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Care and maintenance of stainless steel

Introduction

Stainless steels are selected for applications where their inherent corrosion resistance, strength and aesthetic appeal are required. However, dependent on the service conditions, stainless steels will stain and discolour due to surface deposits and so cannot be assumed to be completely maintenance-free. In order to achieve maximum corrosion resistance and aesthetic appeal, the surface of the 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, good performance and long service life will result.

Factors affecting maintenance

Surface contamination and the formation of deposits on the surface of the stainless steel must be prevented. These deposits may be minute particles of iron or rust generated during construction. Industrial and even naturally occurring atmospheric conditions can produce deposits which can be equally corrosive, e.g. salt deposits from marine conditions.

Working environments can also provide aggressive conditions such as heat and humidity in swimming pool buildings. These conditions can result in surface discolouration of stainless steels and so maintenance on a more frequent basis may be required.

Modern processes use many cleaners, sterilizers and bleaches for hygienic purposes. Proprietary solutions, when used in accordance with makers' instructions, should be safe but if used incorrectly (e.g. warm or concentrated), may cause discolouration or corrosion on stainless steels. Strong acid solutions are sometimes used to clean masonry and tiling of buildings. These acids should never be used where contact with metals, including stainless steel, is possible. If this happens, the acid solution must be removed immediately, followed by dilution and rinsing with clean water.

Maintenance programme

With care taken during fabrication and installation, cleaning before 'hand-over' should not present any problems. More attention may be required if the installation period has been prolonged or hand-over delayed. Where surface contamination is suspected, immediate cleaning after site fixing should avoid problems later. Food handling, pharmaceutical, aerospace and certain nuclear applications may require extremely high levels of cleanliness applicable to each industry.

The frequency of cleaning is dependent on the application - a simple rule is:

Clean the metal when it is dirty in order to restore its original appearance.

This may vary from once to four times a year for external applications, but may be daily for items in 'hygienic' applications. Recommendations on cleaning frequencies in architectural applications are shown below.

Cleaning frequency in architectural applications

Location	430 (1.4016)	304 (1.4301)	316 (1.4401)
Internal	As required to maintain appearance or design		
Suburban or rural	6-12 month intervals (as appropriate to location and design)		
Industrial or urban	Grade not recommended	3-6 months	6-12 months
Coastal or marine	Grade not recommended	Grade not recommended	6-12 months