

## North America 2015 9<sup>th</sup> - 11<sup>th</sup> of Nov

AUTOMOTIVE LIGHTWEIGHT

# PROCUREMENT SYMPOSIUM

Cobo Center, Detroit, USA



### SYMPOSIUM FOCUS

- Aluminum
- Carbon Fibre
- Composites
- High Strength Steel
- Magnesium

The 3<sup>rd</sup> Automotive Lightweight Procurement Symposium to be focused on automotive lightweighting, supply / process chain and procurement management, will take place in Detroit from the 9<sup>th</sup> – 11<sup>th</sup> of Nov 2015. The symposium is held in the days leading up to the "ALUMINUM USA" exhibition taking place at the Cobo Center, Detroit, Michigan (Walking distance to symposium venue)

### ATTENDING COMPANIES:



### ORGANIZING PARTNERS & SPONSORS



AluMag®  
 Europe 2016 27<sup>th</sup> - 29<sup>th</sup> of Nov  
 AUTOMOTIVE LIGHTWEIGHT  
**PROCUREMENT SYMPOSIUM**  
 Hilton Hotel in Duesseldorf, Germany

AluMag®  
 Asia 2016 6<sup>th</sup> - 8<sup>th</sup> of July  
 AUTOMOTIVE LIGHTWEIGHT  
**PROCUREMENT SYMPOSIUM**  
 Jumeirah Himalayas Hotel in Shanghai, China



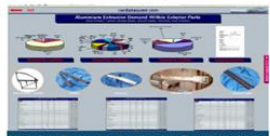
## AluMag® offers the four following services - worldwide:



Market Research

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

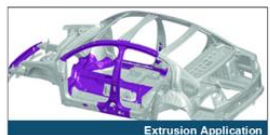
AluMag as your provider of automotive research and forecasting studies, offers you and your business, the market intelligence you need to realize the best strategic decisions



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-research and interviews, AluMag generates validated researches



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

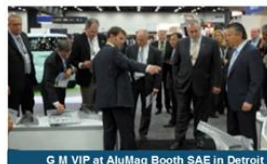
- Organization of Technical & Commercial Roadshows
- Oversea Commercial & Technical Events
- Host In-House Events & Presentation
- Common Technology Booth at Leading Exhibitions

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



Daimler Sindelfingen as Roadshow Location

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



G M VIP at AluMag Booth SAE in Detroit

### Upcoming Events:

- 2015 Nov: Automotive Light-weight Procurement Symposium in Detroit, USA
- 2016 April Common tech- booth at the SAE World Congress in Detroit, USA
- 2016 Jul: Automotive Light-weight Procurement Symposium in Shanghai, China
- 2016 Nov: Automotive Light-weight Procurement Symposium in Duesseldorf, Germany.



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

### 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

## CONTACTS & PROJECT TEAM



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## **N. America Automotive Lightweight Procurement Symposium 2015 9<sup>th</sup> – 11<sup>th</sup> Nov**

Cobo Center One Washington Blvd. Detroit, Michigan, 48226 USA



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# **AluMag<sup>®</sup>**

Europe ■ India ■ Americas ■ Asia  
**THE MARKET DEVELOPER**

## Company Speechs by:

Ford Research and Innovation Center

Carbon War Room and Meritor Headquarters

Striko Westofen America

Kurtz

Bharat Forge Aluminiumtechnik

C.P.C. USA

BOCAR Group

Ford Motor Company

Automotive Insight

EJOT Fastening Systems LP USA

UACJ Corp.

Lightweight Innovations for Tomorrow

Aluminum Blanking Company



# Agenda

## Agenda: (Is Continuously Being Updated)

### Monday The 9th Of November – Cobo Center, Detroit

05:30pm - 07:30pm



Pre-registration and Welcome

Reception

### Tuesday The 10th Of November – Cobo Center, Detroit

08:30am – 09:15am



Registration

Morning Coffee / Tea

09:15am – 09:30am



Welcome:

Mr. Jost GAERTNER - Managing Partner At AluMag Automotive GmbH

09:30am – 10:25am



Opening Keynote: Mr. Craig RENNEKER - Chief Engineer, New A/T Programs & Component – Transmission & Driveline Engineering At Ford Research & Innovation Center

**Lightweight Transmission & Driveline Components: Practical Challenges**

10:25am – 11:00am

Break for Refreshments/Coffee/Tea, Snacks, Networking, Tech Exhibition

11:00am – 11:45am



Paper 1: Mr Mike ROETH – Executive Director At North American Council for Freight Efficiency (NACFE) & Operations Leader – Carbon War Room



Paper 1: Mr. Karl MAYER – Director Product Line Management At Meritor

**Lightweighting Heavy Duty Class 8 Tractors and Trailers**

11:45am – 01:45pm

Break for Lunch, Refreshments, Networking, Tech Exhibition

01:45pm – 02:25pm



Paper 2: Mr Ryan BROWN – Director Of Sales At StrikoWestofen America

**Analysis Of Cost Drivers When Buying Lightweight Solutions / Materials & The Elimination Of These**

02:30pm – 03:10pm



Paper 3: Mr. Lothar HARTMANN – Managing Director Foundry Machines & Trimming Presses At Kurtz GmbH

**Chassis & Suspension Weight Reduction By LPDC Aluminum With Hollow Cross Sections**



Mr. Kevin CROY - NAFTA Sales Manager Foundry Machines & Trimming Presses At Kurtz GmbH

03:15pm – 03:45pm



Paper 4: Mr. Jörg MANTWILL – Director Sales At Bharat Forge Aluminiumtechnik GmbH & Co. KG

**HCM And Aluminum Forging – Partnership To Birth Chassis Parts' Safety**

03:45pm – 04:15pm

Break for Refreshments/Coffee/Tea, Snacks, Networking, Tech Exhibition

04:15pm – 04:55pm



Paper 5: Mr. Gary F. RUFF - President and Chief Executive Officer, Ruff and Associates, LLC 8/12 - Present

**Advanced Counter Pressure Casting Process for Light-Weighting of Auto and Truck Chassis and Suspension Components**

05:00pm – 05:55pm



Closing Keynote: Mr. Gilberto SALDIVAR – New Projects Group Manager At Bocar Group

**Key Factors To Achieve Mechanical Properties In Lightweight Structural Parts**

05:55pm – 06:00pm



Summary:

Mr. Roberto BOEKER – Managing Partner At AluMag Automotive LLC

# Agenda

06:00pm - 08:00pm



Dinner Speech:  
Mr. Richard KLEIN -  
Responsibility Strategic Planning -  
Business Development & German  
Business At BOCAR

**Wednesday The 11th Of Nov – Cobo Center, Detroit**

08:15am – 08:55am



Mr. Ali JAMMOUL – Global Director  
Body Exterior And Safety Engineering  
At Ford

**Body Lightweighting**

09:00am – 09:40am



Paper 1: Dr. Gerald COLE – President  
At Light Weight Strategies LLC

**Light Weighting the Automotive  
Industry - The Road to 2025 CAFÉ**

09:45am – 10:25am



Paper 2: Mr. Laurence CLAUS -  
President At NMI Training & Consulting  
Inc. & Technical Consultant To EJOT  
Fastening Systems LP USA

**EJOT Fastening Solutions Enable  
Lightweight Body-in-white Assembly**

10:25am – 11:00am

Break for Refreshments/Coffee/  
Tea, Snacks, Networking, Tech  
Exhibition

11:00am – 11:40am



Paper 3: Dr. Akio NIIKURA - General  
Manager R&D Division At UACJ Corp.

**UACJ's Global Strategy And  
Approach To The Automotive  
Aluminum Market**

11:45am – 12:05pm



Paper 4:  
Mr. Lawrence E. BROWN – Executive  
Director At Lightweight Innovations For  
Tomorrow

**Lightweight Innovations For  
Tomorrow!!!!**

12:10pm – 12:40pm



Closing Keynote:  
Ms. Laura ANDERSON – CEO At  
Aluminum Blanking Company

**The Story Behind Aluminum's  
Sourcing Evolution: A North  
America Perspective**

12:40pm – 12:45pm



Summary:

Mr. Jost GAERTNER, Managing  
Partner At AluMag Automotive  
GmbH

12:45 pm – 01:30pm



Reception Speech With Snacks &  
Finger Food

Mr. Michael KOEHLER - Industry Vice  
President At Reed Exhibitions USA

01:30pm – 05:30pm



Individual Or Guided Visit At The  
2015 "Aluminum USA" Exhibition



# EXHIBITOR

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## **TITLE**

**UACJ's Global Strategy And Approach To The Automotive Aluminum Market**

## **ABSTRACT**

**Abstract:**

- Outline of UACJ
- UACJ's global strategy
- Approach to Automotive Aluminum Market



## UACJ's Global Strategy and Approach to the Automotive Aluminum Market

November 11, 2015

North America Automotive Lightweight  
Procurement Symposium 2015



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Akio NIIKURA, Ph.D.  
General Manager  
R&D Division

**UACJ Corporation**

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## Contents



**1. Outline**

**2. Global Network**

**3. Approach to the Automotive Aluminum Market**



# 1. Outline

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## Introduction



**Started on October 1st, 2013**

Furukawa-Sky  
Aluminum Corp.



Sumitomo Light Metal  
Industries, Ltd

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## History

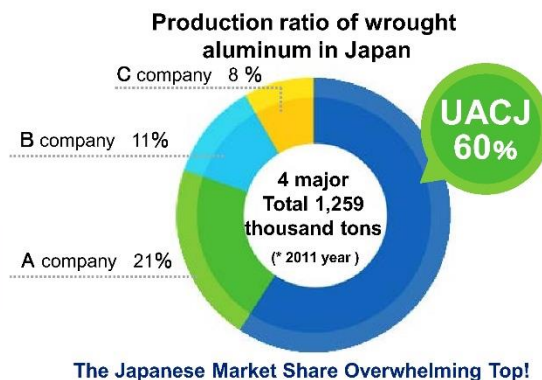
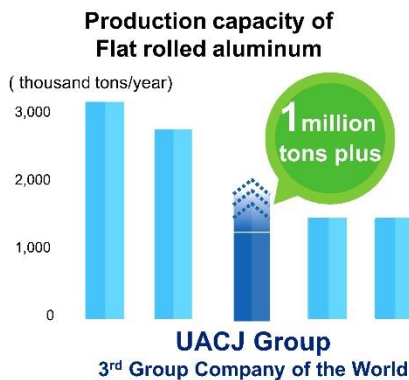


integrated business to form UACJ Corporation

## Business Outline



<b>Establish</b>	<b>October 1, 2013</b>
<b>Capital</b>	<b>45 billion yen</b>
<b>Total Companies</b>	<b>77 (160 bases)</b>
<b>Employee</b>	<b>8,556</b>
<b>Consolidated Net Sales</b>	<b>572.5 billion yen (Fiscal 2015)</b>

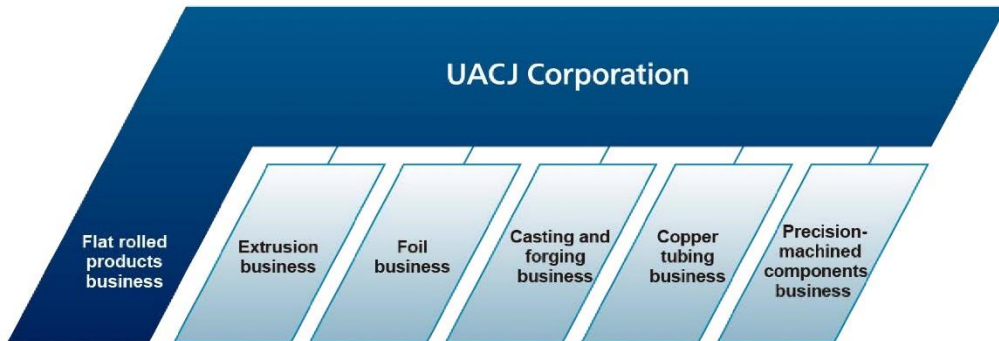


※ Estimated on the basis of the data of Japan Aluminium Association

## Business Fields



**Business areas of UACJ group  
dealing with a wide range of fields**



The UACJ Group is structured along business unit lines.

UACJ Corporation provides oversight for each units and UACJ is also responsible for manufacturing and sales in our flat rolled products business.

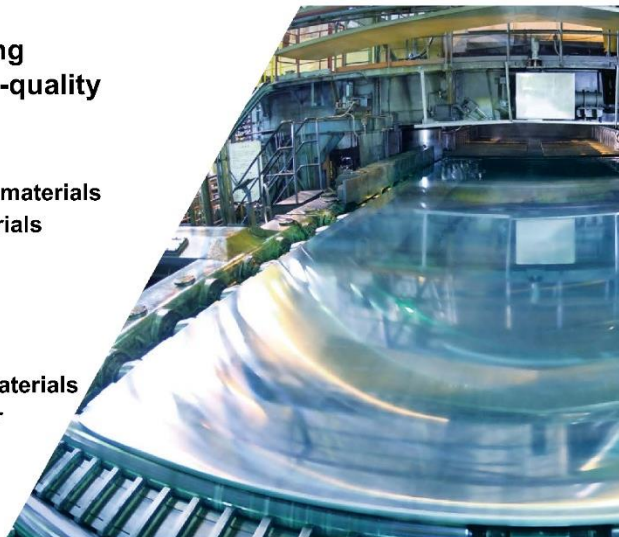
## Business Fields

### Flat Rolled Products Business



**World-leading Manufacturing Capabilities to Deliver High-quality Flat Rolled Products**

- Aluminum can stock and closure materials
- Automotive heat exchanger materials
- BiW (Body-in-White) panels
- LNG tank materials
- Aviation and aerospace materials
- IT materials
- Air-conditioner compressor fin materials
- Liquid crystal and semiconductor equipment thick plates
- Litho sheet materials
- Construction plates



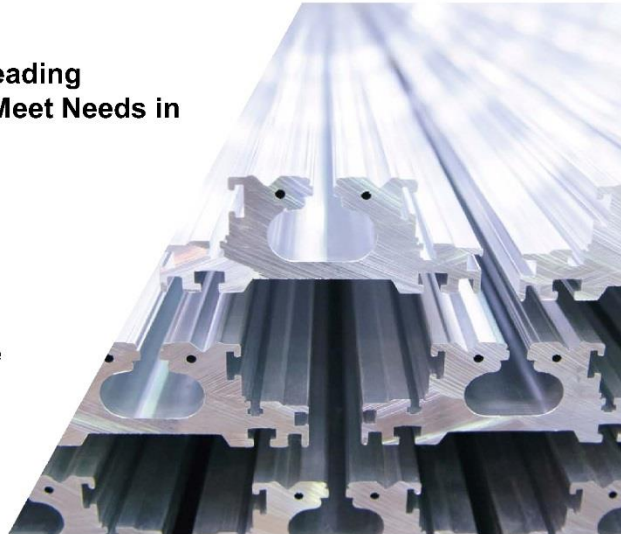
Business Fields

## Extrusion Business



**Comprehensive, Industry-leading Technological Prowess to Meet Needs in a Wide Variety of Fields**

- Automobile heat exchanger and tube materials
- Motorcycle frame materials
- Photocopier photoconductive drum materials
- Machine parts materials



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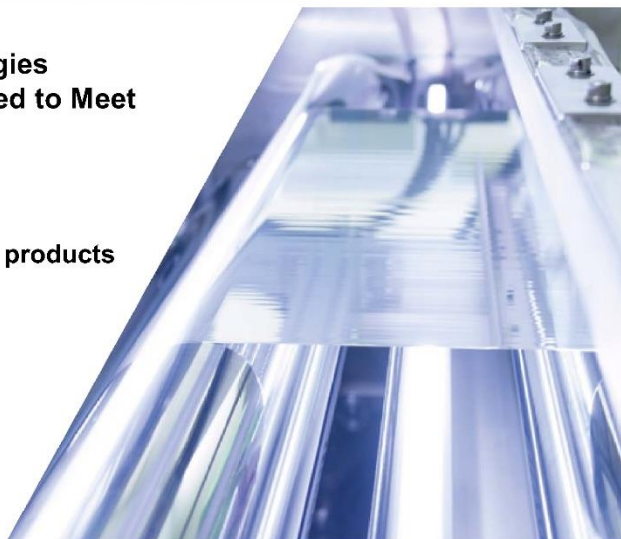
Business Fields

## Foil Business



**Unparalleled Foil Technologies to Supply Products Designed to Meet the Latest Needs**

- Capacitor foil
- Medical industry and chemical products packaging foil
- Foodstuffs and packaging foil
- Lithium-ion battery current collector foil
- Construction foil
- Daily-use foil



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## Business Fields

### Casting and Forging Business



**Delivering Highly Competitive Products  
Utilizing Advanced Technologies  
and Production Network**

- Turbocharger compressor wheels
- Forged products for aviation and aerospace materials
- Forged products for railcars
- Forged products for liquid-crystal production facilities



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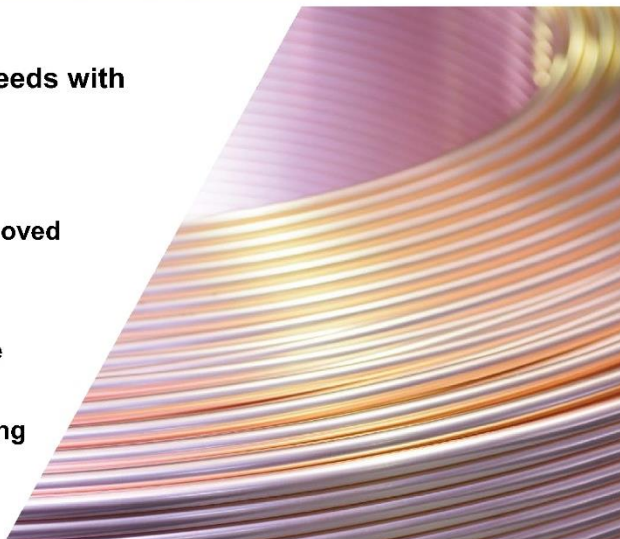
## Business Fields

### Copper Tubing Business



**Meeting a Wide Range of Needs with  
the Superior Materials  
Characteristics of Copper**

- Air-conditioner internally grooved copper tubing
- Hot-water heater pipe
- Construction/refrigerant pipe
- Heat exchanger tubing
- Copper alloy condenser tubing
- Titanium condenser tubing



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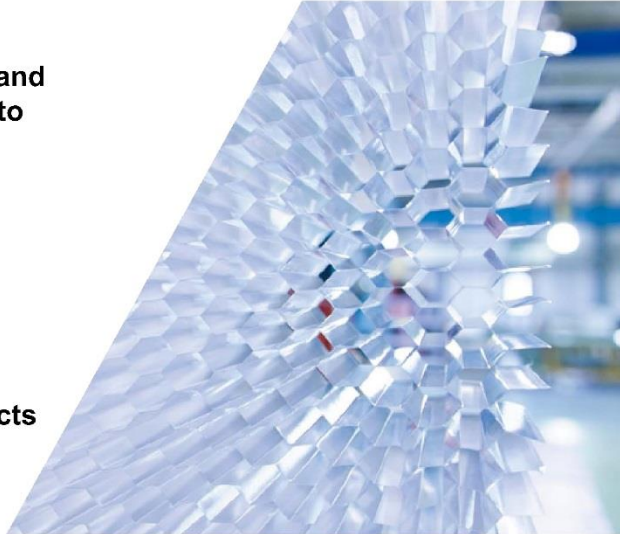
## Business Fields

### Precision-machined Components Business



**A Vast Array of Equipment and Technologies in Response to Various Processing Needs**

- Structural products
- Welded products
- Heat dissipation /cooling products
- Functional material products



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## Research & Development



### Applying Advanced Aluminum Expertise to Create New Innovations

UACJ is continuously developing next-generation products and technologies as we explore the potential of aluminum and create new value in metals. These R&D initiatives are spearheaded by the UACJ Technical Research and Development Center.



Fukaya Center



Nagoya Center

**Pursuing New Possibilities for Aluminum**

**Technology Development Headquarters for the UACJ Group**

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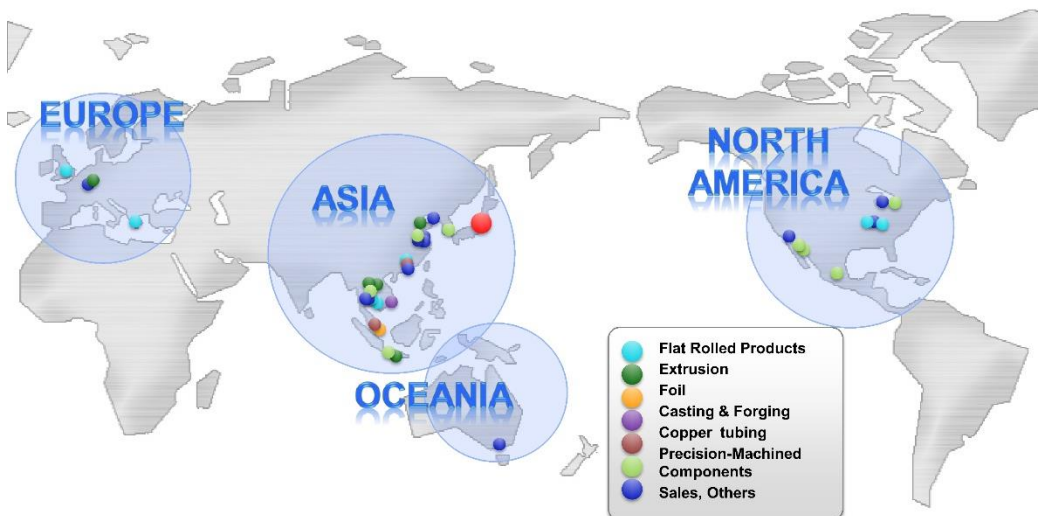
## 2. Global Network

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### Global Network of UACJ group

Global Supply Network to Deliver Products to Regions Worldwide



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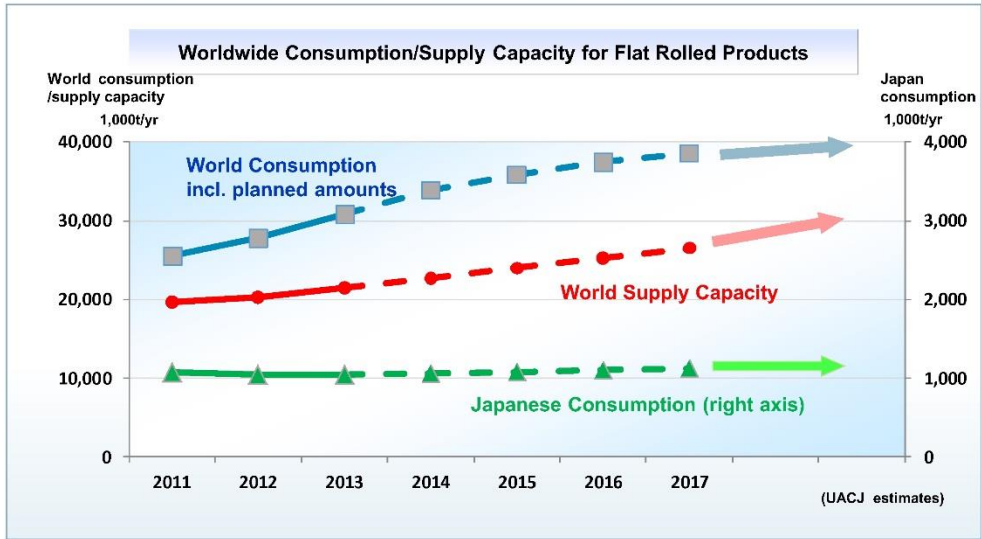
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## World wide Supply and Demand for Flat Rolled Products



World demand for flat rolled products is expected to grow steadily



## Demand for Flat Rolled Products in Growth Regions and Fields



### Growth Regions

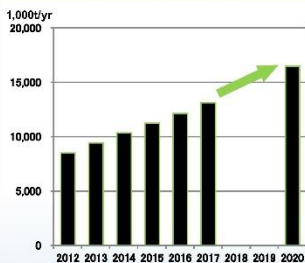
Demand is increasing in all fields, such as can and foil stock, with the remarkable economic growth in Asia and the Middle East.

### Growth Regions

Demand is growing in transportation fields such as the automotive industry and aerospace, especially in Europe and America, due to the need to reduce weight and other factors.

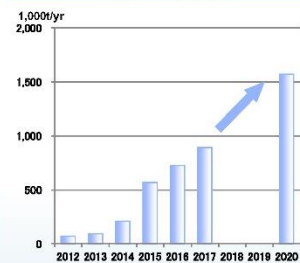
### Growth Regions

#### Total Demand in Asia/Middle East

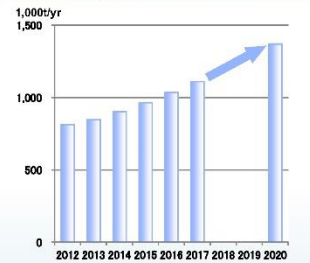


### Growth Fields

#### Demand for BiW in North America



#### Demand in European Transportation Sector



(UACJ estimates)



## Optimize Global Supply Network



Region Main products	Japan	North America	Europe	China/ South Korea	Southeast Asia	India	Middle East/ Africa
Can Stock	Fukui	TAA	-	Fukui	UATH	UATH	UATH
				UATH			
Automotive heat exchanger materials	Nagoya (Nikko)	UATH	AFSEL	Ruyuan	UATH	UATH	UATH
		AFSEL		UATH			
BiW	Nagoya (Fukaya)	Joint venture with Constellium	Under investigation				
Litho sheet	Nagoya	BAL	BAL	Nagoya	Nagoya	BAL	BAL
Thick plate (LNG tanker etc.)	Fukui Fukaya	-	-	Fukui Fukaya	Fukaya	-	-
				UPIA			

TAA: Tri-Arrows Aluminum Inc. (USA),

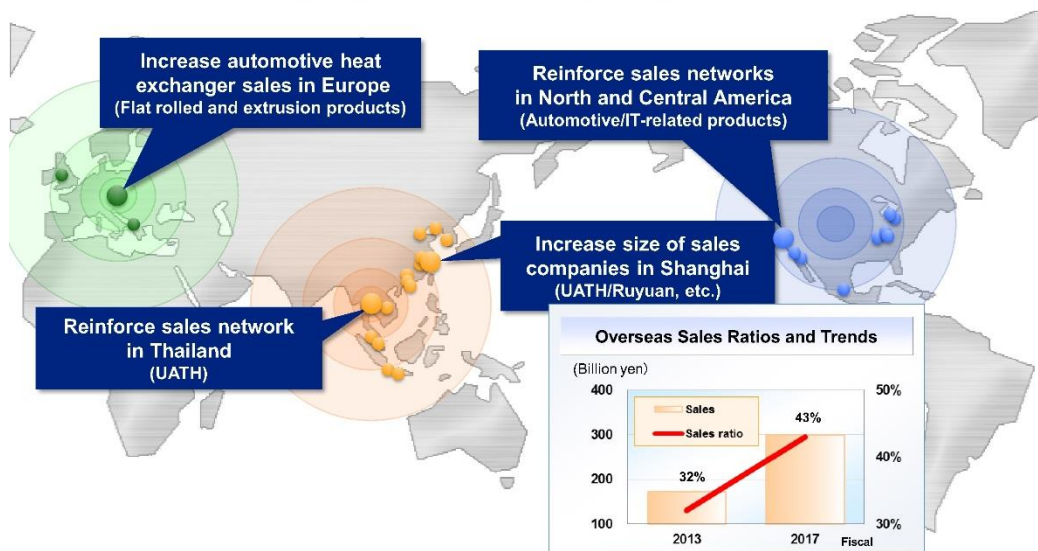
AFSEL: AFSEL S.A. (Joint venture with ELVAL, Greece) BAL: Bridgnorth Aluminum Inc. (UK)

Ruyuan: Ruyuan Dong Yang Guang Fine Foil Co., Ltd., (China)

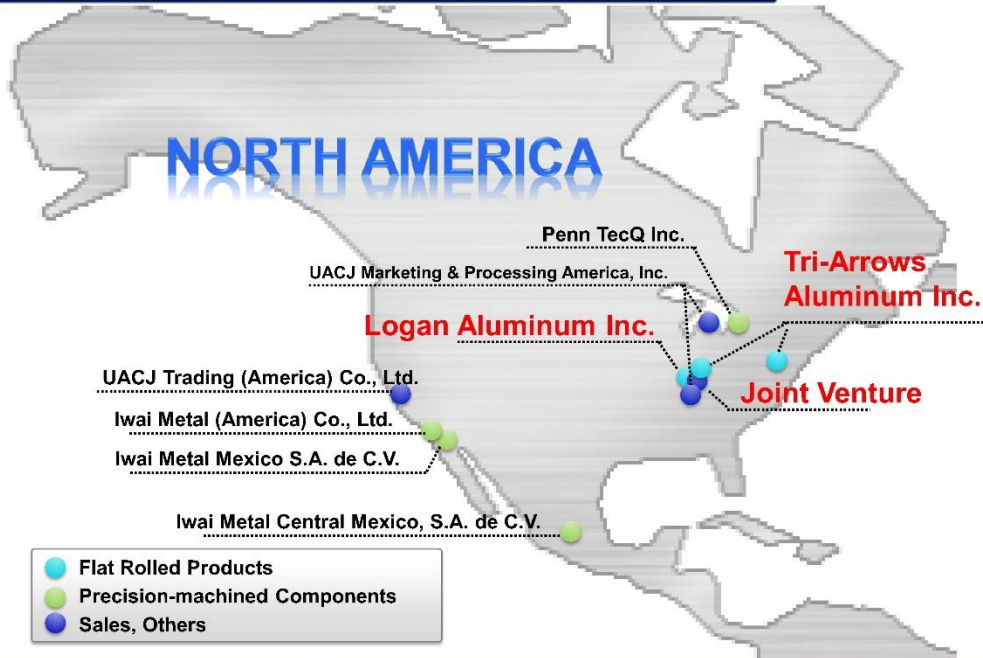
## Strengthening the Global Sales Network



Enhance marketing capabilities utilizing the global network



## Global Network: North America



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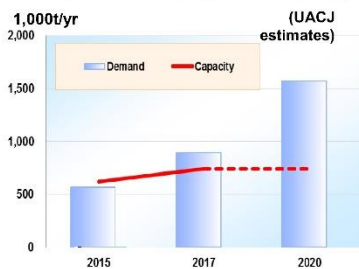
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## North American BiW Business



### Joint venture with Constellium N.V.

BiW Market in North America (UACJ estimates)



Provide high-quality products by combining the technologies of UACJ and Constellium N.V.

Invest in plant and equipment and prepare supply network

- Shorten period for first phase of investment
- ➔ Establish 100,000 t/yr capacity from 2016

Realize fully-integrated manufacturing in North America

- New UACJ-Constellium CALP plant in Bowling Green, KY
- Procure cold-rolled coil mainly from TAA/Logan mill

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## North American BiW Business

(joint venture with Constellium N.V.)



### New UACJ-Constellium plant in Bowling Green, KY



### Continuous Annealing Line with Pre-Treatment



## UACJ (Thailand) Co., Ltd. Rayong Works

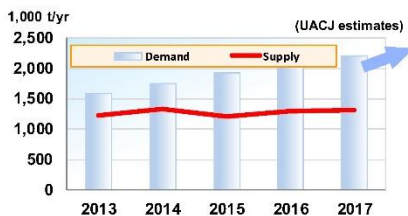


Establish fully-integrated manufacturing network

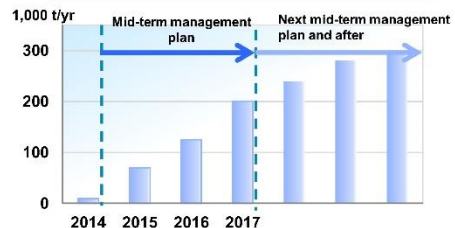
Differentiate by improving competitiveness

Function as first-class aluminum works in Asia

Outlook for Demand in Southeast Asia and Other Nearby Regions (excl. China, S. Korea and Japan)



UATH Production Volume







**Bird's-eye View of the Rayong Works**



**Mass Production**



**Melting Furnace**



**Production of Slabs**



**Hot Rolling Mill**

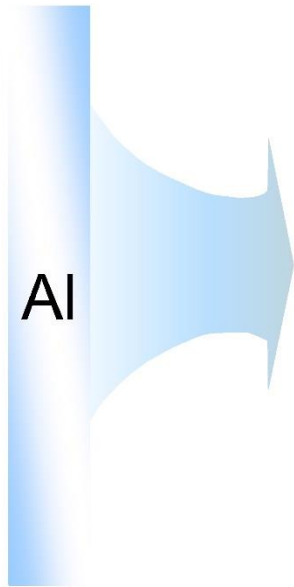


**Four-stand Finishing Mill**

## 3. Approach to the automotive Aluminum Market



## Automotive Lightweight & High-performance



BIW/Structure

Heat Exchanger

EV/HEV/Diesel

Engineering, R&D

- Automotive body panels
- Superplastic aluminum alloy (ALNOVI)
- Aluminum alloy extruded shapes
- Joining Technology, FSW, FSSW
- Tailored blanking
- Clad material (Heat exchanger for automotive)
- Heat-sink
- Aluminum cast product
- LiB module for automotive
- Foil for LiB
- SMART sheet
- CAE Technology

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## Aluminum alloys for automotive body panels



### Point of material design

Controlling tems:

- 1) Chemical composition
- 2) Microstructure
  - Intermetallic compound
  - Grain structure
  - Precipitation and solid solution
  - Crystal orientation

Through the production process

### High-quality surface properties

5xxx series alloy

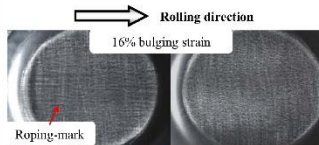
★ High SS-mark resistance ★



Standard SS-mark Free

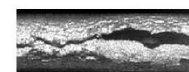
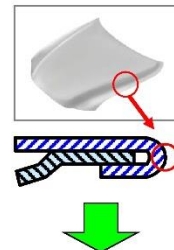
6xxx series alloy

★ High Roping-mark resistance ★

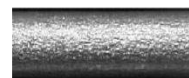


Standard Roping-mark Free

### Good bendability



Normal alloy



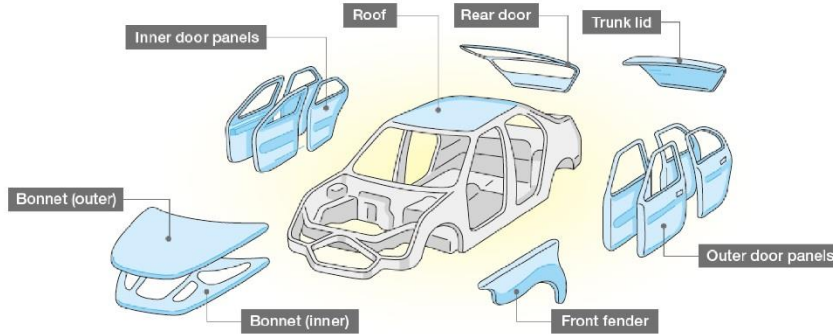
Developed alloy

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## Aluminum alloys for automotive body panels



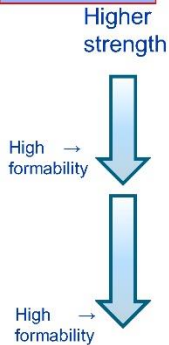
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## Aluminum alloys for automotive body panels



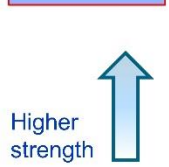
### 6000 series



**Mechanical properties** Types and mechanical properties (Sheet thickness: 1mm)

Material properties	AA <sup>*1</sup>	Tensile strength (N/mm <sup>2</sup> )	Proof stress (N/mm <sup>2</sup> )	Stretch (%)	Proof stress (after baking) <sup>*2</sup> (N/mm <sup>2</sup> )
SG112-T4	(6016)	230	120	27	195
SG212-T4	(6016)	240	130	28	205
SG212-T4 High formability type	(6016)	245	135	30	170
SG312-T4	(6111)	245	120	30	200
TM30-T4	(6005)	210	110	27	200
TM66-T4	(6111)	240	115	29	210
TM67-T4	(6111)	255	120	29	215
TM67-T4 High formability type	(6111)	285	145	29	175

### 5000 series



**Mechanical properties** Types and mechanical properties (Sheet thickness: 1mm)

Material properties	AA <sup>*1</sup>	Tensile strength (N/mm <sup>2</sup> )	Proof stress (N/mm <sup>2</sup> )	Stretch(%)	n value <sup>*2</sup>
GC45-O	5022	280	140	32	0.31
GC55-O	5023	285	130	34	0.35
GM145-O	5182	270	120	28	0.33
52S-O	5052	205	105	28	0.26

\*1 AA: The Aluminum Association (U.S.A.)

\*2 Average value from 2% to the maximum load

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## Superplastic forming Material



Superplastic 5000 Series Aluminum Alloy "ALNOVI"

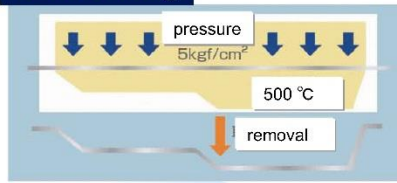
### Superplastic deformation



Aluminum alloys with fine grains show high elongation, 300%- at high temperature, 400~500°C

### Manufacturing technology

#### Blow forming



Superplastic blow forming and ALNOVI enable flexible forming as if plastic.

### Products

#### Automotive



#### Aircraft



#### Miniature model



## Aluminum alloy extruded shapes, tubes



### Material development

- **ZK80**: Alloy with strength and fracture toughness further enhanced than the 7204
- Creating and Optimum **cross-sectional configuration**

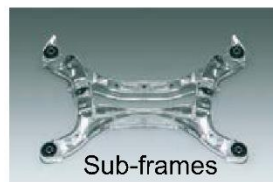
- **254S(A5154)**: non-heat-treatable **5000 series** alloy

- Aluminum materials can be applied to structural and rotational axis materials.

### Manufacturing technology



Bumper



Sub-frames



### Products

Mazda MX-5  
Front Bumper system  
Δweight = -2.4 Kg

## Higher strength 7000 series Extrusion



### Material development

Ordinary extruded shapes

UACJ High strength 7000series

6061-T6	ZK170-T5	ZG62-T76
TS : 315MPa	TS : 440MPa 40%up	TS : 600MPa 90%up
YS : 275MPa	YS : 400MPa	YS : 560MPa
EL : 17%	E : 14%	E : 12%

### Products

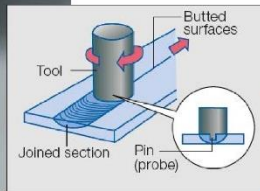
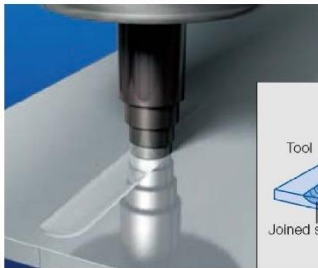


ZG62(A7050) : The world's top share as the front fork outer material for motorbikes

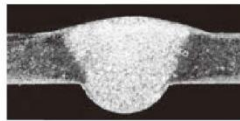
## FSW (Friction Stir Welding)



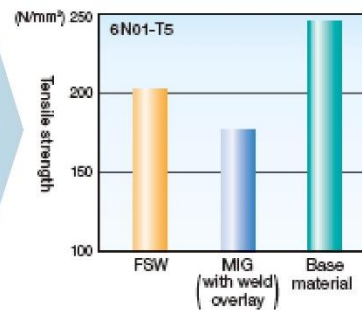
### Manufacturing technology



FSW



Arc welding



Strength at joined section

- The strength reduction at the thermally affected area is very small.
- High joint strength
- As strain is small, Residual stress can be suppressed.

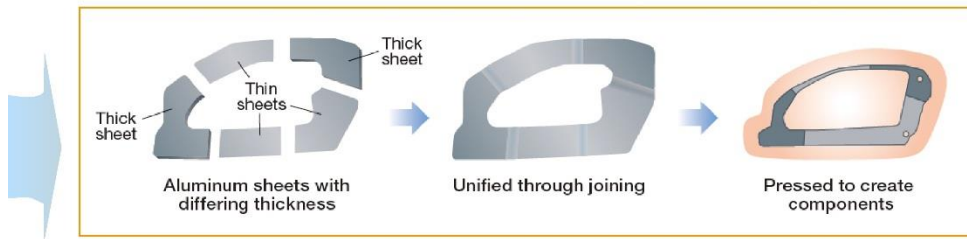


## Tailored blanking



### Manufacturing technology

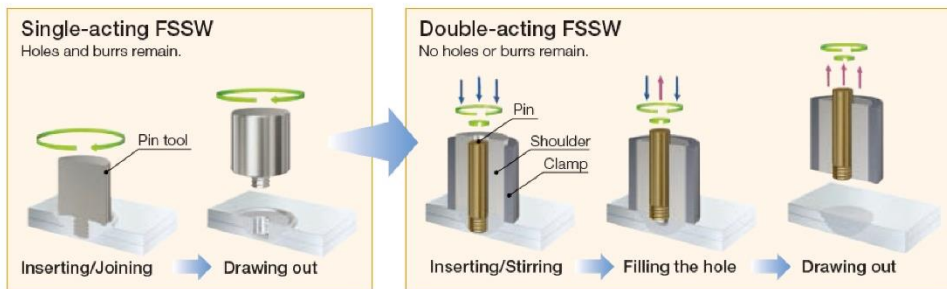
The thickness of materials can be arranged in an optimal manner, which effectively reduces the weight of parts.



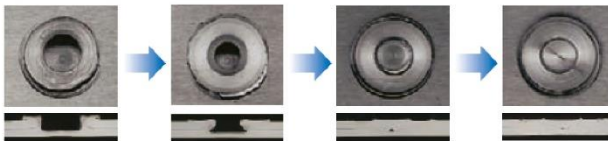
## FSSW (Friction Stir Spot Welding)



### Manufacturing technology



#### Double-acting FSSW process



less energy than resistance spot welding  
Improves the work environment: no sputtering

## Aluminum materials for automotive heat exchanger



### Material development

#### Durability (Strength)

Core Alloy Design  
Use of Age-hardening

#### Corrosion resistance

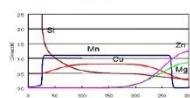
Sacrificial and Core Alloy Design  
Coating Material Development  
Corrosion Life Prediction

#### Brazeability

Filler and Core Alloy Design  
Metallic Structure Control  
Flux Free Brazing

#### Use of Simulation

##### Elemental Diffusion

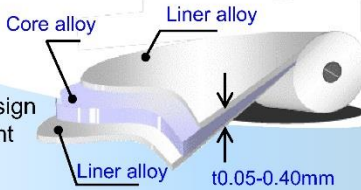


##### Elemental Distribution during Filler Solidification

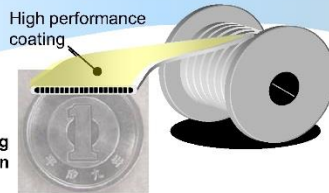


### Manufacturing technology

#### Cladding technology



#### Extrusion and Coating technology



### Products



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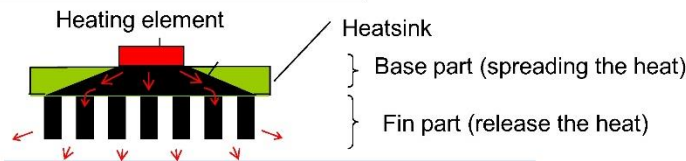
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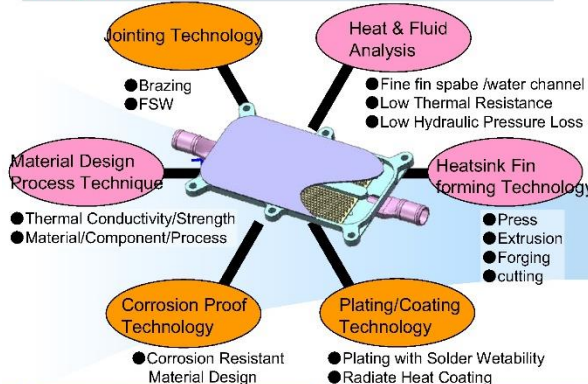
## Heat sink



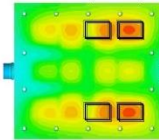
### Heatsink for electronic device



#### Thermal conductivity (material) & construction design : CAE



#### Surface temp. distribution(CAE)



### Products

- ⊙ Automobile (EV, HEV, FCV)
- ⊙ Railway car
- ⊙ Industrial machine controller



Corrugate (off-set type)



Multi-hole extrusion (high aspect ratio)



Forged pin fin

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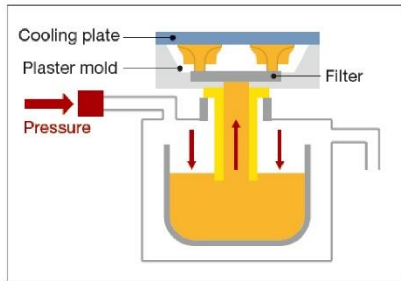
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## Aluminum cast products



### Manufacturing technology

#### Low-pressure casting



The molten aluminum is cast into the mold by applying low-pressure gas. Aluminum castings with excellent strength, durability and dimension accuracy are produced.

### Products

Compressor wheels for automobile Turbocharger



*Over 10million pieces/year*  
*No.1 Share in the World*

## LiB module for automotive



Blow-off pipe  
(Corrosion resistance:  
clad pipe)

Series contact parts  
(Electric conductivity:  
Al busbar)

Cell  
(High heat dissipation :  
Al busbar)

Battery container  
(Electric conductivity,  
Laser welding)

Battery cell cooler (water cooling) :  
(High heat dissipation:heatsink)

Battery protection cover  
(Corrosion resistance:  
pre-coat Al)

Battery computer cover  
(Corrosion resistance:  
pre-coat Al)

Battery board cooler  
( air cooling)  
( High heat dissipation:  
heatsink)

Print circuit board  
(High reliability,  
KO treated material)

Pipe for coolant water  
(Corrosion resistance:  
pipe)

Al foil for polymer exterior  
Al foil for lead tab  
Al foil for electrode collector  
Carbon coated Al foil  
Cu foil for electrode collector

Foil



## Foil for LiB



### Material development

- Strength
- Electric conductivity
- Formability

### Product design

- Electrode Collector
- Surface profile better for active materials
  - Better adhesion properties
  - Lower internal resistance

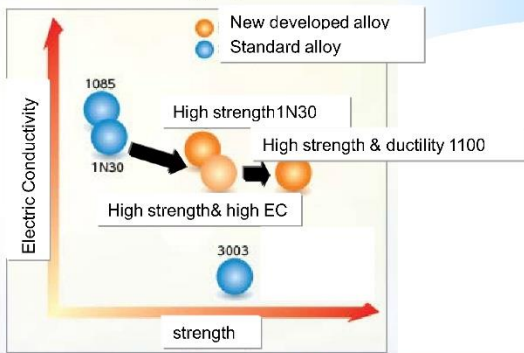
### Products

Electrolytic capacitor



### High strength Al foil

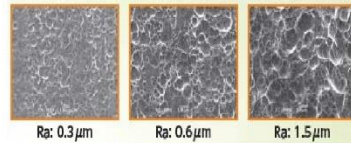
Realize the downgaugeness of foil



LiB  
Electric double-layer capacitor

### Al foil with advanced surface profile

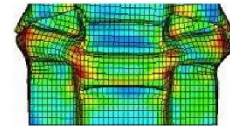
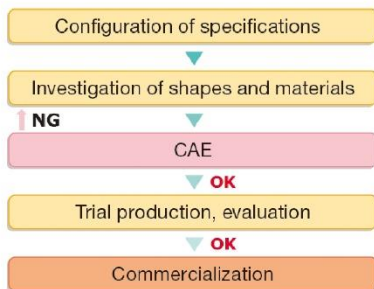
ASP (Advanced Surface Profile)



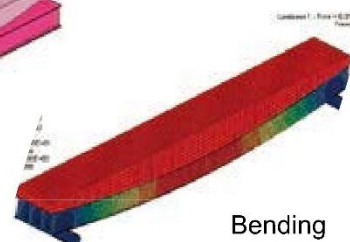
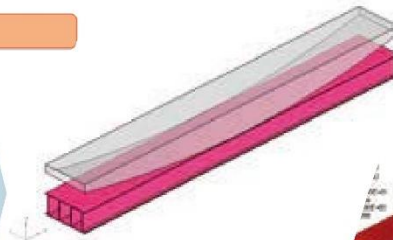
## CAE Computer-Assisted Engineering



### Development procedures



Compression test on energy-absorbing components



Bending

By using various CAE simulations, the number of trial productions and evaluation tests can be reduced.



# SMART sheet

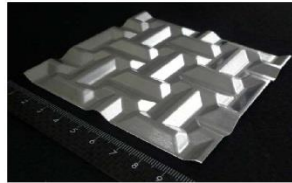
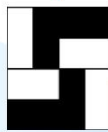


Super Multipurpose Aluminum Reinforced and Textured SHEET

## Design concept

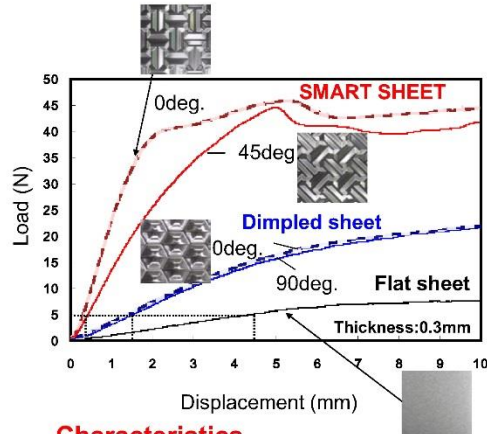
-  : Convex
-  : Concave

Fundamental region



## Creation of the unit pattern

Having high second moment of area at any arbitrary cross sections of the unit pattern



## Characteristics

- Isotropic high bending stiffness
- High energy absorption performance

# Summary



## 1. Outline

UACJ corporation was started on October 1<sup>st</sup> 2013. The annual capacity for flat rolled products exceeded 1 million tons, making them the largest such manufacturer in Japan and the third largest in the world.

## 2. Global Network

UACJ focuses in all fields such as can and foil stock in Asia and the Middle East, and transportation fields such as the automotive industry and aerospace, especially in Europe and America. UACJ has an extensive global network system to supply products worldwide.

## 3. Approach to the Automotive Aluminum Market

Automotive weight reduction technology is indispensable for improving efficiency. UACJ is actively involved in R&D of aluminum material as well as the technological development required for promoting their utilization.

**Thank you for your attention!**

**Please visit UACJ booth #1204  
at the "Aluminum USA 2015 " Exhibition.**

# We Welcome You To Our Next Event

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**AluMag SAE 2016** 12<sup>th</sup> – 14<sup>th</sup> April

Light Weighting - Emission Reduction - Car Comfort

Technology Center, Booth # 763 - Detroit - Cobo Center, MI USA

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**Asia 2016** 6<sup>th</sup> - 8<sup>th</sup> of July

AUTOMOTIVE LIGHTWEIGHT

**PROCUREMENT SYMPOSIUM**

Jumeirah Himalayas Hotel in Shanghai, China

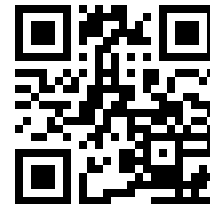
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**Europe 2016** 27<sup>th</sup> - 29<sup>th</sup> of Nov

AUTOMOTIVE LIGHTWEIGHT

**PROCUREMENT SYMPOSIUM**

Hilton Hotel in Duesseldorf, Germany



Organized by AluMag

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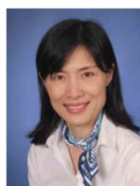


**AluMag®**

Europe ■ India ■ Americas ■ Asia  
**THE MARKET DEVELOPER**



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