



## SSAB's Docol® Tubes in Gacha all-weather autonomous shuttle bus

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Product Manager, SSAB



# AGENDA

DOCOL TUBES IN GACHA BUS

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DOCOL – AUTOMOTIVE STEEL

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SUMMARY

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LEADING PRODUCER OF  
ADVANCED HIGH-STRENGTH  
STEELS FOR OVER 40 YEARS



NORDIC AND  
US-BASED  
STEEL COMPANY



ABOUT 14 300  
EMPLOYEES IN  
50 COUNTRIES




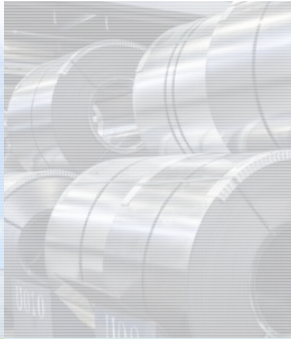
# OUR BRANDED PRODUCT OFFER

						
<b>STRENX™</b> PERFORMANCE STEEL	<b>HARDOX®</b> WEAR PLATE	<b>DOCOL®</b> THE AUTOMOTIVE STEEL	<b>TOOLOX®</b> ENGINEERING & TOOL STEEL	<b>ARMOX®</b> PROTECTION PLATE	<b>GREENCOAT®</b> COLORFUL STEEL	SSAB DOMEX / BORON FORM / WEATHERING LASER PLUS
A game changer in steel performance	Hard and tough for maximum uptime	The automotive steel	Better tool performance	Hardest steel for maximum protection	For harsh weather and greener living	Optimized families

**DOCOL®**  
THE AUTOMOTIVE STEEL

**SSAB**

# OUR AUTOMOTIVE BRAND

						
<b>STRENX™</b> PERFORMANCE STEEL	<b>HARDOX®</b> WEAR PLATE	<b>DOCOL®</b> THE AUTOMOTIVE STEEL	<b>TOOLOX®</b> ENGINEERING & TOOL STEEL	<b>ARMOX®</b> PROTECTION PLATE	<b>GREENCOAT®</b> COLORFUL STEEL	SSAB DOMEX / BORON FORM / WEATHERING LASER PLUS
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**DOCOL®**  
THE AUTOMOTIVE STEEL

**SSAB**



# PRODUCTION SITES FOR AUTOMOTIVE STEEL



BORLÄNGE, SWEDEN  
HOT ROLLING MILL  
COLD ROLLING MILL  
R&D CENTER

HÄMEENLINNA, FINLAND  
METAL COATING LINE  
TUBE MILL  
R&D CENTER

DOCOL TUBES IN  
GACHA BUS

# SSAB'S DOCOL® TUBES IN GACHA ALL-WEATHER AUTONOMOUS SHUTTLE BUS

SSAB is a partner in the Gacha all-weather autonomous shuttle bus premiered in Helsinki in March.

The autonomous minibus is the outcome of collaboration between Finnish robotics company Sensible 4 and the Japanese company MUJI.

SSAB provided its expertise in special steels to the project by donating tubes made of Docol® steel for the bus frame to give the lightness required.





# SSAB'S DOCOL® TUBES IN GACHA ALL-WEATHER AUTONOMOUS SHUTTLE BUS

## FACTS ABOUT GACHA BUS

- Fullstack of autonomous driving sensors; lidars, radars, 360-degree camera vision, high precision GPS, inertia unit and control over 4GLTE/5G
- Max speed: 40 km/h autonomous
- Powertrain: 4WD electric
- Range: 100+ km
- Fast charging with wireless charging as an option
- Dimensions: 4.5 \* 2.4 \* 2.8 m (L\*W\*H)
- Capacity: 10 seats, 6 standing
- Easy access for people with limited mobility
- Exterior displays around the vehicle for vehicle intention communications

# SSAB'S DOCOL® TUBES IN GACHA ALL-WEATHER AUTONOMOUS SHUTTLE BUS

## FUTURE PLANS OF GACHA BUS

- 2019
  - Pilots in Finland in cities of Espoo, Hämeenlinna, Vantaa and Helsinki.
  - First international demonstration
  - Development of first GACHA fleet
- 2020
  - Precommercial operation of GACHA fleets in selected cities in Europe and beyond
- 2021
  - First permanent commercial operations established
  - Integration to public transportation systems
  - Industrial production begin

# SSAB'S DOCOL® TUBES IN GACHA ALL-WEATHER AUTONOMOUS SHUTTLE BUS

Round- and square-shaped SSAB's precision tubes  
Docol® Tube 780 and Docol® Tube 980 for the coach  
Docol® Tube 700LA for the chassis structures  
SSAB's high-strength steels enable lighter and more durable frame structures.



# SSAB'S DOCOL® TUBES IN GACHA ALL-WEATHER AUTONOMOUS SHUTTLE BUS

<https://www.youtube.com/watch?v=W0oxz9KpiIY>

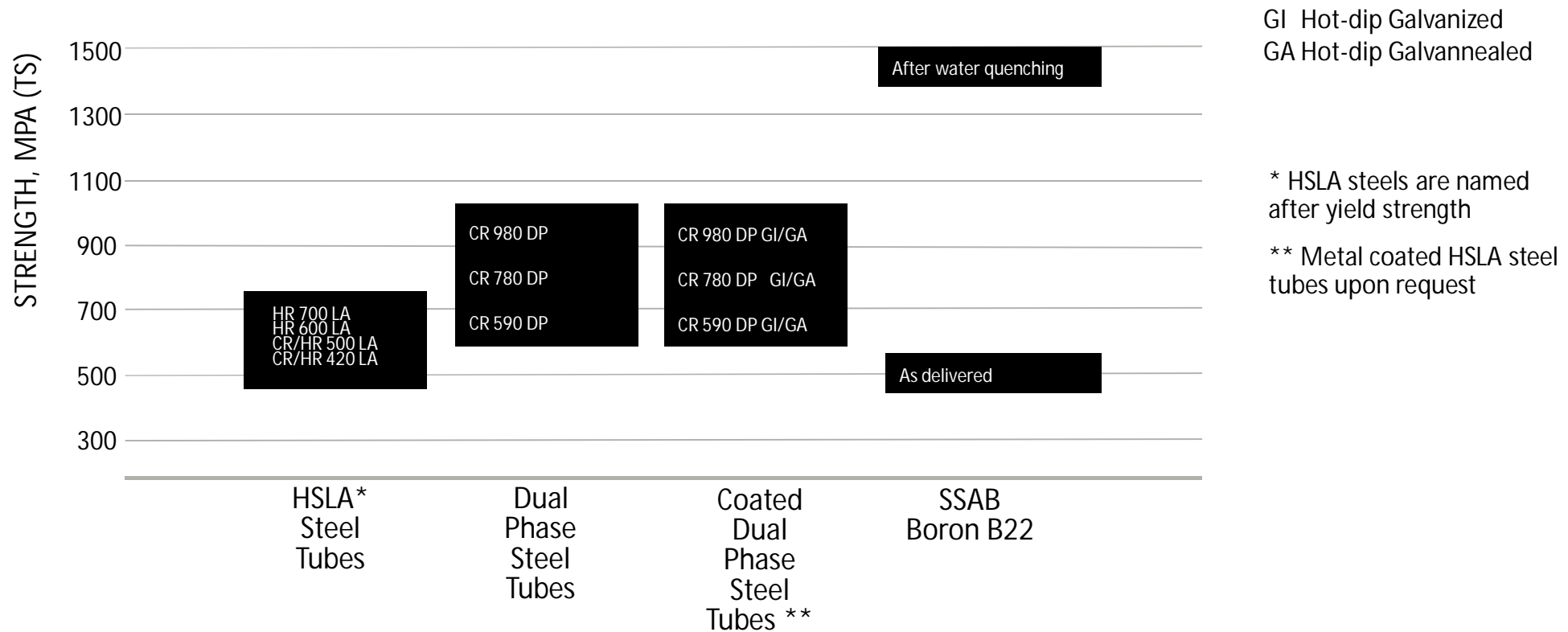
[https://www.youtube.com/watch?v=umx8vhZD\\_do](https://www.youtube.com/watch?v=umx8vhZD_do)



DOCOL –  
AUTOMOTIVE STEEL TUBES



# PRODUCT PORTFOLIO



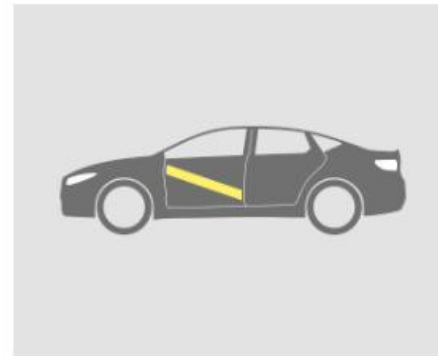
# AUTOMOTIVE STEEL APPLICATIONS



Bumpers



Chassis



Door beams



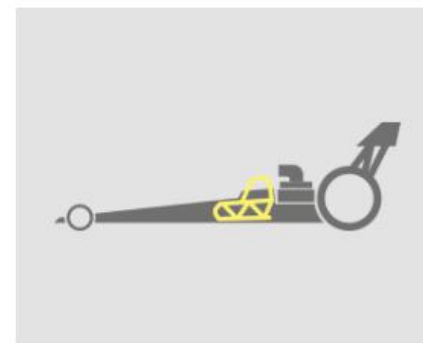
Seating



Structural body parts

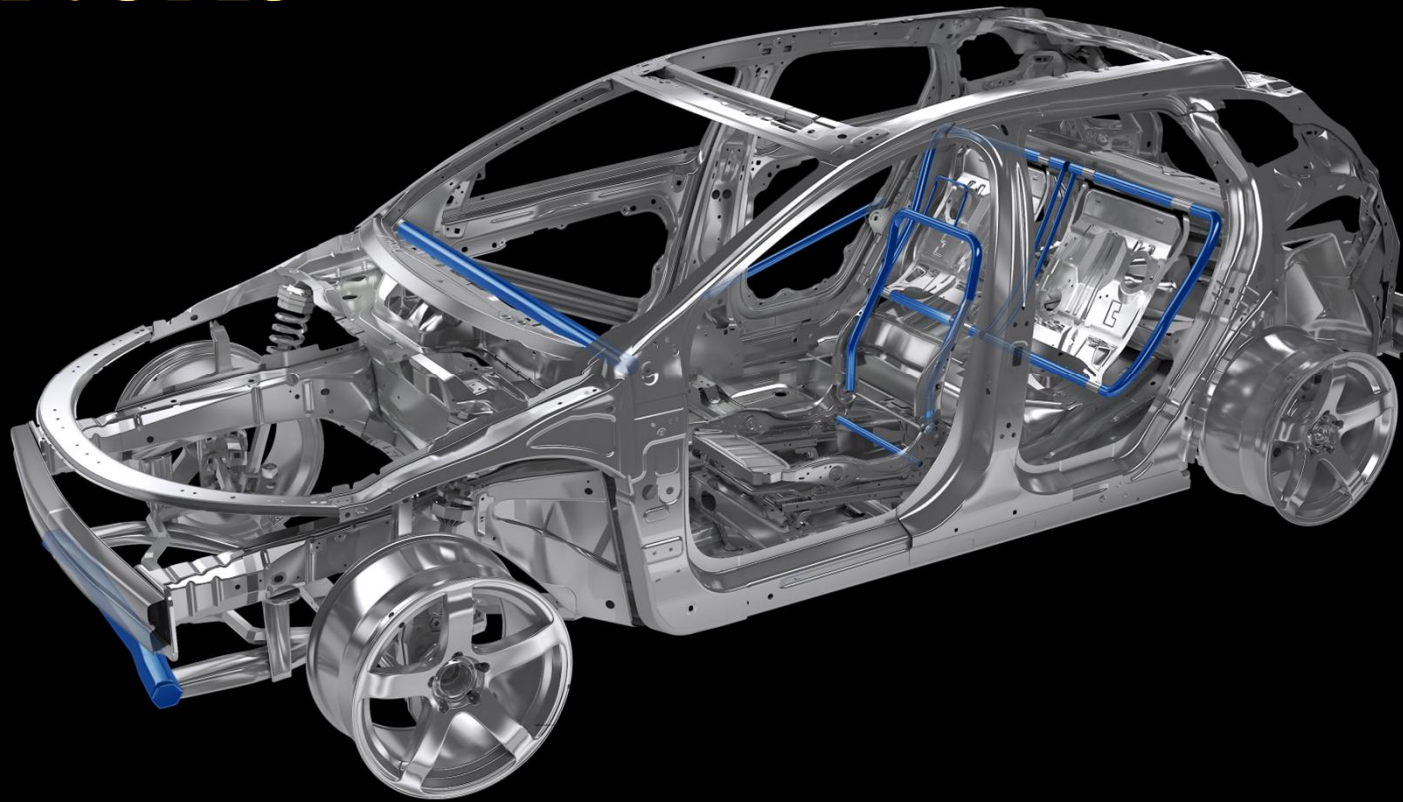


Battery protection



Racing cars

# AREAS OF UTILISATION DOCOL TUBES



# DOCOL® TUBES IN EMOTORSPORT



# Recommendations and handbook

Welding recommendations:

[www.ssab.com/products/brands/docol/Docol-Expertise/AHSS-UHSS-welding-handbook](http://www.ssab.com/products/brands/docol/Docol-Expertise/AHSS-UHSS-welding-handbook)

SSAB Precision Steel Tube Handbook:

[www.ssab.com/precisiontubehandbook](http://www.ssab.com/precisiontubehandbook)





# Contact details

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Gacha bus: Harri Santamala, CEO, Sensible4

***SSAB***



*A stronger,  
lighter and more  
sustainable world*