

Advantages of Ferritic Stainless steels for flues

What is ferritic stainless ?

KARA is the Aperam brand for ferritic stainless solutions.

- > Ferritic stainless steel contains at least 10,5% chromium (as other stainless steels) but does not contain nickel.
- > By choosing ferritic, you can avoid the erratic price fluctuations of the nickel and benefit from more price stability.
- > Ferritic like other stainless steels continually protects itself thanks to a passive layer of chrome which forms naturally on the surface when in contact with air humidity or water.
- > Ferritic stainless is magnetic. There is no link between magnetism and corrosion, the proof being duplex grades (austeno-ferritic) which offer excellent corrosion resistance and which are also magnetic.

KARA
key for value



Ferritic Stainless Advantages

Mechanical and physical properties

- > High proof stress, low expansion, so less distortion to the Té.
- > Good stiffness of the fume pipe, thanks to a high Young modulus.
- > Thermal conductivity coefficient of ferritics avoids cold points within the pipe.

Heat Resistance

- > Low temperature impact on mechanical properties of ferritic stainless steels, unlike other materials. Ferritic stainless steels have a good resistance to hot oxidation and creep.

Fire Resistance

- > The melting point of ferritic stainless steel is up to temperature, which is significantly higher than that of other materials such as aluminium (660°C), zinc (419°C) and copper (1083°C).
- > Giving off no toxic fumes and having good creep resistance.



Resistance to corrosion

- > Resistance of Ferritic stainless steel to aggressive fume condensates is better than other recently used materials.

Recyclability

- > Stainless steel is the «green material» par excellence, infinitely recyclable, neutral in relation to the environment.
- > Stainless steel is particularly well suited to recovering rainwater run-off, there is no leaching of elements which could alter their composition.

Transformation and Durability

- > Stainless steel can be welded, drawn, folded and can be hydroformed. It allows rolling of edges.
- > Stainless steel keeps its finish throughout the life of the installation thanks to its UV and infrared ray resistance.

The appropriate grade

Our experience enables us to recommend the most appropriate grade per application:

- > **K41**: inner flue wall, accessories, fixing
- > **K44**: inner flue wall / outer flue wall

Note that the choice of the grade is appropriate to the type or fume pipe (single or double wall) and to the fuel.



Chemical Composition

Commercial designations	Standards			Chemical composition (typical values)					
	ASTM		EN	C	Si	Mn	Cr	Mo	Others
	Designations								
	TYPE	UNS							
K41	441 ⁽¹⁾	S43932/ S43940	1.4509	0.015	0.60	0.30	17.80		Ti+Nb = 0.65
K44	444	S44400	1.4521	0.015	0.50	0.30	17.70	1.85	Ti+Nb = 0.45

(1) Typical designation

Properties

Properties (typical values)	K41	K44
Density (kg/dm ³)	7.7	7.7
Melting temperature in °C	1505	1495
Young's modulus in MPa x 10 ³ (20°C)	220	220
Yield Strength in MPa at 20°C	310	370
Thermal conductivity in W/m.K	25	23
Mean Thermal expansion coefficient 10 ⁻⁶ /K; 20-200°C	11	10.8
Ultimate tensile strength Rm in MPa at 20°C	480	520

Testimony



«Our products in 4521 were approved by TÜV Munich in accordance with V2 trial of European standard, proof that this ferritic stainless steel has good mechanical performance and a good resistance to corrosion .»

M. Grzegorz Rutkowski, Société MK



Information
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