

AluMag®

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THE MARKET DEVELOPER

AluMag® makes you successful – worldwide!

● AluMag® Worldwide



Market Research

- Tailored Customer Databases about Foundries, Tool Makers, Extrusion Consumers , ...
- Automotive Application, Material & Process Analyses
- Industrial Application Research
- Lightweight Technology Outlook in Aluminum, Carbon, Composites & Magnesium
- M&A Target Research



Market Development

- Analysis & Development of Market Opportunities
- Accelerate Market Penetration
- Manage New Product Launches
- Establish a Sales Force
- Sales on Demand
- Access & Build-up new Markets in Automotive, Truck/Tractor, Trailer, Bus, Rail, O&G, GE, ...



Roadshows / Events

- Organization of Technical & Commercial Roadshows & Events Globally
- Host In-House Events & Presentation Globally
- Common Technology Booth at Leading Exhibitions
- Supply-Chain Automotive Lightweight Symposium [SCALS] in EUROPE, ASIA & N.AMERICA



Strategic Localization

- Warehousing & Distribution Service
- Supplier & Tie-up Localization
- Identification & Trade-off of new Technology
- Foreign Market Business Cases and their Realization
- Green & Brown Field Localization, from Site Selection to Foundation & Ramp-up

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 AUTOMOTIVE PRESENTATION - AUTOMOTIVE APPLICATION DATABASE

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THE MARKET DEVELOPER

MARKET RESEARCH MARKET DEVELOPMENT ROADSHOWS / EVENTS STRATEGIC LOCALIZATION

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MARKET RESEARCH MARKET DEVELOPMENT ROADSHOWS / EVENTS STRATEGIC LOCALIZATION

With the four business units, AluMag is highly capable to support any company in its quest to enter new markets or segments, no matter its current position in the market.

- Market Research
- Market Development
- Road shows / Events
- Strategic Localization

Starting with an initial analysis to test market potential we will arrange Roadshows and events to showcase our client`s products, proceeding with sales and acquisition support, and finally the buildup of a supply chain abroad.

With the AluMag expertise and support, you are in good hands. AluMag has extensive knowledge and contacts as well as excellent references!

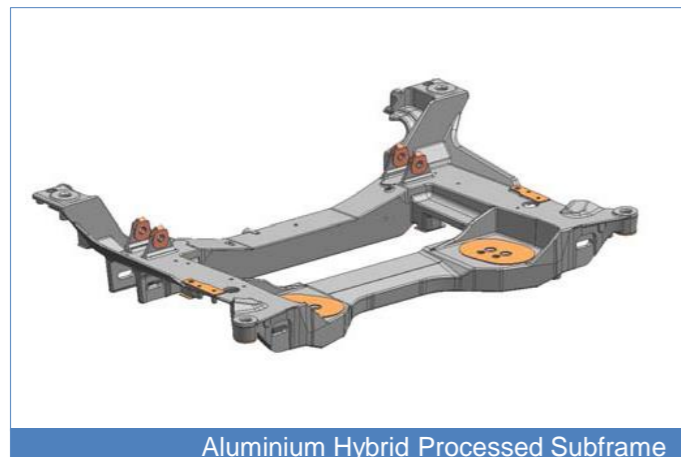
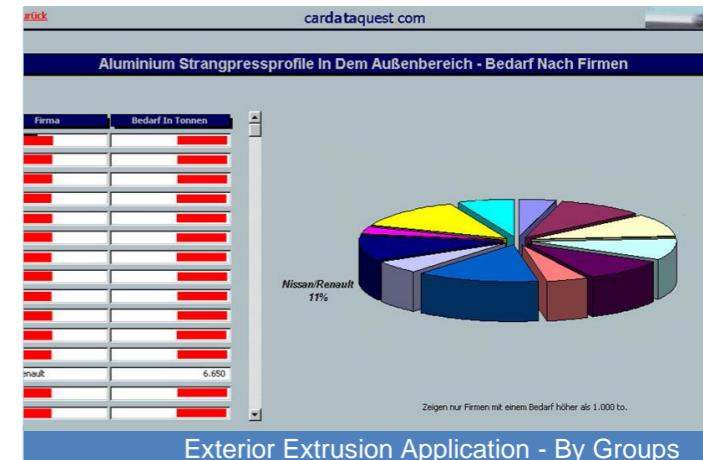
AluMag® makes you successful – worldwide!



Since 1994, AluMag® maintains and executes single (exclusive) and multi client studies for component and system suppliers.

We have more than 150 automotive suppliers as references. AluMag® operates mainly in Europe, North and South America, India, South Korea, China and Japan – giving us the ability to perform worldwide analyses of high quality for our customers.

In the course of our daily research AluMag® is in steady contact with OEMs, suppliers and consultants all over the world. A strong research in international online and offline media confirm the convincing quality of the AluMag® market research.



Your Benefits

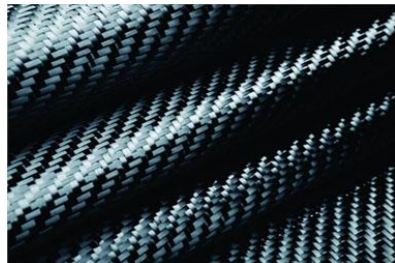
- Learn about your potential clients
- Obtain an inside view of the market
- Identify opportunities and threats
- Minimize risk and optimize profits
- Position your company successfully



Automotive Application Database

Detailed automotive application information by car body variants (Supplier – Material – Process - Weight)

Material Focus:



Carbon / Composites



Aluminium



Magnesium



Steel

Application Focus Areas:

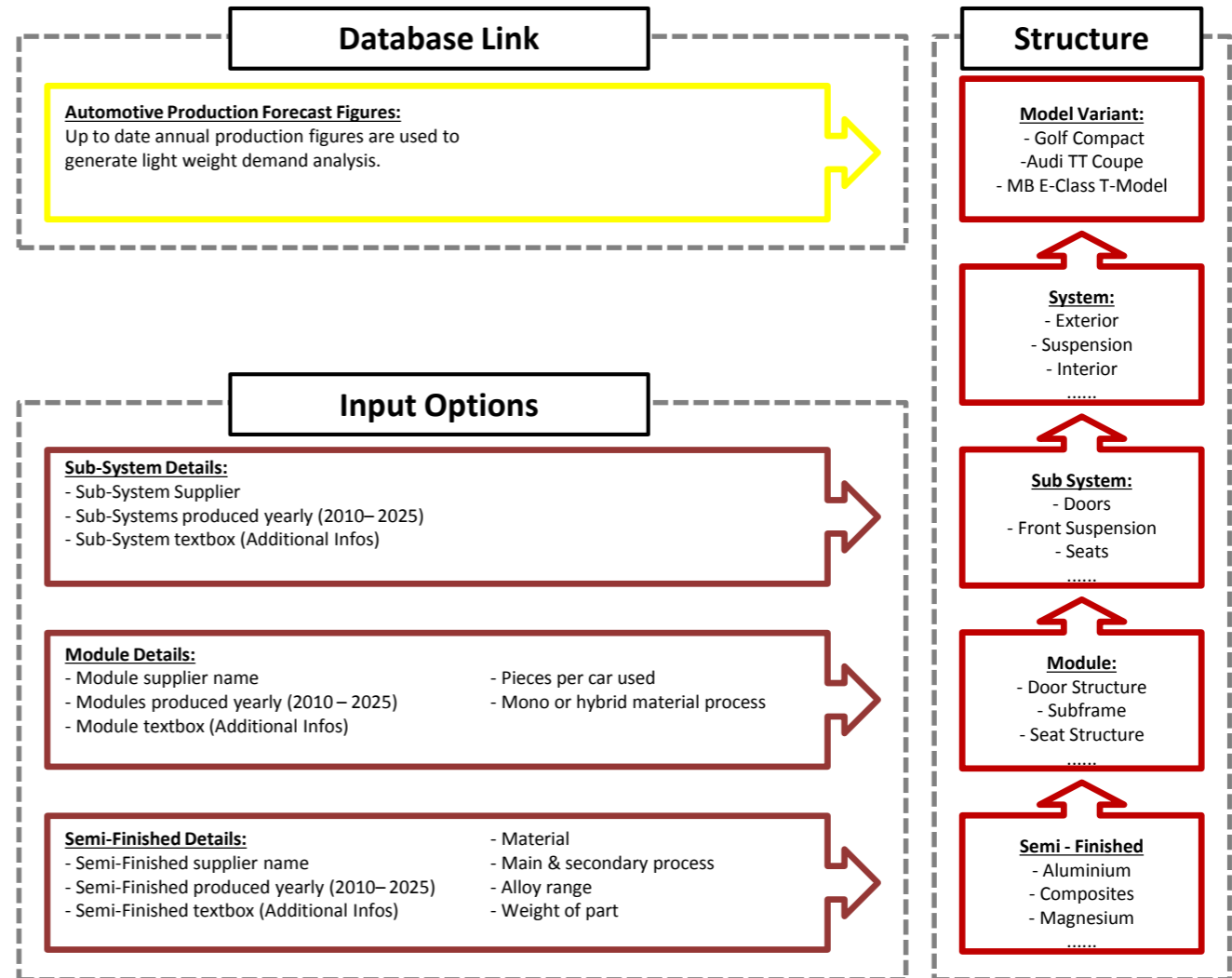
- **Exterior:** Hood & bonnet, lid & tailgate, roof railing, door inner & outer structures, bumper beams, sunroofs ...
- **Suspension / Steering / Braking:** Suspension link-arms, knuckles/wheel carrier, sub frames/cradles/cross members, calipers,
- **BIW:** Front & rear longitudinal carriers, suspension domes, A- / B- / C- pillars, cross members, ...
- **Interior:** Instrument panel beam / cross car beams, passenger airbag housing, cargo management systems, seat structures...
- **Power train:** (Limited focus)

Automotive Application Database

The Automotive Application Database is connected with AluMag in-house automotive production forecast. Accurate material demand analyses by model variant are generated by multiplying an application weight with yearly model variant production.

The direct connection with our automotive production forecast makes it possible to generate several data enquires:

- Demand by material [aluminum, magnesium, steel, composite, carbon]
- Demand by core processes [cast, extruded, rolled, forged, ...]
- Demand by OEM
- Supplier market shares
- Demand by application



Automotive Application Database – MB C-Class W205 Limousine Sub-System Analysis

OPEN MENU PICK A BODYVARIANT: MB C-CLASS / W205 - W205 / MRA - SEDAN/ LIMOUSINE - LIMOUSINE

SUB-SYSTEM INFORMATION

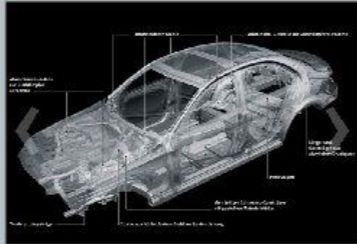
SYSTEM:
Body In White

SUBSYSTEM:
Body in white - Main Frame / Space Frame

SUBSYSTEM TYPE:
No Select - No Select

SUBSYSTEM SUPPLIER:
MB INHOUSE

SUBSYSTEM PICTURE:



SUBSYSTEM MEMO:
Dec 2015: The GLC also has aluminium suspension domes in the front.
Source: mercedes.
Nov 2013: The MB C-Class W205 consist of 48 percent aluminium (Cast and Sheet).
9 parts are made out of aluminium cast.
Spring strut domes, longitudinal and crossmebers are some of the parts in cast.
Nov 2011: All Daimler cast Aluminium Structure parts will

ALREADY EXISTING SYSTEMS FOR THIS BODYVARIANT:

SYSTEM	SUBSYSTEM	MODULE
Axles	Rear Axle	Rear Axle / Wheel- Hubs / -
Axles	Rear Axle	Rear Axle / Wheel- Hubs / -
Axles	Rear Axle	Rear Axle / Wishbones/ Link
Body In White	Main Frame / Space Frame	Cross Member
Body In White	Main Frame / Space Frame	Cross Member
Body In White	Main Frame / Space Frame	Frame / Other Parts
Body In White	Main Frame / Space Frame	Front Suspension Domes
Body In White	Main Frame / Space Frame	Front Suspension Domes

SELECT BODY VARIANTS

- MB C-CLASS - W205 - CABRIOLET - W205 / MRA - C-CLASS CABRIOLET
- MB C-CLASS - W205 - COUPE - W205 / MRA - C-CLASS COUPE
- MB C-CLASS - W205 - VAN - W205 / MRA - CLR
- MB C-CLASS - W205 - SEDAN/ LIMOUSINE - W205 / MRA - LIMOUSINE
- MB C-CLASS - W205 - SUV - W205 / MRA - GLC COUPE
- MB C-CLASS - W205 - STATION - W205 / MRA - T-MODEL
- MB C-CLASS - W205 - SUV - W205 / MRA - GLC

SUBSYSTEM PENETRATION:

YEAR	PEN	TOTAL	UNITS
2010	100,00%		
2011	100,00%		
2012	100,00%		
2013	100,00%		
2014	100,00%	261.284	261.284
2015	100,00%	354.510	354.510
2016	100,00%	377.784	377.784
2017	100,00%	385.339	385.339
2018	100,00%	377.632	377.632
2019	100,00%	370.080	370.080
2020	100,00%	362.679	362.679
2021	100,00%	156.271	156.271
2022	100,00%		
2023	100,00%		
2024	100,00%		
2025	100,00%		

MB C-Class W205 Limousine front suspension domes analysis on next page

Light weight applications (modules) inserted for the MB C-Class W205 Limousine.

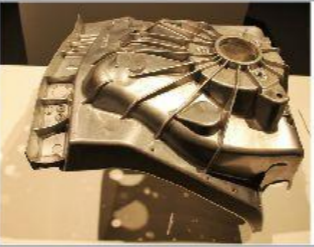
Yearly production in units of the MB C-Class W205 Limousine

Body variants allocated to the inserted application

Automotive Application Database – MB C-Class W205 Limousine Module Analysis

MB C-Class W205
 Limousine front
 suspension domes

MODULE INFORMATION

MODULE: Main Frame / Space Frame - Front Suspension Domes	MODULE PICTURE: 	MODULE MEMO: Oct 2014: NEMAK is going to be the 3rd MB C-Class Suspension dome supplier in Germany, beside DGS and MB inhouse. NEMAK is waitig for their MB approval Source: NEMAK April 2012. Brabant will supply the NG of the C, E & S-class with suspension domes. Source: Supplier sources. June 2010: The front suspension domes for the MB C-Class B205 will be supplied by Brabant in alu cast.
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Module TYPE: No Select - No Select	STATUS: Series
PARTS: 2	MATERIAL HYBRID:
PROCESS HYBRID:	
MODULE SUPPLIER: NEMAK	SUB MODULE SUPPLIER: INPUT SUB MODULE SUPPLIER

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
PENETRATION - %	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%	40,00%

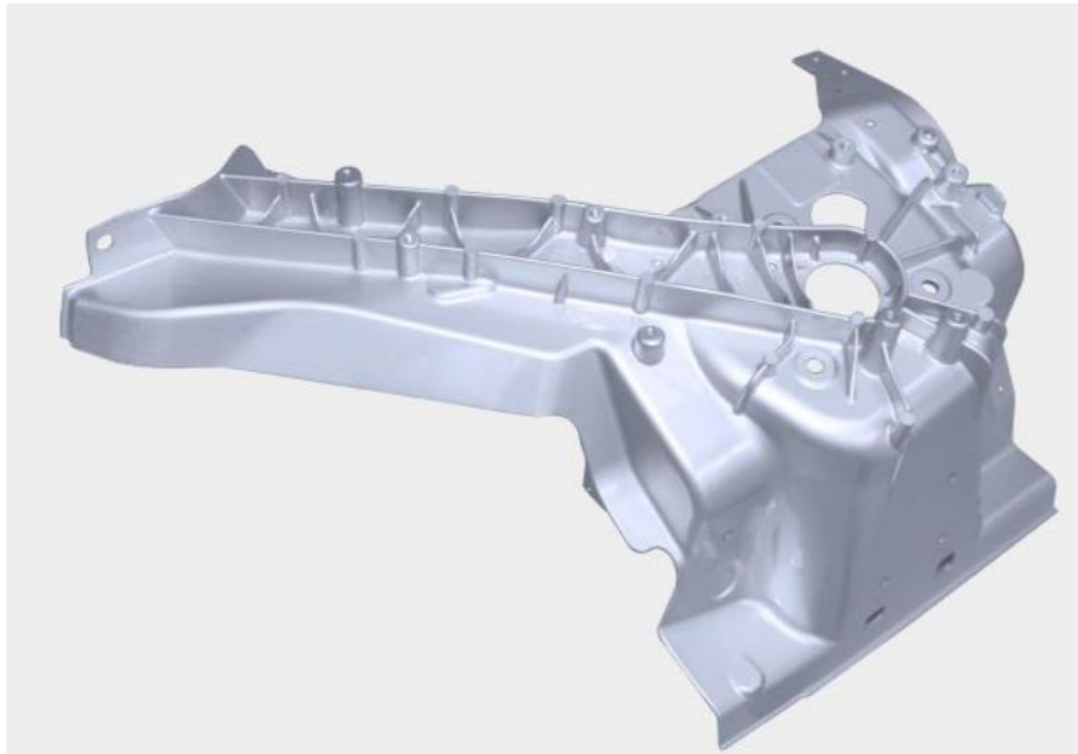
SEMI-FINISHED PART INFORMATION

MATERIAL: Aluminium	ALLOY RANGE: Al-Casting	Confirmed weight!														
MAIN PROCESS: Aluminium / AL Casting	WEIGHT: 3,16	2010	2011	2012	2013	2014	2015	2016	2017	2018						
SECOND PROCESS: AL Casting / HPDC	SUPPLIER: NEMAK	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%						
MATERIAL:	ALLOY RANGE:															
MAIN PROCESS:	WEIGHT: 0,00	2010	2011	2012	2013	2014	2015	2016	2017	2018						
SECOND PROCESS:	SUPPLIER: OTHERS OR N/K	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%						

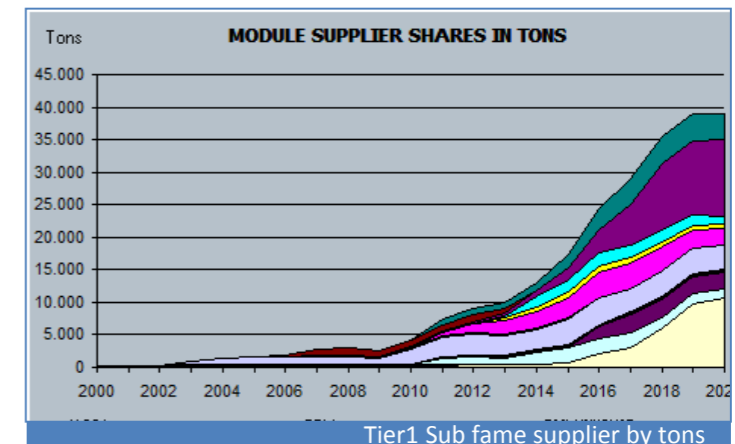
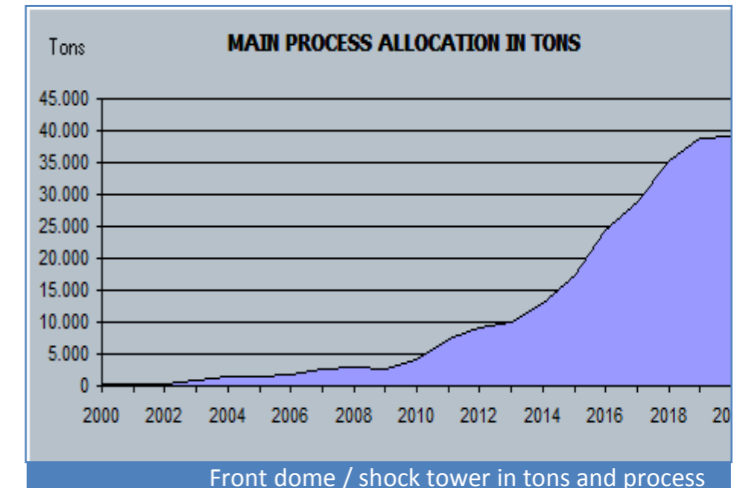
Supplier (Nemak)
 share of total C-Class
 Production

Material and process
 information about MB
 C-Class W205
 Limousine front
 suspension domes

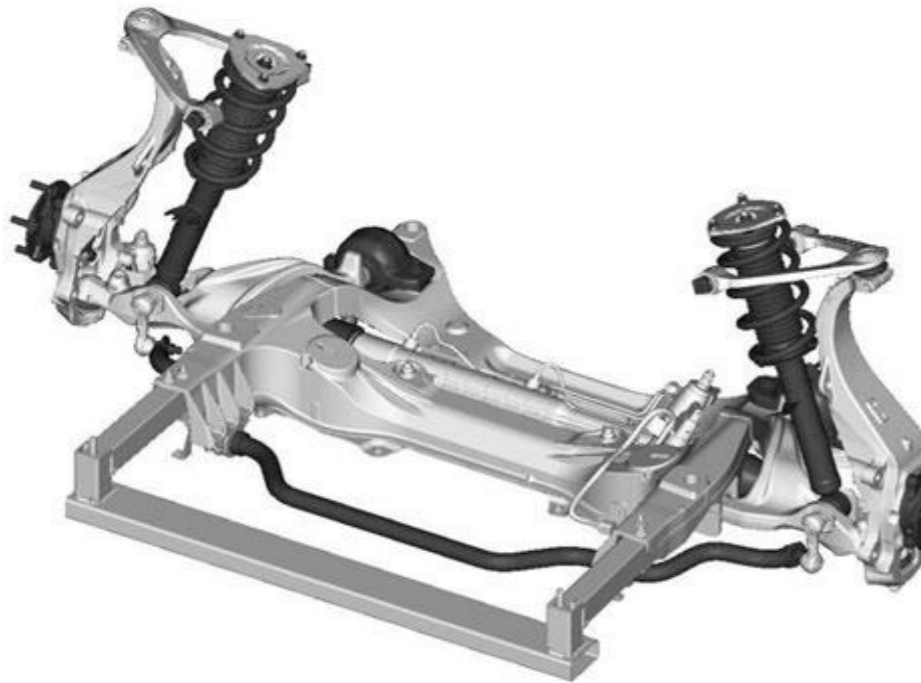
Automotive Application Database – Sample: Front dome by Tier1 supplier, process and tons from year 2010 to 2025



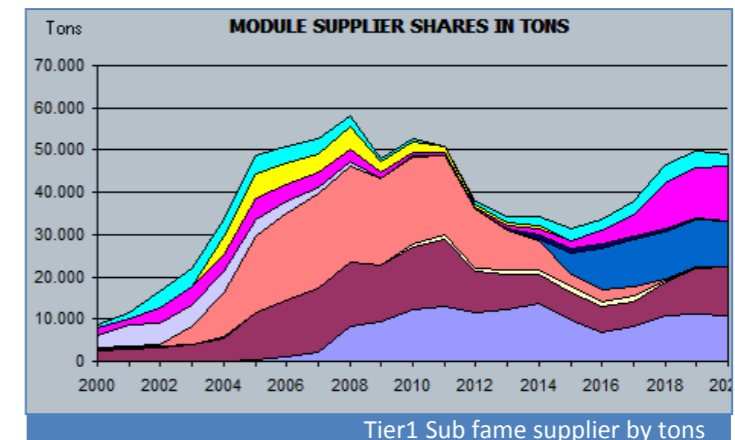
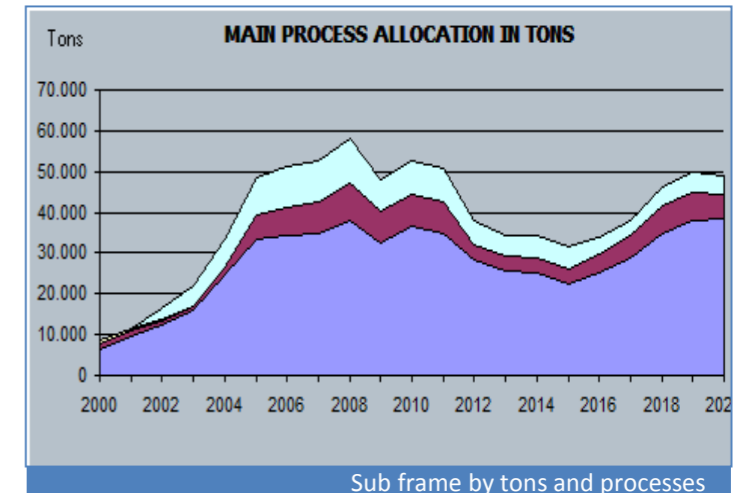
AluMag supplies detailed material and process focused demand analyses in the timeframe 2010 – 2025 for any region in the world.



Automotive Application Database – Sample: Front Sub frame by Tier1 supplier, processes and tons from year 2010 to 2025



AluMag supplies detailed material and process focused demand analyses in the timeframe 2010 – 2025 for any region in the world.



Study Sample – Automotive Application Database

Introduction:

The client (In the following XXX) specializes in the production of cast aluminum powertrain components such as cylinder heads, engine blocks and transmission parts for light vehicles.

XXX has requested support from AluMag Automotive GmbH (In the following AluMag) to execute a European BIW & crossmember analysis to determine the use of aluminum in the light weight vehicle segment.

Scope – Case Sample:

The main target of the study is to analyse the total use of cast, extrusion and sheet aluminum within:

1. BIW frame applications (Excluding closures and hang on parts)
2. Suspension sub-frames, cradles and cross-members.



BIW Frame



Study Content:

1. Focus area is passenger vehicles produced in Europe (Excluding commercials)
Vehicles produced at transplants will not be considered. (BMW X5, MB M-Class...)
2. The timeframe of the analysis is 2000 – 2020.
3. The cast-, rolled- and extruded- aluminum demand will be analyzed by:
 1. Group
 2. Brand
 3. Bodyvariant
4. Only the following **cast aluminum** applications will be described separately with suppliers:
 1. Front & rear suspension subframes (only cast parts with supplier info)
 2. Pillars
 3. Shock Towers
 4. Longitudinal carriers
 5. Other cast frame applications are part of the analysis, but will not be considered with suppliers.



Subframe



5. All other aluminum cast, sheet and extrusion frame components not listed under point “4” will in general be considered together as one application, with no supplier information. Information regarding separate applications not listed under point “4” should be considered as nice to have but not part of the study content.

Sample BIW: Audi A8, (D4) year 2015:

Extrusion demand: xxx tons (No supplier)

Sheet demand: xxx tons (No supplier)

Cast demand excluding applications listed under point 4: xxx tons (No supplier)

Cast a-post: xxx tons (With supplier)

Cast front suspension domes: xxx tons (With supplier)

Cast rear suspension domes xxx tons (With supplier)

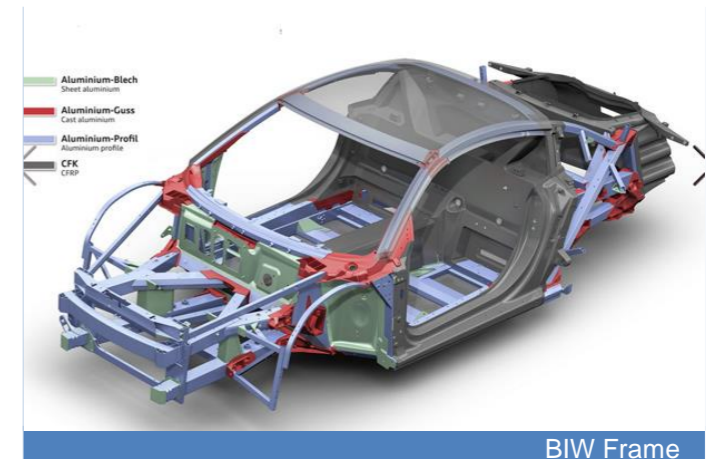
Cast longitudinal carrier: xxx tons (With supplier)

Sample rear hybrid subframe: Audi A4, (MLB) year 2011:

Extrusion demand: xxx tons (No supplier)

Sheet demand: xxx tons (No supplier)

Cast demand: xxx tons (With supplier)

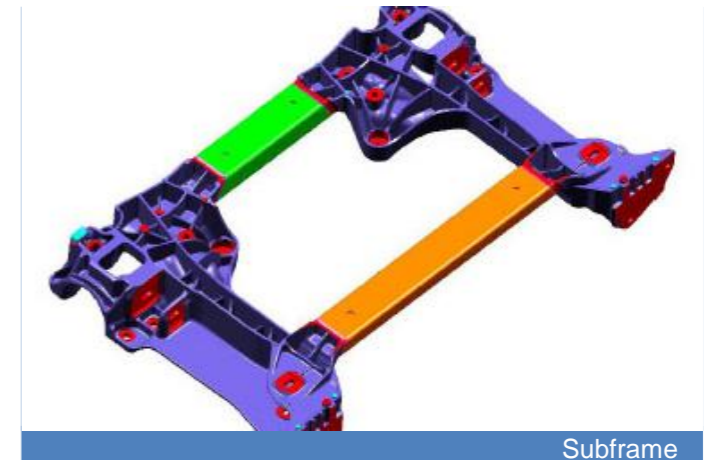


BIW Frame



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6. Casting method information should be considered as “Nice to have” but not part of the quote.
7. Pictures will only be available for some applications.
8. The aluminum demand will be calculated by multiplying the number of produced vehicles with an application weight. The actual application weight can not always be obtained and must therefore be estimated through benchmark with other similar parts.
9. It can be difficult to obtain supplier information for cars produced many years ago.
10. The analysis of cars launched in 2017 and onwards will mostly be based on qualified estimations as information regarding these vehicles are not available yet.
11. Study method: 80/20
12. Data will be supplied by e-mail in a detailed excel list with data by model-variant (Including pictures). A PowerPoint executive summary **will not** be delivered as agreed with XXX.



Subframe

Price & Payment Terms:

Price excl. tax: 51.578 EUR

Payment Terms: 50% after order / 50% after project completion / 10 days net after DOI.



Case Study: HPDC Automotive Aluminium Applications In Nafta

Short Scope Extraction

The client is a Japan based aluminum processing company and a leader in the industry. The client would like to get a sustainable understanding and benchmark of the global industry leaders like; NemaK which specializes in the production of cast aluminum powertrain components such as cylinder heads, engine blocks and transmission parts for light vehicles. Since the cast structural “body in white” [BIW] will be applied for areas where strong part integration is feasible, NemaK is going to target new components / areas like thin-wall, ductile and weldable castings. This is a target market for the client too. The client has requested support from AluMag to execute the following services and analyze:

- Leading cast aluminum structures supplier for body and chassis parts
- Selected car manufacturer in NA with their in-house casting, future strategy and make or buy decision as well as decision maker
- Body and chassis segment NA, strategy, locations, expansions, supplier selection process and risks at selected car manufacturers
-

MODEL INFO:
Platform: F15
Production Plant: Spartanburg, SC
Average Yearly Prod: 140,000 units

CAST ALUMINIUM BIW & SUB-FRAME APPLICATIONS:
According to supplier sources Cosma supplies 5 BIW applications for the BMW X5. So far we have not been able to confirm this information from a second source.

- Front Suspension Domes
 - HPDC Aluminum
 - Cosma

OTHER APPLICATIONS OF INTEREST:

- Magnesium Cross Car Beam
- Supplier Meridian

BMW X5 & X6 Light Weighting by Material and Supplier

Being inside the OEM's supplier parks is not mandatory but an advantage in terms of transportation costs and logistics.

Cosma with facilities in Indiana and Michigan is supplying the Cadillac ATS with suspension domes. The ATS is being produced in Lansing, MI which is located about 100 KM (60 miles) from Cosma facility in Battle Creek, MI.

Bocar, being the supplier of several HPDC structural parts for the MB C-Class W205, has no foundry in USA but is supplying the Mercedes plant in Alabama from their Mexican facilities.

M. Honsel is supplier of the front and rear suspension subframes for the Cadillac CT6 being produced in Detroit, MI. M. Honsel foundry is located in Mexico.

Localization of Structural HPDC Facilities in NA

MARKET RESEARCH MARKET DEVELOPMENT ROADSHOWS / EVENTS STRATEGIC LOCALIZATION

WHY DOES CLIENTS ENGAGE ALUMAG:

- Since 1995 successful globally active and experienced with:
 - Automotive, O&G, Truck/Tractor, Trailer, GE, ...
 - Aluminum, Carbon/Composite, Magnesium, Reinforced Plastics, ...
 - Light weighting, Joining, Surface, ...
 - Creating demands and markets
 - Backed with dozen of studies, databases and analysis
 - Organizer of the “Automotive Lightweight Procurement Symposia in Duesseldorf, Shanghai and Detroit” which generates further executive contacts
- Clients recommended to engage AluMag, due to their excellent experiences in former projects
- AluMag capability and reputation as well as skill and network to execute cross selling in various industries and applications, regardless of the region
- Access and use of the entire databases and network, AluMag has “off the shelf”
- Due to the active AluMag relations globally, the maybe shortest way to connect
- Exclusive partnership for defined applications and materials as well as processes, in the areas agreed
-



Successful Market Development



..... with the right, trustful, connected Performer

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REFERENCES



A world map showing AluMag's presence in various regions, marked with red squares. The squares are located in North America (USA and Mexico), Europe (UK, Germany, France, Italy, Spain, and Eastern Europe), India, and Australia.

	GEORG FISCHER AUTOMOTIVE		NISSAN
sapa:		DENSO	IAMT ENGINEERING
		LIBA TEXTILMASCHINEN	3B the fibreglass company
BÖLLHOFF Joining together!		MOMENTIVE	imperia AUTOMOTIVE ENGINEERING

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REFERENCES

LARGE VARIETY OF CUSTOMERS – LOCAL, REGIONAL AND GLOBAL

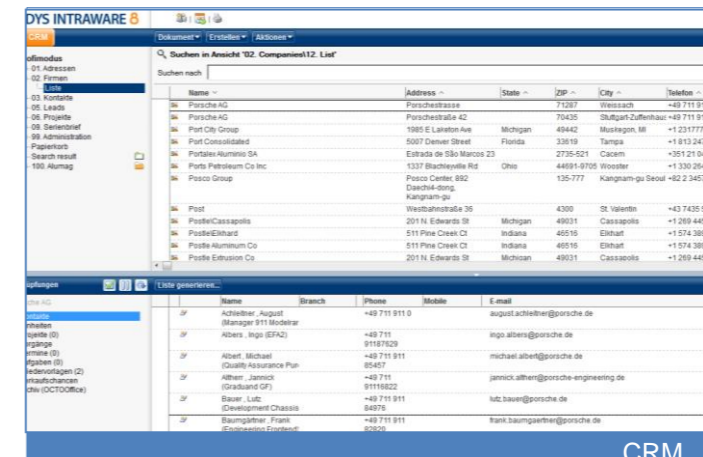
Since the foundation of AluMag® in 1994, AluMag® has helped a large variety of customers worldwide to become successful.

With more than 40+ events, AluMag® has a strong position at the market of research Furthermore we have created a business contact database with more than 7,000+ companies

- More than 180+ satisfied customers worldwide
- Arranged more than 40+ events like road shows, in-house tech and commercial meetings as well as supply-chain symposia since 2008
- 22.000+ contacts in database
- Global active – we are where our clients wants us to be



Satisfied AluMag Customer in Mexico



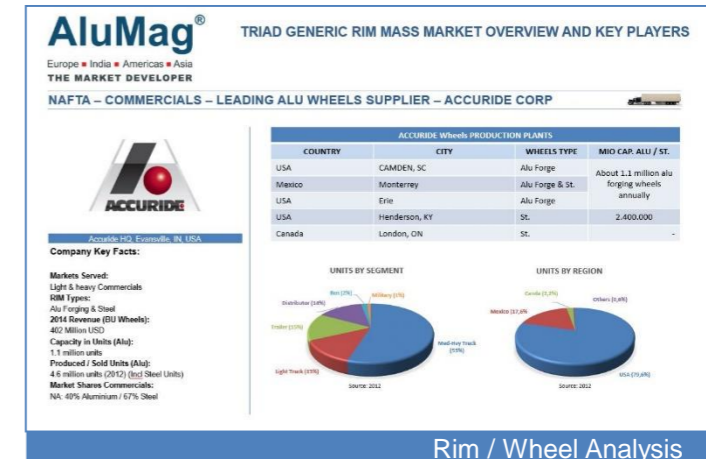
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Porsche AG	5007 Denver Street	Florida	33619	Tampa	+1 813 247
Porsche AG	Estrada de São Marcos 23		2735-521	Cacem	+351 21 04
Porsche AG	1337 Blackwell Rd	Ohio	44889-8705	Worster	+1 330 284
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EXTRACTED REFERENCES

MARKET RESEARCH :

- 2011: European aluminium cylinder head market analysis executed for a German aluminium foundry.
- 2015: Top 15 European automotive aluminium permanent mold foundries were detected and analyzed for a German aluminium foundry.
- 2015: Global cast aluminium / magnesium output allocated by regions, processes and segments from 2000 - 2016. The study was executed for one of the world's leading tradeshow organizers.
- 2015: Global aluminium rim / wheels market analysis was executed for a leading producer of forged aluminium rims.
- 2015: For a leading Japanese aluminium foundry the NAFTA market was analyzed for automotive BIW cast aluminium applications. The study also included a competitor analysis
- 2016: The market potential in NAFTA within automotive BIW & suspension applications, were analyzed for a German aluminium extruder.
- 2016: Global snapshot analysis of the automotive CFRP market for a Chinese electronic applications manufacturer. The study incl. global demand, market shares, supply chain & technology overview.
- 2016: NAFTA automotive sunroof analysis
- 2017: Analysis of the 20 global biggest alloy rim / wheels Tier1 was executed for a leading producer of welding equipment





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