

REFLEX-ROL BLINDS: CONTROLLING SOLAR GLARE, REFLECTION AND HEAT



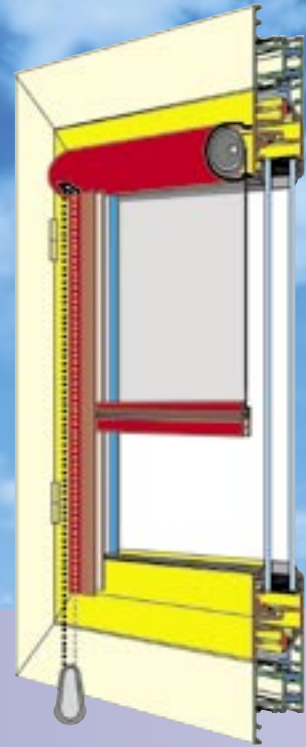
# Reflex-Rol

**SOLAR GLARE,  
REFLECTION AND  
HEAT CONTROL SYSTEMS**



Reflex-Rol is a division of De Leeuw Ltd

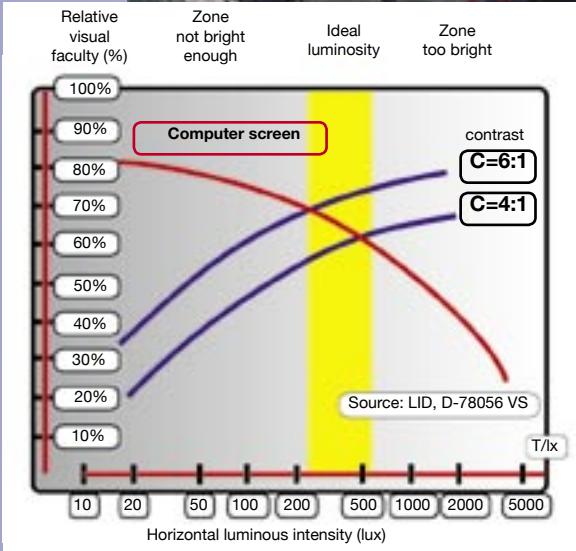




# Reflex-Rol

Reflex-Rol, the universal system combining all functions in a single reflector.

- First-class thermal protection
- Ergonomic solar shading
- Regulation of luminous intensity and brightness on the work surface and in the room
- Visibility towards the outside
- Daylight entering without causing discomfort
- Additional thermal insulation





## Reflex-Rol

### INNOVATIVE AND DECISIVE ADVANTAGES FOR SOLAR AND THERMAL PROTECTION

#### THERMAL INSULATION

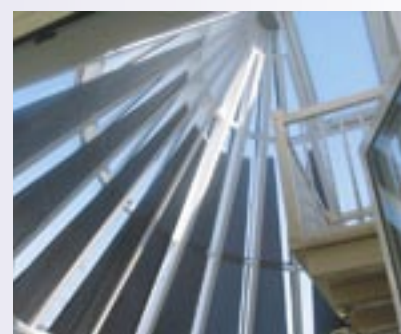
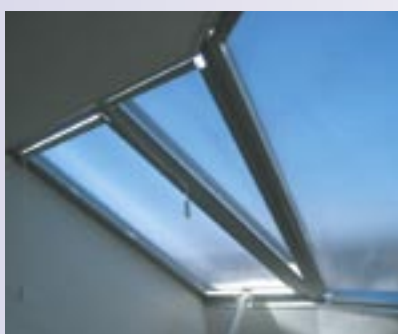
Reflex-Rol blinds are fitted with a semi-transparent, metallic polyester foil with excellent reflective power. The thermal insulation has a twofold action - in summer it prevents the greenhouse effect associated with large expanses of glass and in winter it prevents heat loss.

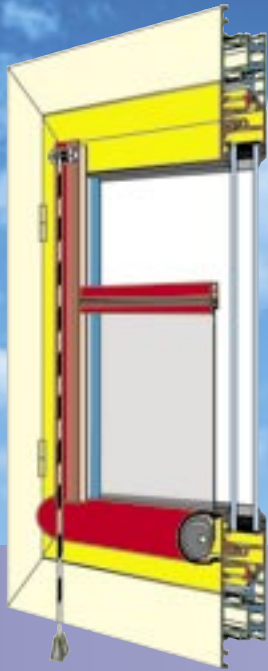
#### ANTI-GLARE

Reflex-Rol has studied the problem of excessive glare in-depth, particularly when working with computers. This research carried out in conjunction with various university institutes reveals that only soft light, filtered uniformly, guarantees good visual comfort, as there is no loss of contact with the natural exterior light. For this reason Reflex-Rol fits semi-transparent metallic polyester foils to its blinds.

#### SOLAR PROTECTION

Intense exposure to the sun's rays causes excessive temperatures in summer and damages the furniture. With Reflex-Rol blinds, the electro-magnetic waves pass through the exterior glass, bouncing off the metallic reflectors, and are then reflected once more towards the exterior without being converted into long waves and therefore heat energy. The room remains at a pleasant temperature, savings are made on air-conditioning costs and visibility is maintained towards the outside.





Aesthetic and discreet, can be fitted anywhere

- Reflex-Rol is discreet and attractively presented and integrates with all decors.
- Reflex-Rol suits all types of construction - wood, metal and aluminium.
- Reflex-Rol is fitted inside, on or between the opening joinery. The entire assembly only requires two fixing brackets.
- Reflex-Rol is presented in a small, carefully designed aluminium casing.
- Three rectangular sizes are available - 40/47, 40/60 and 67/70 mm - plus a Ø 41 round version.
- Over ten models of side guides complete the range for a meticulous installation.

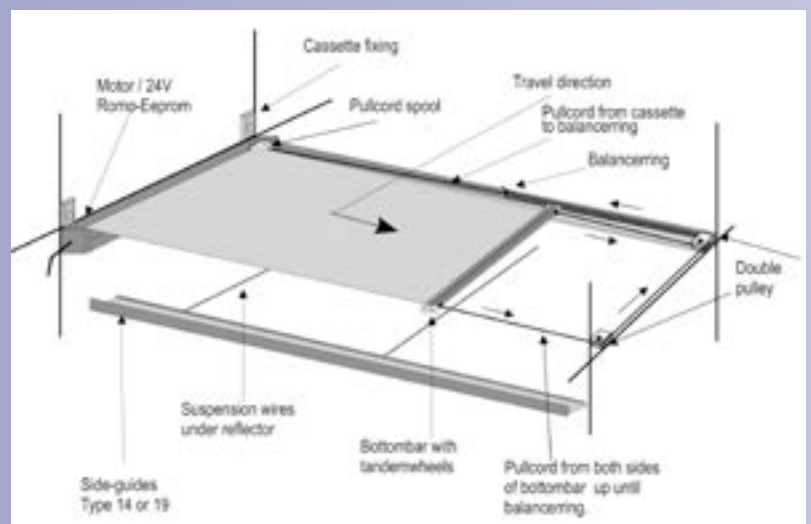
## Reflex-Rol VUNO

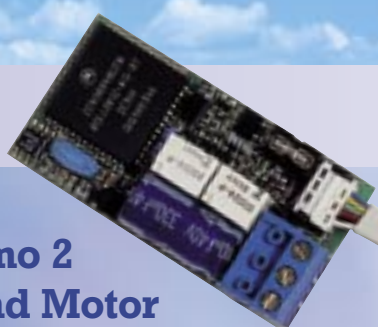
PERFECT SOLAR AND THERMAL PROTECTION IN EVERY WAY

Reflex-Rol's ergonomic research reveals that blinds adjustable from the bottom upwards provide the best visual comfort.

The result of these studies is the **VUNO** system, a specialist version of the **Reflex-Rol** blind.

With **VUNO**, a person working in front of a screen is not bothered by reflections on the screen and still enjoys natural light. This is very important, as the biorhythm is not disturbed when there is ambient light from outside and productivity is increased by 10%.





## Romo 2 Blind Motor

### POSITIONING

Opto-electronic sensors: better than 1 mm precision.

### PROGRAMMING

Some fifty parameters may be set, including five to ten by the end user, with three service modes; in-line connection.

### CONTROL

Individual or grouped connection depending on requirements; external sensors (for operating according to luminous intensity, temperature, time-timeclock, etc.) can be fitted.

### OPERATION

Via wall-mounted switch or infrared remote control (4 channels).

**SUPPLY**  
24V DC

**A SIMPLE INSTALLATION  
CONTROLLED BY HAND  
AND EYE**

Reflex-Rol motor with planetary gearing and electronic 24V control



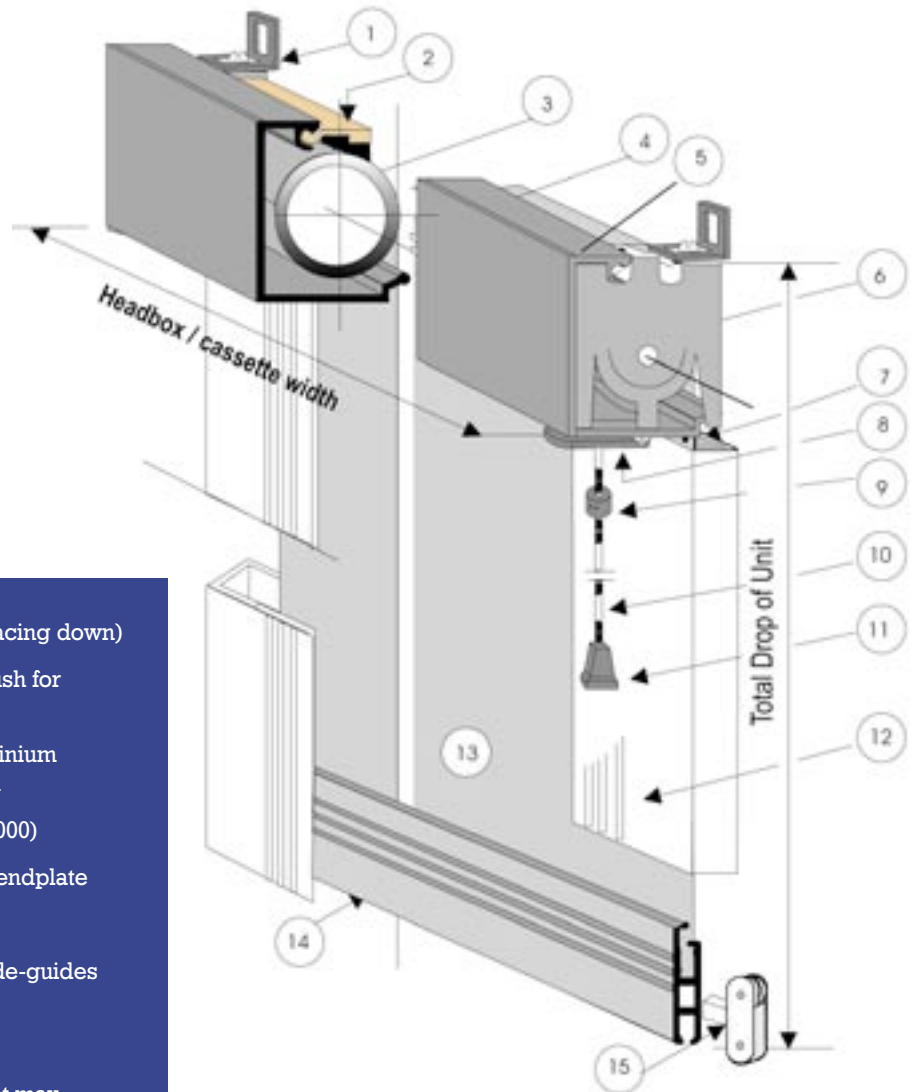
**A FULL  
DRIVE SYSTEM  
WITH PROVEN  
RELIABILITY**



Intelligent blind – can be integrated without difficulty into a centralised building control system.

# SCHEMATIC OF THE REFLEX-ROL ROLLER BLIND SYSTEM

## Reflex-Rol Type 2110 Headbox 2000 with single cord and standard bottom bar



1. Fixing Bracket (normally facing down)
2. Self adjusting cleaning brush for reflector dust removal
3. Roller Tube/standard aluminium 26/28mm or steel 26/27mm
4. Headbox (shown is type 2000)
5. Fixing screw for headbox endplate
6. Nickel plated end-plate
7. Headbox flange (adjust side-guides here)
8. Guide plate for pull-cord
9. Stop with grub-screw to set max. length
10. Pull cord
11. Toggle
12. Side-guides made of aluminium (many different types available).
13. Flat embossed High Capacity Reflector-foil (different grades available).
14. Aluminium Bottom bar.
15. Cosmetic endcap with integrated pulley for **Vuno** system.



## REFLEX-ROL DATA

It is of the greatest importance that H & V Engineers can make accurate calculations regarding heating, cooling and ventilation loads on buildings. The Technical University of Berlin and E.M.P.A. of Switzerland have calculated the data shown below. All calculations are according to E.U. and D.I.N. norms.

In the table below, calculations and measurements have been made with the reflector foil 30mm behind a 4/12/4 clear glass, sealed double glass unit.

Foil Type	$T_e$	$T_{65}$	$T_{uv}$	$r_e$	$r_{65}$	$q_1$	$g_{value}$	$u_{value}$	$r_a$
G2015	1.7	1.6	–	62.3	73.9	16.6	18.3	–	–
G1960	8.4	4.7	0.1	29	23	39.1	47.5	1.8	78
XXS	0.0	0.0	0.0	–	–	–	–	–	0
G1935	0.0	0.0	0.0	68	80	14.2	14.2	1.3	0
G1918	3.0	2.8	–	55	59	22.0	25.0	1.7	–
G1915	3.2	2.9	0.03	62	7.3	16.4	19.6	1.7	88
G1911	1.6	1.7	0.04	66	76	14.8	16.4	1.7	95
G1900	2.4	2.9	0.9	66	76	13.8	16.2	1.7	98

### $T_e$ = Radiation Transmission Degree

The percentage of global radiation entering the room of office without changing wavelength. Global radiation is the combined Solar Radiation and general radiation from the sky.

### $T_{65}$ = Light Transmission Degree

The percentage of light passing through the glass and reflector. All daylight is not constant, we must assume a certain norm. D65 is the norm defined by DIN for European standards.

### $T_{uv}$ = Ultra Violet Transmission Degree

The percentage of ultra violet passing through. Measured between 280-380 nanometres. The UV transmission degree is of vital importance when we wish to protect objects from being damaged like colour coding.

### $r_e$ = Radiation Reflection Degree

This shows us the percentage of global radiation being reflected (ref. to  $T_e$ ).

### $r_{65}$ = Light Reflection Degree

Shows us the percentage of daylight being reflected (norm is D65).

### $q_1$ = Secondary Heat Radiation

Describes the percentage of energy entering the room by secondary effects (Convection-Re-Emission).

### $g_{value}$ = Total Energy Penetration Degree

This figure shows the TOTAL amount of energy coming into the room through the unit, it is therefore the only really important figure to consider for heating and cooling calculation. A figure of for example 16.2% means that an absolute total of 83.8% of all solar energy projected at the windows/units will be kept out and will not enter the building through the units. The  $g_{value}$  is calculated in combination with  $T_e$  and  $q_1$ .

### $u_{value}$ = Insulation Value

The  $u_{value}$  shows us the amount of energy passing through a unit, measured in Watts. It is explained in Watts per square metre x Kelvin ( $U_{value} = W(m^2K)$ ). It is used for indicating the amount of energy passing through a unit outwards from the building i.e. the insulation value.

### $R_a$ = Colour Reproduction Index Figure

$R_a$  shows us how well colours are reflected, with 100 being a true reflection.

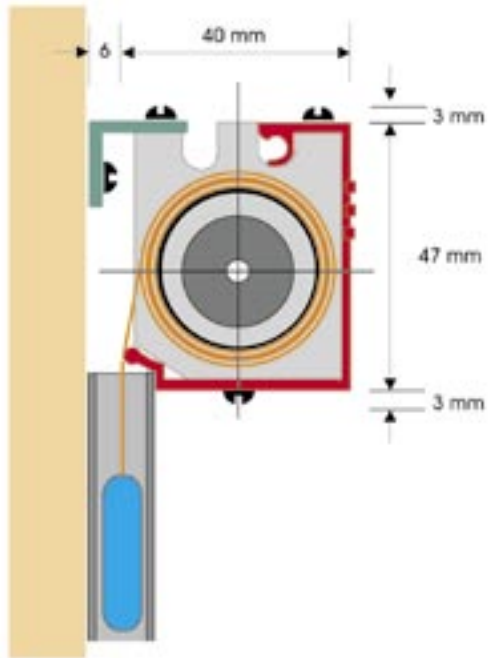
4 Sections have been defined under DIN 6169:

- Section 1: 85-100 No distortion of the colour spectrum.
- Section 2: 70-84 Average distortion.
- Section 3: 40-69 Colours are badly reflected.
- Section 4: 00-39 Colours are difficult to distinguish.

# SCHEMATIC OF ALUMINIUM HEADBOXES

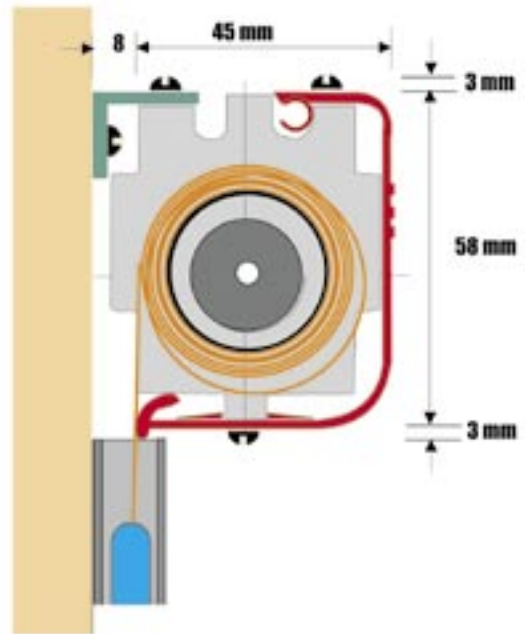
## Type 2000

For drops up to 2000mm



## Type 3000

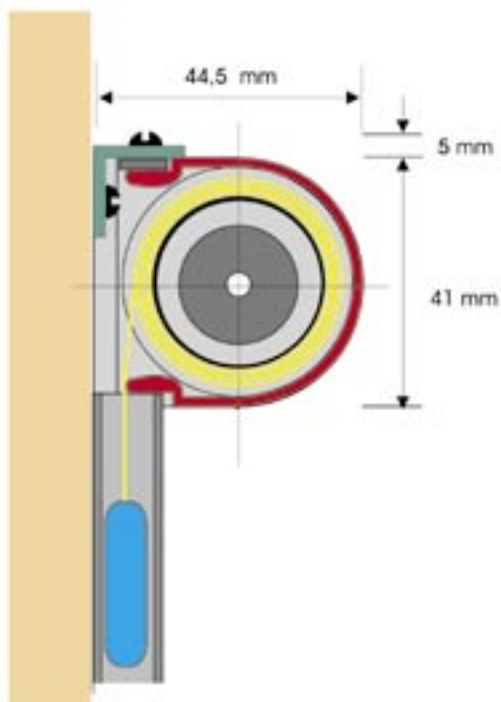
For drops up to 3500mm



All headboxes are aluminium with zinc plated end-plates. Automatic cleaning brushes are optional. All are suitable for manual or motorized (Romo-Eeprom 24V) systems.

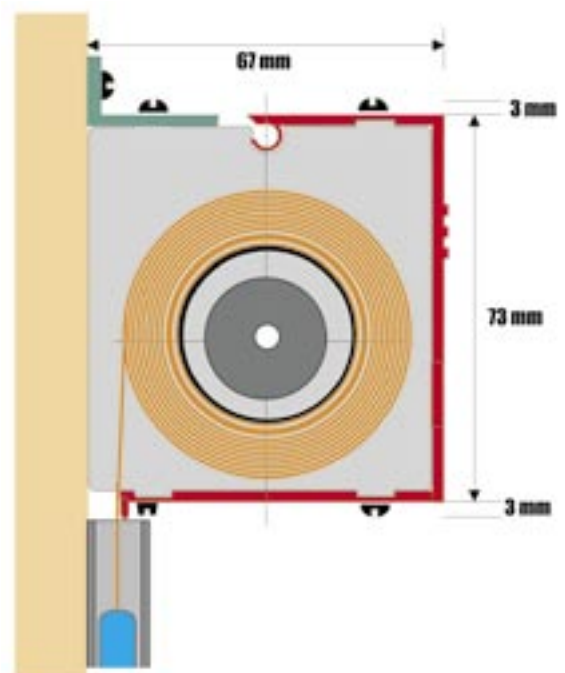
## Type 4000

For drops up to 2000mm



## Type 5000

For drops up to 6000mm



# SCHEMATIC OF SIDE-GUIDES

## Type 3

Angle profile for covering gaps i.e windows that are not straight, or to cover bad plasterwork



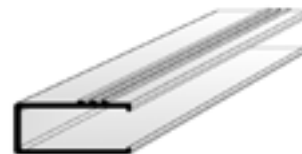
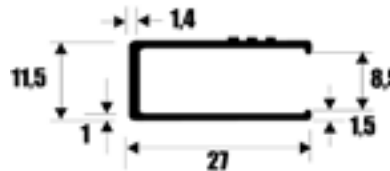
## Type 8

Installation into the frame



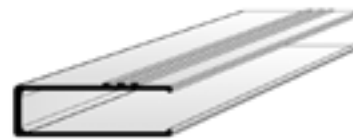
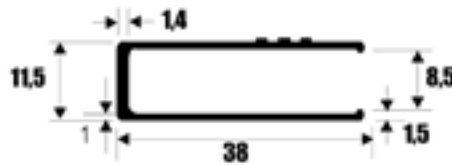
## Type 11

U-profile for smaller sizes



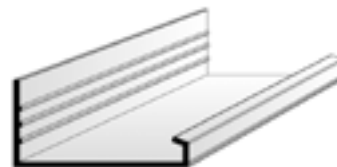
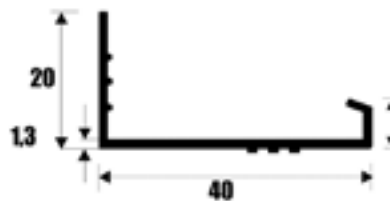
## Type 13

U-profile for larger sized windows/blinds



## Type 14

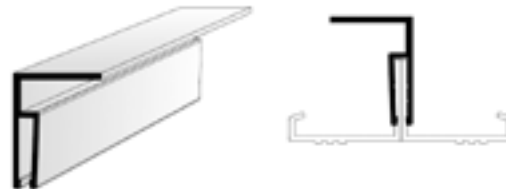
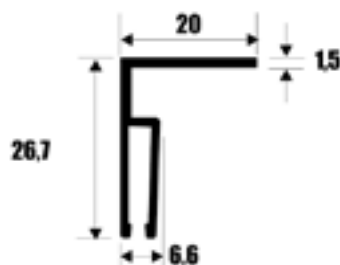
L-shaped profile for roofblinds and other inclined situations; for larger sizes



## Type 15

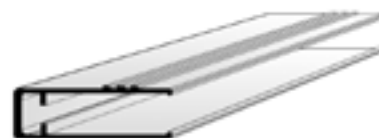
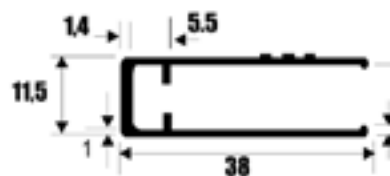
Special extrusion for fitting in guide Type 14, as illustrated.

Example for use: conservatory roofs



## Type 20

U-profile with integrated guide for slider



# REFLECTORS: THE HEART OF THE SYSTEM



Not all reflectors are designed in the same way. Optical coatings are not always the same quality.

Reflex-Rol has used over thirty years of experience to develop thermo-plane embossing.

The main advantages are the clarity in the transparency, flatness and uniform foil stability.

Reflex-Rol puts over thirty years of experience at your service.

## Reflex-Rol reflector foil range

Recommendations for use:

Reflector	Ext. face Int. face	Anti-heat protection	Anti-glare protection	Under-roof installation	View outside
G 2015	silvered blue grey	+	++	0	++
G 1900	silvered silvered	++	+	++	+
G 1911	silvered bronzed	++	++	++	+
G 1915	silvered grey	+	++	0	++
G 1918	grey (light) grey (50%)	0	++	-	++
G 1935	silvered silvered	++	+	++	-
XXS	white grey	0	+	-	-
G 1960	grey grey	-	++	-	++

A complete range of high capacity reflector foils for all applications.

A Reflex-Rol exclusive.

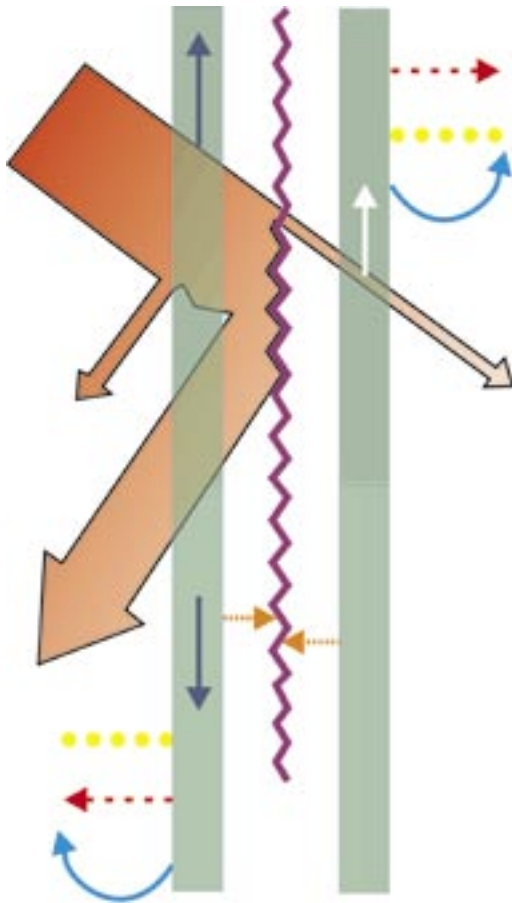
### Comments

Quality level: --, -, 0, +, ++

Foils with low emissions (low E) are used specially to improve the U value.

Anti-heat protection and transparency criteria should be included when evaluating foils for anti-glare protection. Opaque foils (e.g. G 1935) are only suitable for anti-glare applications, therefore with certain reservations.

## UP TO 90% OF SOLAR ENERGY REFLECTED



### HIGH-PERFORMING REFLECTOR FUNCTION

The ultra-performing Reflex-Rol reflectors comprise several transparent polyester foils that are sprayed with a thin metallic layer. The metallic layer is sandwiched and protected against all mechanical or chemical corrosion. This layer has the supreme advantage of reflecting electro-magnetic waves from the sun towards the outside before they can be converted into heat.

**COMPARISON OF THE REFLEX-ROL VUNO SYSTEM WITH OTHER ANTI-GLARE PROTECTION SYSTEMS**  
Ergonomic research reveals that natural light reduces errors significantly whilst increasing productivity by some 10%.

### FABRIC BLINDS

Fabric blinds have to be closed, thus completely preventing all visibility towards the outside, if they are to reduce luminous intensity and brightness.

### VERTICAL LOUVRES AND VENETIAN LOUVRES

The angle of closing of vertical louvres and Venetian louvres depends directly on the exterior lightness and the position of the sun. They frequently have to be adjusted in such a way that it is impossible to see outside, with the brightness still too intense close to the window. The result is excessive contrasts.

### REFLEX ROL VUNO

Various studies have demonstrated that the semi-transparent Reflex-Rol blinds, with their bottom upwards adjustment system (Vuno), are the best solution to the required ergonomic criteria for work stations with computer screens.

### THERMAL PROTECTION

Although Reflex-Rol blinds are installed inside, they produce a thermal protection efficiency second to none. The U value is determined by the type of window glass/foil combination and the positioning of the reflectors.

### REFLEX-ROL BLIND HEAT PROTECTION FUNCTION

Solar energy passes through glass; It is reflected by the reflector on the same wavelength before it is converted into heat. Energy can be reflected up to 90% depending on the reflector type and the room therefore remains at a pleasant temperature.

# Reflex-Rol

No reflection on  
computer screens

Less eye strain for  
increased concentration

Extended productivity

Ideal brightness and  
contrast on the work  
surface and in the  
surroundings

Permanently beneficial  
luminous intensity



Reflex-Rol  
prevents  
headaches,  
eye irritations,  
sight difficulties,  
irritability, lack  
of concentration  
and premature  
tiredness.

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Impression of more space from being able to see out.

Being able to see out and natural light increase well-being.



Reflex-Rol is the ideal equipment for all buildings, both new and undergoing renovation.

## Reflex-Rol PREVENTS COMFORT IN THE WORKPLACE THROUGH CONTROL OF HEAT AND LIGHT

### LUMINOUS INTENSITY

On all work stations with screens, luminous intensity (surface brightness) is between 300 to 500 Lux. Daylight entering the room is obviously a major contributor to this figure.

The luminous intensity of all fairly large objects and surfaces in the visual field should be in the same order of magnitude wherever possible.

### BRIGHTNESS

The surface of objects such as keyboards, mouse mats, work surfaces and, of course, screens, produces brightness - measured in candela ( $\text{cd}/\text{m}^2$ ) - that depends on the level of reflection. For the eyes, these differences are called contrasts.

The recommended brightness for the visual field, i.e. the lower part of the windows, is very important, to achieve a contrast pleasing to the eye.

### CONTRASTS

The pupil is continuously adapting, which means time lost and gymnastics for the eye muscles. Brightness must therefore be adjusted not only to the work surface but also to the entire surroundings, including the windows. In the mid-sections of the visual field (mid-field), contrasts in surface brightness should not exceed a ratio of 3:1.

# Reflex-Rol

SOLAR GLARE,  
REFLECTION &  
HEAT CONTROL  
WORLDWIDE



Reflex-Rol (UK)



**Reflex-Rol (UK)**  
Insulating Solar & Glare Control Systems

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