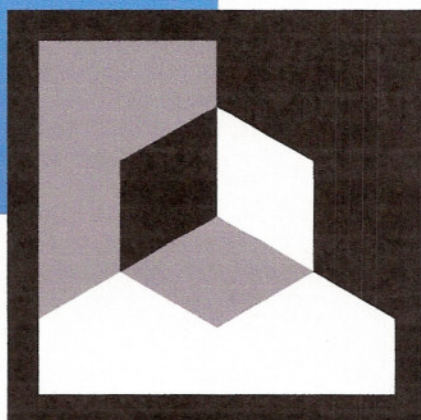


A M E R I C A N A R C H I T E C T U R A L

AAMA 609 & 610-02

**Cleaning and Maintenance
Guide for Architecturally
Finished Aluminum**



M A N U F A C T U R E R S A S S O C I A T I O N

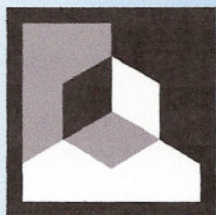


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1. SCOPE

1.1 This guide outlines methods, equipment and materials applicable for cleaning architecturally finished aluminum after construction and for subsequent periodic maintenance.

1.2 The methods outlined herein are intended for use on anodized or painted architectural products whether rolled or extruded shapes, including window and door frames, store fronts and entrances, curtain walls, mullions, columns, panels, hand rails, flag poles and hardware.

1.3 Types of architectural finishes are: anodic coatings, thermoplastic and thermosetting organic coatings.

2. PURPOSE

This information is intended as a guide for architects, owners, building managers, contractors and others in the building industry who are interested in the proper care and maintenance of finished architectural aluminum. Herein are described safe, practical methods for cleaning, maintenance and protection of finished architectural aluminum.

3. GENERAL

3.1 Anodized Aluminum: As with any finished building material, anodized aluminum requires reasonable care prior to and during installation and periodic cleaning and maintenance after installation. Although anodized aluminum possesses exceptional resistance to corrosion, discoloration and wear, its natural beauty can be marred by harsh chemicals, rough conditions or neglect. Such conditions usually affect only the surface finish and do not reduce the service life of the aluminum. However, the marks resulting from such mistreatment may be permanent. For example, mortar, cement and other alkaline materials will quickly corrode anodic coatings if allowed to dry on the metal surface.

3.2 Painted Aluminum: Organic coatings on aluminum do not normally show an appreciable amount of dirt collection. In many atmospheres dirt or soil would not indicate a detrimental risk to the coating, but cleaning and surface care may be desirable for the sake of appearance. Cleaning may become 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.

3.3 Both painted and anodized 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 aluminum is cleaned, the easier and less costly succeeding maintenance is. It is recommended the finish supplier be consulted for proper cleaning schedule.

3.4 In any case, the aluminum cleaning schedule be integrated with other cleaning schedules for efficiency and economy. For example, both the glass and the aluminum curtain wall 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.

4. CLEANING PROCEDURES AND CARE 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 wash of 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.

4.1 REMOVAL OF LIGHT SURFACE SOIL ON ORGANIC AND ANODIC COATINGS

Removal of light surface soil may be accomplished by alternative methods as described in 4.1.1, 4.1.2, 4.1.3 and 4.1.4. Only trial and error testing employing progressively stronger cleaning procedures can determine which will be most effective. 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.

4.1.1 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.

4.1.2 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.

4.1.3 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 run-down, 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.)

4.1.4 Mild soaps or detergents ruled safe for bare hands should be safe for coated aluminum. Stronger detergents should be carefully spot tested and may necessitate 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.

4.2 REMOVAL OF MEDIUM TO HEAVY SURFACE SOIL ON ANODIC COATINGS

4.2.1 If surface soil still adheres after using procedures under 4.1, cleaning with the assistance of a cleaning pad can be employed. Hand scrub the metal surface using a palm-sized nylon cleaning pad. Thoroughly wet pad with clean water or a mild detergent cleaner or pumice powder. Start across the top and work down, rubbing the metal surface in the direction of the metal grain with uniform pressure. After scrubbing, the metal 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. Solvents may be used to remove non-water soluble deposits. Extreme care must be exercised when solvents are used since they may damage organic sealants, gaskets and painted finishes. If solvents are used, rinse the surface completely with clean water and allow the surface to air dry or wipe dry with a chamois, squeegee or lint-free cloth.

CAUTION: These procedures must not be used on surfaces with a factory applied clear organic protective coating unless the clear coating has deteriorated and should be removed. Many organic solvents are flammable and/or toxic refer to MSDS for proper handling.

4.2.2 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 wetted 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 as in paragraph 4.2.1.

After an area has been machined scrubbed, it must be rinsed with clean water and thoroughly scrubbed with a fairly stiff 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 uncleaned lower portions of the building to avoid staining.

4.3 REMOVAL OF MEDIUM TO HEAVY SURFACE SOIL ON ORGANIC COATINGS

4.3.1 A mild solvent such as mineral spirits may be used to remove grease, sealant or caulking compounds. Stronger solvent 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 sparingly.

4.3.1.1 It may be possible for solvents to extract materials from sealants which could stain the painted surface or could prove harmful to sealants; therefore, these possible effects must be considered. Test a small area first.

4.3.2 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 excessive, abrasive rubbing as such may alter surface texture or may impart a "shine" to the surface.

4.3.2.1 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.

4.3.3 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.

4.3.4 Always rinse after removal of any surface soil.

4.4 INSPECTION

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.

4.4.1 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.

4.4.2 Inspect metal surfaces for any discoloration or stains not removed during cleaning operations. Soil or discoloration's still remaining should be manually cleaned in accordance with sections 4.1, 4.2 and 4.3 until a satisfactory appearance is achieved. Stubborn surface soils should be scrubbed in a uniform direction using a nylon cleaning pad and cleaner solution.

5. CLEANING PRECAUTIONS

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

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

5.2 Never use aggressive alkaline or acid cleaners on aluminum finishes. Do not use cleaners containing trisodium phosphate, phosphoric acid, hydrochloric acid, hydrofluoric acid, fluorides, or similar compounds on anodized aluminum surfaces. Strong solvents or abrasive cleaners can cause damage to painted surfaces. Always follow the cleaner manufacturer's recommendations as to the proper cleaner and concentration. Test-clean a small area first. Different cleaners should not be mixed.

5.3 It is preferable to clean the metal 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.

5.4 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.

5.5 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 aluminum. 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 aluminum finish.

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

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

5.7 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.



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