



Properties of Adhesives at a Glance

Specifications	MV 760	MV 760VIS	LV 740	LV 740VIS
Viscosity:	medium 1500 mPas	medium 1500 mPas	low 80 mPas	low 80 mPas
Shear strength:	25 MPa	25 MPa	17 MPa	17 MPa
Bondline gap:	0.08 - 0.5 mm	0.08 - 0.5 mm	0.04 - 0.2 mm	0.04 - 0.2 mm
Max. allowable continuous temperature:	70 °C	70 °C	70 °C	70 °C
Temperature range:	-40 - +120 °C	-40 - +120 °C	-40 - +120 °C	-40 - +120 °C
Colour:	crystal clear	crystal clear	crystal clear	crystal clear
Capillary characteristics:	none	none	very good	very good
Compensation of tension:	limited	limited	limited	limited
Impact resistant:	yes	yes	no	no
Suitable for use with activator:	no	no	no	no
Vibration absorbing:	yes	yes	limited	limited
Moisture resistance:	yes	yes	yes	yes
UVA curing:	yes	yes	yes	yes
Light curing:	no	yes	no	yes
Construction:	open and closed	open and closed	open and closed	open and closed
Yellowing resistant:	yes	yes	yes	yes
Viscoelastic properties:	impact resistant	impact resistant	limited elasticity	limited elasticity
Specifications	B 665-0	B 682-T	B 678-0	B 690-0
Viscosity:	low 80 mPas	medium 900 mPas	medium 600 mPas	medium 600 mPas
Shear strength:	23 MPa	26 MPa	9 MPa	9 MPa
Bondline gap:	0.04 - 0.2 mm	0.09 - 0.5 mm	0.06 - 0.3 mm	0.06 - 0.3 mm
Max. allowable continuous temperature:	50 °C	50 °C	50 °C	50 °C
Temperature range:	-40 - +120 °C	-40 - +140 °C	-40 - +100 °C	-40 - +100 °C
Colour:	crystal clear	transparent	crystal clear	crystal clear
Capillary characteristics:	very good	none	limited	limited
Compensation of tension:	no	limited	very good	very good
Impact resistant:	no	yes	no	no
Suitable for use with activator:	no	yes	no	no
Vibration absorbing:	no	yes	high	high
Moisture resistance:	no	no	yes	yes
UVA curing:	yes	yes	yes	yes
Light curing:	no	no	yes	no
Construction:	open and closed	open and closed	closed	closed
Yellowing resistant:	no	no	yes	yes
Viscoelastic properties:	brittle	impact resistant	elastic	elastic

Specifications	420VIS
Viscosity:	medium 300 mPas
Shear strength:	6 MPa
Bondline gap:	0.07 - 0.2 mm
Max. allowable continuous temperature:	50 °C
Temperature range:	-55 - +120 °C
Colour:	crystal clear
Capillary characteristics:	limited
Compensation of tension:	very good
Impact resistant:	no
Suitable for use with activator:	no
Vibration absorbing:	yes
Moisture resistance:	no
UVA curing:	yes
Light curing:	yes
Construction:	closed
Yellowing resistant:	yes
Viscoelastic properties:	elastic

Temperature resistance

The temperature resistance refers to the maximum allowable continuous temperature at which the cured adhesive is not irreversibly damaged. With increasing temperatures, however, the maximum strength steadily decreases.

Tensile/Shear strength

When recommended minimum and maximum layer thicknesses are taken into consideration, the tensile/shear strengths listed in the table can be achieved.



Possible Bonds

Specifications	MV 760	MV 760VIS	LV 740	LV 740VIS
Glass/glass	yes	yes	yes	yes
Glass/metal	yes	yes	no	no
Tempered glass/tempered glass	yes	yes	yes	yes
Glass/stone	limited	limited	no	no
Glass/wood	limited	limited	no	no
Laminated safety glass/glass	limited	yes	limited	yes
Laminated safety glass/laminated safety glass	no	yes	no	yes
Laminated safety glass/stone	no	limited	no	no
Laminated safety glass/wood	no	limited	no	no
Laminated safety glass/metal	no	yes	no	no
Laminated safety glass/tempered glass	limited	yes	limited	yes
Glass/plastic	limited	limited	no	no
Laminated safety glass/plastic	no	limited	no	no
Plastic/plastic	no	no	no	no
Plastic/metal	no	no	no	no
Plastic/tempered glass	no	limited	no	no

Specifications	B 665-0	B 682-T	B 678-0	B 690-0
Glass/glass	yes	yes	yes	yes
Glass/metal	no	yes	limited	limited
Tempered glass/tempered glass	no	yes	yes	yes
Glass/stone	no	limited	limited	limited
Glass/wood	no	limited	limited	limited
Laminated safety glass/glass	limited	limited	yes	limited
Laminated safety glass/laminated safety glass	no	no	yes	no
Laminated safety glass/stone	no	no	limited	no
Laminated safety glass/wood	no	no	limited	no
Laminated safety glass/metal	no	no	limited	no
Laminated safety glass/tempered glass	no	limited	yes	limited
Glass/plastic	no	limited	limited	no
Laminated safety glass/plastic	no	no	limited	no
Plastic/plastic	no	no	no	no
Plastic/metal	no	no	no	no
Plastic/tempered glass	no	no	limited	no

Specifications	420VIS
Glass/glass	no
Glass/metal	no
Tempered glass/tempered glass	no
Glass/stone	no
Glass/wood	no
Laminated safety glass/glass	no
Laminated safety glass/laminated safety glass	no
Laminated safety glass/stone	no
Laminated safety glass/wood	no
Laminated safety glass/metal	no
Laminated safety glass/tempered glass	no
Glass/plastic	yes
Laminated safety glass/plastic	yes
Plastic/plastic	yes
Plastic/metal	yes
Plastic/tempered glass	yes
Description	suitable for bonding PMMA/PC/PET/ABS



Processing Guidelines for Glass Bonding with UV Adhesives

1. Material selection (suitability of the adhesive):

The material selection and the subsequent selection of the appropriate adhesive (see point 3) results in different mechanical strength properties of the bond. For technical data of our Verifix® bonding portfolio, please see the preceding pages. All specifications relate to transparent, UVA light translucent float glasses. Transparent float glass, mirrors (on the visible side), tempered glass and plate wired glass can be bonded without any difficulty. Special types of glass can lead to reduced mechanical strength properties or cannot be bonded. All types of structured glass are problematic, such as ornamental glass or wired glass. The UVA light translucency depends, among other things, on glass thickness and colour intensity. Important: Glass with a high UV absorption rate, such as laminated safety glass and coloured glass, cannot be bonded with standard UV adhesives. The following highly photosensitive Bohle Verifix® adhesives are suitable for this purpose: MV 760VIS, LV 740VIS or Lamifix 678 and 682-T with activator. Please note: The indicated strength values can be reached within the corresponding layer thicknesses mentioned above. Excessive, too thin or irregular adhesive layer thicknesses have an adverse effect on bonding strength. Extensive tests have shown that stainless steel is especially suitable for bonding glass to metal.

2. Pre-treatment of bonding surfaces

2.1 Cleaning

- The surfaces to be bonded must be completely clean and free of dust and grease (free of separating agents). Use a cleaning agent that is suitable for UV bonding (free from surfactants or separating agents).
- Standard glass or household cleaners are not suitable in most cases.
- Recommendation: Bohle special cleaner for glass bonding, art. no. BO 5107910.

2.2 Removing residual moisture

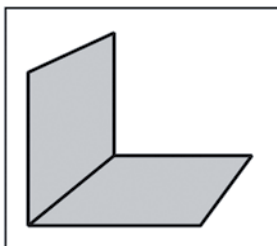
- The adhesive and the parts to be bonded must be at room temperature. In order to achieve a durably stable bond, it is essential to briefly warm the glass and fittings before bonding. In this way residual moisture (condensate) can be completely removed.
- Use hot-air unit or hairdryer. Failure to observe these instructions can lead to decreased stability of the bond which may not be noticed immediately, and thus result in decreasing long-term stability.

2.3 Pyrosil® surface pre-treatment

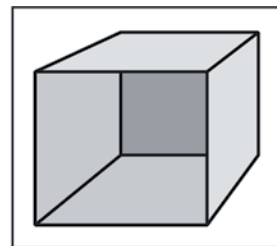
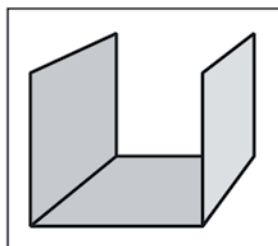
Durable adhesion can be achieved by an additional pre-treatment of problematic bonding surfaces with the Pyrosil® technology protecting the bond from moisture infiltration. This is particularly important for high load-bearing bonds, exterior applications or for use in humid environments.

3. Adhesive selection

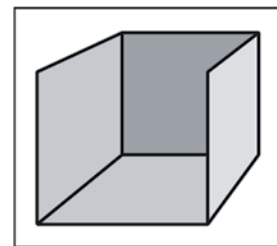
Different Bohle Verifix® UVA and light curing adhesives are available for testing, depending on the requirements of the bond, its desired load capacity and intended use. Special observations: Glass/metal bonds: The medium-viscosity UV adhesives Verifix® B-682-T or Verifix® MV 760 are ideal for dynamic bonds. Glass/glass bonds: When planning and constructing all-glass objects, the construction type should always be "closed" (i.e. self-stabilising, see fig.) for achieving maximum stability. Elastic adhesives, such as B-678-0 and B-690-0, are particularly appropriate for "closed" constructions and for surface bonding of glass/glass and glass/metal constructions. If an "open" construction is explicitly desired for design reasons or if this is the only feasible construction type, only the following adhesives must be used: Verifix® LV 740, Verifix® LV 740VIS, Verifix® B-665-0, Verifix® MV 760VIS, Verifix® MV 760 or Verifix® B-682-T.



open construction



closed construction





4. Fixing aids

It is essential to secure bonded objects against vibrations and slipping in order to guarantee the complete curing of the UV adhesive. The Verifix® product portfolio includes suitable fixing aids which facilitate securing the bonded object in position. Our sales representative will be happy to talk to you about further details.

5. Bonding/application of the adhesive

- Before applying the adhesive, check the objects to be bonded for accuracy of fit. This can best be done by mounting the whole construction by way of a trial (use fixing aids).
- If more than 5 minutes have passed after heating the bonding joints, they must be heated again before applying the adhesive.
- If possible, the adhesive should be applied in a horizontal position; applying it in a vertical position might lead to problems.
- If too much adhesive is used, removing the excess material is time-consuming.
- If the adhesive layer is too thick or too thin, the stability of the bond will be affected!
- Suitable dosing aids facilitate the exact and cost-efficient application of the adhesive.

5.1 Applying the adhesive BEFORE constructing the whole object

Medium-viscosity adhesive (Verifix® MV 760, MV 760VIS, B-678, B-690 and B-682-T) is applied before assembling the construction. For surface bonding (B690-0 and B 678-0), the adhesive is always applied before joining the parts.

- When bonding horizontally, a perfect bond without air bubbles is achieved by carefully and evenly lowering the object.
- For edge bonding, the net weight of the bonding parts is sufficient for spreading the adhesive over the entire bonding surface.

5.2 Applying the adhesive AFTER assembling the construction

- Low viscosity adhesive (Verifix® LV 740, Verifix® LV 740VIS and Verifix® B-665-0) enters the bonding joint by capillary action. That is why the parts to be bonded can be assembled in their final position before applying the adhesive.
- For multiple-part objects, make sure the adhesive is applied on the bonding joints one by one (not all at once).
- Before curing the bond, bonding parts should be lifted briefly and lowered again (open and close the bonding joint) in order to guarantee the optimum distribution of the adhesive.

6. Curing (light exposure) - General Information:

Use suitable UV lamp for curing: The lamp must not be smaller/shorter than the bonding joint in order to avoid tensions in the joint due to irregular light exposure.

- During light exposure (curing) position the lamp as closely as possible to the bonding joint.
- Under no circumstances must the object be moved or exposed to vibrations (use fixing aid).
- All Bohle UVA hand lamps are equipped with special filter screens to avoid injuries to eyes and skin, etc.
- For your own safety, appropriate equipment must be worn when working with UV lamps. Please be aware of the manufacturer's instructions. (The use of appropriate safety equipment is recommended when working with UV lamps.)

Curing is done in 2 steps:

1. During pre-curing, processing strength is achieved (approx. 30% of final strength). Then excess adhesive outside the bonding joints can be easily removed.
 - Pre-curing can take between 10 seconds and approx. 2 minutes, depending on the type of lamp. After pre-curing, remove eventual fixing aids and clean objects from possible excess adhesive using Bohle special cleaner, a glass scraper or steel wool, fineness no. 00.
2. Final curing: Depending on the type of lamp, this can take between 60 seconds and approx. 5 minutes.
 - Excessive light exposure has neither negative nor positive effects on the stability of the bond.
 - After final curing and an additional resting time of 24 hours, the bond has reached its full functionality and load capacity.

7. Test Bonds

If you are not sure about the ideal bonding requirements, always conduct a bonding test:

- Bond the object according to the instructions above.
- Afterwards load the object beyond the intended load capacity, e.g. impacts, tilting or jerky movements, use tools if necessary (e.g. pliers, etc.)
- Load until deformation/break in order to determine the load limit.
- If you have problems or questions concerning certain bonding options, our Bohle experts are happy to assist you any time!

Disclaimer

The preceding information as well as any technical recommendation given in writing, verbally or based on tests is provided to the best of our knowledge. However, these are non-binding recommendations only and do not affect your responsibility to determine the correctness of given recommendations and the suitability of the product for your particular processes and purposes. The application, use or processing of our products as well as the production of products based on our technical recommendations are beyond our control and therefore fall exclusively within your area of responsibility. Sales of our products are subject to our most updated General Sales and Delivery Conditions.