

Information Document - Stainless Steel Products

INTRODUCTION:

It is a common misconception that stainless steel does not rust or mark and the following information helps to identify common causes where this is reported.

STAINLESS STEEL TYPES

Stainless steel is a chromium steel alloy and comes in different grades, each differing in its properties and common uses: -

Steel Type	Typical Grade	Typical Uses	CDA Uses
Austenitic	AS304B	Medical equipment Containers Pipes Construction	All sinks Hob tops Dishwasher interiors
Ferritic	AS430B	Domestic appliances Boilers Indoor Architecture	Extractors Oven exteriors Splashbacks
Austenitic-Ferritic		Industrial Petro-chemical applications	Not used
Martensitic		Turbine blades Knives	Not used

RUST & CORROSION:

Rust is the common name given to the reaction that occurs when any metal is in contact with oxygen (a process known as oxidation). The effect of this reaction depends on the type of metal and will continue as long as the surface of the metal is exposed to oxygen (or air)

Unlike mild steel and iron, which form a coarse & loose layer of rust that allows oxygen through, stainless steel forms a micro layer of chromium oxide that prevents oxygen from reaching the metal surface (aluminium also exhibits this property). This is invisible to the naked eye is chemically stable and further rusting is prevented. However, if this layer of chromium oxide is damaged by scratching or chemicals then the rusting process will start over. It is therefore important that care is taken when cleaning stainless steels to avoid scratches and chemicals that can break down the protective chromium oxide layer.

Stainless steel is stain-less, not stain-impossible and most likely to rust for one of the following two reasons: -

Bimetallic or Electro-galvanic corrosion:

When two dissimilar metals come into contact with each other in a wet or damp environment, an electrical reaction can occur that can damage the surface; this is most likely noticed as black spotting. Cutlery in a dishwasher can be prone to this form of corrosion.

Note that austenitic steels are not usually affected by this issue.

Pitting Corrosion:

When stainless steel is exposed to certain chemicals, localised damage can occur. This is most likely to be seen in a domestic environment where chlorides (Salt or bleach) have been in contact with the surface.



Information Document - Stainless Steel Products

In the domestic environment, the following agents are common and can cause the breakdown of the protective oxide coating on the surface of the steel:

Chemical Type	Examples
Chlorides	Bleach Sodium hypochlorite (Toilet or drain cleaner) Hydrochloric acid based cleaners Oven cleaners Salt Vinegar
Alkaloids	Tea Coffee Potatoes Most fruit and vegetables
Others	Ammonia Brick & mortar cleaners

Any spillage of these chemicals should always be cleaned up immediately, or as soon as possible.

Products containing these chemicals may not have been applied directly to the steel surface, there may be residues on cloths or over spray whilst cleaning other surfaces.

CLEANING STAINLESS STEEL:

Before cleaning any stainless steel surface it is important to determine whether it has been treated with an anti-fingerprint coating, as this coating can be damaged by some cleaning products. The instructions provided with your appliance will advise if this has been the case. If in doubt, always assume that the surface has been finished with an anti-fingerprint coating.

The following table can be used as a guide for when cleaning stainless steels: -

Requirement	Suggested Method	Notes
Routine cleaning of light soiling	Use a dilute soap or detergent and apply with a clean sponge or soft cloth. Rinse with clean water and then dry using a soft cloth	This is satisfactory on most surfaces. Always work in the direction of the finish.
Fingerprints	Use detergent and warm water, or a stainless steel cleaner. Apply with a soft cloth or sponge and rinse of any residues with clean water before drying with a soft cloth	Suitable cleaners are available from most supermarkets. Always work in the direction of the grain
Oil & grease marks	Use a stainless steel cleaner or alcohol based product. Apply with a soft cloth or sponge. Rinse of any residues with clean water before drying with a soft cloth.	
Stubborn spots, stains and light discolouration. Light rust stains	Use stainless steel cleaner and apply with a soft cloth or sponge. Rinse of any residues with clean water before drying	Avoid abrasive cleaning pastes. Suitable cleaners are available from most supermarkets. Always work in the direction of the finish

An E-cloth system is available from CDA as an accessory that is very effective at cleaning most stains and marks from stainless steel



MT 16/02/2011