

Europe's stainless steel leader for EV Battery Packs



- > $R_m = 1000$ MPa and elongation up to 30 %
- > Supporting your development with a strong R&D centre and external partnerships
- > Aperam stainless offers the best €/kg value for Battery Housing



Electric Vehicle



Module Casing



Battery Housing

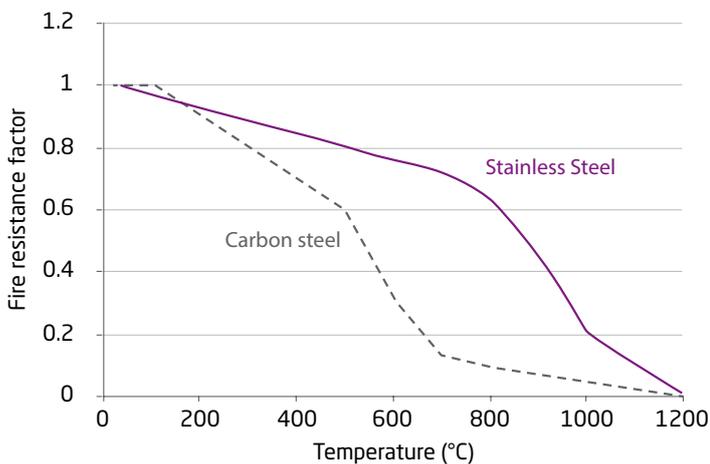
Our solution for battery module casing

Casing of the Battery Module is designed to provide the **mechanical strength and corrosion resistance** needed to meet the security and durability requirements of the future electric vehicle.

The casing's **compactness** is key to increasing the energy density of the entire pack. Aperam's solution uses stainless steel with a high ultimate tensile strength of about 1000 MPa and an elongation of up to 30 % with very thin gauges (down to 0.4 mm).

Fire protection

Stiffness resistance at high temperature



Only stainless steel can provide the sufficient fire protection needed to support thermal runaway. Stainless steel is a non-combustible material that does not release any smoke (contrary to polymers). Stainless steel also have a far higher melting temperature (1500 °C) than Aluminium one (660 °C) and Plastics (300 °C).

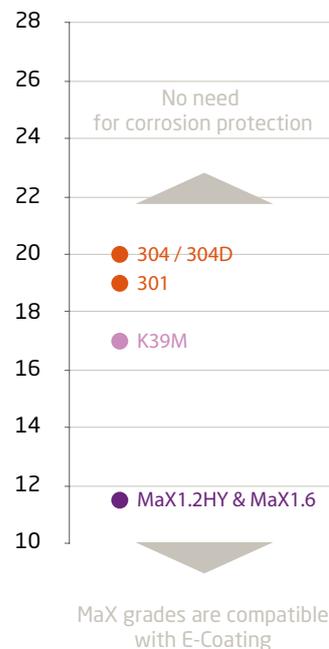
Stainless steel maintains a higher mechanical stiffness and creep strength in a larger range of temperatures compared to carbon steel.

Stainless steel is the material of choice for module casing.

Aperam supports your development via our R&D centre in France and external partnerships with best-in-class partners located across Europe (including MIT and Altair engineering). Samples and our detailed technical reports are available on request.

Corrosion protection

PREN of main stainless grades for batteries



Stainless steels are known for their corrosion resistance in severe environments, outperforming both carbon steels and aluminium -without the need for coating protection.

Only stainless steel has the corrosion resistance to sustain hazardous substances.

Our solution for battery housing

Aperam stainless offers the best €/kg value for Battery Housing

Stainless steel combines both strong mechanical properties and high corrosion resistance, resulting in a high-performance material against crashes, severe environmental conditions and fire. As an added bonus, stainless steel comes with a longer warranty period.

Stainless steel also has excellent forming properties. This is particularly true for ferritics in deep drawing, due to its high anisotropy, and for austenitics high expansion, a result of their high strength hardening.

Stainless grade	Young Modulus (GPa)	YS (MPa)	UTS (MPa)	EL% JIS A50	PREN	Part
K39M	220	290	450	31	17.0	Upper cover
304	200	300	650	54	20.0	Upper cover
MaX1.2HY	200	870	1130	13	11.3	Structural parts
MaX1.6	200	1200	1600	10	11.8	Structural parts - cross members, digital longits
301 C1000	200	750	1100	30	19.0	Structural parts and lower plates
304 C1000	200	900	1000	20(*)	20.0	Structural parts and lower plates

100% recyclable



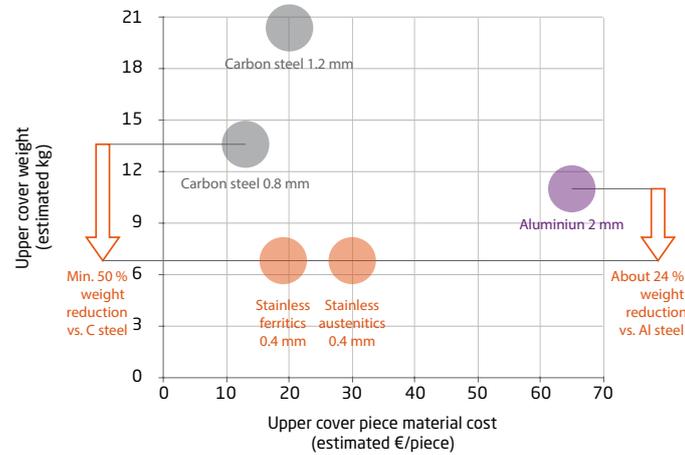
Being infinitely recyclable, stainless steel is a 'green' material par excellence. The recycling rate of stainless steel is much higher than that of industrial alloys.

Aperam produces the "world's greenest stainless steel". In Europe, most of our production comes from scrap, (80 % for austenitics). Furthermore, 30 % of our energy comes from renewables, and our 2017 carbon footprint was 50 % lower than ISSF standards. Using Aperam's stainless steel, OEMs and Tier 1 manufacturers can decrease their automotive carbon footprint.

Upper Casing

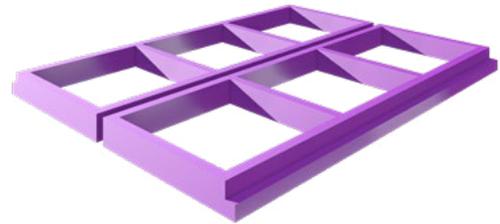


Lightweight and cost effective material, with complex parts feasible from 0.4 mm. Thanks to superb drawability and material range down to 0.4 mm, stainless steel is a lightweight, cost-effective alternative offering a saving of EUR 3/kg.



Our ferritic grades, along with our cold work hardened austenitic stainless steels, are all magnetic, thus providing natural electromagnetic shielding.

Structural Components

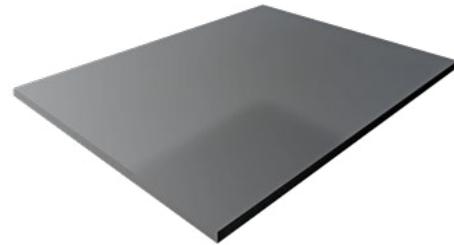


Our MaX1.6 is the ideal solution for cross members and internal longits, with a **tensile strength of 1.6 GPa**, yield strength of 1.1 GPa, and elongation A80 at 7 %.

With MaX1.6, one can **reduce thickness by 20 %** for internal longits compared to hot forming Boron steel, **allowing for a 2 kg weight reduction** per battery pack.

Hot-formed MaX1.6 shows very good anti-intrusion results: **22 % less intrusion for pole test with MaX1.6**. The 304 and 301 C1000 are the cold forming alternatives for side pole tests.

Lower plate



Hardened stainless steel offers sufficient shielding to **protect the underbody of the car from intrusion**. Stainless steel under armor deflects road debris and **ensures fire protection shielding**, protecting both the battery pack and the passengers.

Aperam's innovation portfolio covers entire Automotive landscape:



Fuel cell stacks bipolar plates



MaX for Body in White



MaX for Chassis applications



Exhaust



Fuel tank



Automotive decoration

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