

AIM:

To introduce the versatile energy-saving solar control device **"ROLLA-RAY"** see-thru solar film roller blinds. In consideration of N.E.R.S.A's (2013) approval of E.S.K.O.M.'s request for the incremental annual electricity increase over the next 5+ yrs, it is vital that Architects, Quantity Surveyors, Construction Companies, Property Management Organisation's and Green Building Consultants install **"GREEN"** energy savings devices into buildings to maintain viability and become less dependant on costly means to heat and cool the same. The diversely functional product; **"ROLLA-RAY"** solar film roller blinds will offer simultaneous product features to any newly designed and retro-fit building namely; Solar light glare-reduction, effective U.V. (A) filtration, Summer solar heat rejection and Winter thermal insulation properties...all equating to better building comfort at a lower maintenance cost.

SICK BUILDING SYNDROME

A Lawrence Berkley Laboratory California U.S.A. Study, found that in an attempt to create the productive workplace, a major factor in consideration thereof was to regulate the ambient interior air temperature using "clean" devices hence; A rises of 1°C in the office;

- Will result in a 2% loss in productivity and up to 30°C.
- Use of aged or less sophisticated air-filtering and the dependency on air temperature regulation using air-conditioning systems during Winter & Summer month's will manifest in direct productivity decreases.
- **"ROLLA-RAY"** will noticeably reduce the dependency to maintain a natural and predictable interior ambient air temperature using artificial cooling devices.

Buildings located below the Equator face North, offering 180 degree exposure to solar light and heat are exposed to Summer heat welcome Winter warmth. **"ROLLA-RAY"** offers the user the flexibility to control solar light & heat penetration intensity on demand. A large portion of electrically generated energy during Winter month's is lost via the glazing. The aim is to induce "passive energy gain" by installing the **"ROLLA-RAY"** and reversing the energy loss gained throughout the day thereby greatly reducing thermal lag or heat loss during Winter.. The S.A.B.S.; S.A.N.S. 204 (2) & (3) energy savings Regulation defines that all new and Retro-fitted buildings are to conform to the energy saving co-efficient. To this end, window coverings installed are to reject Summer Heat and are able to retract during Winter month's to allow for natural solar warmth to permeate the glazing.

U-VALUE

Definition: Why refer to U-values when considering the **"ROLLA-RAY"** in a window system ?

A U-value is a measure of heat loss in a building element such as its windows. The U-Value can also be referred to as an 'overall heat transfer co-efficient' and measures how well parts of a building transfer heat. This means that the higher the U-value the worse the thermal performance of the window 'envelope'. A low U-value indicates high levels of thermal insulation. U-values are important because they form the basis of any energy or carbon reduction standard. In practice, nearly every building element has to comply with thermal standards that are expressed as a maximum U-value. Knowledge of how to simply calculate U-values at an early stage in the design process, avoids expensive re-working later on in a project. It allows the designer to test the feasibility of their project at an early stage to ensure it is fit for purpose and will comply with regulatory frameworks.

The **"ROLLA-RAY"** solar film roller blind greatly contributes to the window "envelope" effectiveness in SUMMER (optimum U-Value) as well as (optimum R-value) WINTER. The mechanical manipulation of the solar film level allows either the U-value to be increased and decreased on demand or during seasonal changes and in accordance with the User's requirements.

U-value is reciprocal of R-value.

"ROLLA-RAY"-U-value improvement



by day



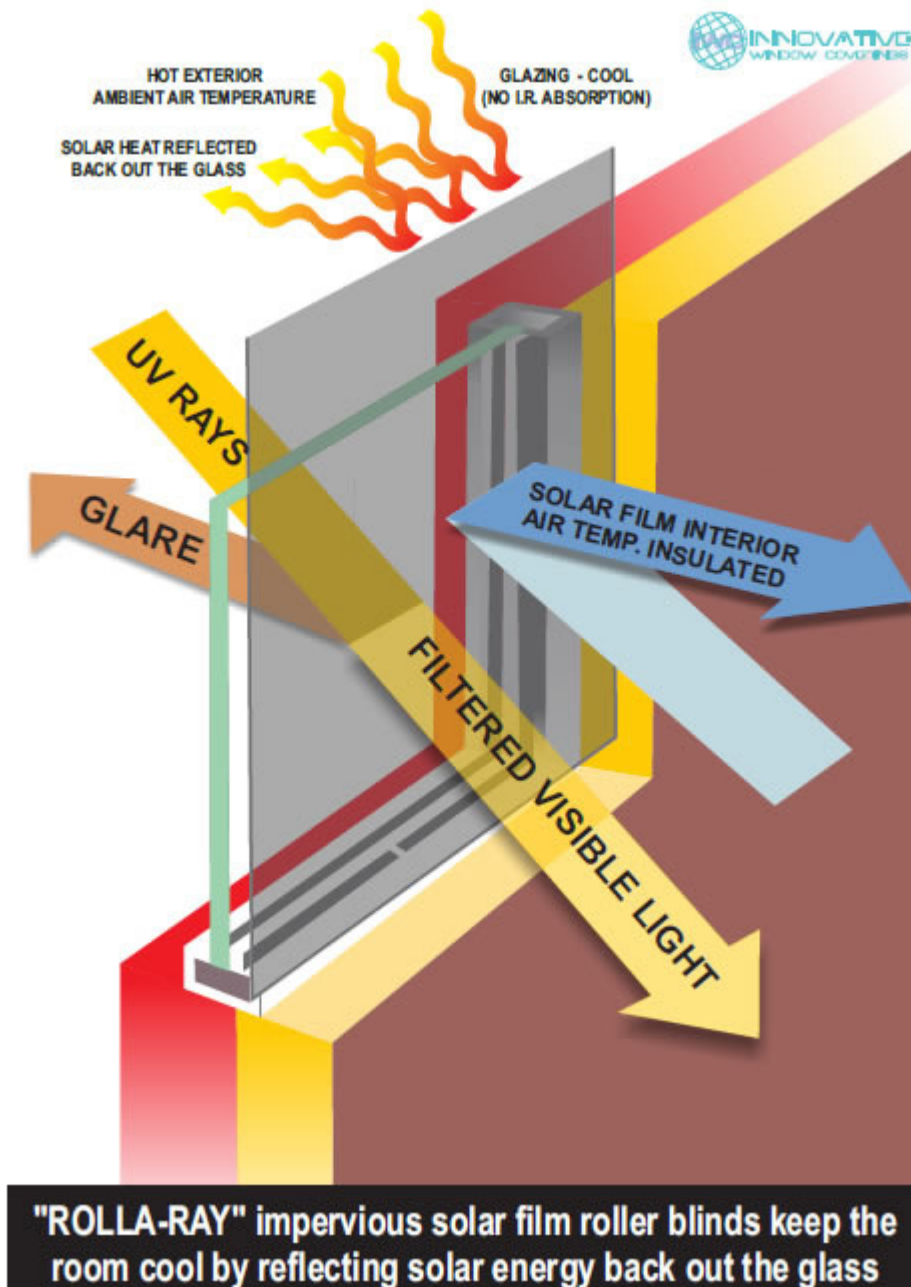
at night

U-value

The overall heat transfer coefficient of the glazing system, U-Factor, is a measure of the heat transfer that occurs through the glazing system, and its outer and inner surfaces. This value is a function of temperature and is expressed on BTU per square foot per hour per degree Fahrenheit (BTU/SQ. FT/HR/DF). The Lower the U-Factor, the better the insulation of the glazing system.

"ROLLA-RAY"

Reflective solar film roller blinds rejects incidental solar energy back out the glass.



R-VALUE

Definition: Why refer to R-Values when considering the "ROLLA-RAY"?

The R-value is a measure of thermal resistance used in the building and construction industry. Under uniform conditions it is the ratio of the temperature difference across an insulator and the heat flux (heat transfer per unit area per unit time). The R-value is the unit thermal resistance. This is used for a unit value of any particular material. It is expressed as the thickness of the material divided by the thermal conductivity. As the ROLLA-RAY" solar film thickness is offered between 75 -100 Microns, the conductivity is minimal.

R-value is the reciprocal of U-value.

The R-value is a measure of an insulation sample's ability to reduce the rate of heat flow under specified test conditions. The primary mode of heat transfer impeded by insulation is conduction, but insulation also reduces heat loss by all three heat transfer modes: conduction, convection, and radiation. The primary means of heat loss across an uninsulated air-filled space is natural convection, which occurs because of changes in air density with temperature. Insulation greatly retards natural convection making the primary mode of heat transfer conduction. Insulation is accomplished by trapping air so that significant convective heat loss is eliminated, leaving only conduction and minor radiation transfer. The primary role of such insulation is to make the thermal conductivity of the insulation that of trapped, stagnant air. The minor radiated heat transfer is minimized by having many surfaces interrupting a "clear view" between the inner and outer surfaces of the insulation much as visible light is interrupted from passing through porous materials. Radiation is also minimized by low emissivity (highly reflective) exterior surface such as the reverse side of the "ROLLA-RAY" solar shade film.

Quantifiable Energy Saving using "ROLLA-RAY" roller blinds

Situation and given quantities;

- | | |
|---|---------------------------------|
| (a) A building with 10 m ² glass surface | - A = 10 m ² |
| (b) U-value of the windowpane (clear glass 4/12/4) | - U = 2,4 W/(m ² *K) |
| (c) U-value of the blind film | - U = 1,7 W/(m ² *K) |
| (d) temperature outside | - TA = - 10 °C |
| (e) temperature inside | - TI = + 20 °C |
| (f) temperature difference | - ΔT = 30 K |

formula to calculate the energy loss:

energy loss = glass surface x temperature difference x U-value

$$E = A \times \Delta T \times U$$

Energy loss without "ROLLA-RAY" roller blinds

Energy loss: 10 m² x 30 K x 2,4 W/(m²*K) = 720 W

Energy loss with closed "ROLLA-RAY" roller blind

Energy loss: 10 m² x 30 K x 1,7 W/(m²*K) = 510 W

Energy saving with "ROLLA-RAY" roller blinds = 210 W

CAPEX vs. SAVING

* Example;

- Window size: width 2.245m x height 1360m
- Film type: Embossed Reflective Bronze film
- Capex cost: ZAR 1812.00 + V.A.T
- Utility expectancy: 8 years
- Capex amortised over 8 yrs: R 18.88 + V.A.T. p.m
- Winter Heating cost saving = 55% + pm. (given all variables are satisfied & ref. U/R-value calculation)

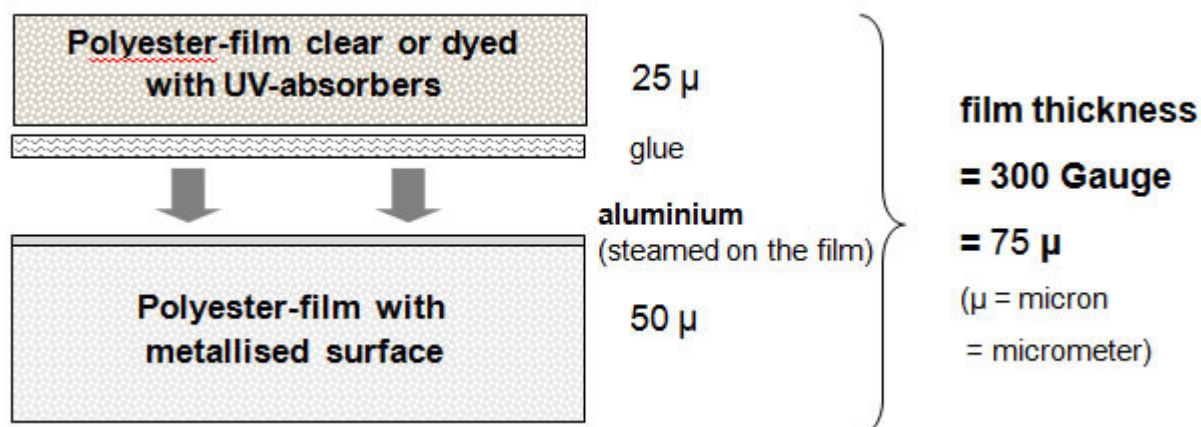
* Values are subject to change and are supplied to indicate assessment on-Capex Return.

* Cost confirmation offered upon written enquiry.

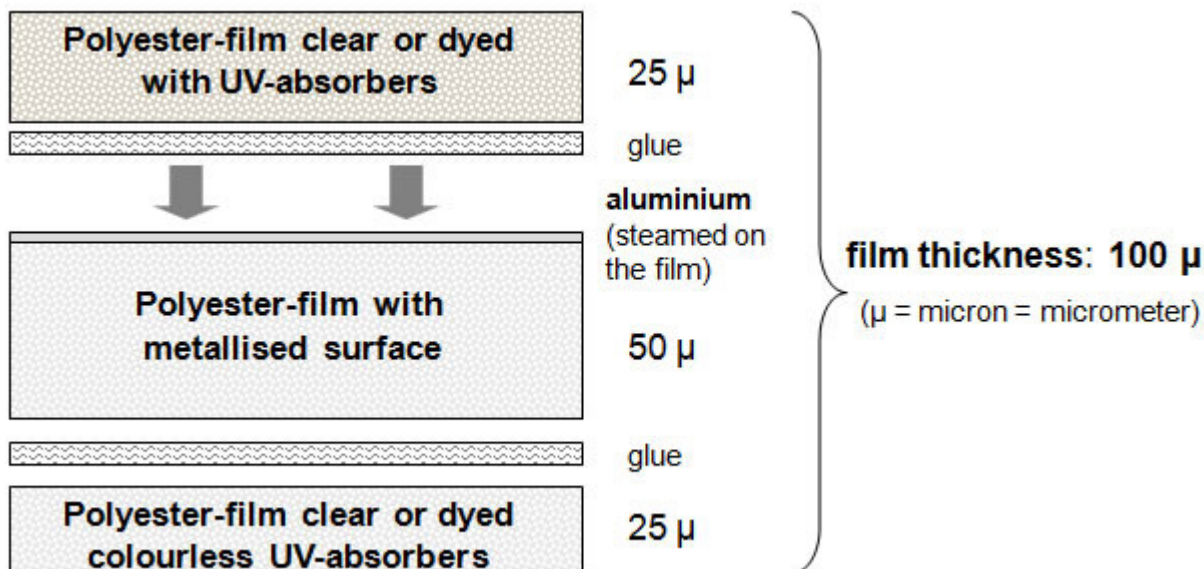
ROLLA-RAY ROLLER SHADE FILM SELECTION

"ROLLA-RAY" ROLLER SHADE FILM SELECTION											
Item	Roller blind	Shade film Product	Winter U-Value	Summer U-Value	Solar Reflectance	VLT	Solar Absorptance	TSER	NEW ! Internal light Illumination	Shading Co-Efficient	Roll width
1	Smoke Silver	EMBOSSED Reflective Film	1,10	1,00	17%	9%	59%	61%		0,40	1.52m
2	Smoke Silver	FLAT Reflective Film	1,14	1,06	62%	7%	29%	84%		0,19	1.83m
3	Bronze Silver	FLAT Reflective Film	0,94	0,94	66%	10%	22%	83%		0,19	1.83m
4	Grey Grey	FLAT Sputtered Film	1,15	1,05	15%	7%	53%	40%		0,70	1.83m
5	Grey Silver Grey	FLAT Transparent Film	1,08	0,99	20%	7%	59%	64%		0,42	1.83m
6	Bronze Silver Bronze	FLAT Transparent Film	1,08	0,99	11%	13%	55%	61%		0,45	1.83m
7	Bronze Bronze	FLAT Reflective Film	0,99	0,99	20%	13%	55%	61%		0,45	1.83m
8	Gold Grey	FLAT Reflective Film	1,04	0,94	58%	5%	34%	84%		0,18	1.83m
9	Reflective Blockout White 22mm Pleated		0,05	0,05	85%	0%	15%	97%	75%	0,05	1.52m
10	Reflective Bronze (B) 22mm Pleated (Dark)		0,10	0,10	78%	2%	25%	73%	12%	0,09	1.52m
11	Reflective Charcoal (A) 22mm Pleated (Dark)		0,14	0,14	68%	3%	26%	81%	18%	0,19	1.52m
12	Non Reflective Navy Blue 22mm Pleated		0,14	0,14	29%	2%	47%	50%	30%	0,17	1.52m

The structure of two-ply "ROLLA-RAY" film



The structure of three-ply "ROLLA-RAY" film



IN SHORT...

Due to the relative insignificant material thickness and UV-stable product composition (75 / 100 micron) to the overall glazing system, energy transfer is minimal thereby effectively controlling any interior heat gain/loss. Furthermore, (P.E.T.) is treated with a UV-infused Inhibitor resistant to Ultra-Violet attack whilst remaining highly effective in simultaneous glare, solar heat (IR) control through all Seasons. Unlike other petrochemical substrates such as PVC and Polyester based-window coverings and in consideration of their manufacturing processes and recyclability, P.E.T. offers far greater "GREEN" advantages than the aforementioned comparative materials.

WHO WE ARE...

Innovative Window Coverings C.C. is a specialist solar film roller blind manufacturer. Established in 1996, our firm offers a bespoke site-specific service concentration on new as well as retro-fit projects of any size nationwide. All window coverings are supplied made-to-measure within manufacturing tolerances. Roller blinds manufactured are serviced and supported by in-house staff whom have been extensively trained in their skills.

WHAT WE SUPPLY...

"ROLLA-RAY" solar film roller blinds are covered using the active ingredient, a world-patented multi-pleat (P.E.T.) cross laminate Mylar film supplied in either Reflective (non-metalised) or Reflective (metalised) variants. Supplied in either motorised (optional control devices supplied by SOMFY S.A.) or manual operation, the **"ROLLA-RAY"** solar film roller blind is available in sizes up to 2400mm wide (Flat film only) and 1550mm (Pleated and Flat film) denominations with a height of up to 4000mm (S.T.C.).

WE ARE "GREEN" & DO RECYCLE DIRECT MATERIALS...

All metal components are supplied in aluminium. Hence; excess materials are recycled and sold to scrap. Roller blind shade film (P.E.T.) excesses are reworked into the marketing program and used as samples. The roller blind shade film is often fused to fabricate large screen sized- roller blinds. Due to the roller blind shade film's insignificant composition albeit durable strength, the diverse User-benefit savings and longevity relative to minimal Carbon footprint makes the **"ROLLA-RAY"** solar film roller blind an unrivalled solar control device in any window glazing system.