ALCAN COMPOSITES

CLEANING AND MAINTENANCE OF ALUCOBOND, DIBOND AND ALUCORE STOVE LACQUERED SURFACES

ALUCOBOND ARCHITECTURAL PTY LIMITED

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APPLICATION

Expert and regular cleaning not only maintain the aesthetic and representative finish of stove lacquered surfaces but also maintains their quality through the removal of dirt and aggressive deposits. Cleaning Intervals depend on local environment conditions and the resulting amount of soiling.

Surfaces should be cleaned either manually or with a suitable cleaning device from top to bottom. Please use any non-abrasive pads on lacquered surfaces (such as scotch bright No's 263, 99 or 8440).

We recommend that the cleaning agent be tried on an unobtrusive part of the object to be cleaned to check whether the surface is affected.

Do not clean hot surfaces (>40 deg. Celsius) as the quick drying process may cause blemishes.

All cleaning agents should have a neutral Ph of 5-8.

SUITABLE CLEANING AGENTS

Normal – Medium Soiling

TURCO® PLAUDIT TURCO® CHEMPO TURCO® AIRTEC 23	Henkel Pty Ltd (P) 1300 736 777 www.henkel.com.au
PURPLE MAGIC	J. Racenstein & Co. Inc (USA) www.racenstein.com

Medium – Heavy Soiling

KLEN 2207	Klenco (Singspore) Pte Ltd www.**klenco**-asia.com

For Material Safety Data Sheets and Tech Data Sheets contact Alucobond Architectural.

Extended cleaning may be required in some instances, contact Alucobond Architectural for technical support.

UNSUITABLE CLEANING AGENTS

Please do not use any powerful alkaline cleaning agents such as potassium hydroxide, sodium carbonate or caustic soda, any powerful acidic products, or any heavily abrasive scouring agents such as Vim, Ajax, lmi or lacquer-dissolving cleaning agents.

Prior to cleaning it is recommended that the cleaning product be tested in an inconspicuous area.

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TURCO DISTRIBUTORS – AUSTRALIA

VICTORIA	Elite Surface Technologies 13 Graham Rd, Clayton South, Vic 3169 (P) 03 9548-3661 Contact: Bill Butcher
NEW SOUTH WALES	Solvents Australia 77-79 Bassett St, Monavale, NSW 2103 (P) 02 9979-6866 http://www.solvents.net.au/
SOUTH AUSTRALIA	AED 2 Kiwi Crt, Lonsdale, SA 5160 (P) 8326 1734 Contact: Christine Barker
QUEENSLAND NORTHERN TERRITORY	Avanti Chemicals 26 Notar Drive, Ormeau, Qld 4208 (P) 07 5549-3666 Contact: Gavin Campbell http://www.workin4u.com/avchem/
WESTERN AUSTRALIA	Telford Industries 7 Valentine St, Kewdale, WA 6105 (P) 08 9353-2053 http://www.telfordindustries.com.au/index.html

REMOVAL OF PROTECTIVE FOIL ADHESIVE RESIDUES ON LACQUERED ALUCOBOND SURFACES

CAUSE & APPEARANCE

Under certain circumstances (e.g. if part of the foil had been removed, and part of it had remained on the surface over a long period of time), adhesive residue from the protective foil may remain on the Alucobond surface.

The transparent adhesive residues are difficult to perceive on various shades of colour, but dirt and dust can adhere aggressively to the surface. In this case such areas appear dirty after short exposure to the weather. As a result the colour looks different from the rest of the façade cladding material.

It is typical for this weathered look that the dirt concentrates on small areas and appears in lineal structures.

REMOVAL OF ADHESIVE RESIDUES

The adhesive residue can be removed without any problems by using Hexane (white petroleum spirit). The dirt is removed together with the residue.

1) Removal with cellucotton moistened with Hexane.
2) Possibly second cleaning with slightly moistened cellucotton.
3) Leave Alucobond to regenerate for at least 24 hours. Due to the reaction of the solvent the lacquering may swell and is sensitive to mechanical stress in this situation. The swelling is reversible and does not influence the quality of the lacquering.
4) The colour of the cleaned area may be different from the colour of the other areas. Overall cleaning may be necessary. For such a cleaning process cleaning agents for “normal soiling” are sufficient.

Caution:

- The recommended solvent is inflammable. Do not smoke during work or in close proximity.
- Please ensure proper ventilation. Insufficient ventilation may cause solvent vapours to build up leading to danger of explosion.
- If a large amount of a cellucotton soaked with solvent is used, please dispose properly.

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THE REMOVAL OF GRAFFITI FROM STOVE-LACQUERED ALUCOBOND SURFACES

The cleaning operation described bellow allows you to almost completely remove graffiti sprayed on to stove-lacquered Alucobond surfaces.

It is recommended that you first try the cleaning process on a small test surface.

1. Remove large dirt particles with water in order to avoid scratches on the surface caused by subsequent cleaning operations. Wipe panels dry.
2. Remove the graffiti by means of solvent-impregnated cotton wool (suitable solvents – see table below).
3. Remove the mixture of lacquer and solvent by the use of dry cotton wool. The cotton wool should be changed frequently.
4. Wipe the surface again with clean cotton wool lightly impregnated with solvent until the residual lacquer is removed.
5. Allow the Alucobond lacquer to dry for at least 24 hours, irrespective of the result of the cleaning operation obtained. The benefit of this 24 hour drying period is that the service life of the lacquer will be unaffected

If there are still signs of graffiti left after this process, repeat the process (stages 2-4 above) again.

General remarks

- After cleaning it may well be that there are still shadows of the graffiti left on the lacquered Alucobond surface. This phenomenon is the result of the migratory organic dyes possibly contained in the spray colours. Experience has shown, however, that these dyes only offer poor light-fastness and the shadow effect will disappear as a result.
- If large-size surfaces are spray lacquered: a considerable amount of cotton wool impregnated with solvents and lacquer has to be disposed of according to local waste disposal codes.

Caution:

- The recommended solvent is inflammable. Do not smoke during work or in close proximity.
- Provide for good ventilation. Where ventilation is restricted, e.g. in enclosed areas, solvent vapours may concentrate.

Table:

	Hexane (naphtha solvent + naphtha)	Ethyl-alcohol (methylated spirit)	Methy-glycolacetat
PVF2	X	X	X
PE	X	X	X
SPE	X	X	O

X = Suitable by observing the cleaning steps 1-5
O = Unsuitable

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ALUCOBOND COMPOSITE PANELS WITH ANODISED SURFACES

GENERAL INFORMATION

Anodically oxidized Aluminium elements are used in exterior and interior design because of their corrosion resistance and their decorative effect.

These features can only be preserved for a longer period of time, if the oxide layer on the material possesses a sufficient thickness and is well consolidated.

Additionally there has to be cleaning of the elements according to the corrosive burden.

Tests carried out on anodised façade elements indicate the reduction of the oxide layer is so minimal, a performance life in excess of 30 years can be expected.

PRODUCT INFORMATION

Anodised Alucobond composite panels are anodised according to DIN 17611, anodically oxidized semi-finished material of Aluminium, with a minimal oxide layer thickness of 20 microns for exterior application.

Quality assurance during the production of the panels as per DIN EN ISO 9001, guarantees a high quality finish.

- Standard surfaces anodised on both sides(E6/EV1), natural colour shade
- Coloured anodised surfaces on request

Please note: When working with Natural Anodised Alucobond panels, the sheets have rack marks 25mm from each end of the panel where they have been held during anodising. These marks are covered by the protective foil and are not immediately visible. Please take into consideration when determining visible surface area.

HINTS FOR PROCESSING

Due to the brittle nature of anodic films, hairline cracks may be located on the bending or folding line. These hairline cracks have no effect on integrity, serviceability and performance of the anodic coating.

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CLEANING OF ALUCOBOND PANELS WITH ANODISED SURFACE

For light stains, we suggest the use of a neutral detergent (with pH-value 5-8) which should be diluted with water as per manufacturer's directions. The chemicals shall not contain additives which affect the anodic film, in particular Fluorides, Chlorides and Sulphates.

To remove more severe stains, abrasive cleaning agents can be used. Such cleaners (with pH value 5-8) shall neither contain acidic nor alkaline additives. The solvents and the fine abrasive powders of such cleaning agents must be chemically and mechanically effective and shall not affect the anodic film. Apply the abrasive cleaner to a cloth and rub the panel surface in a longitudinal direction, applying sufficient pressure to remove the stains. The cloth shall frequently be changed. Alternatively, we can recommend the use of scouring pads like Scotch-Brite from 3M (Type A – red) together with a detergent recommended for light stains.

In all cases, it must be made sure that all detergents, chemicals, abrasive powders etc, will be properly removed by using plenty of clean water. High-pressure jets are recommended for this purpose.

The above recommendations apply only for ALUCOBOND panels with anodised surface. For other surfaces, in particular for glass, please follow supplier's instructions.

Under no circumstances should rough scrubbing tools or materials causing grinding or scratch marks, like sand paper, steel wool or wire brushes be used.

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BEHAVIOUR OF ALUCOBOND PANELS WITH MILL FINISH SURFACE IN OUTDOOR APPLICATIONS

SURFACE CHANGES DUE TO WEATHERING EXPOSURE

When using Alucobond panels with mill finish surface which are neither protected by lacquer nor by anodizing against atmospheric influence, a change in the appearance of the aluminium surface is to be expected.

The untreated mill finish aluminium surface which does not meet any decorative requirements generates a natural oxide layer of which the thickness gradually increases under the influence of outside atmosphere until reaching a thickness of approx 0.1microns.

The surface covered by the oxidized film has a strongly reduced reflectivity compared to the new surface which means that it will loose its metallic gloss and get a dull grey appearance. This impression is intensified by dirt deposits in and on the surface. This greying effect is often considered to be positive.

It is true that the reactions of the mill finish to atmospheric influences change the appearance of the surface. **This reaction does not affect the stability of the Alucobond panel**. Only the surface reacts while the oxide layer protects the material below against further corrosive attack.

CLEANING

Cleaning of mill finish aluminium is generally not necessary or recommended.

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RESISTANCE OF ALUCOBOND PVF2 – SURFACE AGAINST CHEMICALS

Surface Front coil coated (Standard 2-coat, Metallic 3-coat)
Reverse Mill Finish

Test Conditions Tests at ambient temperature for 24 hours
Rating of gloss, hardness, colour resp, corrosion

Chemicals	Concentration	Coated	Mill Finish
Petrol, Gasoline	Concentrated	No change	No change
Deionized water	Concentrated	No change	No change
Germicide (Sagrotan)	Concentrated	No change	No change
Acid of vinegar	10%	No change	No change
Ethanol	25%	No change	No change
Ethanol	95%	No change	No change
Formaldehyde	10%	No change	No change
Parafinne/Diesel oil	Concentrated	No change	No change
Caustic potash sol. (KOH)	10%	No change	Totally dissolved
Butanon	Concentrated	No change	No change
Sea water (NaCl)	3.5%	No change	No change
Lactic acid	10%	No change	No change
Soda lye (NaOH)	10%	No change	Totally dissolved
Sodium carbonate	10%	No change	Milkiness
Carrel-Dakin solution (NaOCI)	5%	No change	No change
Phenol	5%	Yellow	No change
Phosphoric acid	10%	No change	Milkiness
Petroleum	Concentrated	No change	No change
Hydrochloric acid	10%	No change	Totally dissolved
Nitric acid	10%	Colour change (AE 1)	Milkiness
Sulphuric acid	10%	No change	Milkiness
Rinsing agent (Pril)	5%	No change	No change
Tuloul	Concentrated	Gloss raise (ca.10%)	No change
Washing agent (Sunil, Data, Korall, Persil)	5%	No change	No change
Xylene	Concentrated	No change	No change
Citric acid	Fat solution	No change	No change

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RECYCLING OF ALUMINIUM-PLASTIC COMPOSITE PRODUCTS FOR BUILDING APPLICATIONS

GENERAL

Composite panels consisting of a polyethylene (PE) core embedded between two aluminium sheets are used as façade elements of buildings. These panels are generally 4mm thick panels which consist of about 50% aluminium by mass, have excellent stiffness and bending properties, are lighter than other metal panels and can be easily fixed on the building.

Alucobond has been installed on buildings since 1969.
There is currently no indication of a limited life-time existing of this product and it may stay on buildings for more than 50-100 years. This is the reason why recycling occurs for new scrap rather than end-of-life panels.

MATERIAL RECOVERY PROCEDURE

Producers of aluminium plastic composite material have been faced with the problem of new scrap recycling from the beginning of production. The main problem, the separation of aluminium from the PE under economical conditions, has been possible for many years. One method is the use of knife mills which cut the composite panel into small pieces. The aluminium chips and the plastic particles are separated by commonly known methods. Another useful technique – mainly for bigger-sized scrap – is based on separation by rolling operations.

The aluminium component is sold as a one-single-alloy scrap e.g. for the production of rolling ingots. The PE component, after some simple preparation steps, is used again for the production of the composite material. Scrap produced during processing/fabrication can be recycled by such methods.

RECYLCING WITH THERMAL RECOVERY OF THE PLASTICS COMPONENT

Alternative recycling methods have been established. Composite material scrap is fed into a conventional shredder and cut into small pieces. The shredded composite material is heated in a closed furnace to a temperature high enough to decompose the PE completely. These evaporating gases contain a high energy potential and leave the almunium as scrap for further recycling. The energy of the PE component is usually recovered for further decomposition and melting.

RECYCLING OF OLD SCRAP

Composite panels are normally used for large buildings. When buildings containing composite panels are dismantled, many tones of material can be recovered at once which represents a significant economic value. This means that, even without any regulation, such dismantled panels will never go to a landfill but will rather be recycled using one of the methods previously described.

Usually, the molecular structure of plastics is affected by solar radiation which causes quality losses of recycled material by an ageing effect. This is not the case with aluminium-plastics composites, because the aluminium protects the plastics from solar radiation.

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LIFE CYCLE ASSESSMENT OF PRODUCT SYSTEMS WITH DIFFERENT RECYCLING PROCEDURES

Based on EN ISO 14040, a life cycle assessment (LCA) study has been performed in order to identify the environmental burdens of an aluminium-PE composite façade in comparison with a façade consisting of solid aluminium panels. For the composite alternative, five different recycling scenarios have been examined, including material recovery of the PE component and incineration with/without energy recovery. For solid aluminium, another alternative where the aluminium us coated on the back side with a plastic layer for noise protection has been included.

The study shows that aluminium-PE composite panels, if recycling with material or energy recovery of the PE is used, the environment burdens caused by the composite material compare favorably with those caused by solid aluminium. If incineration of the PE without thermal recovery occurs, then the composite panels are still comparable with the solid aluminium bearing a noise dampening coating.

For both alternatives, the environmental data were advantageous because of the high recycling rates and the high value conservation of the aluminium fraction.

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