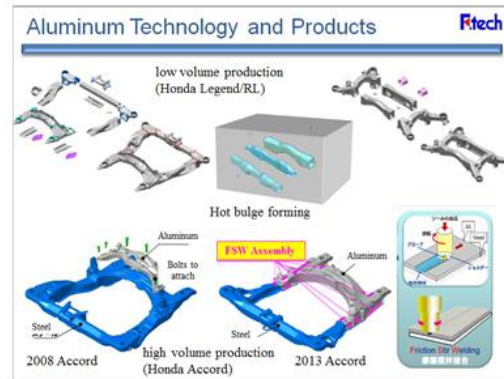


E-coating

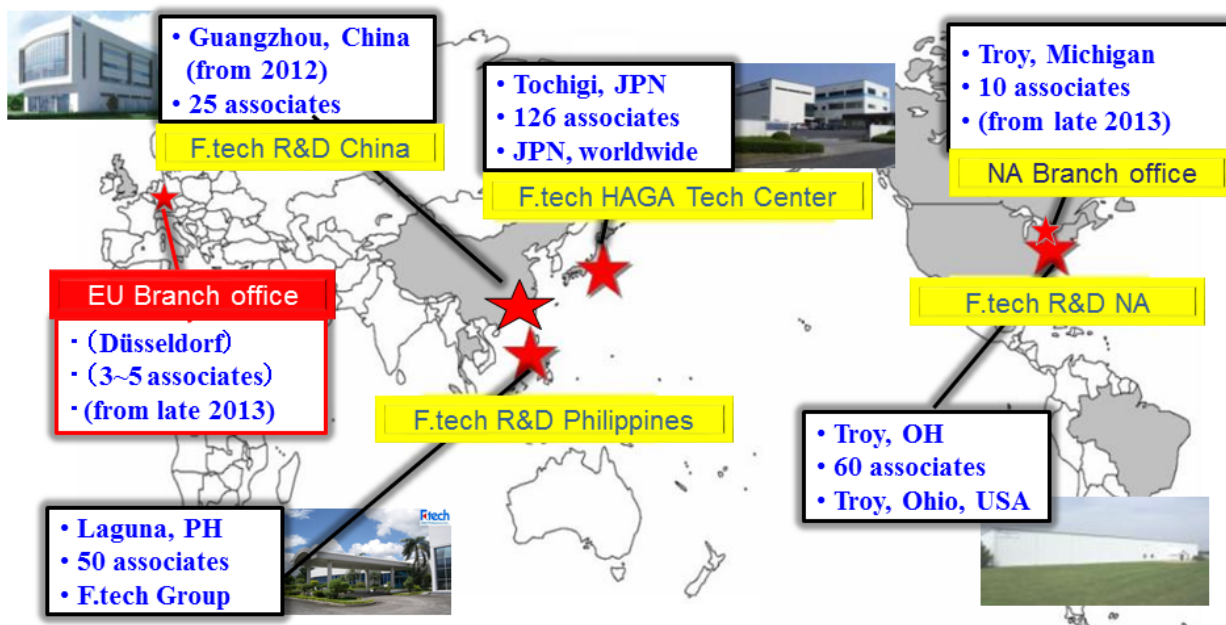
Light Weigh Applications



- Make full use of UHSS to achieve the highest competitive STEEL designs with optimization design technology.
- Aluminum applications with our manufacturing technologies to meet more challenging light weight targets

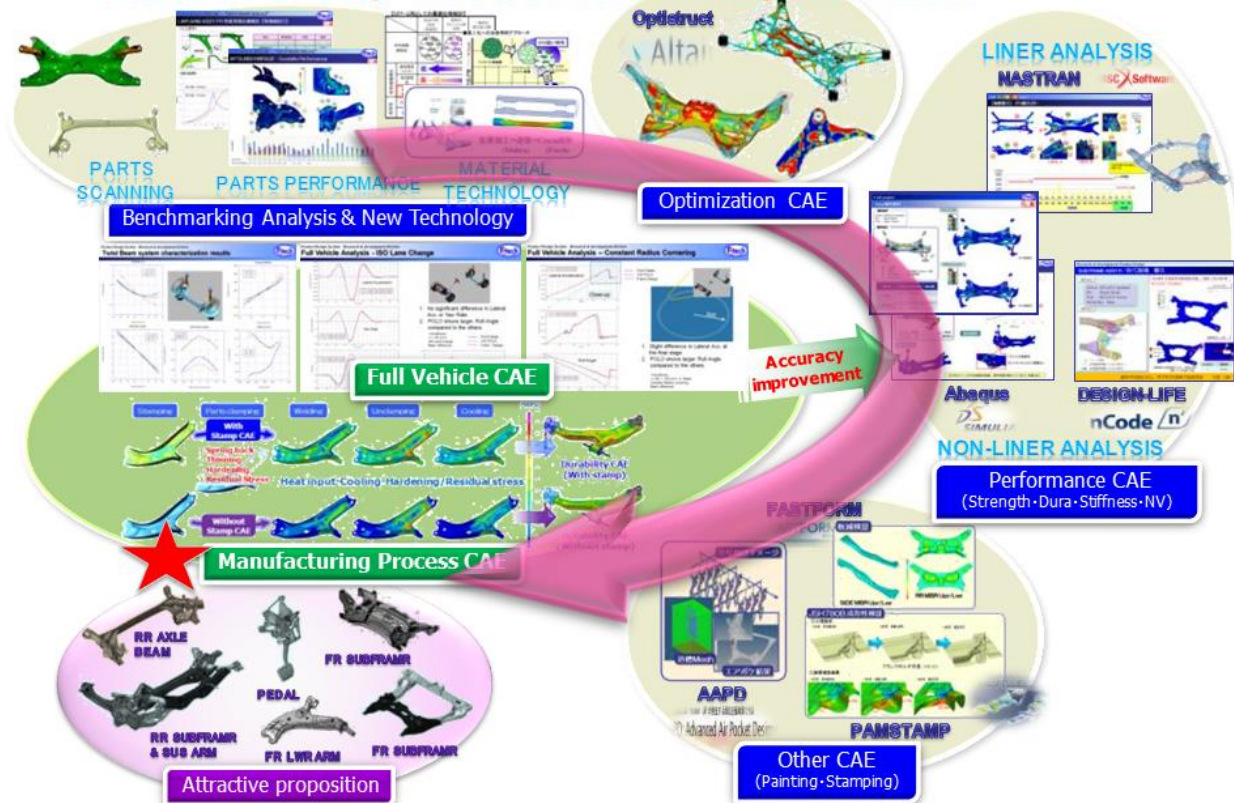


F.tech Group Global R&D



Global development network
Total 310 associates

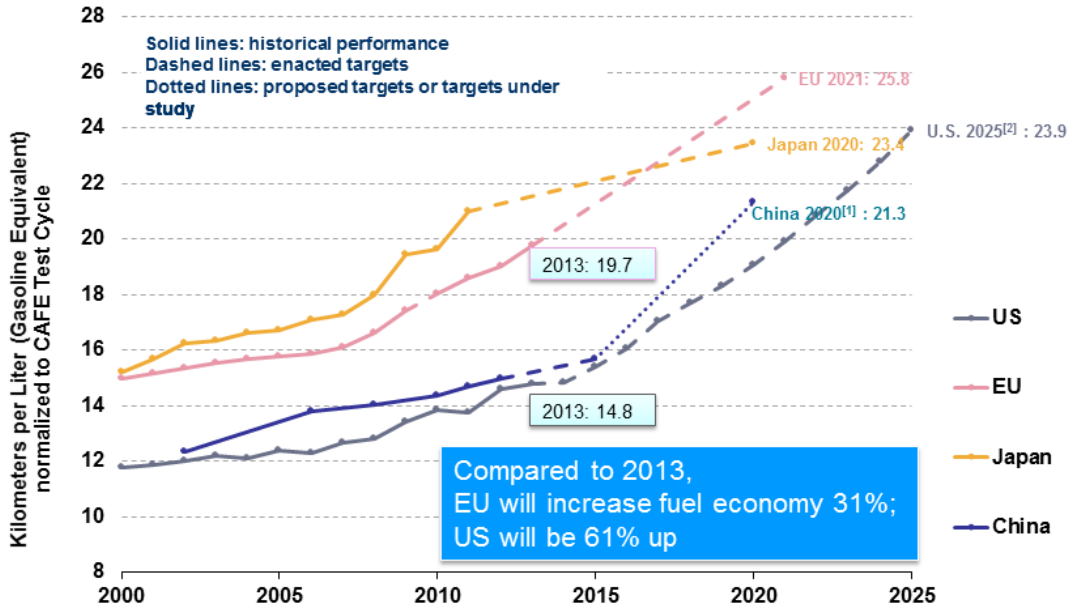
F.tech Group Global R&D Capabilities



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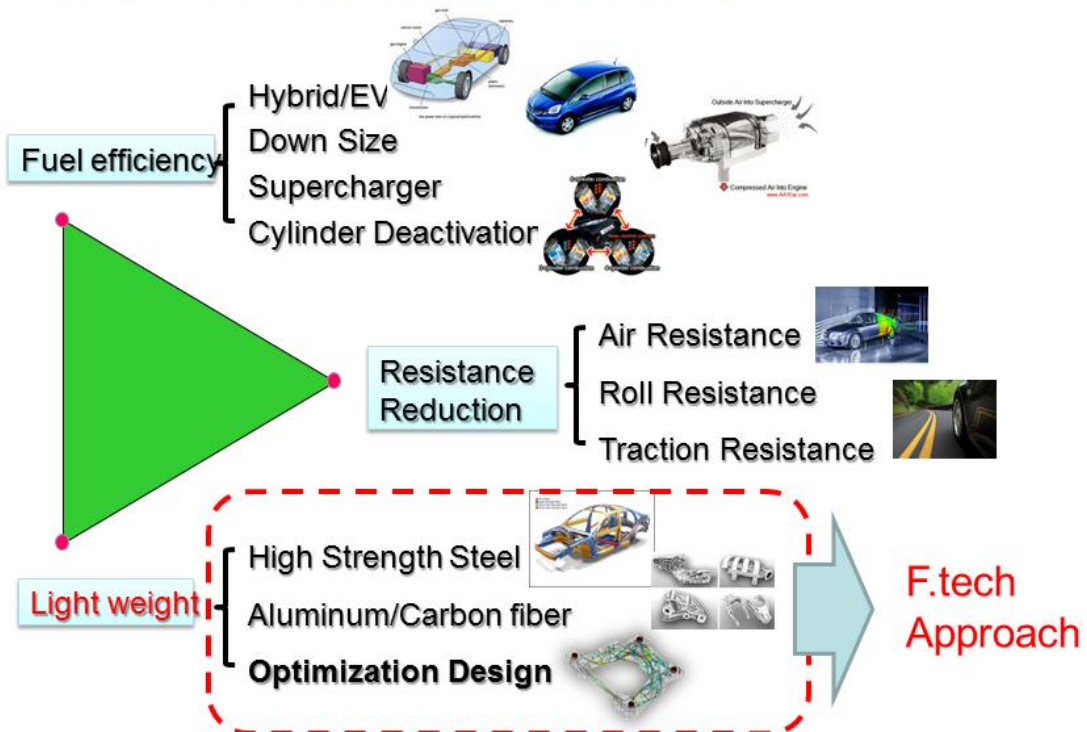
Global Vehicle Fuel Economy Trend



[1] China's target reflects gasoline vehicles only. The target may be higher after new energy vehicles are considered.
 [2] The U.S. standards are fuel economy standards set by NHTSA, which is slightly different from GHG standards due to A/C credits.

Source: the International Council on Clean Transportation


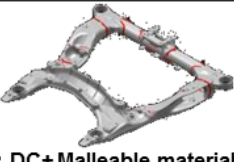


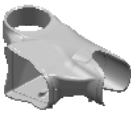



The Ways to Improve Fuel Economy



Agenda

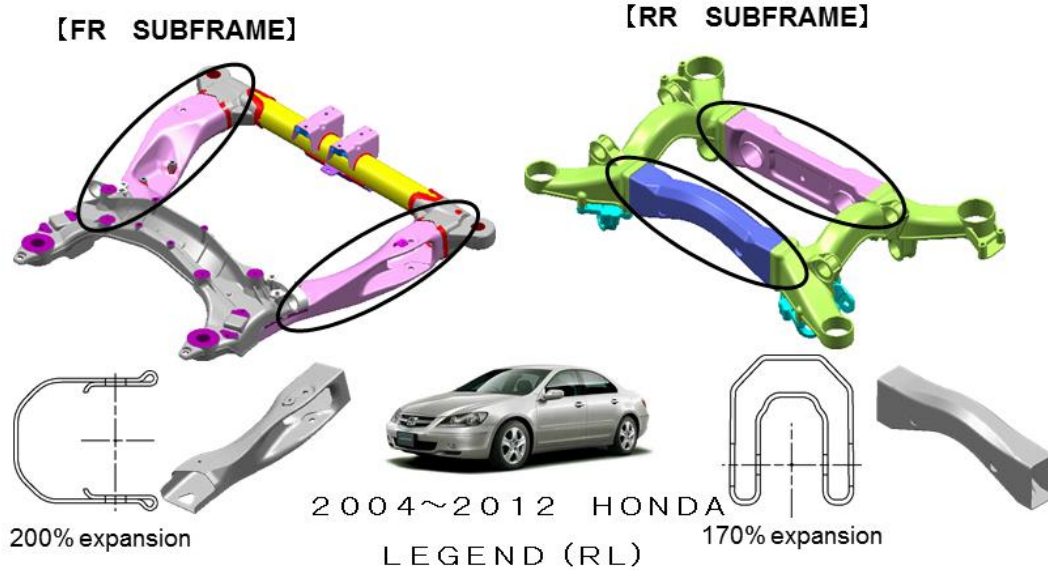
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F-Tech/Technology Trend of Aluminum Products

	1990~	2004~2012	2012~	2013~
Formation of development	 Malleable material spot structure Adopted for 90NSX	 <ul style="list-style-type: none"> • DC+Malleable material welded structure • Bulging new technology parts • SDC (squeeze) parts 	<ul style="list-style-type: none"> • DC combination structure 	<ul style="list-style-type: none"> • Fe/AL DC combination structure 
Production Technology	Aluminum panel press Spot welding Establishment of technology	  <ul style="list-style-type: none"> • Establishment of MIG welding technology • Establishment of SDC technology • Adaptation of bulging technology for mass production 	DC/DC welding technology 	Application of FSW technology for mass production 

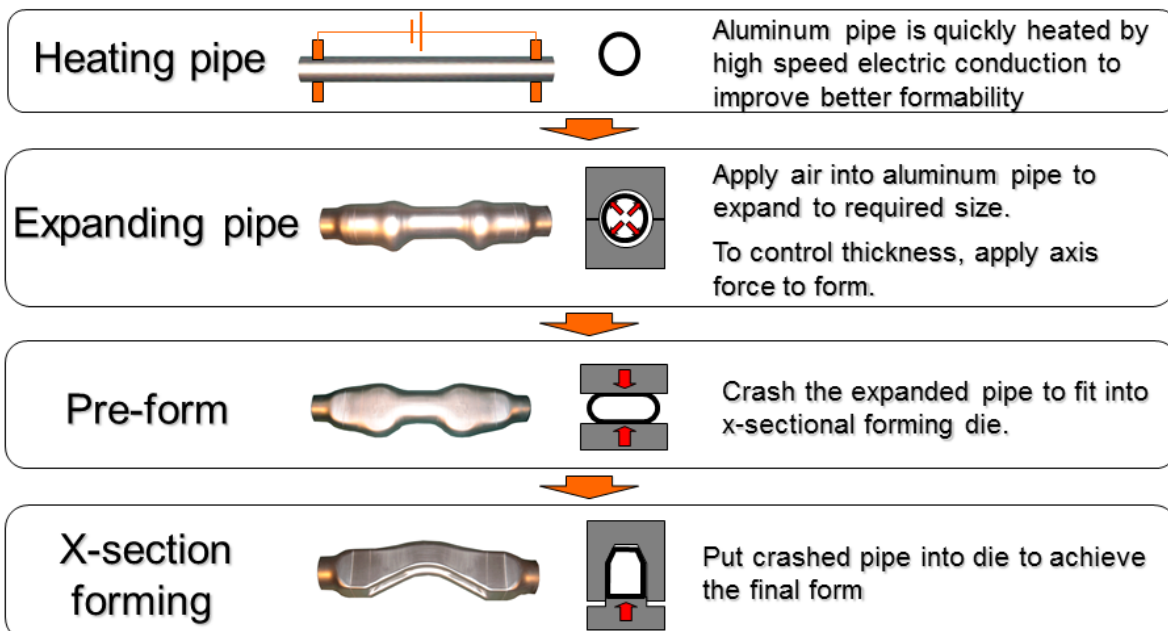
F.TECH group is progressing their aluminum lightweight technologies such as aluminum welding, Hot Bulging, FSW, etc.

Applicable Parts for Hot Bulging Forming



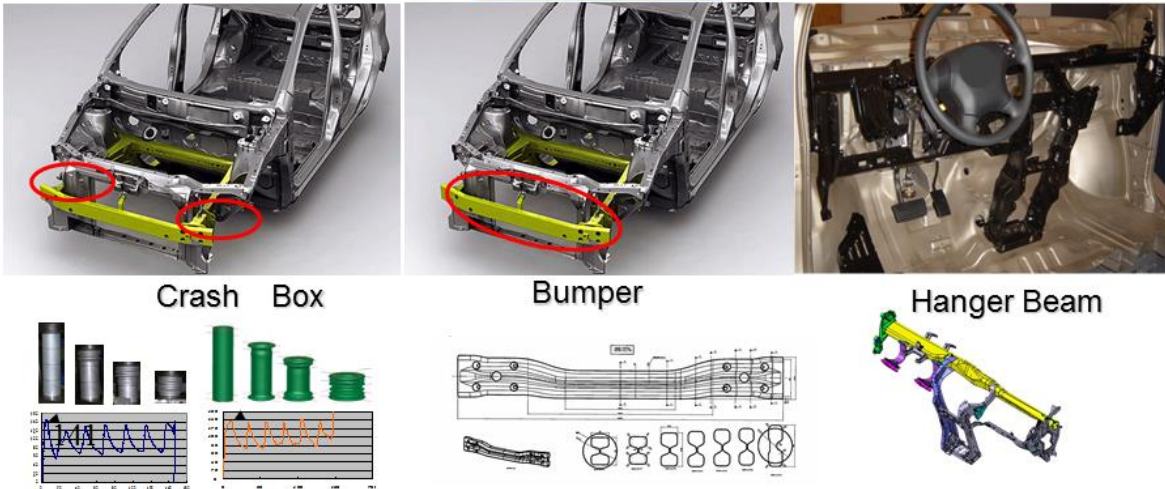
To able to achieve more than 10% weight reduction compared the previous aluminum subframe to the subframe with applications of Hot Bulge forming technology and aluminum welding technology

Hot Bulging Forming Process



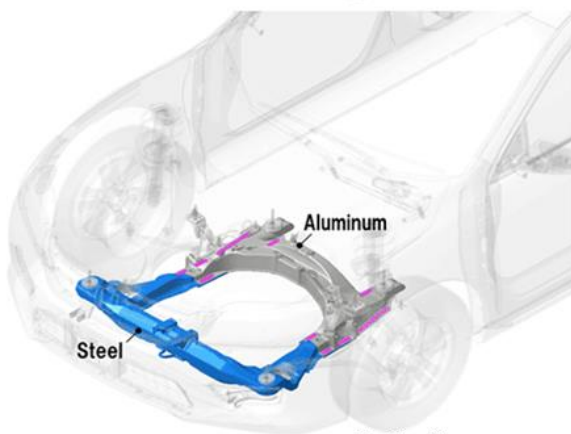
Applicable Parts for Hot Bulging Forming

Lightweight study



Equipment and technology has been transferred to F.tech North America for seeking more applications. Depending on business models, F.tech believes this technology can bring lighter weight benefit for our customers in a much larger market scale.

World First Steel and Aluminum Hybrid Structure Subframe using FSW



The newly redesigned 2013 Honda Accord subframe is made with a combination of steel and aluminum joined together with a process called **Friction Stir Welding (FSW)**.

This new technology contributes to an improvement in fuel economy by reducing body weight by 25% compared to a conventional steel subframe.

Friction Stir Welding can be also be used for aluminum-to-aluminum welding and could be used for production of a full-aluminum subframe.

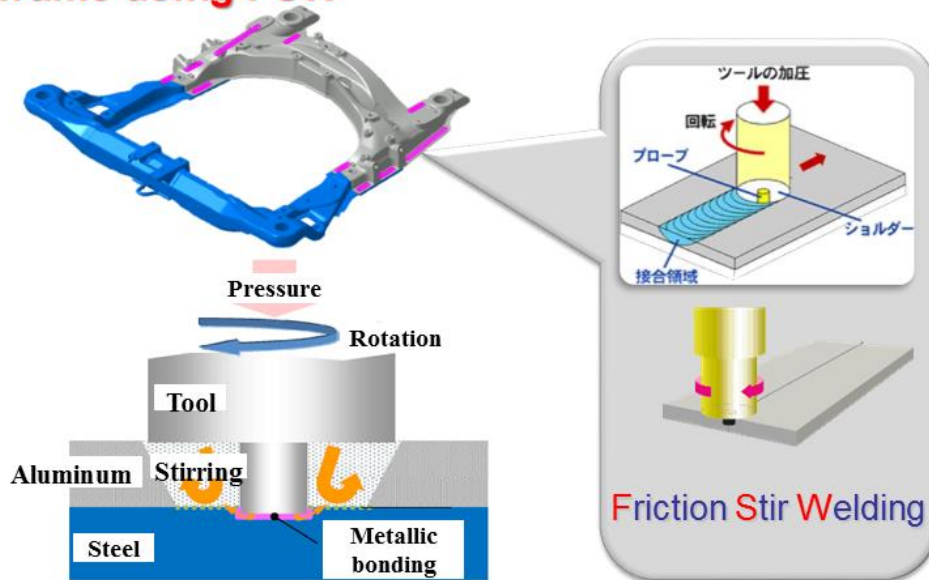


Fr Cradle
2008M
vs.
2013M



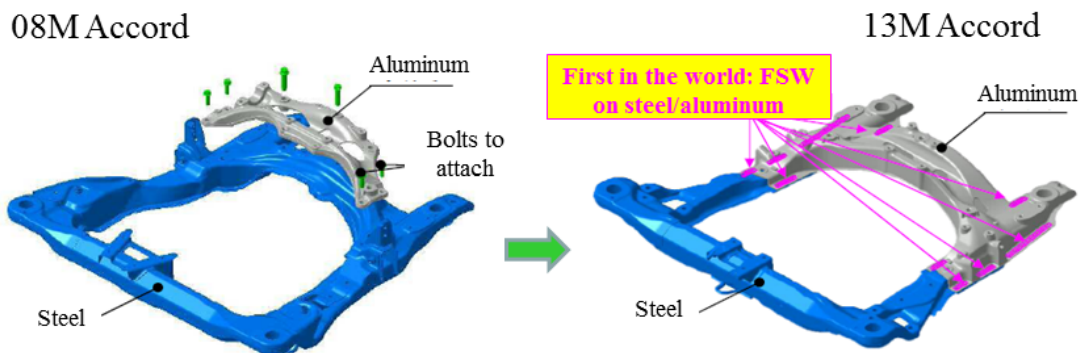
2013~ HONDA Accord

World First Steel and Aluminum Hybrid Structure Subframe using FSW



Bond chemical compound is generated between steel and aluminum

World First Steel and Aluminum Hybrid Structure Subframe using FSW



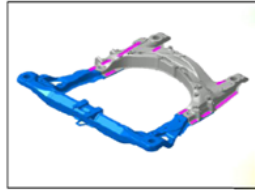
Bolts to attach steel and aluminum parts

FSW to joint steel and aluminum parts

• Significant weight reduction	- 25% (6Kg)
• Improve driving performance , Suspension mount point's rigidity up by	+ 20%
• Energy requirement for the production , Energy reduced by	- 50%
• Total Cost reduced by	- 5%

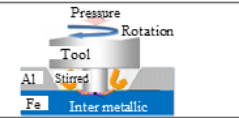
World First Steel and Aluminum Hybrid Structure Subframe using FSW

New Technology Highlights



FSW technology

First in the world
FSW continuous joint technology on two different materials of steel and



Hybrid structure technology

First in the world
Technology for the structure and anti-corrosion



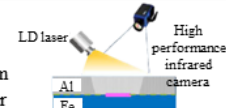
Mass production technology

First in the world
FSW production system with industrial robots



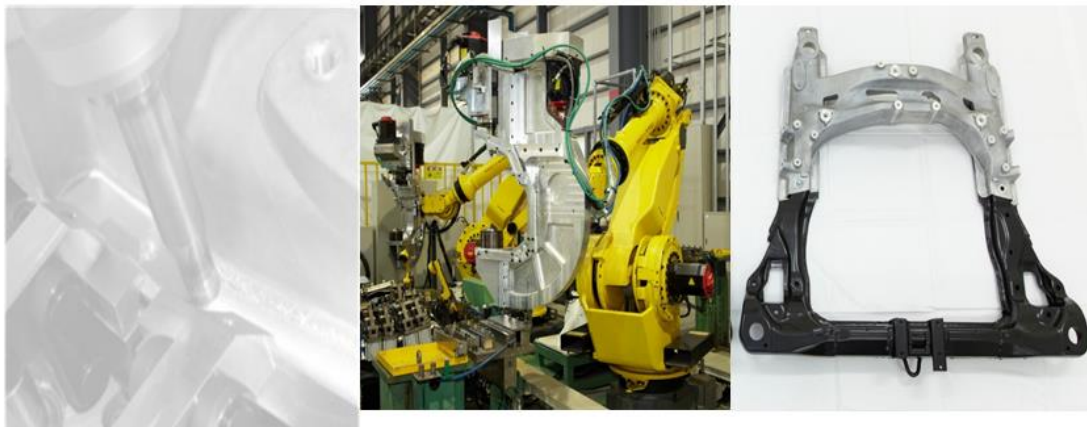
Mass production technology

First in the world
Non-destructive testing system with infrared camera and laser



Not only the steel/aluminum bonding technology with FSW, but also its successful applications to high volume mass production subframe

More successful applications to be expected



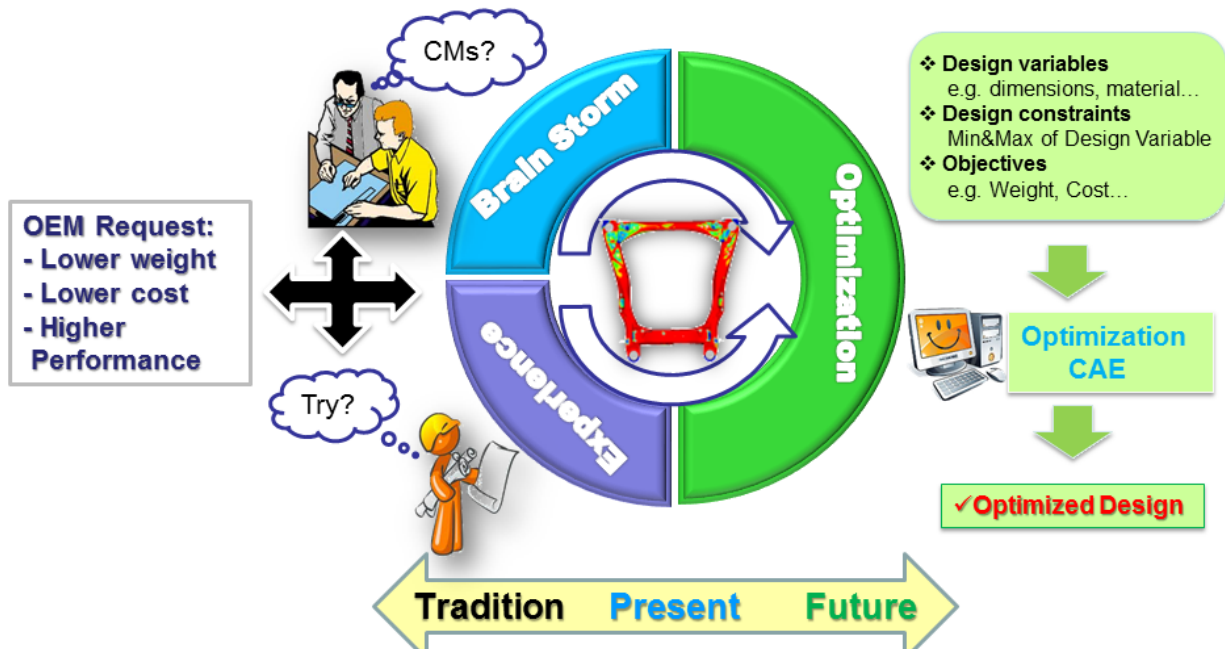
Not only successful applications for Honda so far, but also is it expected for more applications to more OEMs

Agenda

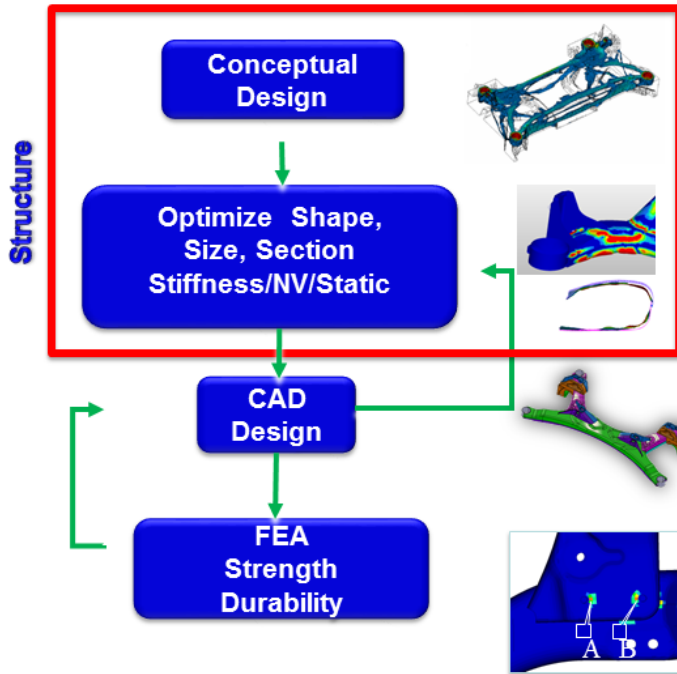
- F.tech Group Introduction
- F.tech Lightweight Challenge
 - Market Trend and Our Approach
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 - **HSS Application with Optimization Design**
- Summary

Optimization Driven Design

Optimization is a mathematical discipline that concerns the finding of minima and maxima of functions, subject to so-called constraints.



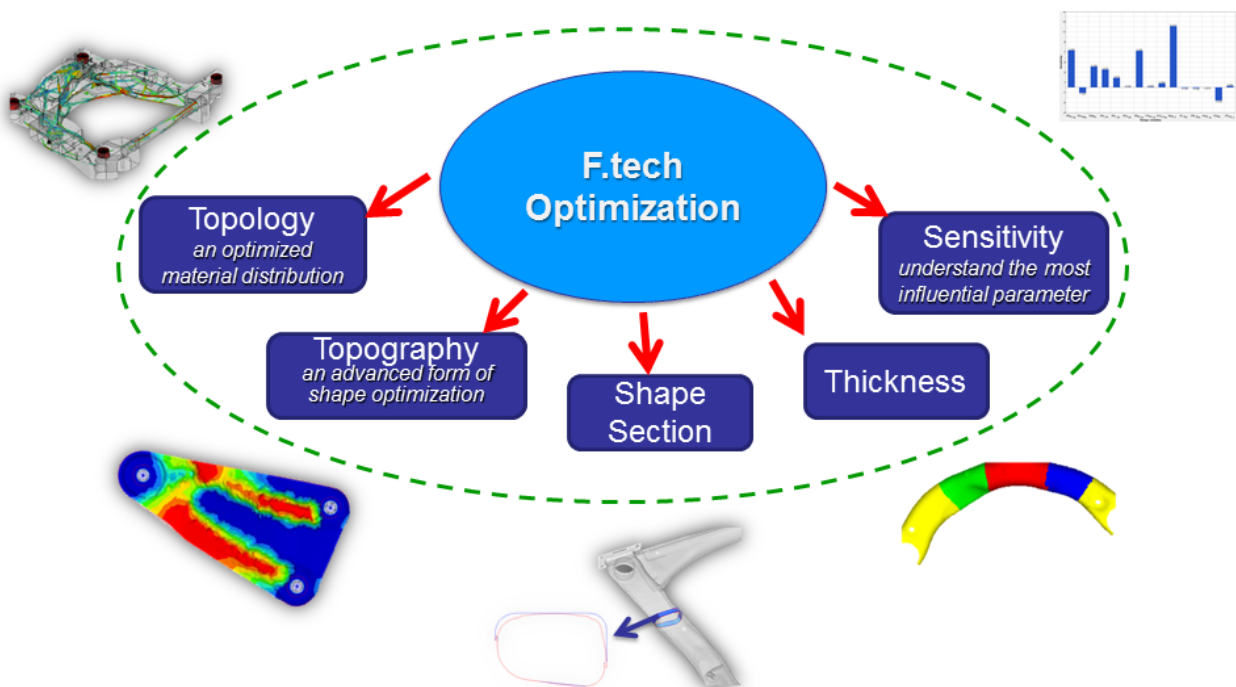
Optimization in Design Process



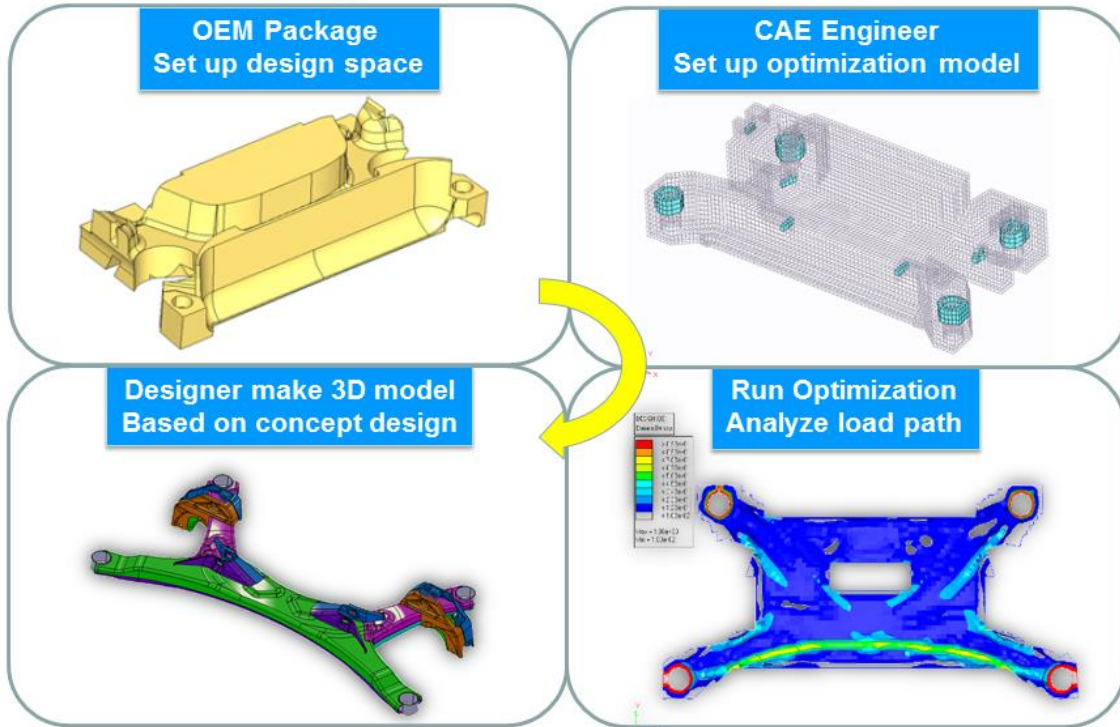
The concept phase plays a fundamental role concerning overall efficiency of the design and the cost of the overall development process. 90% cost and weight will be decided in the process.

The concept can be based on results of a computational optimization rather than on estimations.

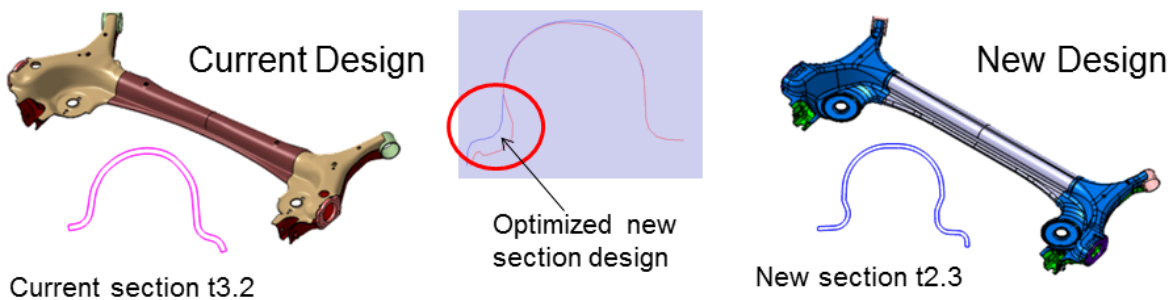
Optimization Capabilities



Concept Design based on Optimization



Shape/Section Optimization



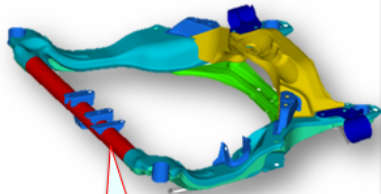
Rear Axial Beam optimized to best section to improve performance with same weight or reduce weight with same performance.



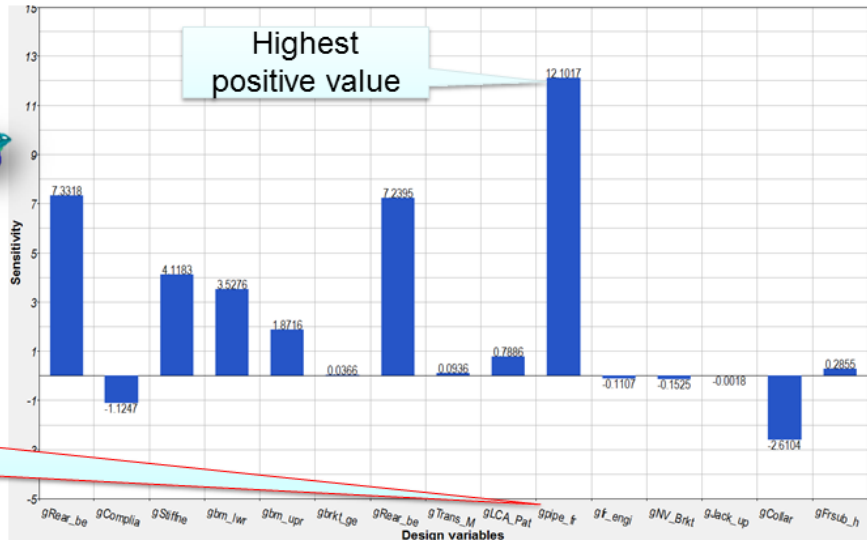
Design Options:
1. Torsional Rigidity: +20% with same weight
2. Weight down: 7% With same torsional rigidity

Sensitivity

Gauge sensitivity is used to find which part is most influential on performance.



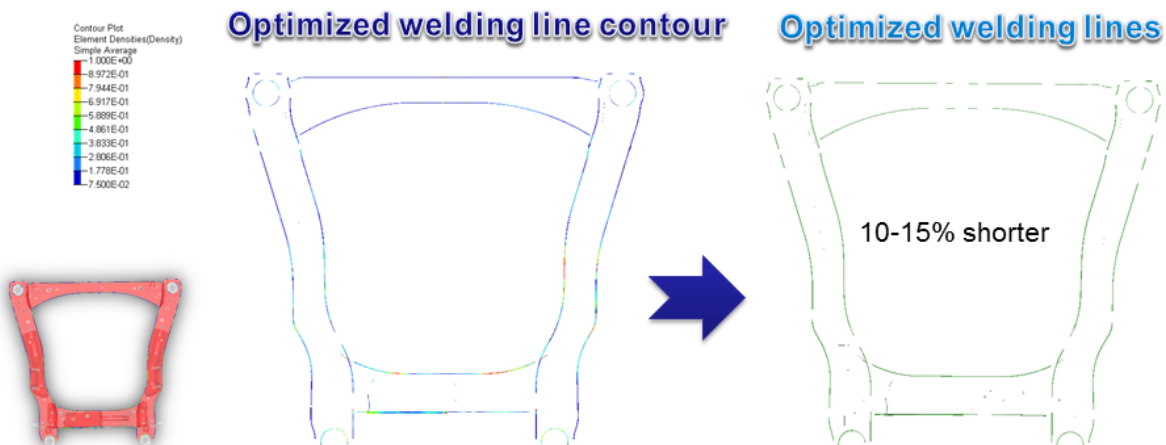
Front pipe is most sensitive to cradle torsional stiffness.



Efficient way to set up directions on how to achieve the required performance with competitive weight

Welding Optimization

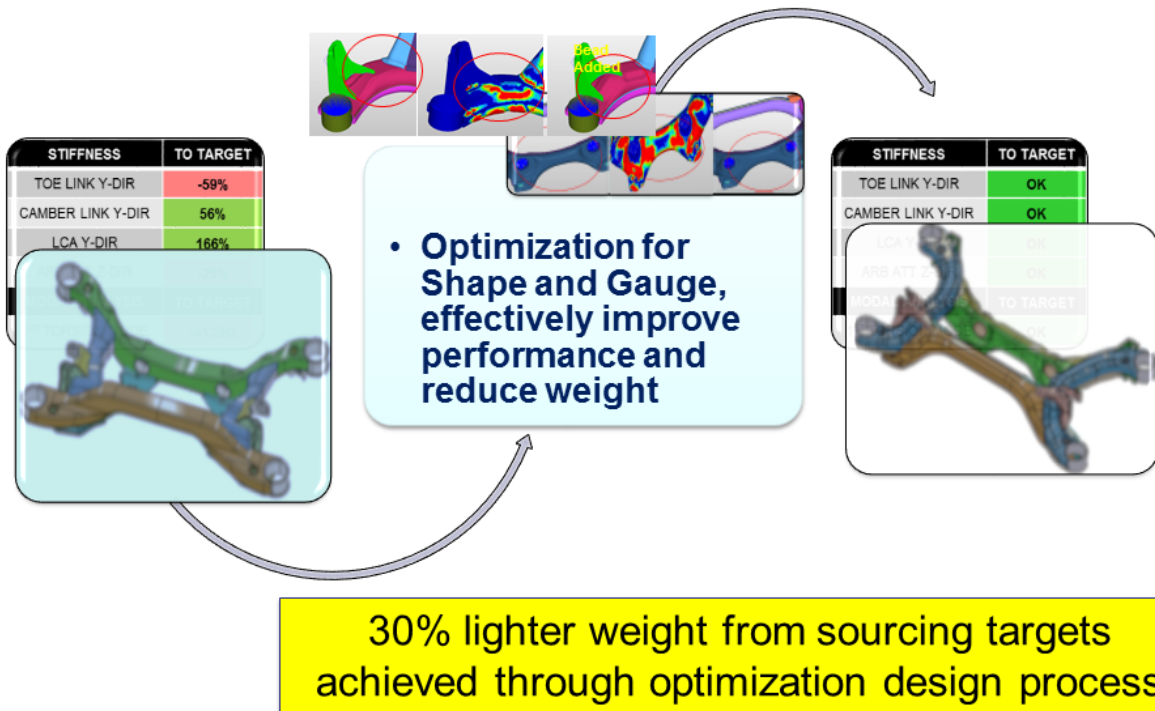
For a cradle, welding is important for durability, the cut-off welding location for paint holes and lower cost is critical to keep performance.



Red : Most important for performance
Blue: Least important for performance

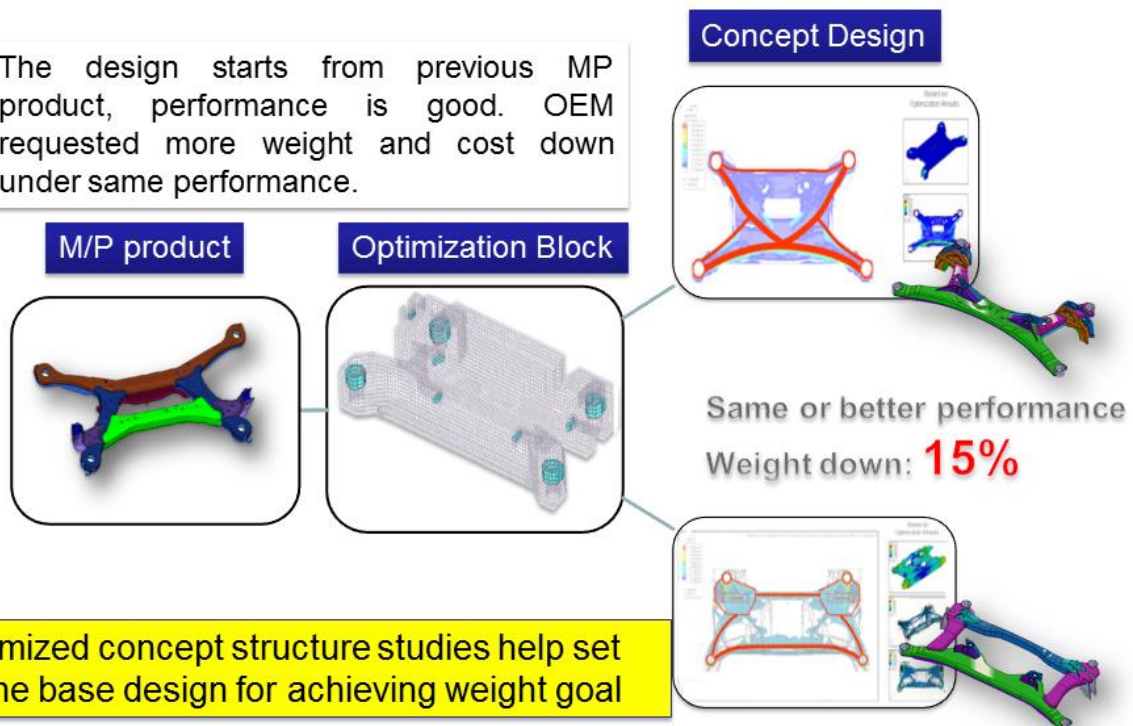
The welding length cut 10-15%

OEM Product 1- Rear Cradle



OEM Product 2 – Rear Cradle

The design starts from previous MP product, performance is good. OEM requested more weight and cost down under same performance.



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Summary

- ✓ F.tech, as a global Tier-1 chassis supplier, provides competitive technology and products to OEMs.
- ✓ Aluminum hot bulging technology can effectively help reduce more weight with more design flexibility. The world-first FSW technology achieves performance and cost balance by welding steel and aluminum.
- ✓ F.tech applies optimization driven design, which can greatly reduce development time, achieve optimum performance, and lower cost.

