

# Novelis- Overview of Flat rolled Aluminium products

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Henrik Olandersson  
Key account manager Automotive  
Jönköping, Nov. 8, 2016

Novelis



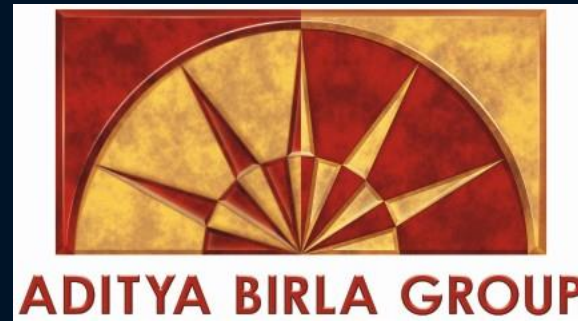
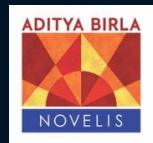
# Agenda

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- 1 Novelis company overview**
  - 2 Automotive market development**
  - 3 Novelis Automotive products**
  - 4 Novelis Specialties products**
-

# Novelis, since 2007 part of the Aditya Birla Group



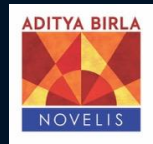
## The Aditya Birla Group at a Glance

- ▶ Revenues of \$40 billion
- ▶ 136,000 employees
- ▶ Operations in 33 countries
- ▶ Major player in aluminum, copper, cement, viscose staple fiber, carbon black, insulators, fertilizer and more

Not just aluminum, Novelis Aluminum.

# Novelis, fact & figures

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12,000



**Employees**

\$10b



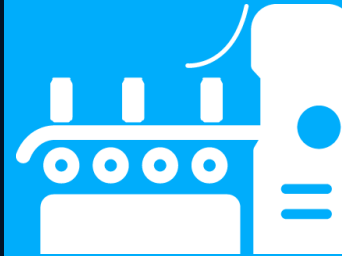
**FY16  
Revenues**

3.1 Mt



**FY16 FRP  
Shipments**

25



**Operations**

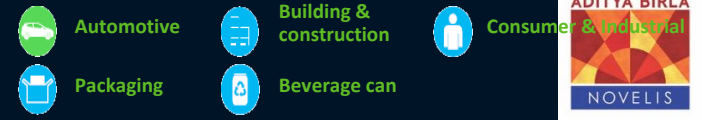
11



**Countries**



# Novelis Global Footprint



GLOBAL  
ALUMINUM  
LEADER IN:

Flat Rolled  
Products

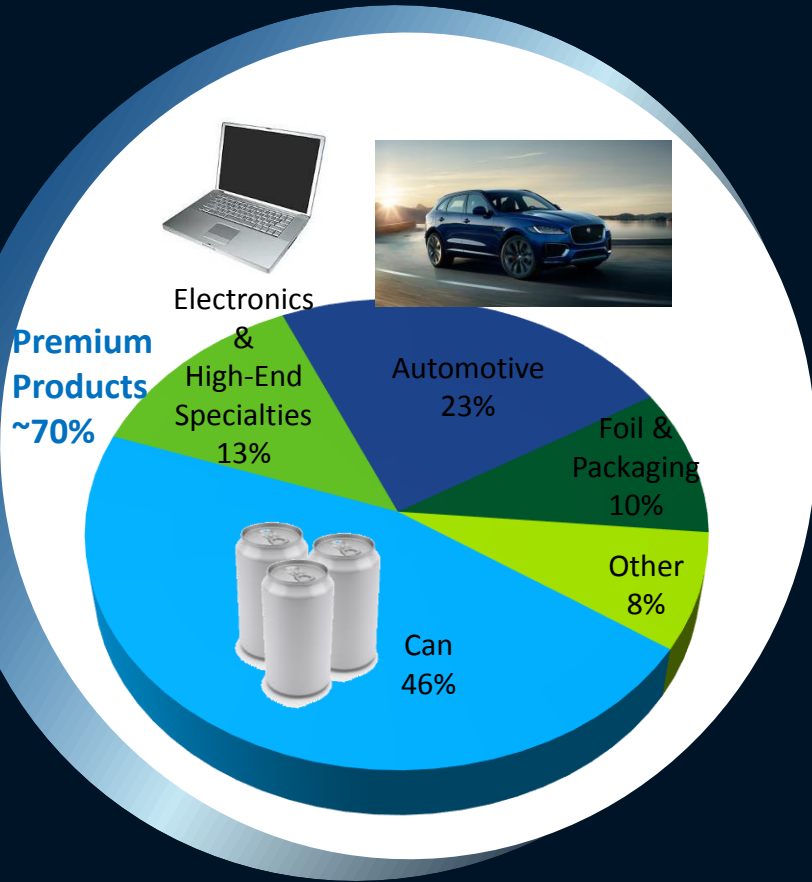
Automotive  
BiW Sheet

Recycling

# Focus on High-End Products and Customers



## NE Shipments by Market, FY2015



Based on FY 2015 Shipments

## Strong, L-T Customer Relationships

### Beverage Cans



### Automotive



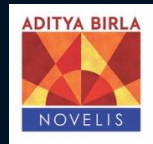
### Industrial & Electronics



Not just aluminum, Novelis Aluminum.

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-

# Automotive BIW History: 1970 – Today

- Invention of first modern automotive BIW alloy

- Porsche 928:



1970

- Cadillac Allanté



1980

- S-class



- Land Rover Discovery



- Audi A8



1990

- Audi A2 – Full aluminum car



- Low volume full aluminium cars



- High volume hang-on applications

2000

High volume, full aluminium vehicle

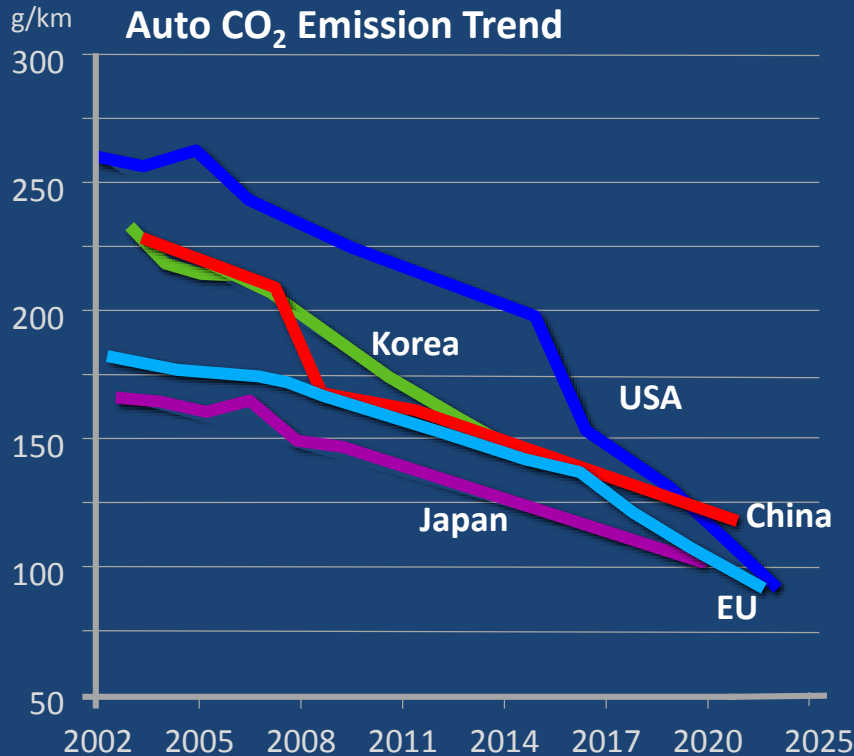


2010

Today



# Legislation – Drive for lightweight

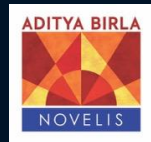


Source: International Council on Clean Transportation (ICCT)

## Lower Global Trend (g/km of CO<sub>2</sub>)

	USA	2008: 240
		2012: 228
		2016: 172
		2025: 93
	China	2008: 185
		2015: 167
		2020: 117
	Korea	2008: 198
		2015: 150
	EU	2008: 154
		2015: 130
		2020: 95
	Japan	2007: 147
		2015: 125
		2020: 105

# Aluminium growth in Automotive



Press release

## New study shows aluminium content in cars to increase by up to 30%

**7 September 2016 – A Ducker Worldwide study forecasts the aluminium content in cars to increase by up to 30% over the next ten years, where Auto Body Sheet leads the same period. The growth is largely attributed to aluminium's role in lightweighting cars, thereby contributing to low emission mobility.**

The amount of aluminium used in cars is expected to see a significant increase by 2025, according to a study recently published by consulting and research firm Ducker Worldwide. The study, commissioned by European Aluminium, predicts that the aluminium content of cars produced in Europe could reach nearly 200 kg per vehicle by 2025, up from 150 kg today.

*"We expect the aluminium content in cars to continue to grow significantly over the next ten years," stated Wouter Vogelaar from Ducker Worldwide. "Aluminium is therefore an integral part of the EU's transition to a low carbon society," said Dieter Höll, Chairman of the Automotive & Transport Board at European Aluminium. "We hope the European Commission's strategy to decarbonise transport will stress the benefits of lightweight materials such as aluminium."*

*"Without lightweight cars there can be no energy efficient mobility. Aluminium is therefore an integral part of the EU's transition to a low carbon society," said Dieter Höll, Chairman of the Automotive & Transport Board at European Aluminium. "We hope the European Commission's strategy to decarbonise transport will stress the benefits of lightweight materials such as aluminium."*

Ducker Worldwide also found that the share of rolled products grew significantly in the last four years due to the increased penetration rate for body closures and body structures. The share of forgings and extrusions in the total aluminium consumption remained relatively stable.

The study includes data from automotive companies and suppliers, European Aluminium member companies and past Ducker Worldwide data. It is based on a detailed analysis of the use of aluminium castings, extrusions, forgings and sheets for 33 component groups across a sample of 93 car models, subsequently extrapolated to the entire 2016 production forecast in EU 28.

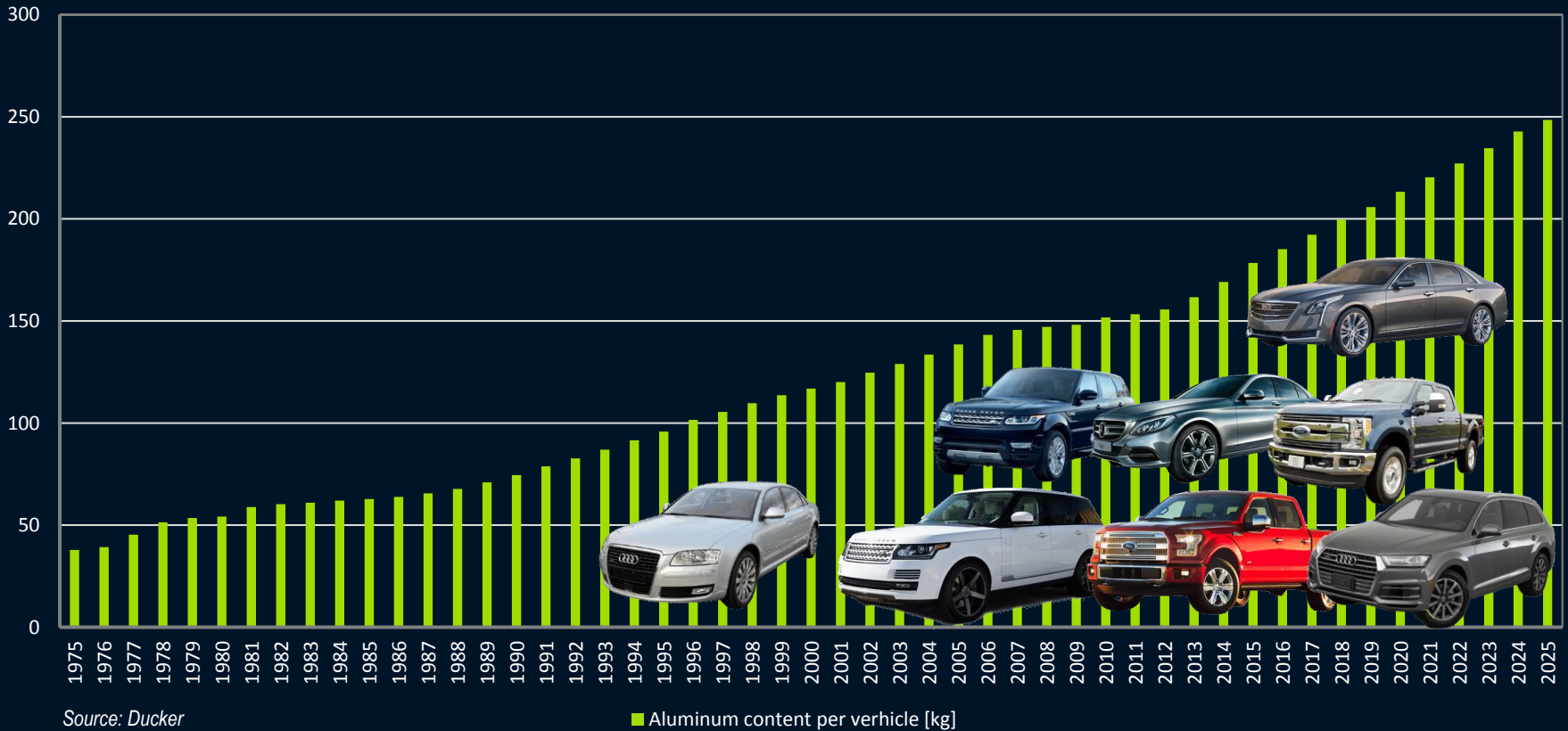
The public summary can be found [here](#). The full report (140 pages) is available to members of European Aluminium's Automotive and Transport Market Group. For more information please contact Patrik Ragnarsson ([ragnarsson@european-aluminium.eu](mailto:ragnarsson@european-aluminium.eu)).

**7 September 2016 – A Ducker Worldwide study forecasts the aluminium content in cars to increase by up to 30% over the next ten years. This surge is mainly from rolled and extruded products, where Auto Body Sheet leads the growth with an expected increase of 110% over the same period. The growth is largely attributed to aluminium's role in lightweighting cars, thereby contributing to low emission mobility.**

The amount of aluminium used in cars is expected to see a significant increase by 2025, according to a study recently published by consulting and research firm Ducker Worldwide. The study, commissioned by European Aluminium, predicts that the aluminium content of cars produced in Europe could reach nearly 200 kg per vehicle by 2025, up from 150 kg today.

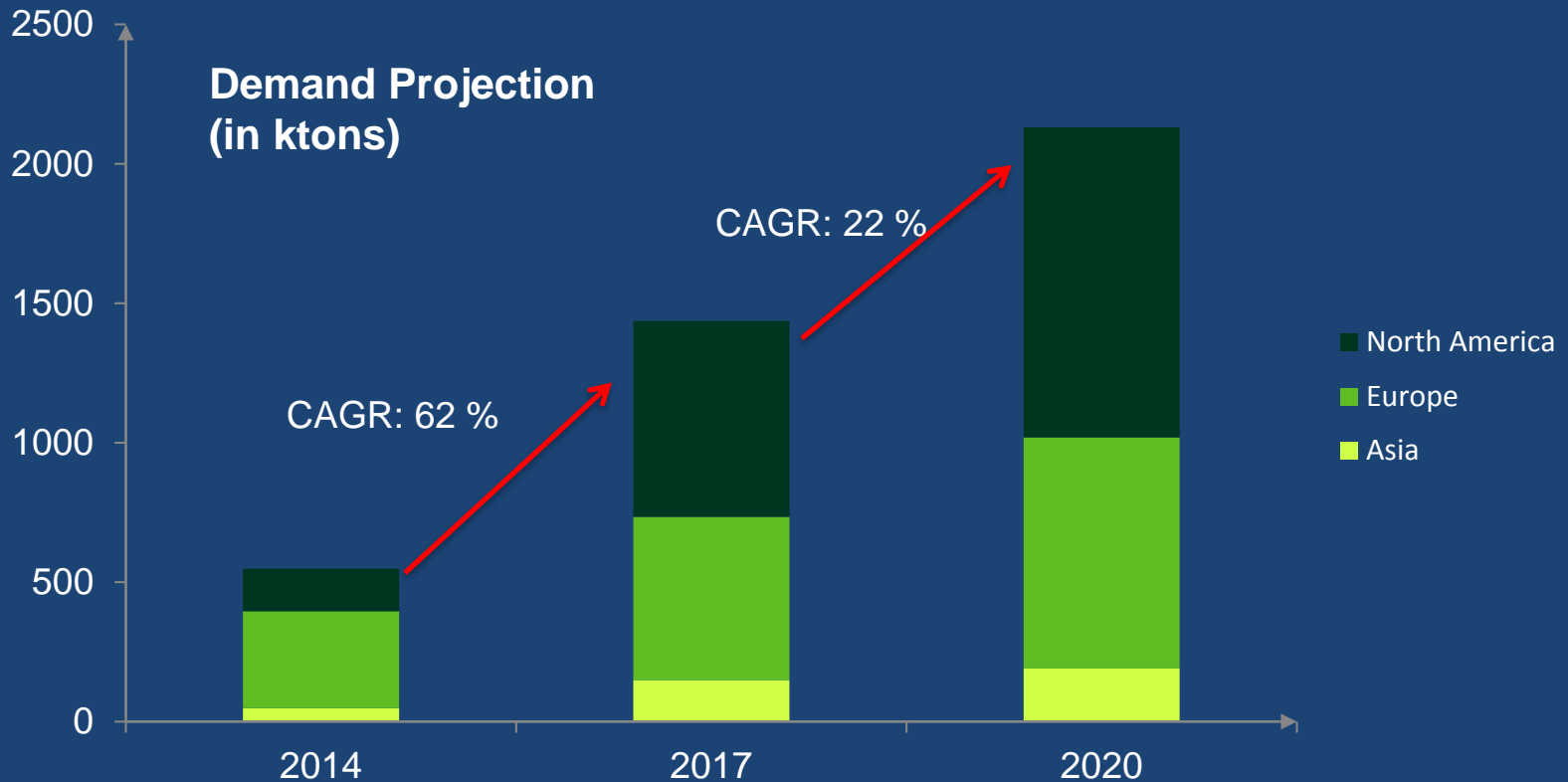
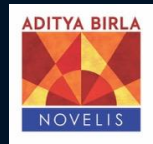
# Aluminum growth in automotive

Aluminum content per vehicle [kg]



Not just aluminum, Novelis Aluminum.

# Global Automotive Aluminium Sheet Demand

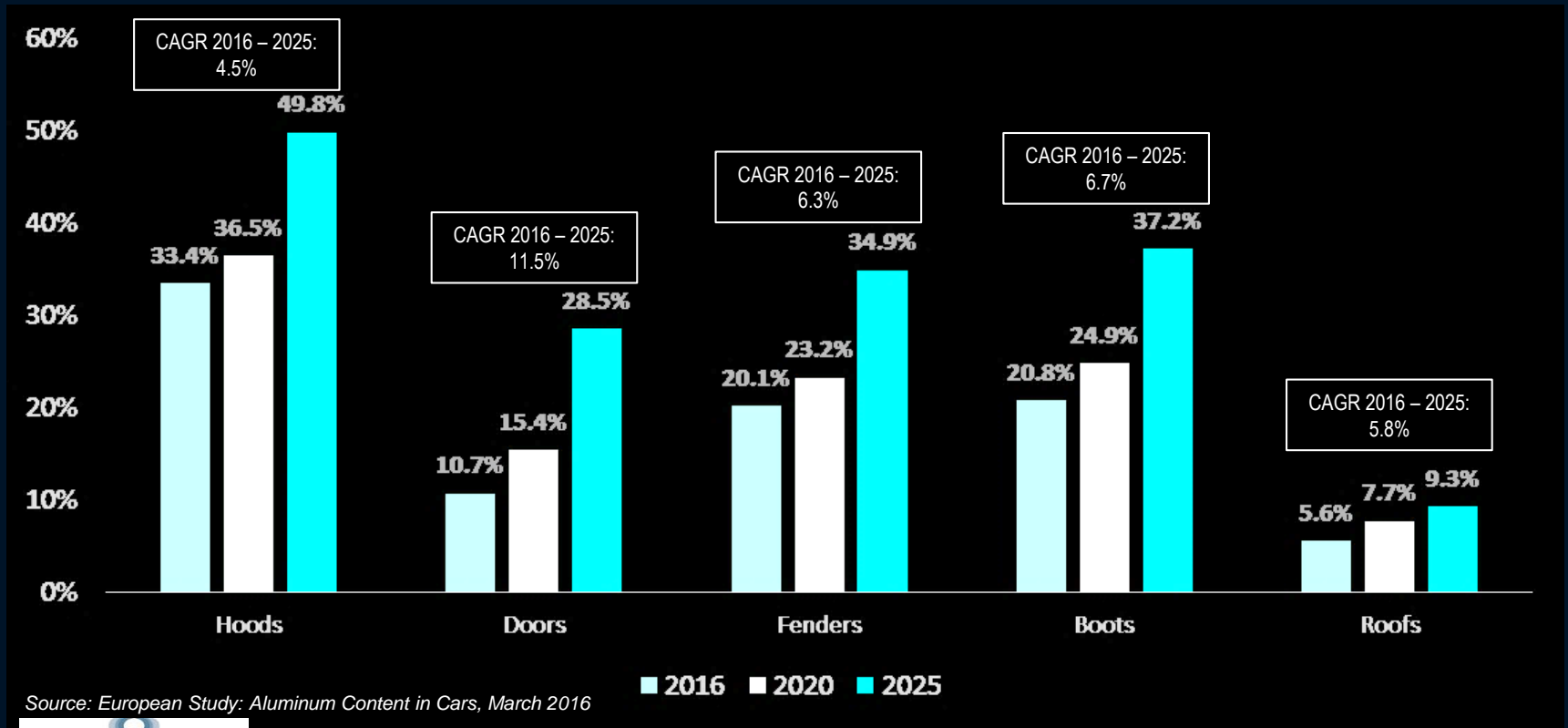
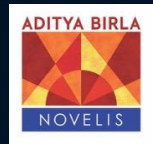


Source Novelis internal – Global Automotive Demand – Status: August 2014

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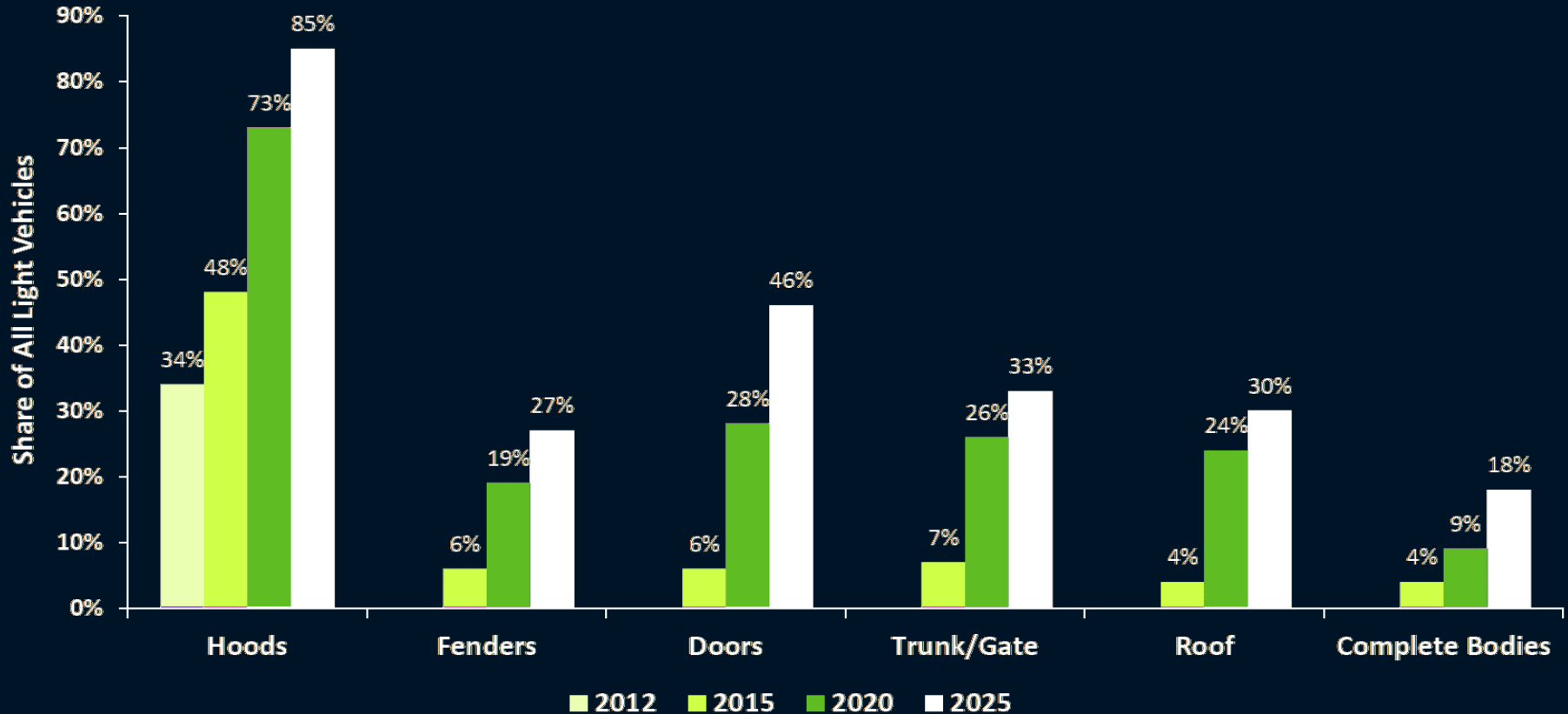


# Aluminum Penetration Rate for Body Closures: Europe



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# Alu Penetration Rate for Closures & Complete Bodies: US



Source: Duckers Study "2015 North American Light Vehicle Aluminum Content Study" June 2014

# Aluminium Moving into Smaller Segments



Complete Structure + Hood + Fenders in Aluminium



Hood + Fenders + Doors in Aluminium



Hood in Aluminium



Closures + Roof in Aluminium



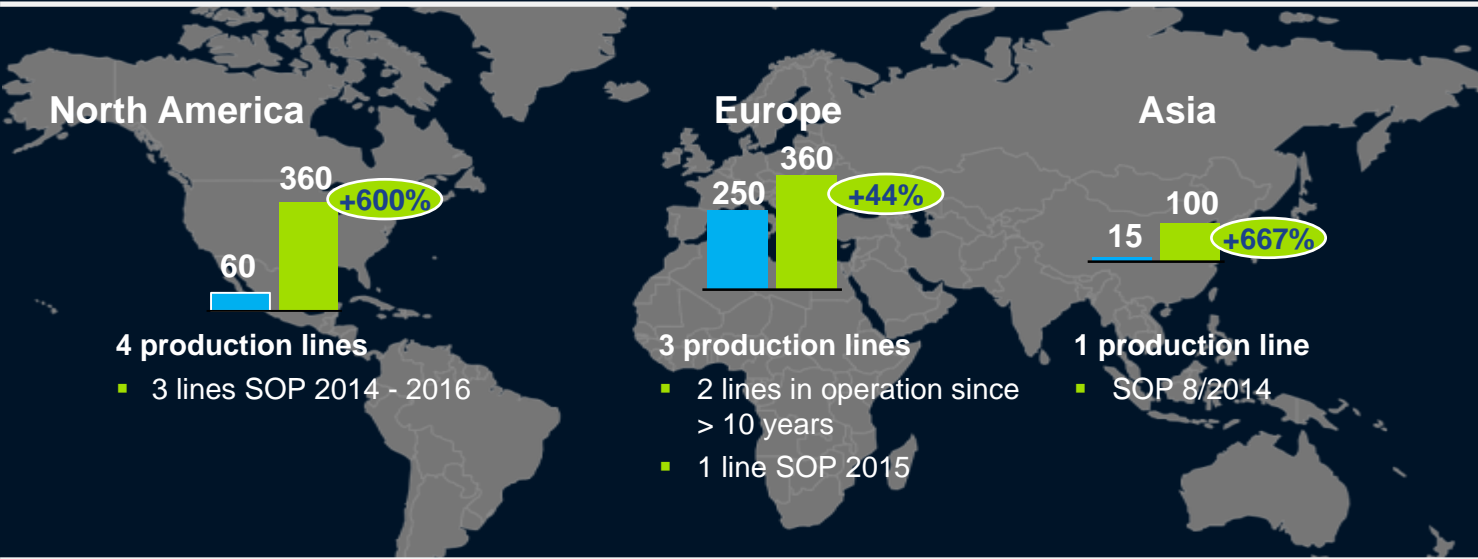
Hood + Fenders in Aluminium



Hood + Tailgate in Aluminium

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# Novelis Automotive BiW Sheet Capacity Worldwide, 2013 vs. 2017



### North America

- 4 production lines
- 3 lines SOP 2014 - 2016

### Europe

### 3 production lines

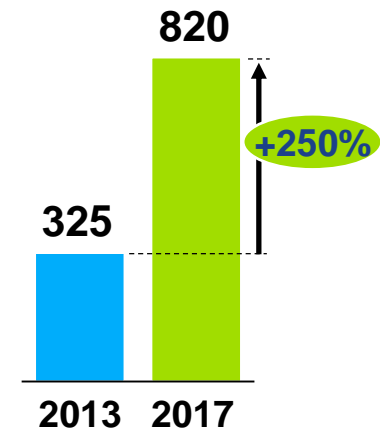
- 2 lines in operation since > 10 years
- 1 line SOP 2015

### Asia

### 1 production line

- SOP 8/2014

## Novelis Global

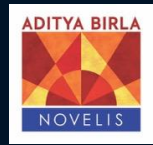


Novelis Automotive BiW capacity 2014 vs. 2017, in kt



# Novelis Automotive BiW Capacity - Latest Addition in Europe

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- New aluminium automotive sheet finishing line at existing Nachterstedt, Germany facility
- 120 kt annual capacity
- Increase Novelis' aluminium automotive sheet capacity in Europe to almost 360,000 kt p.a.
- SOP: October 2015



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# Aluminum sheet still small in automotive ..... with a long way to go



80 Mt flat rolled steel, 2015

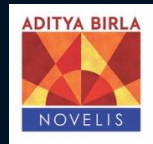


2.2 Mt Aluminum FRP, 2020

1Mt Aluminum FRP for cars, 2015

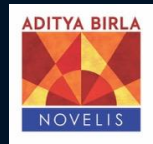
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# Global Automotive R&D Program



## ALLOY INNOVATION



### Forming

- Advanz™ e200
- Advanz Fusion™ e200
- Elevated Temperature

### Strength / Crash

- Advanz™ s615
- 6xHS: 330 MPa
- 7xHS: 500 MPa
- 7xHS: Phase 2

### Joining

- Advanz Fusion™ for RLW
- Multi-material Joining

### Recycling

- 6xxx skin and structural
- 5xxx structural
- End of Life vehicle

## ENGINEERED SURFACES

- Unified global pretreatment
- Mixed body solutions
- Optimized surface topography

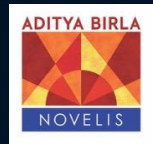
## APPLICATION TECHNOLOGY

- Global technology & engineering support
- Tailored Aluminum Blank (FSW & LW)
- Formability & crash characterization
- Elevated temperature forming characterization

Not just aluminum, Novelis Aluminum.



# Novelis Unique Portfolio of Alloys



**Exterior**



**Inner/Structure**



**Strength**



**Crash**

**Novelis New Product Launches**

Advanz™ Fusion e200\*  
Advanz™ e200

Advanz™ s200  
RC5754  
RC5182

Advanz™ s7xx  
Advanz™ s615

**Novelis Global Products**

Advanz™ e170  
Advanz™ e600

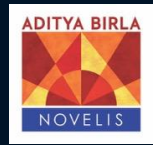
Advanz™ s118  
Advanz™ s600

Advanz™ c300

**Standard Products**

AA6016  
AA5182  
AA5754  
AA6111

# Complete portfolio for all BiW applications



A complete portfolio for all applications

A globally standardized portfolio

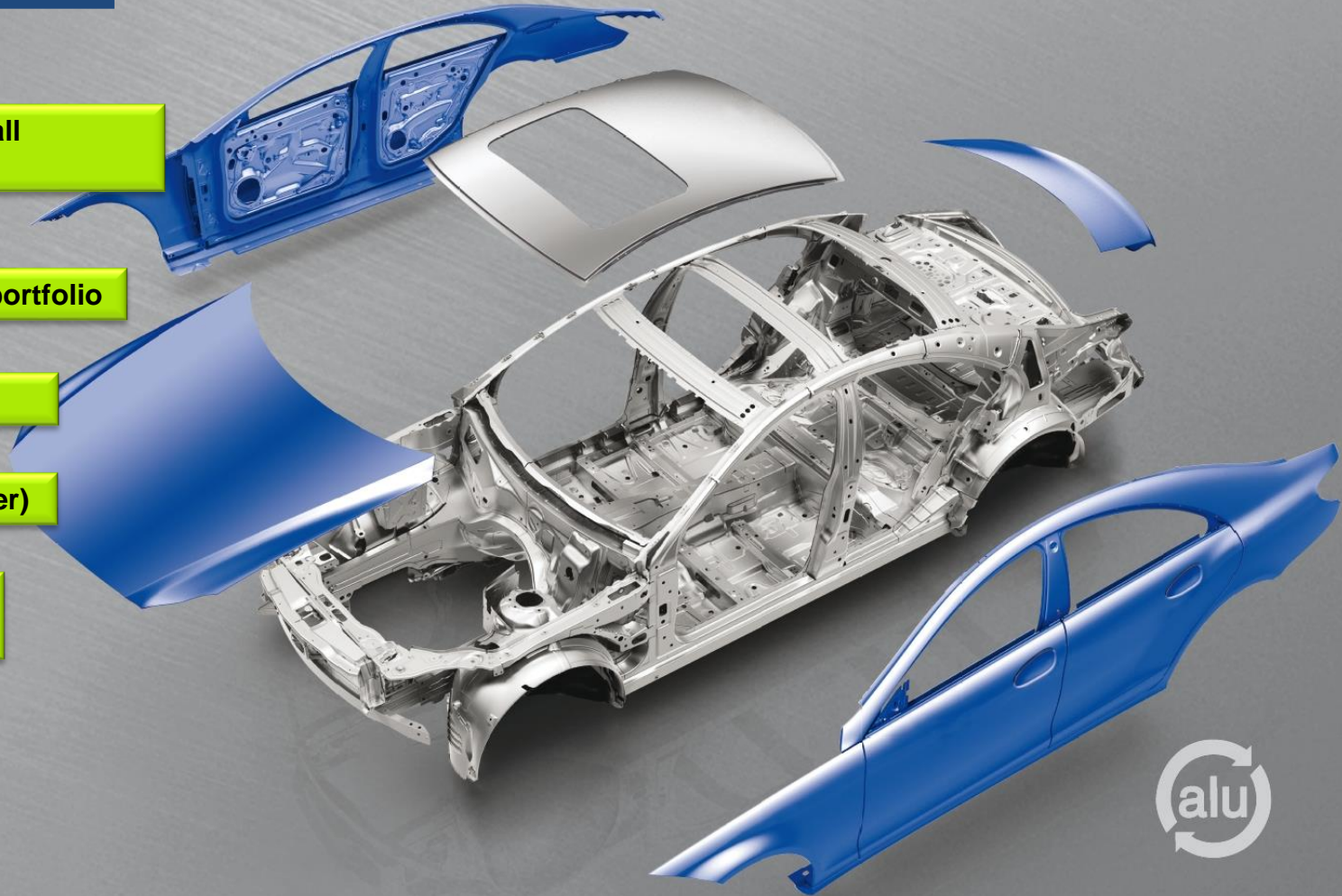
Wide material (2200mm)

Customized shapes (Laser)

Pre-lubricate and surface-treated material

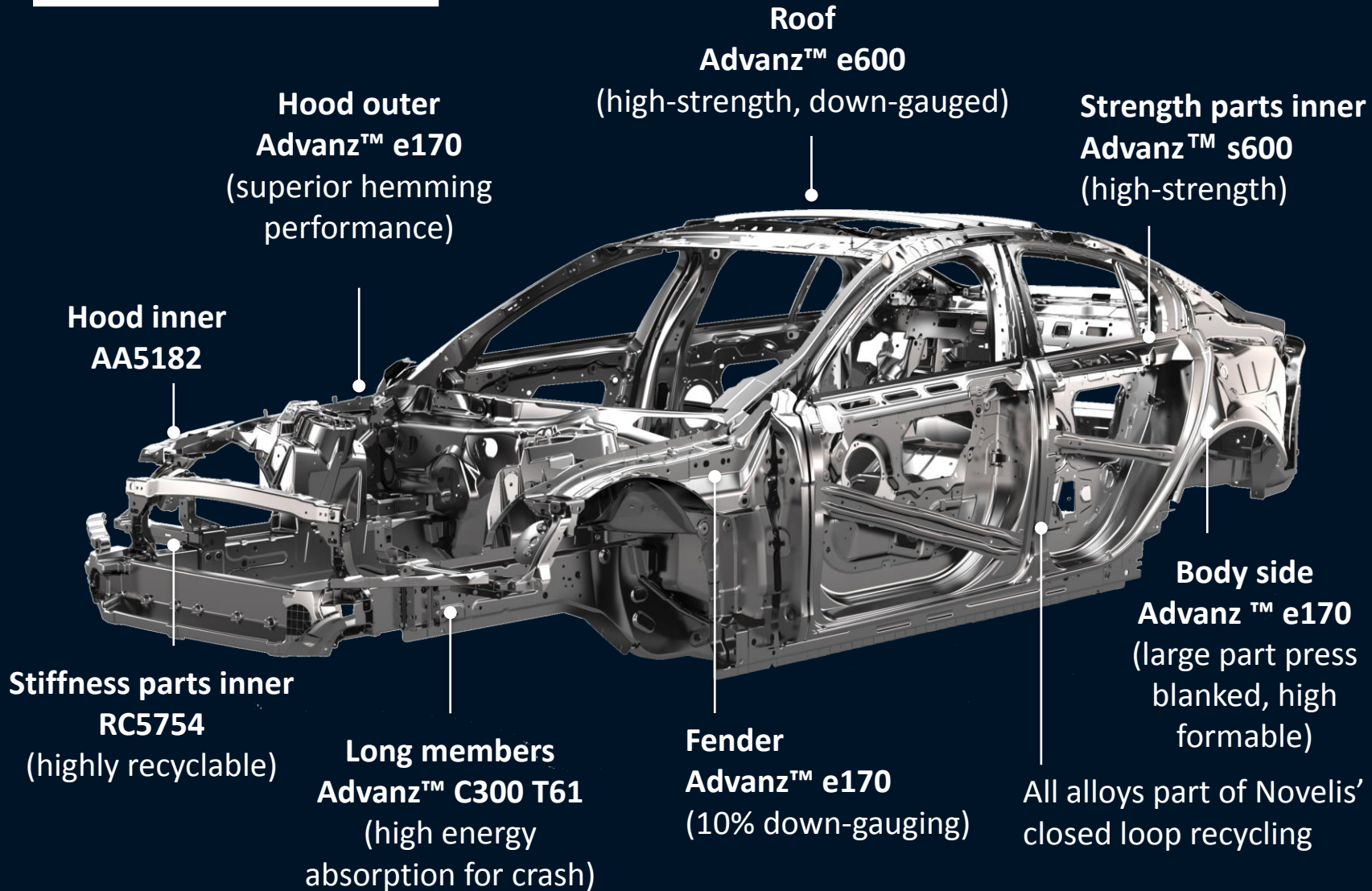
MF or EDT texture

[www.novelis.com](http://www.novelis.com)



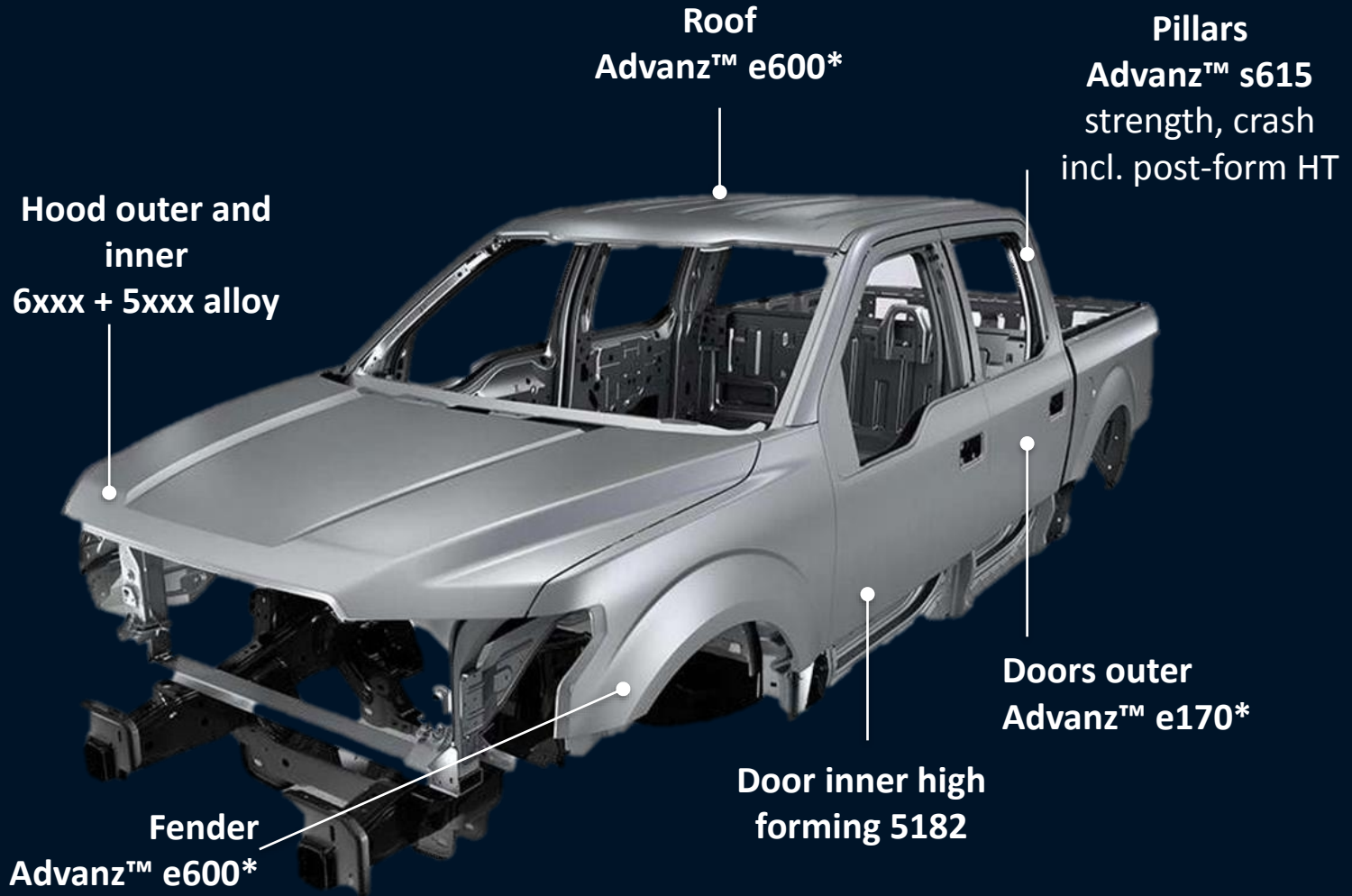
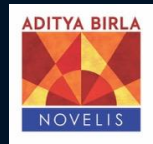
Not just aluminum, Novelis Aluminum.

# Novelis Products Help Create Jaguar's XE Model



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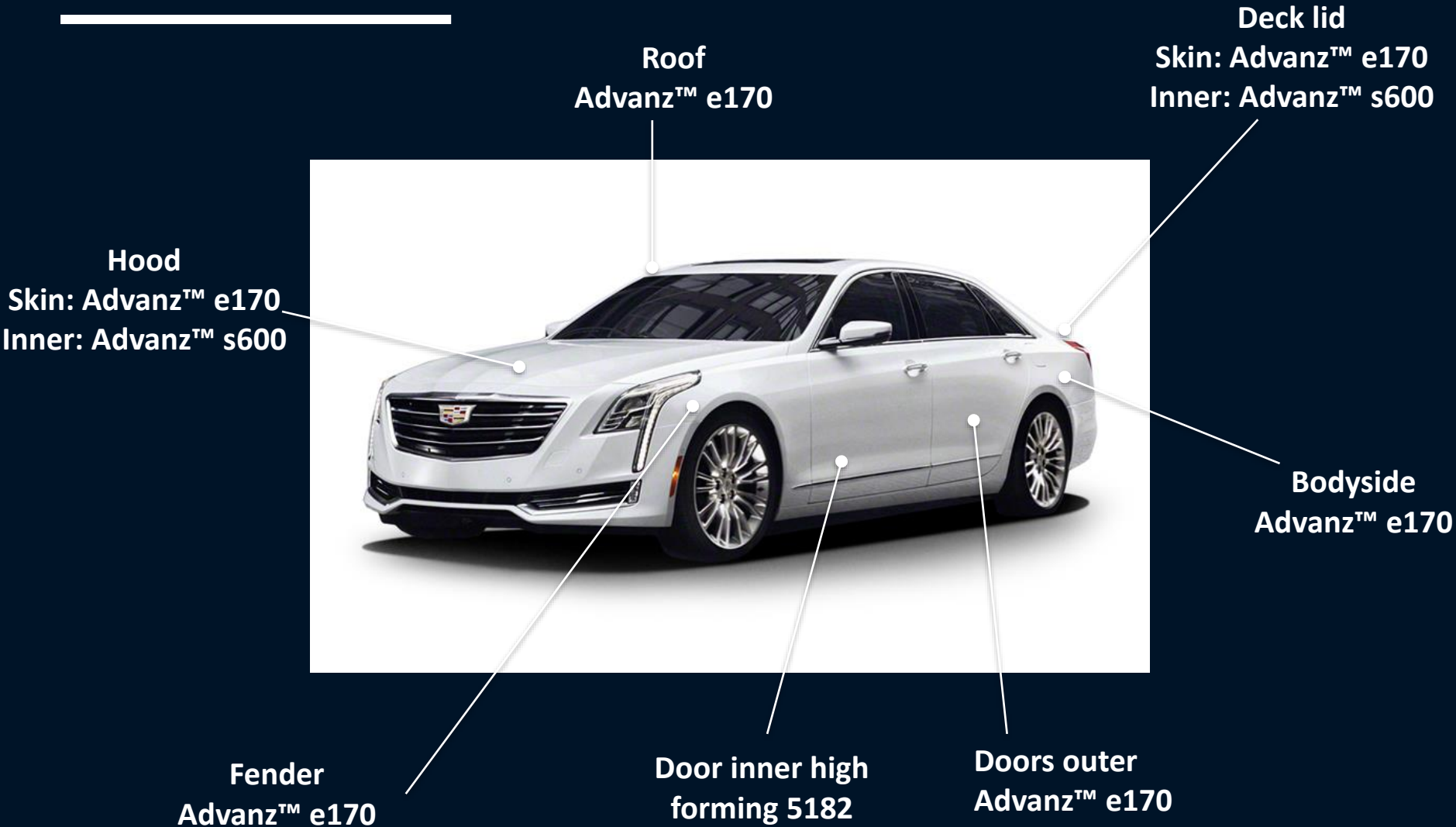
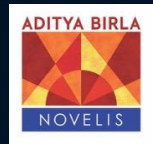
# Major Supplier for Ford's F-150 Program



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# Major Supplier for GM's CT6 Program in China



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# Novelis Specialties product portfolio



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# Novelis Specialties product portfolio



**main alloys:** 1050, 3003, 3005, 5005, 5010, 5052, 5083, 5754, 6xxx, 8006, 8011

**gauges:** 30 Micron up to 8 mm

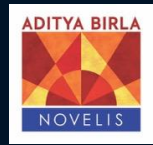
**width:** 19 mm up to 2070 mm

**surface:** mill finish, degreased, re-lubricated, primer coatings, decorative coatings, technical anodizing layer, anodized, anodizing quality, brushed

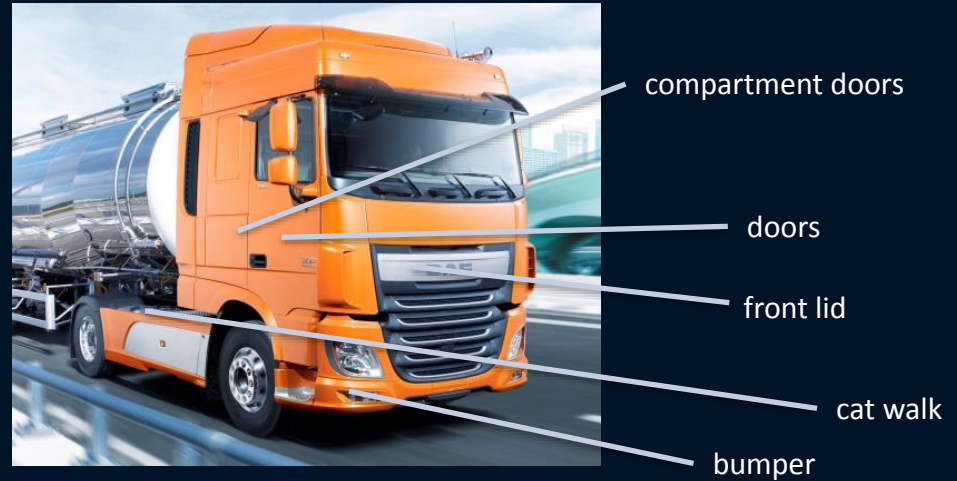
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# Novelis Specialties product - Trucks



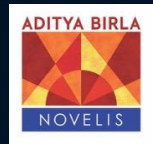
- Hang-on parts trucks (door, lids...)
  - ENAW 5152
  - 6xxx-alloys
- Cat walks
  - ENAW 5754
  - Specialized quality for finish in anodized surface
- Fuel tanks
  - ENAW 5754
  - ENAW 5052
- Heat shields, brackets and side cover sheets with a special stamping ability



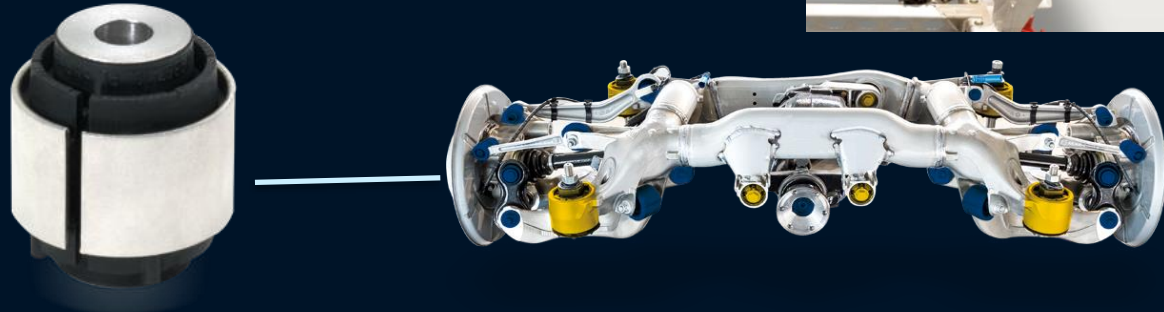
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# Novelis Specialties product – Thin & Thick gauge



- Chassis Engineering
  - Mill finish, one side or both sides coated with primer
  - Strong 5754 alloy
  - Slitting expertise down to 18 mm width

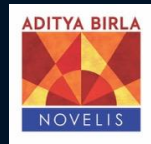


- Joint customer developments
  - Special surface finishes for interior – like ,soft touch‘
  - Experience in auto interior application
  - Battery housings with dedicated alloys and surfaces

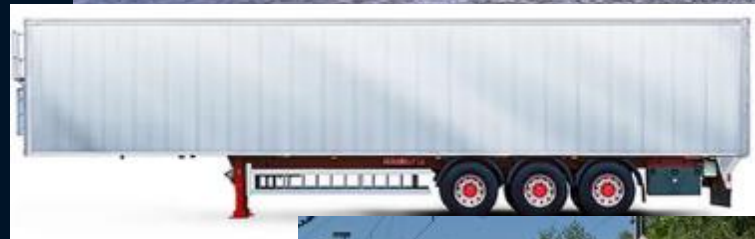


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# Novelis Specialties product - Special transportation

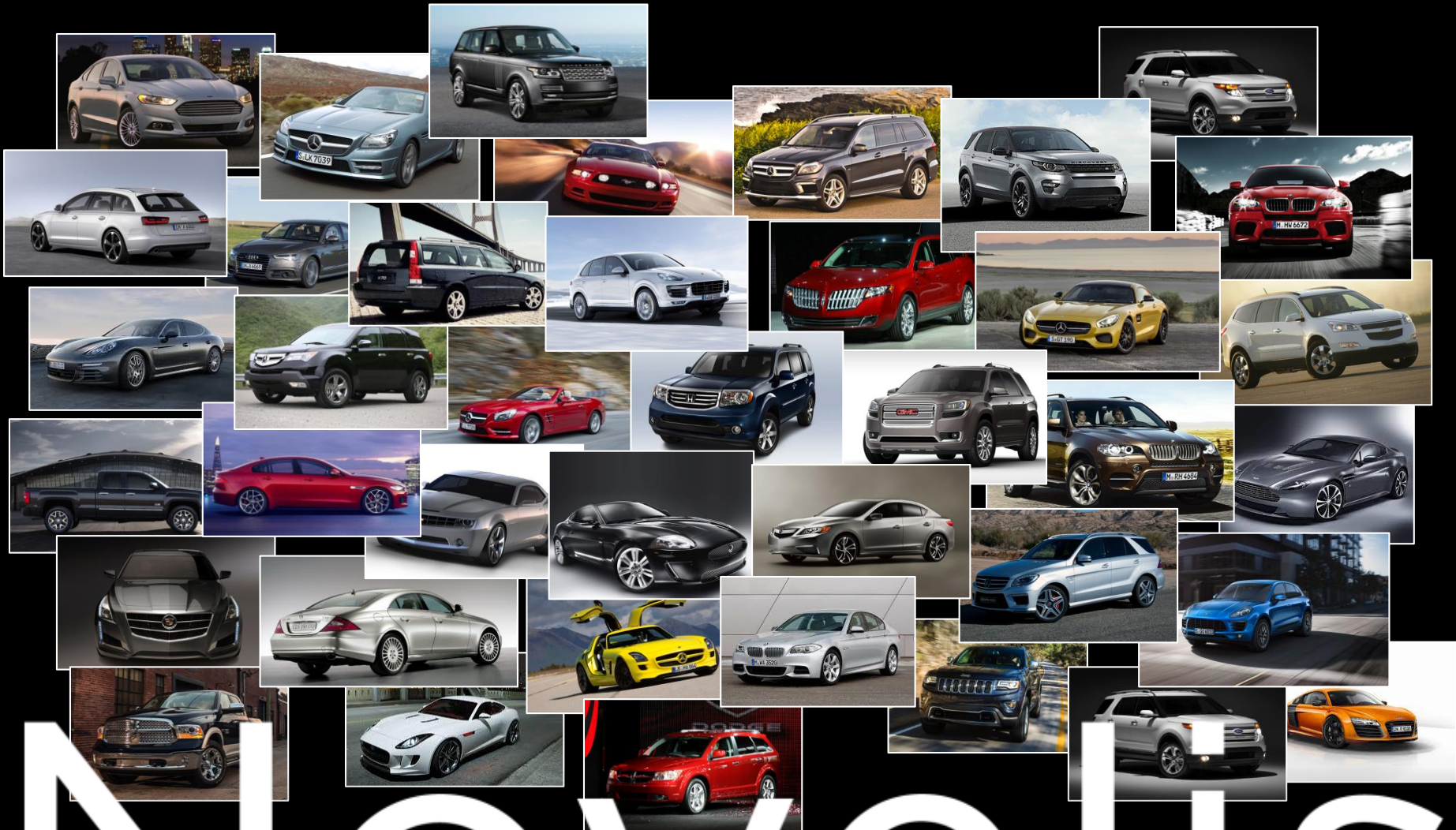


- Special transportation
  - ENAW 5754
  - Gauges up to 8 mm
- Heat protection
  - ENAW 5754
  - ENAW 3005
- Know how in transportation
  - ENAW 5754 / 6xxx
  - Primer coating or degreased surfaces
  - High strength alloys / high formability
- Know how in doors and compounds (mixmaterial)
  - Degreased or pre-treated for coating and compound



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# NOVELTIS