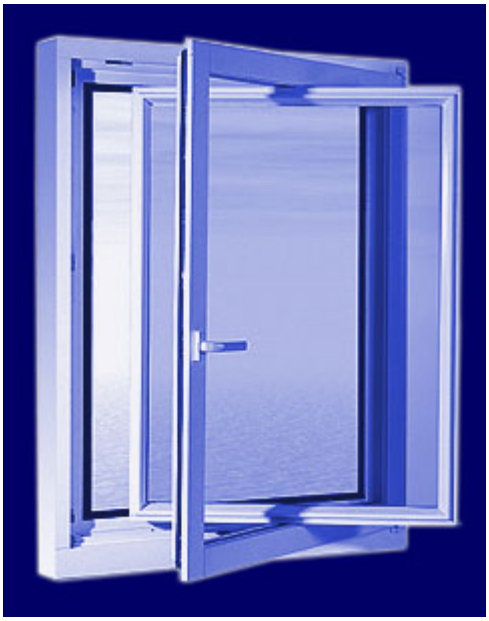
Paper of information

KSD-solar-diode-window™



The solar window with the right spin…

a further innovative product of the inventor of

- heatable vehicle rear window
- autoglazing without frame
- sun protection glazing
- and much more

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KSD - The first window
which can cool and heat.
Brilliantly simple - simply brilliant!

Many advantages for KSD

1. Remarkable savings in heating costs
2. Pleasant heat radiation instead of cold radiation of the pane in winter
3. High cool effect in summer
4. Pleasant room climate
5. Additional burglary protection by group pane technology
6. Raised sound insulation 39 dB
7. Prevention of mould formation
8. No thermal whirlwind of dust
9. Reduction of allergic charges
10. Saving of building costs by possible renunciation of shutters, Venetian blinds, air-conditioning as well as possible reduction of heating systems, possibly to necessary insulating measures and more
11. Possible optical and architectural optimisation of building and glass facades (thereby also rise of possible energy profits)
12. Two main kinds: Classic-Line: made of wood (pine, meranti)
    TopThermPlus: wooden aluminium window with aluminium-outside bowl
13. Increase of the residential quality
14. Thermal and energetic efficiency
15. Economical benefit
16. Combining because of multifunctions (heating, chill factor, sound, burglary protection, density) several window systems and thereby achieves a value without any competition

The revolution:
The KSD-window™ as a tiled stove

With this intelligent window you can win energy.

In the last years window developments have just achieved reducing heating losses, in addition our window system can win energy to heat living rooms with normal solar irradiation.

The advantage for the customer

Cosy heat radiation in winter, because the patented pane system absorbs sunlight, converts it into heat radiation and radiates - like a tiled stove - heat in the room. On sunny winter days the KSD inside pane can warm itself up to pleasantly 50 ° C.

Even vague lighting conditions during the day are sufficient, and the heat absorbed during the day is held in the room at night.

The statement "There´s a draught” near of the pane is put to the past.

Your window will become a small solar power station. This lowers the heating need and protects the environment.

In no time at all:
The KSD-window™ as an air-conditioner

The active generation of energy in winter and the heating of inner rooms in summer are undesirable.

Exactly here the window proves its strengths: The pane can be turned by the patented mechanism in summer in a second and works as a highly efficient heat insulation glass.

The advantage for the customer

Refreshing "chill factor" in summer, because sunrays are reflected and superfluous heat is radiated outwardly or led away by the aerial current.

This saves additional shading and costly room climate control, because cooling a room is three to four times more expensive than heating!

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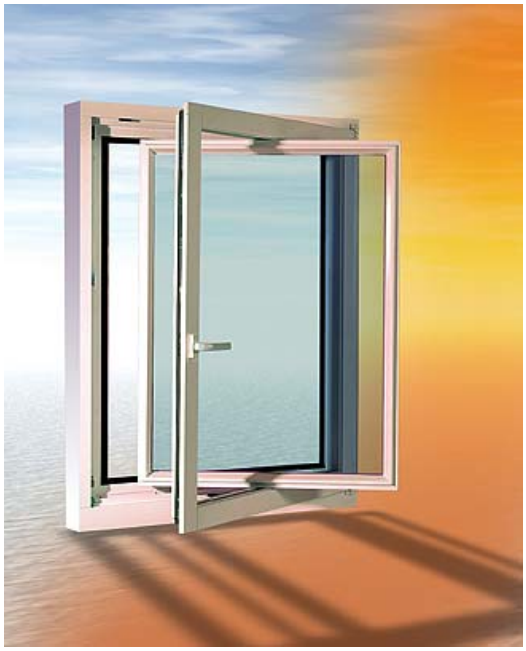
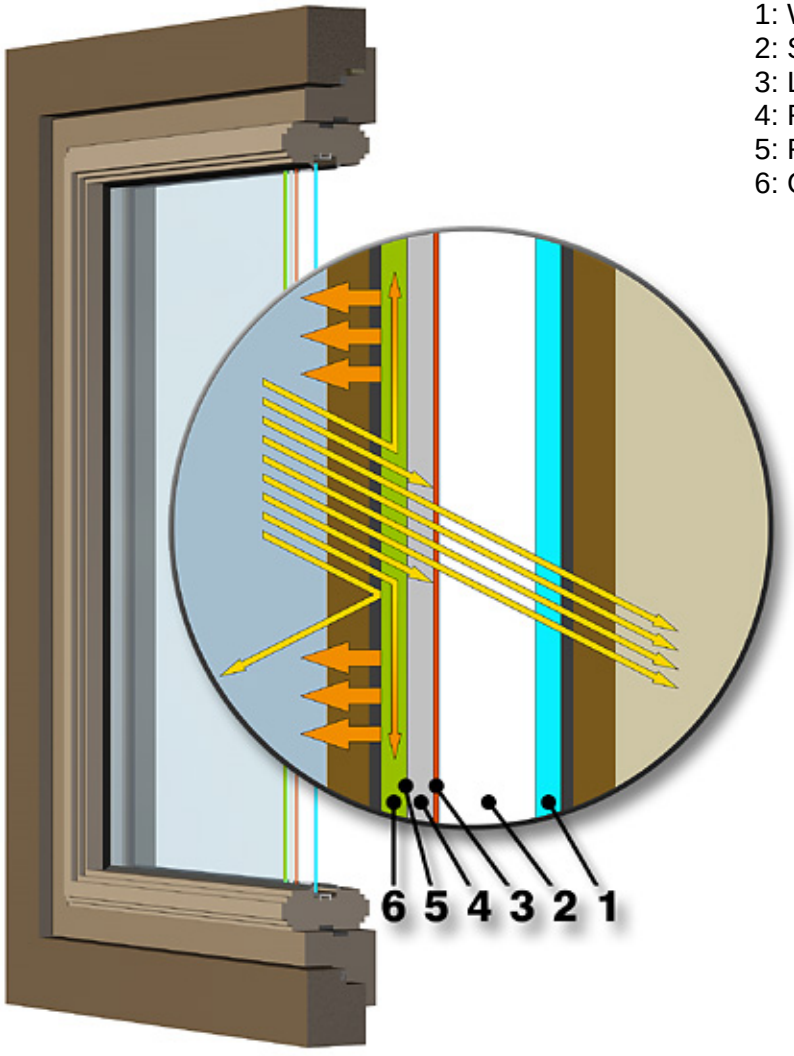


Sun protection in summer
The summer position = "air-condition"



The functional elements

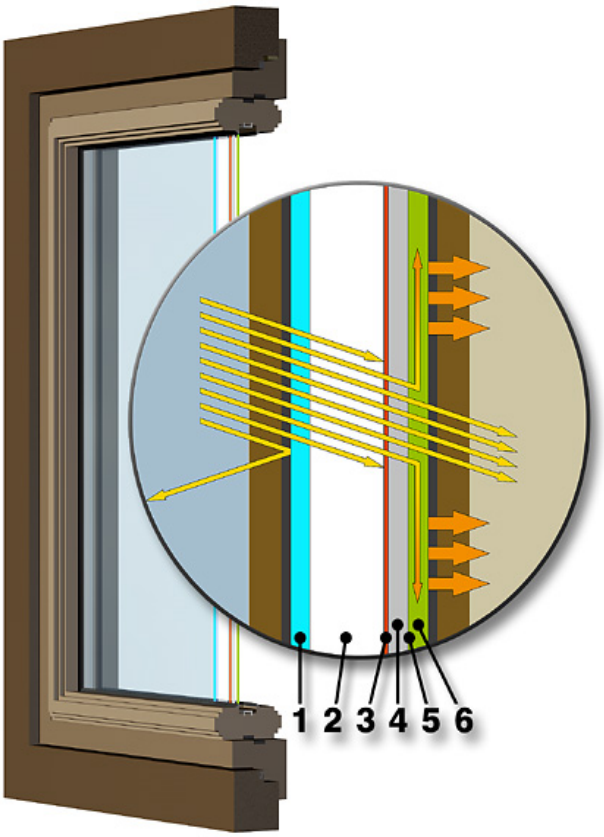
1: White glass
2: SZR with argon filling
3: Low - E - layer
4: Floatglass
5: Foil
6: Green glass

Rotating the patented inner wing lasts only a few seconds.

The effect

- reduction of the solar irradiation up to 70%
- radiation of the absorbed heat
- chill effect without any shade

Solar heating in winter - The winter position = "heating"



The functional elements

1: White glass
2: SZR with argon filling
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4: Floatglass
5: Foil
6: Green glass

The effect

- solar energy passageway 69%
- invisibly solar irradiation is changed into heat radiation
- pane warming - ambient temperature
- even reached by diffused light
- whole-flat radiation of the absorbed heat inwards (tiled stove effect)
- higher wintry solar irradiation means possible warming up to 50 ° C!

Result:

Today usual special glasses and windows function - ***however in each case in one direction!***

- Isolation of passive windows or glasses is satisfying, permit however no sufficient solar profit.
- Solar sun sealing panes / windows hold the house / building in the summer coolly, unfortunately in addition, in the winter. Therefore is none, and/or not sufficient heat gain possible, exactly in the season where warmth is necessary.

The solution:

KSD window™ perfectly for each season

- Cooling in the summer PLUS free
and pollution free solar ***heat gains in the winter -***

KSD Berlin Ltd.

Data and facts - values of insulating glazing with 3 panes

possible pane temperature (°C) example

value of light transmission	0,70	U-value frame	0,62
Ug-value glass	1,10	Uw-value whole window	0,92
		(size 1x1 m, 35 mms of insulating bowl)	

	air temperature	winter position		summer position	
		To = 0º	Ti = 20º	To = 21º	Ti = 20º
	solar irradiation (W/m²)	outside pane	inside pane	outside pane	inside pane
	0	1,3	16,3	20,9	20,2
*1	100	2,2	21,3	23,7	20,9
	300	3,3	29,7	29,0	22,2
	500	4,6	37,0	37,0	23,5
	700	5,9	43,8	39,4	25,0

To = temperature outside, Ti = temperature inside

(*1) example

Even 100 W of solar irradiation in winter (of cloudy skies) and an outside temperature of 0 º C means the inside pane heats up to more than 21 º C (=> ambient temperature). There is created a so-called " thermal barrier " (without help of heaters!) >>> no energy loss due to the glass!

U eff = +/- 0,0 W/m² K !

Technical details

	double pane windows 3.0	energy saving windows 1.4	passive windows 0.7-0.9	KSD-windows™
colour neutrality	very well	well	adequate	well
sound absorption	30 dB	32 dB	32-34 dB	39 dB
security / burglary protection	no	no	no	yes
U-value with 100 W/m²	3.0	1.4	0.8	0.0
thermal transmission coefficient [g]	67 %	58 %	48 %	summer 39 % winter 69 %
inside pane - temperature (temperature outside 0 °C)	12,2 °C	16,4 °C	17,1 °C	see table above*

The "excellent" window

The window system has been proved at home, abroad and more over, it has excelled all expectations. Therefore it was awarded several times.

- Presented during the environmental week of the Federal President in the castle Bellevue in Berlin
- Award granted by the State of Bavaria
- Professor-Adalbert-Seifriz Prize of the Steinbeis endowment
- Special prize of the Ministry of the Environment North Rhine-Westphalia
- 2-nd prize with the "simply brilliant" of MDR (tv)
- Trade-environmental prize of the city of Koblenz - environmental office
- as well as many other honourings

Housing quality

- no cold and daughty window fronts by tempered windows
- no cold floor near the window
- feeling more comfortable because of heat radiation
- higher wintry solar irradiation means pane temperatures up to 50 ° C - "tiled stove" by extensively thermal radiation
- better hygienic conditions because of less aerial current, whirling up fine dust and fibrous suspended matters
- including anti-rheumatism effect because of regular temperatures inside and around the room
- windows stopping passers`- by looking into the room even without curtains

Thermal and energetic efficiency

- optimized solar entry by high total energy transmission factor (g=0,69)
- rise of the solar level of utilisation by actual warm storage in the walls as a result of half room radiation of the warm energy absorbed by the internal pane - avoidance of excessive room air temperatures
- adaption to the wall temperatures means sinking of temperatures inside the room without comfort loss about 2-4 Kelvin, thereby heating costs can be reduced up to 40%
- with diffused solar irradiation of only 100 W/m² warming of the absorption pane room-turned with the winter position on temperature of the room air, and value then actually of the glazing U eff = 0.0 W/m² K! (= " thermal barrier "), so direct compensation of the warm passageway losses already with solar irradiation of low density also in not southwardly directed or glass fronts overshadowed
- in summer position: turning of the pane wing around 180° means approximately halving the solar irradiation, thereby avoidance of too warm of rooms or considerable decrease of chill factor

Construction-economic use

- solar-conscious construction under retention of usual construction forms and traditionally architectural styles - no solar collector or energy house architecture
- usual window design - trouble-free integration in available construction bodies
- no need of facilities and building measures for summery solar protection
- full use of the room close to the window (in office rooms and school rooms as well in hospital-rooms cold and drafty zones along the window fronts are not good for long-term use)
- enlarged room use by possible renunciation of heaters near the window space-saving by reduction of heating systems)
- walls of new buildings do not need much time to become dry
- renovation of still wet walls by continuous operation of the solar windows in winter position as well as in summer
- observance of the usual building cost level - short amortisation times for the measure (5 -10 years)

References

Kohl Medical AG administration building and warehouse

3,400 m² power-saving heatable offices and storage space on 4 floors

Ecological housing estate Tennenbronn and ecological housing estate Donaueschingen

References

private houses

KSD Berlin Ltd.

The KSD-solar-diode-window™

the solar energy - WIN - window
with the right spin…

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