



Muntin Bars: Create a Custom Look for the Home

Adhesive bonding competence in the building industry

The Duplomont®
918 product
family



koester | metafol

The Duplomont® 918 product family – technically mature adhesive tapes for bonding muntin bars

Duplomont® 918 double-sided mounting tape was originally developed for the bonding of mirrors in the furniture industry. The heavy weight of a mirror and the need for a secure, long-life and bonding performance require an adhesive with outstanding cohesion and non-ageing characteristics.

Continuous research focussing on this highly successful product family has led to the development of adhesive tapes that are perfectly suited for the fastening of muntin bars made from a variety of materials. This application has the added requirement of withstanding typical outdoor exposures: heat, cold, humidity, UV-light, and high winds.

Lohmann – solutions from one single source



Adhesive

Formulation. Polymerisation.

Lohmann's polymerisation capabilities allow for the development and the manufacture of specific high-performance adhesives in consistently high quality.



Coating

With and without carrier material.

A permanent quality control is maintained during the entire tape manufacturing process from coating to the finished product. Of course, this includes in process control.



Converting

Slitting. Winding. Spooling.

Lohmann Adhesive Tape Systems' converting is customer-oriented. Depending on the width, the tapes are supplied in rolls or in spools on 180 or 300 mm wide cores, in lengths up to 3,000 m with virtually tension-free winding.



Die-Cutting

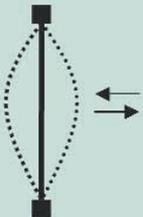
Geometrically shaped. Customised. Accurate.

Recent developments in window technology pose new challenges for the tape manufacturers. Adhesive die cuts offer a multitude of opportunities in design and function. As an example, die cuts made of double-sided PE-foam tapes provide a sealing function in mitre cuts.

Quality Products with ift-Testing

Quality and performance need to be verifiable. With this in mind we have requested the independent Institute for Window Technology of Rosenheim/Germany to carry out a realistic and relevant test program. The following tests are reflecting the typical strains and loads muntin bars are exposed to.

The 'ift' has extensively tested our Duplomont adhesive tapes and found them suitable for the application of bonding muntin bars in windows.



Test
Wind-load resistance, 300 cycles, +/- 1000 Pa

Load
Dynamic "push-in pressure" in the centre of the pane



Test
Wind-driven rain up to a test pressure of 1200 Pa

Load
Humidity



Test
One-side temperature exposure +50 °C/24 hrs.

Load
"push-in pressure" in the centre of the pane and expansion in length



Test
One-side temperature exposure to -15 °C/24 hrs.

Load
"push in pressure" in the centre of the pane and reduction in length



Test
Climate cycle test with 16 cycles

Load
Expansion in length of the muntin bars

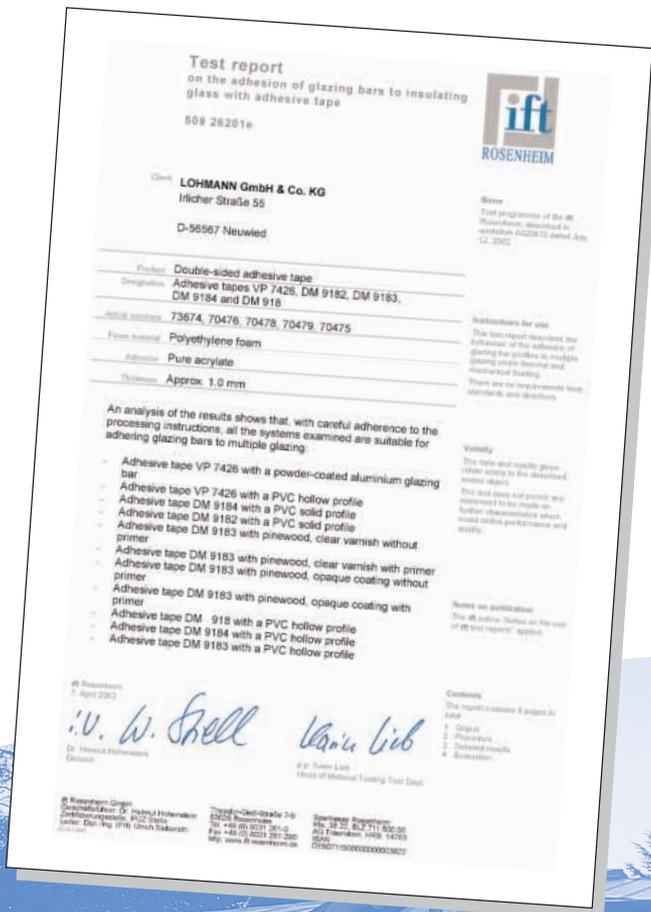
Climate cycle test

Temperature (°C)	Time
20	0
20	10
20	20
20	30
20	40
20	50
20	60
20	70
20	80
20	90
20	100
20	110
20	120
20	130
20	140
20	150
20	160
20	170
20	180
20	190
20	200
20	210
20	220
20	230
20	240
20	250
20	260
20	270
20	280
20	290
20	300



Test
UV radiation, 300 Watt, four times 68 hrs.

Load
UV-resistance



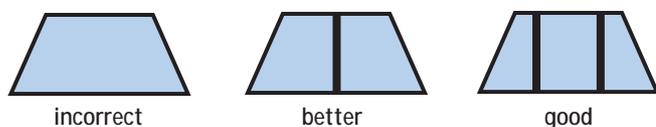
Application Instructions for the Use of Duplomont® Double-Sided Adhesive Tapes for the Lamination of Muntin Bars and Profiles



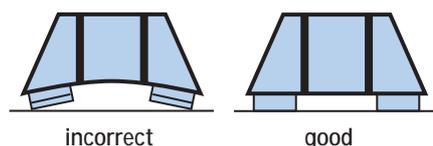
The following instructions and tips should be considered when manufacturing self-adhesive muntin bars and profiles:

Profile Extrusion

Reinforced, multi-chambered profiles should be designed in a way that flatness is not affected when material tensions occur.

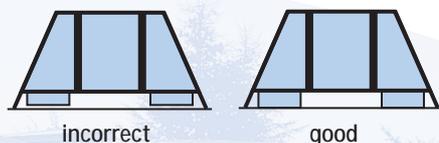


In order to develop intimate contact of the adhesive tape with the bonding surface of the profile, the plastic extrusion needs to be absolutely flat.



With a view of eliminating excessive shrinkage, PVC profiles should be tempered before adhesive lamination. Extrusion-induced material tensions will only show under temperature stress at the finished window. Shrinkage will cause tensions between the tape and the profile significantly affecting the bonding strength.

Extruded profiles with lips should be designed with the tape thickness in mind to avoid tensions caused by a "memory effect" of the lip tending to return to its original shape.



Two narrow tape strips at the edges of the extrusion often give a better result than one strip over the entire surface of the profile.

Bonding a film-wrapped profile is principally more difficult than the adhesive lamination of a solid plastic profile. The problem lays in differential expansion coefficients of film and profile or in tensions built in the film lamination process. In addition, black coloured profile wraps heat up to significantly higher temperatures than light-colour muntin bars resulting in more thermal stress of the bond.

Adhesive Lamination of Plastic Profiles

All surfaces should be dry, clean and free of dust and grease. Residual extrusion lubricants have to be removed from the profile with an appropriate detergent.

Make sure the tape is fed with no tension and laminated with defined application pressure. The recommended application pressure is around 50 % of the possible compression. Never use the maximum compression.

The adhesive tape is best laminated at a sharp angle. The use of an electrically powered tape spool unwinder is highly recommended.

The maximum bond strength will only be achieved after 24 hrs. at ambient temperature.

It is possible in principal to laminate adhesive tapes at temperatures from approximately +5 °C but this will significantly increase the time for the bond to reach its final adhesive strength.

Inadequate stacking/packaging of the adhesive laminated profiles may cause pressure dents. The tape liner may slide partially out of place exposing the adhesive and thus reducing the available adhesive surface for the later application.



Cutting Profiles to Length

Make sure the mitre cuts are clean and avoid burrs and over-lengths. Do not lift or remove the tape liner to prevent cutting dust to contaminate the adhesive surface.



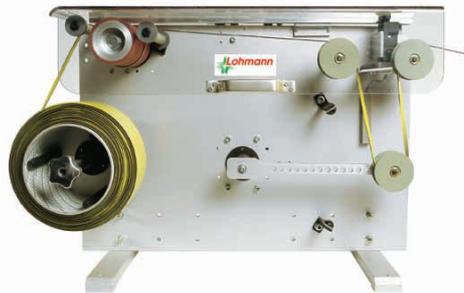
Bonding of Muntin Bars

When plastic profiles are mounted on glass both material should have the same temperature as condensing water will form when the glass is too cold.

The glass surface needs to be clean, dry, and free of grease.

Depending on the composition of the glass water may cause the tape bond to fail (see "General Remarks on the Composition and Reactivity of Glass"). We recommend to pretreat the glass surface with a glass primer. The user should evaluate relevant primers on the original materials for determining if they are suitable for the intended application. Useful hints and tips are available from our Application Technology Service. Observe the curing and drying time of the primer.

When mounting the muntin bars provide for a minimum application pressure of 1 to 2 kgs/sq.cm. The maximum bond strength between the glass and the plastic muntin bar at room temperature will only be achieved after 24 hrs. Generally it is possible to laminate adhesive tapes at temperatures from approximately + 5°C, but this will significantly increase the time for the bond to reach its final adhesive strength.



In order to secure that Lohmann adhesive tapes work suitable to industrial scales we advise on a comprehensive series of application reliefs – ranging from dispensers to automatic machines which laminate trims, profiles or flexible web materials. If required the contact surfaces will be pretreated by roughening, coating primers, preheating or corona discharge.

Consult our Application Technology Service for more details:

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General Remarks on the Composition and Reactivity of Glass

Occasionally muntin bars lift off from the window glass. The reason for these bond failures may be found in the use of an inadequate cleaning agent, in excessive shrinkage of the profile or in the hydrophillic properties of glass. In this case the adhesion is pressed back to the glass and a water film is formed between the adhesive and the glass. At first sight, glass is a completely inert material but in chemical connection it is a highactive medium, at least at the surface.

Window glass mainly consists of magnesium, sodium, calcium oxyde and silicon dioxyde, and is a sodium-calcium-magnesium silicate. Glass may hydrolyse with water on the surface while forming alkali and earth alkaline hydroxydes. Most likely this reaction causes the described aqueous film between the tape and the glass.

Once this hydroxide film has been washed off, the only way for the glass to take up water is by forming hydrogen bridges. However these hydrogen bridges are too weak to suppress the adhesion forces, i.e. the adhesive forms a stronger bond to OH-groups than to alkali silicate groups.

This phenomenon has been confirmed by observations of our Application Technology Service. The bond between the tape and the new glass is significantly less resistant to humidity than the adhesion on glass which has already been exposed to humidity.

In order to eliminate the effects caused by the hydrophillic properties of glass and to create a defined, humidity-resistant surface, we recommend to pretreat the glass with a suitable primer before mounting the muntin bars.

To assure their maximum bond strength do not touch the exposed adhesive once the liner has been removed and make sure that the adhesive surface is not contaminated.

Duplomont® Double-Sided Adhesive Tapes for Bonding Muntin Bars

Product	Liner	Carrier	Thickness
DM 9042	PE-paper, white	PE-foam, black	0,65 mm
DM 918	PE-paper, blue	PE-foam, white	1,0 mm
DM 9182	PE-film, yellow	PE-foam, black	1,0 mm
DM 9183	PE-paper, white	PE-foam, black	1,0 mm
DM 9184	PE-film, yellow	PE-foam, white	1,0 mm
DM 919	PE-paper, blue	PE-foam, white	1,6 mm
DM 9192	PE-paper, blue	PE-foam, black	1,6 mm

Adhesive

Pure solvent-based acrylics offer high cohesion combined with excellent resistance against high temperatures, solvents, chemicals, and UV-light.

Carrier

High-density, closed-cell cross-linked PE-copolymer foam, white or black colored.

Liner

Blue or white polyethylene-coated paper, or yellow film liner.

