Introduction

Product Characteristics

GKD manufactures high-quality woven metal fabrics, primarily of AISI Type 316 stainless steel. Each order is delivered clean and free of oils. Maintaining the appearance of the product requires very little effort.

For over half a century, stainless steel has provided architects with the means to produce a permanent expression of their design concepts. This visual permanency is due to the material's excellent resistance to corrosion allowing the surface to retain its original appearance indefinitely. Over the same time period, the surface appearance options for stainless steel have been continuously increasing. Consequently, it is not surprising that stainless steel has been specified with confidence by generations of architects for so many indoor and outdoor applications.

However, like any other building material, stainless steel may become soiled in service by the deposition of airborne dirt, by accidental damage or through acts of vandalism.

This brochure will provide you with guidance for the cleaning and maintenance of our products.

Resistance to Corrosion

We use austenitic stainless steel, most commonly AISI Type 316. Because stainless steel is non-corrosive, no protective coatings or paints should be used. Their use will detract from the natural qualities of the product and will provide no benefit.

Durability

Our metal fabrics are fire, heat and impact resistant, and are suitable for all climates. Stainless steel is a highly durable material. It is a permanent choice in an increasingly disposable world, reducing demand on our natural resources and providing long-term value.

Care and Cleaning

Initial Cleaning

In common with many other building materials, stainless steel arrives on site with its surface in the finished condition. If the surface has been exposed to construction dirt and dust an initial cleaning may be required before handing-over. A typical procedure would be:

1. Rinse with water to remove loose dirt.

2. Wash with water containing soap, detergent or 5% ammonia, using a soft, long fiber brush if necessary. The cleaner utilized should be a multi-purpose cleaner that neutralizes and removes salts. An environmentally safe cleaner is suggested to remove oils and dirt from the metal fabric.

3. Rinse with water.

4. Allow to dry.

Routine Cleaning

The quality of the environment and the aesthetic standard required will obviously influence the frequency of routine cleaning. For outside locations, rain can wash a well designed building, cloaked in woven metallic fabric quite effectively, but it may be desired to supplement this natural process by routinely washing the stainless steel once or twice a year. For instance, a stainless steel curtain wall may be washed at the same time as the windows. However, where severe environmental situations exist, such as coastal regions, areas of high humidity or severe pollution, washing once or twice a year may be desired if a high aesthetic standard is required.

The cleaning procedure used for initial cleaning can be adopted, with a multi-purpose cleaner that neutralizes and removes salts.

In some locations heavier soiling may occur, such as splashing in winter from adjacent road surfaces. In such cases the following procedure is usually adequate: Pressure jet cleaning with hot water in the spring to remove material adhering to the surface, followed by rubbing with a mild-abrasive cleaner for stainless steel (if necessary). Then, a water rinse followed by drying. Again, the cleaner should be safe for stainless steel and should remove and neutralize salts. (Normal domestic cleaners that contain harsh abrasives or chlorine compounds should be avoided).

Vandalism, Accidents and Remedial Cleaning

Graffiti, using marker pens, spray or brush paint is a major problem in some areas. However, **GKDMetalFabrics** provide little satisfaction for graffiti sprayers. The corrosion resistance of stainless steel can be used to advantage, allowing most solvents and chemical paint removers to be used. Caution should be exercised and obviously the surface and any joints should be well washed with water after using any chemicals.

Removing paint by scraping should not be attempted, as this will damage the surface. A suitable non-metallic abrasive pad may be used in combination with a paint remover, but care should be taken to avoid "polishing" the surface. Never use pads that have been used on carbon steel or the surface of the stainless steel will become contaminated with carbon steel particles, leading to rust staining. Steel wool must not be used on stainless steel for the same reason.

Vandalism by scratching with a knife or similar implement is also encountered. Some removal can be achieved by rubbing suitable abrasive cloths and Scotchbrite pads in the direction of the "grain". Removal is impossible, but the harder surface produced by the embossing plus the irregular surface tends to minimize the visual impact of the attack.

Splashing with cement or mortar is perhaps the most common accidental damage encountered at a building site. Removal with water before hardening is essential. If this is not done, proprietary cleaners used to remove mortar from tiles must not be used, as they normally contain strong chemicals that would etch the stainless steel. A combination of power washing and cautious mechanical methods may be used to remove the bulk of the splash, followed by a mild-abrasive cleaning compound designed for stainless steel, and is a multi-purpose cleaner that neutralizes and removes salts.

Contamination by carbon steel may also occur accidentally on site. The outcome is that the carbon steel rusts, producing brown stains. Extensive carbon steel contamination is difficult to rectify on site.

However, most accidents produce localized rust stains which may be removed using proprietary gels, or a 10% phosphoric acid solution, followed by rinsing with an ammonia solution and then cold water or by wetting the stain with an oxalic acid solution for up to 15 minutes, followed by a cold water rinse and drying.

Contamination by oil and grease requires careful removal to avoid leaving a thin film on the surface that would produce colored rings. The majority of the oil or grease should be removed with a solvent such as acetone, benzene, or alcohol, applied with a sponge or cloth. This could then be followed by washing with a detergent solution, rinsing with water and allowing to dry.

Contamination by finger marking in high traffic, highly polished areas may require regular cleaning to maintain a satisfactory aesthetic standard. The suppression of finger marking may be achieved by rubbing the surface with "Baby Oil" or spraying with aerosol oil.

Although regular cleaning is the best way to retain the appearance of stainless steel, it is still possible to restore the surface if it has been neglected. A typical remedial treatment could be:

1. Wash loose dirt from the surface with water containing detergent.
2. Rub the surface with a paste containing 200 mesh calcium carbonate or a suitable, proprietary mild-abrasive cleaning paste.
3. Wipe off the moist paste.
4. Rinse with water.

Commercial cleaning companies also offer other very effective methods using complex, proprietary mixtures of surfactants and other chemicals. A suggested cleaner would be one that is a multi-purpose cleaner designed for neutralization and removal of salts. Environmentally safe degreasers / cleaners are also suggested as they will emulsify and remove grease or dirt from the mesh.

Summary

Maintenance and cleaning aspects must be considered early in the design of any architectural project. Where aesthetic standards are important, it is fortunate that the type of stainless steels used in architecture, buildings and construction are exactly the same as used by the chemical industry to resist corrosion in many parts of their production plants. A wide range of effective cleaning reagents can therefore be used, making restoration of surface appearance relatively easy—if the correct procedure is adopted.

Footnote

It has been assumed that clean, potable water is available for cleaning, If this is not correct, then consideration should be given to the effect of any impurities in the water on the cleaned surface, e.g. a mineral/dry residue content that is high enough to deposit excessive amounts of solids on evaporation, organic matter and soil in suspension. Similarly, seawater should not be used in view of its high chloride content.

Practical Guidelines for Design

- Evaluate the environment and probable cleaning regime to determine the likelihood of accumulated deposits and air pollutants such as soot, iron oxide particles, sulfur dioxide, and salt exposure before selecting the stainless steel grade.
- Use a design that allows rain to rinse away surface deposits.
- Specify a higher grade of stainless steel in sheltered areas that are not washed regularly.
- Minimize crevices in areas exposed to moisture and/or aggressive corrosives.
- Use a stainless steel fastener with equivalent or higher corrosion resistance than the component being fastened.
- Never use carbon steel brushes or steel wool on stainless steel. Use stainless steel brushes or soft-bristle brushes made of an inert material.
- Never use hydrochloric or muriatic acid on or around stainless steels. If muriatic acid is accidentally splashed on stainless it should be washed immediately with large quantities of water before the acid severely damages the stainless steel.
- Dissimilar metals should be electrically isolated from each other in application where they may get wet. This can be achieved using inert washers, protective coatings like paint, and other physical barriers that prevent direct contact. Dissimilar metals should be avoided in applications where standing water is likely and it is not possible to insulate the metals.
- If the design requires welding sections heavier than about 0.25 inches (6 mm) and the weld area will be exposed to a corrosive environment, use low carbon versions of the stainless steels (e.g., 304L or 316L) to reduce the risk of sensitization and improve weld corrosion resistance.
- If a filler metal is used in welding, its corrosion resistance should be equivalent to or greater than the corrosion resistance of the base metal.
- Weld imperfections, such as blowholes, cracks, slag or weld spatter, are potential sites for corrosion and should be repaired or removed.
- Visible welds should be dressed and polished to match the parent metal surface finish, taking care to remove any traces of spatter and heat tint.
- Do not use abrasive polishing or blasting materials that have been used previously on carbon steel. This will embed carbon steel in the surface.
- Clean tools and work areas previously used for carbon steel to remove iron particles and prevent their transfer to the stainless steel surface.
- Protect the stainless steel during fabrication, shipping, and installation with paper or strippable plastic film.
- Clean grease, oil lubricants, and paint and crayon markings from the surface prior to welding to prevent weld contamination. Surface chromium depletion and a subsequent reduction of corrosion resistance may be caused by inadequate gas shielding during welding or insufficient heat tint removal.

References

(NiDI) Nickel Development Institute
1. Answers for Architects, Nickel Development Institute. Jan 1988
2. Stainless Steels in Architecture, Building and Construction, Nickel Development Institute, April 2002

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