

2. CLEANING

To ensure the longevity and hassle-free operation of Wispeco's systems, the following cleaning and maintenance procedures must be strictly adhered to.

Cleaning procedures are divided into the type of material being cleaned.

2.1. Aluminium

2.1.1. Anodised Aluminium

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

- Never use aggressive alkaline or acid cleaners on aluminium finishes. It is important not to use cleaners containing trisodium phosphate, phosphoric acid, hydrochloric acid, hydrofluoric acid, flourides, or similar compounds on anodised aluminium surfaces. Always follow the recommendations of the cleaner manufacturer as to the proper cleaner and concentration. Test clean a small area first. Different cleaners should not be mixed.
- 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 cleaning non-uniformity can occur. Surfaces cleaned under these adverse conditions can become streaked or stained so that they cannot be restored to their original appearance. Also avoid cleaning during freezing temperatures or when metal temperatures are sufficiently cold to cause condensation.
- 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 and as long as practical.
- Cleaners containing strong organic solvents will have a deleterious effect on organic overlay coatings, but not on anodised aluminium. The possibility of solvents extracting stain-producing chemicals from sealants and affecting the function of the sealants, however, must be considered. Test a small area first.
- 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 aluminium. Solutions of water and mild detergents should be used on windows. If for some particular reason, an aggressive cleaner is required for some other component of the building; extreme care must be taken to prevent the cleaner from contacting the aluminium finish.

2.1.2. Powder Coated Aluminium:

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. 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. Method of cleaning, type of cleaner, etc. of one component of the building must be used with consideration for other components such as glass, sealants, painted surfaces, etc.

- Over cleaning or excessive rubbing can do more harm than good.
- Strong solvents or strong cleaner concentrations can cause damage to painted surfaces.
- Avoid abrasive cleaners. Do not use household cleaners that contain abrasives on painted surfaces.
- Abrasive materials such as steel wool, abrasive brushes, etc., can wear and harm finish.
- Avoid drips and splashes. Remove run downs as quickly as possible.
- Avoid temperature extremes. Heat accelerates chemical reactions and may evaporate water from solution. Extremely low temperatures may give poor cleaning effects. Cleaning under adverse conditions may result in streaking or staining. Ideally, cleaning should be done in shade at moderate temperature.
- Do not substitute a heavy duty cleaner for frequently used mild cleaner.
- Do not scour painted surfaces.
- Never use paint removers, aggressive alkaline, acid or abrasive cleaners. Do not use trisodium phosphate, highly alkaline or highly acidic cleaners. Always do a surface test.
- Follow manufacturers' recommendations for mixing and diluting cleaners.
- Never mix cleaners.
- To prevent marking, make sure cleaning sponges, cloth etc. are grit free.

2.2. Glass

2.2.1. Cleaning instructions for glass:

The following cleaning products must not be used:

- Acid products
- Highly abrasive products such as polish, blades or sandpaper
- Water containing abrasive granules (cement etc.)

Clean warm water containing a highly diluted mild household detergent is recommended. Glass should be cleaned often enough to prevent heavy soiling (e.g. monthly). If the glass surface is still soiled after normal cleaning, the supplier should be consulted for remedial advice.

2.2.2. Cleaning instructions for reflective Low-E glass:

Hand Washing Pilkington Eclipse Advantage™ Reflective Low-E Glass.

Pilkington Eclipse Advantage™ Reflective Low-E Glass has a very thin pyrolitic coating on its top surface. This hard and durable low emissivity top coating gives the glass improved solar control and thermal insulation performance compared to ordinary clear glass but the low emissivity coating does have a very fine, hard texture which requires a slightly different cleaning procedure. Pilkington Eclipse Advantage™ Reflective Low-E Glass can be cleaned and maintained by hand washing with non-abrasive, ordinary glass cleaning solutions. For hand washing, a mild detergent and water solution is recommended. Uniformly apply the solution to the glass and wash with a clean, soft cloth, sponge or pad. Rinse thoroughly with clean water and wipe or squeegee dry immediately. Make sure no metal parts of the cleaning equipment touch the reflective glass surface, and that no abrasive particles are trapped between the glass and the cleaning materials. Stubborn stains can be removed with organic solvents such as mineral spirits, de-natured alcohol, acetone, or MEK, following appropriate safety procedures. The solvent wash should be followed immediately by a detergent wash and clear water rinse to remove solvent and dirt residues. Do not use harsh chemical cleaners, abrasives, opaque liquid cleaning solutions, steel wool, or razor blades on the reflective surface. Do not use any strong acidic cleaners on the Pilkington Eclipse Advantage™ reflective coating. There are a number of solutions commercially available for 'rejuvenating' water-stained glass surfaces. These products usually contain hydrofluoric acid and can severely damage the reflective surface of Pilkington Eclipse Advantage™ Reflective Glass. An exposed Pilkington Eclipse Advantage™ reflective coating will not get dirtier any faster than non-coated glass in the same location, but the reflective surface will show dirt and other deposits more readily. The reflective coating should never be allowed to become dirtier than visibly acceptable. It should be cleaned as frequently as is necessary to prevent it from ever appearing unacceptably dirty. In this way problems with the accumulation and hardening of excessive dirt deposits can be prevented.

Spot Cleaning:

Occasionally spot cleaning may be required to remove stubborn dirt or foreign materials that can adhere to the low emissivity glass surface. Spot cleaning products work to remove paint or markings from grease, oil, tape adhesive, and crayons or other waxy materials as well as rub marks from plastics.

Recommended Spot Cleaning Products:

- Denatured alcohol, acetone or organic solvents available from hardware stores.

Spot Cleaning Procedure:

1. Apply a small quantity of one of the cleaners listed above to a clean, wet cloth or towel.



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2. Rub on areas of glass needing spot cleaning.
3. Wipe clean using a dry, clean, lint free towel or cloth followed by the routine cleaning procedure given above.

Specialized Cleaning:

Do not contact the low emissivity coated surface with razor blades, steel wool or other metallic objects. If metallic objects contact the coated surface, a thin layer of metal removed from the object may be deposited onto the coating which results in a discoloured stain which is difficult to remove using normal cleaning procedures.

Recommended Specialized Cleaning Products for Metal Marks, etc.:

- HTH swimming pool acid with 40% hydrochloric acid.

Specialised Cleaning Procedure for Metal Marks, etc.:

1. Apply a small quantity of one of the specialized cleaning products listed above to a wet, clean cloth or towel.
2. Rub on areas of glass needing cleaning.
3. Wipe cleaning using a dry, clean, lint free towel or cloth followed by the routine cleaning procedure.

2.2.3. Cleaning instructions for Energy Saving glass:

Cleaning Instructions for McLam® Energy Saving Glass™

This information is offered as a general guide only. Specific advice on the cleaning of glass should always be sought from a reputable glazier or professional window cleaner before any glass cleaning is undertaken.

All McLam® Energy Saving Glass™ products have a very thin, hard, pyrolytic coating on one surface. This durable low emissivity coating gives them improved thermal insulation performance, and in the case of McLam® ESG™ Grey, Green & Neutral, improved solar control, compared to ordinary clear glass. The low emissivity coating has a very fine, hard texture which requires a slightly different cleaning procedure compared to plain, non-coated glass.

Routine Cleaning:

Hand cleaning of a pyrolytic low emissivity coating, to visibly remove accumulated dust or fingerprints, can be accomplished using a number of different cleaning products which are readily available from domestic supply, grocery and hardware stores. Do not use razor blades, steel wool or other metallic objects on the coated surface. The hard coating would probably not be damaged but

fine metal marks, looking like scratches in sunlight, could easily be left on the coating. Such marks need special cleaning techniques to remove them – see Spot Cleaning below. Follow the manufacturers' recommended handling procedures for each product listed.

Recommended Routine Cleaning Products for McLam® Energy Saving Glass™ etc.:

- Mr Muscle Window & Surface Cleaner, by SC Johnson & Son, Inc.
- Mixture of one part clear vinegar with one to ten parts clean water.

Commercially available vinegar-based glass cleaners have generally demonstrated an ability to provide a clean, streak-free coated surface. McCoy's glass does not recommend the use of ammonia or alcohol based glass cleaners because these products can leave visible streaks on the coating.

Typical Routine Cleaning Procedure:

- Flood the low emissivity coated surface with a spray-on cleaning solution or with a wet cloth saturated with the cleaning solution to thoroughly wet the surface and remove any grit particles. Be generous with the amount of solution applied.
- Rub the wetted surface with a clean, lint free towel or cloth. It is preferable not to use a squeegee on the low emissivity surface.
- To prevent streaking, stop wiping when the glass is almost dry and there is still a uniform, thin film of moisture left on the glass surface. This film will quickly evaporate leaving a clean surface. Note: streaking is simply the re-deposition of smears of non-uniform dirt, and detergent from the cleaning solution if there was too much dirt and too little volume of cleaning solution.

Detailed Cleaning Procedure to Remove Large Amounts of Dirt:

- If the coated surface is heavily contaminated with dirt, such as during installation on a construction site, use a water spray from a hose or garden spray pressure bottle to flush away insoluble particulate matter without risk of creating fine scratches.
- Flood the low emissivity coated surface with a spray-on cleaning solution or with a cloth saturated with the cleaning solution. Be generous with the amount of solution applied.
- Rub the wetted surface with a clean, lint free towel or cloth, to fully dissolve any dirt on the coating.
- Wipe dry with a dry, clean, lint free towel or cloth. It is preferable not to use a squeegee on the low emissivity surface. To prevent streaking – stop wiping when the glass is almost dry and there is still a uniform thin film of moisture left on the glass surface. This film will quickly evaporate leaving a clean surface. Note: streaking is simply the re-deposition of smear or non-uniform dirt and detergent from the cleaning solution if there was too much dirt and too little volume of cleaning solution.
- If after the above procedure, and under critical viewing, the glass does not appear clean then a final rinse with distilled water should be made before the cleaning solution has had

time to evaporate, to remove the dirt contaminated detergent solution. This allows the final evaporation of a thin film of pure, clean water which cannot leave any visible deposits.

Spot Cleaning:

Occasional spot cleaning may be required to remove stubborn dirt or foreign materials that have adhered to the low emissivity coated surface. Spot cleaning products containing organic solvents, or the one-time hand application of very fine abrasives, can be used to remove markings from grease, oil tape adhesive, and crayons or other waxy materials as well as paint and rub-off marks from plastics.

Recommended Spot Cleaning Products:

- Methyl Ethyl Ketone, Acetone or other organic solvents available from hardware stores.

Spot Cleaning Procedure:

- Use a cloth saturated with a routine cleaning solution to thoroughly wet the surface and to remove any grit particles.
- Apply a small quantity of one of the cleaners listed above to a clean, wet cloth or towel.
- Rub on areas of coating needing spot cleaning.
- Take particular care to prevent solvents, such as those listed above, from contacting glass sealants, framing and adjacent paintwork.
- Wipe clean using a dry, clean, lint free towel or cloth and immediately follow with the rinsing procedure given above in "Detailed Cleaning Procedure."

Specialized Cleaning:

If metallic objects have contacted the coated surface, a thin layer of metal removed from the object may be deposited onto the coating which results in discoloured stains or marks that looks like a scratch. Such marks cannot be removed using the normal cleaning procedures given above but require the specialized techniques below.

Recommended Specialized Cleaning Products for Removal of Metal Marks, etc.:

- 20-30% hydrochloric acid solution – typically found in domestic liquid swimming pool acid.

Specialized Cleaning Procedure:

- Use a cloth saturated with a routine cleaning solution to thoroughly wet the surface and to remove any grit particles.
- Apply a small quantity of one of the specialized cleaning products listed above to a wet, clean cloth or towel.
- Rub on areas of glass needing cleaning.

- Wipe clean using a dry, clean, lint free towel or cloth. Follow with the rinsing procedure given above in “Detailed Cleaning Procedure.”

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2.2.4. Cleaning instructions for Sunergy glass products:

Ordinary Cleaning Regimen:

In most cases, glass can be washed with plenty of clean water. Sometimes a bit of neutral detergent or an appropriate commercial cleaning product can be added to the water. A squeegee or specially designed cloths are also used. Once cleaned, the glass should be rinsed with clean water and wiped with a squeegee.

Special Cleaning Regimen:

When ordinary cleaning is not enough, other steps can be taken:

- Remove oily spots and other organic pollution with solvents such as isopropyl alcohol or acetone applied with a soft, clean cloth.
- Remove other residue by lightly polishing with a suspension of cerium oxide in water (between 100 and 200 grams per litre).
- Rinse thoroughly and then follow the ordinary cleaning regimen.

Initial Cleaning after the Glass is Installed:

When glass is cleaned for the first time after being installed (end of project), it may be particularly dirty. We recommend the following steps:

- Remove labels and cork interlayers as soon as possible.
- Rinse thoroughly to remove as much dust as possible.
- Perform the ordinary cleaning regimen.
- Examine any remaining dirty marks.
- Very carefully remove the majority of any remaining deposits of sealing compound, putty, cement, etc. using a specially designed scraper or razor blade. There is a very high risk of scratching the glass, so take great care at all times. This is especially true for coated glasses.
- Perform the special cleaning regimen where necessary.

Special Instructions for Coated Glass:

Sunergy has a metal oxide coating that is applied to the glass. These coatings are very resistant and durable. No particular precautions need to be taken when the coating is positioned on the inside of the insulating glazing unit (position 2 or 3, i.e. in contact with the air/gas layer). In single glazing or when the coating is located on the outside of the insulating glazing unit (position 1, external side of the building, or position 4, internal side of the building), the ordinary and special cleaning regimens described above are also suitable. However, bear in mind that a transparent and very thin metal surface is also being washed.

Remember:

- Any scratching will penetrate the surface of the coating and cannot be repaired.
- Any excessive mechanical treatment might remove the coating in localised areas.
- Avoid all contact with metal objects.
- Avoid all chemicals that would attack the surface and damage it irreparably.

Consequently, special care should be taken to follow the guideline and precautions set out in this document. In areas with high levels of pollution, treatments and products supplied by experienced professionals are essential.

Hints and Tips:

- All products containing hydrofluoric acid or fluorine derivatives are prohibited since they can destroy the coating and the surface of the glass.
- Highly acidic and alkaline products are prohibited, as are abrasive products.
- Ensure compatibility between the products used and other components (seals, paints used on the frame, aluminium, stone, etc.).
- Comply with the instruction manuals. When in doubt, contact the manufacturer.
- When carrying out the special cleaning regimen, always start with a trial on a small area.
- Do not wash the glass when it is fully exposed to the sun. Avoid washing it when it is too cold or hot.
- Take advantage of the washing process to inspect seals, drainage and frame.
- Make sure that cloths, squeegees and other tools are in good condition at all times.

2.3. Stainless Steel Components:

Introduction:

Stainless Steels are inherently corrosion resistant materials that do not need additional surface protection to enhance their appearance and durability. Some routine maintenance and cleaning is needed to keep stainless steel surfaces in good condition so that they aesthetic appearance and

corrosion resistance are not compromised. In this respect, stainless steels are no different to other construction materials such as glass, plastics or coated steels, which are never maintenance free throughout the life of a building. These guidelines are to give building owners, developers and facility manager's advice on efficient, cost-effective cleaning that will allow them to take advantage of the corrosion resistant properties of stainless steel.

The Self-Repair Mechanism of Stainless Steel:

First of all, it is important to understand why stainless steel is so corrosion resistant. The alloying elements in stainless steel form a thin, transparent "passive layer" on the surface. Although this protective passive layer is only a few atoms thick, it instantaneously reforms in the presence of oxygen from air or water, so even if the material is scratched or damaged the passive layer continues protecting the surface from corrosion.

This explains why stainless steel does not require any coating or other corrosion protection to remain bright and shiny even after decades of use.

Initial Cleaning:

The first cleaning is generally done before the building is handed over to the owner. If the stainless steel parts have been protected adequately then simple "maintenance cleaning" at the hand-over stage will probably be sufficient. An adhesive plastic film during fabrication, transport and assembly often protects stainless steel parts. Although providing excellent protection against damage and soiling, some plastic films deteriorate on exposure to the ultraviolet radiation in sunlight and which can make them difficult to strip. The film adhesive can also stick to the stainless steel surface. Protective plastic films should be removed as soon as they are no longer needed for protection during the installation/erection stage, starting at the top of the building and working downwards.

Motor and cement splashes can be treated with a solution containing a small amount of phosphoric acid. Rinse with water (preferably deionised water) and dry. Deionised water reduces the risk of water staining marks. Proprietary products are available from specialists finishing companies. Never allow mortar removers or diluted hydrochloric acid to be used on stainless steel. If they have accidentally been applied to or spilt over the stainless steel, rinse generously with fresh water.

Building contractors and tradesmen are not always aware how dangerous proprietary building mortar removers containing hydrochloric acid are to stainless steel components. This should be stressed. If possible, the sequence of operations should be changed so that any ceramic tile fixing and cleaning is completed before neighbouring stainless steel components such as skirting boards or kick plates are installed.

Iron particles picked up from tools or from contact with structural steel, scaffold tubing etc. must be removed immediately.

Steel dust particles created during operations such as welding, cutting, drilling and grinding of carbon (non-stainless) steel will rust quickly. Besides corroding themselves, these particles can locally break the self-healing “passive film” of stainless steel resulting in pitting corrosion in spite of their normally good corrosion resistance.

At an early stage, light deposits can be removed mechanically using nylon pads, such as the “Scotch-Brite” type used in the kitchen. Alternatively the contamination can be removed with a proprietary stainless steel cleaner containing phosphoric acid.

If pitting attack has occurred, depending on its severity, acid pickling treatments or mechanical rectification will be needed to restore the surface. Pickling agents in paste form are available for localised, on-site application. Care must be taken to use these products in accordance with the supplier’s directions so that there is a safe system of work and the relevant legislation on environmental protection is adhered to. Specialist finishing companies will often carry out this service on site.

While restoring the corrosion resistance of the surface, pickling may change the surface appearance of the steel. Further mechanical or chemical treatments may be necessary to restore the original surface finish. It is therefore advisable to avoid contamination, in the first place by either protecting the stainless steel parts, whilst work is being done or by installing those after other operations that could cause contamination have been completed.

Initial Cleaning:

On **external applications**, such as facades, rainfall can normally be expected to wash off accumulations of dirt and other deposits efficiently, depending on the amount of exposure of the elevation.

Special attention should be given to sheltered areas during routine cleaning to ensure that accumulations of airborne contaminants are removed. This is particularly important in marine and industrial environments, where build-up of airborne chlorides or SO_x can result in localised corrosion, if not effectively removed.

On **interior applications**, finger marks can be an issue. There is a wide range of finishes available for stainless steels, many of which are particularly suitable for use in heavily exposed (high traffic) public areas. Selecting finishes that are less sensitive to fingerprint marking in the design process will reduce the effort and costs of cleaning during the service life of the finished building.

Brushed finishes, which are a popular choice for interiors, may show finger marks in the period immediately after installation, but the visibility of the marking should become less evident after the first few cleaning operations.

Cleanders:

To remove fingerprints and other marks from architectural finishes, soapy water or a mild detergent are usually safe and successful. Proprietary spray cleaners are available, which combine ease of cleaning with a light film that produces an even and smooth lustre. These spray cleaners remove existing fingerprints and leave the surface in a condition that reduces the tendency for fingerprints to show in subsequent service. After applying the spray to the surface, polish with a dry cloth. Your nearest national stainless steel association should be able to advise on products locally available.

Mirror-polished stainless steel can be cleaned with glass cleansers. These products should be selected chloride-free.

For more **stubborn stains**, mild household cream cleansers should be effective. This should also be suitable for cleaning off watermarks and light discolouration. After cleaning, remove the residues with (preferably deionised) water (available in supermarkets, e.g. for steam ironing or car batteries) and dry to avoid streaking and water marks. Scouring powders should not be used as these products can leave scratches on stainless steel surfaces.

Care is needed with solvents to avoid spreading the staining on the stainless steels, which can then be difficult to fully remove. It is advisable to apply clean solvent several times with a clean, non-scratching cloth, until all traces of the partially dissolved oil/grease are removed.

Paint and Graffiti can be treated with proprietary alkaline or solvent-based paint strippers. The use of hard scrapers or knives should be avoided as the underlying stainless steel surface may become scratched.

Heavily neglected surfaces can be treated with metal polishes, such as those for cleaning chromium-plated items (e.g. automotive trim). Furthermore, polishes used for re-finishing car paint can be considered. Care must be taken as highly polished surfaces may become scratched with these cleaners.

Alternatively, use a proprietary stainless steel cleaner containing phosphoric acid to remove contamination, rinse with deionised water and dry. It is advisable that the entire surface of the component is treated so that a patchy appearance is avoided.

Before commencing any task, ensure that you have received the appropriate health and safety literature from the supplier and fully understand it. If in doubt, seek further advice.

Cleaners that should NOT be used on stainless steels include:

- Chloride-containing cleansers, especially those containing hydrochloric acid.
- Hypochlorite bleaches should not be used on stainless steels; if applied accidentally or spilt on stainless steel surfaces should be rinsed off immediately with liberal amounts of fresh water.
- Silver-cleaners must not be used on stainless steel.

Cleaning Utensils:

A **damp cloth** or **chamois leather** will usually be suitable for removing normal soiling, fingerprints etc.

For more stubborn dirt, **nylon pads** such as those known as “Scotch-Brite” pads are usually satisfactory. Non-stainless steel based scouring pads, cleaning wool or wire brushes must not be used on stainless steel. Apart from scratching the surface, these pads can leave carbon steel deposits on the stainless surface, which can subsequently develop into rust spots, if the surface becomes wet.

Soft nylon brushes can be used for cleaning stainless steel with patterned finishes. Non-stainless steel wire brushes must not be used. On “grained” directional finishes, such as EN 10088-3 types G, J and K the direction of cleaning strokes should be along the grain and not across it.

Where water has been used for cleaning or rinsing, wiping the surface dry to prevent watermarks, especially in hard water areas may be advisable. The use of deionised water will prevent the formation of hard water staining.

To avoid “cross-contamination” from iron particles, ensure that cleaning utensils have not been used for “ordinary” (i.e. carbon) steel before. Cleaning materials for use on stainless steel items should preferably be reserved exclusively for that purpose.

Cleaning Intervals:

The cleaning of stainless steel items for building interiors is really no different to other materials. Cleaning should be done before there is a visible build-up of soiling or finger-marking, so that the effort and cost of cleaning is minimised along with the risk of marking altering the appearance of the surfaces.

On building exterior applications, stainless steel may be exposed to a wider range of potentially more aggressive environments as a result of contact with: marine atmospheres, environments laden with industrial pollutants, salt spray from road de-icing salt, atmospheric dirt and traffic film.

All cause brown staining to appear. It is a good practice to clean the stainless steel at the **same frequency as the building’s windows (glazing)**. Depending on the severity of soiling and deposit build up, routine cleaning frequencies of 6-12 months for light soiling and 3-6 months for heavy soiling or environments such as those listed above is advisable. A stainless steel cleaner containing phosphoric acid will remove this form of contamination.

2.4. EN AC 46100 Aluminium Alloy used in the Manufactory of Hardware Items:

The Wispeco systems using hardware items made from EN AC 46100 are as follows:

- 540 Sliding Window System
- 1000 Series Sliding Window
- 4500 Sliding Door
- 5000 Series Sliding Folding Door
- Crealco Serene Series of Windows and Sliding Doors.

Where these products are used in an average to high corrosion area, it is important that the manufacturing process, as set out in the relevant system manuals, must be followed.



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CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF ALUMINIUM ALLOY EN AC 46100

Rule:	UNI EN 1706:1999
Title:	Aluminium and aluminium alloys – Castings – Chemical composition and mechanical properties
Group:	Al Si 9 Cu
Designation:	EN AC 46100 – Al Si 11 Cu 2 (Fe)

The standard aluminium alloy used is EN AC 46100 – Al Si 11 Cu 2 (Fe). This alloy combines good physical-mechanical properties and a good resistance to oxidation from corrosive agents.

CHEMICAL COMPOSITION %

ALLOY	ELEMENTS											Individual	Global	
	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	Sn	Ti			
EN AC														



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INSTALLATION, CLEANING & MAINTENANCE

46100												impurities	impurities
Min	10.0	0.45	1.5										
Max	12.0	1.0	2.5	0.55	0.30	0.15	0.45	0.45	1.7	0.15	0.20	0.05	0.05

MECHANICAL PROPERTIES

EN 1706	DENOMINATION	METALLURGICAL STATE AND CASTING PROCESS (1)	MECHANICAL CHARACTERISTICS (2)				CORROSION RESISTANCE (3)
			R	Rp(0.2)	A	HB	
			N/mm ²	N/mm ²	%		
EN AC 46100	EN AC- AlSi11Cu2(Fe)	DF	240 (*)	140 (*)	<1(*)	80(*)	D

(1) DF = JET IN DIE CASTING

(2) MINIMUM CHARACTERISTICS (EN 1706) AT ROOM TEMPERATURE

R = BREAKING LOAD

Rp0.2 = YIELD LOAD

A = ELONGATION

HB = BRINNELL HARDNESS



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CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF ALUMINIUM ALLOY EN AC 46100

(3) A = EXCELLENT

B = GOOD

C = CORRECT

D = MEDIOCRE

E = DISCOURAGED

F = SINCOMPATIBLE

(*) ONLY INDICATIVE VALUES



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SPECIFIC WEIGHT	2,65 – 2.68 kg/dm ³
ELASTICITY MODULUS	E = 70000 – 78000 Mpa
COEFFICIENT OF THERMAL EXPANSION	20°C ... 200° = 20 – 25 X 10 ^{-b°} C ⁻¹

REDUCTION FACTORS VALUES OF TRACTION STRENGTH AS A FUNCTION OF TEMPERATURE

TEMPERATURE	-250°C	0°C	50°C	100°C	150°C	200°C
COEFFICIENT	1	1	1	0.85-0.9	0.7	0.5

3. MAINTENANCE

3.1. Wispeco Product Maintenance:

Casement Windows:

- 28mm Casement Window
- 30.5 Casement Window
- 340 Casement Window
- 38 Casement Window
- Tilt & Turn Window
- Edge System
- Clip 44 Casement Window

Sliding Windows:

- 500 Series Sliding Window
- 540 Sliding Window
- 1000 Series Sliding Window
- Rouge Sliding Window
- Elite sliding window

Vertical Slider:

- Vert 70.

Sliding Doors:

- 700 Patio Door
- Rouge Sliding Door
- 4500 SQ/MC Sliding Door
- Palace Multi
- Clip 44 Sliding Door
- Tilt & Slide Door

Shower Doors:

- SEAL Door

Sliding Folding Bottom Rolling

Door:

- Vista Door

Sliding Folding Top Hung Sliding

Door:

- 5000 Series Door

Shopfront System:

- Clip 44

- Clip38

Louvres:

- Horizon
- Door Vent

Insect Screen:

- Cassette 40
- Fly Screen 54
- Patio Door Insect Screen

Garage Door:

- AlDoor

Curtain Wall System:

- Façade 60

Balustrade:

- New York Balustrade

Putty glazed window:

- 500 Series Sliding Window

Internal Glass Partition:

- Infinity Partition.

Security Barrier:

- Guardian door.

3.2. Maintenance Procedures

3.2.1. Casement Windows

- 3.2.1.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.1.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.1.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.1.4. Stainless Steel Friction Stays should be cleaned once every 3 months as in [2.3](#).
- 3.2.1.5. Seal on opening sashes must be clear of sand and dirt.
- 3.2.1.6. The correct grade of stainless steel, depending on the location, inland or coastal must be used, and it must be clearly marked on the stay.

Note: *Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.*

3.2.2. Sliding Windows

- 3.2.2.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.2.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.2.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.2.4. If sliding sashes do not slide freely, the sash should be removed and the wheels checked for damage and replaced if needed.
- 3.2.2.5. All cavities, wheels, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.
- 3.2.2.6. Drainage holes to be kept clean and unblocked.

1.1.1.1.

Note: *Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.*

3.2.3. Vertical Sliding Window

- 3.2.3.1. Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.3.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.3.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.3.4. The spring balance should only be removed by a competent person, the spring is under tensions and when taking it out, the correct method must be used.
- 3.2.3.5. All cavities, wheels, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.
- 3.2.3.6. Drainage holes to be kept clean and unblocked.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.4. Sliding Doors

- 3.2.4.1. Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.4.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.4.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.4.4. If sliding sashes do not slide freely, the sash should be removed and the wheels checked for damage and replaced if needed.
- 3.2.4.5. All cavities, wheels, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the door.
- 3.2.4.6. Check that the correct roller casings have been used. At the coast, a stainless steel casing MUST be used. Inland, a galvanized yellow passivated casing or a stainless steel casing can be used.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.5. Sliding/Folding Doors Bottom Rolling

- 3.2.5.1. Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.5.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.5.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.5.4. Wheel's tracks must be kept free from debris, the top channel must be clear of obstacles. If the door is not opening smoothly then a competent person must be called in to service this product.
- 3.2.5.5. All cavities, wheels, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.
- 3.2.5.6. Hinges should be checked and where necessary adjusted and tightened. Flush bolts should be aligned with hole in the floor.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.6. Sliding/Folding Doors Top Hung

- 3.2.6.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.6.2.** Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.6.3.** Handles should be cleaned when necessary with water and a cloth.
- 3.2.6.4.** Wheel's tracks must be kept free from debris, the top channel must be clear of obstacles. If the door is not opening smoothly then a competent person must be called in to service this product.
- 3.2.6.5.** All cavities, wheels, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.
- 3.2.6.6.** Hinges should be checked and where necessary adjusted and tightened. Flush bolts should be aligned with hole in the frame.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.7. Shop Fronts

- 3.2.7.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.7.2.** Maintenance of Glass when necessary as in accordance with [2.2](#).

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.8. Hinged Doors

- 3.2.8.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.8.2.** Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.8.3.** Handles should be cleaned when necessary with water and a cloth.
- 3.2.8.4.** When the door leaf starts to drag or scratch the floor when opening, it can be that the glass has not been glazed correctly or the hinges are coming loose. A glazer should be called in to re-set the glass and the hinges can be tightened.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.9. Pivot Doors

- 3.2.9.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.9.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.9.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.9.4. Pivot should be cleaned weekly.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.10. Louvres

- 3.2.10.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.10.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.10.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.10.4. All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.11. Façade 60

- 3.2.11.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.11.2. Maintenance of Glass when necessary as in accordance with [2.2](#).

3.2.12. Tilt & Turn Windows/Doors

- 3.2.12.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.12.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.12.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.12.4. All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.13. Tilt & Slide Door

- 3.2.13.1. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).
- 3.2.13.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.13.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.13.4. All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.14. Shower Doors

- 3.2.14.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.14.2.** Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.14.3.** Handles should be cleaned when necessary with water and a cloth.
- 3.2.14.4.** The wheels should always be on the top track.
- 3.2.14.5.** All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the door. Fungus growing in corners must be removed with a shower cleaner designed to kill and remove it.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.15. AlDoor Garage Doors

- 3.2.15.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.15.2.** Wheels should be maintained in accordance with the manufacturer's specifications.
- 3.2.15.3.** All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the AlDoor.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.16. Insect Screen

- 3.2.16.1.** Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.16.2.** Handles should be cleaned when necessary with water and a cloth.
- 3.2.16.3.** Check that the Flyscreen does not have holes in and that the spring is working.
- 3.2.16.4.** All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.17. Hatch System (bottom rolling sliding system)

- 3.2.17.1. Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.17.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.17.3. Handles should be cleaned when necessary with water and a cloth.
- 3.2.17.4. If panels are not sliding, remove the glass panels, check the wheels and replace if damaged.
- 3.2.17.5. All cavities, dust and dirt traps should be vacuumed to remove debris that could damage the workings of the window.

Note: Depending on the location of the Hatch System, it should be cleaned daily.

3.2.18. York Balustrade

- 3.2.18.1. Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.18.2. Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.18.3. Corrosion Resistance - Balustrade that is exposed to an external or aggressive environment shall be treated to resist corrosion. Regular inspections need to be done for possible corrosion.
- 3.2.18.4. Maintenance - Balustrade shall be periodically inspected for evidence of excessive wear, damage or reduced strength. Any element, connection or anchorage that shows a loss of strength or a loss of stiffness of 20 % or more shall be either replaced or restored to its initial condition. The loss of strength shall be determined by comparing the deflection of the balustrade under a certain load with the deflection of a new replicate under the same load.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.19.0 Wrap putty glazed window.

- 3.2.19.0 Maintenance of Aluminium frame work as in [2.1.1 and 2.1.2](#).
- 3.2.19.0 Maintenance of Glass when necessary as in accordance with [2.2](#).
- 3.2.19.0 Handles should be cleaned when necessary with water and a cloth.
- 3.2.19.0 Seal on opening sashes must be clear of sand and dirt.

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

3.2.19. Infinity Internal Partition.

3.2.20. Maintenance of Glass when necessary as in accordance with [2.2.](#)

3.2.21. Board as recommended by the manufacture.

Note: cleaning of glass will be relevant to the marks on the glass, every second day?

3.2.22. Guardian Door.

3.2.23. Bottom track to be kept clear of dirt.

3.2.24. Maintenance of Aluminium frame work as in [2.1.1](#) and [2.1.2](#).

Note: Depending on the location of the casement window, it should be cleaned at least every 3 months. No dirt or sand must be allowed to build up between frame and sash. The closer to the coast the more frequently the system must be cleaned.

General notes.

When cleaning any window, door or façade, high-pressure water cleaning equipment should NOT be used, unless by qualified Façade window clearers.

The following links refer to some useful articles relating to the corrosion of aluminium:

1. http://www.qualisino.com/jswzinfo_en.aspx?id=117
2. <http://www.sharpsell.co.za/index.php/contact-us>
3. http://www.rhinoindustrial.co.za/index.php/rhinoindustrial.html?gclid=CjgKEAiw286dBRDmwbLi8KP71GQSJAAOk4sj5jEUnKvjxkdw8H0NOBp5LY1OIZrnH-5_aRsX2bUFI_D_BwE
4. <http://aluminumsurface.blogspot.com/2009/05/three-most-common-corrosion-mechanisme.html?m=1>
5. <http://www.windowcleaners.net.au/window-maintenance/>