

aperam

From Farm to Table



made for life



From Farm to Table, Stainless Steel is the Material of Choice for All Things Food

From farms to food processing facilities, restaurant kitchens to the kitchen counter, stainless steel has become a ubiquitous part of the food, beverage and cooking industries.



Why Stainless Steel?

Stainless steel is the material of choice for food storage, packaging, and preparation because of its many unique characteristics. Not only is it completely safe when in contact with food, it also doesn't impact the product's taste, smell, or colour.

Other advantages include:

- > Corrosion resistant
- > Doesn't give products a metallic taste
- > Easy to clean and disinfect
- > Withstands heat, cold and sudden changes in temperature
- > Extremely strong and durable
- > Environmentally friendly

In practice, this means that stainless steel saucepans don't discolour, stainless steel dishes and utensils don't leave a metallic taste in your mouth, and stainless steel sinks are easy to clean. With stainless steel, cooking equipment stays hygienic, cutlery never has to be polished, and storage and processing tanks last a lifetime with little to no maintenance.

But before we get into its advantages, let's first take a look at what exactly makes stainless steel stainless.

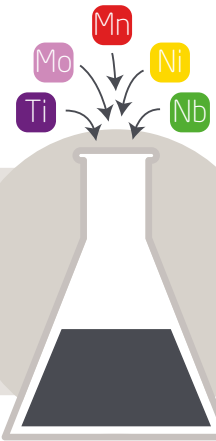
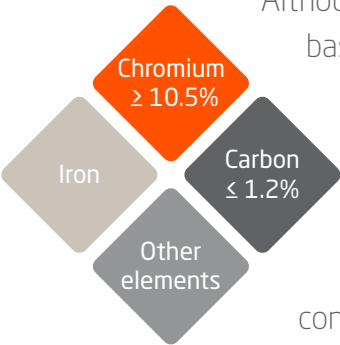


What is Stainless Steel?



Although we've all heard of it, and most of us use it in some way or another on a daily basis, many would be hard pressed to tell you what stainless steel is.

Discovered in 1912, stainless steel is the generic name given to a group of over 200 corrosion resistant steels manufactured for different applications. But if you really want to impress your friends, you can tell them that stainless steels are alloyed steels that have a chromium content greater than or equal to 10.5% and a carbon content of less than or equal to 1.2% (EN 10020).



alloy *noun* /'æloɪ/

A metal made by combining two or more metallic elements, especially to give greater strength or resistance to corrosion.



It is stainless steel's chromium content that makes it the ideal material for the food, beverage and cooking industries. So long as it contains at least 13% chromium, it is deemed suitable - and safe - for use with food. Although the stainless steel may contain other elements (nickel, manganese, niobium, molybdenum, titanium, etc.), there are strict limitations as to how much of each of these elements is allowed.

Which Stainless for What Application?



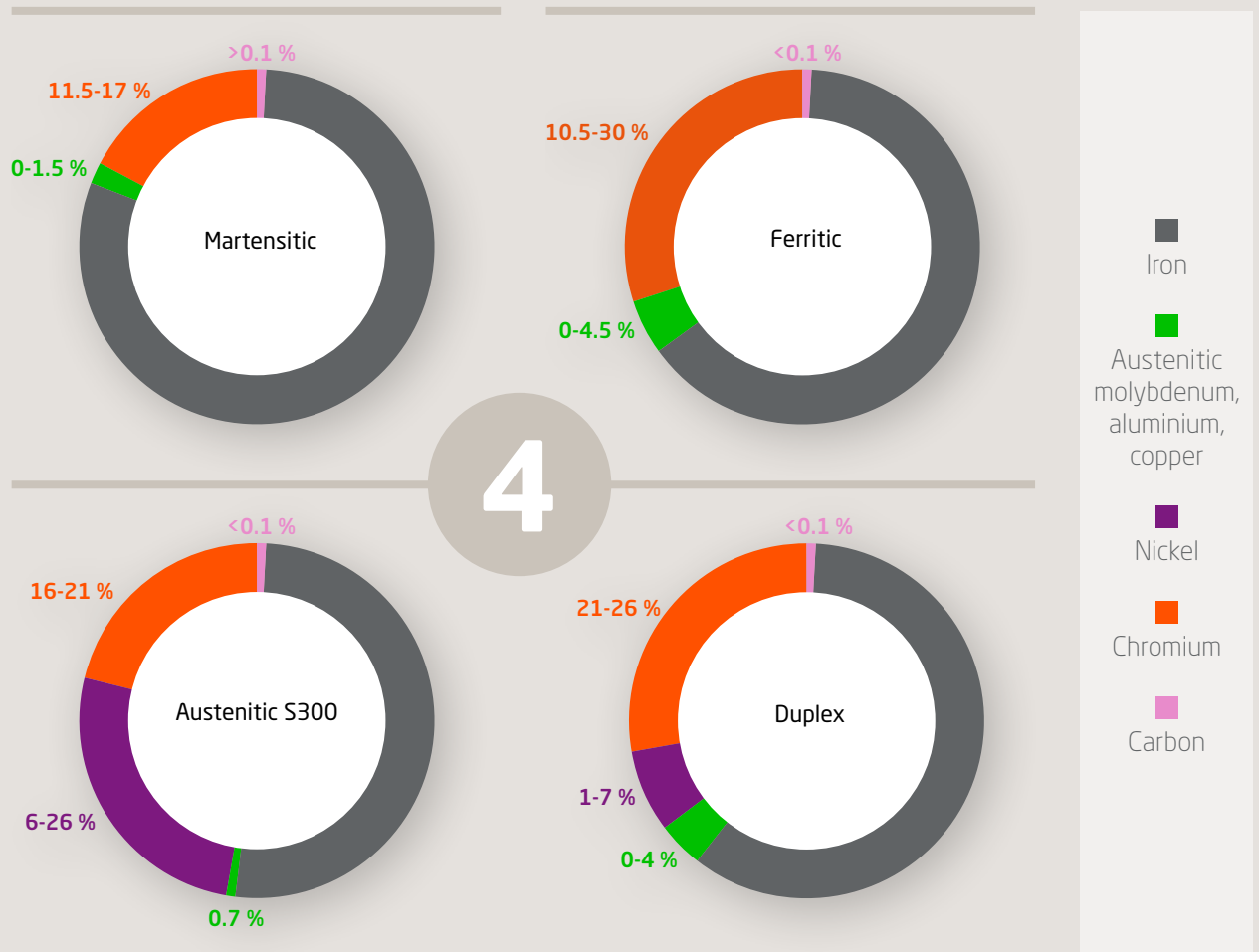
As there is a wide-range of stainless steels, each of which offers its own unique portfolio of corrosion resistance, mechanical strength, formability, and weldability, how do you decide which stainless steel is right for you?

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The Four Types of Stainless Steel

Depending on their alloy structure, stainless steels are broken down into four types:

- Martensitic Steels:** > 0.1% carbon, 10.5 to 17% chromium. Ideal for both cutlery and professional knives.
- Ferritic Steels:** 0.02 to 0.06% carbon, 10.5 to 30% chromium, 0 to 4% molybdenum. These grades are commonly used internally and are now being developed for envelope and structural products. Ideal for cutlery, hollow-ware, table surfaces, panels, and worktops.
- Austenitic Steels:** 0.015 to 0.10% carbon, 16 to 21% chromium, 6 to 26% nickel, 0 to 7% molybdenum. The presence of nickel improves corrosion resistance in an acid medium and makes this stainless steel more ductile. The presence of molybdenum further enhances the resistance to corrosion in an acid medium. The most common grades are 304/304L and 316/316L. Used for both domestic (cutlery, hollow-ware, kitchen utensils) and industrial (food processing, storage and transport equipment, pipe-work) applications.
- Duplex Steels:** also known as austenitic-ferritic steels, these steels have very high levels of chromium — 22% in grade 1.4462 (2205) and 23% in grade 1.4362 (2304) — and, in the case of 1.4462, about 3% molybdenum. Ideal for use with aggressive foodstuffs, such as the meat industry.



When choosing a stainless steel, one must always keep in mind the intended end use. That's because not every stainless steel will resist staining in every operating environment. For example, if conditions are particularly harsh, some grades may corrode more quickly than others. In such cases, a grade with more



chromium - or that has had nickel, molybdenum, nitrogen, or copper added to it - may offer better resistance to a specific type of environment.

Furthermore, adding or changing elements will impact how easily a particular grade is formed, machined, or welded. It will also impact the fabrication of the equipment and the material's toughness. But don't forget that adding elements to enhance any one of these properties could at the same time reduce another - and add to the material's overall cost.

Ferritic stainless steels, which are magnetic, are often used in household appliances like dishwashers, refrigerators and pots and pans. Although most grades offer acceptable levels of corrosion resistance, they can be difficult to form and weld. However, this can be overcome by adding titanium and/or niobium. To make ferritics more resistant to pitting corrosion, one can add molybdenum.

If what you need is formability, weldability and corrosion resistance, austenitic stainless steels may be your answer. These durable steels are known for their ability to be easily roll-formed, pressed and deep-drawn, making them the most commonly used stainless steels in the food and beverage industries.

And for those working in very corrosive environments (we're looking at you cheese dairies and fish canners), there's duplex steels - which not only offer great resistance to general corrosion, but also high mechanical strength ■

Did you know?

Although the food and beverage industry uses a range of different stainless steels, most applications contain around 18% chromium - the optimum concentration for corrosion resistance.

18%

24

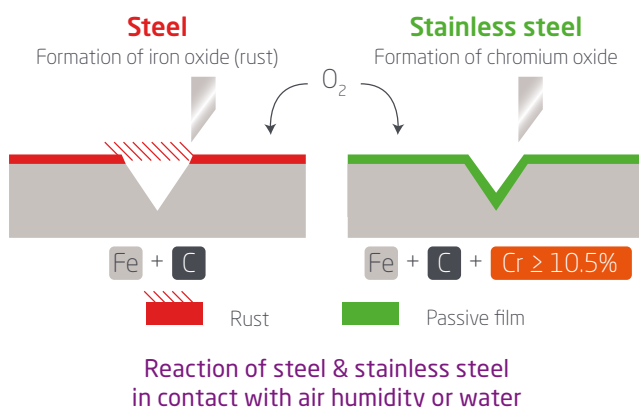
Cr

Chrome

So which stainless is right for your foodstuff application? Because martensitic stainless steels contain only about 13% chromium and have high levels of carbon, they are difficult to form and weld. This also means they are very hard and strong. Thus, martensitic steels are ideal for use in mild environments but where resistance to wear is important.

Stainless Steel Advantages

Throughout many scientific studies, stainless steel has never been shown to have an adverse effect when used with food. This is largely the result of stainless steel being a homogeneous alloy composed primarily of iron, chromium, and nickel. However, thanks to stainless steel's high-level of corrosion resistance, very little of these elements (well below the amount naturally found in food) is able to leach into food, essentially eliminating any risk of toxicity caused by chromium or nickel.



In fact, it is stainless steel's chromium content that makes it so resistant to corrosion. The oxygen found in the air and in water causes the chromium to form a natural oxide film on the stainless steel's surface. This thin, adhering film, which immediately repairs itself whenever the surface is damaged, acts as a protective layer that effectively prevents corrosion – and thus leaching.

This protective layer also helps prevent the accumulation of bacteria, making stainless steel one of the most hygienic materials on the market.

Stainless steel's hygienic characteristic is further bolstered by its smooth surface. To maintain optimum hygiene, a material's surface must be smooth and free of any pits, folds, crevices or other imperfections. That's because

materials with rough surfaces are more likely to have food stick to it - food that can be full of microorganisms. If left uncleaned, these microorganisms can multiply and potentially infect the next batch of food.

With stainless steel, on the other hand, it's not only easy to create smooth, non-absorbent surfaces, it also maintains this smoothness for long periods of time. Better yet, this smoothness makes stainless steel incredibly easy to clean. According to a Euro Inox study, a smooth stainless steel surface is easier to clean than a surface made of such materials as aluminium and polymers and is comparable to glass and porcelain. According to that same study, a standard dishwasher using detergents eliminated 97% of microorganisms from stainless steel's surface. In comparison, the same dishwasher only eliminated between 16 and 31% of the microorganisms found on a polymer surface. As an added bonus, cleaners and detergents work better with stainless steel, with the study showing that standard cleaners are three to four times more effective when used with stainless steel than they are on polymers or aluminium.

8 simple rules for prolonging the life and finish of your stainless steel equipment:



1. Avoid using excessive quantities of cleaning and disinfectant products
2. Do not use concentrated and/or hot bleach
3. Comply with the contact times specified by product manufacturers
4. For certain cleaning products, the stainless steel surface must be cold
5. Rinse copiously as a matter of routine after each cleaning and disinfection operation
6. Use approved cleaning products only
7. Add salt to hot water and always adhere to this sequence
8. For all new cooking equipment, the first use should be without food

From freezing to boiling, stainless steels are also extremely tolerant to the wide range of temperatures used in food production. They are highly resistant to thermal shock and can handle rapid and wide-ranging changes in temperature extremely well.

This is very important for equipment used for the processing or storage of foods and beverages, where designs are highly regulated in order to avoid any risk of infection, sickness or contagion.

Did you know?



Welding two stainless steel components together affects the mechanical properties and the corrosion resistance of both the joint and the area immediately adjacent to the weld. As to corrosion resistance, this is because the weld disrupts the material's smooth surface.

Thanks to its physical properties, stainless steel is highly formable, meaning it's easy to construct the processes, tools, and equipment that the food, beverage and cooking industries depend on. They can also be readily welded and they are very resistant to impact, fatigue, wear, abrasion, and erosion.

Stainless steel also offers numerous environmental advantages. For example, unlike the plastic straws, cups and cutlery that fill our landfills and pollute our oceans, stainless steel is **100% recyclable**. Furthermore, some austenitic stainless steels are made from up to 88% scrap material ■



Stainless Steel *In Action*

Food Production & Transportation

Orange Juice



Oranges are a key source of vitamin C – a nutrient we often enjoy through a refreshing glass of orange juice. Thanks in part to stainless steel, we can even benefit from orange juice’s vitamin content when served in concentrate form. This is because stainless steel does not react with the citric acid found in oranges.

After the oranges are squeezed, the pulp is stored in a stainless tank where its flavor, acid content, and color are controlled and standardized.

Stainless steel also maintains the hot temperature needed for pasteurization and the near-freezing temperature required for concentration. As a result, you get to enjoy a delicious, vitamin C rich glass of OJ!



Chocolate



Making chocolate is a delicate process that demands strict hygiene at every stage. This is why chocolatiers around the world depend on stainless steel. From cleaning and roasting to mixing, moulding and packaging, all steps rely on stainless steel equipment.



Beer



We all know that brewing beer involves barley, hops, yeast and water. But what about stainless steel, the unsung hero of brewing? When brewers mix malt with water, they use special stainless steel vats that provide an unparalleled level of consistency. During fermentation, beer is stored in stainless steel equipment that can maintain the necessary near-freezing temperatures for multiple days. From there, it goes into airtight, highly-resistant stainless steel kegs for transportation and storage.

So the next time you're enjoying a clear, clean, and refreshing beer, be sure to raise a glass to stainless steel. Cheers!



Drink responsibly

Tomatoes



Canned or concentrated, in soups or sauces and sliced onto a salad, tomatoes are a staple ingredient in many of the foods we love. It is also a vital source of vitamins A, B, C and D. But without stainless steel, much of this flavor and nutrients would be lost. Because stainless steel doesn't react to the fruit's natural acidity, the tomato is able to maintain its original taste. That's why stainless steel is the material of choice for processing tomatoes.

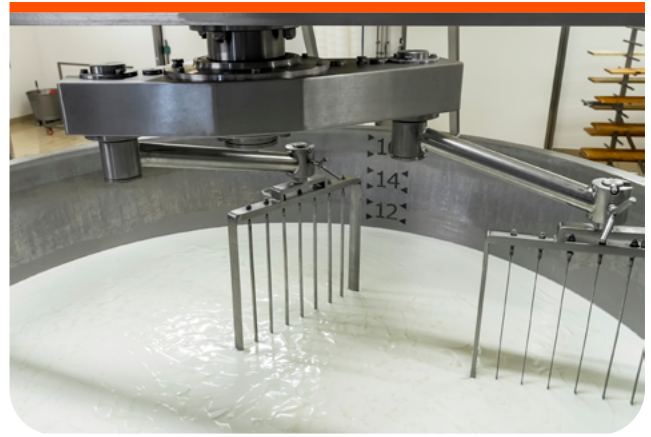


Fish



It used to be that only those living by the sea could enjoy fresh seafood. But this all changed thanks in part to stainless steel. Harvested in stainless steel tanks, cleaned and gutted on stainless steel production lines, and packed and shipped in stainless steel containers, stainless plays a vital role along every step of the fish processing supply chain. This, in part, is due to the material being extremely easy to clean and disinfect. It also doesn't pick up fishy taste, nor does it leave a metallic one. That means that even by the time the fish ends up on your plate, it still tastes like it was just freshly caught.

Cheese



Although each of the thousands of different types of cheeses made around the world are the result of a unique process, craft, and flavors, they all have one ingredient in common: stainless steel. Cleanliness is of vital importance in the dairy process, and no other material offers the hygienic qualities of stainless steel. The stainless steel equipment used by cheesemakers is easy to clean and does not react with the lactic acids formed when milk is fermented. So instead of worrying about hygiene, cheesemakers can focus on creating the textures and flavors that each of us enjoys.



Ice Cream



I scream, you scream, we all scream for ice cream! But without stainless steel, you'd probably prefer to let your ice cream melt.

As a dairy product, ice cream is highly susceptible to contamination. Luckily, using

stainless steel eliminates many of these risks. Its smooth surface resists the growth of bacteria and makes it easy to clean and sterilize. Stainless steel's high corrosion resistance

means it can shrug off the attacks from the natural fatty acids found in milk and fruit flavorings. Furthermore, stainless steel doesn't affect the taste of the product. It should therefore come as no surprise that the equipment used at nearly every stage of the production and distribution process is made from stainless steel.

With that in mind, go ahead, order that extra scoop and enjoy!

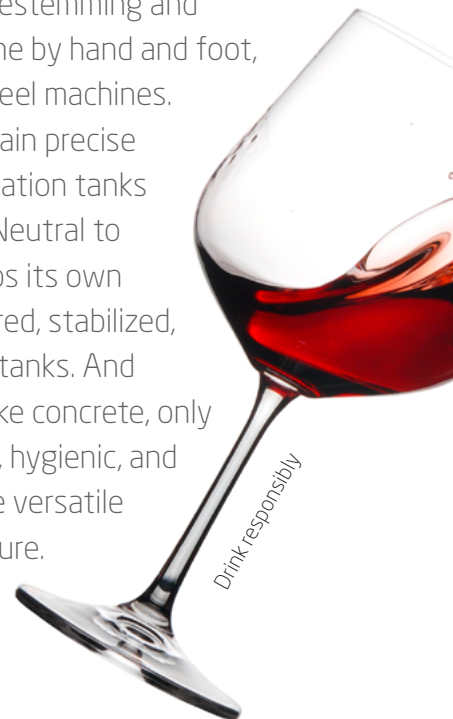


Wine



Although heavily steeped in tradition, viticulture and winemaking have long recognized the benefits of stainless steel. Destemming and crushing, processes once done by hand and foot, are now done by stainless steel machines.

Thanks to its ability to maintain precise temperatures, many fermentation tanks are made of stainless steel. Neutral to taste and color, wine develops its own distinct character when filtered, stabilized, and stored in stainless steel tanks. And unlike alternative materials like concrete, only stainless steel is sustainable, hygienic, and cost-effective – making it the versatile material of choice for viticulture.



Milk



Because milk is highly susceptible to spoiling, every step of the production process - from the milking of cows to processing and transportation - is subject to very strict rules and regulations. With milk being in regular contact with the walls of the equipment used to process and transport it, the material used must be extremely hygienic. This is why the milk industry favors stainless steel - its smooth surface is ideal for preventing bacterial contamination and facilitates easy cleaning and disinfection.

Stainless Steel *In Action*

Kitchens, utensils and catering equipment

Indoor kitchens



Stainless steel is the ideal material for kitchens, both professional and domestic alike. Used for everything from work surfaces to pans, refrigerators, sinks, display units, rotisseries, ovens, fryers, cabinets, dishwashers, woks, extractor hoods and knives (to name only a few!), stainless steel can be found in kitchens the world over.

As it complies with health and food safety standards and is easy to clean, it is used for everything from refrigerators to ovens, dishwashers, extractors, small appliances, counter tops, trolleys and utensils. Furthermore, stainless steel's low expansion at high temperature makes it the material of choice for equipment that is subject to high amplitude temperature cycles such as oven walls, cookers, burners and hot plates.

Stable prices, enduring relationships

Equipping a large kitchen represents a major long-term investment. Naturally, the very best quality-price ratio is required. The prices of the various constituents of ferritic stainless steels have fluctuated very little over recent years. Manufacturers of equipment for institutional catering who have opted for Aperam's KARA ferritic steels can therefore guarantee their customers stable prices.



Unlike other stainless steels, the KARA range does not contain nickel: it is thus exempt from the erratic price fluctuations of this alloying element, whose price has increased tenfold in a few years. This price stability enables the establishment of transparent and trustful relationships with each customer, through a dynamic partnership-based commercial strategy.

The catering trade in particular requires equipment that is beyond reproach in terms of food safety. Being totally inert, stainless steels do not impair the organoleptic properties (taste, colour and smell) of the food and do not alter its chemical composition. This property is endorsed and recognised by several national and international regulations (such as NSF).

As catering also often requires large scale and frequent washing, the fact that stainless steel is extremely easy to clean is another big benefit.



For Outdoor Kitchens Too!



When your barbecue isn't clean, you could spend more time scrubbing than you do grilling. But if you had a stainless steel grill, you'd be well on your way to enjoying that perfectly grilled burger or juicy brat. Not only is stainless steel extremely easy to keep clean, it's also safe for cooking. That's because you can clean stainless steel without the use of chemicals. In addition, stainless steel is heat resistant, making it easy to maintain the right temperature for that barbecue masterpiece. Happy grilling!





Did you know?

Want to keep your stainless steel utensils and catering equipment looking like new? The secret is simple: regular washing with water – that’s it! But washing does more than keep that brand-new shine, it also helps maintain the product’s corrosion resistance. That’s because stainless steel contains chromium, which, when exposed to water or moisture, forms a protective layer of chromium oxide. This passive layer is what protects stainless steel from corrosion.

Magnetism

With the exception of austenitics, stainless steel offers another unique advantage: **it’s magnetic**. This magnetism has proved very useful in the catering business, being used for everything from induction cooking to door catches and storage systems.

Induction cooking

Lid handles

Settings, menus and warnings

Customize kitchens and catering equipment with your logo

Temporary fixtures

Austenitic

Non magnetic

Ferritic

Magnetic

About Aesthetics



And let's not forget the aesthetic aspect of stainless steel. Coming in a number of finishes – from matt to shiny, including brushed and polished finishes – top chefs can customise their kitchens, which become a reflection of their art.

More pleasant and inviting for the staff who work there, these stainless steel kitchens also ensure enhanced safety.



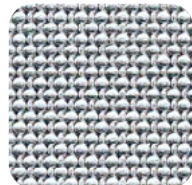
Uginox Rolled-On



Uginox Sand



Uginox Leather



Uginox Linen



Uginox Square



Uginox Lozenge

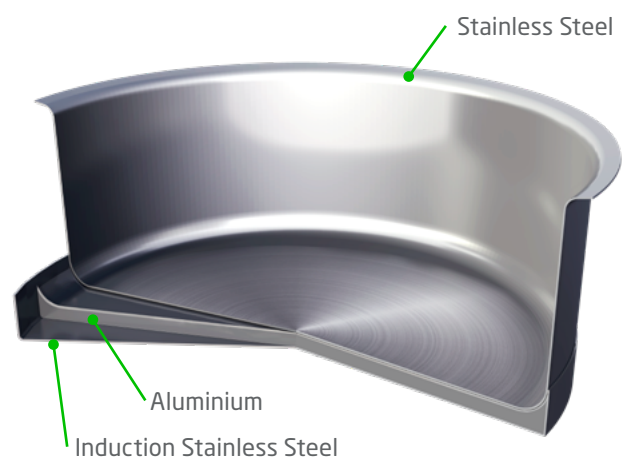
Cooking utensils



The thermal conductivity of stainless steel allows it to distribute heat across an entire heated surface, making it an ideal material for cooking utensils. Thanks to its resistance to scratches, wear, and tear, if properly maintained, stainless steel pots and pans can retain their original condition for a remarkably long time. It also has the advantage of being easy to clean, with most equipment being dishwasher-safe.

Stainless steel is particularly ideal for cooking food that is unlikely to burn, such as pasta, and foods cooked with a lot of water, such as vegetables.

However, if using a triple-layer stainless steel pot or pan (where the bottom is layered with stainless steel, aluminium and stainless steel), one can cook nearly any type of food. Furthermore, because stainless steel is non-reactive, it is ideal for dishes used with such acidic ingredients as wine and vinegar.



Did you know?

It is true, aluminium's ability to distribute heat quickly and evenly makes it one of the best metals for cooking utensils. And although it is lightweight and corrosion-resistant, unlike stainless steel, it is highly vulnerable to scratches. That means aluminium pans must be handled with particular care.

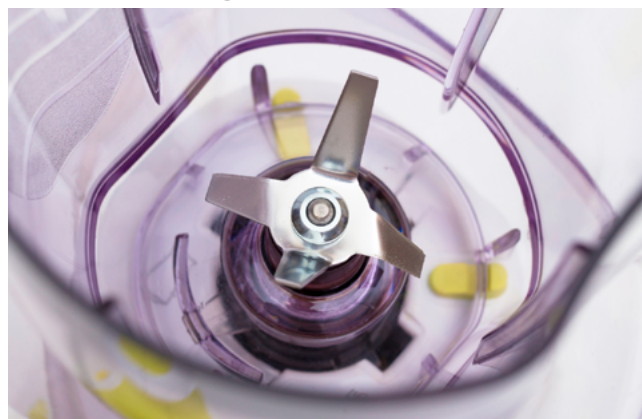


Knives



Thanks to their high-degree of hardness, martensitic stainless steels guarantee a good cutting edge. However, getting this level of hardness requires the use of a high level of carbon content – a content that depletes chromium carbides during heat treatment and thus leaves the stainless steel more susceptible to corrosion. Although the corrosion resistance of high carbon grades can be improved by adding molybdenum, doing so is extremely expensive.

As an alternative, Aperam introduces its nitrogen-infused MA5 grade. Not only does nitrogen offer the hardness advantage of carbon, when combined with an increase in chromium content, it also improves corrosion resistance – without the need to add molybdenum. Because MA5 offers a high degree of hardness and improved resistance to corrosion, it has been quickly embraced by the cutlery and kitchen utensils market, who regularly uses it in manufacturing knife blades and other cutting tools.





Your Preferred Supplier

From farm to table, stainless steel helps enable the safe and efficient production, storage, processing, transportation, preparation and consumption of many of the foods and beverages we enjoy. Due to its durability, cleanliness and ease of use, stainless steel can be found along all steps of the food supply chain. As a result, stainless steel has become the material of choice for the food, beverage and cooking industries.



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