ITEM OPPORTUNITY SYNOPSIS

Name of the item to be scouted: Aluminum Carshell for High Speed Rail

State item to be used in: Nevada

Describe the Item:

Please describe the item application/the end use of item. Looking for suppliers that have experience with the manufacturing of aluminum carshells for high-speed rail application (220mph)

Supplier Information:

Type of Supplier being sought (select from list below)

Manufacturer

Contract Manufacturer

Distributor

Other (please specify)

Reason for scouting submission (select from list below)

2nd Supplier

Price

Re-Shore

Past supplier no longer available

New Product Startup

Other (please specify) BABA

Summary of Technical Specifications and Performance Requirements:

Describe the manufacturing processes (elaborate to provide as much detail as possible). please see attached requirements

Provide dimensions / size / tolerances / performance specifications of the item. The car body shells of the Velaro are 2,900mm to 3,300mm wide and 25,000 mm to 29,000 mm long. They are designed as an integrated lightweight aluminum structure of the car bodies. It is largely constructed of large aluminum extruded profiles. To provide the maximum protection against corrosion, only extrusions made of silicon alloyed aluminum are used. In Figure -1 an example of the cross-section of the profiles in the car bodies are shown. The rear area of the front-end head structure consists of a welded-in load-bearing aluminum framework and a fabricated steel structure that is bolted on in the front area. The visible exterior construction utilizes sandwich

Fiber-reinforced polymer (FRP). The chemical composition of the semi-finished aluminum parts and their alloys used in the car body is defined in DIN EN 573-3. The strength requirements are specified in DIN EN 755-2 for extruded profiles (e.g., ENAW 6005A T6, ENAW 6106 T6) and in DIN EN 485-2 for sheet metal (e.g., ENAW 5083 H111, ENAW 5083 H 321).

List required materials needed to make the product, including materials of product components, if applicable. please see attached requirements

Are there applicable certification requirements?

Yes

No

Please Explain: ISO

ISO 9001

Other

The chemical composition of the semi-finished aluminum parts and their alloys used in the car body is defined in DIN EN 573-3. The strength requirements are specified in DIN EN 755-2 for extruded profiles (e.g., ENAW 6005A T6, ENAW 6106 T6) and in DIN EN 485-2 for sheet metal (e.g., ENAW 5083 H111, ENAW 5083 H 321). All welding will meet the requirements for welded connections, per EN 15085, weld performance class CPC2, certification level CL1. The EN 15085 welding standard is not an equivalent to the AWS welding standard typically applied in the US. The primary difference is that in the US, each welder (person) is qualified to the particular/specific welding process being used, while the EN standard qualifies the business or site for the type of welding being performed. So, in the EU, the business is qualified and the people (welders) performing the welding activity may or may not have been qualified (tested) to make sure they can perform the work to the proper quality level. Welding procedures are Friction Stir Welding (FSW) and MIG Welding please see attached certification requirements.

Are there any applicable regulations that apply to the production of this item?

Yes

No

Please Explain: Needs to be compliant with FRA Tier III requirements (https://www.federalregister.gov/documents/2018/11/21/2018-25020/passenger-equipment-safety-standards-standards-for-alternative-compliance-and-high-speed-trainsets#:~:text=Tier%20III%20passenger%20trains%20are,mph%2C%20up%20to%20220%20mph.)

Are there any other standards, requirements?

Yes

No

Please Explain: Welding Certification according to EN15085. FSW (Friction Stir Welding) experience required. The EN 15085 welding standard is not an equivalent to the AWS welding standard typically applied in the US. The primary difference is that in the US, each welder (person) is qualified to the particular/specific welding process being used, while the EN standard qualifies the business or site for the type of welding being

performed. So, in the EU, the business is qualified and the people (welders) performing the welding activity may or may not have been qualified (tested) to make sure they can perform the work to the proper quality level.

Additional Comments:

Additional technical comments: Supplier needs to have proven track record in the rail environment.

Volume and Pricing:

Estimated Potential Business Volume (i.e. #Units per day, month, year): 56 carshells

Estimated Target Price / Unit Cost Information: Around USD $20M for initial order

Delivery Requirements:

When is it needed by? (Immediate, 30 days, 6 months, etc) 1st car body shell: July 3, 2025 56th car body shell: January 11, 2027

Describe packaging requirements (i.e., individually/ group packaging). Ready for shipment via flat bed

Where will this item be shipped? Las Vegas, Nevada

Additional Comments:

Is there other information you would like to include? For any additional information, a Non-Disclosure Agreement (NDA) will need to be signed.

Information for the National Institute of Standards and Technology – Manufacturing Extension Partnership (NIST-MEP) scouting

Car body shells for High Speed Trains with operational speed up to 220 mph

1.1 Car Body Shell

The car body shells will be used in the Siemens Velaro high-speed trainsets with distributed power. The operational top speed of the Velaro trains is up to 220mph.

The car body shells of the Velaro are 2,900mm to 3,300mm wide and 25,000 mm to 29,000 mm long. They are designed as an integrated lightweight aluminum structure of the car bodies. It is largely constructed of large aluminum extruded profiles. To provide the maximum protection against corrosion, only extrusions made of silicon alloyed aluminum are used. In Figure -1 an example of the cross-section of the profiles in the car bodies are shown.

The rear area of the front-end head structure consists of a welded-in load-bearing aluminum framework and a fabricated steel structure that is bolted on in the front area. The visible exterior construction utilizes sandwich FRP.

The chemical composition of the semi-finished aluminum parts and their alloys used in the car body is defined in DIN EN 573-3. The strength requirements are specified in DIN EN 755-2 for extruded profiles (e.g., ENAW 6005A T6, ENAW 6106 T6) and in DIN EN 485-2 for sheet metal (e.g., ENAW 5083 H111, ENAW 5083 H 321).

All welding will meet the requirements for welded connections, per EN 15085, weld performance class CPC2, certification level CL1.

Welding procedures are Friction Stir Welding (FSW) and MIG Welding

Needed production tools are Milling machines (up to 29,000mm) / automated FSW- / MIG Welding for welding seems up to 29,000mm, robot based, Tooling for production of underframe, sidewalls, roof, front-end and the whole car shell.

The car body shell provides suitable interfaces for the integration of the equipment, e.g., C-rails, rivet nuts and welded or riveted supports.

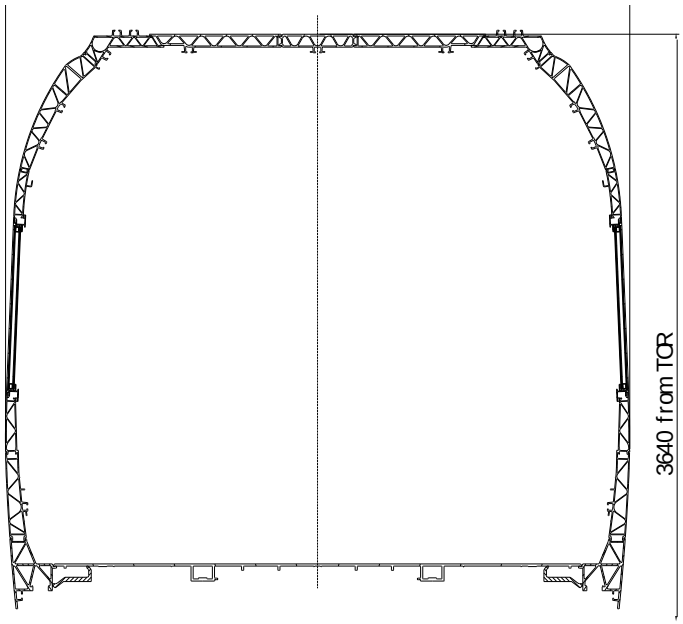

Figure -1: Example of the car body cross section of a Velaro High Speed Train

1.2 Scope and delivery dates

The scope include 56 car body shells. The car body shells need to be painted and ready for assembly.

The delivery dates, ex-works, are as follows:

1st car body shell: July 3, 2025

56th car body shell: January 11, 2027