Asymmetrical Products
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The most advanced sun shading systems must be able to meet many different requirements. During the day, they should provide pleasant shade, whereas in the evening, they should allow as many of the last rays of the sun to enter the room as possible. They should keep the room cool in summer but help to save energy in winter. WAREMA state-of-the-art sun shading products meet all of these requirements, even with asymmetrical and angled glazing.

They are made to measure to meet every requirement - tailor-made for every window, every terrace, every balcony, every conservatory and thus fit every façade perfectly.

A huge variety of materials, shapes, colours and designs turns your every design wish into reality. With WAREMA’s trusted quality!
Photometric values of the sun

Interesting facts
The sun, as the source of natural light, radiates an almost constant energy of 4.2 billions of kilowatt hours per day to the Earth. There are four reasons why the radiation arriving on the surface of the Earth is not constant nor distributed evenly.

1. In 24 hours, the Earth rotates once around its own axis.

2. The axis of the Earth is inclined by 23.45 degrees away from the plane of the Earth's orbit, leading to a variation in the angle of radiation of the sun's 46.9 degrees during one rotation around the sun (one year).

3. Meteorological changes, due to clouds and haze, reflect part of the sun's energy back into space.

4. Depending on the geographical latitude, the sun rays hit the surface of the Earth at different angles. The further away from the Equator, the smaller the angle and the less heat is generated per defined surface unit.

The height of the sun results from the time of day and the seasonal path of the Earth. The resulting fact is that, seen in terms of anti-glare protection, the sun has to be classified as being more aggressive in winter and spring, due to its low angle of incidence.

This is why every glazed surface needs sun and glare protection - even asymmetrical windows!

The sun's rays can be split into different sections

- **UVC radiation** (radiation wavelength 200 - 280 nm)
  - Energy-rich, short-wave radiation that is blocked by the ozone layer of the atmosphere.

- **UVB radiation** (radiation wavelength 280 - 315 nm)
  - Portion of radiation that causes sunburn and skin damage.

- **UVA radiation** (radiation wavelength 315 – 380 nm)
  - Partially responsible for sunburn and skin ageing.

- **Visible light** (radiation wavelength 380 – 780 nm)
  - Part of the radiation wavelength visible to the human eye.

- **Infrared radiation** (radiation wavelength 780 – 2,500 nm)
  - Heat radiation.
An illustration of the problem

Modern architecture is characterised by a large proportion of windows and glazing. Unorthodox shapes, eye-catching designs and a certain ease of construction are all architectural details designed to meet the demands of builders and architects.

This results in a number of problem surfaces that pose a challenge to the WAREMA sun shade experts.

There are more and more triangular- and rhombus-shaped glass surfaces urgently requiring shading, in addition to asymmetrical glazing on glazed extensions and conservatories etc.

The necessity to create a pleasant interior environment and to achieve comfort and sometimes even a requirement to be able to use the rooms at all, requires sun shading systems, which can provide shading in even problematic cases.

WAREMA supplies a wide range of internal and external systems to meet these requirements.

The WAREMA range includes:
- External venetian blinds
- Roller shutters
- Triangular and rhombus-shaped canopy awnings
- Dutch canopy awnings
- Roller blinds
- Pleated blinds
- Vertical louvre blinds
- Internal venetian blinds
Asymmetrical roller shutters

The asymmetrical roller shutter is a made-to-measure solution for modern asymmetrically glazed windows. Special clips, specially designed guide rails and the unique technology in the shutter box guarantee their smooth operation.

**Box**
The angled or half-round box which is made of extruded material and closed on four sides can be easily mounted into the soffit - without the box protruding.

**Guide rails**
Special guide rails with a continuous plastic layer ensure silent and smooth running of the curtain.

**Operation**
By means of a powerful 230 V drive. Also available with remote control or solar-powered drive without mains connection and need for an opening; always with remote control.

**Curtain**
Rollformed, CFC-free foam-filled aluminium profile A 36 without light slits. Only one or two bars of the raised shutter curtain are still visible, that is scarcely an annoying triangle that restricts light.

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**Asymmetrical roller shutter with rectangular/asymmetrical box FR 91**

1. Cover panel
2. Inspection cover
3. Guide rail
4. Roller shutter curtain
5. Shaft
6. End rail

**Asymmetrical roller shutter with half-round cover FR 92**

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**Suggested applications**

Simple and easy to fit within the soffit without projecting out

Alternatively available with solar drive

No annoying curtain visible when the shutter is rolled up
Special features
WAREMA asymmetrical roller shutters
- No lateral projection of the box beyond the guide rails
- Roller shutter curtain retracts almost completely inside the box
- High operating convenience thanks to motor drive, also available with remote control
- Optional solar-powered drive, without mains connection or wiring
- Exposed aluminium parts are powder coated in accordance with the RAL colour chart

<table>
<thead>
<tr>
<th>Box sizes</th>
<th>Asymmetrical roller shutter FR 91</th>
<th>Asymmetrical roller shutter FR 92</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. width</td>
<td>190-250 cm</td>
<td>190-250 cm</td>
</tr>
<tr>
<td>Max. height</td>
<td>230-300 cm</td>
<td>230-300 cm</td>
</tr>
<tr>
<td>Max. surface area</td>
<td>approx. 5.5 m²</td>
<td>approx. 5.5 m²</td>
</tr>
<tr>
<td>Angle</td>
<td>10-45°</td>
<td>10-45°</td>
</tr>
<tr>
<td>Curtain colours</td>
<td>A 36</td>
<td>35</td>
</tr>
<tr>
<td>Colours for boxes, guide rails, end rails</td>
<td>to RAL colour chart</td>
<td>35</td>
</tr>
</tbody>
</table>
WAREMA's asymmetrical external venetian blinds can be used on almost all asymmetrical windows that are a standard feature in modern architecture.

WAREMA's asymmetrical external venetian blinds visually blend with other venetian blinds to create a uniform visual appearance.
Cover panel
Folded cover panels are available in different colours and shapes, adjusting to the angle of inclination of the top rail.

Top rail
Top rail made of extruded aluminium. No corrosion, bending or twisting. With electric drive, special bearing and fixtures for side guidance.

Lifting tape
Per blind, there are only two lifting tapes made of weatherproof material. An unobtrusive width of 6 mm, but extremely tear resistant.

Slat guidance
80 mm wide flat slats, with coated edges. The lifting tape and guidance perforations are lined with plastic eyelets to reduce abrasion and wear to a minimum.

Connection slat/ladder tape by means of special perforation for minimum incidence of light.

Lateral guidance
Lateral guidance by a 6 mm stainless steel rod or by a plastic coated stainless steel cable with special spring tension device for optimal cable guidance.

Slat guidance
Slat guidance in the end rail with fully rotating, special nipples on slide bearings.

End rail
The telescopic end rail does not tilt with the slats to blend consistently with standard venetian blinds.

Special perforations ensure the least possible incidence of light

Some of the many possible uses
The various blinds can be combined with each other! - Our sales offices will be happy to advise you!

<table>
<thead>
<tr>
<th>Maximum/minimum dimensions</th>
<th>Inclination of the top rail</th>
<th>Max. width</th>
<th>Min. width</th>
<th>Max. height long side</th>
<th>Min. height short side</th>
<th>Max. awning area</th>
<th>Slat width</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5° - 45°</td>
<td>182 cm (b)</td>
<td>70 cm</td>
<td>390 cm</td>
<td>18 cm</td>
<td>7m²</td>
<td>80 mm</td>
<td>80 switches</td>
<td></td>
</tr>
<tr>
<td>251 cm</td>
<td>75 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The maximum and minimum widths depend on the axis of inclination of the top rail and refer to the axis dimension of the lateral guidance.

Curtain surface = ((a+b)/2)xb
Triangular shading systems

Due to their large glazed area, conservatories require effective and complete sun screening systems. However, there are many triangular panes, especially in conservatories, which cannot be screened using standard awning systems. The WAREMA triangular shading system ensures that even these panes are also screened and that the temperature in the conservatory remains at a pleasant level.

Product
The triangular shading system functions on the back pull principle, i.e. while the awning is being projected, the fabric is wound off its extruded aluminium shaft and, at the same time, the textile draw element is wound up. A spring mechanism accommodated within the fabric tube evens out the difference between the different winding diameters and ensures that the fabric tension is perfect.

Shapes
WAREMA conservatory awning Type D2 can be manufactured in a triangular and rhombus shape with equal leg lengths, right angles or asymmetrical.

Fabric selection
All fabrics are manufactured with the assembly seams running in a radial direction.

Acrylic fabrics
The light-resistant and tear-resistant brand acrylic curtain is impregnated and is thus made stain-resistant and water-repellent. A wide range of mono-colours are available.

Soltis fabric
Soltis fabrics are coated under extremely high tension. This results in an extremely dimensionally stable fabric with minimum stretch that is ideal for large areas of shading. Soltis 92 has minimal warp - not just in the warp and weft but also in terms of its diagonal stability. The fabric is hardly inflammable and/or self-extinguishing.
Clamping frames
The surface of the aluminium arched profile triangular clamping frame, 45 x 18 mm or 75 x 18 mm, is powercoated; either natural or anodized in a colour. Corners are mitre cut and riveted. The arched profile is equipped with a sealing strip. The awning fabric can either be made of 100% brand acrylic fabric or Solits 92, which is invisibly fixed to the weather strip. Vertical stiffening profiles are provided, spaced approx. 60 to 70 cm apart. These are fixed using aluminium support brackets.

| Type 1 | Type 2 | Type 3 |

<table>
<thead>
<tr>
<th>D1</th>
<th>Clamping frames</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. width</td>
<td>500 cm*</td>
</tr>
<tr>
<td>Max. projection</td>
<td>400 cm*</td>
</tr>
<tr>
<td>Max. surface area</td>
<td>10 m²*</td>
</tr>
<tr>
<td>Mech. coupled blinds</td>
<td>no coupling is possible</td>
</tr>
<tr>
<td>Drive</td>
<td>motor</td>
</tr>
</tbody>
</table>

*depending on fabric
Roller blinds

Rhombus and triangular blinds, in all shapes, colours and designs are the solution to the problem of modern glazed architecture.

<table>
<thead>
<tr>
<th>Uses</th>
<th>pivoting and tilting windows, fixed glazing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>central cord/motor</td>
</tr>
<tr>
<td>Lateral guidance</td>
<td>—</td>
</tr>
<tr>
<td>Methods of installation</td>
<td>wall, ceiling and soffit</td>
</tr>
<tr>
<td>Max. width</td>
<td>150 cm</td>
</tr>
<tr>
<td>Max. height</td>
<td>150 cm</td>
</tr>
<tr>
<td>Max. m²</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Pleated blinds

Asymmetrical systems (Slope)
The asymmetrical blinds designed for vertical gable windows are operated by a cord. They can be stopped at any position using a cord winder. These blinds can be fully operated up to angles of 50°. Narrower angles leave a triangular part showing.

Special shapes (Type X)
Rhombus and triangular blinds, in all shapes, colours and designs are the solution to the problem of challenging applications and modern glazed architecture. Fixed frames can be used for non-operable glazed surfaces. The popular special types can be operated by a handle or rod.

<table>
<thead>
<tr>
<th>Asymmetrical systems (Slope)</th>
<th>Special shapes (Type X)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uses</strong></td>
<td>angled gable windows</td>
</tr>
<tr>
<td></td>
<td>vertical or horizontal</td>
</tr>
<tr>
<td></td>
<td>unusually-shaped glazing</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td>cord</td>
</tr>
<tr>
<td></td>
<td>handle or rod</td>
</tr>
<tr>
<td><strong>Lateral guidance</strong></td>
<td>not available</td>
</tr>
<tr>
<td></td>
<td>possible</td>
</tr>
<tr>
<td><strong>Methods of inst.</strong></td>
<td>wall, ceiling, soffit,</td>
</tr>
<tr>
<td></td>
<td>glass profile</td>
</tr>
<tr>
<td><strong>Max. width</strong></td>
<td>220 cm*</td>
</tr>
<tr>
<td><strong>Max. height</strong></td>
<td>260 cm</td>
</tr>
<tr>
<td></td>
<td>200 cm</td>
</tr>
<tr>
<td></td>
<td>250 cm (accord. to design)</td>
</tr>
</tbody>
</table>

*dependent on the width of the fabric and the angle of inclination
Vertical louvre blinds

Sloped blinds
All "Slope" designs, operated either by cord or motor, are perfectly suited for slanted roof windows.

<table>
<thead>
<tr>
<th>Uses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>windows, doors and gable glazing</td>
</tr>
<tr>
<td>Operation</td>
<td>ball chain and cord, motor</td>
</tr>
<tr>
<td>Methods of installation</td>
<td>wall, ceiling and soffit</td>
</tr>
<tr>
<td>Max. width</td>
<td>700 cm (length of top rail)</td>
</tr>
<tr>
<td>Max. height</td>
<td>500 cm</td>
</tr>
<tr>
<td>Max. surface area (m²)</td>
<td>15 m²</td>
</tr>
<tr>
<td>Slat width</td>
<td>127 or 89 mm</td>
</tr>
</tbody>
</table>
Internal venetian blinds

The asymmetrical louvre blind is the sophisticated solution for asymmetrical gable glazing. Especially when accommodated within the glass profile does it truly function as sun shading. The louvres in the rectangular section of the blind can be adjusted and turned. The handy battery-operated turning motor can be provided for positions that are hard to reach.

<table>
<thead>
<tr>
<th>Uses</th>
<th>windows, doors and gable glazing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>cord (turning-only), turning motor</td>
</tr>
<tr>
<td>Methods of Installation</td>
<td>wall, ceiling and soffit</td>
</tr>
<tr>
<td>Max. width</td>
<td>250 cm (width of top rail)</td>
</tr>
<tr>
<td>Max. height</td>
<td>250 cm</td>
</tr>
<tr>
<td>Max. surface area (m²)</td>
<td>4 m²</td>
</tr>
<tr>
<td>Slat width</td>
<td>16, 25 and 35 mm</td>
</tr>
</tbody>
</table>
Dutch canopy awnings

The WAREMA Dutch canopy awning meets even the most individual demands. Four different shapes in more than 15 designs can not only be adapted to any structural conditions, but also leave plenty of room for individual choice. More than 100 designs from the varnished fabric and acrylic fabric collection will satisfy any individual preference.

WAREMA Dutch canopy awnings have no limits in terms of design either, as they can be supplied fixed as well as movable. If required, an electric motor and remote or automatic controller are available for ease of operation.

<table>
<thead>
<tr>
<th>Uses</th>
<th>unusually-shaped windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. width</td>
<td>450 cm</td>
</tr>
<tr>
<td>Max. height</td>
<td>160 cm</td>
</tr>
<tr>
<td>Mech. coupled blinds</td>
<td>no coupling is possible</td>
</tr>
<tr>
<td>Drive mechanism</td>
<td>fixed, crank, motor</td>
</tr>
</tbody>
</table>
Spoilt for choice

WAREMA asymmetrical products are not just tailor-made, in terms of their function, to meet your personal design guarantees. The wide range of fabrics, materials and colours guarantee that everyone can find something to their taste. In short: inside and outside - WAREMA has the product to make your individual design style reality.

Colours

Colours have a higher impact than we realise. They affect us by their radiation and intensity. With yellow, we can feel how we gain energy, while blue has a calming effect on us. Red colour gives us strength and green gives us a relaxing freshness. By perceiving the colours and immersing yourself in the colours, you create your own personal style - inside and outside.

The expressiveness of the colours is increased by your own sense of colour and style of living. Colour and style preferences are thus also crucial in the design of exterior space. Combine the worlds of fabric colour with the superior engineering and quality of WAREMA products.

Fabrics and Materials

Each collection offers a wide range of materials for every application. Our interior sun shading fabrics are thus not only delicate and decorative but also meet specific technical requirements, depending on their use. They are either hardly inflammable, in compliance with DIN 4102, PVC-free, suitable for use in humid environments and extremely easy to look after. We use exceptionally high-performance fabrics for external use. We set the most exacting standards for these and all other materials, such as aluminium profiles, brackets etc. And we meet these by means of strict quality control and continuous product development.
Total product range
External venetian blinds
External venetian blinds, with their horizontal slats, are perfect for regulating daylight. They are equally suitable for domestic conservatories and private dwellings as well as offices and public buildings. A wide range of designs, louvre shapes and cover panels, and of course their high level of stability, makes these marvellous all-rounders.

Roller shutters
Front-mounted systems enable these to be used almost unrestrictedly on the façade of any building. They also provide improved heat insulation, protection against break-in, privacy and sun shading. They can of course also be integrated inconspicuously into the façade of the building and be designed with additional insect screening.

Total black-out systems
These total black-out systems have been specifically designed to meet the most stringent demands in terms of 100% blackout. They are widely used in laboratories, hospitals, lecture rooms, schools and anywhere that needs maximum possible blockage of daylight.

Vertical awnings, Markisolettes, Façade awnings
Fabric sun shading systems, available in a limitless range of designs, create a friendly, minimalist and colourful atmosphere. The simple engineering enables vertical awnings to be easily and unobtrusively incorporated into the façades of buildings.

Conservatory awnings
Modern architecture entails expansive areas of glazing. But even unusual areas, or surfaces that are difficult to screen, present no problem for WAREMA conservatory awnings. Their high level of technical reliability, wide range of automatic control options and of course their practical use are key to this. With their integrated sensor control, conservatory awnings Types W6 and W8 can also monitor the wind and control the awning according to the sun’s intensity, without the need for cables for the weather sensors.

Articulated arm awnings, Cassette awnings
Nine different WAREMA awnings provide effective protection from the sun and comfortable shading on balconies and terraces. The wide range of colours and designs will meet your every demand and turn every house into a work of art.

Insect screens
The complete range of insect screens provides pleasing protection from annual pests, in the form of a vertical roller blind, sash door, revolving door or fixed frame. Unobtrusively fitted and yet very strong, insect screening systems provide effective protection.

Sun shading systems for roof windows
Roof window shutters and awnings are ideal for effective sun shading. Internal systems, louvres and roller and pleated blinds, provide screening from the sun’s rays and create a wonderful interior environment. All products can be supplied for the majority of roof windows available on the market.