Like most high-performance finishes, ES Metals powder coatings require periodic cleaning and maintenance after installation. Although ES Metals finishes possess exceptional resistance to corrosion, discoloration and wear, its natural beauty can be marred by harsh chemicals, rough conditions or neglect. Such conditions normally affect only the surface finish and do not reduce the service life of the finish. However, the marks resulting from such mistreatment may be permanent. For example, mortar, cement and other alkaline materials may attack coatings if allowed to remain fixed on finishes.

Organic coatings on aluminum do not normally show an appreciable amount of dirt collection. In many environments dirt or soil would not indicate a detrimental risk to the coating, but reasonable cleaning and surface care may be desirable for the sake of appearance. Cleaning is desirable in areas where heavy industrial deposits have dulled the surface, where materials from construction processes have soiled the surface or where cleaner run-down from other surfaces should be removed.

Painted surfaces, exposed to the atmosphere collect soil and dirt, the amount of which may vary depending on geographic area, environmental conditions, finish and location on the building. Local atmospheric conditions as well as building location within a geographical area quite naturally have an effect on cleanliness. More frequent cleaning will be required in heavy industrialized areas compared to rural areas. Seasonal rainfall can affect washing frequency by removing water soluble deposits and less adherent soil. In foggy coastal regions, frequent cycles of condensation and drying can create a heavy build-up of atmospheric salts and dirt which may adhere tenaciously. In climates where rainfall is low, the opportunity for atmospheric washing of the surface is minimal. Los Angeles, for example, has a unique combination of limited rainfall, temperature fluctuation, smog and condensation. This situation requires that cleaning be done more frequently than in other metropolitan areas where rainfall is more frequent. In both wet and dry climates, recessed and sheltered areas usually become more heavily soiled because of the lack of rain washing. Frequent and longer periods of condensation also occur in protected areas increasing the adhesion of the soil. This is particularly true of soffit areas on some overhangs, bottom areas of fascia panels, sheltered column covers and the like. Periodic maintenance inhibits long-term accumulation of soil which, under certain conditions, can accelerate weathering of the finish. The more frequently surfaces are cleaned, the easier and less costly succeeding maintenance is. In most cases, the cleaning can be integrated with other activities for efficiency and economy. For example, both the glass and the aluminum curtain walls on the same building can be cleaned at the same time. If automatic wall cleaning equipment is to be used on a building, a test should be made early in equipment design to insure that the cleaning solutions, brushes, as well as the frequency of cleaning have no detrimental effect on the coating.

CLEANING AFTER INSTALLATION

Construction soils, including concrete or mortar, etc., should be removed as soon as possible. The exact procedure for cleaning will vary depending on the nature and degree of soil. When selecting a method of cleaning and type of cleaner, consideration should be given to all other materials that may be adversely affected by the cleaning process. Try to restrict cleaning to mild weather. Cleaning should be done on the shaded side of the building or ideally on a mild, cloudy day.

REMOVAL OF LIGHT SURFACE SOIL

Begin the cleaning process at the top of the building by rinsing an area the width of the stage or scaffolding to the ground level in continuous drop with forceful water spray. This should be done at the beginning and the end of each drop regardless of the final cleaning materials employed.

The simplest procedure is to flush the surface with water using moderate pressure to dislodge the soil. If soil is still adhering after drying, then a mild detergent will be necessary. When mild detergent or mild soap is necessary for removal of soil, it should be used with brushing or sponging. The washing should be done with uniform pressure, cleaning first with a horizontal motion and then with a vertical motion. Apply cleaners only to an area that can be conveniently cleaned without changing position. The surface must be thoroughly rinsed with clean water. It may be necessary to sponge the surface while rinsing, particularly if cleaner is permitted to dry on the surface. The rinsed surface is permitted to air dry or is wiped dry with a chamois, squeegee or lint-free cloth.

Run-down of cleaner (from any operation) to the lower portions of the building should be minimized and these areas should be rinsed as soon as and as long as necessary to lessen streaking, etc., from unavoidable rundown, lower areas should be kept wet or flooded with water. Do not allow cleaning chemicals to collect on surfaces or to "puddle" on horizontal surfaces, crevices, etc. These should be flushed with water and dried. Always clean coated surfaces down from top to bottom and follow with a thorough rinsing with clean water. (With one-story or low elevation buildings, it is recommended to clean from bottom up and rinse from top down.)

Mild soaps or detergents ruled safe for bare hands should be safe for powder coated surfaces. Stronger detergents should be carefully spot-tested and may require rubber gloves, long handled brushes, etc. With any soap or detergent the finish should be thoroughly rinsed with clean water and dried. Some mild cleaning solutions, comprised of selected wetting agents in water solution, are available for automatic-building-washing machines. These machines would have built-in brush agitation, squeegee, filtration and re-circulation; in some, a fresh water connection may be provided.

REMOVAL OF MEDIUM TO HEAVY SURFACE SOIL

If surface soil still adheres after using procedures under, cleaning with the assistance of a cleaning pad can be employed. Hand-scrub the surfaces using a soft, palm-sized nylon cleaning pad. Thoroughly wet the pad with clean water or a mild detergent cleaner. Start across the top and work down, rubbing the painted surface in the direction of the wood grain with uniform pressure. After scrubbing, the surface should be rinsed thoroughly with clean water to remove all residues. It may be necessary to sponge the surface while rinsing, particularly if the cleaner is permitted to dry on the surface.

In some cases, the use of power cleaning tools may be necessary for removal of unusually heavy soils from large areas including panels and column covers. In such cases an air-driven reciprocating machine fitted with abrasive pads can be employed. During this operation, the surface being cleaned must be continually wet with clean water or mild detergent cleaning solution to provide lubrication and a medium for carrying away the dirt. The cleaning solution may be applied to the panels by sponging or brushing. Water may be applied in the same manner by spraying from a hose or by utilizing the

water connection on the cleaning machine. The machine is moved over the metal by the operator with a sufficient number of overlapped passes to effect maximum cleaning. The direction of travel with the cleaning machine is dependent largely upon the geometric configuration of the surface being cleaned. However, when possible, the machine strokes should be made first in one direction and then in a direction perpendicular to the first; (e.g., horizontal passes followed by vertical passes). Areas which are not accessible with the machine must be manually cleaned.

After an area has been machined scrubbed, it must be rinsed with clean water and thoroughly scrubbed with a plastic bristle brush. While still wet, a final water rinse without brushing completes this cleaning operation. The rinsed surface should be either permitted to air dry or wiped dry with a squeegee, chamois or lint-free cloth. It is important to promptly remove any cleaner rundown from the un-cleaned lower portions of the building to avoid staining.

REMOVAL OF MEDIUM TO HEAVY SURFACE SOIL

Stronger detergents may be used to remove grease and other stubborn compounds. Solvents or solvent containing cleaners may have a deleterious or softening effect on paints. To prevent harm to the finish, these types of solvent or emulsion cleaners should be spot tested and preferably the coating manufacturer should be consulted. Care should be taken to assure that no marring of the surface is taking place in this manner since this could give an undesirable appearance at certain viewing angles. Cleaners of this type are usually applied with a clean cloth and removed with a cloth. Remaining residue should be washed with mild soap and rinsed with water. Use solvent cleaners very sparingly.

If cleaning of heavy surface soil has been postponed or in the cases of an especially tenacious soil, stubborn stains, etc., a more aggressive cleaner and technique may be required. Cleaner and technique should be matched to the soil and the painted finish. Some local manual cleaning may be needed at this point. Always follow the recommendations of the cleaner manufacturer as to proper cleaner and concentration. Test clean a small area first. Cleaners should not be used indiscriminately. Do not use excessively aggressive rubbing as such may alter surface texture or may impart a "shine" to the surface.

Concrete spillage that has dried on the painted surface may become quite stubborn to remove. Special cleaners and/or vigorous rubbing with non-abrasive brushes or plastic scrapers may be necessary. Diluted solutions of Muriatic Acid (under 10%) may be effective in removing dried concrete stains, however, a test area should be tried first. Proper handling precautions must be exercised for safety reasons. Also, effective proprietary cleaners for concrete and mortar staining are available.

Never mix cleaners together. The mixing of cleaners may not only be ineffective, but also very dangerous. For example, mixing of chlorine containing materials such as bleaches, with other cleaning compounds containing ammonia, can result in poison gas emission. Always rinse after removal of any surface soil.

INSPECTIONS

It is suggested that the building owner provide an engineer or representative to inspect the cleaning work to ensure satisfactory clean appearance of the building. Metal seams, crevices, sills and any other area that may trap water, cleaner or dirt must be cleaned and thoroughly dried. These "trap" areas must be hand-wiped with absorbent towels or cloths to prevent rundown streaks or "puddling" which will later cause discoloration.

Inspect metal surfaces for any discoloration or stains not removed during cleaning operations. Soil or discoloration's still remaining should be manually cleaned until a satisfactory appearance is achieved. Stubborn surface soils should be scrubbed in a uniform direction using a nylon cleaning pad and cleaner solution.

CLEANING PRECAUTIONS

Here's a common sense summary of cleaning recommendations for architectural finishes.

Correctly identify the type of finish to be cleaned when selecting an appropriate cleaning method. Check specifications and/or "as-built" drawings if in doubt as to the finish.

Never use aggressive alkaline or acid cleaners on finishes. Do not use cleaners containing Tri-sodium Phosphate, Phosphoric Acid, Hydrochloric Acid, hydrofluoric acid, fluorides, or similar compounds can react with metal surfaces. Strong solvents or abrasive cleaners can cause damage to painted surfaces. Always follow the recommendations on labels as to the cleaner amount and concentration. Test-clean a small area first. Different cleaners should not be mixed.

It is preferable to clean surfaces when shaded. Do not attempt to clean hot, sun-heated surfaces since possible chemical reactions on hot metal surfaces will be highly accelerated and non-uniform. Also, avoid cleaning in freezing temperatures or when metal temperatures are sufficiently cold to cause condensation. Surfaces cleaned under these adverse conditions can become so streaked or tainted that they cannot be restored to their original appearance.

Apply the cleaning solution only to an area that can be conveniently cleaned without changing position. Thoroughly rinse the surface with clean water before applying cleaner. Minimize cleaner rundown over the lower portions of the building and rinse such areas as soon as practical.

Strong cleaners should not be used on windows and other building accessories where it is possible for the cleaner to come in contact with the bare metal. Solutions of water and mild detergents should be tried first. If an aggressive cleaner is required for some other component of the building, care must be taken to prevent the cleaner from contacting the underlying metal.

Note: Care should be taken to avoid over spray or run off of cleaner onto other buildings components such as glazing materials, weather stripping sealants, etc.

Do not use excessive abrasive rubbing to remove stubborn stains. Such procedures can produce an undesirable appearance or adversely affect the finish.

The type and frequency of cleaning and coating will vary with the amount of atmospheric soil and dirt accumulated on the surfaces and the owners desires regarding appearance. Periodic re-application and wipe on surface protectants will assist in maintaining the appearance and reduce the cleaning required.

RECOMMENDED CLEANING SCHEDULES

1. Non-aggressive environments: Clean and check every 12 months

2. Tropical Environments: Clean and check every 9 months

3. Chlorinated Swimming & Leisure Pools: Clean and check every 6 months

4. Marine Environments: Clean and check every 3 months

5. Industrial Environments Clean and check every 3 months

6. Aggressive/Hazardous Environments: Clean and check every 1 month

We recommend avoiding the use of white spirits to assist with stubborn stains. If cleaning with white spirits should become necessary, it must be done in a shaded are and during cooler temperatures using soft cloths and wiping gently only. It is also recommended that a small, non-visible area be tested initially to ensure that no color change or damage will occur.

WARNING: Do not, under any circumstances use strong solvents such as thinners or solutions containing chlorinated hydrocarbons, esters or ketones. Abrasive cleaners or cutting compounds should not be used either.

The frequency of such cleaning will depend on several factors:

- Geographical location of the building powder coat application to residential house.

- Environment surrounding the building e.g. marine, industrial, alkaline or acidic, etc.

- Levels of atmospheric pollution including salts.

- Prevailing winds and the possibility of air borne debris causing erosive wear of the coating e.g. Sand blowing causing abrasion.

- Protection of part or all of the building by other buildings.

- Change in environmental circumstances during the lifetime of the building e.g. If a rural area became industrial.

Cleaning should start at the time the products are installed, ensuring that construction materials such as concrete, plaster and paint splashes are removed before they have a chance to dry. Failure to remove these materials at this early stage will cause the incrustation of materials into the surface and

require the use of aggressive cleaning materials and techniques with potential damage to the powder coated surfaces.

The best method of cleaning is by regular washing of the coating using a solution of warm water and non-abrasive, pH neutral detergent solution. Surfaces should be thoroughly rinsed after cleaning to remove all residues. All surfaces should be cleaned using a soft cloth or sponge or a soft natural bristle brush. Cleaning of powder coated sections can be done at the same time as window cleaning.

This document partially uses AAMA 609 & 610-02 cleaning recommendations. **Contact ES Metals with any questions on protecting your decorative powder coatings.**