



## FOR CLEAR VISIBILITY WITHOUT REFLECTIONS

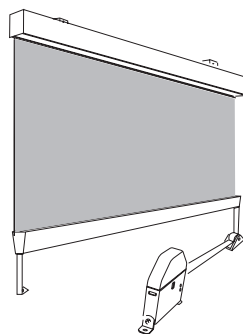
### Solar protection for ship bridges

The BERGAFLEX system for sun and glare protection has been installed on a great number of ship bridges since the 1980s.

We take the measurements on board, make and fit the solar protection system within the agreed time, and integrate it with all other equipment on the bridge.

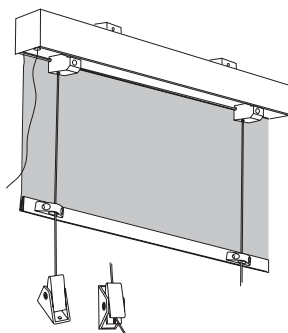
BERGAFLEX shades, based on metallised polyester film, are available in different colour combinations. They reduce solar energy by up to 90 % and have a light transmission of between 2 % and 13 %.

Please contact us for further information regarding sunscreens or blackouts for map rooms and cabins on board.



BERGAFLEX sunscreen with roller spring, constant tension, double pulley bottom rail.

*Produced in cassettes 027/S, 058/S or 069/S. Cord or textile band for positioning*



BERGAFLEX sunscreen with steel wire designed to guide the film sideways and to maintain the distance to the window.

*Produced in cassette 027/S as a cord reel type, in cassette 058/S and 069/S as a cord reel or band reel version, or motorised with a 220V/1 phase 50–60 Hz tube motor.*

## Our Brand

Is synonymous with exceptional quality and carefully considered designs which integrate perfectly with windows.

We produce high-tech products that build on tradition and experience.

The company was founded in 1964. Since 1970, we have concentrated on metallised films.

## Metallised Films

Ordinary water boils at 100°C at sea-level. At the top of Mount Everest where the air pressure is lower, however, water boils much quicker. In a vacuum (1/100,000 air pressure) aluminium, copper, titanium and stainless steel will all boil when heated. The steam from the melting metal condenses onto a plastic film where it is steered and controlled in order to achieve:

- increased light transmission/light reflection
- the required level of heat resolution
- the required electrical conductivity.

## Pigmented Films

Colour pigments, metal pigments and other microscopic particles float in a high-pressure bath and are pressed into the film from both sides. The longer the film is left in the bath, the more pigment it absorbs. Once encapsulated within the film, the pigments are protected against UV-rays.

The choice of pigments determines the levels of light and heat absorption, as well as the colour of the light that penetrates the film.

## Combination Films

As the name implies, combination films are a combination of a metallised film with either one or two different dyed films, or a combination of two dyed films.

Films can be used in BERGAFLEX shades, or permanently laminated to a window with the addition of another layer of glue.

## Why Metallised?

Metallised films act as mirrors – they have a unique ability to reflect high-intensity rays from the sun. This indoor solar protection is relatively cheap to buy and maintain. It also has an unsurpassable life expectancy, and is not affected by weather, corrosion or pollution.

## Shades

Our shades work in combination with metallised films and blackout materials. They are made with protective and functional aluminium casings. We measure up and produce the shades to integrate fully with all types of windows.

Our side rails are adequately proportioned, and may be directed and combined with our aluminium casings. For operating purposes, we can offer a cord reel or roller

spring unit for casing 027, a cord reel, a tape reel shades spring unit or an electric motor for casing 069.

When choosing metallised films, you should consider three factors:

1. Light transmission
2. Shading coefficient
3. Light colour

For blackout shades, fabrics are available in different colours and with different properties (fire proof, etc.). We can, however, also use a fabric of the customer's own choice. We measure up, make and fit the shades ourselves or via our authorised retailers.

## Laminated Films

These change and add value to standard window glass. Depending on the individual film, the following effect may be achieved:

- reflective glass
- light- and heat-absorbent glass
- sanitary glass
- protective glass

Most films are laminated on the inside of the glass, but some films are tested and approved for use on the outside. These are suitable for the lamination of insulated glass for which any still-valid insurance warranty against glass breakage may expire if laminated on the inside. Please contact us for advice on the treatment of insulated glass.

## Reflective Glass

Different degrees of light transmission and shading can be achieved depending on the degree of metallisation.

## Absorbing Films

Different degrees of light transmission and heat absorption can be achieved depending on the degree of pigmentation.

## Combination Films

These are a combination of reflecting and absorbing films. Most films fall into this category.

## Dispersing Films

Depending on the treatment and structure of the film, light dispersion will be achieved. The addition of pigment results in coloured light.

This film is suitable for use in dressing rooms and sanitary establishments, where a good light supply is required during the day but privacy is desirable at night.

## Safety Films

Different thickness levels exist for different safety requirements. Some are available with a metallised treatment (see separate product sheet).



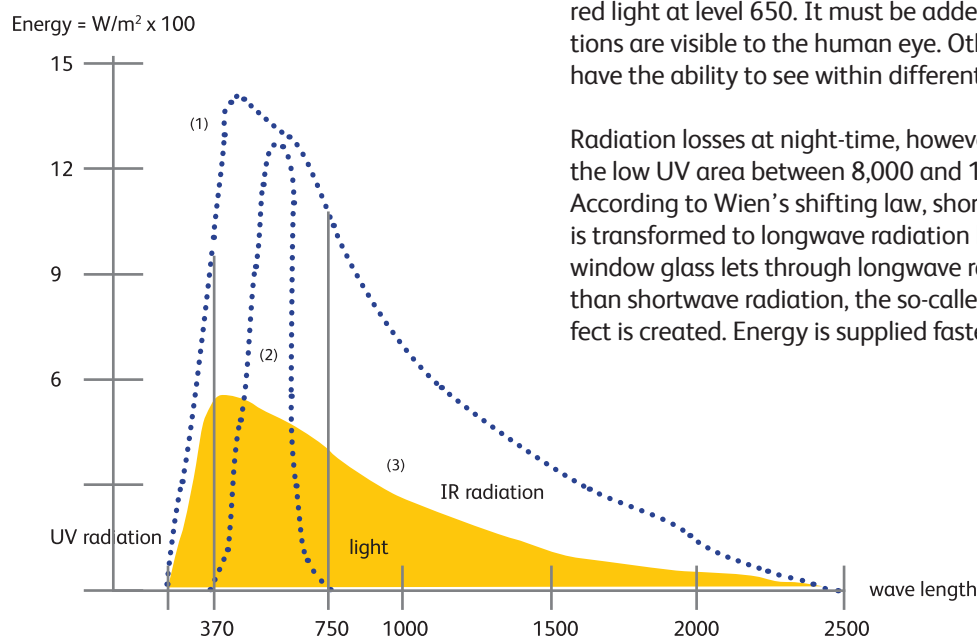
## Energy contents of the sun at our latitude and at sea level

The area between curve 1 and the baseline represents the total solar energy as measured at ground level. The vertical lines at 370 and 750 nanometres restrict the energy content of the light. The eye does not detect light at all times. The average value is 35 % as shown by curve 2. The area between curve 1 and curve 2 represents the

amount of energy which is stopped by a foil with 70 % total reflection (equal to shading coefficient 0.30). The area between curve 2 and the baseline represents the energy leakage into the room.

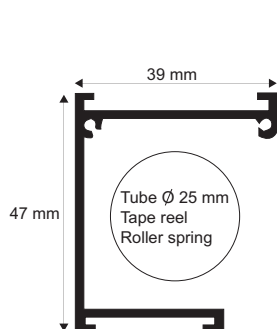
The ultraviolet area is on the left of 370 nanometres, and has a relatively low energy content. Most of the UV radiation is absorbed by the glass, which explains why it is not possible to get a suntan through a window. The window will also remain relatively cold to the touch. The transition to UV light takes place at level 370, and to red light at level 650. It must be added that those transitions are visible to the human eye. Other living creatures have the ability to see within different limits.

Radiation losses at night-time, however, mainly lie within the low UV area between 8,000 and 12,000 nanometres. According to Wien's shifting law, shortwave radiation is transformed to longwave radiation by absorption. As window glass lets through longwave radiation slower than shortwave radiation, the so-called greenhouse effect is created. Energy is supplied faster than it is lost.

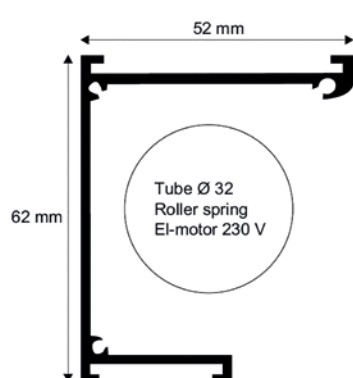


## Product Features

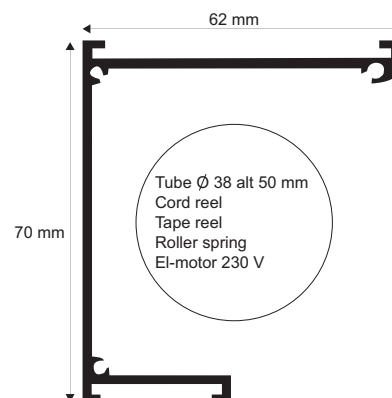
	Cassette 027/S	Cassette 058/S	Cassette 069/S
Drivers	Cord reel, roller spring	Roller spring, motor	Cord or tape reel, roller spring, motor
Standard colour	white powder painted (RAL 9010U) natural or brown anodised aluminium	natural anodised aluminium	natural anodised aluminium white powder painted (RAL 9010U)
Max. dim. mm (approx.) dependent on thickness and weight	1,800 x 1,500	2,500 x 2,500	3,600 x 3,000



Cassette 027/S

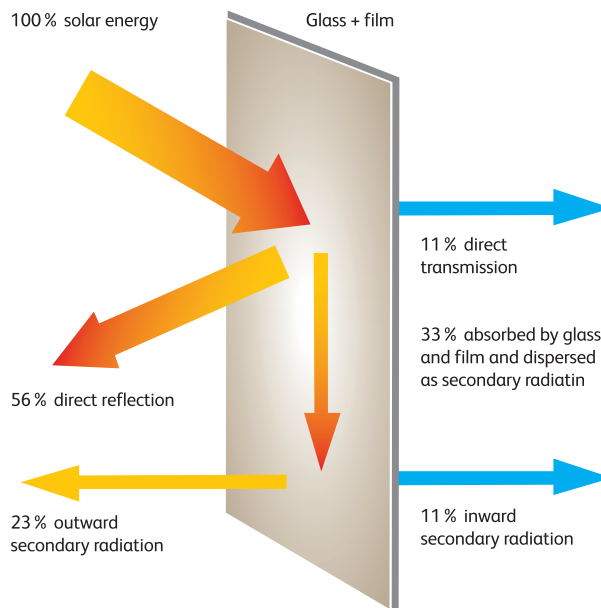


Cassette 058/S



Cassette 069/S

## Energy dispersion in a film with 79% total heat reduction



## BERGAFLEX Shade films (standard films)

Film type/ Properties	BSG 2	SG 2.4	GGR	Bronze	GSG	BSG 6	P-Grey •	P-White •	P-Blue •
Light transmission %	2	2	6	10	9	6	0.00	0.00	0.00
UV transmission %	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Shading coefficient	0.10	0.10	0.22	0.52	0.45	0.47	–	–	–
External colour impression	bronze	silver	gold	bronze	grey	bronze	alu	alu	alu
Internal colour impression	grey	grey	grey	bronze	grey	grey	grey	white	blue

The table shows the most common films. Our product range also includes other types of films.

## BERGAFLEX Laminating films

Film type/ Properties	Silv 16	Silv 30	Brons Silv	Sputter A	Silv Ext 16	Silv Ext 30	Si/Bro Ext
Light transmission %	16	30	8	36	16	30	8
UV transmission %	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Shading coefficient	0.22	0.34	0.28	0.51	0.18	0.28	0.24
External colour impression	silver	silver	bronze	metal	silver	silver	bronze
Internal colour impression	silver	silver	silver	metal	silver	silver	silver

## BERGAFLEX Safety films

Film type/ Properties	SA 4	SA 8	SA 11	SA 12	SA 16	SA 5 MS 50	SA 5 SPS 35	SA 5 SPS	SA 5 PB
Thickness mm	0.1	0.2	0.3	0.3	0.4	0.125	0.125	0.125	0.125
Foil layers	2	4	5	6	8	3	3	3	3
Light transmission %	93	93	93	92	91	20	50	35	50
UV transmission %	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

The shading coefficient shows the amount of solar energy which ends up behind the arrangement, most often in the form of secondary radiation. The lower the value the more effective the reflective arrangement. Still, a high-coefficient foil can be used to good effect if heat absorbed in the foil is ventilated away, which is the case if the foil is fitted to a self-ventilated window.

All values are based on Ashrae-testing methods. This means, among other things, that the foil is fitted to the inside of 4-millimetre thick neutral glass.