

**ipasol**

Solar-Control Glazing

Visionary Façade Concepts





## The Age of Glass

Glass architecture is the architecture of the 21st century. Glass façades dominate the cities of the world. Glass fires the imagination of designers. Glass has taken centre stage.

But visionary architecture needs high-tech glass. The visual and energy-relevant demands on building envelopes are constantly being raised. This applies particularly for transparent solar control: astronomical costs for air-conditioning loom in summer and for heating in winter. Innovative approaches to control the indoor climate have become imperative! The general trend is toward colour-neutral glazing with a low level of exterior reflection. However, glazing with colour accents or higher reflectance is experiencing a renaissance in some regions.

The potential lies in the coating technology: in a complex process, multi-layer coatings are applied to the surface of float glass. Only glass that has been processed in this way has proven to be a multi-purpose, high-quality product that reduces overheating and saves heating energy.



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The products in the ipasol range represent top-class solar-control glazing.

The newest ipasol generation impressively demonstrates the advantages of these products. Whether total solar energy transmittance (g value), light transmittance ( $\tau_L$  value) or thermal transmittance ( $U_g$  value), ipasol offers performance that inspires. At long last, buildings can be optimised to save energy yet still have a glazed exterior and bright interior spaces! The ipasol product range has already proven its structural and optical merits in prestigious major projects around the world. ipasol lowers air-conditioning and heating costs, and captivates by its further optimised appearance.

This means total freedom in this age of glass.





## Harnessing the Sun

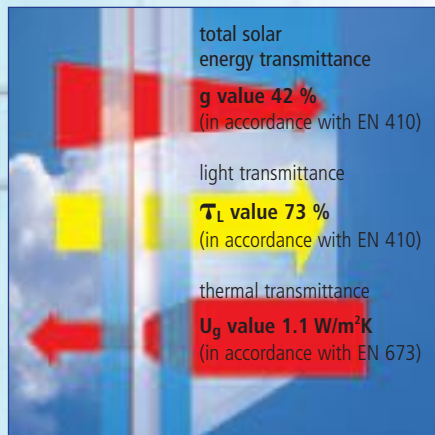
### The right combination of values

The performance of solar-control glazing depends on various parameters such as total solar energy transmittance, light transmittance, thermal insulation, transparency and colour neutrality. Now that innovative coating processes have established themselves as the state of the art, it is important to find the right combination of technical specifications. What is the point of having the most effective solar control, if expensive or unpleasant artificial lighting must be used inside the building, or the view to the outside is hindered? A further criterion is the widespread desire for colour-neutral façade designs. Creative solutions from glass processors are in strong demand.

### Highly selective coatings

With its combinations of performance specifications, the ipasol product range often approaches the limits of what is physically feasible. The latest generation again has very complex coatings that consist of up to 10 individual layers. They are all variations of a single principle: The highly selective coatings reflect most of the long-wave solar radiation (lower  $g$  value) while transmitting as much short-wave radiation (daylight) as possible (higher  $\tau_L$  value). Most of the heat remains outside, but not the light. In this way, the ipasol product range can optimally meet the seemingly irreconcilable requirements on modern architectural glazing.





*Light, solar and thermal properties  
 ipasol neutral 73/39*



## Minimise costs, maximise aesthetics

Thanks to its excellent performance, ipasol helps to save pure cash. Firstly, it delays and reduces the heating up of rooms in summer, thus considerably lowering air-conditioning costs, which are often much higher than winter heating costs. Secondly, ipasol also improves the "psychological environment", because bright rooms filled with natural light increase the motivation and productivity of the people working in the building.

Thirdly, ipasol distinguishes itself in winter by the outstanding thermal insulation it provides. It increases the quality of life, preserves the environment and lowers operating costs. This also provides a sound financial foundation for visionary architecture.

## ipacolor - Perfection in detail

Often, a façade appears perfectly harmonious only if it is glazed entirely. For completely glazed façades, Interpane offers a finely tuned range of ipacolor spandrel panels, which are perfectly co-ordinated with the ipasol product range. This allows the whole building envelope to be both homogeneous and functional.

ipasol spandrel panels are available with single or double glazing, with or without additional thermal insulation. The functional benefits of ipacolor are obvious.

ipacolor spandrel panels are:

- resistant to weathering
- resistant to environmental influences
- durable
- mechanically stable

## ipasol and ipacolor - a great pair for great façades



## Also with optimised edge seals

### its: Warm to the edge

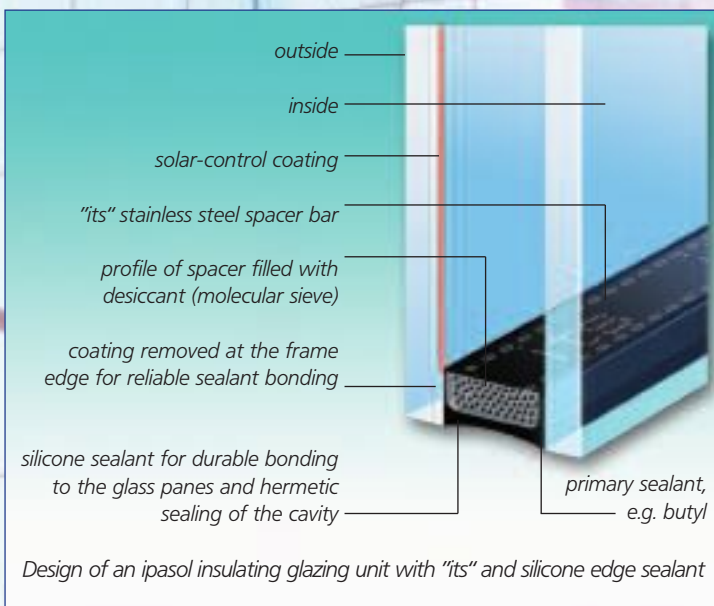
As multi-purpose, high-performance glazing, ipasol not only offers excellent solar control but also excellent thermal insulation. However, for future-orientated energy-saving strategies, all of the individual components of the solar-control insulating glazing must be examined, e.g. to prevent heat bridges from forming around the edges between the glass and the spacer bar.

Consequently, Interpane developed the "its" thermal spacer system with a special stainless steel profile. Stainless steel has a much lower thermal conductivity than aluminium. It reduces the heat bridges and thus improves the surface temperature at the edge of the glass. This "warm edge" reduces the linear thermal transmittance coefficient  $\psi$  by around 25 %.

### Structural glazing with gas-impermeable silicone edge sealant

Based on the well-proven principle of the metal spacer bar with a dual sealing system, a new type of gas-impermeable edge sealant with silicone as the secondary sealing material was developed. This allows, for example, structural glazing systems to be created that are based on the principle of mounting glazing elements with an exposed edge seal. This high-grade silicone edge sealant system is not only UV-resistant but also allows the cavity between the panes to be filled with argon or krypton, due to its high gas impermeability.

### Visionary architecture needs future-orientated products.



# Delivery Programme

## Standard Solar-Control Product Range

### Technical Data: *ipasol*

product name	config-uration outer pane/ space Argon/ inner pane	U <sub>g</sub> value according to EN 673	rated light and solar-radiation properties according to EN 410					selectivity	shading coefficient (solar factor EN 410/0.80)	shading coefficient (solar factor EN 410/0.87)	thickness	mass
			solar factor	light transmittance	light reflectance outdoors	absorptance of outer pane	absorptance of inner pane					
	mm	W/(m <sup>2</sup> K)	%	%	%	%	%	%	-	-	mm	kg/m <sup>2</sup>
ipasol platin 25/15	6/16/4	1.1	15	25	28	55	0	1.67	0.19	0.17	26	25
ipasol platin 25/15*	8/16/6	1.1	15	24	28	58	1	1.60	0.19	0.17	30	35
ipasol sky 30/17*	6/16/4	1.1	17	30	18	63	0	1.76	0.21	0.20	26	25
ipasol sky 30/17*	8/16/6	1.1	17	29	18	65	1	1.71	0.21	0.20	30	35
ipasol shine 40/22	6/16/4	1.1	22	40	16	53	1	1.82	0.28	0.25	26	25
ipasol shine 40/22	8/16/6	1.1	22	39	16	55	1	1.77	0.28	0.25	30	35
ipasol platin 47/29	6/16/4	1.1	29	47	40	29	2	1.62	0.36	0.33	26	25
ipasol platin 47/29	8/16/6	1.1	29	46	40	33	2	1.59	0.36	0.33	30	35
ipasol neutral 48/27	6/16/4	1.1	27	48	16	46	1	1.78	0.34	0.31	26	25
ipasol neutral 48/27	8/16/6	1.1	27	47	16	49	2	1.74	0.34	0.31	30	35
ipasol neutral 50/27	6/16/4	1.1	27	50	9	48	1	1.85	0.34	0.31	26	25
ipasol neutral 50/27	8/16/6	1.1	27	49	9	50	2	1.81	0.34	0.31	30	35
ipasol neutral 60/33	6/16/4	1.0	33	60	11	39	1	1.82	0.41	0.38	26	25
ipasol neutral 60/33	8/16/6	1.0	32	59	11	43	2	1.84	0.40	0.37	30	35
ipasol neutral 61/33	6/16/4	1.1	33	61	13	37	1	1.85	0.41	0.38	26	25
ipasol neutral 61/33	8/16/6	1.1	33	60	12	40	2	1.82	0.41	0.38	30	35
ipasol ultraselect 62/29	6/16/4	1.0	29	62	10	32	1	2.14	0.36	0.33	26	25
ipasol ultraselect 62/29	8/16/6	1.0	29	61	10	35	1	2.10	0.36	0.33	30	35
ipasol neutral 69/37	6/16/4	1.0	37	69	12	31	1	1.84	0.46	0.43	26	25
ipasol neutral 69/37	8/16/6	1.0	36	67	12	35	2	1.83	0.45	0.41	30	35
ipasol neutral 70/39	6/16/4	1.0	39	70	12	33	2	1.79	0.49	0.45	26	25
ipasol neutral 70/39	8/16/6	1.0	38	68	12	36	2	1.79	0.48	0.44	30	35
ipasol neutral 73/42	6/16/4	1.1	42	73	10	32	2	1.74	0.53	0.48	26	25
ipasol neutral 73/42	8/16/6	1.1	41	71	10	36	3	1.73	0.51	0.47	30	35
ipasol bright neutral	6/16/4	1.1	46	57	35	17	6	1.24	0.58	0.53	26	25
ipasol bright neutral	8/16/6	1.1	45	56	34	22	7	1.24	0.56	0.52	30	35
ipasol bright white	6/16/4	1.1	50	58	36	5	8	1.16	0.63	0.57	26	25
ipasol bright white	8/16/6	1.1	50	58	36	6	9	1.16	0.63	0.57	30	35
ipasol bright grey*	6/16/4	1.1	28	28	12	59	4	1.00	0.35	0.32	26	25
ipasol bright grey*	8/16/6	1.1	23	22	9	68	4	0.96	0.29	0.26	30	35
ipasol bright green*	6/16/4	1.1	31	48	26	55	3	1.55	0.39	0.36	26	25
ipasol bright green*	8/16/6	1.1	28	45	24	61	3	1.61	0.35	0.32	30	35
ipasol bright bronze*	6/16/4	1.1	29	32	14	57	4	1.10	0.36	0.33	26	25
ipasol bright bronze*	8/16/6	1.1	24	25	11	66	4	1.04	0.30	0.28	30	35
ipasol bright blue*	6/16/4	1.1	25	34	16	66	2	1.36	0.31	0.29	26	25
ipasol bright blue*	8/16/6	1.1	21	29	13	73	2	1.38	0.26	0.24	30	35

\* The outer pane is made of thermally toughened glass or heat-strengthened glass.

- ipasol can be combined with ipaphon sound-insulating glazing, ipasafe thermally toughened, heat-strengthened or laminated safety glass and cast glass. Bullet-resistant glazing is available on demand. Cast glass or wired glass cannot be coated.
- The customer ordering our products is responsible for ensuring that the glass thickness is dimensioned correctly according to the applicable technical regulations.
- The specified rated values refer to the testing conditions and the application scope of the referenced standard. Non vertical mounting leads to different values..
- Tolerances apply to all technical data according to the INTERPANE tolerance handbook
- If the energy absorptance in the outer pane exceeds 55 % (vertical glazing) or 50 % (inclined glazing), we recommend the use of thermally treated ipasafe safety glass.

# Delivery Programme

## ipasol triple glazing solar control

### Technische Daten: *ipasol triple glazing solar control*

product name	configuration outer pane/ space Argon/ centre/ space Argon/ inner pane	U <sub>g</sub> value according to EN 673	rated light and solar-radiation properties according to EN 410						selectivity	shading coefficient (solar factor EN 410/0.80)	shading coefficient (solar factor EN 410/0.87)	thickness	mass
			solar factor	light transmittance	light reflectance outdoors	absorptance of outer pane	absorptance of middle pane	absorptance of inner pane					
	mm	W/(m <sup>2</sup> K)	%	%	%	%	%	%	%	-	-	mm	kg/m <sup>2</sup>
ipasol platin 25/15	6/12/4/12/4	0,7	13	23	29	56	1	1	1,77	0,16	0,15	38	35
ipasol platin 25/15*	8/12/4/12/6	0,7	13	22	28	58	1	1	1,69	0,16	0,15	42	45
ipasol sky 30/17*	6/12/4/12/4	0,7	15	27	19	63	1	1	1,80	0,19	0,17	38	35
ipasol sky 30/17*	8/12/4/12/6	0,7	15	26	18	65	1	1	1,73	0,19	0,17	42	45
ipasol shine 40/22	6/12/4/12/4	0,7	20	36	17	53	1	2	1,80	0,25	0,23	38	35
ipasol shine 40/22	8/12/4/12/6	0,7	20	35	17	55	1	2	1,75	0,25	0,23	42	45
ipasol platin 47/29	6/12/4/12/4	0,7	26	42	41	30	2	3	1,62	0,33	0,30	38	35
ipasol platin 47/29	8/12/4/12/6	0,7	26	41	40	33	2	3	1,58	0,33	0,30	42	45
ipasol neutral 48/27	6/12/4/12/4	0,7	24	43	17	47	1	2	1,79	0,30	0,28	38	35
ipasol neutral 48/27	8/12/4/12/6	0,7	24	42	17	50	1	2	1,75	0,30	0,28	42	45
ipasol neutral 50/27	6/12/4/12/4	0,7	25	44	10	49	1	2	1,76	0,31	0,29	38	35
ipasol neutral 50/27	8/12/4/12/6	0,7	24	44	10	51	1	2	1,83	0,30	0,28	42	45
ipasol neutral 60/33	6/12/4/12/4	0,7	30	54	13	40	2	3	1,80	0,38	0,34	38	35
ipasol neutral 60/33	8/12/4/12/6	0,7	29	53	13	44	2	3	1,83	0,36	0,33	42	45
ipasol neutral 61/33	6/12/4/12/4	0,7	30	54	14	37	2	3	1,80	0,38	0,34	38	35
ipasol neutral 61/33	8/12/4/12/6	0,7	30	53	14	41	1	3	1,77	0,38	0,34	42	45
ipasol ultraselect 62/29	6/12/4/12/4	0,7	27	55	12	33	1	2	2,04	0,34	0,31	38	35
ipasol ultraselect 62/29	8/12/4/12/6	0,7	27	54	11	35	1	2	2,00	0,34	0,31	42	45
ipasol neutral 69/37	6/12/4/12/4	0,7	34	62	14	32	2	3	1,82	0,43	0,39	38	35
ipasol neutral 69/37	8/12/4/12/6	0,7	33	60	14	36	2	3	1,82	0,41	0,38	42	45
ipasol neutral 70/39	6/12/4/12/4	0,7	35	62	14	33	2	3	1,77	0,44	0,40	38	35
ipasol neutral 70/39	8/12/4/12/6	0,7	35	61	14	37	2	4	1,74	0,44	0,40	42	45
ipasol neutral 73/42	6/12/4/12/4	0,7	38	65	13	33	2	3	1,71	0,48	0,44	38	35
ipasol neutral 73/42	8/12/4/12/6	0,7	37	64	13	37	2	4	1,73	0,46	0,43	42	45
ipasol bright neutral	6/12/4/12/4	1,0	43	53	38	17	7	6	1,23	0,54	0,49	38	35
ipasol bright neutral	8/12/4/12/6	1,0	41	52	37	21	6	6	1,27	0,51	0,47	42	45
ipasol bright white	6/12/4/12/4	1,0	46	54	40	4	8	6	1,17	0,58	0,53	38	35
ipasol bright white	8/12/4/12/6	1,0	46	53	39	6	8	8	1,15	0,58	0,53	42	45
ipasol bright grey*	6/12/4/12/4	1,0	26	26	13	59	4	3	1,00	0,33	0,30	38	35
ipasol bright grey*	8/12/4/12/6	1,0	21	20	9	68	3	3	0,95	0,26	0,24	42	45
ipasol bright green*	6/12/4/12/4	1,0	29	44	28	55	3	3	1,52	0,36	0,33	38	35
ipasol bright green*	8/12/4/12/6	1,0	25	42	26	61	2	3	1,68	0,31	0,29	42	45
ipasol bright bronze*	6/12/4/12/4	1,0	27	29	15	56	4	3	1,07	0,34	0,31	38	35
ipasol bright bronze*	8/12/4/12/6	1,0	22	24	11	66	3	3	1,09	0,28	0,25	42	45
ipasol bright blue*	6/12/4/12/4	1,0	23	32	17	66	2	2	1,39	0,29	0,26	38	35
ipasol bright blue*	8/12/4/12/6	1,0	19	26	14	73	1	2	1,37	0,24	0,22	42	45

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- Tolerances apply to all technical data according to the INTERPANE tolerance handbook
- If the energy absorptance in the outer pane exceeds 55 % (vertical glazing) or 50 % (inclined glazing), we recommend the use of thermally treated ipasafe safety glass.



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