



CWCT CURTAIN WALL INSTALLATION HANDBOOK

Chapter 6 Finishes

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This handbook was written by the Centre for Window and Cladding Technology (CWCT) as part of its training programme to improve the standard of curtain wall installation.

It will be of benefit to all those installing, or supervising, the installation of curtain walling and other glazed building elements.

This is one of eight chapters from the CWCT Installers' handbook.

- 1 The façade
- 2 Principles of weathertightness
- 3 Frames
- 4 Gaskets
- 5 Sealants
- 6 Finishes
- 7 Glass
- 8 Brackets and fixings

Introduction

The installation of facades and façade elements is one of the more complex operations on a construction site. It requires a range of skills and knowledge yet has not been recognised as a particular skill or trade. Façade failure, particularly water leakage, is the most common cause of failure in new buildings.

This handbook brings together advice on installation of curtain walling including all the major components: frames, gaskets, sealants, finishes, glass and fixings. It is based on experience gained by CWCT in setting up training centres for installers and in training main contractors' site supervisors.

The book explains why things should be done and highlights those things that are most critical to the success of curtain wall and window installation.

This Handbook is a guide to achieving better curtain wall installation. However, it is not a substitute for care and diligence, nor should it be a substitute for proper training. Full details of CWCT's training programme are available at <http://www.cwct.co.uk/installers>.

6 Finishes

• Function

Many facade materials have to be finished or coated to protect them from the environment and give the required appearance. The quality of the finish may be the greatest factor affecting the useful life of the wall and is likely to be a contentious issue if the appearance is not acceptable to the client.

Materials may rot, corrode and suffer other forms of degradation in the presence of moisture, U.V., salt laden air and air borne pollutants. The materials most in need of protection from these atmospheric conditions are metals and timber. Plastics and other materials may be painted for reasons of appearance.

• Aluminium

Mill finish

Aluminium may be left uncoated as 'mill finish' aluminium. In this form the surface oxidises to form a stable coat. However the oxide coating appears as a slightly white bloom that may not be visually acceptable.

Although the oxide coating is stable it will penetrate under adjacent paint and powder finishes allowing them to blister and separate.

Coatings

Coated aluminium is a durable material and a useful life of 25 years or more can be achieved. The quality of the paint or powder finish depends on the materials used and the cleaning and pre-treatment of the aluminium prior to painting.

Paints and powder coatings are applied to closely controlled thicknesses in the range 40-100 microns. The coating is then oven baked to achieve a uniform and durable surface.

Finished aluminium is a quality product that cannot easily be repaired on site. It should be treated with care and protected as necessary during construction.

The commonly used coatings are:

- Polyester powder coating
- PVDF (Polyvinylidene Fluoride)
- Wet applied paints

Anodising

Aluminium may be anodised to form a hard resistant oxide coating. This coating is integral with the aluminium but should be treated with the same care as painted and powder coated surfaces.

Anodised aluminium may be coloured or clear. Clear finishes are used to give corrosion protection and should be treated with the same care as coloured surfaces.

Cut edges

Aluminium is often finished in lengths prior to cutting and fabrication. Cut edges can be the starting point for corrosion and some contracts do not allow the use of pre-finished (post-cut) aluminium.

The risk of corrosion occurring at cut edges depends on the quality of cutting, standard of pre-treatment and coating. The use of hand held saws and drills is unlikely to give a satisfactory edge quality. Factory machining uses separate drills and blades for working aluminium and steel.

Protection

All significant surfaces should be protected from abrasion, scuffing and other damage during transportation and installation.

Protective tapes are used on coated aluminium surfaces but they are no substitute for careful handling. Additional methods such as protective boards may be used to protect against damage by following trades.

Only low tack tapes should be used as agreed by the manufacturer. Tapes should not be left in place for more than six months or difficulty may be experienced in removing them.

Tapes should be removed by peeling. If this is difficult a soft tool should be used. Sharp blades and solvents should not be used.

Products such as windows may be protected during transport to site by using bubble wrap, shrink wrap or card. Tape should still be applied to protect significant surfaces during and after installation.

Mortar drops and similar alkaline materials are particularly damaging to coatings and paint finishes which should be appropriately protected.

Remedial work

Site repairs to finishes should be agreed with the Client's agent. It is seldom possible to achieve a repair that looks good and the Architect may ask that the component be replaced. This decision must depend on the extent of damage and any disruption that may arise.

Repairs to coated surfaces should be carried out in accordance with the suppliers instructions. This often requires the use of specialist paint contractors.

• Steel

All steel has to be finished to protect it from corrosion. Steel may be coated in the same way as aluminium but these finish coats are applied over a protective treatment. For use in facades steel sections are hot dip galvanised, or equivalent. This is done after machining to avoid edge corrosion. Paint or powder coat is then applied to give the required appearance.

Galvanising deposits a zinc layer on the steel, which protects the steel by forming a barrier between the environment and the steel surface. The zinc layer will corrode unless protected by a coating but corrodes more slowly than steel.

Zinc also provides protection to the steel by corroding preferentially to the steel at breaks in the zinc layer. This process is a form of cathodic protection but is only effective when a sufficient area of the zinc is exposed.

Where there is a paint finish on the zinc surface, protection only occurs at small scratches. Larger areas of damage to the galvanising should be made good with zinc paint.

Protection of finishes and repair of any damage should be dealt with in the same way as damage to finishes on aluminium.

Steel may also be plastic coated. This finish is used for metal coil that is subsequently formed into profiled metal sheets or flat cladding panels. The plastic coating is applied at the steel mill before the metal is shaped and cut and no attention is given to machine cut edges.

Holes and cut edges made with hand held tools will not have such clean cut edges and may be sites for early corrosion.

• Timber

Timber is treated and then finished to prevent the onset of rot and provide a good appearance. The finishes most commonly used are paints and micro-porous stains. Timber windows are often pre-finished at the factory but may be supplied primed for painting on site.

Exposure of untreated timber to sunlight will adversely affect the durability of paint finishes hence untreated timber should be painted, or at least primed, as soon as possible.

Most timber finishes can be repaired by site painting but it is difficult to conceal heavy damage to stained timber. Timber frames should be treated with the same care as other finished materials.

• Plastics

Many plastic components are made from self-coloured plastic, predominantly white although brown and other colours are available. These plastics cannot be refinished. They should be protected and treated with care. Components may be coloured by co-extruding a coloured outer layer of the required colour. Damage to this layer may allow the base material colour to show.

Low tack protective tapes should be used on all significant surfaces even if they are only self coloured plastic surfaces. Tapes should be peelable and used in accordance with the manufacturers instructions. Plastics are easily damaged by solvents and some adhesives.

Plastics can be finished by painting or applying foil to the surface. Adhesive foil is commonly used to achieve a wood grain effect on domestic windows. Repairs to painted and foiled surfaces are difficult to achieve with any degree of success and the manufacturer should be consulted before any remedial work is started.

• Appearance

Finishes determine the appearance of the completed building and this is a subjective issue. It is little wonder that the appearance of finishes is so often questioned. Appearance depends on:

- Colour match
- Level of gloss
- Texture

On larger contracts it is common practice to make samples showing the acceptable colour range and level of gloss. All oven baked finishes will suffer some orange peeling and this texture is to be expected. Samples will show the acceptable limits of this texturing. In some cases an independent inspector will be employed to acceptance test the finishes.

In either case it is advisable to gain acceptance for the finishes before they are delivered to site or at least as the components are installed.

When inspecting finishes for appearance they should be viewed from a distance of one metre using normal, corrected vision in diffuse daylight.

• Cleaning down

Protective tape and other protective measures should be left in place as long as possible. If tape is removed for inspection it should be replaced, if necessary with new tape of the same type.

On completion surfaces should be cleaned down using water containing a mild detergent. Neither abrasives or solvents should be used on any finished surfaces.