



VIG vacuum insulating glass A Revolutionary Solution for Energy- Efficient Buildings

Speaker Jan Fischelmanns

KG Hanseata Gesellschaft f. Ueberseehandel mbH & Co.

Sollredder 9

D 21465 Wentorf b. HH

www.hanseata.de



Introduction

What is Vacuum Insulated Glass?

Vacuum Insulated Glass (VIG) is an advanced type of insulating glass composed of two glass panes with a vacuum between them. The vacuum eliminates any fill gases and all associated conduction and convection losses through the gas, resulting in a significant reduction in heat loss from the glazing unit.

Purpose: To significantly improve thermal insulation in windows and other transparent elements f.e. commercial refrigerators

Structure and Working Principle

How is Vacuum Insulated Glass Structured?

- two glass panes (tempered or floatglas, one low-e coating) typically with a thin gap of about 0.1 to 0.3 mm Vacuum.
- tiny spacers/pillars prevent the panes from touching each other distance from 20x20 to 50x50 mm
- the edge sealing 9 - 14 mm (made from glass solder or metal) seals the vacuum and prevents air from entering
- metal getter (stripe or dot) keeps the vacuum clear from noble gases

Working Principle:

The vacuum eliminates heat loss through convection and minimizes heat transfer through conduction and radiation.





Advantages of VIG

- superior thermal insulation: down to 0,4 u-value marketleader (2xlow-e and 0,3 mm vaccum) this is significantly better insulation compared to traditional double or triple glazing
- thin: only 8,3 mm, achieves high insulation performance with a thinner construction, ideal for space-constrained applications (old windows)
- long life time: high resistance to moisture and gas ingress due to the vacuum Better edge sealing then traditional double or triple glazing (glass seller or metal) no plastic
- weight reduction: lighter than traditional insulated glass with comparable thermal performance
- sustainability: fewer raw materials, less transport space, old windows - whether wooden or plastic - do not need to be replaced, easy recycling no plastic
- better lightransmission: up to 83%, less artificial light required
- better sound-reduction: 36 RwdB at 8.3 mm thickness



Applications of VIG

- Renovation Windows: simple installation, low costs because there are no new frames needed
- Historic Buildings: Allows modern insulation while preserving historical aesthetics
- New Building Windows: Especially in high-energy-efficient new constructions
- Transportation: used in vehicles like trains and ships to improve insulation with reduced weight.
- glass-doors for refrigerators

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simple installation - the old window frames can be preserved



Challenges and Costs

What are the Challenges?

- Cost: 6 - 7 times higher production costs compared to traditional insulating glass
- Manufacturing: new manufacturing process, new machines are necessary, high investment approx. 30 Mio. EUR
- Market Penetration: Limited availability and less established supply chains. lead-time today 14 - 20 weeks. No significant production capacity in Europe
- How to increase awareness, glazier and window-maker, must be convinced of the technology change. Potential end users need knowledge about VIG.



Available products in Europe today

key-facts overview									
product	thickness	max. size	spacer dots distance	tempered glass	thickness vaccum	low-e coating	U-Value LT	price ex works in EUR/m ²	country of manufacture
Landvac Bengglas MAX*	8,3 mm	4200x2440 mm	50x50 mm	yes		0,3yes	0,5 78%	260,00	China
AGC Fineo	8,1 mm	2400x1600 mm	30x30 mm	no		0,1yes	0,7 79%	280,00	Japan and Belgium
Pilkington Super Spacia	8,2 mm	2400x1500 mm	20x20 mm	no		0,2yes	0,7 69%	410,00	Japan

more to come...but when and who?



Future Developments & Risk

What's Next?

- technological Advancements: Improving production processes and reducing costs due to higher volumes
- building up production capacity in Europe
- wider Adoption: Increasing acceptance in the construction industry, especially with stricter energy-saving regulations

Risk?

- will the glass industry block VIG, because 30% less floatglass compared to triple-IGU is needed in production.
- investments in triple insulating glass production have not yet been amortized.



Summary

Key Takeaways:

- Vacuum Insulated Glass offers an innovative and effective solution to achieve the best possible thermal insulation with minimal use of materials.
- It combines excellent insulation properties with a slim design, making it particularly valuable in energy-efficient and historic buildings.
- Despite current challenges related to cost and availability, VIG is poised to play a key role in the future of energy-efficient building design. In our opinion VIG is a game changer. The market launch progress already started and the growth phase will begin shortly.
- real sustainability in all aspects



Questions & Discussion

Any Questions?

- Thank you for your attention!
- Please think about the opportunities and challenges of Vacuum Insulated Glass