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SOLAR PROTECTION AND SHADING SYSTEMS

■ Solar protection systems

■ Noise-absorbing blade systems

■ Light-architecture at night





# CS Airfoil<sup>®</sup>

## Blades and System Components

• **Blade**  
extruded from a corrosion resistant aluminium alloy.

• **Birdsmouth Brackets**  
in aluminium, 30°, 45° and 90° (for blades up to AF 320).

• **Closing Plate**  
in aluminium or stainless steel.

• **Direct End Fixing Plate** in stainless steel, 90°.

• **Direct End Fixing Plate** in stainless steel, 45°.

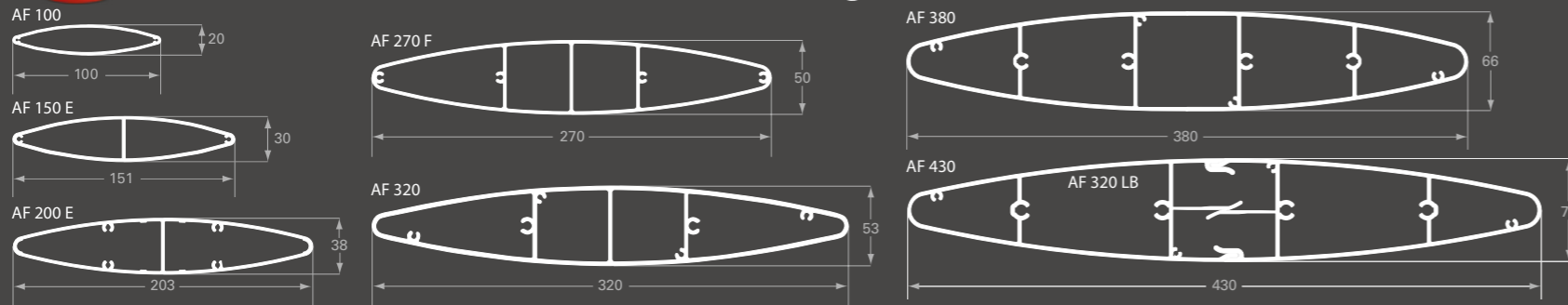
• **Custom Made Fixing Brackets and Plates**  
in stainless steel.

• **Parallel Off-Set Bracket**  
in stainless steel and various angles.

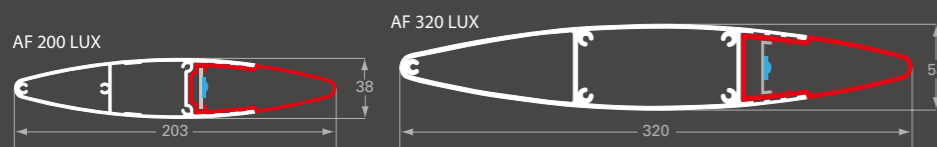
• **Compound Angle Fixing Bracket**  
in stainless steel and various angles.



## CS Airfoil<sup>®</sup> Solar Protection and Shading Blades



## CS Airfoil<sup>®</sup> LUX<sup>®</sup> Illuminated Blades



## CS Airfoil<sup>®</sup> Noise-Absorbing Blades



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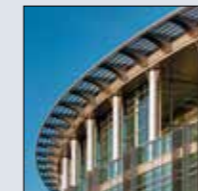
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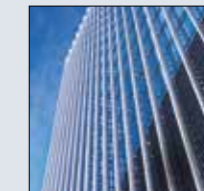
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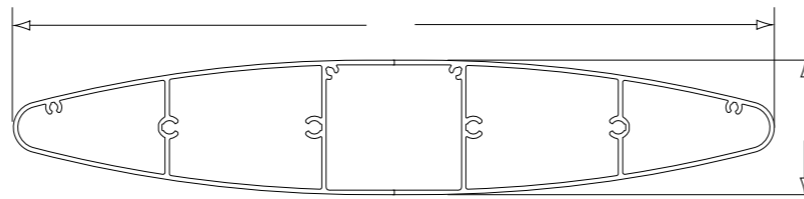
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Technical Information





## Captivating Façade Design and Efficient Solar Protection

### Eye-catching architecture and efficient solar protection

The CS Airfoil® solar shading system is simply the most effective method of reducing heat gain and glare in a building's interior while adding a distinguished touch to its architectural design.

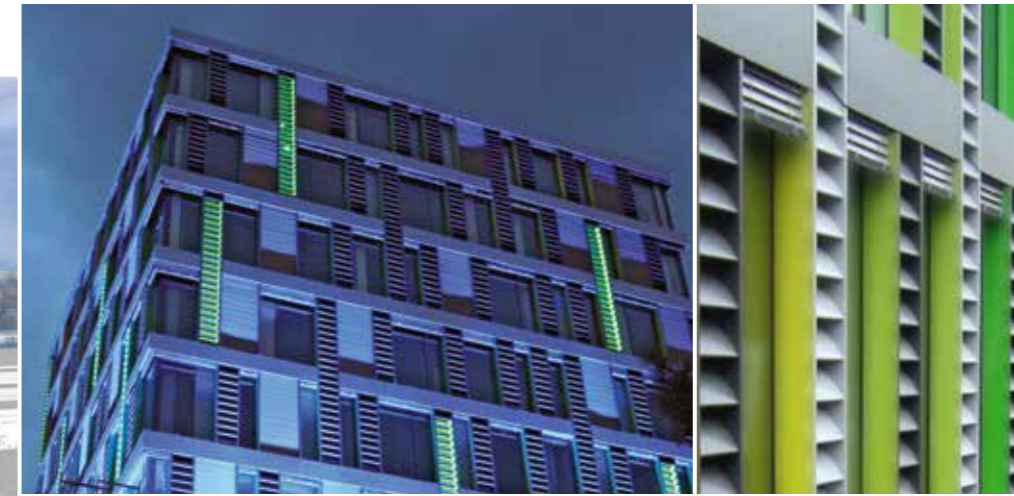
The sleek lines of CS Airfoil® blades enhance a building's appearance of quality and individuality, especially when combined with building materials such as glass, metal or stone. In the planning, design and installation of exterior illumination, CS Airfoil® blades also prove to be a very attractive and individual design element.

The unsurpassed range of system modules, solar protection, noise-absorbing and illuminated blades integrate seamlessly into even the most challenging and sophisticated of façade projects, making CS Airfoil® the architect's preferred choice.



Administration buildings, **office buildings**, car show rooms, **museums**, shopping malls, **cinemas and theatres**, large glazed constructions, **schools**, banks, **military installations**, airports, **universities**, motorway service stations, **railway stations**, hospitals, **sports stadiums**, emergency stairways, **motels**, elderly homes, **high schools**, exhibition and conference centres, **swimming pools**, bus terminals, **covered sports halls**, post offices, **hotels**, petrol stations, **car parks**, etc.





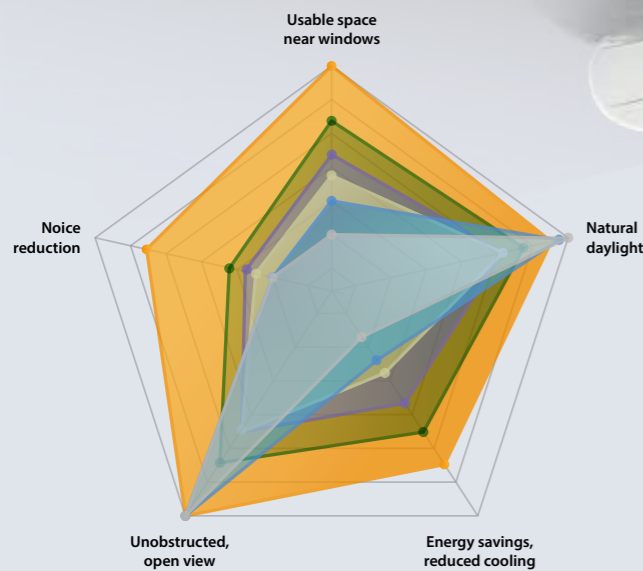
**A success story of how to solve the equation.**

Ample natural light, large windows and expansive views come high up on the list of commercial building 'desirables' but enter also other, less desirable factors in to the equation.

More window space often equates to significant heat gain within buildings, hiking energy consumption for additionally needed cooling. In addition, heat and glare from direct sunlight often render valuable office space near windows useless or oblige to cover them up with conventional solutions, which makes you wonder why you needed such big windows in the first place.

CS Airfoil® blades help provide an extremely viable solution to this often complex equation. They block out heat, glare and even noise pollution but still allow softly shaded natural daylight to flow into interiors. Their unique design and construction help to maintain an unobstructed view from large windows, creating visually appealing open-plan work spaces with a comfortable atmosphere.

With these benefits in mind the town hall in Heilbronn, Germany was designed with conventional and noise-absorbing CS Airfoil® blades. A unique LED lighting system illuminates the sleek blades, creating a stunning effect for this outstanding signature building.



- CS Airfoil® sun control and shading systems
- Exterior Venetian blinds
- Interior venetian blinds
- Rollup stores
- Reflective double glazing
- Interior Venetian blinds

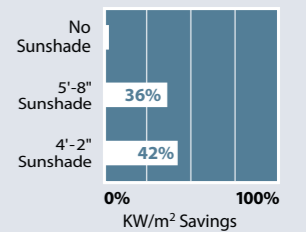
An AMCA study suggests CS Airfoil® shading systems help achieve substantial reductions in total energy usage and reductions in peak energy demand.



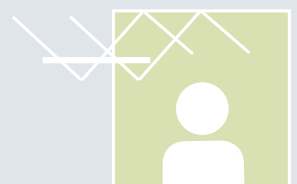
CS Airfoil® sun control and shading systems have achieved Cradle to Cradle Silver Certification.



In the Energy and Atmosphere section of USGBC LEED® Credits 2009 Edition, Version 3, LEED® calls on architects to improve building performance beyond the baseline in ASHRAE/IESNA Standard 90.1-2007.



An AMCA study suggests CS Airfoil® sun control systems help achieve substantial reductions in total energy usage and reductions in peak energy demand.



CS Airfoil® contributes to enhanced occupant comfort, increases worker productivity and improves educational performance.





▲ **Concert hall.** Horizontally arranged CS Airfoil® blades have been combined with CS Airfoil® LUX® illuminated blades to further enhance the building's impressive illuminated nighttime appearance.



▲ **Power supply.** CS Airfoil® LUX® illuminated blades are supplied with 12 V low voltage transformers accommodated inside the building.

**Outstandingly stylish during the daytime, breathtaking at night.**

CS Airfoil®, the market leading solar protection and shading system expands its range of architectural solutions with a global first: the illuminated blade CS Airfoil® LUX®.

No matter where this extraordinary lighting system is installed, it enhances any architecture with its exclusivity and appealing elegance, instantly transforming an illuminated building in to an eye-catching attraction.

Clever combinations of CS Airfoil® LUX® illuminated blades with our conventional solar protection blades, plus a refined choice of colours can achieve highly efficient solar protection and exciting facade designs for both daytime and nighttime.



Patent registration number: 765334-0001



Linked up LED units are fixed on an aluminium support rail.

• **LED**

Linked up LED units with three LEDs each are mounted on an aluminium support rail which is then inserted into the PMMA nose profile of the blade. LEDs are available in five standard colours (white, red, blue, green and yellow). Power consumption: 9,6 W for 20 LED units (2,7 m) (30 units = 4 m)



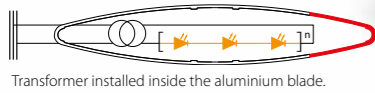
LED unit with 3 LEDs, 12 V DC, 10 x 100 mm.



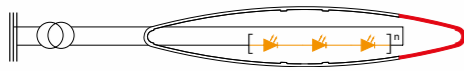
• **Straightforward installation**

All blades are shipped from our factory completely equipped with all electrical components. On site they only need to be fixed and connected.

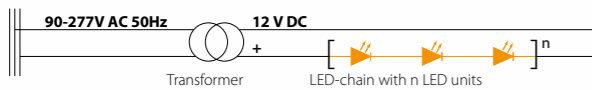
It is highly recommended to install the transformers within the building although in very specific cases the transformer could be stored inside the blade.



Transformer installed inside the aluminium blade.



Transformer located inside the building.



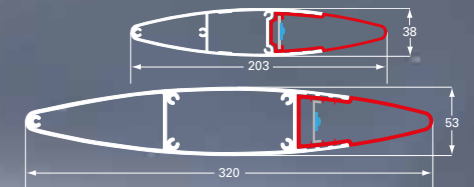
• **Fixing brackets and plates**

CS Airfoil® illuminated blades are mounted with the same parallel off-set fixing brackets and direct end fixing plates as all other horizontal arrangements with conventional blades. This advantage allows for the design and construction of attractive and efficient combinations of illuminated blades and conventional sun control blades without any additional effort.



• **Blade profiles**

CS Airfoil LUX® illuminated blades are manufactured from extruded aluminium profiles in widths of 200 mm or 320 mm and can be shipped powder-coated in all available RAL-colours.



• **PMMA light profile**

The PMMA light profile is available in five standard colours (white, red, blue, green, yellow) or upon request in all Pantone® colours.

• **LED lighting**

The PMMA profile is illuminated from within by a low voltage LED chain. LEDs are available in five standard colours (white, red, blue, green, yellow).







▲ **Office building.** The horizontally mounted CS Airfoil® noise-absorbing blades AF320 LB offer efficient solar protection and reduce external noise pollution entering the inside of the building.

**For all round comfort: soft shading, quiet atmosphere, unobstructed views.**

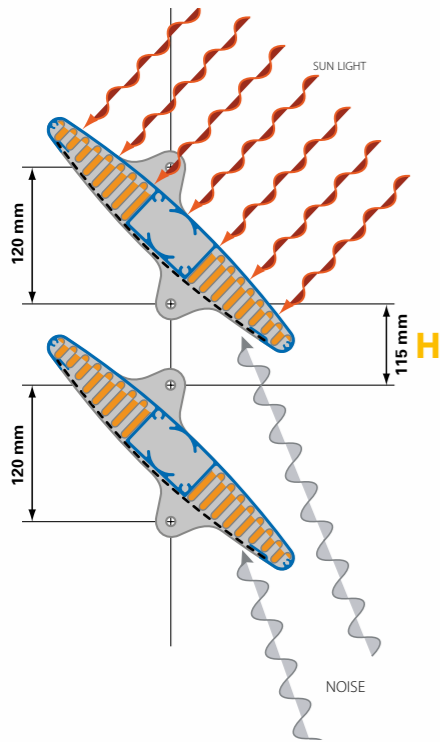
Thanks to its noise absorbing core, the AF 320 LB blade dramatically reduces noise pollution from busy city centres entering into the interior of buildings.

Additionally, the AF 320 LB blade effectively reduces solar heat gain inside buildings. The demands placed on air conditioning are therefore greatly reduced, so improving the interior climate and saving energy. Thanks to reduced heat, glare and noise, valuable office space near windows can be used more efficiently and without the need for other conventional solutions to make this space fully functional in sunny conditions, while retaining sought after and unobstructed views of the outside.

• **Effective sun control and efficient sound insulation**

The AF 320 LB blade offers an all-in-one protection against heat, sun, glare and noise pollution entering the inside of buildings. Without obstructing the external views the AF 320 LB is capable of reducing noise by 5 to 8 dB.

The noise reducing effectiveness depends on the blade distance H (see table below).



• **Colour combinations**

The blade's surface can be either RAL powder coated or silver anodised. The colours of the perforated aluminium sheet can be chosen independently from the profile's colour, allowing for a virtually unlimited range of colour combinations and providing the architect with an additional design feature.

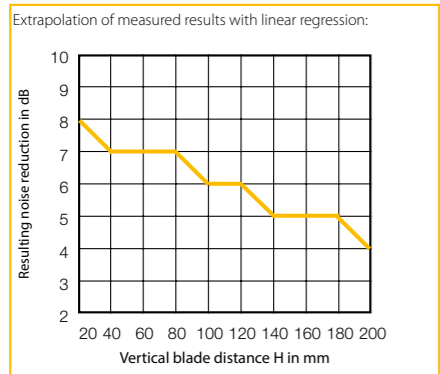


The noise absorbing AF 320 LB is constructed from a 3 mm thick, extruded, high quality aluminium profile and a perforated aluminium sheet.

The blade contains noise absorbing fibreglass which is covered with a black fibreglass tissue to conceal the colour of its core.

• **Fixing brackets and plates**

The noise absorbing AF 320 LB blade is mounted with the same parallel off-set fixing brackets and direct end fixing plates as all other horizontal arrangements available with conventional blades. This advantage allows for the design and construction of attractive and efficient combinations of AF 320 LB blades and conventional sun control blades without any additional effort.



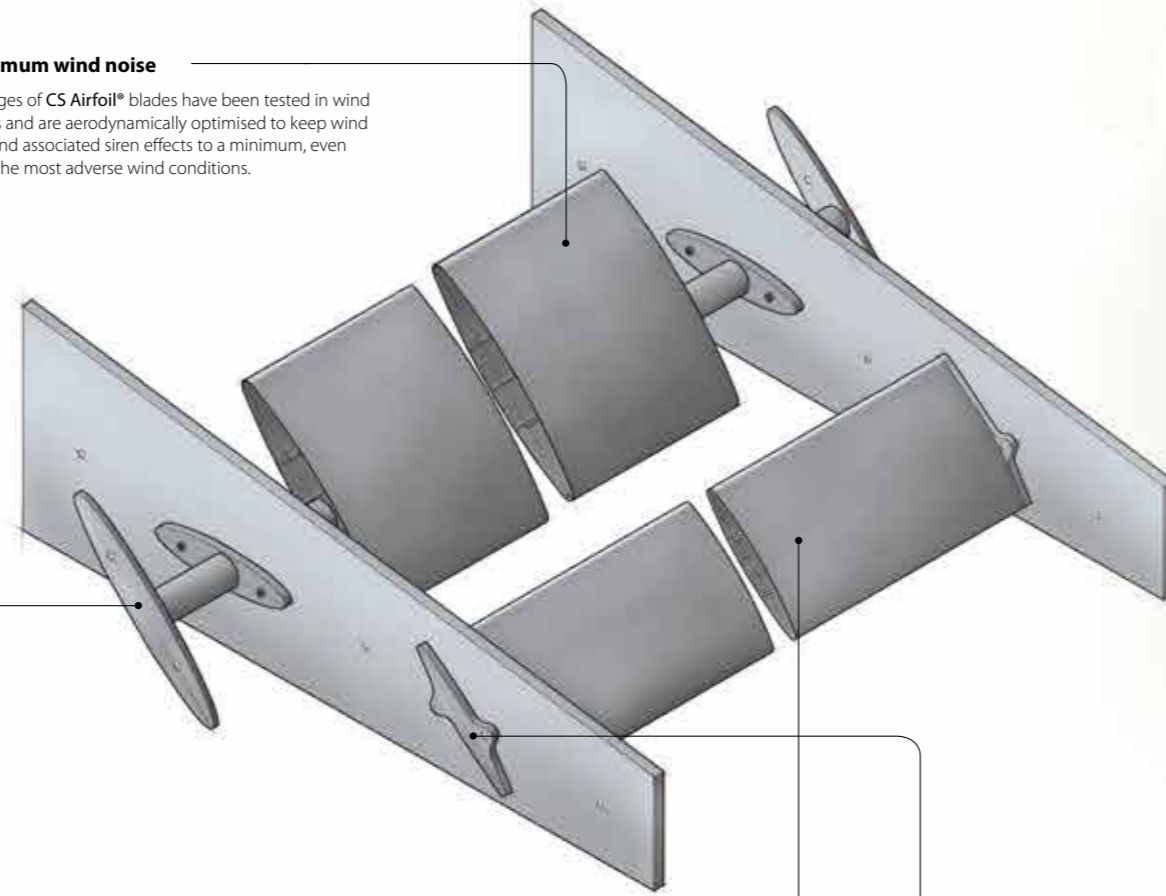




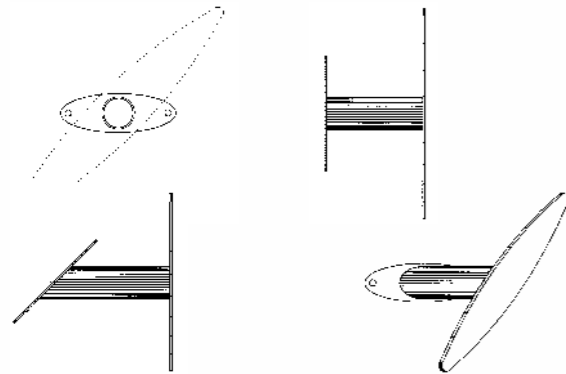
▲ **VW show room.** CS Airfoil® blades in a cantilevered solar protection system in front of the glass facade of a VW car show room.

• **Minimum wind noise**

The edges of CS Airfoil® blades have been tested in wind tunnels and are aerodynamically optimised to keep wind noise and associated siren effects to a minimum, even under the most adverse wind conditions.



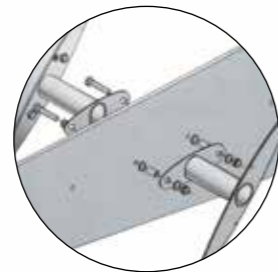
• **Parallel off-set fixing brackets and compound angle fixing brackets**



Standard stainless steel fixing brackets with 45° blade inclination are available for straight runs and with 45° corner angles. Other inclinations and/or corner angles are available upon request.

• **Expansion system**

C/S FRANCE expansion system compensates for the expansion or contraction the blades may experience due to temperature changes. The shear and tear of their fixtures and support structures is therefore avoided, contributing to a maintenance free lifetime cycle.



**Cantilevered support**

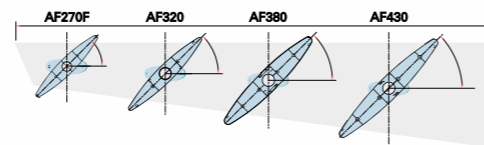
Metal sleeves allow for movement of fixing bracket.

Mobile fixing bracket compensates for blade expansion or contraction.

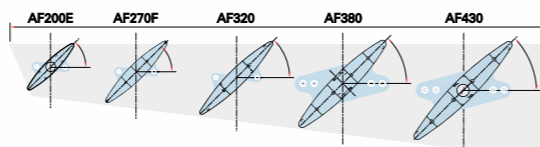
Parallel off-set fixing bracket firmly fixed to the cantilevered support structure

• **Examples of cantilevered projections**

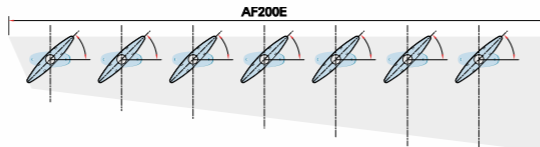
Depending on building or architectural design specifications, cantilevered systems can be designed with uniform or different sized blade arrangements to cater for virtually all building peculiarities and specific sun protection needs.



Parallel off-set fixing brackets with 45° inclination anchor this arrangement of four differently sized blades to the support structure.

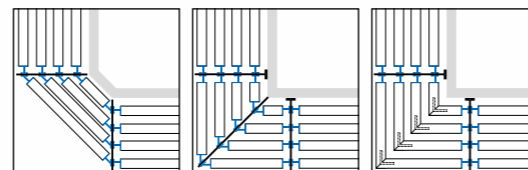


Direct end fixing plates with 45° inclination anchor this arrangement of five differently sized blades to the support structure.

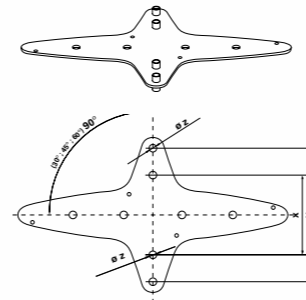


Parallel off-set fixing brackets with 45° inclination anchor this uniform arrangement of seven blades to the support structure.

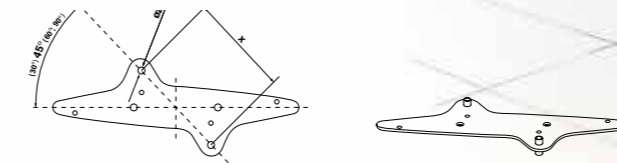
• **Corner solutions**



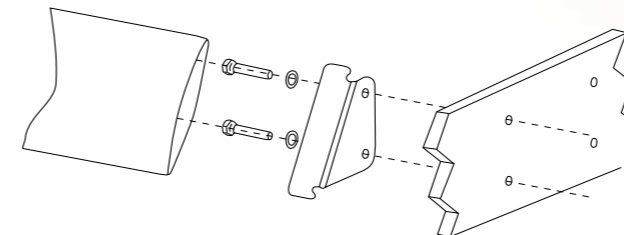
• **Direct end fixing plates in stainless steel**



Direct end fixing plate 90° made of stainless steel for 90° blade inclination.



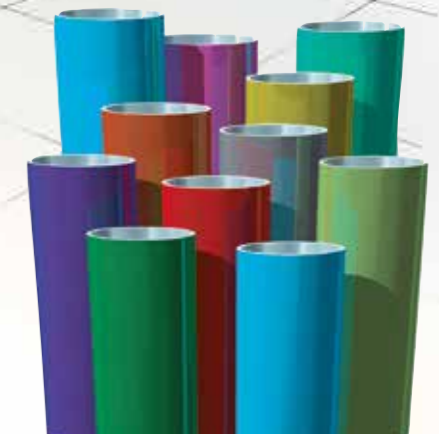
Direct end fixing plate 45° made of stainless steel for 45° blade inclination.



Insertion fixing plate (only AF 100) made of stainless steel is simply inserted into the blade and fixed with screws onto the structural support. Available in any desired angle.

• **Finishing options**

CS Airfoil® blades are RAL powder coated or silver anodised to offer surface protection and prevent corrosion.







▲ **Modern high school.** A smart combination of horizontal and cantilevered CS Airfoil® blades protect interiors from heat and glare while adding a distinguishing touch to the building.

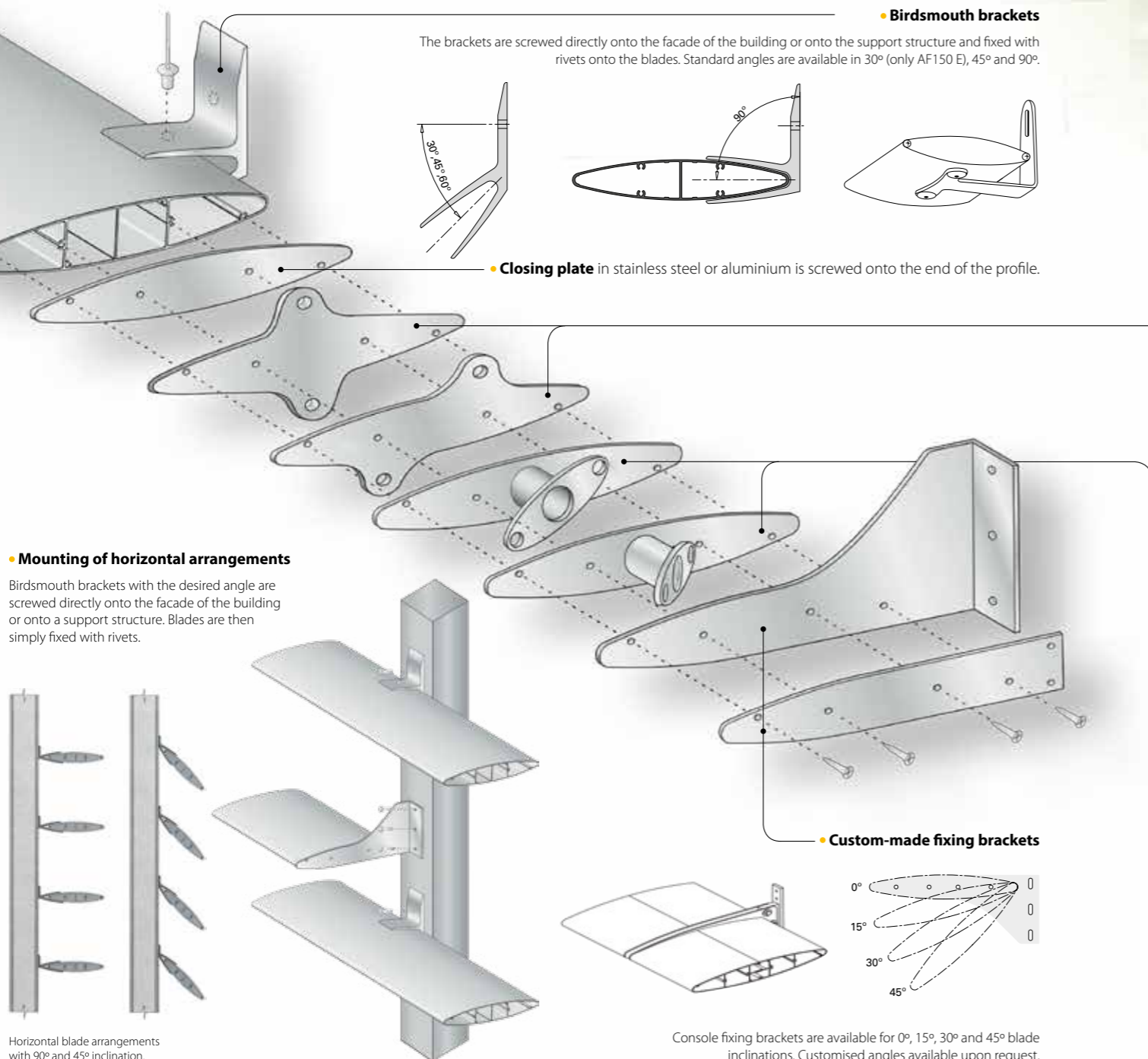
**Solar protection with design in mind.**

In horizontal arrangements CS Airfoil® blades are the primary choice for its unsurpassed combination of functionality, appearance and quality.

The sleek and elegant horizontal lines of CS Airfoil® blades integrate harmoniously into the architecture of any building and put a stamp of individuality on the visual appearance of its facade.

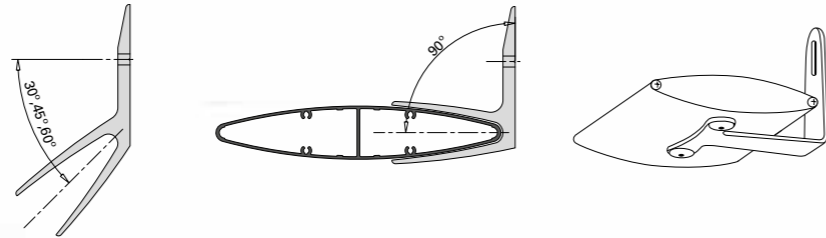
The horizontal arrangement also helps to effectively minimise unwanted heat from direct sunlight, so greatly reducing the need for air conditioning, while improving the interior climate.

Horizontal CS Airfoil® blades are also an excellent protection against intrusion and vandalism, especially for low level storeys, while reducing noise pollution commonly experienced in busy city centres.



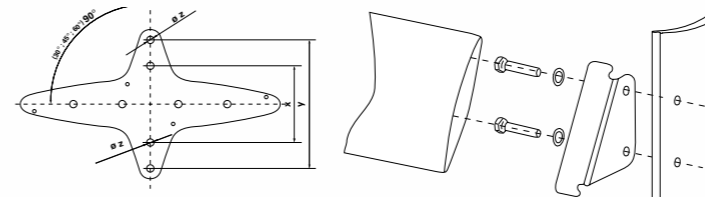
• **Birdsmouth brackets**

The brackets are screwed directly onto the facade of the building or onto the support structure and fixed with rivets onto the blades. Standard angles are available in 30° (only AF150 E), 45° and 90°.

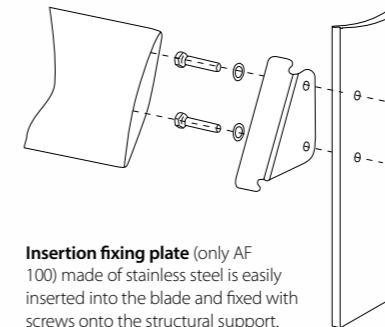


• **Closing plate** in stainless steel or aluminium is screwed onto the end of the profile.

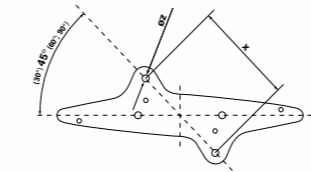
• **Direct end fixing plates in stainless steel**



**Direct end fixing plate 90°** in stainless steel for 90° blade inclination.



**Insertion fixing plate** (only AF 100) made of stainless steel is easily inserted into the blade and fixed with screws onto the structural support. Available in any desired angle.



**Direct end fixing plate 45°** in stainless steel for 45° blade inclination.



**Console fixing brackets** in stainless steel for adjustable inclination angles of blades.

• **Parallel off-set fixing brackets and compound angle fixing brackets**

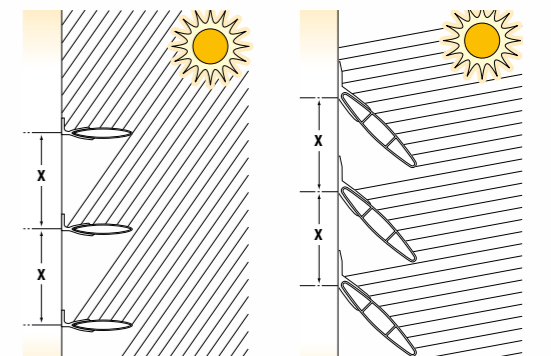


• **Corner joint solutions**



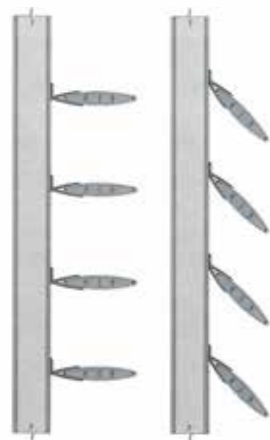
• **Shadow projection of horizontal arrangements**

The distance X between blades varies depending on the type of blade, its inclination angle and the altitude. Please consult the maximum span admission table published on page 15 or contact our technical office to obtain additional product information and/or any project related assistance.



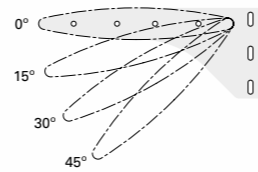
• **Mounting of horizontal arrangements**

Birdsmouth brackets with the desired angle are screwed directly onto the facade of the building or onto a support structure. Blades are then simply fixed with rivets.



Horizontal blade arrangements with 90° and 45° inclination.

• **Custom-made fixing brackets**



Console fixing brackets are available for 0°, 15°, 30° and 45° blade inclinations. Customised angles available upon request.





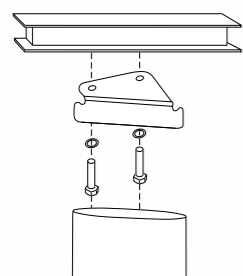
▲ **Tall office building.** Sleek, vertically mounted CS Airfoil® blades are the centrepiece of this unique and daring piece of architecture, providing effective shading due to the south-east orientation of the building



▲ **Museum.** Colourful CS Airfoil® blades with our high quality powder coated finish follow the silhouette of the building creating an artful effect of an otherwise unappealing façade.



▲ **Restaurant.** Vertically mounted CS Airfoil® AF 380 blades are used in this restaurant as a decorative element and as a separator within the tables' section.



● **Insertion fixing plate (only AF 100)**

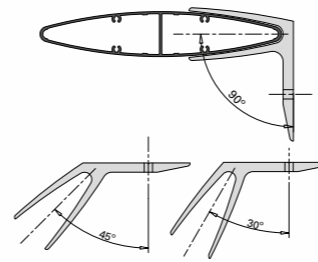
The stainless steel insertion fixing plate is simply inserted into the blade and fixed with screws onto the structural support. Available in any desired angle.

● **Synergy of functionality and design.**

Whether you are thinking about sun control systems for buildings with east or west orientation, using the sleek design of our CS Airfoil® blades to enhance a building's appearance, stylishly concealing unsightly building elements or using them to provide a solid barrier against intrusion and vandalism, you will always find in CS Airfoil® an unrivalled combination of design and functionality.

● **Birdsmouth brackets**

The brackets are screwed directly onto the facade of the building or onto the support structure and fixed with rivets onto the blades. Standard angles are available in 30° (only AF 150 E), 45° and 90°.

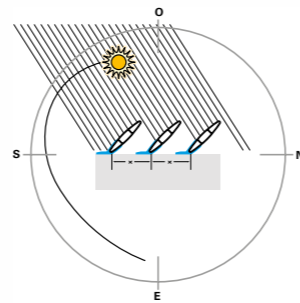


● **Closing plate**

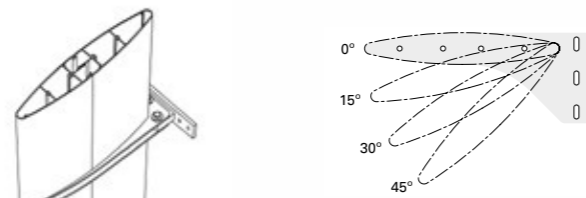
Closing plate in stainless steel or aluminium is screwed onto the end of the blade profile.

● **Shadow projection of vertical systems**

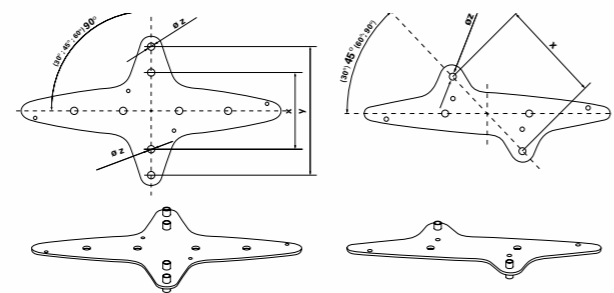
The distance X between blades varies depending on the type of blade, its inclination angle and the altitude. Please contact our technical office to obtain project related assistance.



● **Console fixing brackets**

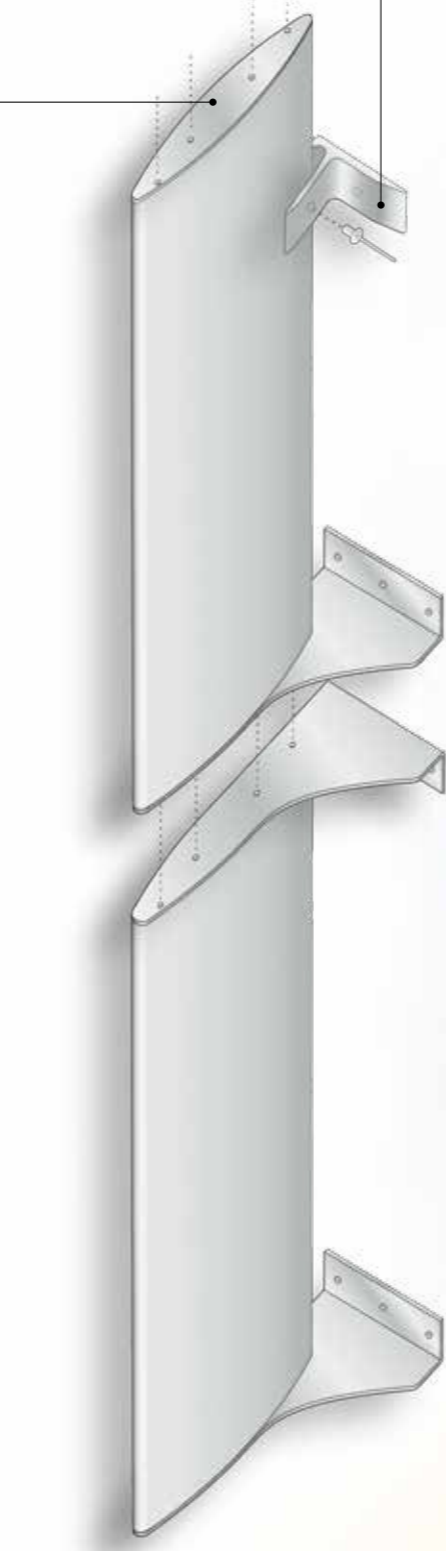


Console fixing brackets are available for 0°, 15°, 30° and 45° blade inclinations. Customised angles available upon request.

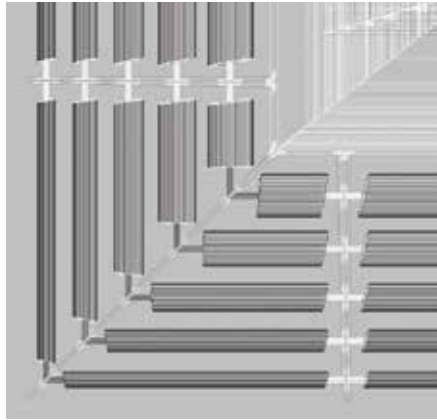


● **Direct end fixing plates in stainless steel**

Direct end fixing plate 90° in stainless steel are screwed first onto the end of the blade and are then fixed to the support structure. Available in the most commonly used angles.







▲ **Office building.** 3D model of a cantilevered arrangement of CS Airfoil® blades of 5 different sizes using compound angle fixing brackets as corner solution.



▲ **Screw channels.** In the front view of this CS Airfoil® AF380 blade the incorporated screw channels are clearly visible. The channels are part of the extrusion of the blade and run through its entire length. This allows for onsite cutting of the blade to any desired length and immediate fastening onto any fixing plate or bracket, saving time and effort during the installation process.



▲ **Birdsmouth brackets.** Horizontally mounted CS Airfoil® AF270 blades and their mounting structure shown from behind. Birdsmouth brackets have been fixed onto vertical support segments at specified distances and CS Airfoil® blades were then simply slotted into the brackets and fixed with screws or rivets. Birdsmouth brackets allow for speedy onsite installations and have the additional advantage of being virtually invisible when seen from the front.

**Blades**

CS Airfoil® blades are extruded in grade 6063-T6 aluminium alloy in seven standard widths. Blades can be extruded in lengths of 4.0 and 6.0 metres.

However, subject to minimum quantities, we are able to extrude any blade profile to one or more specific lengths to suit project requirements and minimise unnecessary waste through excessive cutting .

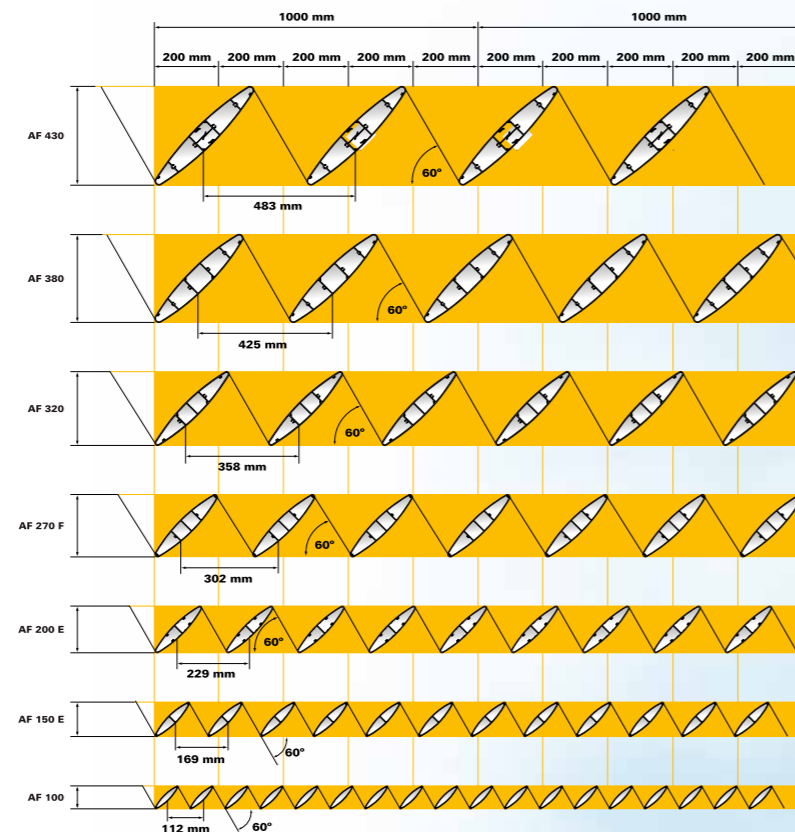
**Mounting Options**

There are various methods for fastening CS Airfoil® blades to the supporting structure, although usually blades would be 'end fixed' between the depth of the supporting frames. An alternative fixing method is the use of birdsmouth brackets which have the additional advantage of being virtually invisible after installation.

**Bracket and blade size compatibility**

	Material	Angle	AF-100	AF-150	AF-200	AF-270	AF-320	AF-380	AF-430
<b>Birdsmouth bracket</b>	Aluminium	30°	—	●	—	—	—	—	—
	Aluminium	45°	—	●	●	●	●	—	—
	Aluminium	60°	—	—	—	—	●	—	—
	Aluminium	90°	—	●	●	●	●	—	—
<b>Closing Plate for use with birdsmouth bracket</b>	Aluminium		—	●	●	●	●	—	—
	Stainless Steel		—	●	●	●	●	—	—
<b>Direct ends fixing plate</b>	Stainless Steel	various	●	●	●	●	●	●	●
	Steel		—	—	—	—	—	—	—
<b>Parallel Off-set fixing bracket</b>	Stainless Steel	various	—	●	●	●	●	●	●
	Steel		—	—	—	—	—	—	—
<b>Compound angle fixing bracket</b>	Stainless Steel	various	—	●	●	●	●	●	●
	Steel		—	—	—	—	—	—	—
<b>Custom made fixing bracket</b>	Aluminium	various	●	●	●	●	●	●	●
	Stainless Steel		—	—	—	—	—	—	—

**Blade inclination of 45° and shadow projection of 60°**



**End Fixings**

All CS Airfoil® blades incorporate screw channels within the extrusion, allowing self-tapping screws/or bolts to be passed through supporting end plates and into the end of the blades.

This method of fixing is strong enough to support the blade even at its maximum span.

**Birdsmouth Brackets**

Extruded aluminium brackets for AF-150E, AF-200E, AF-270F and AF-320 blade profiles are available in 45° and 90° angle options and can be cut to custom width to adapt to the metallic structure.

**Blade span capacity**

Blade	Snow load	Blade span with inclination angles of 45° and 90°		
		0 - 8 m	Height 8 - 20 m	20 - 100 m
AF 100	I	2340	2145	2000
	II	2170	2020	1905
AF 150 E	I	3105	2850	2660
	II	2885	2650	2525
AF 200 E	I	3980	3660	3420
	II	3705	3455	3265
AF 270 F	I	4405	4055	3795
	II	4105	3830	3620
AF 320	I	4835	4465	4185
	II	4515	4225	3995
AF 380	I	5915	5475	5140
	II	5540	5150	4920
AF 430	I	6070	5620	5280
	II	5685	5330	5050



▲ **Custom blade supports.** The custom blade supports shown above have been specifically designed for cantilevered projections of Audi showrooms. CS Airfoil® AF270 blades are fixed onto vertical custom-made supports which, in turn, are attached to horizontal support segments. The lightweight but extremely robust structure of CS Airfoil® blades allow for the design of any imaginable support, fixture, suspension or attachment. The result is an extremely versatile, architectural design element as well as a highly efficient and effective sun control system.



▲ **Parallel offset fixing bracket.** A detailed view of an 90° parallel offset fixing bracket attaching a CS Airfoil® AF 270F blade onto a vertical support segment is illustrated above. The brackets are screwed directly onto the end of the blade thanks to the special screw channels incorporated into the extrusion. The bracket-blade unit is then fixed with bolts onto the support segment. The availability of parallel off-set fixing brackets and compound angle fixing brackets in a wide variety of angles cater for an unlimited range of design possibilities and adapt to virtually any project specifications.





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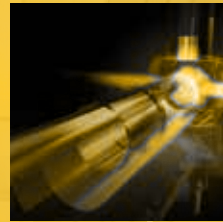
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