

**The Role of Midsize Automotive Module Suppliers in Meeting the
Goals of the Energy Independence and Security Act of 2007**

AZ Automotive Corp.



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1

Who are we?

AZ Automotive

- \$300 million stamping parts supplier (Ranked 116 out of 178 Automotive suppliers based on NA sales)
- 4 plants in Detroit, 2 in London, Ontario, 1 in Lenexa, Kansas
- 1000 employees; mostly UAW
- Technically competent
 - Highest quality, delivery reliability, safety, and new program launch record
 - Subassembly engineering skills
 - Module assembly experience
- 80% Detroit 3
- Owned by private equity
 - Consistently profitable
 - Strong management team

Steven Walleck

- Chairman of the Board of Directors
- Former CEO, Magnetic Data Technology
- For 23 years McKinsey & Co. consultant; Director; Head of the Operations Practice
- “Operating Partner” for several private equity firms
 - Dubilier & Co.
 - AIG Vantage Capital

Bruce Osani

- AZ’s Director, Product Engineering
- VP Engineering Zenith Industrial
- Chief Engineer International Truck
- Honda of America/Engineering Group North America (13 years Manufacturing & Engineering)

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2

Why are we here?

- **We share the concerns of many small automotive suppliers**
 - Our industry faces unprecedented challenges, e.g.,
 - Reduce the consumption of imported oil
 - Reduce pollution of the environment, including CO2 emissions
 - Produce small passenger cars consumers want to purchase
 - Our primary customers [it is said] face bankruptcy
- **We believe small suppliers like AZ can help**
 - We are bidding on parts and subassemblies for the Chevy Volt and a Chrysler Electric Vehicle
 - We have already made significant investments in advanced metal forming technologies, which can provide a base for future developments supported by DOE funding

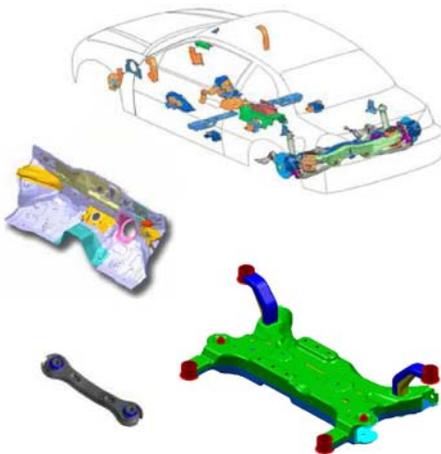
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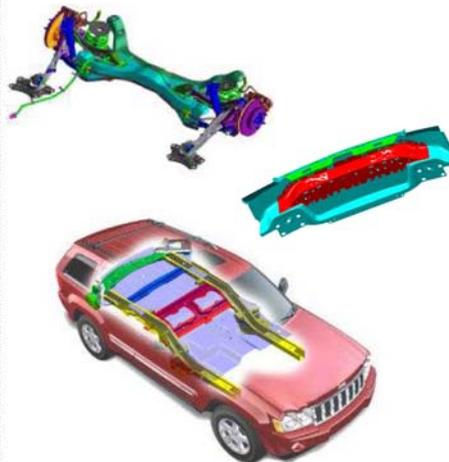
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AZ Automotive - Core Business

Chassis and Body Stampings



Complex Suspension/Body Modules

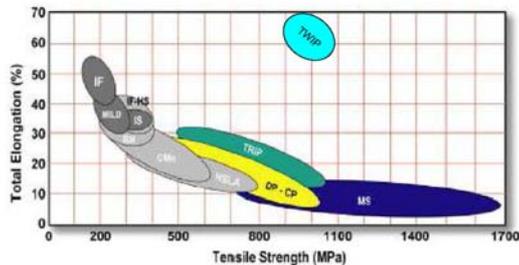


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4

Advanced High Strength Steel (AHSS) overview



Color = AHSS
Grey = HSS

Figure 1-1A - Schematic of AHSS steels (shown in colour) compared to low strength steels (dark grey) and traditional HSS (light grey).¹³

Source:
ADVANCED HIGH STRENGTH STEEL (AHSS)
APPLICATION GUIDELINES
Version 3
Prepared by
INTERNATIONAL IRON & STEEL INSTITUTE
Committee on Automotive Applications

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5

Our message:

- 1. An overriding process technology strategy for the industry is needed to align the North American supply chain**
 - Mill > Steel Service Yard > Stampers > Welders > Module Assembly
- 2. Smaller suppliers have an important role to play**
 - Seedbeds for new process technology
 - Immediately available capacity
 - “Can Do” attitude, backed by competence and commitment
- 3. Working with small suppliers will require a “small loan” capability on the part of the DOE**
 - \$5 billion (500 to 1000 small projects at \$1-\$5 million apiece)
 - Targeted at technology priorities (Body Structures, Batteries, Charge Management Software)

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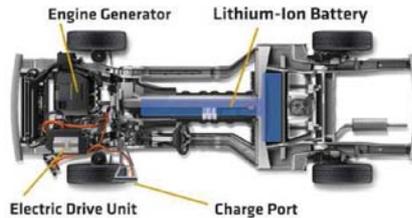
6

Advanced Technology Vehicle Programs

- Chevy Volt
 - Best available serial hybrid technology
 - Gen 1 Volt pack - Lithium Ion Batteries from South Korea's LG Chem
 - Motor technology
 - Charge management software
 - Shared scale with Chevy Cruze
 - Light, strong, affordable body structures



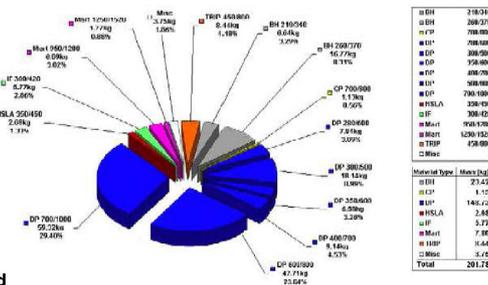
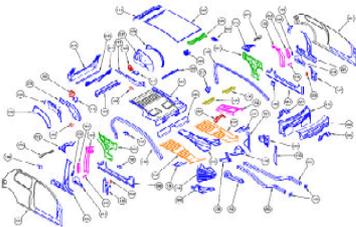
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Example AHSS applications for the ULSAB-AVC (Advanced Vehicle Concept)



Chevy Volt – Supplier’s role

- **Stamping Supplier role**
 - **Build-to-print**
 - **Mfg. Volume Flexibility** – Various reports suggest a gradual production ramp-up
- **Possible DOE assistance**
 - **Support for new process skills** (e.g., Expand current state of the art software forming simulations)
 - **Funding support to bring down the cost of under-utilized process capital**
As an example, equipment will be needed to weld, apply structural adhesives and fasteners for large assemblies

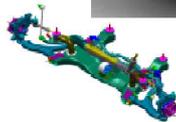
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Advanced Technology Vehicle Programs

- **Chrysler Electric Minivan – Possible application program**
 - “**Electrify**” an existing vehicle (Dodge Caravan)
 - **Partner with body module suppliers** (like AZ)
 - **Outsource key module design & engineering**
 - **Outsource both weldment assembly and module assembly**



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10

Summary

- **Small suppliers like AZ Automotive play a key enabling role in bringing advanced technology vehicles to market**
 - **Forming & fabrication technology for new materials and processes**
 - **System design & manufacturing skills for new modules**
- **Small amounts of capital, strategically placed, can help a lot to allow US nameplate OEMs to catch up**
 - **Provide necessary cash to develop new capabilities**
 - **Support investments with uncertain market acceptance**
 - **Offer surge capacity to rush new programs through**

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13

Appendix

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14

Advanced High Strength Steel (AHSS) definitions

1.A. Definitions

Automotive steels can be classified in several different ways. One is by a metallurgical designation. Common designations include low-strength steels (interstitial-free and mild steels); conventional HSS (carbon-manganese, bake hardenable, high-strength interstitial-free, and high-strength, low-alloy steels); and the newer types of AHSS (dual phase, transformation-induced plasticity, complex phase, and martensitic steels). Additional higher strength steels for the automotive market include ferritic-bainitic, twinning-induced plasticity, nano, hot-formed, and post-forming heat-treated steels.

A second classification method important to part designers is strength of the steel. Therefore, this document will use the general terms HSS and AHSS to designate all higher strength steels. In contrast, much of the current literature uses narrowly defined ranges to categorize different steel strength levels. One such system defines High-Strength Steels (HSS) as yield strengths from 210 to 550 MPa and tensile strengths from 270-700 MPa, while Ultra-High-Strength Steels (UHSS) steels have yield strengths greater than 550 MPa and tensile strengths greater than 700 MPa. These arbitrary ranges suggest discontinuous changes when moving from one category to another. However, data show property changes are a continuum across the entire span of steel strengths. In addition, many steel types have a wide range of grades covering two or more strength ranges.

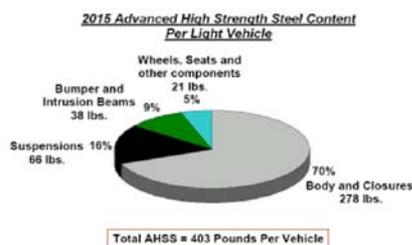
Source:
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15

AHSS Technologies that will meet Automotive OEM / DOE legislative objectives



Source:
 Great designs in steel seminar
 METALLIC MATERIAL TRENDS FOR NORTH
 AMERICAN LIGHT VEHICLES, Richard A.
 Schultz, Ducker Worldwide North America

To achieve vehicle mass reduction:

- Advanced high strength steels will grow at a 14 percent CAGR and reach over 400 pounds per vehicle by 2015
- Advanced high strength steels in the body structure will increase from 11 percent of the body weight today to 40 percent of the body weight by 2015
- The total amount of steel content per light vehicle will decline from 2,300 pounds in 2007 to 2,100 pounds in 2015, as Advanced High Strength Steels replace other steels to save weight and improve performance
- Aluminum and magnesium will only increase from seven pounds per vehicle in the body and closures today to 20 pounds in the body and closures by 2015

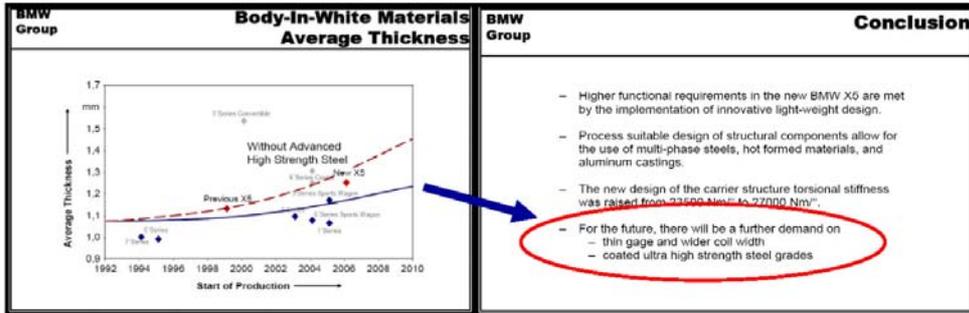
High-volume domestic OEM producers continue to advance the use of AHSS with advanced manufacturing processes for their advanced vehicle programs but lag behind European & Asian competitors...

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16

AHSS/Advance Mfg. capability – Example European OEM, (BMW)



- BMW projects average Minimum Yield Strength will rise which will help to decrease the average steel thickness and reduce weight
- BMW is fighting the same performance constraints as all OEMS – Safety/Content enhancements, Mass reduction/Fuel Economy.
- European car manufacturers use of AHSS and advance manufacturing technologies exceed domestics

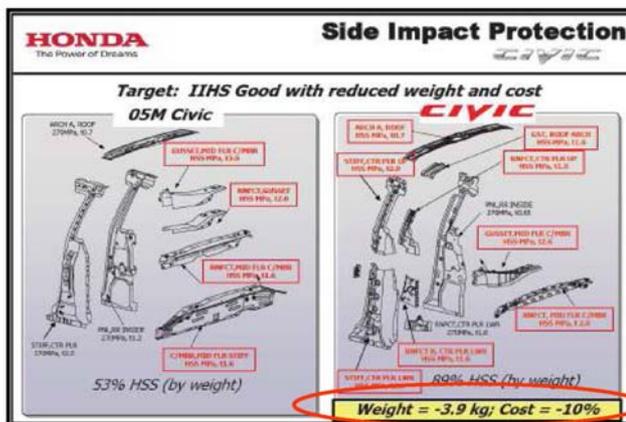
Source:
 Great designs in steel seminar
 The Mixed Material Concept of the
 New BMW X5, Markus Pleistorf, BMW Group,
 Duane Copeland, BMW MC, BMW Group

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17

AHSS/Advance Mfg. capability – Example Asian OEM (2006 MY Honda Civic)



Source:
 Great designs in steel seminar
 Advanced High Strength Steel Technology in the
 2006 Honda Civic
 Creating Special Appeal with Steel Mark Pafumi,
 Honda R&D Americas, Inc.

- Honda uses AHSS extensively to manage Cost, Crash Worthiness and Vehicle Mass.

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18

