

TECHNICAL RECOMMENDATIONS REAL ANODIZED

BENDING OF REAL ANODISED:

Real anodized should only be bent under certain conditions and with the appropriate know-how.

Crazing:

It is the transformation of aluminium in aluminium oxide up to a certain depth thickness.

If continuously anodised aluminium is folded, the anodic film of aluminium oxide will crack and 'crazing' will be formed. This crazing is not a problem for the corrosion resistance and should not be a problem in terms of aesthetics if the bending is executed properly.

No filiform corrosion – natural oxidation:

Real Anodized is pure aluminium and aluminium oxide. The anodic film is integral with the core material. If the anodised surface is cracked by folding this is not really a problem because this zone will be re-oxidised immediately by the oxygen present in the atmosphere and no corrosion or filiform corrosion will be generated.

Aesthetic effect:

The only real area of concern can be the aesthetic effect in the bending zone.

Crazing occurs as fine white lines and may cause whitening effect in the bent zones. The objective is to contain the cracking in the folded area only and to not affect the rest of the panel.

BENDING RECOMMENDATIONS:

Film:

The surface must be protected by a protective film to avoid any marks of the mechanized machine on the surface.

Bending radius:

The selection of the bending radius is a key factor of success. The challenge is to find a good balance between the aesthetic and mechanical characteristics.

To limit the crazing inside the bending area, it is recommended to use a bending radius as small as possible. However, the use of a small bending radius can affect the mechanical resistance of the material. So, a good balance has to be found in each case.

Alloy 5005 H14/H24 EN 485-2	Folding at 90°	Folding at 180°
	1.5T	2.5T
	Radius according to EN 485-2	
2mm	3mm	5mm
3mm	4.5mm	7.5mm

The EN-485-2 standard contains the minimum 'recommended' bending radius per alloy and temper at which no cracking (of the metal) is observed. Severe cracking may cause real deterioration in the metal strength around the bend (so it is not just an optical phenomenon).

If the visual appearance at the bent radius specified in the norm is not satisfactory, a smaller radius can be considered.

Conclusions:

- The crazing will result in a whitening of the surface and will be, therefore, more visible in darker colours.
- The visibility of the crazing depends also on the viewing distance.

Recommendations:

- The thinner the metal, the better bending results will be achieved.
- Protect the surface with an appropriate protection film before bending.
- Depending on the metal sheet, there will be a difference in bending behaviour between bending parallel and opposite to the rolling direction.

CUT-TO-LENGTH-WIDTH AND PROTECTION OF CUT EDGES

In order to achieve sheets with perfect flatness without damaging the anodic film layer a specialist process involving a particular specification of cut-to-length line and specialist operators must be performed.

Technical considerations for cut-to-length

Special attention should be given on the cleaning of the cut-to-length line before processing, including:

- Removal of aluminium particles
- Pull cleaning felt through the line
- Working in production campaigns

During the cut-to-length process:

- Use oil or lubricant during leveling.
- Avoid too much pressure which can damage the anodic layer
- For higher gauges (> 2 mm) or higher anodic layer thicknesses (> 10 µm), keep protection film after leveling.

Cut edges

Real Anodized does not suffer from filiform corrosion and, therefore, there is no risk of the propagation of corrosion affecting the flat surfaces of the sheet after cut-to-length. The cut surface of the aluminium will oxidise naturally and rapidly, thereby ensuring adequate surface protection of the cut surface.

RECOMMENDATIONS FOR THE FIXING OF *larson*® Real Anodized ALUMINIUM COMPOSITE PANELS

Orientation of the panels

Special care must be extended to the orientation of the panels (direction and sense) as a consequence of the mill line direction.

A panel oriented parallel or perpendicular with the mill direction will present two different shades.

Alucoil®'s panels show in the protector film and printed in the internal face of each panel, the sense of the arrow, to indicate mill direction.

Vertical orientation recommended

It is recommended to install the panels vertically and not horizontally or oriented with an angle less or equal to 45°. It is important to avoid design allowing the accumulation of liquid, fluid on the surface. It is also important that panels can be washed by rain water.

Ventilation

Panels must be installed to permit good aeration or ventilation of the surface to avoid concentration of humidity, local chemical variations, etc. The creation of openings is not recommended (perforations).

Dilatation joint – Fixing points

Aluminium is a metal that is a good heat conductor and can be sensitive to temperature variations.

The metal can have the tendency to retract and/or expand due to the effect of temperature variations. A dilatation joint must be foreseen between each panel to permit these dimensional variations.

The fixing system should be compatible with the potential dilatation of aluminium sheets.

Galvanic corrosion

To avoid galvanic corrosion between the pre-anodised aluminium with another metal, **larson**® real anodized panels cannot be put directly in contact with another metal (like galvanised steel, stainless steel, copper...) without protection (insulation).

This remark is particularly important for the fixing of the panels - avoid bolting with stainless steel bolts without protection, riveting with rivets in another metal etc.

Fixing of panels

Aluminium is a light metal (density of aluminium is one third of the density of steel) and could be sensitive to influences like wind. To avoid detachment of the panels from the wall cladding under strong wind, the panels require to be solidly fixed on the exteriors of buildings.

REAL ANODIZED MAINTENANCE

Anodising is the best treatment for aluminium used in architectural applications – for a number of different reasons – its authentic metallic sheen, its low weight, its durability and its recyclability. Key to the long term sustainability of a building is the low maintenance after construction. The anodic layer reduces the adherence of dust and dirt, this way reducing cleaning frequency and effort.

Natural washing by rainwater is the most effective means of maintaining a clean surface and removing foreign matter from the panels. By respecting some basic design rules, the architect can create conditions for optimising natural washing.

However, like any other building cladding, anodised aluminium should be regularly maintained in order to maintain the finish and to protect the surface against possible corrosion.

Cleaning frequency

The cleaning frequency is depending on several factors:

- Surrounding environment
- Climatic conditions
- Building design

It is recommended to clean the exterior of a building at least twice per year. Due to specific local conditions, this frequency should be increased.

On the building parts which cannot be naturally washed by rainwater (such as openings, entry porches etc.) the cleaning frequency should be increased.

The greater the cleaning frequency, the more the cleaning will be easy.

If the building is cleaned from the beginning at regular intervals, the cleaning operation will be easy, cheaper and the cleaning agents will be softer and more environmental friendly.

In urban and marine environments, it is recommended that the anodised surface should be washed down at three monthly intervals but at a minimum every four months. In industrial environments, this cleaning may need to be more frequently.

General Cleaning

The general and regular cleaning of anodised aluminium consists of a simple washing with water added with a neutral soft detergent followed by a rinsing with clear water and a wiping with a soft, absorbent rag. This operation can be carried out at the same time as window cleaning. On a quality continuously anodised surface, the aluminium oxide on the surface will be stable in a pH range between 5 to 8; cleaning solutions should have a pH figure in this range.

Specific Cleaning

It may be necessary to scrub some surfaces, particularly in areas where dirt accumulates as a consequence of rainwater failing to wash deposits off naturally. The anodising will tolerate use of a stiff bristle or nylon brush without any damage to the finish or invalidation of the guarantee.

In the case of tenacious deposits or smut formation, it may be necessary to use more aggressive cleaners such as ultra-fine abrasive pads, powdered pumice with water or proprietary cleaner.

Tenacious deposits normally only occur when the method or frequency of general cleaning is inadequate for the local environment.

After cleaning, all surfaces should be washed down to remove any residual deposits.

Use of a more aggressive cleaner will not compensate for lack of regular maintenance, in particular because the use of such a cleaner may damage the anodised surface.

It is recommended that an unobtrusive test area is cleaned before work commences using the cleaning agent at the correct concentration and applied in accordance with the manufacturer's instructions. After the cleaning agent has been allowed to dry an assessment should be made to confirm that the results are satisfactory.