

Perfect bonding for windows and doors





OTTO and bonding

From the very beginning, windows have been the focus of our company: in 1881, Hermann Otto founded a factory in Berlin for the production of window putty. Through the continuous expansion of the product range, this developed over time into the medium-sized company OTTO-CHEMIE, which is now one of Europe's leading manufacturers of sealants and adhesives.

Bonding as a new manufacturing technology has also found its way into window construction. As in automotive and aircraft construction, adhesive bonding technology offers forward-thinking window manufacturers numerous advantages that simplify production and improve windows.

On the following pages, we explain the many advantages of bonding window panes and sash frames. OTTO has developed special adhesives for this purpose and offers you a comprehensive overall system and service package.

Everything from a single source!

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We keep track of everything

When bonding window panes and window frames, it is essential that all components are compatible with each other – only then can material compatibility and adhesion be guaranteed. Depending on your profile system (PVC, wood or aluminium windows) and the insulating glass edge seal used for the panes, the following pages will show you which adhesive is suitable for you, what types of bonding are available and what advantages bonded windows offer you.

Adhesives at a glance



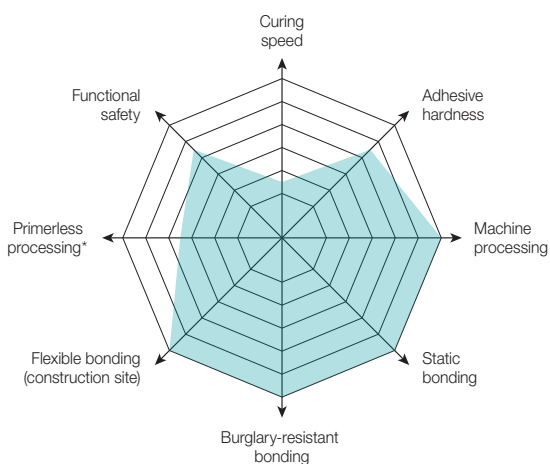
OTTOCOLL® S88

The 1-component silicone for bonded windows

- ✔ **Static window bonding**
- ✔ Low odour
- ✔ High strength
- ✔ Insulating and laminated safety glass

Fields of application

- Bonding of insulating glass to the glass edge (~ 10mm depth)
- Bonding and sealing of glass, wood, metal and plastics



OTTOCOLL® S81

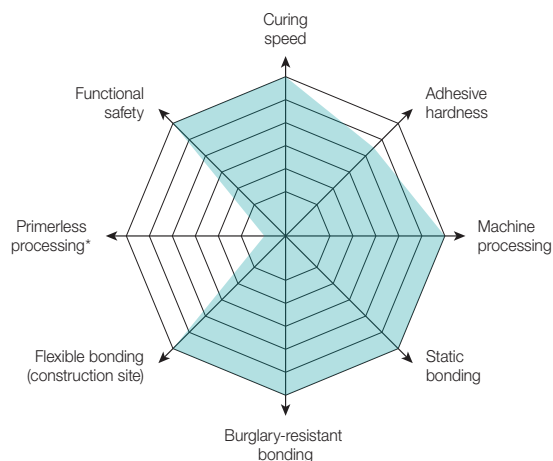
The premium 2-component silicone for bonded windows

★★★★★
PREMIUM

- ✔ **Safe application**
- ✔ Fast curing
- ✔ High strength
- ✔ Insulating and laminated safety glass

Fields of application

- Bonding of different materials
- Bonding and sealing of glass elements (e.g. partitioning walls)
- Manufacture of RC-tested construction elements



* Consultation with application technology required



OTTOCOLL® S670

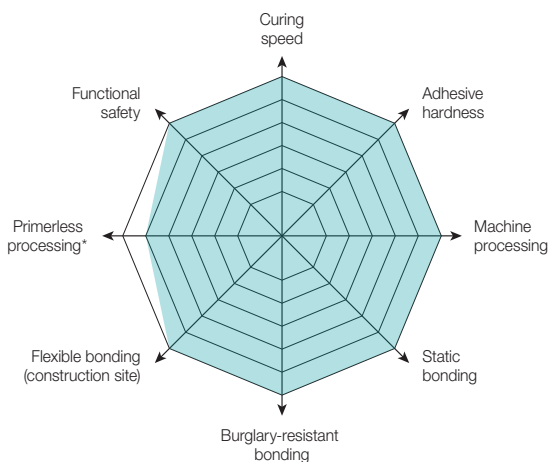
The premium 2-component silicone for bonded windows with increased reinforcement

★★★★★
PREMIUM

- ✔ **Rapid application**
- ✔ Fast curing
- ✔ Very high strength
- ✔ Insulating and laminated safety glass

Fields of application

- ▶ Bonding of insulating glass
- ▶ Bonding and sealing of glass elements (e.g. partitioning walls)
- ▶ Manufacture of RC-tested construction elements

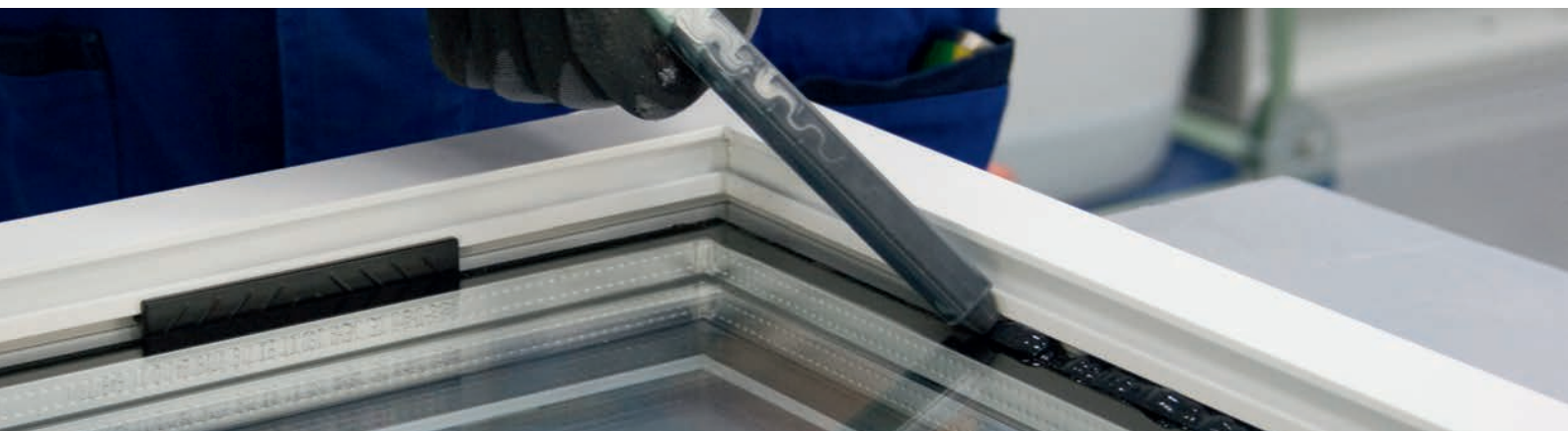
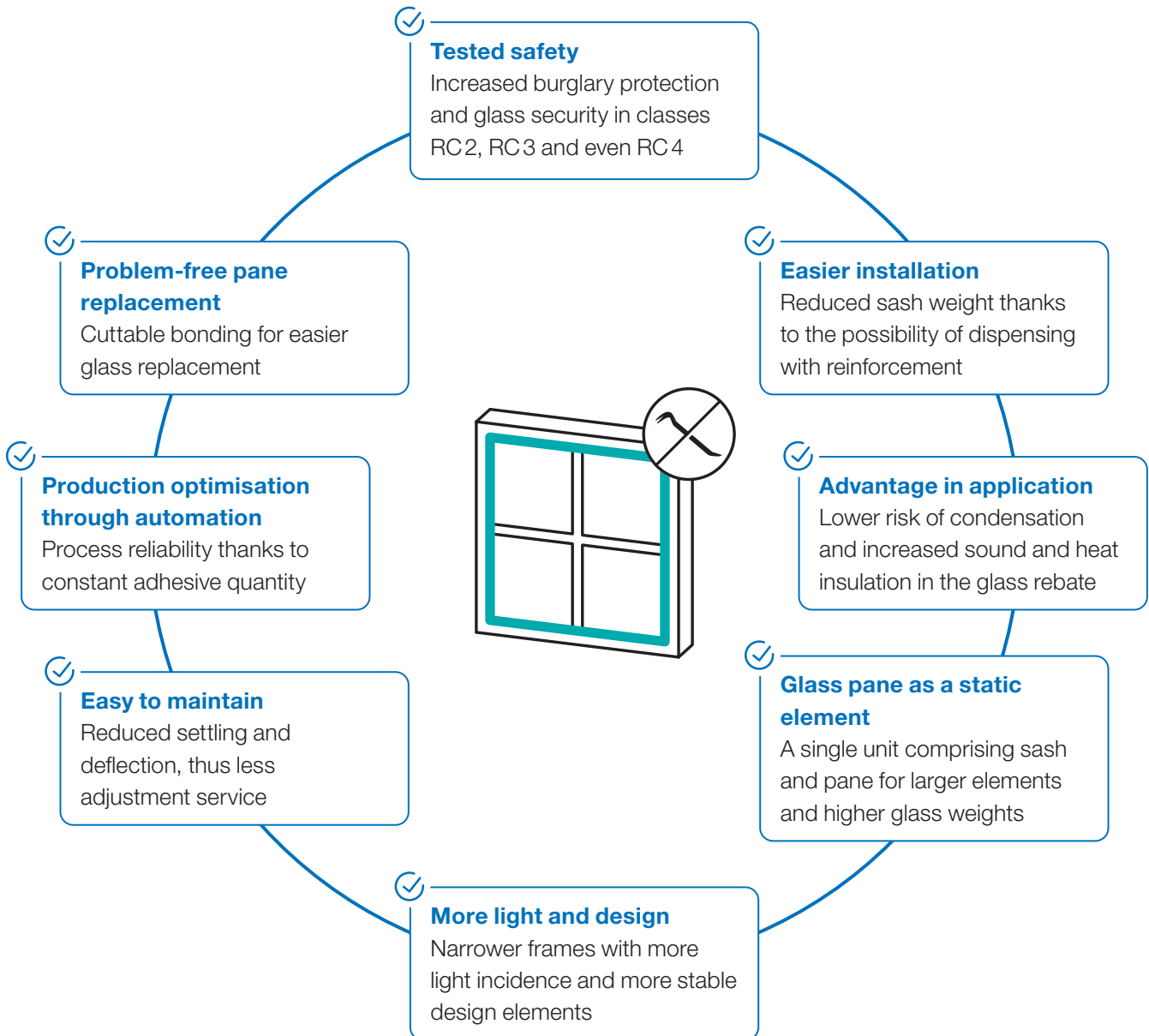


Advantages of the BlueLine cartridge

The „BlueLine“ technology from the 10:1 cartridge ensures a **higher application rate in less time** compared to a conventional cartridge. The application of OTTOCOLL® S81/ OTTOCOLL® S670 with the BlueLine cartridge thus saves the user a considerable amount of time. The static mixing nozzle, which was developed specifically for the „BlueLine“ technology, ensures safe and fast application of the adhesive.



The advantages of bonding



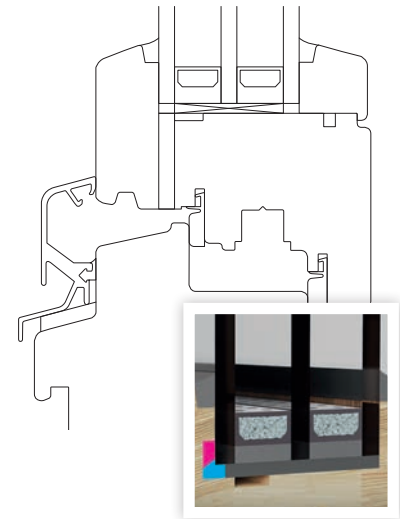
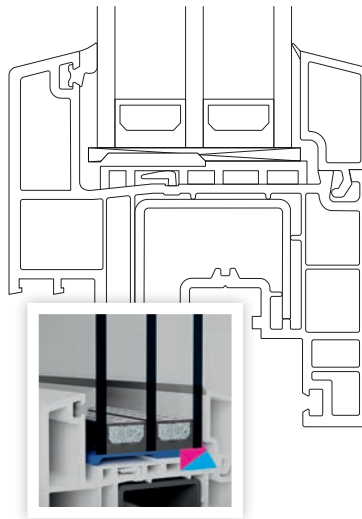
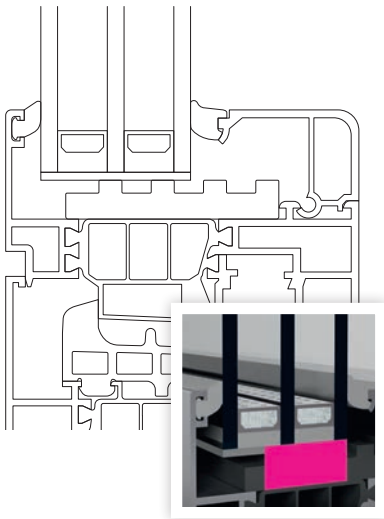
The bonding positions

Window bonding is possible with all frame materials, from wood to plastic to aluminium. Depending on the profile system and the requirements for the window's security class, various bonding positions are possible, such as rebate base bonding, glass edge bonding or overlap bonding. With our OTTOCOLL® adhesives, you are always on the right side. You can see which combinations our adhesive systems allow here:

Rebate base bonding

Glass edge bonding

Overlap bonding



■ G-secondary edge bonding
■ Bonding

- ✔ Very well suited for static reinforcement of the window
- ✔ Suitable for use up to security class RC 4
- ✔ Suitable for 2K adhesive

- ✔ Well suited for static reinforcement of the window
- ✔ Suitable for use up to security class RC 2
- ✔ Suitable for 1K and 2K adhesives
- ✔ Lower adhesive consumption

- ✔ Well suited for static reinforcement of the window
- ✔ Usually combined with rebate bonding for high RC classes
- ✔ Lower adhesive consumption

	OTTOCOLL® S88	OTTOCOLL® S81	OTTOCOLL® S670
Rebate base bonding	✘	✔	✔
Glass edge bonding	✔	✔	✔
Overlap bonding	✔	✔	✔

The processing options

Application with a gun

- ✔ Cost-effective introduction to adhesive technology
- ✔ For processing all OTTOCOLL® adhesives
- ✔ Easy handling
- ✔ Ideal for one-off production and repair glazing



OTTO Compressed air gun P 490 DP2X



OTTO Accumulator gun 2K AP 400



Manual processing of OTTOCOLL® S81 with the BlueLine cartridge



OTTO rental gun service

You don't have the right gun for your application?
OTTO's rental gun service has the perfect solution for you.

We look forward to receiving your enquiry at sales.international@otto-chemie.com



Manual processing with hand sealing systems

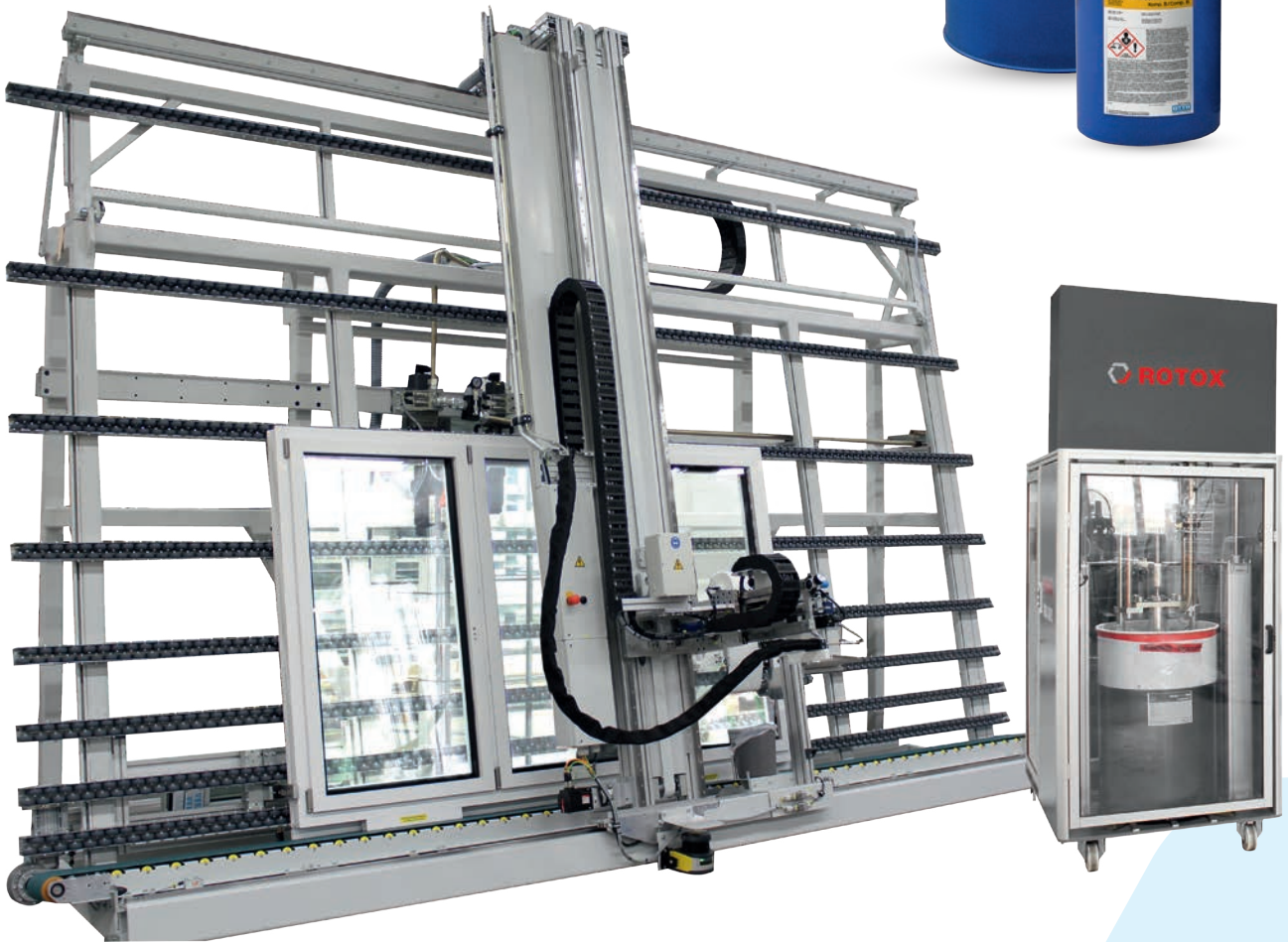
- ✔ Cost-effective solution for industrial production
- ✔ Can be processed with OTTOCOLL® S81 and OTTOCOLL® S670
- ✔ Ideal for small and medium-sized series production



Manual processing of OTTOCOLL® S81/OTTOCOLL® S670 with a manual sealing system; e.g. mastermix XS 2K, a hydraulic two-component sealing system with 2K gun for disposable mixers from t-s-i.de Misch- und Dosiertechnik GmbH

Automated processing with glass bonding machines

- ✔ Process reliability through automated processing
- ✔ Efficient and flexible adhesive application
- ✔ Highest manufacturing quality thanks to defined parameters
- ✔ Optimised product costs in large-scale production



Automatic processing of OTTOCOLL® S 81/
OTTOCOLL® S 670; e. g. with the automatic glass
bonding machine GKA 242 from ROTOX GmbH

Working together for success

Our service includes coordination with the system manufacturer

At OTTO, we offer our customers a unique all-round service, ranging from expert advice on adhesive selection to coordination with your plant manufacturer and window system supplier. Because only when all components are perfectly coordinated can the best results be achieved. Our goal is to ensure that the bonding technology of your choice can be integrated into your production process in the best possible way. The key to success lies in precisely identifying your requirements and wishes for the bonded window system. Based on these specifications, we define the right bonding material and coordinate with the equipment manufacturer and window system supplier.

Benefit from our many years of experience in the field of industrial bonding. Just get in touch with us – we will be happy to assist you!



Your direct line to OTTO

Do you have a question about glass windows and façades? Our internal sales team will be happy to hear from you and will connect you with the appropriate specialist department.

Telephone: +49 8684 908-5300

Email: sales.international@otto-chemie.com



Leaf covering door fillings

When using leaf covering door fillings, the panel protrudes beyond the edge of the door leaf, creating a modern, flush appearance. This special design places high demands on the fastening solution – both in terms of stability and durability. OTTOCOLL® M580 enables bonding and assembly of these fillings quickly, efficiently and reliably. The high-performance adhesive offers high initial adhesion and lasting strength.



✓ High production efficiency

Pot life 5–10 minutes, functional strength after just 25–40 minutes – ideal for fast, industrial processes

✓ Broad adhesion & high performance

On wood, metal, glass, plastics or mineral substrates – no primer required

✓ Dynamic & durable

Hybrid polymer STPU, free of isocyanates, reliably compensates for material stresses and temperature fluctuations – resilient from –40 °C to +80 °C

✓ Clean and safe processing

Low odour, silicone-free – suitable for sensitive production environments



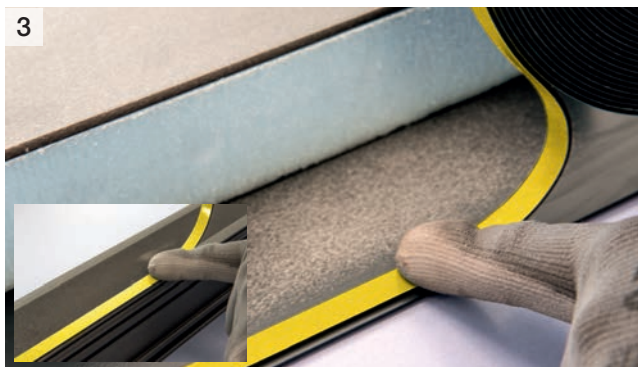
Processing instructions



1 Sand the surface (100 grit or brush), vacuum up sanding dust – the adhesive surface must then be matt



2 Clean adhesive surfaces with OTTO Cleanprimer 1101 and a lint-free cloth in one direction – turn the cloth regularly, do not wipe multiple times, do not use in the visible area



3 Apply OTTOTAPE Fixing tape (1 mm) approx. 1–2mm from the outer edge to the filling margin or wing, leave the ends protruding approx. 5 cm, press down with a rubber roller, partially remove the liner



4 Activate OTTOCOLL® M580 according to the instructions and apply as an approx. 8 mm bead to the edge of the panel or leaf – coat at least $\frac{3}{4}$ of the bonding surface with 1 mm of adhesive; continue processing within 5–10 minutes



5 Align the door panel with two people (do not touch the adhesive surfaces), then remove the liner from the OTTOTAPE Fixing tape all the way around.



6 Press the door panel from the centre outwards by hand – apply sufficient pressure to ensure secure contact without compressing the OTTOTAPE Fixing tape; no pressing or tensioning required

7 After 60–90 minutes, turn the door leaf with the panel indoor, fill the gap with OTTOCORD PE back-up foam rod and OTTOPUR foam if necessary, then insert the retaining strip without tension

High tack for the most demanding requirements – OTTOCOLL® M550



The universal solution for windows, doors and façades

OTTOCOLL® M550 is the universal solution for applications around doors, windows and façade. Whether for impact plates, strips or window sills, this high-performance 1-component hybrid adhesive impresses with its reliable adhesion, high elasticity and very good workability.

Bumper plates and skirting boards for front doors

- ✔ Secure hold on aluminium, stainless steel and other metals
- ✔ No primer required for many substrates
- ✔ Permanent adhesion – vibration and impact resistant
- ✔ Weather- and aging-resistant



External installation on windows and façades

- ✔ Bonding of mounting strips, decorative profiles and facing shells
- ✔ Can be recoated
- ✔ Low shrinkage for a precise appearance



Bonding window sills

- ✔ Flexible, high-strength adhesive for indoor and outdoor use
- ✔ Moisture-resistant and temperature-stable
- ✔ Easy to apply with a cartridge or tube bag



Processing with the cartridge

Preparation for processing the adhesive with a BlueLine cartridge

These brief instructions are intended to supplement the system description/general processing guidelines. The processing temperature of the adhesive is between +5 °C and +40 °C. Processing at higher or lower temperatures is not recommended!



OTTOCOLL® S81 in the BlueLine cartridge



Inserting the BlueLine cartridge into the gun



OTTO Compressed air gun P 490 DP2X



OTTO Static mixing nozzle MBLX 14-16G



Unscrew the union nut and remove the plug



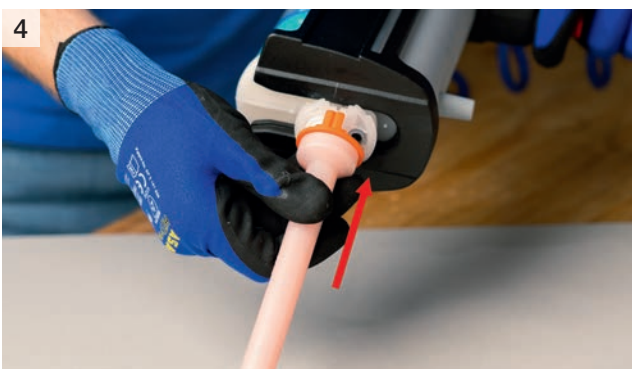
OTTO Accumulator gun 2K AP 400



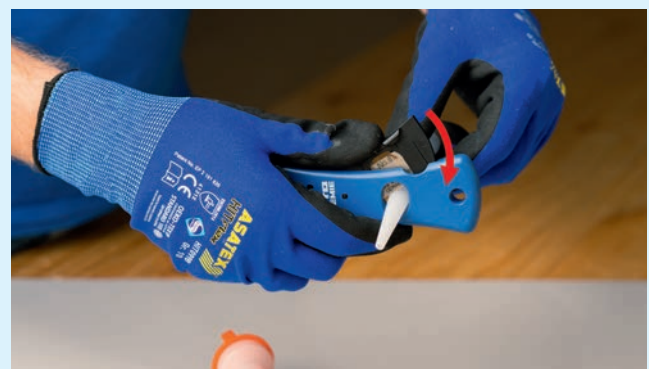
OTTO Standard nozzle for cartridges



Extrude material **without** a static mixing nozzle until material emerges from **both** openings



4 Wipe off material and attach static mixing nozzle



Shorten the standard nozzle as required before screwing it on



5 Secure the static mixing nozzle with the union nut



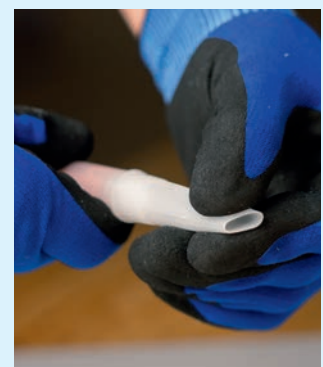
Screw the standard cartridge nozzle onto the static mixing nozzle for BlueLine cartridges as far as it will go



6 Fill the static mixing nozzle with adhesive. Check the homogeneity of the mixture (see quality controls during processing of 2K products).



Static mixing nozzle with standard cartridge nozzle screwed on



Standard cartridge nozzle pressed flat

Technical details

For particularly narrow adhesive joints, the standard cartridge nozzle can be screwed onto the static mixing nozzle for BlueLine cartridges. The nozzle can be adapted to the respective geometry of the adhesive joint by shortening and flattening the tip.

The quality control

Determination of pot life

Aim of the test

Determining the pot life allows the correct mixing ratio and the correct curing speed to be checked.

Procedure

Apply mixed 2K silicone to a PE film or glass. Use a spatula to spread the paste. The paste is soft at first and becomes increasingly tough as it begins to cure. When the paste shows signs of setting, the pot life has reached its end. As the pot life is influenced by factors such as ambient temperature and humidity, fluctuations may occur.



Consistency is pasty, spreadable – pot life has not yet been reached



Consistency is 'chewing gum-like', the sealant 'retracts' – pot life has been reached

Glass plate test

Aim of the test

This test serves to ensure the perfect homogeneity of the mixture.

Procedure

For the glass plate test, apply a small amount of the mixed adhesive to a clean piece of glass (dimensions approx. 10x10 cm). Then place a second piece of glass on top and press the two pieces of glass together. The adhesive between the pieces of glass must have a uniform, homogeneous colour. When using side by side cartridges, fine white streaks are acceptable.



Inhomogeneous mixture



Homogeneous mixture

Butterfly test

Aim of the test

This test serves to ensure the perfect homogeneity of the mixture.

Procedure

Apply a small amount of the mixed adhesive to a white sheet of paper or PE film, fold the paper/film, press it smooth and then unfold it.

As with the glass plate test, the mixture should be checked for streaks or streaks.



Mixed image when processing via a mixing and dosing system



Mixed image for cartridge processing

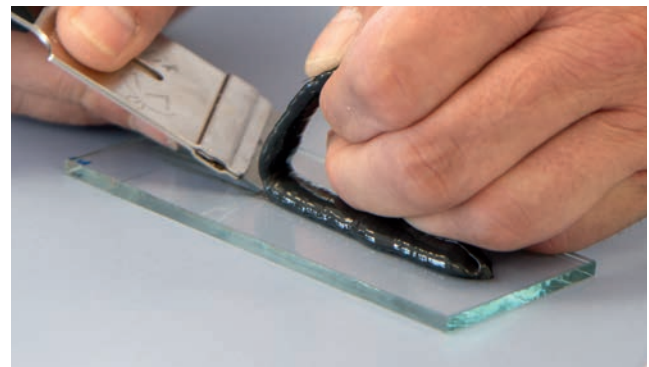
Adhesion test (peel test)*

Aim of the test

The peel test checks the correct adhesion of the adhesive to the substrates to be bonded.

Procedure

Apply an approx. 10x10mm wide or thick adhesive strip to each of the substrates pre-treated according to the specifications in the technical data sheet of the 2-component adhesive. The length of the adhesive strip is 10 cm. After a curing time of 24 hours, cut the adhesive on one side with a knife and try to pull the adhesive off the substrate by hand at an angle of $>90^\circ$. The test must be carried out for both substrates.



Cutting between adhesive and glass pane



Pulling off the adhesive bead and assessing the fracture pattern: If there is a cohesion break in the adhesive, the adhesion to the substrate is perfect

Our complementary system products



OTTOSEAL® S 110

The premium construction silicone



- ✔ High wear resistance
- ✔ Very good adhesion on many substrates
- ✔ Excellent early resistance to stress
- ✔ Non-corrosive



OTTOSEAL® S 120

The premium glazing silicone



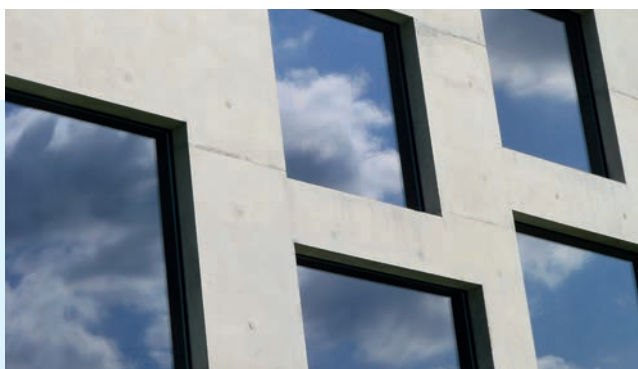
- ✔ Streak-free and abrasion-resistant
- ✔ Resistant to stress at an early stage
- ✔ Laminated safety glass
- ✔ Very long-lasting joint

Fields of application

- ▶ Expansion joints on prefabricated concrete and cellular concrete units
- ▶ Sealing of connection joints on construction elements
- ▶ Suitable for sealing on glass elements

Fields of application

- ▶ Window pane sealing on wooden windows
- ▶ Glass, window and metal construction
- ▶ Sealing double-glazings (e.g. Profilit)





OTTOSEAL® S 112

The silicone sealant for window bars

SPECIAL

- ✔ Low odour
- ✔ Repair-friendly
- ✔ Laminated safety glass



OTTOSEAL® M 360

The hybrid sealant for building joints

- ✔ Can be painted over
- ✔ Silicone-free
- ✔ Durable and robust joint
- ✔ RAL assembly

Fields of application

- ▶ Sealing and back filling of window bars for perfect blower door results



Fields of application

- ▶ Sealing of joints on façades, metal constructions
- ▶ Bonding of OTTO Window tapes
- ▶ Sealing of connection joints on construction elements



Our tested accessories

Primers and cleaners

OTTO Primer and cleaners are perfectly matched to our adhesives. This enables them to create the best and most secure bonded windows in the system. We are happy to advise and train you in the correct use of our products.



Guns

Only the best tools can achieve perfect results. See for yourself our coordinated range of guns.

We have the right product for every bonding situation: from the compressed air gun, which is a must-have in every workshop, to battery-powered construction site solutions and simple hand-operated guns.

Static mixing nozzle and nozzles

Only a perfectly calibrated static mixing nozzle can produce the ideal mix, ensuring maximum quality and process reliability. OTTO static mixing nozzles are the right choice here.



Step by step to the RC test

Assessment of your requirements

The first step towards your tested RC system is to accurately assess your requirements. This is not just about which RC class you want to achieve, but also which window system you use, which fittings you use, which surface finish is used and how you want to apply the adhesive technology. Benefit from our many years of experience in the window industry: we have excellent connections with all wellknown hardware manufacturers, window system suppliers and testing institutes.



Joint production of test specimens

Once your requirements have been clearly defined and coordination with all parties involved has yielded the best possible result, we put it into practice. We support you in the production of your test specimens and bond them together with you. Here we discuss step by step what is important in RC bonding. We explain how quality control works and how OTTO adhesives are best handled.

Support during testing

The next step is to visit the testing institute. Here, your elements are tested and classified in accordance with EN 1627 requirements and classification of burglar-resistant components. First, the static strength is tested in accordance with EN 1628. To do this, precisely defined points on the test specimen are subjected to a static test load. Next, the dynamic load test is carried out in accordance with EN 1629. Finally, the test specimen is subjected to a manual attack in accordance with EN 1630, in which the available tools and time count: depending on how long the test specimen withstands which tool, the burglar resistance is classified into RC classes 2, 3 or 4.



Support with implementation in your business

Practice makes perfect, as the saying goes. We follow this well-known adage when implementing solutions in your production facility and train your employees in the correct use of our products. Furthermore, we work closely with you to develop production-related measures tailored to your requirements and needs.

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For information relating to certification marks, please see www.otto-chemie.com under the heading "Information on Certification Marks". The requirements and test criteria of the DGNB and LEED can be found on www.dgnb.de and www.german-gba.org. Please note that these companies do not evaluate our individual products, but the sustainability as a whole of each complete building project.

The information in the present document corresponds to the status quo on going to print, (refer to the index on the outside back cover). With a new edition this edition becomes invalid. Due to the many possible influences during and after application, the customer always has to carry out trials first. Please observe the respective technical data sheet! This information is available on the Internet at www.otto-chemie.com. Errors and typographical errors are excepted.

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SEALING & BONDING