

Asia 2015 6th - 8th of Jul

AUTOMOTIVE LIGHTWEIGHT

PROCUREMENT SYMPOSIUM

Jumeirah Himalayas Hotel in Shanghai, China



SYMPOSIUM FOCUS

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

HIGHLIGHTS

• INTERNATIONAL SPEAKERS

AUDI - MAGNA - DGS - GEELY - NOVELIS - JSC - VOESTALPINE, ...

• LIGHTWEIGHT TECHNOLOGY EXHIBITION

DGS - StrikoWestofen - Kurtz - Novelis – Idra

• SIMULTANEOUS INTERPRETING

Chinese - English / English - Chinese

ATTENDING COMPANIES



MEDIA & ORGANIZATION PARTNERS



Brings together the procurement and supply side of lightweight materials and their advanced processes in accompany with cost balance or reduction....

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

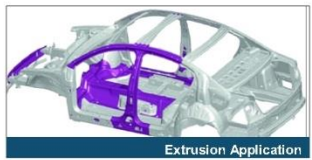
AluMag as your provider of automotive research and forecasting studies, offers you and your business, the market intelligence you need to realize the best strategic decisions



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



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 Jul: Automotive Light-weight Procurement Symposium in Shanghai, China
- 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



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



Mr. Jost GÄRTNER
Managing Partner
AluMag® Automotive GmbH
Kirchplatz 1a
59706 Mendon
GERMANY
Tel.: +49 2373 929492
j.gaertner@alumag.de
German & English



Ms. Ying ZHOU
Project Coordinator
Japan & China
AluMag® Automotive GmbH
Kirchplatz 1a
59706 Mendon
GERMANY
Call: +49 172 6415876
y.zhou@alumag.de
German & English & Chinese & Japanese



Mr. Roberto BOEKER
Managing Partner
AluMag® Automotive LLC
42055 Michigan Avenue
Canton, MI 48103
USA
Call: +1 248 962 5086
r.boeker@alumag.de
English & German & Spanish



Mr. Thomas KATZMARK
New Business Development Manager
AluMag® Automotive LLC
20829 Sunnydale
Farmington Hills, MI 48336
USA
Call: +1 313 410 0965
t.katzmark@alumag.de
English



Mr. Jesper LARSEN
Manager Market Research
AluMag® Scandinavia
Byagorvænget 58
8330 Beder
DENMARK
Call: +45 2573 8790
jlarsen@alumag.de
German & English & Danish



Ms. Jacqueline TEUBER
Senior Roadshow Organizer
AluMag® Automotive GmbH
Kirchplatz 1a
59706 Mendon
GERMANY
Tel.: +49 2373 929496
j.teuber@alumag.de
German & English



Mr. Ricardo SCHOER
Senior Consultant
AluMag® Automotive LLC
Av. San Antonio 189-131
Col. Napoles 03810
MEXICO
Call: +52 55 4002 0501
r.schoer@alumag.de
English & German & Spanish





Asia Automotive Lightweight Procurement Symposium
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AluMag Automotive GmbH
Jost Gaertner
Managing Partner
Tel.: +49 2373 929492
Cell: +49 172 6000569
j.gaertner@alumag.de
www.alumag.de

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THE MARKET DEVELOPER

Company Speechs by:

<u>Audi AG</u>	<u>10</u>
<u>Magna Steyr Engineering AG & Co KG</u>	<u>16</u>
<u>DGS Druckguss Systeme AG</u>	<u>42</u>
<u>Guangdong Hongtu Technology Co.,Ltd</u>	<u>58</u>
<u>Kurtz GmbH</u>	<u>68</u>
<u>Voestalpine AG</u>	<u>90</u>
<u>JSC Automotive Consulting Co. Ltd.</u>	<u>108</u>
<u>StrikoWestofen GmbH</u>	<u>124</u>
<u>Geely Automobile Research Institute</u>	<u>140</u>
<u>Novelis China</u>	<u>156</u>
<u>Sapa Technology Asia</u>	<u>174</u>
<u>Kobelco (China) Holding Co Ltd.</u>	<u>202</u>
<u>GASGOO Research Institute</u>	<u>224</u>
<u>AluMag Automotive GmbH</u>	<u>225</u>

Agenda

Agenda: (Is Continuously Being Updated)

Monday The 6th Of July – Jumeirah Himalayas Hotel, Shanghai – 6th Floor

06:00pm - 10:00pm

Pre-registration and Welcome Reception

Tuesday The 7th Of July – Jumeirah Himalayas Hotel, Shanghai – 6th Floor

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. Frank VENIER, Strategy and Innovation; Lightweight Design Centre at AUDI AG

Lightweighting SUV - The New Audi Q7 In Multimaterial Car Body Design

10:25am – 11:00am

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

11:00am – 12:00am

Paper 1 – Part 1:

Mr. Gerhard KRACHLER, Director Advanced Development & Product Strategy at MAGNA STEYR Engineering AG & Co.KG

Paper 1 – Part 2:

Mr. Christian JURICEK, Manager R&D Europe at COSMA MAGNA International

Magna's Global Advanced Lightweight Competences

12:00pm – 01:45pm

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

01:45pm – 02:25pm

Paper 2:

Mr. Andreas MUELLER, CEO at DGS Druckguss Systeme AG

Localization And Industrialization Of Cast Aluminium Structural Applications

02:30pm – 03:10pm

Paper 3:

Mr. Li WAN, Vice President at Guangdong Hongtu Technology (Holdings) Co Ltd

Aluminum Alloy High Vacuum Die Casting Technology And It's Application On Automotive Structural Parts

03:15pm – 03:45pm

Paper 4:

Mr. Lothar HARTMANN – Managing Director Foundry Machines & Trimming Presses at Kurtz GmbH

Mr. Michael BARTEL – Asia Sales Manager Foundry Machines & Trimming Presses – Kurtz GmbH

Low Pressure Casting

A traditional casting technology helping to step ahead for light weight solutions in engine block manufacturing

03:45pm – 04:15pm

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

04:15pm – 04:55pm

Paper 5:

Mr. Peter BERNSCHER, Member Of The Board & Director Automotive Body Parts at Voestalpine Metal Forming GmbH

Lightweight Solutions In The Automotive Industry By Voestalpine

05:00pm – 05:55pm

Closing Keynote:

Mr. Jochen SIEBERT, Managing Partner at JSC Automotive Consulting Co. Ltd.

Outlook And Hurdles Of The Chinese Economy And Automotive Industry

05:55pm – 06:00pm

Summary:

Ms. Ying ZHOU, Project Coordinator China – Japan at ALUMAG Automotive GmbH

06:00pm - 10:00pm

Reception Sponsored By StrikoWestofen

Dinner Speech – Part 1:

Mr. Rudolf RIEDEL – Group Managing Director at StrikoWestofen GmbH

Dinner Speech – Part 2:

Mr. Rainer ERDMANN – Managing Director Asia Operations at StrikoWestofen Thermal Equipment Co.Ltd

Profits With Light Metal Castings Start In The Melt Shop

Agenda

Agenda: (Is Continuously Being Updated)

Wednesday The 8th Of July

08:15am – 08:55am

Opening Keynote:

Prof. Fei XIONG Chief Engineer & Director of Auto Lightweight Department at GEELY

Automotive Lightweight Promoting The Application Of Aluminium

09:00am – 09:40am

Paper 1:

Mr. James LIU, Managing Director and Vice President of Asia Auto at NOVELIS China

High Volume Aluminum Solutions For Lightweighting

09:45am – 10:25am

Paper 2:

Dr. Jin HOU – General Manager – Sapa Technology Asia

High Performance Aluminium Alloys For Automotive Light-Weighting

10:25am – 11:00am

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

11:00am – 11:40am

Paper 3:

Mr. Yoshikazu MUKAI, Executive Vice President & Technical Specialist at Kobelco Automotive Aluminium Rolled Products (China) Co.,Ltd – Shanghai Branch

Kobe's R&D Activities For Automobile Lightweighting

11:45am – 12:25pm

Closing Keynote:

Mr. Martin SHI, Chief Editor at GASGOO International And Senior Analyst at GASGOO Research Institute

The Status And Development Trends Of China Automobile Lightweight

12:30pm – 12:35pm

Summary:

Mr. Jost GAERTNER, Managing Partner at ALUMAG Automotive GmbH

12:45pm – 01:00pm

Walk To The SNIEC Shanghai New International Expo Centre

01:00pm – 01:40pm

Reception With Snacks & Finger Food at the SNIEC

01:40pm – 05:30pm

Individual Or Guided Visit At The 2015 "Aluminium China " And "China Diecasting" Exhibitions

Backup Speech

Mr. Jost GAERTNER, Managing Partner at AluMag Automotive GmbH

Top 16 Global Ranking Of Aluminium And Magnesium Foundries By Revenue

EXHIBITOR

DGS Druckguss Systeme AG
CHE 9015 St. Gallen-Winkeln
Tel.: +41 71313 8888
www.dgs-druckguss.com



IDRA CHINA Limited
200122 Pudong
Tel.: +86 21 68751216
www.idrachina.com



Kurtz GmbH
97892 Kreuzwertheim
Tel.: +49 9342 807 0
<http://www.kurtzrsa.de>



Novelis China
CHN 201103 Shanghai
Tel.: +86 21 60355121
www.novelis.com



StrikoWestofen GmbH
GER 51643 Gummersbach
Tel.: +49 2261 709 10
www.strikowestofen.com



voestalpine

EINEN SCHRITT VORAUS.



Mr. Peter Bernscher
Member Of The Board &
Director Automotive Body Parts

Voestalpine AG
4020 Linz
Tel.: +43 50304 15 4339
www.voestalpine.com

TITLE

Lightweight Solutions In The Automotive Industry By Voestalpine

ABSTRACT

Lightweight design will play an increasingly central role. The right material in the right place is essential. In vehicle high- and ultrahigh-strength steels, aluminum, plastics and hybrids are gaining in importance. The future of lightweight construction in the automotive industry are different concepts of a mix of materials, depending on the volume and price structure of a vehicle but always driven by increasing safety and efficiency targets. The Metal Forming Division of voestalpine now works with various materials. The largest contribution to the lightweight is undoubtedly in the steel sector (phs-ultraform steels), but also aluminum and hybrid components are an issue. Voestalpine is constantly working on new lightweight solutions, not only for the automotive sector but also for other industrial segments.



Lightweight Solutions in the Automotive Industry by voestalpine

Peter Bernscher
Shanghai, 7th July 2015

voestalpine
ONE STEP AHEAD.

voestalpine Activity Overview



Steel	Special Steel	Metal Engineering	Metal Forming
Top European Player	Global Leadership	Global Leadership	Global Top Player
Top-three European supplier of high quality sheet and global top position in heavy plate for the most demanding applications.	Worldwide leader in tool steel. Leading position in high-speed steel and special forgings.	European market leader for rails and processed wire, world market leader for turnouts and complete railway systems; leading position in welding consumables and seamless tubes.	Leading worldwide supplier of high-quality metal processing solutions, in particular special sections and precision steel coil as well as complex components for the automobile industry.

voestalpine in Figures Overview

Key figures for 2014/15

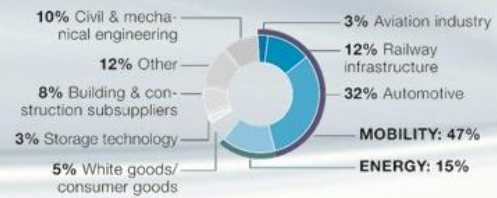
Employees	47,418
Revenue	EUR 11,189.5 million
EBITDA	EUR 1,530.2 million
EBIT	EUR 886,3.3 million
EBIT margin	7.9%

500 Group companies and locations in more than 50 countries and on all five continents.

Revenue by regions (Business year 2014/15)



Revenue by industries (Business year 2014/15)



Why Lightweight Design?

General Requirements

CO₂ Emission



Weight reduction



Economy / Costs

Customer Expectations

Safety

Comfort

Protection of Environment

Durability

Short Lifecycles

Standardization

Safety Regulations

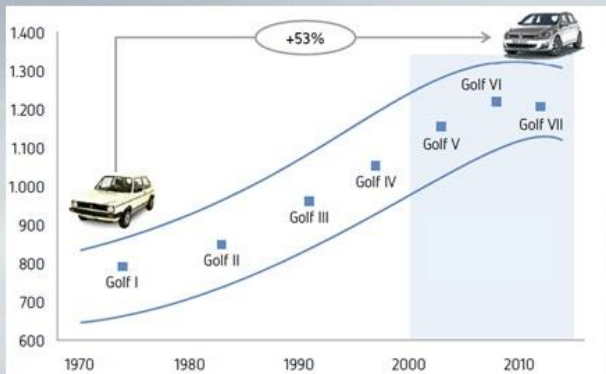
LCA

Overall Performance



Increase in Vehicle Weight

Vehicle weight by generation comparison
kg, standard equipment, Basic performance



Source: Berylls Strategy Advisors

Increased weight due to additional content over the years

- Significant weight drivers were
 - Size growth (length, width)
 - Passive Vehicle Safety (NCAP)
 - Comfort functions (new, series)
 - Expectations in driving comfort and dynamics (incl. Electronic Control systems)
 - NVH behavior

The Golf VII was the first model to break the pattern of increasing vehicle weight.

- Intensive construction, lightweight (Body structure)
- Chassis optimization

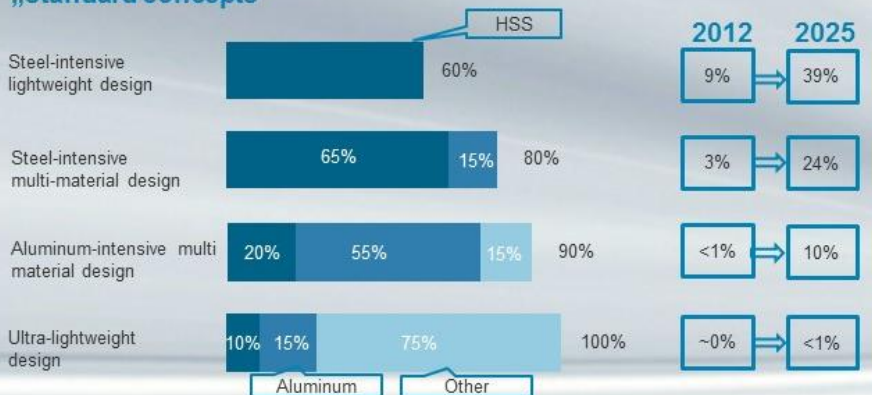
Compensation of additional vehicle content through lightweight solutions "right across the vehicle".

5 Shanghai, 7th July 2015

Development of Material Mix

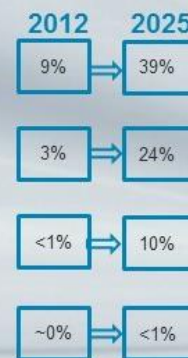
In the mid-term, archetypal „standard concepts“ with a growing share of lightweight design and a different material mix will emerge for the body.

Share of lightweight design by „standard concepts“



HSS includes high-strength steel (HSS), advanced high-strength steel (AHSS), ultra-strength steel (UHSS)

Market share



Examples



Source: Berylls Strategy Advisors

6 Shanghai, 7th July 2015

Lightweight Design by voestalpine

- The driving force of lightweight development within voestalpine group is linked to the automotive industry.
- The Metal Forming Division of voestalpine is working with different materials since 15 years.
- The greatest contribution comes from the steel side (phs-ultraform steels), but also aluminum and hybrid components are an issue.
- voestalpines advantages start with steel, which form the basis for various lightweight structures. The development of new steels is far from exhausted and "3. Generation" steels open more diverse potentials.
- Lightweight potential can be not only found in cars, but also in planes, commercial vehicles, cranes, containers, railway cars and agricultural and construction machinery as well as in many other products.
- In addition, innovative design and joining techniques enable additional weight saving.

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Turnover with Lightweight Design in Mio € by divisions and industry segment

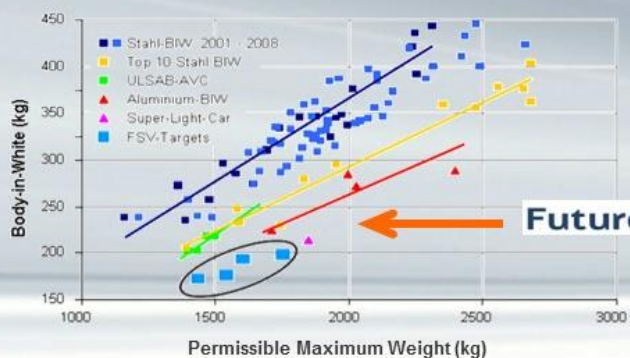
	Cars	Commercial Vehicles	Building Industry	Energy	Aviation
Steel	690	50			
Metal Forming	430	40	100	20	20
Special Steel	180 <small>Tooling material</small>				280
Metal Engineering	200			100	
Sum: 2.110	1.500	90	100	120	300

8 Shanghai, 7th July 2015

Overview Lightweight Design: Steel by voestalpine

Steel: The Weight-Watcher

- Project of 17 steel producers, among them voestalpine, as part of WorldAutoSteel
- Configuration of 4 vehicles of different size and 3 drive systems
- Design of a lightweight body for an electrical vehicle of 190kg



Steel: The Weight-Watcher

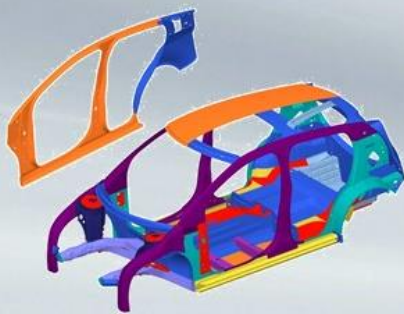


Vehicle	BIW Mass (kg)	Length (mm)	Width (mm)	Height (mm)	Wheelbase (mm)	Track Frt/Rr (mm)	Powertrain Mass (kg)	Curb Mass (kg)	Payload (Max)	GVW (kg)	Plan View Area (m ²)
FSV	190.7	3820	1705	1495	2524	1470	328.7	958	475	1433	6.51
BMW i3	269.8	3999	1775	1597	2570	1572	447.3	1297	425	1722	7.10

Mass of Body Structure

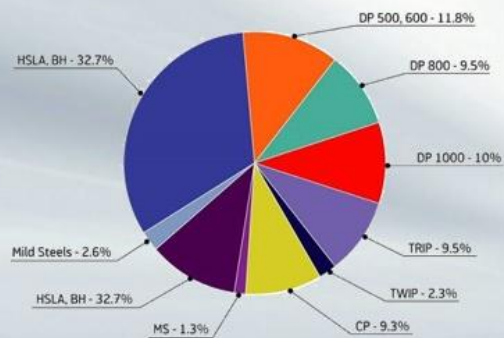
$$m = 1.0437(\text{GVM kg})^{0.546} (\text{Area m}^2)^{0.579} \begin{bmatrix} 1.00 \text{ Aluminum} \\ 1.443 \text{ FSV - AHSS} \\ 1.524 \text{ Steel} \end{bmatrix}$$

Steel: The Weight-Watcher

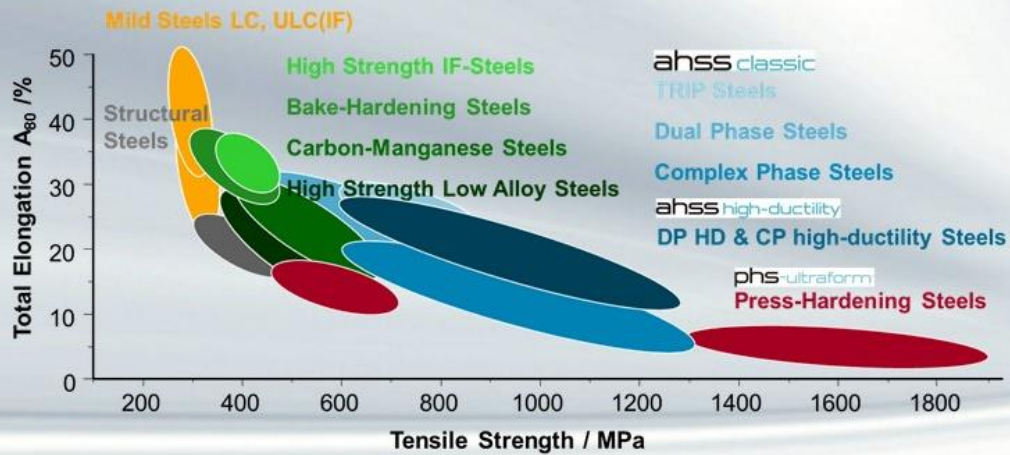


Weight reduction: 35% or 102 kg

FSV BEV Steel Types
as % of Body Structure Mass



Steel grades by voestalpine



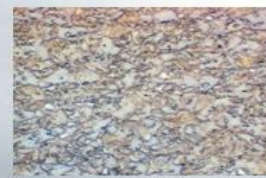
13 Shanghai, 7th July 2015

Coldforming

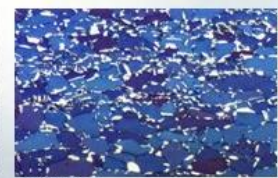
Highest strength steels for lightweight car body production

Lightweight construction through increased use of high-strength and ultra high strength steels

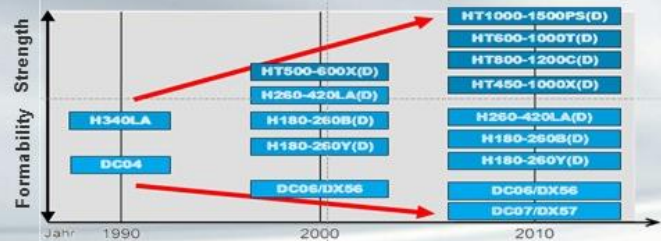
- Use the right materials in the right places by application-optimized material design
- Dual-phase and TRIP steels for deep-drawn parts.
- Complex-phase steels for section and bending type parts.



Complex-phase-Steel



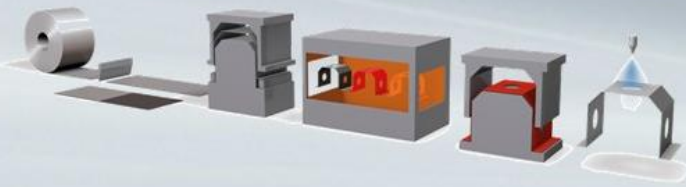
TRIP-Steel



14 Shanghai, 7th July 2015

Hotforming pHS-ultraform

Indirect Process



pHS-ultraform Advantages:

- Strength appr. 1800 N/mm²
- Complex geometries
- Cathodic corrosion protection
- Tight tolerances
- Tailor-welded blanks possible
- Partial hot formed parts
- Weight reduction
- Thickness reduction
- Large parts possible (2.8 x 1.4m)

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Hotforming pHS-ultraform Tailored Property Parts



Hardened

Tailor welded
blank

Patch inside /
Patch outside

Annealed

Tailored tempering
(local)

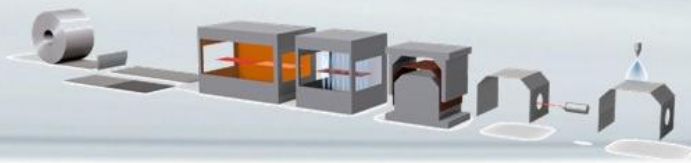
- Hardened = 1500 or 1800 MPa
- Partner material HT490 = 500 MPa
- Tempered < 1500 MPa
- Initial hardness = 500 MPa

16 Shanghai, 7th July 2015

Hotforming pht-directform

- Direct process for zinc-coated material: Technology is ready (Pre-cooling).
- Microcracks-problem solved.
- First serial production line in procurement.
- SOP March 2016

Direct Process



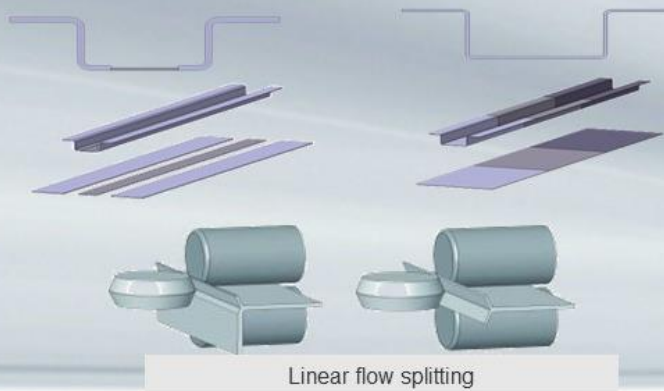
pht-directform Advantages:

- Cathodic corrosion protection
- Only one tool necessary
- Optimized material use
- Low tool wear
- Existing direct hot forming lines are adaptable.
- Over 10 years experience with galvanized press-hardened steels.

17 Shanghai, 7th July 2015

Lightweight Design with Tubes and Sections

■ Tailored Tubes



- Rollform Hardening
- Quenched & Tempered



**Tailored Tubes and temperature-treated tubes and sections:
Weight reduction through customized thicknesses and strengths.**

18 Shanghai, 7th July 2015

Rotational Forming

- Local material hardening and different wall thicknesses over component length allow application-specific component design.
- Production of rotationally symmetrical parts
 - Processing of C and stainless steel, aluminum, copper
 - Rotary swaging and round forging
 - Rotational forming in cold, warm and hot state
- Elimination of welded seams (one formed part instead of several welded parts)
- Weight reduction: 10-15% possible.



19 Shanghai, 7th July 2015

Rotational Forming – Examples

Pressure Vessel for Air Suspension Systems – Aluminum or Steel:



Pistons for Air Suspension Systems - Aluminum or Steel



Various Vessels – Aluminum, Steel or Stainless Steel:



Airbag components

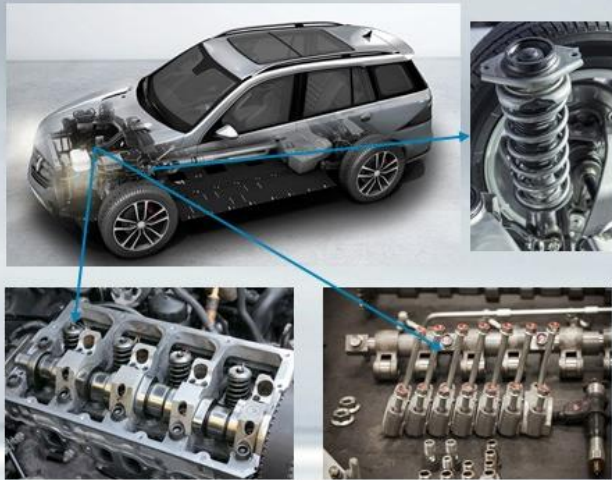


Avalanche airbag



20 Shanghai, 7th July 2015

Wire Solutions for Automotive Industry



Pre-material for multiple components -- e.g Spring and Bolts

- Large variety of micro-alloyed CHQ grades with tight strength range and optimized microstructure
- High purity steels for special end-use applications (e.g for highest fatigue applications)
- Ultra High Strength CHQ wires for UHT motor screws (e.g strength class 14.9 and higher)
- Using the of the Super Clean technology for highly dynamically loaded springs

21 Shanghai, 7th July 2015

Overview Lightweight Design: Hybrids, Aluminum and Other Materials by voestalpine

Customized Semifinished Products

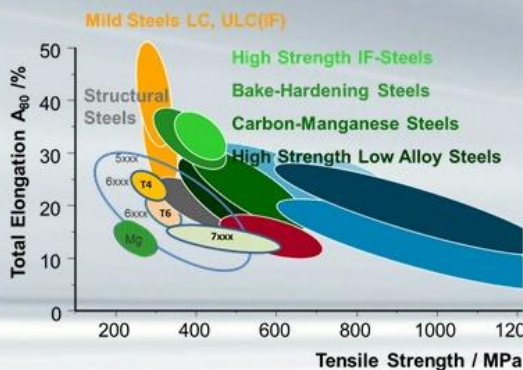
- Laser-Welded Blanks (Weight: -10-15%)
 - With continuous thickness transition
 - With variable thickness jump
 - With linear and non-linear seams
 - Aluminum/Aluminum welded blanks
- High-strength laser-welded blanks
 - phs-ultraform®
 - Multi-phase steels ($R_m \geq 600$ MPa)
- Hybrid Blanks
 - Steel/Aluminum (weight: -30-40%)
 - Steel/Special steel
- Partial press hardening with phs-ultraform®



Potential for weight reduction of 10-35% by varying strengths and optimizing materials mix!

Lightweight Metals used by voestalpine

- In comparison to steel
 - Reduced formability => cold forming, super plastic forming
 - Modified joining processes => welding, toxing, clinching, FDS
 - Modified painting processes => modified cataphoretic painting



Aluminum Processing

- “Hot forming” of high strength AA7xxx (cooperation with AMAG and LCCR)



Side impact beam BMW i8

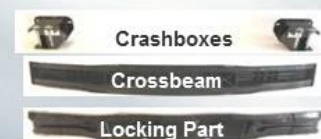
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Plastics/Steel-Compounds

- Steel wire / Viscose– fabrics in Polypropylene / Glass fiber-Matrix
- High ductility and high strength
- Design freedom
- 15% less weight compared to aluminum concept



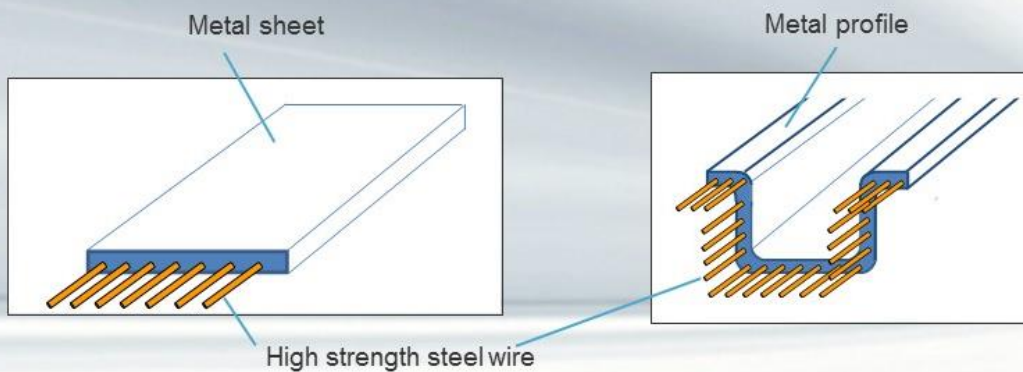
Quelle: AutoBild.de



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Steel Wire Reinforced Metal

- Strengthening of metal blanks and structural components with high strength steel wire.
 - E.g. Aluminum with min. 45% increased tensile strength



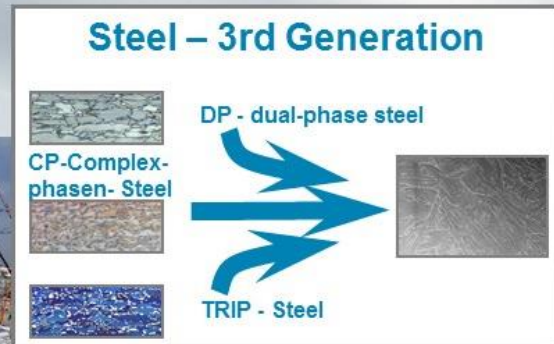
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Lightweight Design Innovation by voestalpine
Other Segments

Lightweight Design by voestalpine Non automotive

Building Construction
Commercial Vehicles
Mobile and Truck cranes
Concrete pumps
Railcars
Containers
Agricultural machinery
Forestry machinery

Ultra-high-strength steel allows lightweight construction.



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Lightweight Design by voestalpine Non automotive

Lightweight Railway Car

- Weight reduction of a freight car of
 - About 10% = 3 tons
 - Through high strength hot rolled strip



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Lightweight Design by voestalpine Non automotive - Sustainability

Wind turbine gearboxes
Growth of + 17% per annum



Substructures for solar and photovoltaic
Systems: Weight reduction of 30%



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Lightweight Design by voestalpine Non automotive – Aviation Industry

voestalpine supplies pre material and components for the aviation industry

- Rotor and power-unit components
 - Turbine plates, gear wheels
 - Rotor adjustments for helicopter



- Fuselage components
 - Aluminum frames



- Structural components
 - Flap track fairings
 - Engine mount structure



- Interior
 - Titanium seat rail



- Chassis components
 - Landing gear



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Lightweight Design by voestalpine Crane Constructions



Seamless steel tube solutions for crane constructions

- Standard Q&T seamless steel tubes up to grade S890QL.
- ToughTubes® - thermo-mechanically rolled seamless tubes with high strength, excellent toughness and excellent weldability.
- Ultra-high strength thermo-mechanically rolled seamless steel tubes with yield strength > 1000 MPa + excellent toughness and weldability.

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Lightweight Design by voestalpine Conclusion

- Global Footprint: Worldwide availability of modern (steel) materials and processes.
- Integrated value chain from steel pre material to the final assemblies and modules.
- Weight reduction potentials between 15-40% through modern steel grades and intelligent components development.

Customers benefit from the extensive know-how in steel development as well as from construction knowledge with steel and alternative materials!



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North America 2015 9th - 11th of Nov
 AUTOMOTIVE LIGHTWEIGHT
PROCUREMENT SYMPOSIUM
 Westin Hotel in Detroit, USA



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AluMag SAE 2016 12th - 14th April
 Light Weighting - Emission Reduction - Car Comfort
 Technology Center, Booth # 763 - Detroit - Cobo Center, MI USA



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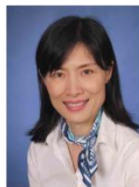
Europe 2016 27th - 29th of Nov
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CONTACTS & PROJECT TEAM



Mr. Jost GAERTNER
 Managing Partner
AluMag® Automotive GmbH
 Kirchplatz 1a
 58706 Menden
 GERMANY
 Tel.: +49 2373 929492
 j.gaertner@alumag.de
 German & English



Ms. Ying ZHOU
 Project Coordinator Japan & China
AluMag® Automotive GmbH
 Kirchplatz 1a
 58706 Menden
 GERMANY
 Cell: +49 172 6415876
 y.zhou@alumag.de
 German & English & Chinese & Japanese



Mr. Jesper Ove LARSEN
 Manager Market Research
AluMag® Scandinavia
 Byagervænget 69
 8330 Beder
 DENMARK
 Cell: +45 2573 8790
 j.larsen@alumag.de
 German & English & Danish



Mr. Roberto BOEKER
 Managing Partner
AluMag® Automotive LLC
 42056 Michigan Avenue
 Canton, MI 48188
 USA
 Cell: +1 248 962 5086
 r.boeker@alumag.de
 English & German & Spanish



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THE MARKET DEVELOPER



Mr. Ricardo SCHOER
 Senior Consultant
AluMag® Automotive LLC
 Av. San Antonio 189-131
 Col. Napoles 03810
 MEXICO
 Cell: +52 55 4002 0501
 r.schoer@alumag.de
 English & German & Spanish



Ms. Jacqueline TEUBER
 Senior Roadshow Organizer
AluMag® Automotive GmbH
 Kirchplatz 1a
 58706 Menden
 GERMANY
 Tel: +49 2373 929496
 j.teuber@alumag.de
 German & English



Mr. Thomas KATCHMARK
 New Business Development Manager
AluMag® Automotive LLC
 20929 Sunnydale
 Farmington Hills, MI 48336
 USA
 Cell: +1 313 410 0865
 t.katchmark@alumag.de
 English