



# Static Direct Glassing SDG<sup>®</sup> for windows

Application, reference customers and case studies

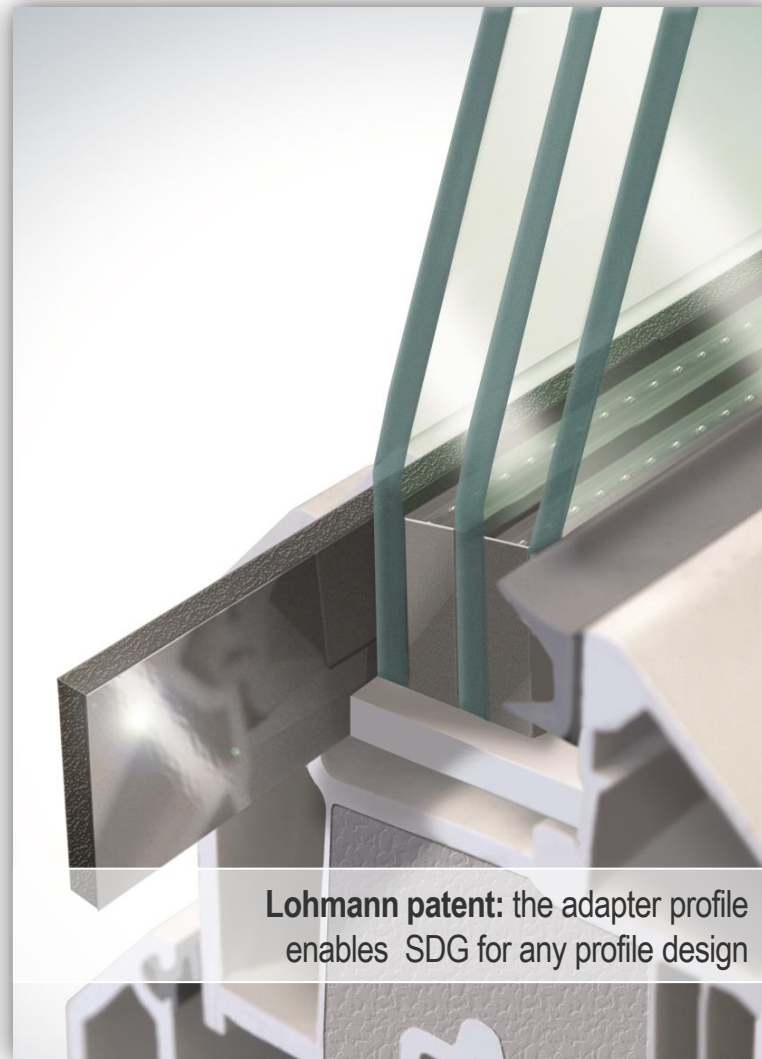
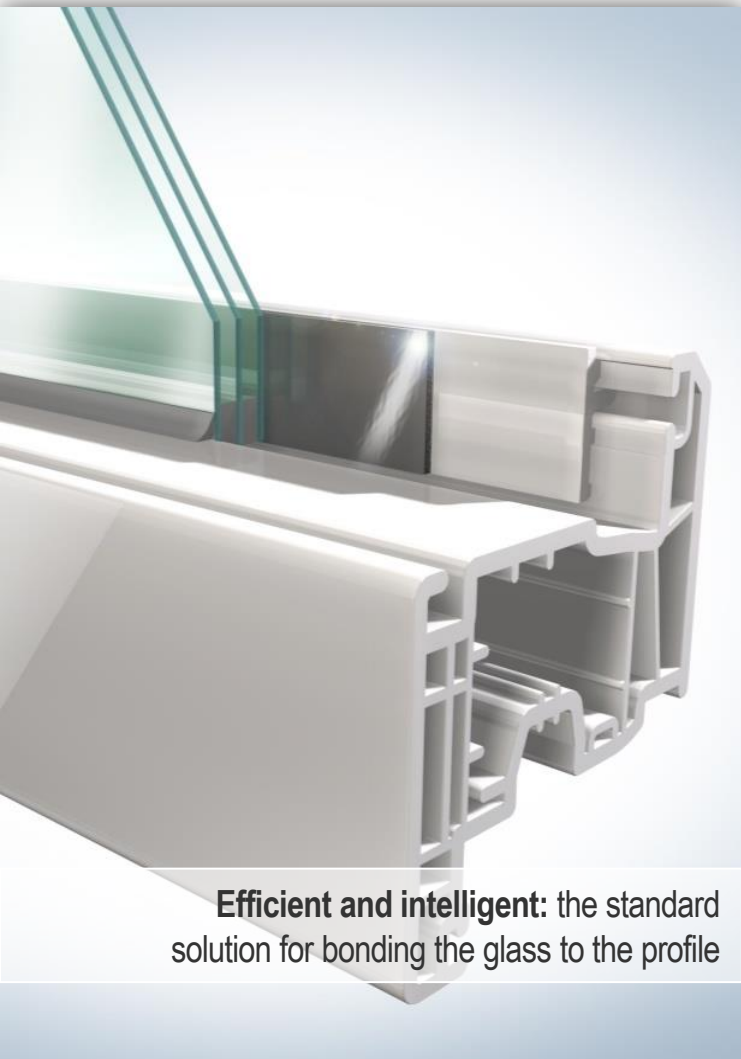
Strategic Management Process



# Content



1. Summary
2. Application
3. Reference customers and case study

## Summary: Lohmann Static Direct Glassing (SDG®)



- The double-sided adhesive tape is applied to the window frame profile.
- The adhesive tape bonds along the entire window sash the glass and replaces the sealing.
- The statics is distributed to the entire composite of profile and glass; the steel core can be omitted.
- The window is lighter and more stable.
- The tape solution is suitable for existing and new profile designs – the design imagination knows no limits.

# Summary: Premium bonding technology with various advantages

Handling	Design and insulation	Security
<ul style="list-style-type: none"><li>• Quick manufacture by pre-applied adhesive tape</li><li>• Danger of a shifting block setting is very low</li><li>• Reduced weight of the window as steel core can be left out</li><li>• Simple repair in case of glass breakage</li><li>• Considerably better usage feeling of manufacturer by stabilization of the handle side of the wing</li><li>• Invest of manufacturers is small: the tape is applied inline in the extrusion process on to the profile</li><li>• Windows are easier to maintain by permanent relief of fittings</li></ul>	<ul style="list-style-type: none"><li>• new design possibilities with bigger glass fronts and slim wings</li><li>• Better sealing between glass and profile</li><li>• improved thermal insulation by minimized usage of steel reinforcement</li><li>• additional insulation by usage of steel core chamber</li><li>• improved eco-balance of the window (higher insulation values, lower reinforcement)</li></ul>	<ul style="list-style-type: none"><li>• 10 years of experience</li><li>• increased intrusion security by persistent bonded glass- frame construction</li><li>• Longtime guarantee onto the bonding</li><li>• ift and RAL-certified products and systems</li></ul> <div style="text-align: right;"></div>

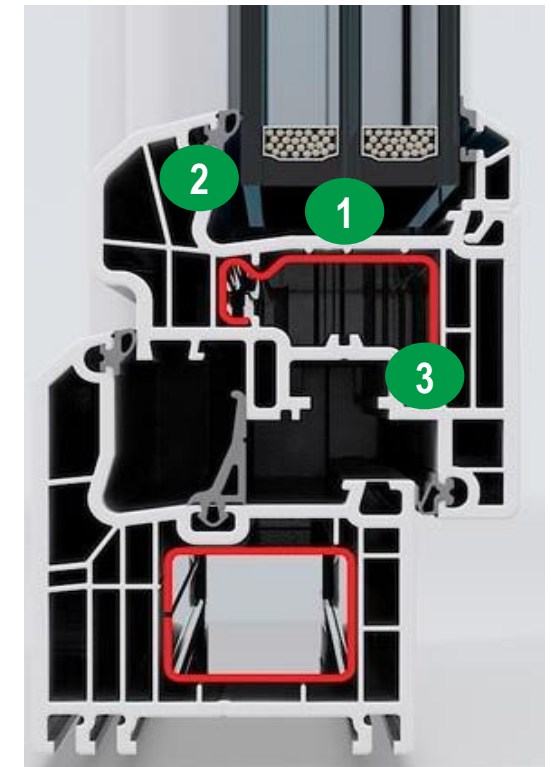
# Application: Traditional fixation

The solution suits for wood and aluminum as well but presented here for PVC

	Today	Consequence
1	With buffers only point wise load around the profile	Thicker and heavier profiles required
2	Sealing required for protection from dirt and water	Higher cost and negative impact on optical appearance results
3	Steel core required to support statics	<ul style="list-style-type: none"><li>• Steel increases weight and cost.</li><li>• Thicker profiles reduce design possibilities.</li></ul>

## Conclusion

Traditional fixation is by far not the ideal solution for windows.



APPLICATION

PRODUCTS

TOOLS

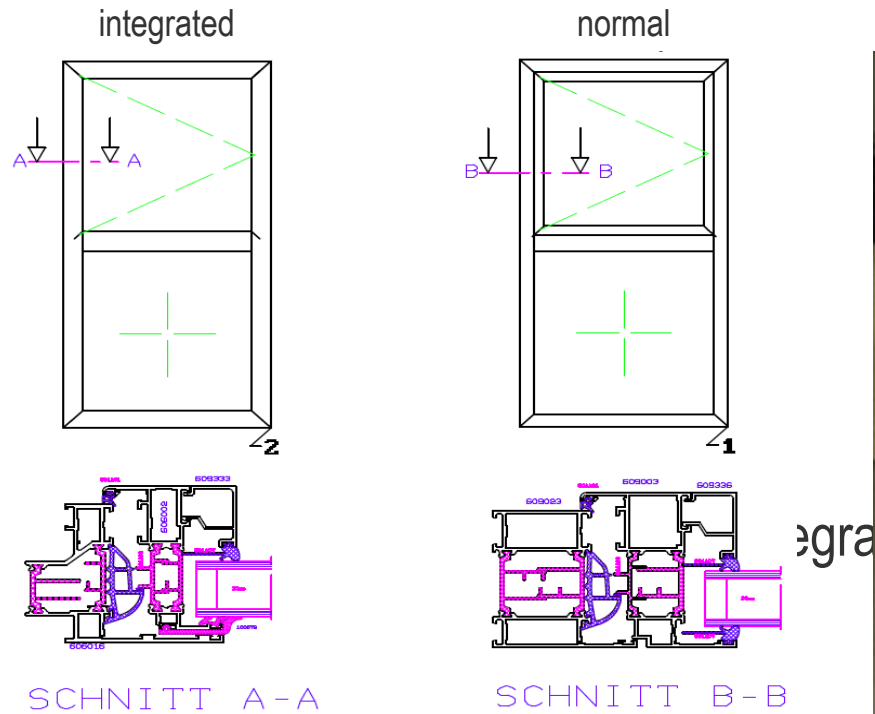
SERVICES

# Bonded construction performance

## Advantages in design

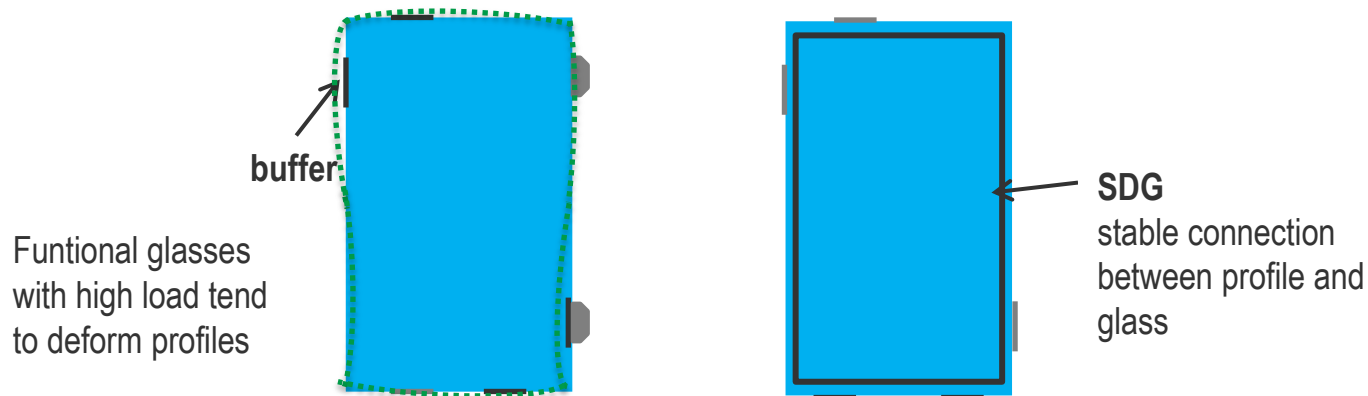
Using adhesive tapes in windows allows:

- new designs



# Glass fixation

Traditional fixation	New fixation: static bonding	
<ul style="list-style-type: none"> <li>• Glass is only placed on, not bonded to the profile (using buffers)</li> <li>• Today standard for aluminum and wooden windows</li> <li>• <b>Used to be standard for PVC but statics requires additional reinforcement</b></li> </ul>	<ul style="list-style-type: none"> <li>• Frame is bonded along the whole glass</li> <li>• Improvement of total system statics</li> <li>• Strong trend in PVC window market</li> </ul>	
	<i>Liquid – e.g. silicone</i>	<b>Dry – the Lohmann way with SDG</b>



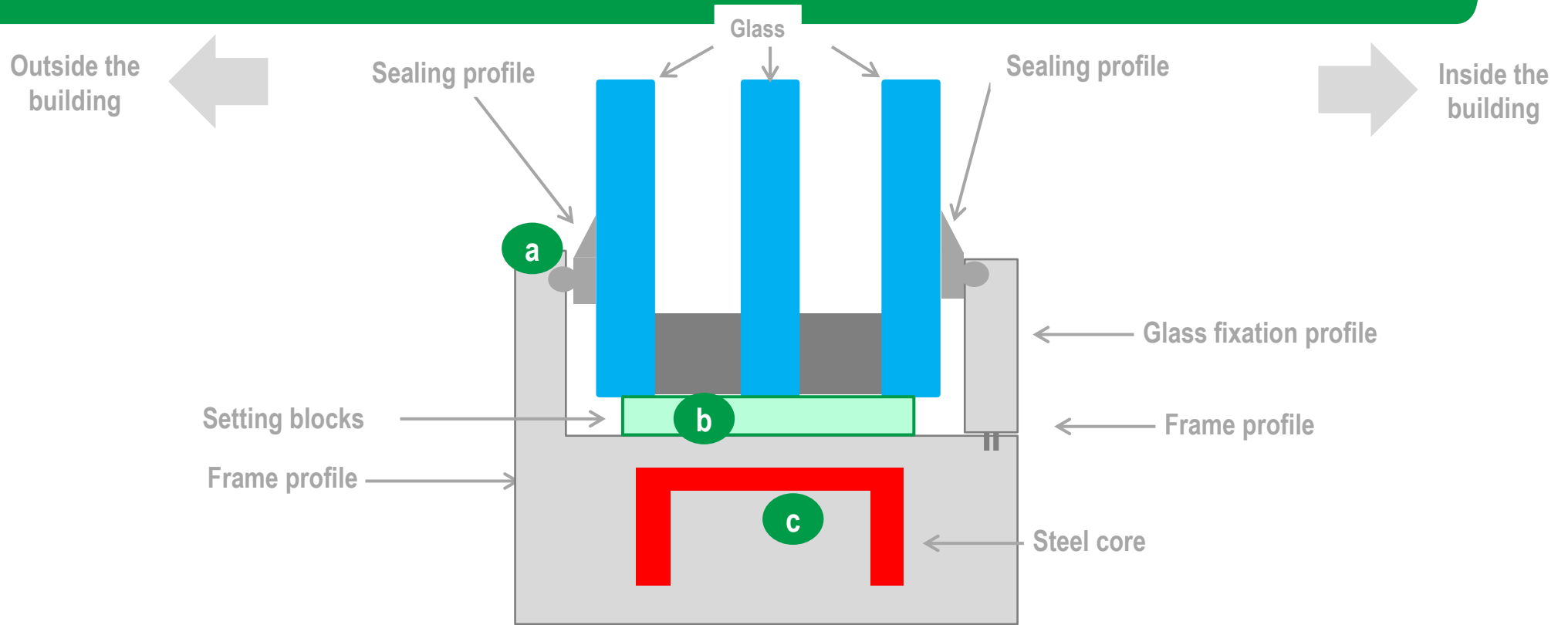
APPLICATION

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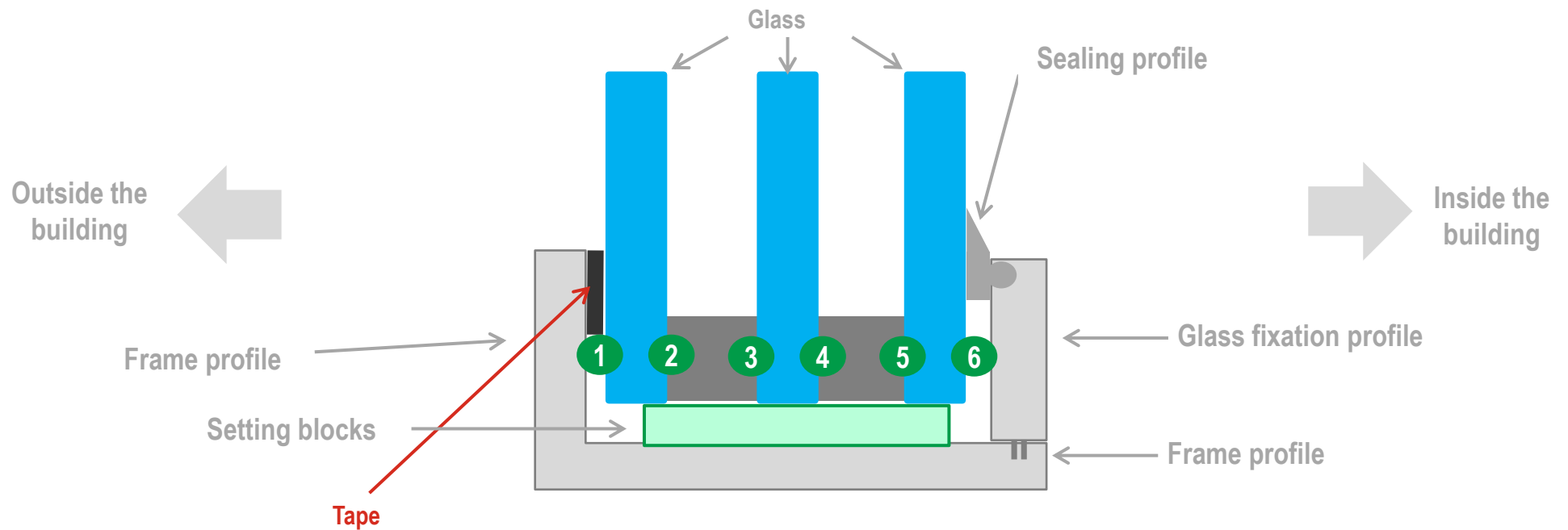
# Components of a traditional window



Today	Consequence
<b>a</b> With setting blocks only point wise load around the profile	Thicker and heavier profiles required
<b>b</b> Sealing required for protection from dirt and water	Higher cost and negative impact on optical appearance results
<b>c</b> Steel core required to support statics	<ul style="list-style-type: none"> <li>▪ Steel increases weight and cost.</li> <li>▪ Thicker profiles reduce design possibilities.</li> </ul>



# DSB in the window (position 1)



In 75% of all windows the bonding takes place at Position 1.

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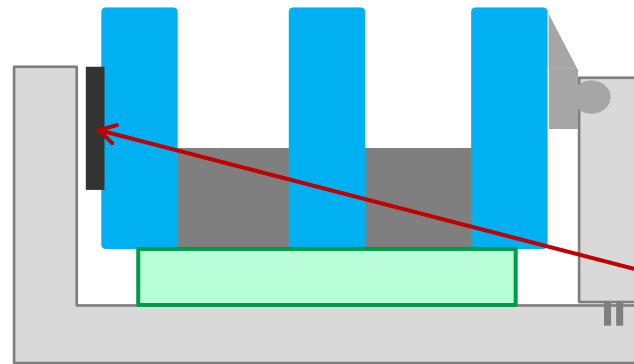
SERVICES

# The tape in the window

Disappearance of the steel core gives two options concerning design and functionality.

## Option 1

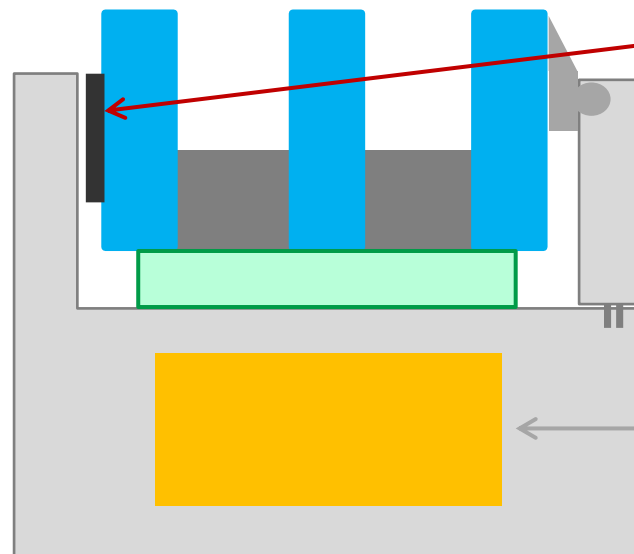
Slimmer profile and less weight



Tape at position 1

## Option 2

Free chamber (originally steel core) can be filled with insulation material

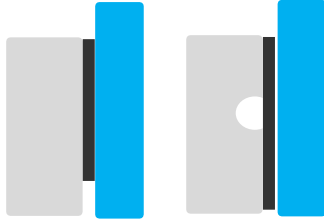


Insulation material

# Three ways to bond frame and glass with tape

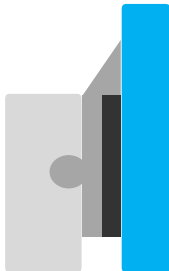
For each of those three options, we have reference customers with certified systems.

Tape only,  
no sealing  
required



- **Tape is applied (semi) automatically to the frame profile.**
  - + Ideal solution if material consumption and production process shall be optimised.
  - + Allows maximum bonding area.
  - + Optical appearance improves: slimmer frames and no additional sealing

Sealing  
adapter  
profile  
**Lohmann  
patent**



- **Tape is applied (semi) automatically to the sealing adapter profile.**
  - + Ideal solution if existing frame profile design shall be kept.
  - + High flexibility because both bonded and traditional installation are possible.
  - + Maximum bonding area along the adapter profile.

Sealing  
profile plus  
tape



- **Tape is applied (semi) automatically to the frame profile**
  - + Ideal solution if the existing frame and sealing profile designs shall be kept.
  - + High flexibility because both bonded and traditional installation are possible

APPLICATION

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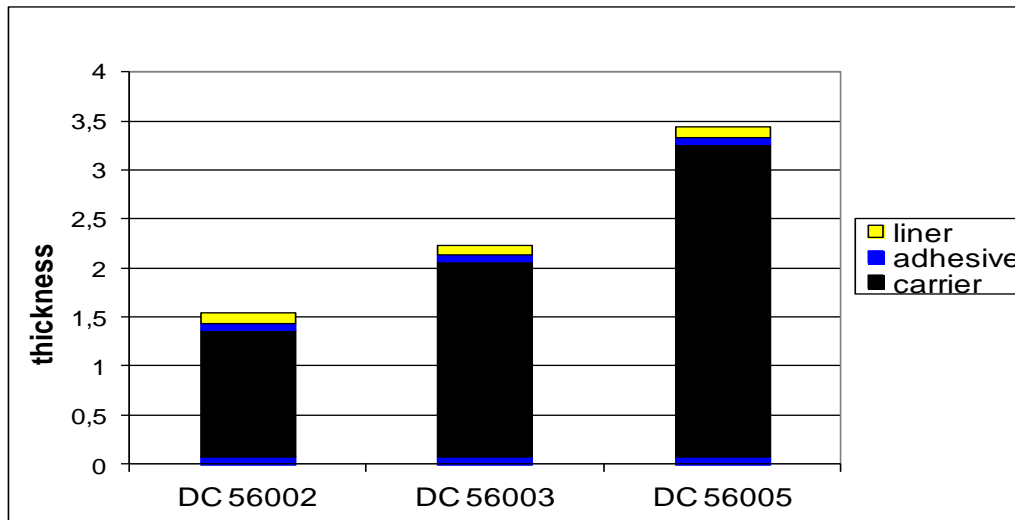
SERVICES

# Products

Our 5600x series is the state-of-the-art standard setting-product in the building industry.

## Features of 5600x series

- High performance foam tape with pure acrylic adhesives
- Three thicknesses as standard (1.3 / 2.0 / 3.2 mm)
- Outstanding UV- resistance
- Excellent temperature resistance
- Approval acc. IFT VE08/1 standard for bonded windows
- Certification acc. RAL 716/1-III for PVC bonded windows



**Nachweis**  
Charakterisierung eines Klebesystems nach der ift-Richtlinie VE-08/1, Teil 1

Prüfbericht 507 36747/1 R1

Auftraggeber **LOHMANN GmbH & Co. KG**  
Irlicher Straße 55  
56567 Neuwied

Gegenstand **H - Probekörper bestehend aus:**

Substrat A **PVC-U, weiß, Fa. Inoutic / Deceuninck GmbH**

Substrat B **Floatglas nach EN 572-2**

Klebeband **Duplocoll® 56004, grau, Fa. Lohmann GmbH & Co. KG**

Besonderheiten **Dicke des Klebebandes d = 3,2 mm**



**Grundlagen**  
ift-Richtlinie VE-08/1 :  
2008-09  
Beurteilungsgrundlage für ge-  
klebte Verglasungssysteme ;  
Teil 1: Charakterisierung des  
Klebesystems.  
Prüfbericht 507 36747/1 vom  
17. Februar 2009

**Verwendungshinweise**  
Dieser Prüfbericht dient zum  
Nachweis der Dauerhaftigkeit  
eines Klebesystems

**Gültigkeit**  
Die genannten Daten und Er-  
gebnisse beziehen sich aus-  
schließlich auf das geprüfte und  
beschriebene Produkt.  
Die Prüfung des Haft-Dehn-  
Verhaltens ermöglicht keine  
Aussage über weitere  
Leistungs- und qualitätsbestim-  
menden Eigenschaften des ge-  
prüften Klebesystems.

**Veröffentlichungshinweise**  
Es gilt das ift-Merkblatt „Bedin-  
gungen und Hinweise zur Be-  
nutzung von ift-Prüf-  
dokumentationen“.  
Das Deckblatt kann als Kurz-  
fassung verwendet werden.

**Inhalt**  
Der Nachweis umfasst insge-  
samt 15 Seiten  
1 Gegenstand  
2 Durchführung  
3 Einzelergebnisse  
4 Auswertung

Anlage 1 (2 Seiten)



Die Anforderungen der ift-Richtlinie VE-08/1, Teil 1, zum Haftverhalten des Klebebandes **Duplocoll® 56004** auf den Oberflächen der oben genannten Substrate A und B werden erfüllt.



Monika Hutter, Dipl.-Ing. (FH)  
Prüfingenieur  
ift Zentrum Glas, Baustoffe & Bauphysik

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# Applying the tape onto the frame profile (simplified)

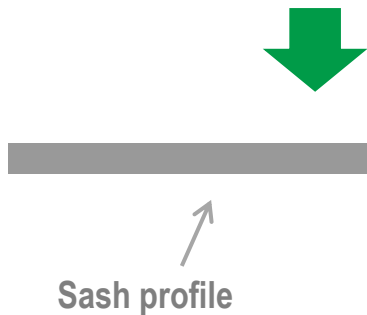
Tape application is part of the frame profile production (inline process).

## Production of the frame profile

- PVC and aluminum profiles are extruded.
- Wooden profiles are sawed.

## Three options to apply the tape onto the frame profile

- Semi / fully automatic process is for PVC and aluminum.
- Manual process is for wooden windows and for reparation of windows.



Automatic



Semi-automatic



Manual

APPLICATION

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## Additional Tools: Cleaner and Primer

### DuploCOLL® Cleaner U & Primer G

Part of a bonding system to guarantee a sustainable customer product:

- Increases surface energy
- Reliable bonded-joint
- Harmonized bonding system



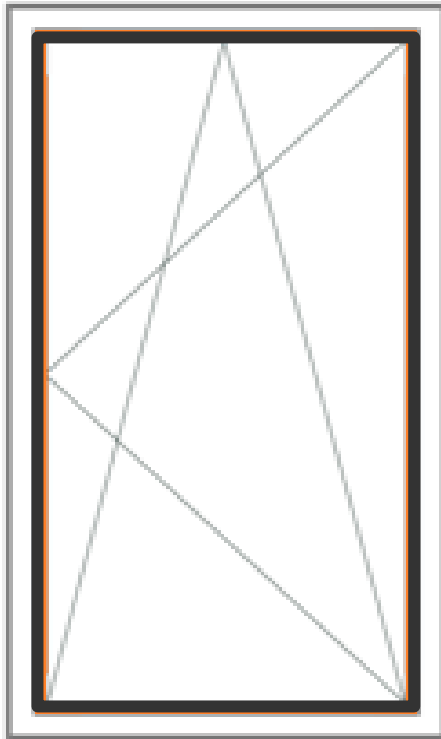
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# Tape benefits: Profile bonded along the whole glass

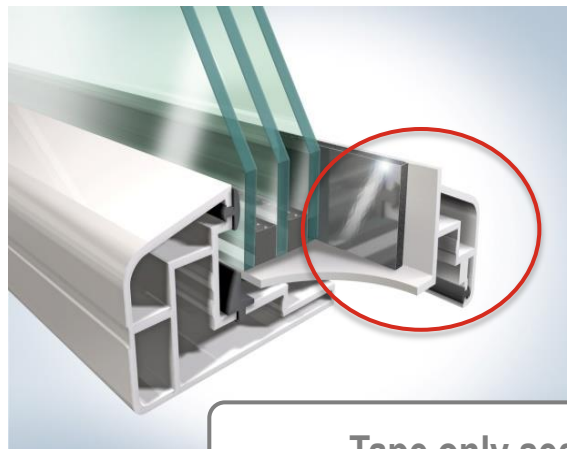


Technical benefit	Commercial benefit	Relevance for		
		PVC	Alu	Wood
<ul style="list-style-type: none"> <li>Stability around the whole glass</li> <li>Traditional fixation allows only partial stability (point load)</li> <li>Trend to slimmer profiles with aluminum and wood: Area load becomes more important not only for PVC</li> </ul>		+++	+++	+++
<p>PVC frames do not require steel core any longer:</p> <ul style="list-style-type: none"> <li>Option 1: Improve optical appearance with slimmer profiles and less weight</li> <li>Option 2: Fill free chamber with additional insulation (better energy efficiency)</li> </ul>	<ul style="list-style-type: none"> <li>0.80-1.00 €/m</li> <li>4.00-5.00 €/ window</li> </ul>	+++	N.a.	N.a.



# Tape benefits: Tape taking over the sealing function

Technical benefit		Relevance for		
		PV C	Alu	Woo d
<ul style="list-style-type: none"> <li>Sealing profile is not required any longer and can disappear.</li> <li>Improvement of optical appearance</li> </ul>	<p>Three types of sealings and their cost savings:</p> <ul style="list-style-type: none"> <li>Coextruded: low quality, is extruded as part of the PVC frame profile production (0.15 €/m)</li> <li>EPDM: applied after frame profile extrusion (0.20 to 0.30 €/m)</li> <li>Silicone sealing for wooden windows:(0,6 €/m)</li> </ul>	+++	+++	+++



Tape only sealing

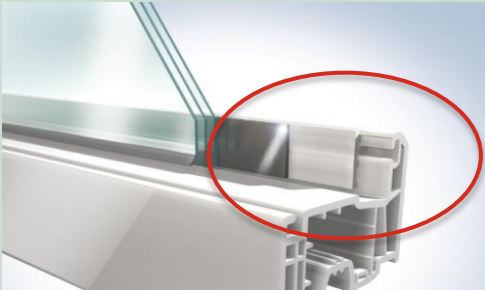
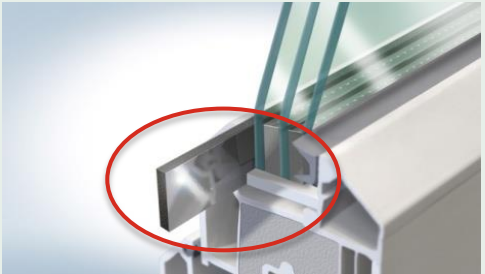


# Dry bonding with tapes compared to liquid bonding

Technical benefit	Commercial benefit	Relevance for		
		PVC	Alu	Wood
Tape allows consistent bonding along the glass.	Material cost the same for both liquid and dry, but: <ul style="list-style-type: none"> <li>• Manual application: Consistent application of liquid is not possible and generates additional cost for cleaning</li> <li>• Automatic application: 100 k€ invest for liquid vs. 0 dry</li> </ul>	+++	++	+++
Tapes are more flexible in handling and storage.	Reduction of waste	++	++	+++
No drying time for tape, compared to 1 h for liquids	Optimisation of time and space	++	++	+++
Liquids require additional sealing, tapes do not.	See previous slide.	++	++	+++

# Case study tape solution

The example shall outline how we helped to improve our customers' applications

Customer application	Lohmann USP
<p>Solution required to use tape with adapter profile for standard profiles. I.e. design of frame profile shall not be changed.</p> 	<ul style="list-style-type: none"><li>• Lohmann patent pending</li><li>• Solution can be used in most of existing profiles → no tooling cost, no new system</li><li>• Application of „self-bonding-adapter-profile“ inline or during sash-production → flexibility</li><li>• Can also be used in aluminum profiles.</li><li>• Easy to remove in case of glass-damage</li></ul>
<p>Tape only solution for newly designed frame profile with premium optical appearance.</p> 	<ul style="list-style-type: none"><li>• Certified and proven solution</li><li>• First mover success with foam tape solution</li></ul>

# Case study application machinery

We deliver customised out-of-the-box solutions to optimize performance individually.



## Customer application

- Tape integrated in suitable sash design
- The requirements are an efficient integration into production process of the profiles.



Tape only

## Lohmann USP

- Inline application of tape to profile during extrusion process → lowest application cost
- No change in manufacturing & assembling process → no additional equipment & process time

### 3. Reference customers and case studies

## Our reference customers in EMEA

Many well-known window manufacturers trust in our Dry Static Bonding Technology- for a good reason.



We offer up to ten years of warranty. Thus, many window customers benefit from the innovative Lohmann solutions

## Bonded construction examples

project: GEALAN

Profile manufacturer: open

window manufacturer: open

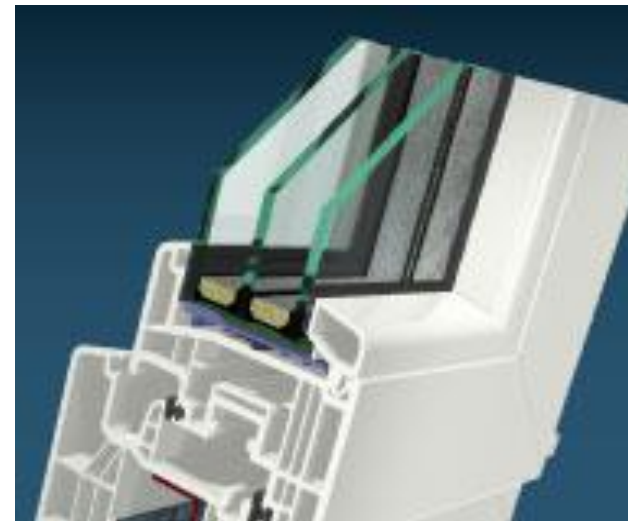
engineer: GEALAN Systemtechnologies

window material: PVC

tape: DC 56012

status: System STV already running

„Static dry glazing“



## Bonded construction examples

project: Glassline

profileproducer: Veka (D)

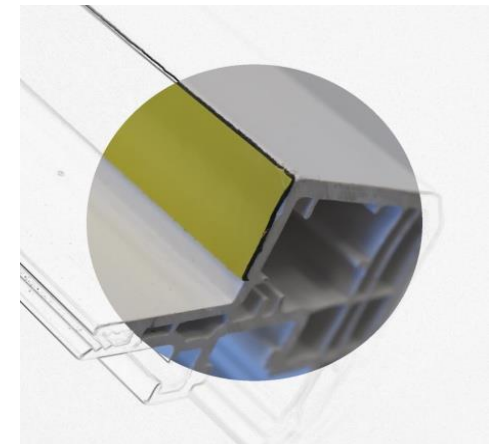
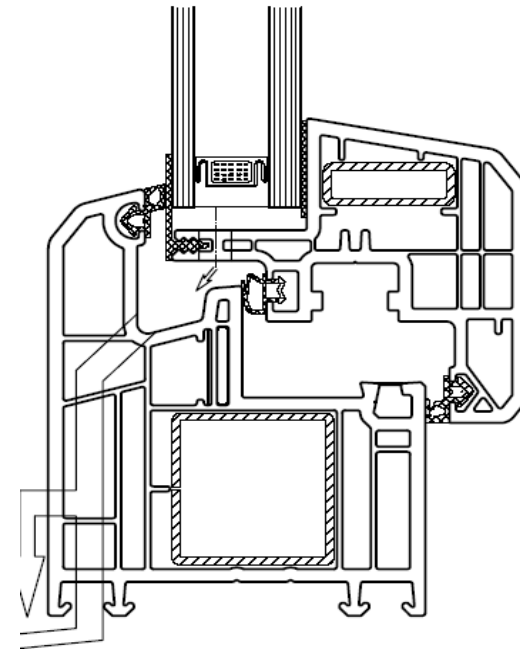
window manufacturer: Gaulhofer (AT)

windowmaterial: PVC

tape: DM 910FN – 19mm / spools

status: in production since 2004

no wing profile from outside



## Bonded construction examples

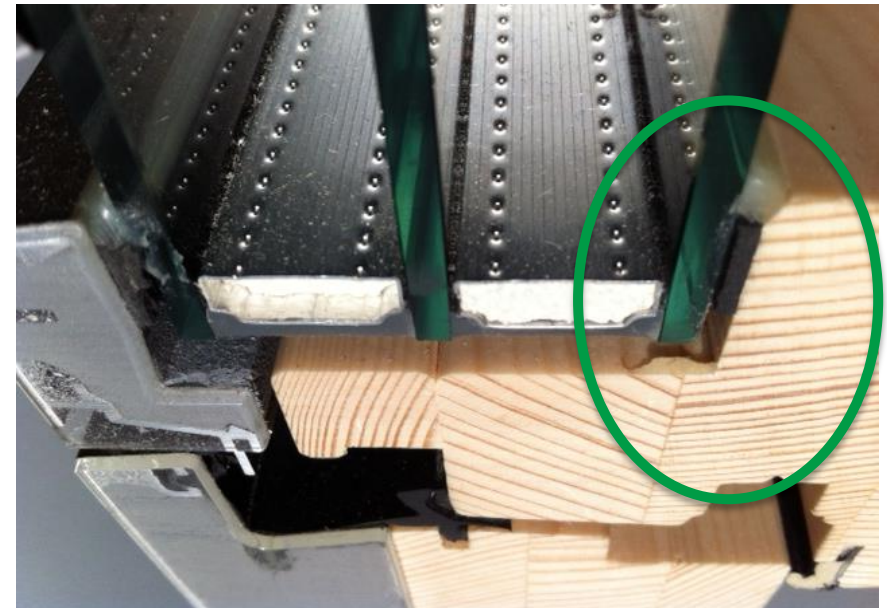
project: Internorm

profile producer: Internorm (AT)

window manufacturer: Internorm (AT)

window material: wood / aluminium

status: in production since 2010





## Bonded construction examples

project: Profine

profile manufacturer: KBE, Trocal,  
Kömmerling

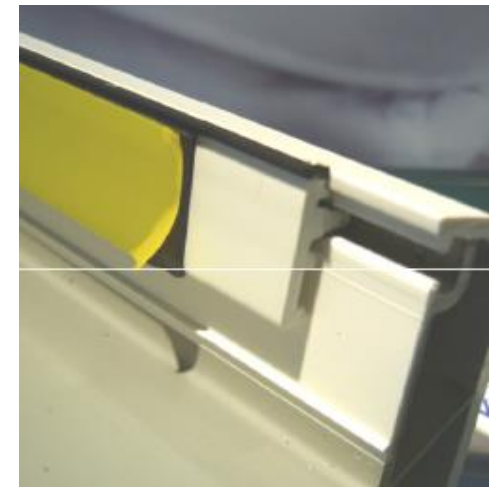
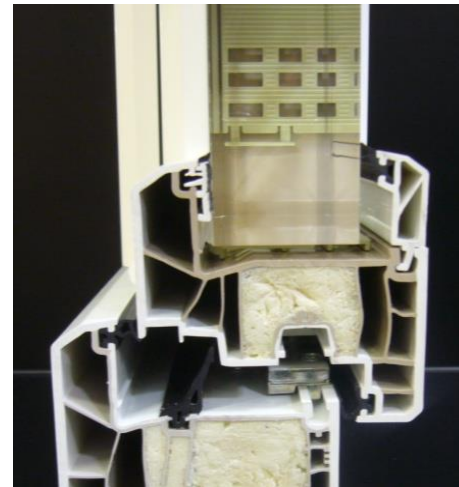
window manufacturer: open

engineer: Profine

window material: PVC

tape: DC 56002, 15mm

status: starting 08/2012



## Bonded construction examples

project: Composite window

profile manufacturer: Hueck Hartmann

window manufacturer: open

engineer: Hueck

window material: Aluminium

tape: DC 56002, 25mm

status: starting 02/2012



Thank you very much  
for your attention!

