AISI 409, 409L Stainless Steel Sheet Plate

General Characteristics:

According to UNS S40910, ASTM a240 grade 409 is a titanium stabilised ferritic stainless steel with roughly 11% chromium. Chromium enables the generation of a passive surface coating that offers corrosion resistance. By adding titanium, intergranular corrosion that can be detrimental chromium carbides is prevented from developing while the product is in use. Due to its ability to create ferrite, titanium helps prevent hardening as a result of cooling after welding. Additionally, titanium forms a chemical bond with sulphur, increasing its resistance to pitting corrosion. This grade's resistance to atmospheric corrosion is about 250 times greater than that of mild steel. When good formability and weldability are required in slightly corrosive conditions, this grade is well suited.

Due to the following reasons, 409L stainless steel sheet plates are particularly well suited for the production of comprehensive automotive systems:

- Excellent cold workability, comparable to that of low alloy steels.
- Strong resistance to corrosion in naturally occurring environments and when in contact with moderately corrosive media.
- Excellent resistance to oxidation up to 800 0C.
- Excellent weldability.

SS 409 Sheet Plate Chemical Properties:

Designation		%C	%Mn	%S	%P	%Si	%Ni	%Cr	%N	%Ti
UNS S40910	Min	--	--	--	--	--	--	10.5	-	6*(%C+%N)
	Max	0.030	1.00	0.020	0.040	1.00	0.50	11.7	0.030	0.50

409 Stainless Steel Sheet Plate Physical Properties:

Young's Modulus in tension GPa	Density gm/cm3	Specific Heat at 23-100ºC J/Kg-K	Electrical resistivity □Ω-m	Thermal conductivity W/m. K(100ºC)	Mean Co-efficient of Thermal Expansion (25ºC-100ºC) (/°C)
200	7.8	458	590	25.4	11.2×10^{-6}

SS 409 Sheet Plate Mechanical Properties:

Mechanical properties	UTS (MPa)	YS (MPa)	%EL	Hardness
ASTM A240 - UNS S40910	380 min	170 min	20 min	88 HRB max

Products available:

Hot Rolled Plates & Coil, Cold Rolled Coil & Sheets

Corrosion Resistance:

In many applications where carbon steel, galvanised, aluminized, coated steel, or aluminium provide insufficient longevity, this alloy is effective. In terms of resistance to intergranular corrosion, titanium stabilised carbon and nitrogen shows good performance. Additionally, titanium stabilises the sulphur, enhancing its resistance to pitting corrosion. 409 is relatively resistant to stress corrosion cracking because it is ferritic. Although this alloy can form a thin surface rust film, it can withstand environments like the atmosphere in brick kilns and the acids found in automobile exhaust. It must be painted before being used in decorative applications.

Oxidation Resistance:

In typical combustion environments, 409 displays good oxidation resistance up to about 800°C. It offers exhaust systems adequate oxidation resistance. On the surface, it creates a thin, tenacious oxide film that resists peeling in response to these thermal cycles.

Formability:

This stainless steel is easily formed into a wide range of comprehensive system components through welding, drawing, bending, folding, and blanking. To minimise the impacts of grain formation, all welding processes must be performed with the least amount of heat input. It is possible to employ conventional welding techniques such *as* gas tungsten arc, electrical resistance, or gas metal arc. Without filler metal, automotive exhaust tubing is easily welded. AWS ER309 is advised when weld filler is necessary.

Applications:

SS 409 is most suited for making vehicle exhaust systems, especially those parts exposed to working temperatures of up to 750-800^{0}C, like

- Manifolds.
- Front pipes.
- Catalytic shells.
- Mufflers.

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