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Stainless Steel - Care and Maintenance

Last Updated **18 July 2019**

All grades of stainless steel will stain and discolour due to surface deposits and can not be considered completely maintenance-free. In order to retain maximum corrosion resistance and aesthetic appeal, the surface of stainless steel must be kept clean.

Provided the grade of stainless steel and the surface finish are correctly selected, and cleaning schedules carried out on a regular basis then good performance and long service life are assured.

FACTORS AFFECTING MAINTENANCE

Surface contamination and the formation of deposits must be prevented. These deposits may be minute particles of iron or rust from other sources used in the building of new premises and not removed until after the stainless steel items have been fixed. Industrial and even naturally occurring atmospheric conditions can cause deposits that can be equally corrosive, e.g. salt deposits from marine conditions.

A working environment which offers more aggressive conditions, e.g. hot & humid, such as in a swimming pool, increases the speed of discolouration and therefore requires maintenance on a more frequent basis. Modern processes use many cleaners, sterilisers and bleaches for hygienic purposes. All these proprietary solutions, when used in accordance with makers' instructions, are safe, but if used incorrectly (e.g. warm or concentrated), can cause discolouration and corrosion on the surface of any quality of stainless steel.

Strong acid solutions are sometimes used to clean masonry and tiling of buildings but they should never be permitted to come into contact with metals, including stainless steel. If this should happen, the acid solution must be removed immediately by copious applications of water.

Selection of Finish

The selection of the correct surface finish on stainless steel makes its cleaning and maintenance much easier. A dry ground finish leaves many microscopic tears in the surface, allowing a build-up of dirt.

MAINTENANCE PROGRAMME

Provided care is taken during fabrication and installation, final cleaning before handing over to the client should present no special problems, although more attention than normal may be required if the installation period has been prolonged. Where surface contamination is suspected, immediate attention to cleaning after on-site fixing will encourage a trouble-free product life. Food handling, pharmaceutical, aerospace and certain nuclear applications require extremely high levels of cleanliness.

Advice is often sought concerning the frequency of cleaning stainless steel and the answer is quite simple: "clean the metal when it is dirty in order to restore its original appearance". This may vary from one to four times a year for external applications or it may be once a day for items in hygienic or aggressive situations.

Frequency and cost of cleaning is lower with stainless steel than with any other materials and will often outweigh the initial higher cost of this superior product.

GENERAL CLEANING METHODS

Stainless steel is easy to clean. Washing with soap or a mild detergent and warm water, followed by a clear water rinse, is usually quite adequate for domestic and architectural equipment. An enhanced aesthetic appearance will be achieved if the cleaned surface is wiped dry.

Where stainless steel has become extremely dirty with signs of surface discolouration, (perhaps following a period of neglect or misuse), methods of cleaning are detailed in the chart.

SPECIALIST CLEANING

Buildings

Careful planning is necessary to achieve and maintain the desired surface appearance on external parts of the buildings. The choice of cleaning process is influenced mainly by the contaminant to be removed, the required degree of cleanliness and the cost of the operation.

The smooth surface of stainless steel does not encourage dirt deposits and there is little danger of superficial corrosion roughening the metal surface.

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External
Rain plays an important part in the washing-down of a building. Sheltered areas will collect dirt which, if not washed away periodically, could lead to deterioration of appearance or corrosion. In highly industrialised or coastal areas more frequent cleaning may be required than in rural areas or where clean air regulations apply. To remove normal atmospheric dirt, sponging down with water containing soap, detergent or ammonia, followed by rinsing with clear water and wiping dry, is generally sufficient.

Domestic, Institutional and Catering Equipment
In general, cleaning is carried out to restore the original surface appearance, prevent corrosion and maintain hygienic conditions.

Stainless steel is easy to clean and washing with soap or a mild detergent and warm water, followed by a clear water rinse, is usually quite adequate for domestic, architectural and commercial catering equipment. If the water is hard, the steel should then be dried with a soft cloth to prevent water spotting.

Hygiene
Thorough cleaning is particularly important in catering and medical applications where cleanliness is required not only for aesthetic purposes but also for hygiene.

Stainless steel's smooth and pore-free surface does not harbour bacteria and is easily cleaned, if necessary using the most vigorous techniques. Studies on cleanability have shown stainless steel, if polished correctly, performs similarly to glass and china and markedly better than plastics and other metals tested.

Catering Equipment
When the steel has become extremely dirty, perhaps following periods of neglect or after being subjected to a particularly aggressive environment, mild abrasion only (such as scrubbing with a nylon or other non-scratching scourer) may be necessary. Ordinary steel wool soap pads should never be used as they may leave particles of mild steel on the surface of the stainless steel, which may cause localised areas of rusting. Stainless steel soap pads, are quite suitable.

A bright annealed or 2B finish will be permanently marked by the use of abrasives which, therefore, should be avoided at all costs. Discolouration, heavy dirt or rust which may resist normal cleaning methods can be removed using a proprietary stainless steel cleaner followed by a clear water rinse.

Some deposits and stains encountered in catering and medical applications can be difficult to remove.

It should be noted that nearly all abrasive cleaners will scratch a bright annealed or 2B finish of stainless steel. On other finishes the cleaner should be used in the direction of the polish. A clean dust and grit-free cloth should be used to avoid scratching. In all cases the mildest cleaning procedure that will do the job efficiently should be used.

Notes for designers
Today more and more designers, fabricators and end-users are realising that the total cost of equipment over the required period of service can be more important than initial cost. Charges for maintenance, repair and replacement of inferior quality materials within that life period will often outweigh a higher initial capital cost associated with more durable materials. It is, thus important to select the correct finish at the outset.

Stainless steels offer long life and require far less cleaning and maintenance than most constructional methods.

Provided the grade of stainless steel appropriate for the service environment is selected, it has been polished correctly and cleaning schedules are carried out on a regular basis, good performance and long service life are assured.

Surface finish also plays an important role, not only for appearance but also for ease of maintenance.

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GENERAL CLEANING METHODS

Problem	Cleaning Agent	Comments
Routine cleaning - All finishes	Soap or mild detergent (such as "Fairy Liquid") and water.	Sponge, rinse with clean water; wipe dry if necessary.
Fingerprints - All finishes	Soap or warm water or organic solvent, e.g. Usher-Walker Thinners No. PF8017, acetone, alcohol, genklene.	Rinse with clean water; wipe dry if necessary.
Stubborn stains/Discolouration - All finishes	Mild non-abrasive cleaning solutions or creams. e.g. Jif, Goddard stainless steel care.	Rinse well with clean water and wipe dry.
Oil/grease marks - All finishes	Organic solvents, e.g. Usher-Walker Thinners No. PF8017, acetone, alcohol, genklene.	Clean afterwards with soap and water and wipe dry.
Rust and other corrosion products - All finishes	Various special gels, 10% Phosphoric Acid or Oxalic Acid solution. The cleaning solution should be applied with a swab and allowed to stand for 15-20 minutes before being washed away with water. May continue using Jif or similar products to give final clean.	Rinse well with clean water. For Phosphoric Acid rinse first with Ammonia. (precautions for acid cleaners should be observed).
Scratches on Brush (Satin) Finish	Slight scratches: impregnated nylon pads. Polishing with scurfs dressed with iron-free abrasives. Deeper scratches: apply in direction of polishing, then clean with soap or detergent as per routine cleaning.	Do not use ordinary steel wool, as iron particles can become embedded in stainless steel and cause further surface damage.
Paint / Graffiti	Alkaline or solvent paint strippers according to type of paint.	Use soft nylon or bristle brush. Follow manufacturer's instructions.

PRECAUTIONS

- Acids should only be used for on-site cleaning when all other methods have been proved unsatisfactory.
- Rubber gloves should be used and care taken to see that acid cleaners are not spilt over adjacent areas. (N.B. Special precautions are necessary with oxalic acid.)
- Solvents should not be used in enclosed spaces.
- Smoking must be avoided when using solvents.
- In all instances follow the manufacturer's safety instructions.

CONCLUSION

If all the suggestions and actions in the chart have been attempted unsuccessfully, stainless steel has the facility to be mechanically or electro-polished by specialists on-site, as the material is complete and not a surface plating.

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