What is stainless steel?

Steel is an alloy containing iron and carbon. Stainless steels are steels containing less than 1.2% carbon and at least 10.5% chromium, and other alloying elements. The chromium content provides stainless steel with its corrosion resistance, enabling the natural and continuous development of a chromium oxide surface layer. This oxide, referred to as the “passive layer”, provides it with lasting protection against all types of corrosion. This passive layer is naturally self-healing when in contact with humidity or water.

We differentiate austenitics from ferritics:

- Ferritic stainless steel contains at least 10.5% chromium (as other stainless steels) but does not contain nickel (unlike other stainless steels).
- By choosing ferritic, you can avoid the erratic price fluctuations of the nickel and benefit from more price stability.
- 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 is the Aperam brand for ferritic stainless solutions.

Stainless steel advantages for cooking utensils

**Recyclability**
- Stainless steel is the «green material» par excellence, infinitely recyclable, neutral in relation to the environment.

**Health/Hygiene**
- Unlike other materials, stainless steel is recommended for contact with food: it does not alter the organoleptic properties of food.
- Stainless steel can be cleaned and is dishwasher safe.

**Aesthetic**
- Keeps its original aspect throughout its life.
- Several aspects are available: bright, matt or polished.

**In use**
- Unlike other materials, stainless steel has good corrosion resistance.
- Shock, scratch, thermal resistance.
- Mechanical resistance.
- Temperature/Heat resistance.
- Excellent life cycle which makes it the material of choice for professionals.
- The ferritic stainless steel, is magnetic, therefore is the material of choice for induction cooking.
- The use of stainless steel is interesting because it keeps its original form enabling a perfect alignment between the lid and the pan.

**Forming**
- Stainless steel can be drawn but is also weldable and can be formed.
The adapted grades

Our experience as a supplier to the main catering manufacturers enables us to recommend the most appropriate grades:

**Austenitic grades = the traditional offer:**
- 304: the traditionally used grade
- 304D: improved drawability in comparison with 304
- 304ED: particularly suitable for deep drawing

**Ferritic Grades (0% Nickel content) = a good compromise between price stability/drawing ability.**

**Recommended grades for domestic use**
- K30: an entry level grade
- K30ED: an economical solution enabling drawing and suitable for several designs
- K41: a good compromise between corrosion resistance/drawing.

**Recommended grades for professional use**
- K45: equivalent to 304 in terms of corrosion resistance
- K36: particularly adapted for high quality cooking utensils thanks to its molybdenum content.

These grades are available in Bright Annealed or Matt finishes.

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**Thermal conductivity**

The ferritic thermal conductivity is higher than austenitics reducing the number of hot points on the base of the utensils.

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<thead>
<tr>
<th></th>
<th>Austenitic 304</th>
<th>Ferritic K30</th>
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<tbody>
<tr>
<td>Thermal conductivity (W/m°C)</td>
<td>15</td>
<td>18</td>
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**Thermal expansion coefficient**

Due to their low thermal expansion coefficient, the base of cooking utensils keep their flatness enabling a better cooking uniformity especially for the induction method.

**Drawing recommendations for ferritics**

Ferritics behave differently to austenitics and this should be taken into account during drawing by using the swaging method (as opposed to expansion).

**Polishing recommendations**

The corrosion resistance of stainless steel depends on its chemical analysis and its surface finish. The higher the surface roughness, the lower the resistance to corrosion. Care should be taken to achieve polishing with fine finishing abrasives for both the interior and exterior of the cookware including the base.

**Maintenance & Cleaning advice**

Material users have little knowledge of the cleaning and disinfecting precautions to take in order to preserve the stainless steel in its delivered state. Please do not hesitate to communicate the relevant information on its maintenance. Please refer to our brochure “Maintenance Advice for Stainless Steel in Catering” also available on our web-site at the address below http://www.aperam.com/stainlesseurope/catering-cleaning.html

**Product Range**

**Forms:** sheets, blanks, coils, strip.
**Thicknesses:** 0.4 to 1.5 (other thicknesses, please consult us).
**Width:** according to thickness; please consult us.

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