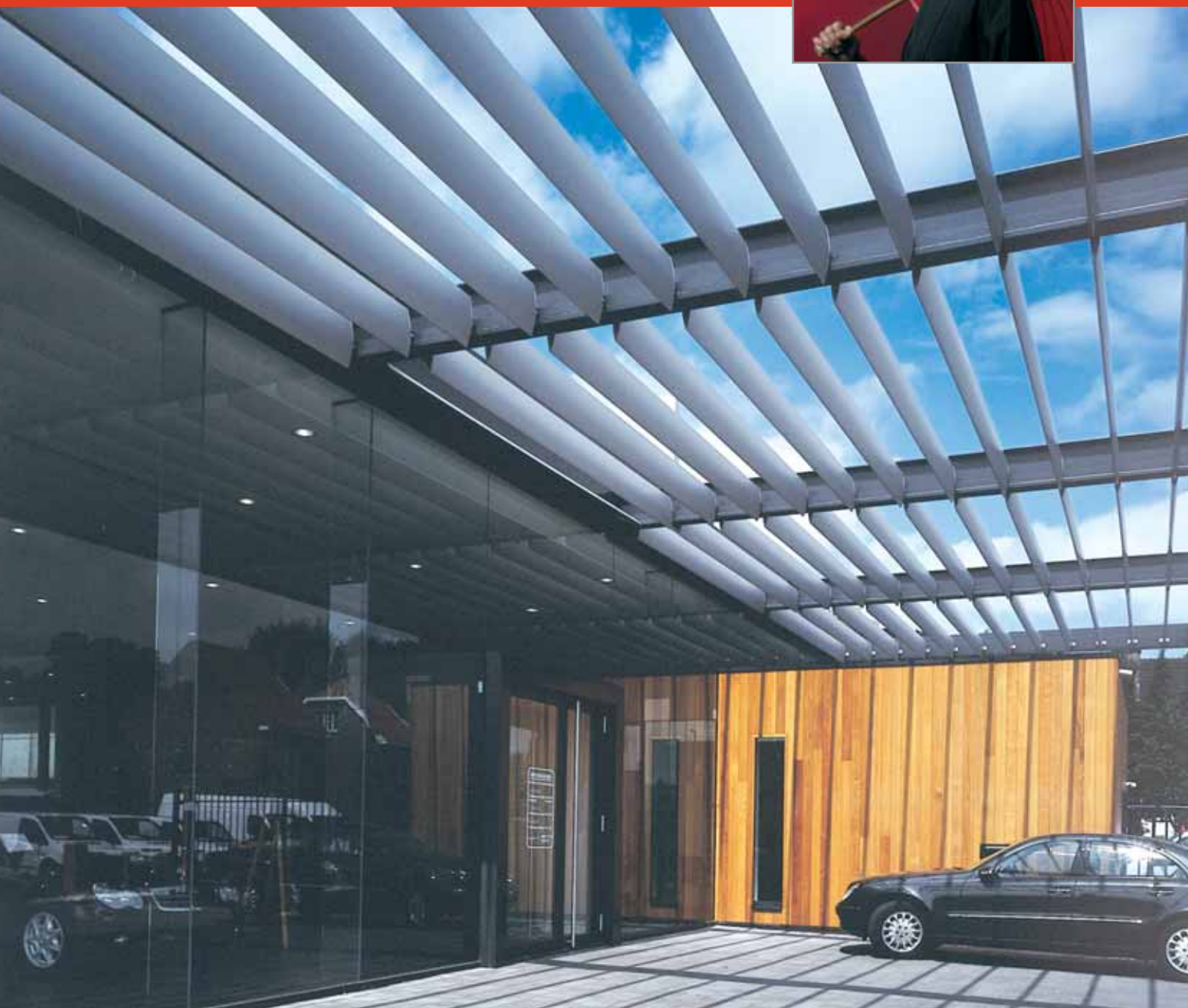
RENSON

DESIGN IN SUNPROTECTION

FIXED AND MOVABLE AEROFOIL BLADE

ICARUS®



INTRODUCTION

ICARUS® RENSON, Waregem (BE) arch. : J. Crepain

Importance and necessity for sun protection

Large glazed surfaces on a building, for visual contact and exterior view, can lead to uncomfortable situations like overheating and blinding by too much light.

External shading can dramatically reduce direct solar radiation on the glass or elevation and reduces the effect of blinding without limiting the visual comfort to the outside environment.

KYOTO protocol

Through the general Kyoto-protocol, every country has acknowledged this worldwide problem. A lot of countries in Europe have already established new building regulations to encounter the greenhouse effect by reducing the energy consumption with these measures.

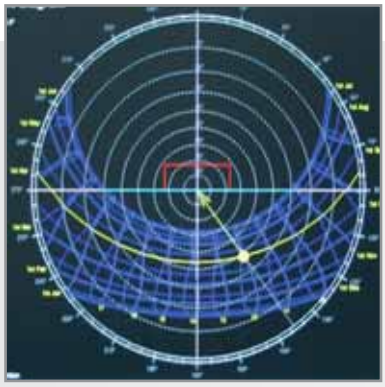
An important consumption of energy in building is cooling. By applying an efficient sunshading the remaining cooling need can be strongly reduced or even completely eliminated.

The different already existing regulations are dealing with energy consumption, insulation and ventilation.

- Belgium : Energie Prestatie Regelgeving (EPB)
- The Netherlands : Energie Prestatie Coëfficiënt (EPC)
- France : Réglement Thermique 2005 (RT2005)
- Germany : Energieeinsparverordnung
- UK : Approved Document L1 'Conservation of fuel and power in dwellings'
  Approved Document L2 'Conservation of fuel and power in buildings other than dwellings'

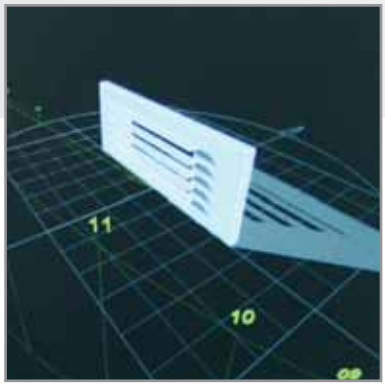
ICARUS® RENSON, Waregem (BE) arch. : J. Crepain

SUNCLIPS® Lou Clapas, Monaco, arch. : Montat



Design of sunshading

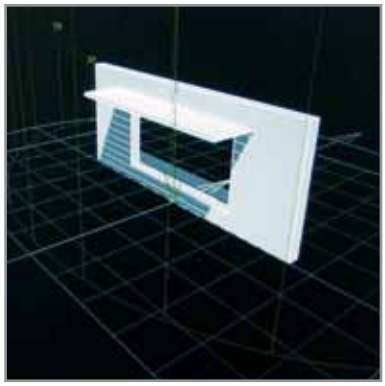
The sun is an important primary source of heat and light. The design, dimensioning and control of the sunshading device is sometimes quite complex and difficult. The sunshading has to be designed so it reduces the direct solar heat during summertime, nevertheless solar heat during wintertime can be acceptable and welcome. Beside the heat, sunlight control is also important to reduce blinding and achieve an acceptable light comfort and work efficiency.



Below are some basics concerning the relevant data in order to dimension a solar shading.

Sunpath

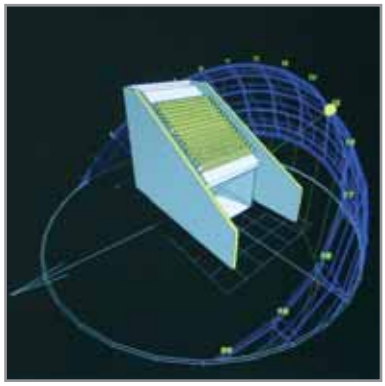
The position of the sun varies from hour to hour, from day to day. The different positions can be visually presented in a sun path diagram. These diagrams are dependant on position on the globe, which can be determined with latitude and longitude degrees.



The diagrams are always based on solar time (highest sun-position at 12 noon) and need to be adapted to the local time zone and eventually winter or summertime.

Taking into account the above parameter, together with the orientation of the elevation, the exact shading angles can be calculated to design the correct dimensions of the shading.

RENSON "Design in Sun protection" has sophisticated simulation tools available to work out the ideal solution for your project.



RENSON "Design in Sun protection" can also advice you with complete building simulation to achieve an optimal comfort with minimal energy consumption.

Development

New developments are conceived with high-end development methods like CFD simulations and collaboration with famous research institutes like BRE, BBRI, Von-Karman Institute, CSTB, …
All products are profoundly tested on stability and durability.

snow load test

Stability and design

According to different building regulations, like Eurocodes, a detailed wind and snow loading stability calculation and report can be made. With these loadings the correct spans, design of the mullions and fixing method will be determined.

wind load test

Project solutions

This documentation only illustrates a short overview of our standard solutions and possibilities. Through years of experience we have built up the know-how for almost every design to be realised. Our project-team is at your service to find the appropriate solution for your project.

RENSON "DESIGN IN SUN PROTECTION" OFFERS DIFFERENT POSSIBILITIES TO REALIZE AN AESTHETIC AND ARCHITECTURAL SUNSHADING ACCORDING TO THE DIFFERENT REGULATIONS.

ICARUS® 360, Telindus, Haasrode (BE), Arch. : Crepain - Binst architecten, photo : Toon Grobet

ICARUS® sunshading

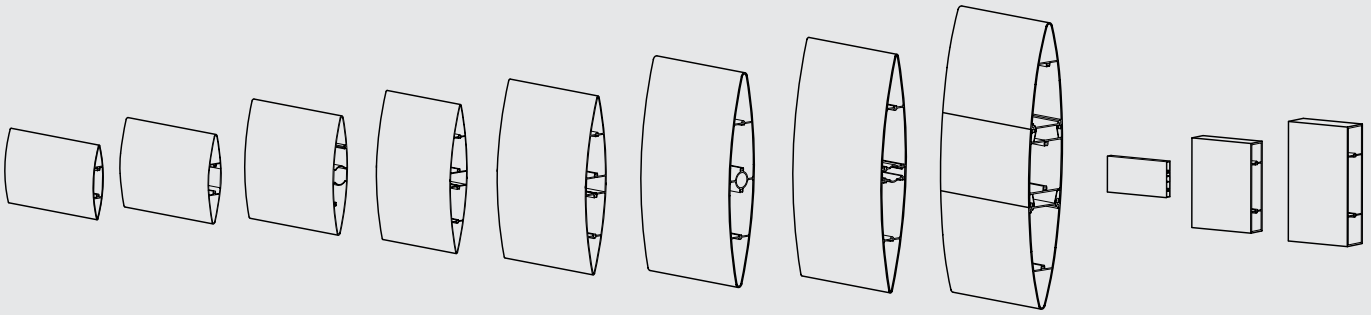
ICARUS® sunshading consists of extruded aluminium aerofoil or rectangular blades for an optimal sun protection. The sunshading can be realised with fixed or movable blades, in horizontal and vertical installation.

SUNCLIPS® Classic, Apotheek De Pauw, Varsenare (BE), Arch. : Ivan decoster

SUNCLIPS® sunshading

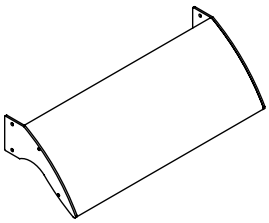
SUNCLIPS® sunshading consists of extruded C-shape blades mounted on a fixed structure. The system can be installed horizontally, vertically, or inclined to achieve an optimal shading effect.

OVERVIEW ICARUS® BLADES

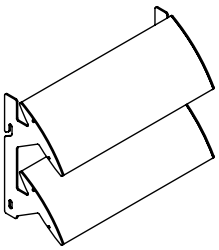


• Aero IC125 • Aero IC150 • Aero IC200 • Aero IC250 • Aero IC300 • Aero IC360 • Aero IC400 • Aero IC480 • Plano 60 • Plano 150 • Plano 200

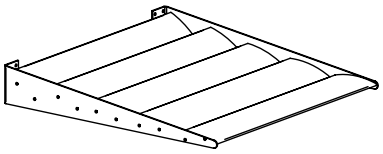
ICARUS® MOUNTING POSSIBILITIES



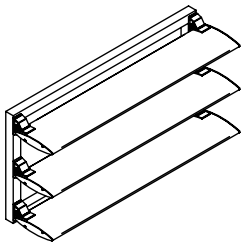
• ICARUS® fixed single blade *pg8*



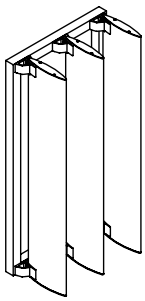
• ICARUS® fixed multiple blades vertical *pg10*



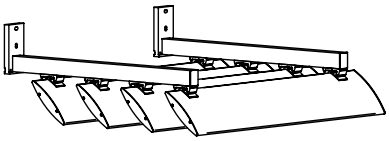
• ICARUS® fixed multiple blades horizontal or inclined *pg10*



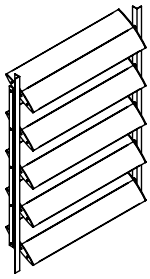
• ICARUS® QuickFix vertical *pg12*



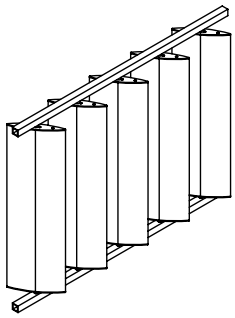
• ICARUS® Quickfix vertical blades *pg12*



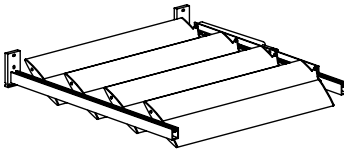
• ICARUS® Quickfix horizontal *pg12*



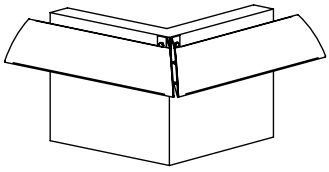
• ICARUS® movable vertical *pg14*



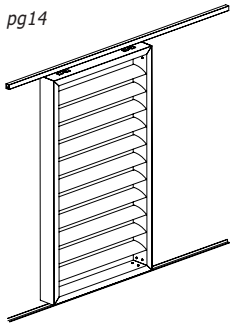
• ICARUS® movable vertical blades *pg14*



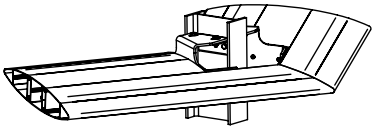
• ICARUS® movable horizontal blades *pg14*



• ICARUS® corner solutions *pg17*



• ICARUS® Patio *pg18*



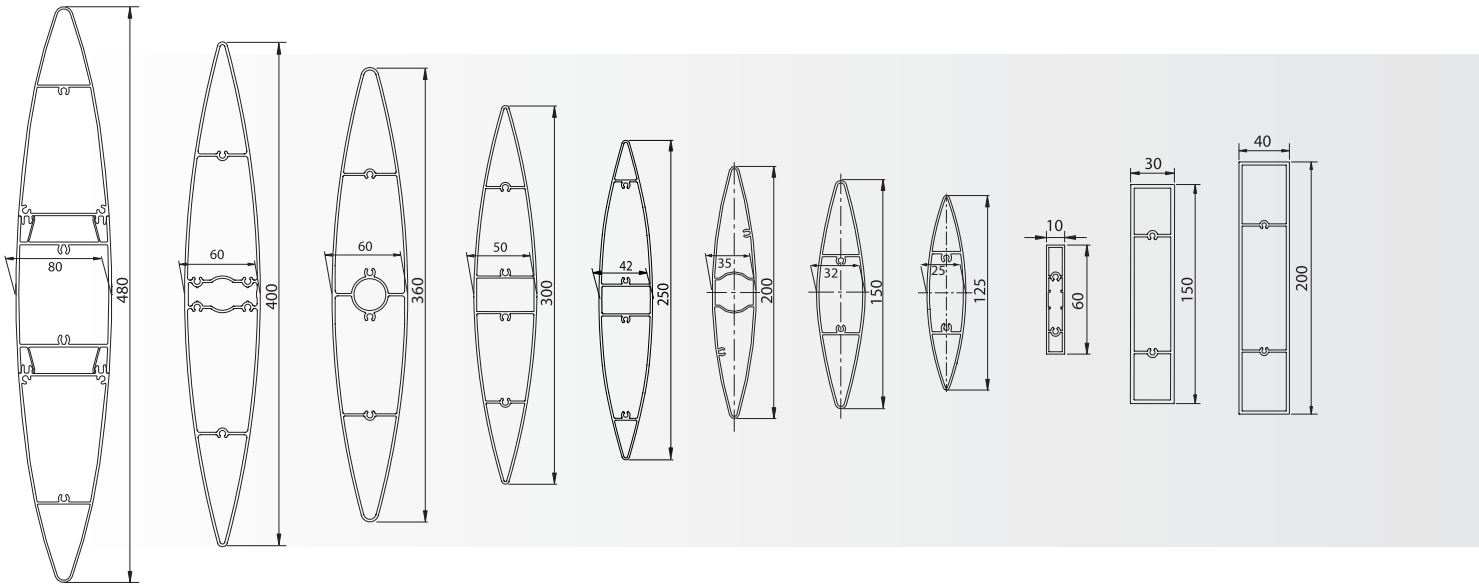
• ICARUS® project solutions *pg19*

ICARUS® movable commands pg16

ICARUS® QuickFix mullions pg16

RENSON
DESIGN IN SUNPROTECTION

ICARUS® BLADES



Description

ICARUS® blades composed of extruded aluminium profiles applicable as sunshading, cladding or visual barrier.
ICARUS® Aero are aerofoil blades with a width ranging from 125 to 480mm.
ICARUS® Plano are block blades with a width of 60,150 or 200 mm.

Other forms or dimensions can be designed with our project department, depending on project needs.

Office Notaris Sabbe, Blankenberge (BE), arch.: Bonne

MATERIAL

Aluminium extrusion alloy EN AW-6063 T66

FINISH

- Anodised (20 microns) SAA and Euras colour range C31-C34
- Polyester powder coating (60-70 micron) RAL colours

TECHNICAL DETAILS

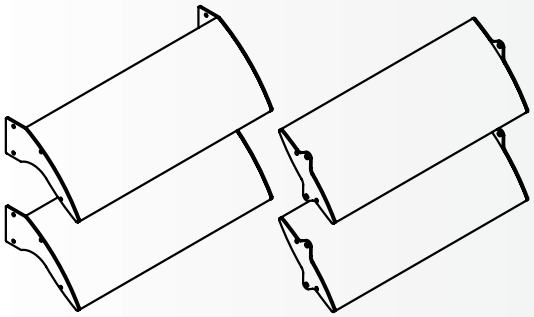
ICARUS® Aero	Width (mm)	Height (mm)	I_y (mm^4)	W_y (mm^3)	I_z (mm^4)	W_z (mm^3)
IC A125	125	25	484640	7754	29399	2352
IC A150	150	32	950301	12616	64713	3936
IC A200	200	35	2367193	23672	120070	6861
IC A250	250	42	5155315	41231	214720	10264
IC A300	300	50	9699889	64666	402436	16097
IC A360	360	60	17180788	95447	756541	25217
IC A400	400	60	23853116	119266	874358	29079
IC A480	480	80	46149163	192285	2321828	58045
ICARUS® Plano	**Width (mm)**	**Height (mm)**	**I_y (mm^4)**	**W_y (mm^3)**	**I_z (mm^4)**	**W_z (mm^3)**
IC P060	60	10	70800	2333	3131	626
IC P150	150	30	2270694	30273	153477	10232
IC P200	200	40	5417853	54177	382888	19143

y: stronger axis • z: weaker axis

Living Tomorrow 3,Vilvoorde (BE), IC Plano, arch. : Bellën

ref Doncaster Innovation Centre (UK), IC300, Arch. Arup Design

ICARUS® FIXED SINGLE BLADE



Brüchsal, (DU)

ICARUS® Plano, CHU Chinon (Fr), Agence Brunet & Saunier

Description

Horizontal or inclined fixed shading with the blades positioned between endplates. Inclination, projection and form can be made-to-measure, designed according the project needs.

MATERIAL AND PARTS

Blade : Aluminium extrusion alloy EN AW-6063 T66.
Endplates are made of aluminium ($AlMg_3$) or steel, thickness depending on projection and loading on the sunshading construction.
All fixings are made of stainless steel.

FINISH

- Anodised (20 microns) SAA and Euras colour range C31-C34.
- Polyester powder coating (60-70 micron) RAL-colours.
- Metal parts are galvanised before powder coating.

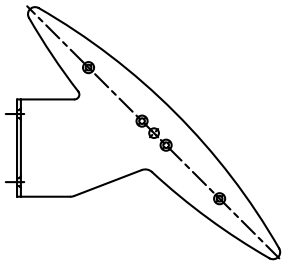
BLADE TYPE

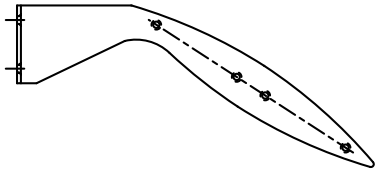
Applicable on all types of blade.

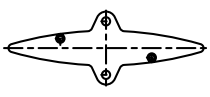
MAXIMUM SPANS

Maximum advised spans of the blades.

Blade type	Wind loading		
	650 Pa	**800 Pa**	**1250 Pa**
IC A125	2900 mm	2800 mm	2500 mm
IC A150	3400 mm	3200 mm	2900 mm
IC A200	3700 mm	3500 mm	3100 mm
IC A250	4100 mm	3900 mm	3400 mm
IC A300	4500 mm	4300 mm	3900 mm
IC A360	5000 mm	4800 mm	4300 mm
IC A400	5100 mm	4900 mm	4400 mm
IC A480	6000 mm	6000 mm	5300 mm
IC P060	2000 mm	1900 mm	1700 mm
IC P150	4200 mm	4000 mm	3600 mm
IC P200	5000 mm	4700 mm	4200 mm



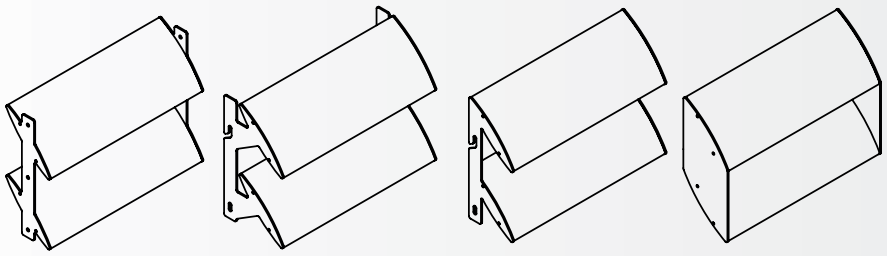




Other spans are possible after detailed calculation of loading, blade inclination and mounting principle.

Bedford University, Polhill Avenue, Bedford (UK), IC300

ICARUS® FIXED MULTIPLE BLADES



Domaine des pins, Montpellier (FR), IC Aero 200 sur consoles, Arch. : Garcia Diaz à Montpellier

Garage Audi,Tielt (BE), IC between endplates

John Smith Business Park - Five, IC200 between endplates, (UK)

Freibad Ergolding, (DU)

Description

Horizontal or inclined fixed shading with multiple blades positioned between endplates. Inclination, projection and form can be made-to-measure and designed according the project needs.

MATERIAL AND PARTS

Blade: Aluminium extrusion alloy EN AW-6063 T66
Endplates are made of aluminium ($AlMg_3$) or steel, thickness depending on projection and loading on the sunshading construction.
All fixings are made of stainless steel.

FINISH

- Anodised (20 microns) SAA and Euras colour range C31-C34
- Polyester powder coating (60-70 micron) RAL colours
- Metal parts are galvanised before powder coating.

BLADE TYPE

Applicable on all types of blade.

MAXIMUM SPANS

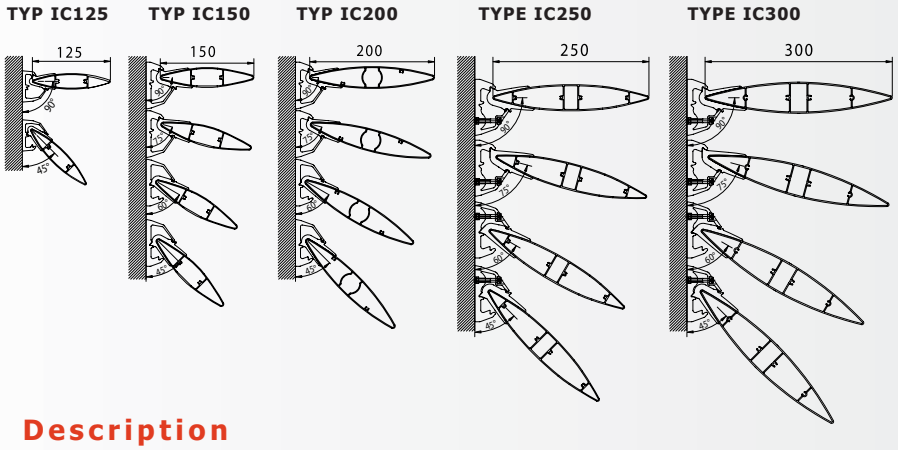
Maximum advised spans of the blades

Blade type	Wind loading		
	650 Pa	**800 Pa**	**1250 Pa**
IC A125	2900 mm	2800 mm	2500 mm
IC A150	3400 mm	3200 mm	2900 mm
IC A200	3700 mm	3500 mm	3100 mm
IC A250	4100 mm	3900 mm	3400 mm
IC A300	4500 mm	4300 mm	3900 mm
IC A360	5000 mm	4800 mm	4300 mm
IC A400	5100 mm	4900 mm	4400 mm
IC A480	6000 mm	6000 mm	5300 mm
IC P060	2000 mm	1900 mm	1700 mm
IC P150	4200 mm	4000 mm	3600 mm
IC P200	5000 mm	4700 mm	4200 mm

Other spans are possible after detailed calculation of loading, blade inclination and mounting principle.

Ref Atass, Exeter Business Park, IC 200 between endplates, (UK)

ICARUS® FIXED QUICKFIX



IT Portal, (D)

Optiek Claeyssens, Quickfix luifel, Gent (BE)

Description

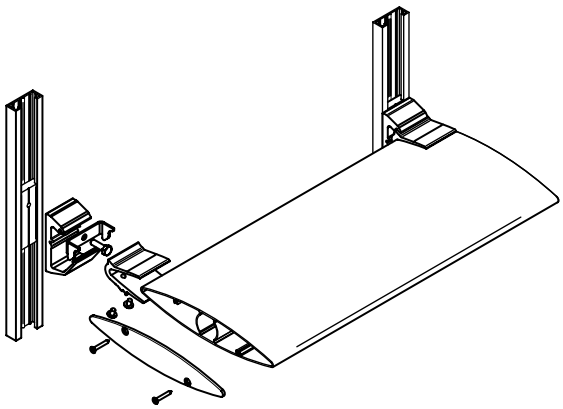
ICARUS® QuickFix is a unique and patented easy to install structural sunshading. ICARUS® QuickFix can be supplied as a system. By mounting a fork part onto the blades, the blades can be easily clipped into supports mounted on the façade. The supports can be pre-mounted on mullions. With this system the blades can achieve a continuous visual line.

MATERIAL AND PARTS

Blade : Aluminium extrusion alloy EN AW-6063 T66
Endcaps are made of aluminium ($AlMg_3$)
All fixings are made of stainless steel.

FINISH

- Anodised (20 microns) SAA and Euras colour range C31-C34 (only aluminium)
- Polyester powder coating (60-70 micron) RAL-colours



BLADE TYPE

Following blade types and standard inclinations can be realised:
IC 125, 150, 200, 250, 300 : 45° and 90°
IC 150, 200, 250, 300 : 60° and 75°

For other inclinations special parts or adaptations can be designed with our project department.

MAXIMUM SPANS

Maximum advised spans of the blades

Blade type	Wind loading		
	650 Pa	**800 Pa**	**1250 Pa**
IC A125	2500 mm	2300 mm	2000 mm
IC A150	3000 mm	2800 mm	2400 mm
IC A200	3500 mm	3100 mm	2700 mm
IC A250	3500 mm	3300 mm	3100 mm
IC A300	3500 mm	3500 mm	3500 mm

Other spans are possible after detailed calculation of loading, blade inclination and mounting principle.

City hall, Deerlijk (BE), IC Quickfix

Description

Horizontal or inclined movable shading. Blades are movable 90 degrees, other inclinations or project requests can be designed with our project department.

MATERIAL AND PARTS

Blade : Aluminium extrusion alloy EN AW-6063 T66
Endplates are made of aluminium ($AlMg_3$) or steel, thickness depending on projection and loading on the sunshading construction.
Axles made of stainless steel mounted centrally on the aluminium endcaps.
Bearings and locking rings made of UV-resistant synthetic material.
All fixings are made of stainless steel.

FINISH

- Anodised (20 microns) SAA and Euras colour range C31-C34
- Polyester powder coating (60-70 micron) RAL colours
- Metal parts are galvanised before powder coating.

BLADE TYPE

Applicable on all types of blade.

MAXIMUM SPANS

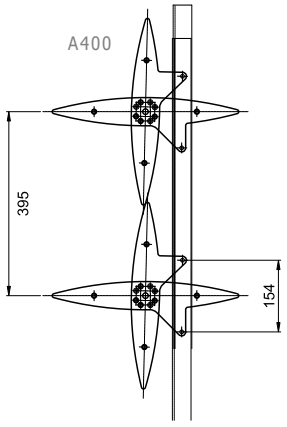
Maximum advised spans of the blades

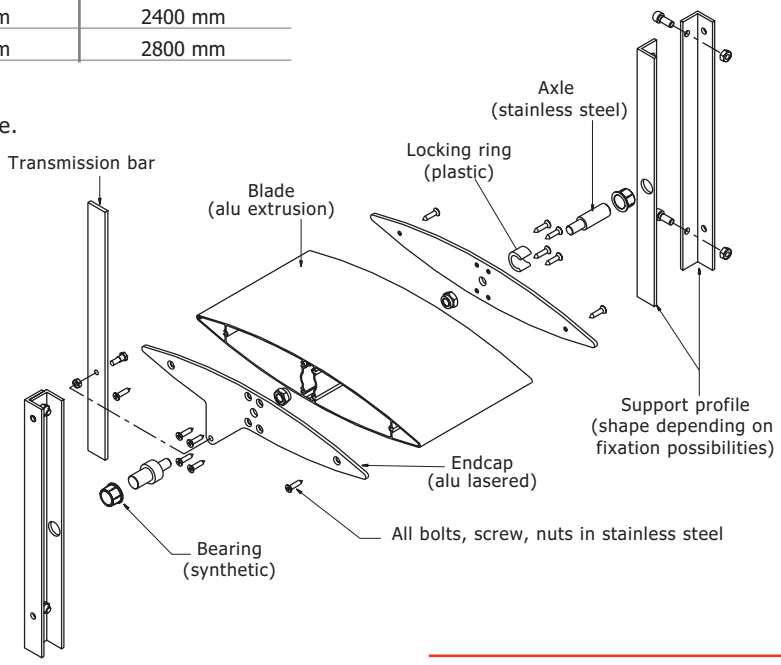
Blade type	Wind loading		
	650 Pa	**800 Pa**	**1250 Pa**
IC A125	2100 mm	2000 mm	1800 mm
IC A150	2500 mm	2300 mm	2100 mm
IC A200	2600 mm	2500 mm	2200 mm
IC A250	2700 mm	2600 mm	2300 mm
IC A300	3300 mm	3000 mm	2700 mm
IC A360	3600 mm	3400 mm	3000 mm
IC A400	3700 mm	3500 mm	3100 mm
IC A480	4500 mm	4200 mm	3800 mm
IC P150	2800 mm	2700 mm	2400 mm
IC P200	3300 mm	3000 mm	2800 mm

Other spans are possible after detailed calculation of loading, blade inclination and mounting principle.

Private house - IC 150 movable Beverlo (BE), Arch. Eric Vaes

IC Aero 360 movable, Cegid (FR)



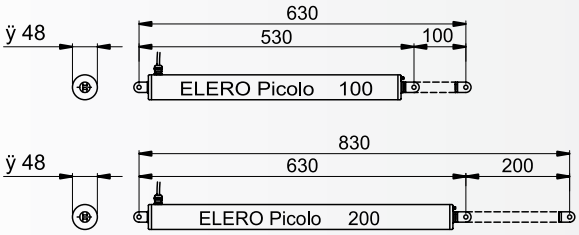


Toren Belgocontrol, Steenokkerzeel (BE), IC 300,
Arch.: W.J. Van Campenhout, L.M. Chapeaus & Geocal

Private house, Brussels (BE)

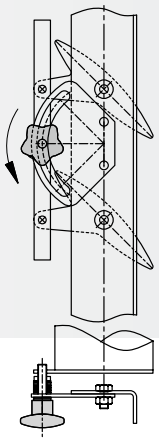
ICARUS® movable operating commands

AUTOMATIC CONTROL

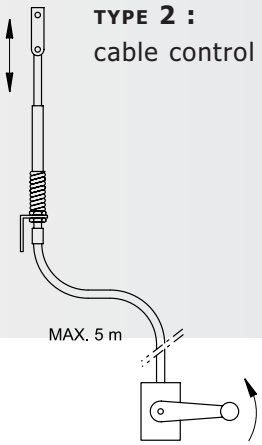


MANUAL CONTROL

TYPE 1 :
direct
manual
control

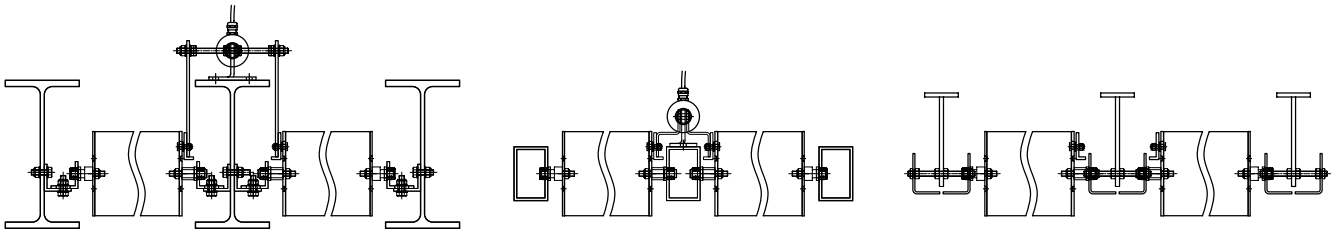


TYPE 2 :
cable control



ICARUS® movable mounting principles

Different mounting principles can be designed according to the project needs.



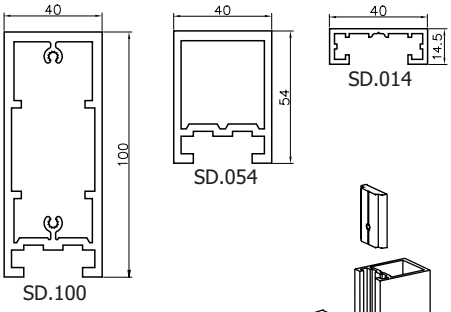
ICARUS® MULLIONS

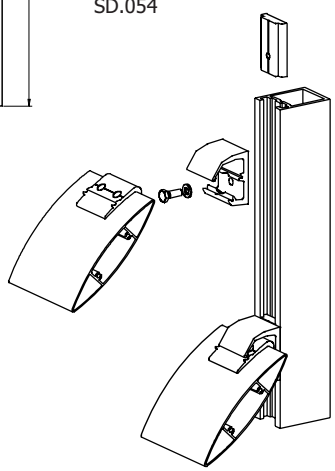
SUNCLIPS® mullion type SD

DESCRIPTION
Extruded aluminium profiles are preferably used as mullions for pre-mounting ICARUS® Quickfix supports.

MATERIAL
Aluminium extrusion alloy EN AW-6063 T66.

FINISH
- Anodised (20 microns) SAA and Euras colour range C31-C34.
- Polyester powder coating (60-70 micron) RAL-colours.





TECHNICAL CHARACTERISTICS

	SD.014	SD.054	SD.100
Depth profile	14,5 mm	54 mm	100 mm
With profile	40 mm	40 mm	40 mm
Moments of inertia	4510 mm^4	208672 mm^4	1248414 mm^4
Section modulus	497 mm^3	7360 mm^3	24405 mm^3

Linde, Krakow (PL), MTJ Poznan

Univé Medemblik, (NL)

ICARUS® fixed with endplate on mitred corner. Blades mitred and fixed on the endplate.

ICARUS® fixed with cantilever blade

ICARUS® blades mitred and fixed on the right side on endcap plate. Mitred corner is cantilevered (only limited length possible)

Caravelle, Genemuiden (NL)

Brüchsal, (D)

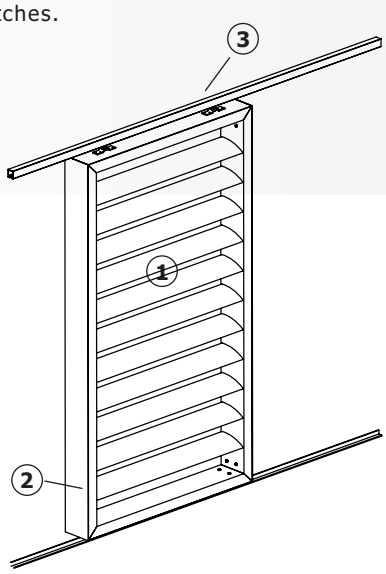
ICARUS® fixed with welded blades

Blades are mitred and welded together. (only possible with polyester powder coated profiles).

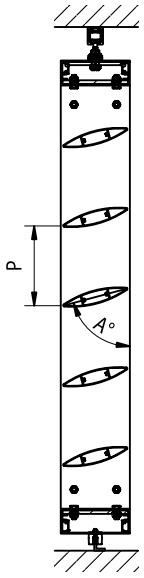
ICARUS® fixed quickfix corner solution

ICARUS® PATIO

To obtain an optimal solar heat and natural light, RENSON have developed ICARUS® Patio sunshading aluminium sliding panels. The panels consist of a fixed frame (LOGGIA® 130) in which ICARUS® blades are fitted : BLADE TYPE IC A125, IC A150, IC P150. The blades can be fitted under different angles and pitches.



Appartements, Kirchberg (Luxembourg)



Typical maximum dimensions of sliding panels LOGGIA®130 (width x height)

Blade type	Blade angle (A)	Pitch (P)	650Pa	800Pa	1250Pa
IC A125	90°	125 mm	1500 x 5770	1500 x 5770	1500 x 5770
IC A125	60°	125 mm	1500 x 5190	1500 x 4930	1500 x 4410
IC A125	45°	150 mm	1500 x 4820	1500 x 4230	1500 x 4080
IC A150	59°	150 mm	1500 x 5150	1500 x 4890	1500 x 4370
IC A150	45°	200 mm	1500 x 4930	1500 x 4200	1500 x 4180
IC P150	45°	150 mm	1500 x 3420	1500 x 3420	1500 x 3420
IC P150	45°	200 mm	1500 x 4350	1500 x 4350	1500 x 4210

Other dimensions available on request

STANDARD ASSEMBLY

1. Blade type ICARUS®
2. Frame type LOGGIA®
3. Silent low friction rail system

CONTROL

Manual or motorised

ALTERNATIVE :

Sliding panels with the blades positioned between end plates. Blade type : applicable with different types of ICARUS® blades (propositions on request).

Zwolle (NL), Windesheim university

Ref Espace Innova, IC Aero, Ploemeur (FR) ,
Arch.: SARL Yvon Le Brigant & François Trouve Architectes

Bedford University, Polhill (UK)

Centre de loisirs, Liffre (FR), Cabinet Golhen Liffre

Asia Center, Budapest (HU)
arch. : Makat - Dr. Lengger

This brochure will only give an overview of our standard solutions. Our project department can advise you and design your specific project solution.

RENSON: YOUR PARTNER IN NATURAL VENTILATION AND SOLAR SHADING

RENSON, with its rich tradition in innovation and experience since 1909, is profiling itself as an undisputed market leader in natural ventilation and solar shading. Since 2003, our head quarters have been located next to the E17 Kortrijk - Gent motorway in Waregem (Belgium). This remarkable building is a real and working model of our "Healthy Building Concept" and is a prototype exhibiting our technological strengths.

RENSON headquarters (BE)

A healthy internal climate is RENSON's priority and this is far more than just a trend. We develop and commercialise products that contribute to lower energy consumption. In this way, RENSON provides an important link towards the regulation applications from the Kyoto Climate Treaty.

RENSON headquarters (BE)

RENSON HAS IT ALL

• Our multidisciplinary R&D department is co-operating with leading European research organizations. The outcome is a complete range of innovative concepts and products.

• Our automatically powder coating installation, anodisation unit, PVC injection installation, PVC mould construction, assembly department and warehouse facilities are spread over a surface area of 75.000 m^2. Thanks to its consequent vertical integration, RENSON delivers high quality products.

• RENSON's head quarters, sales and marketing department are in Belgium, but we also have plants and offices in France and the UK. RENSON also has a sales structure beyond the European borders.

• The diversity and capability from RENSON's project team are our warranty for correct solutions for each individual building project. The creation of constructive long term relationships with construction specialists is our priority.

RENSON (UK) Maidstone

Conditional technical changes • The most recent edition of the brochure can be downloaded on www.renson.eu

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RENSON DESIGN IN SUNPROTECTION

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