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**comar**  
ARCHITECTURAL ALUMINIUM SYSTEMS

**comar6**

## Curtain Wall Systems-Ladder Frame and Stick Build

This innovative system offers one of the most versatile approaches to insulated curtain walling, as well as integrated window and door solutions.

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complementing architecture

Design

Solution

Perform

Deliver

On-time

Sustainable





Comar Architectural Aluminium Systems is the largest British, privately owned aluminium systems company in Europe.

Comar designs, extrudes and distributes over 700 integrated profiles to a Nationwide approved fabricator network for use in aluminium ground floor treatment, window, door and curtain walling applications.

Comar has built its reputation on delivery; over £3M of mill, standard white polyester powder coating, silver and bronze anodised profiles are kept in stock. This means that 99% of orders are fulfilled by our customers next weekly delivery. Single and dual colour polyester powder coating can be delivered in 15 working days. For architects and specifiers, a Nationwide team of specification consultants provide project-by-project advice on design, building regulations, U-value and wind loading calculations as well as NBS specifications, budget pricing and approved fabricators. This service to specifiers ensures that projects run smoothly from concept to installation.

Comar Architectural Aluminium Systems is an ISO 9002 registered company. Comar is a sponsor member of the CWCT; is a member of the Council for Aluminium in Building (C.A.B), and is a Technical Committee member. Comar provides CPD seminars to architects and designers through the RIBA CPD network and offers CWCT training courses and seminars through its own Training Centre at Mitcham in Surrey.

Membership with these Associations ensures that customers are kept up-to-date with the very latest in building technology and regulations.

Comar Designed for Performance, Backed by Delivery.

# design

## Comar 6 Curtain Walling

The curtain wall gives the architect the opportunity to create stunning envelopes and Comar 6 delivers the capability.

With an extensive range of profiles and accessories, Comar 6 is one of the most comprehensive curtain walling systems on the market today.

Minimalist lines through sheer glazed façades are a basic design requirement. Comar 6 provides a range of transoms and mullions with a 50mm sight-line. Where the façade demands multi-storey spans and performance, a range of high lxx value mullion and transoms achieve the design brief, standardising with the same 50mm sight-lines.

Design options expand with the ability to add depth and feature with a variety of cover-caps that provide specifiers with fifteen façade options, including bull noses for Trame Horizontale façades. For faceted curtain walls, corner mullions are adjustable from 15° to 145°. This means that roof-glazing applications such as barrel vaults, pyramids and sloped glazing can be achieved from the same profile range.

Comar 6 has two forms of construction: stick build and ladder frame. In stick build the transoms can be square or step cut, the latter providing a true mullion drained system.

Glass mirrored, tinted or opaque provides the façade with feature and distinction; incorporating panels also add to the façade. To allow panels and glass of different widths to integrate into the same curtain wall, without the need to step-cut the panels, Comar have specifically designed a range of gaskets and pressure plates to provide glazing options of 3mm to 50mm.

Comar 6 is continuously improving, developing with the demands of design: new profiles are constantly added and tested to the highest standards. This approach delivers the most innovative design brief coupled with reassured performance.

## Technical Back-up

Supporting the Comar 6 suite is Comar's Technical Department who offer advice to architects, specifiers and fabricators on calculations such as wind loading, deflection loads, integration with other Comar systems and envelope materials. This service is offered on a project-by-project basis at any stage of the tender process.

## Thermal Performance

The nature of curtain wall construction is a two part system with pressure plates added to secure glazed elements and completed with a cover cap; this provides an efficient thermal break. To improve thermal performance, a plastic pressure plate can be used.

Comar's Technical Department advise on a project-by-project basis thermal performance by individual elevation U-value calculations.

## V6

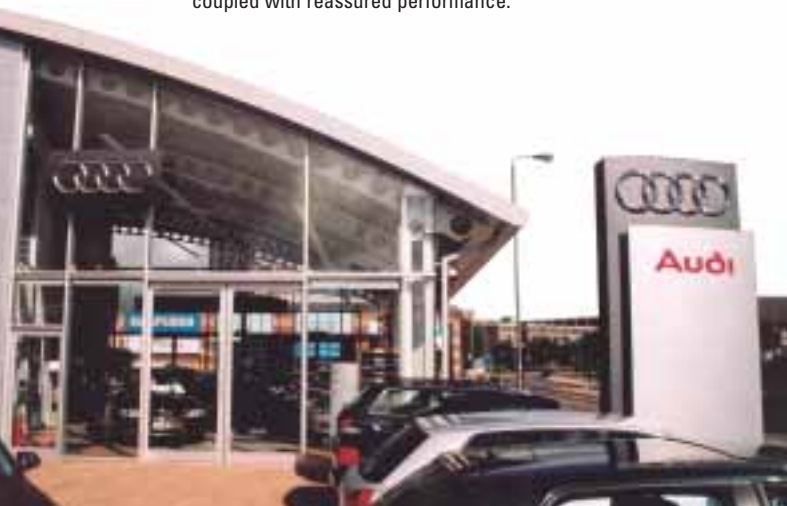
To our Nationwide network of approved fabricators, Comar supplies V6 estimating software. V6 is a powerful estimating tool; it provides fast, accurate pricing from plans and tenders for the entire Comar product range.

V6 includes the facility to provide section through details which can be exported to CAD so Comar approved fabricators can add detail to design drawings.

All approved fabricators are trained in V6, ensuring Comar approved fabricators provide accurate budget pricing and tender returns.

## Research and Development

Comar 6 has been continuously developed to ensure it can be used to complete the most demanding façade. New profiles are regularly introduced. If your project requires new extrusions, Comar's Technical Department will discuss individual projects and develop new profiles to achieve the design brief.



comar6

# solution

## Comar 6 Curtain Walling

### Description

Comar 6 is a range of integrated curtain wall profiles with high span mullions and transoms which provide high performance in retail, public buildings, schools and leisure applications. Standardisation is achieved throughout with the same standard 50mm sight line.

### Types

Single storey or high, multi-story applications spanning floors fitted with expansion brackets, frame horizontal, roof glazing such as pyramid, barrel vaults, sloped roofs, canopies, faceted and curved façades.

## Combinations

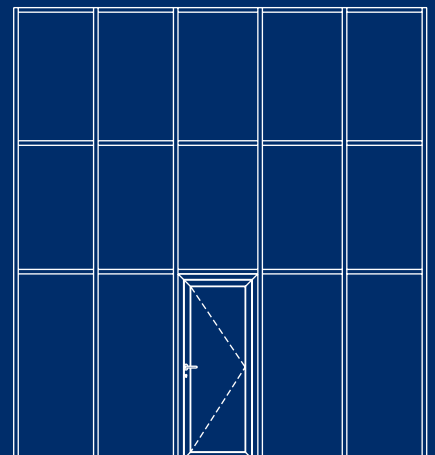
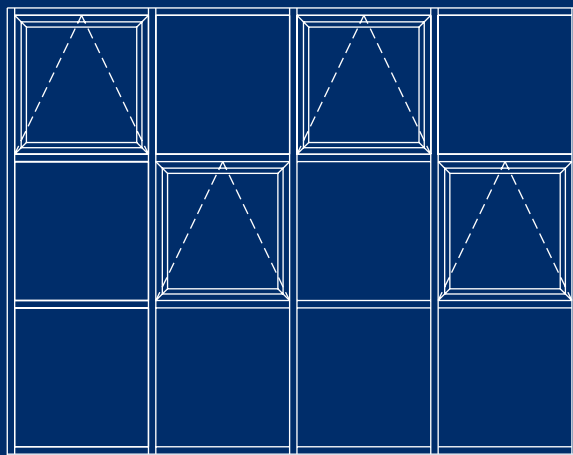
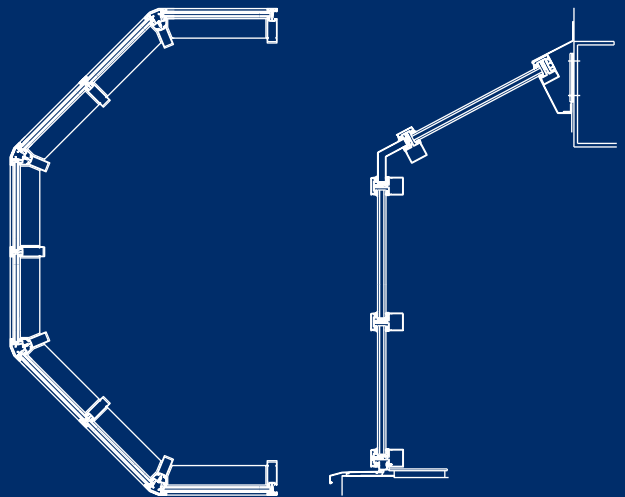
Comar 7 doors integrate directly into Comar 6 curtain walling without the need for additional coupling profiles: hinge styles and transom closers are hung directly from Comar 6. This maintains the same slim 50mm sight lines throughout the façade. For opening vents, Comar 5 can create tilt and turn, pivot, top-swing reversible, casement and sliding window configurations.

## Cover Cap Options

In order to maximise the design flexibility of Comar 6, a wide range of feature cover caps are available which creates 15 design options, whilst maintaining a 50mm sight -line.

## Adjustable Corner Mullions

To create curved or corner applications a range of adjustable mullions are available which accommodate angles from 90° to 165°. This permits the design of barrel vaults and pyramids for sloped glazing applications as well as faceted, curved vertical façades.



# perform

## Specification

Comar Architectural Aluminium Systems a Nationwide team of Architectural Advisors who specialise in providing architects and specifiers with project support, calculations and NBS specifications.

The relevant NBS clauses are:

- H11 Curtain Walling
- L10 Windows/Rooflights/Screens
- L20 Doors/Shutters/Hatches

## Nationwide Approved Fabricator Network

Once Comar 6 has been specified, a Nationwide network of approved fabricators ensures the successful completion of projects. Your Comar Architectural Advisor can provide fabricators who specialise in commercial, new, refurbishment or public building work.

## Calculation

Calculations, such as wind-loading, U-values, size and weight limitations for projects, can be obtained from Comar's Technical Department.

## Finishes

Comar 6 finishes are available in all RAL, Syntha-Pulvin and BS colours. Aluminium Profiles are finished to the following specifications: Silver, bronze and black anodising AA 25 to BS EN 12373-1 : 2001 or BS 3987. Liquid organic coating to BS 4842 : 1984. Polyester powder coating to BS 6496 : 1984.

## Weather Performance

Mullion drained system, pressure equalised curtain wall which conforms to the required elements of BS 6375 to BS 8200: 1986 Code of Practice for Design of Non-loadbearing External Vertical Enclosures of Buildings and The CWCT "Standard and Guide to Good Working Practice for Curtain Walling":

Air Permeability	Pass Grade C
Water Tightness	Pass 600Pa
Wind Resistance	Pass 2400Pa





# perform

## Glazing & Gaskets

### Glazing

Generally, all glazing shall comply with the requirements of BS 6262: 1982, British Standard Code of practice for Glazing in Buildings.

Glass or panels from 3mm to 50mm thick are supported on an aluminium self fixing shelf. Glazing is set dry against EPDM rubber gaskets in drained and ventilated rebates as per BS 6262.

Where specified, hermetically sealed double glazed units shall comply with the requirement of BS 5713 : 1979. The specification of hermetically sealed double glazed units shall be as stated in the works section.

### Gaskets

Glazing materials are high performance pre-formed non-structural gaskets complying with the requirements of BS 4255, Part 2.

## Security

Comar 6 has been designed to conform to the relevant industry standards, such as those laid down in the CWCT's "Standard and Guide to Good Working Practices".

## Materials

Extruded aluminium profiles are of aluminium alloy 6063 T5, T6 to BS EN 755-1 : 1997. Glazing gaskets are extruded from EPDM rubber.

## System Limitations

The critical limiting factor in specifying curtain walling is wind loading. Comar's Technical Department is able to offer guidance on wind loading on a project-by-project basis which conforms to BS 6399, Part 2.



# perform

## Construction

### Ladder Frame

Ladder frame is assembled in the factory and transported to site in modules or ladder frames. The mullions are a two-part box and channel section that are clipped together on site to form a 50mm box section.

Square cut transoms are fixed to mullions with self tapping screws. Punch tooling and jigs are available.

### Stick Build, Step Cut Curtain Wall

Is regarded as fast track installation on site and in the factory. Requires punch tooling. Transoms are stepped. If a spring loaded cleat is required, fixing holes are created on the mullion and transoms. Preps such as this are created in the factory. The curtain wall is assembled on site, usually from the centre out, mullion first, then transoms are front loaded to form the curtain wall.

The pressure on a step cut curtain wall is the same on the inside as the outside, known as pressure equalised. Water therefore drains freely and is a true mullion drained system.

### Stick Build Square Cut Curtain Wall

As step cut, but transoms are not notched and fixed "square" direct to the mullions with brackets.

### Drainage

25mm by 5mm drainage slots required on all transoms over 1200mm centres.

Sill sections, with optional flashing to front transom ensures the water does not penetrate at floor level.

Against the structure CS 692 is fitted to the jambs to prevent water penetration.

### Installation of Curtain Wall

Glazing supports (CS 642/641) are clipped into transoms at glazing block positions.

Gaskets and spacers are then added, together with the pressure plate, which is screwed in place to 7N-m with a torque wrench.

Face caps in a variety of shapes are clipped on the mullion and transoms to create the finished curtain wall.

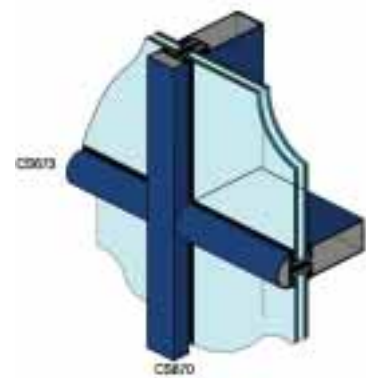
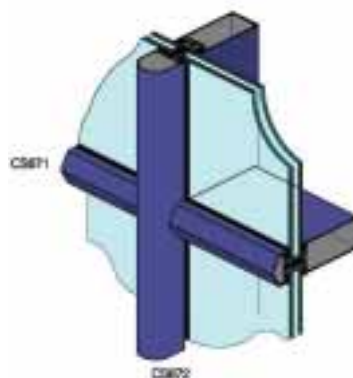
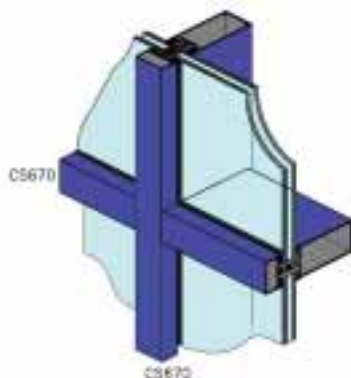
### Propped or Hung Conditions

Fixing Comar 6 has two options - the propped or hung condition.

In the propped condition, Comar 6 is fixed from floor level and, in the hung condition, fixing occurs at the top of the building and is hung down the façade.

### Facetted Options

Adjustable 15° to 145°, returns are available.

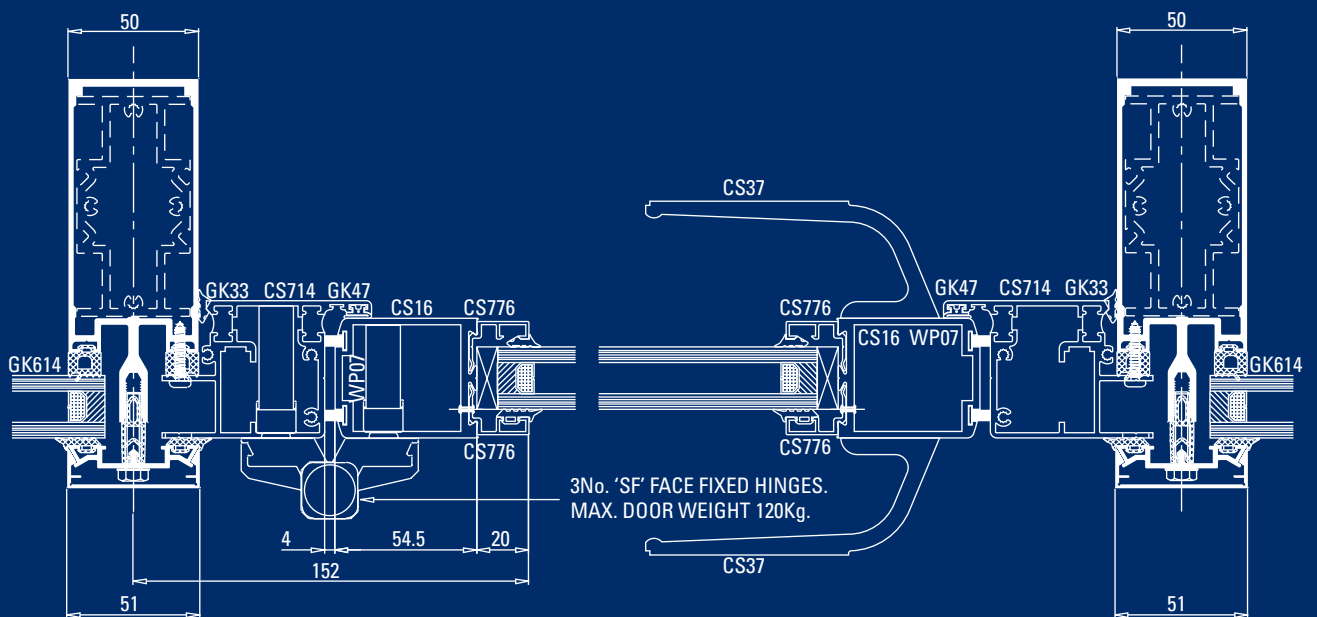




# on-time

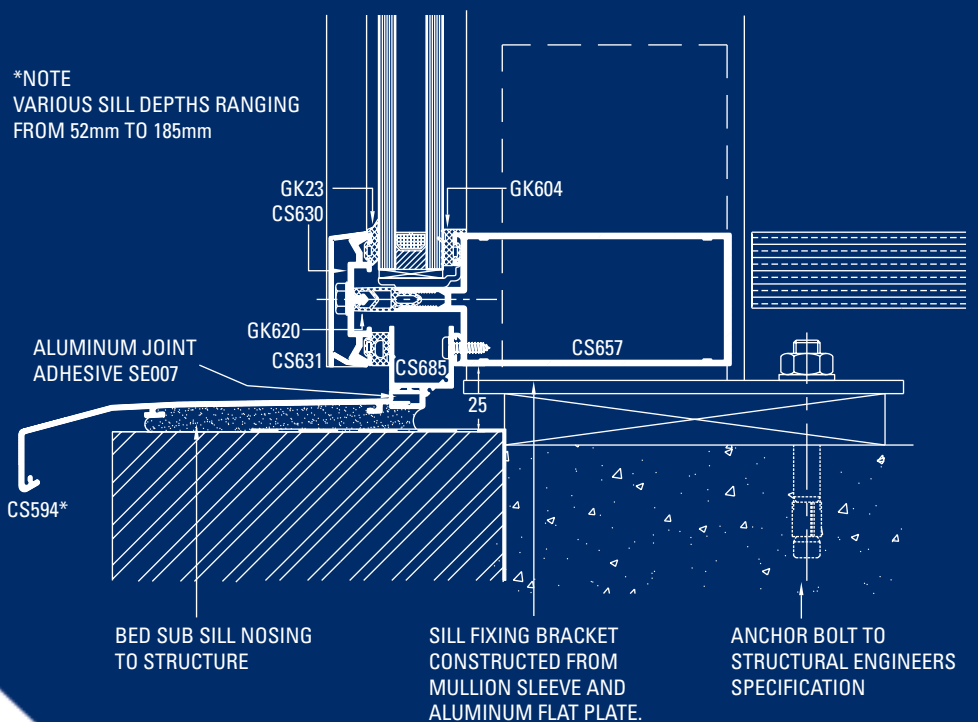
## Integration of door into Curtain Wall

General arrangement showing integration of Comar 7 High Performance Tempest door into Comar 6 Curtain Walling.



## Curtain Wall sill options

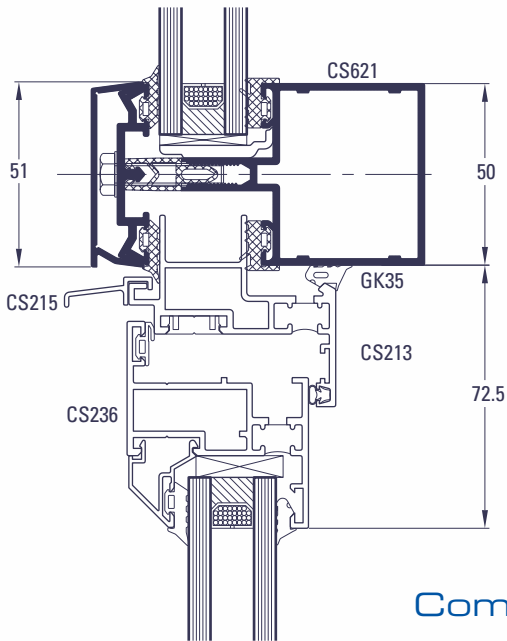
General arrangement showing sill options and fixing of Curtain Wall.



# on-time

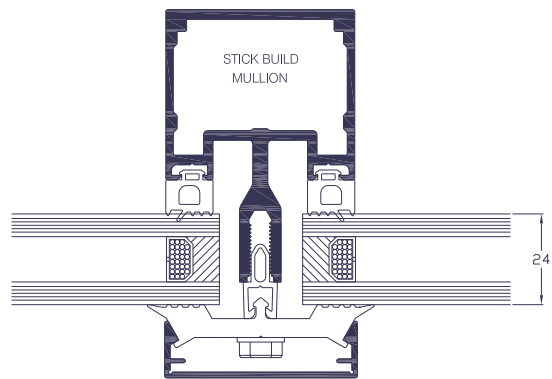
## Comar 6 with integrated Opening Vent

General arrangement showing Comar 6 Curtain Wall with glazed opening vent.



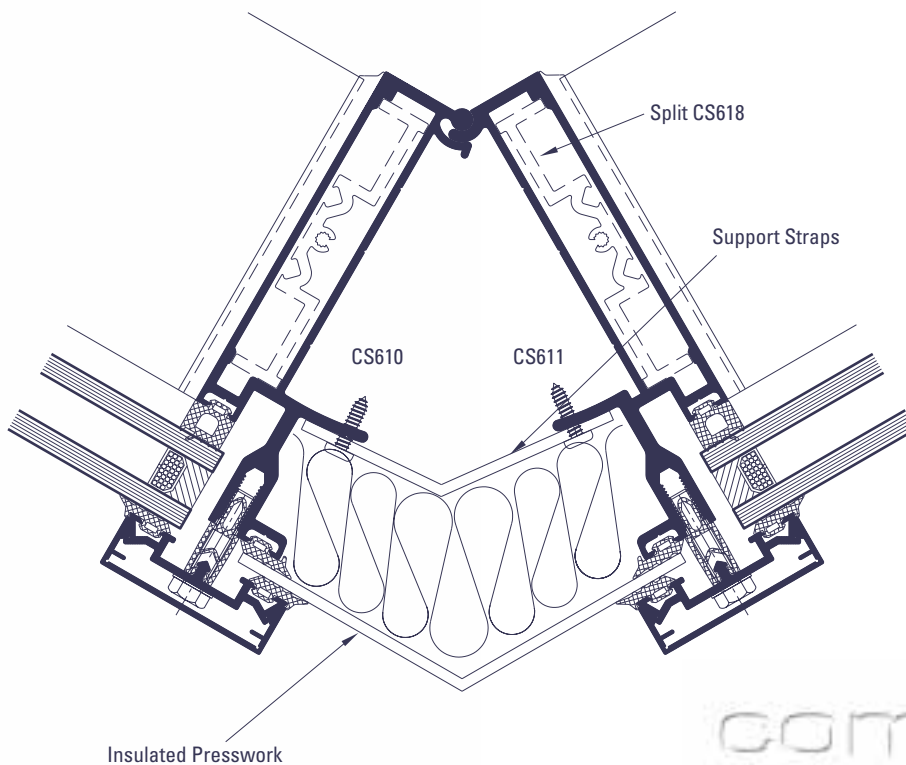
## Comar 6 Plastic Pressure Plate

General arrangement showing Curtain Wall system with plastic pressure plate option.



## Comar 6 Facetted Option

Detail showing variable angle options from 15° to 145°.



# sustainable

Today's world calls for us all to be more conscious of our environment. In 1998 the world recognized this by signing the Kyoto Agreement. The Kyoto Agreement directly affected the construction industry by demanding that buildings become more thermally efficient. With these demands longevity, thermal efficiency, sustainability and recyclability are now critical factors in construction.

## Why Aluminium...

Aluminium provides a unique solution for today's construction needs. Aluminium is light, strong, durable and flexible which provides tremendous potential for achieving even the most demanding design brief. Two-thirds of the energy required to extract aluminium is supplied by environmentally friendly, hydroelectric power. Couple this with the recyclability of aluminium and aluminium is the ideal choice for windows, doors and façades.

## Longevity

Unlike some alternative building materials, aluminium offers an almost unlimited life expectancy. A notable example of this is the Statue of Eros in London's Piccadilly Circus, which has only just been cleaned and renovated, and The Empire State Building, the latter being the first building to use anodised aluminium. Aluminium does not age like other organic materials and needs no protection from ultra-violet light. Aluminium can be polyester powder coated or anodised to a variety of colours, which enhances the material's natural durability. Comar's powder coaters guarantee their finishes for 25 years and anodisers for 30 years.

## Sustainability...

The recycling process now produces high quality aluminium, which is very cost effective and can be carried out on an indefinite number of occasions without impairing the quality in any way. It is a very durable material and has very low maintenance requirements, therefore reducing the whole-life cost. It is long lasting and can withstand the ravages of the most extreme conditions. Aluminium is an excellent material to use in marine and coastal environments, as the effect of sodium chloride is minimal.

Sustainability concerns are alleviated by the knowledge that we have at least 300 years of known reserves of the raw material, Bauxite, and this does not allow for the fact that 70% of all aluminium used is recycled at the end of its product life.

Thus with ever increasing proportion of re-cycled material in use, aluminium can be accurately described as the ultimate sustainable material.

## Recycling Check List

*"The recyclability of aluminium – one of its unique properties along with strength, durability and corrosion resistance – has led to its increased use in construction over recent years. Used aluminium is valuable and is easily and endlessly recycled without quality loss. The material is very rarely 'lost' entirely because of this."*

## Important issues to note are:

- The quality of aluminium is not impaired by endlessly recycling
- Re-smelting aluminium saves up to 95% of the energy needed to produce the primary product
- It is the most cost effective material to recycle
- The overall market for used aluminium is steadily growing, so the more aluminium there is in a product, the more chance it has of being recycled
- The recycling rate of used aluminium products in building is over 80% (over 95% in transportation and 30% in packaging)
- 30% of the 1.9 million tonnes of aluminium used in Europe in 1997 came from recycling

*Source: Council for Aluminium Building and The European Aluminium Association.*

## Standards

BS-EN ISO 9002:	Comar is an ISO 9002 registered firm, certificate number: A0852
BS-EN 755:	Aluminium alloy extrusion
BS-EN 485:	Aluminium alloy sheet
BS-EN515:	Aluminium and aluminium alloys – Wrought products temper designations
BS 4255 Part-1:	Gaskets
BS-EN573-3:	Aluminium and aluminium alloys – Chemical composition – Wrought products – part 3
BS-EN755-2:	Aluminium and aluminium alloys – Extruded profiles – part 2: Mechanical properties.
BS-EN755-9:	Aluminium and aluminium alloys – Extruded profiles – part 9: Profile tolerances.
BS-EN12020-1:	Aluminium and aluminium alloys – Extruded precision profiles – part1: inspection and delivery
BS-EN12020-2:	Aluminium and aluminium alloys – Extruded precision profiles – part 2: tolerances on dimension and form.
BS 4873:	Specification for aluminium alloy windows.
BS 6375 Part 1:	Classification for weather tightness.
BS 5713:	Hermetically sealed flat double glazed units
BS 6262:	Code of practice for glazing of buildings
BS 6496:	Specification for powder organic coatings to aluminium alloys for external architectural purposes
BS 1615:	Method of specifying anodic oxidation coatings on aluminium and its alloy
BS 3987:	Specification for anodic oxide coatings for external architectural purposes
BS 6399 Part 2:	Code of practice for wind loads
C.W.C.T.	Centre for Window & Cladding Technology

## Technical Back-Up

An experienced Sales Team covers the UK while the Technical Department offers an unsurpassed design and installation advice service to designers, specifiers and fabricators; Simply call: +44(0) 20 8685 9685

## For More Information

To find out more about this or any other Comar Architectural Aluminium System, or to obtain your personal copies of the COMAR TECHNICAL MANUALS call: +44(0) 20 8685 9685 or fax on: +44(0) 20 8646 5096

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