

# Adhesive Primer

Expert Knowledge on Glues and Adhesives



# Content

<b>Introduction</b> .....	<b>3</b>
<b>Adhesion and cohesion</b> .....	<b>4</b>
<b>Natural glues of animal origin - protein glues</b> .....	<b>5</b>
Bone glue .....	5
Hide glue .....	6
Rabbit skin glue .....	6
Isinglass glue .....	7
Fish glue.....	7
<b>Stress load and construction</b> .....	<b>8</b>
<b>Dispersion glues, PVAc glues</b> .....	<b>10</b>
Titebond® adhesives .....	10
Bindan® adhesives .....	15
<b>Glueing times</b> .....	<b>18</b>
<b>Waterproof, water-resistant and the standards</b> .....	<b>19</b>
<b>Chemical and reaction adhesives</b> .....	<b>20</b>
<b>Glue Pots</b> .....	<b>24</b>
<b>Adhesive tapes</b> .....	<b>25</b>
Veneer and Washi tapes .....	25
<b>Choosing the right adhesive</b> .....	<b>26</b>
<b>Application procedures</b> .....	<b>28</b>
<b>Keep your clamps clean with BATES®!</b> .....	<b>29</b>
<b>Application tools</b> .....	<b>30</b>
<b>Clamping tools</b> .....	<b>34</b>
<b>Connectors as glueing aids</b> .....	<b>42</b>
<b>Glueing checklist</b> .....	<b>44</b>
<b>Heat your workshop!</b> .....	<b>46</b>



## Introduction

Gluing can be defined as the surface-to-surface connection of identical or different materials with the aid of an adhesive layer that adheres to the surfaces of the parts to be connected. The adhesives used to bond wooden parts are generally referred to as »glues«.

### Advantages of glueing

Glueing allows different materials to be joined without changing their properties and structure. In addition to holding the various parts together, the adhesive performs several other tasks. Adhesives can bridge tolerances in fit and fill gaps, compensate for the different expansion coefficients of materials, seal, insulate and much more. Glueing enables the production of complex workpieces, surface connections and lightweight constructions (sandwich panels).

### Disadvantages of glueing

Glueing, however, also has its limits. The heat resistance of adhesives is usually limited. They are subject to environmental influences such as sunlight and weathering, as well as the influence of chemicals – adhesives and bonded joints age. Working with adhesives requires care when mixing the components, adherence to certain times and professional application on the workpieces. It is therefore crucial to select an adhesive or glue that is suitable for the durability of the joint.

## Adhesion and cohesion

Adhesives are as non-metallic substances which can be used to join components through surface adherence (adhesion) and internal strength (cohesion) without significantly changing the structure of the body.

**Adhesion** refers to the force that causes a substance to adhere to another substance (adhesive force).

**Cohesion** is the force that holds a substance together and is also called »inner strength«.

Both sufficient adhesion and cohesion are necessary for a stable bond. Therefore, the aim of an adhesive bond is usually a balanced ratio of adhesion and cohesion. For certain tasks, e.g. in instrument making, adhesives with a cohesion lower than that of the workpiece are deliberately used, since it is easier to repair a break in the glue joint than to reconstruct a soundboard for example.

If a load is applied to a joint and the adhesion of the adhesive is stronger than the internal strength of the material, the joint in the workpiece will break (cohesive fracture). If the adhesive adheres to the surface of the workpiece (adhesion), but has too little strength in itself, this is also referred to as a cohesive failure. On the other hand, if the adhesive



Fracture in the wood – a clear cohesive failure.



A break in the glue line is also a cohesive failure.



Missing bond between wood and glue – a clear adhesive failure.

does not form a sufficient bond with the surface of the workpiece, an adhesive failure can occur.

**Video**  You can find a video containing more information on this on our YouTube channel.

## Natural glues of animal origin – protein glues

These glues are among the oldest adhesives in human history. The use of animal glue can be traced back to the ancient Egyptian carpenters in around 1475 BC.

### Adjusting protein glues

You can »adjust« glues of animal origin to suit different tasks. For most situations, the glue is modified to produce a solution with a creamy consistency. In order to achieve this, place the glue granules in a glass or ceramic container and fill it with (distilled) water until they are fully covered. Leave this mixture to swell for a few hours or overnight. Then heat the glue mixture in the glue pot to approx. 65 °C. You can adjust the flowability (viscosity) of the glue to your working method and task by adding more or less water. The finished glue has a limited shelf life. Therefore only mix as much glue as you require. Any left-over glue can be stored in the refrigerator for a few days.

### Bone glue

Bone glue is ideal for hard joints, easy to grind when dry, resistant to ageing and easy to repair.



### Bone Glue, Granulate

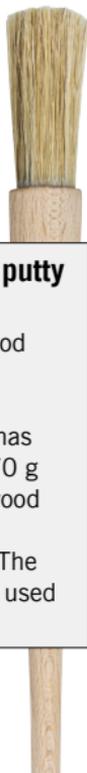
Amber glue line.

250 g	<b>No. 450141</b>
1 kg	<b>No. 450144</b>
5 kg	<b>No. 450145</b>
10 kg	<b>No. 450146</b>

### Typical recipe for wood putty made from bone glue

For filling in flaws in the wood before and after staining. Heat 70 g of bone glue in 1 litre of water until the glue has completely dissolved. Add 70 g of finely ground end-grain wood (grinding dust) and 70 g of ground chalk and mix well. The resulting wood putty can be used immediately.

► For glue pots see page 24.



## Hide glue

These glues are used for flexible bonds, e.g. for book spines or in instrument making. Hide glue is made from animal skins.

### Hide Glue, Granulate

Amber glue line.

250 g **No. 450140**

1 kg **No. 450143**



### Titebond® Hide Glue

The first hide glue in ready-to-use liquid form. It has almost the same properties as conventional hide glue. In our tests, it exhibited a slightly higher bond strength than our hide glue granulate. Titebond Hide Glue joints can easily be taken apart, just like those made with traditional hide glues, by warming and moistening. In contrast to traditional hide glue, it does not need to be processed warm, which makes application much easier. Titebond Hide Glue is therefore ideal for demanding tasks in furniture construction, veneering, restoration work and instrument making. Translucent glue line.

237 g **No. 450368**

*Protein glue with additives, storage life min. 6 months from purchase.*

## Rabbit skin glue

Small amounts of this glue go a long way; it has a higher viscosity and can be applied thinly. It is more elastic than hide and bone glue and is used in musical instrument making and veneering.

### Rabbit Skin Glue, Granulate

Light yellow glue line.

500 g **No. 450153**

1 kg **No. 450154**





**Tip:** In order to prevent unused glue residues from going mouldy, we recommend adding citric acid, available in pharmacies and drugstores. Only a few drops in the glue are enough to prevent mould.

## Isinglass glue

This glue has a much higher bond strength than other animal glues. The glue concentration in the solution can therefore be much lower than with, for example, bone or hide glue, meaning that Isinglass glue granulate goes an extremely long way. The granules offered by DICTUM consist of the untreated air bladders of a Russian sturgeon species (beluga). Fishing quotas have been drastically reduced in order not to endanger the stock of this rare fish species.



### Isinglass Glue, Granulate

Light yellow to nearly transparent glue line.

100 g

**No. 450142**

## Fish glue

This glue combines the good properties of bone glue and hide glue. It has an impressively high bond strength and yet remains very flexible. Fish glue is used in furniture construction. One advantage is that it can be applied when cold. The joint can be softened again for repairs by simple heating.



100 ml **No. 450188**

250 ml **No. 450189**

500 ml **No. 450169**

## Canadian Fish Glue

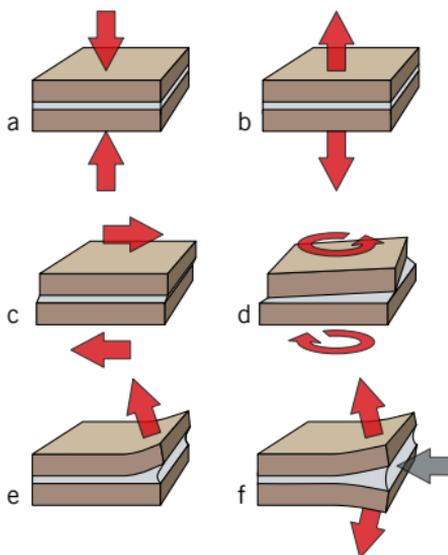
Ready-to-use, liquid form, very high glueing effect. Yellow transparent glue line.

*Storage life min. 12 months from purchase.*

## Stress load and construction

The key tenet of adhesive technology construction is:

»The stress must be less than the strain!«



### Stress load types

Every construction is exposed to certain forces which more or less stress it. With the mechanical load types shown on the left (a. pressing, b. pulling, c. shearing, d. twisting, e. peeling and f. splitting) the stress on the adhesive joint increases steadily from a. to f. Glue bonds can therefore usually withstand compressive and tensile loads very well, but most bonded joints fail under the stress of peeling or splitting forces.

### Testing glues yourself

In every workshop, glue residues accumulate over time. You can easily test whether a glue still sets after a long time and offers enough strength. Put a few drops of the glue on a wooden board and allow it to run off. This way you can see whether the glue is still liquid enough to wet the surface. Leave the drip of glue to stand for a few hours. If it hardens and becomes translucent (with PVAc glues), the glue can still be used. To be on the safe side, glue two pieces of wood together and use this sample to conduct a breaking test (hammer blow). If the break occurs mostly in the wood, the glue can still be used.



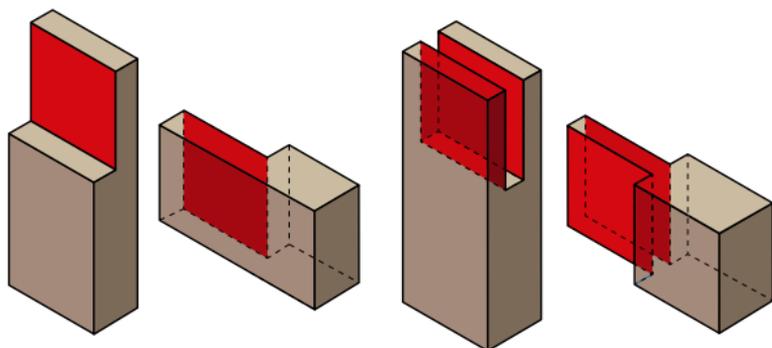
### Titebond® Original Wood Glue

Yellowish-translucent  
glue line.

237 g

No. 450360

*Aliphatic resin  
emulsion storage life  
min. 12 months from  
purchase.*

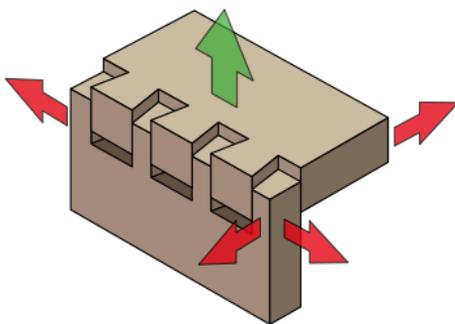


One single tenon increases the glueing area by twice as much as an overlap joint.

### The best possible joint

Most modern glues have a higher bond strength than the wooden material. Properly joined and professionally glued, even a butt joint is more likely to break in the wood than in the glue. The aim of the construction should therefore be to optimise the position and size of the glued areas (strain), taking into consideration the expected mechanical loads. Classic wood joints are a prime example of good construction. On the one hand, they enlarge the areas to which the glue adheres. Even a simple tenon joint doubles the glued areas compared to an overlap joint. On the other hand, due to their shape, many wood joints transfer the occurring tensions into the solid components. This means that a positive-locking dovetail joint

can be stressed along several axes in tension and compression, even without glue. A durable adhesive bond therefore always requires professional construction.



It is already impossible to slide this corner joint with dovetails along two axes due to positive locking.

## Dispersion glues, PVAc glues

With dispersion glues, the binding agents are very finely distributed (dispersed) in water.

### Dispersion glues

Dispersion adhesives are often based on polyvinyl acetate (PVAc), which is why they are usually referred to as PVAc white glues.

An exception among the glues listed here is Titebond Original, which is an aliphatic resin emulsion.

**Advantages:** non-toxic and solvent-free, ready for use, easy application, if necessary soluble by heat (thermoplastic), good shelf life.

**Disadvantages:** limited bond strength.

Glue	Open assembly time
Titebond® Original Wood Glue	4-6 min
Titebond® II Premium Wood Glue	3-5 min
Titebond® II Extend Wood Glue	15 min
Titebond® III Ultimate Wood Glue	8-10 min
Titebond® II Dark Wood Glue	10 min



### Titebond® Glues/Adhesives

The first choice when high bond strength is necessary: for extremely solid glue joints in woodworking applications, restoration and musical instrument making. For more than 65 years, Titebond has been the market leader in bonding wood and wood products in the USA.

### Titebond® Original, II or III?

In short, Titebond Glue Original, II and III differ in their »open assembly time« and in their resistance to moisture. Titebond Original Wood Glue corresponds to a standard PVAc white glue. Titebond II Premium Wood Glue has the same open assembly time as Titebond Original, but is waterproof according to ANSI Type 2. Titebond III Ultimate Wood Glue has a relatively long open assembly time, is water-resistant according to ANSI Type 1 and can still be processed at low temperatures.

Closed assembly time	Clamping time	Final strength	Indoors	Moisture	Outdoors	Standard	Processing temperature
10 min	30 min	24 h	+	-	-	(D1)	10-30 °C
10 min	30 min	24 h	+	+	-/+	ANSI Type II (D3)	13-30 °C
10 min	30 min	24 h	+	+	-/+	ANSI Type II (D3)	13-30 °C
15 min	30 min	24 h	+	+	+	ANSI Type I (D3+)	8-30 °C
10 min	30 min	24 h	+	+	-/+	ANSI Type II (D3)	13-30 °C

## Titebond®

Most Titebond glues are non-toxic, solvent-free and resistant to most solvents. Residues can be wiped off with water, easily sanded and painted over.

### Titebond® Original Wood Glue

Yellowish-translucent glue line.

237 g

**No. 450360**

*Aliphatic resin emulsion\**

### Titebond® II Premium Wood Glue

Yellowish-translucent glue line.

237 g

**No. 450364**

*Polyvinyl acetate glue\**

### Titebond® II Extend Wood Glue

Creme coloured glue line.

473 g

**No. 450387**

*Polyvinyl acetate glue\**

### Titebond® III Ultimate Wood Glue

Light brown glue line.

237 g

**No. 450362**

*Polyvinyl acetate glue\**

## Titebond® II Dark Wood Glue

Brown dyed glue for waterproof bonds indoors and outdoors that are occasionally exposed to moisture (external doors, garden furniture etc.). Ideal for discreet glue joints in darker woods such as teak or iroko.



- Excess glue can be wiped off with water
- Excellent sandability without softening
- Unaffected by finishes
- Non-toxic and solvent-free

Brown glue line.

237 g

**No. 450372**

*Polyvinyl acetate glue\**

\* Storage life min. 12 months from purchase.

Glue	Open assembly time	Closed assembly time	Clamping time	Final strength
Titebond® Translucent Wood Glue	5 min	10 min	20 min	24 h
Titebond® Cold Press Veneer	15 min	5 min	45-60 min	24 h



### Titebond® Translucent Wood Glue

Ideal glue for general household and furniture-making projects with short clamping time and transparent glue line.

- Rapid curing
- Excess glue can be wiped off with water
- Excellent sandability without softening
- Non-toxic and solvent-free

Transparent glue line.

237 g

**No. 450396**

*Polyvinyl acetate glue\**



### Titebond® Cold Press Veneer

High-quality veneer glue for cold press bonding of open-pored materials such as wood and wood composites.

- Long open assembly time
- Minimised »bleed-through«
- Excess glue can be wiped off with water

Dark brown glue line.

946 g

**No. 450385**

*Polyvinyl acetate glue\**

\* Storage life min. 12 months from purchase.

Indoors	Moisture	Outdoors	Standard	Processing temperature
+	-	-	(D1)	10-30 °C
only for veneer-work	-	-	(D1)	10-30 °C

► Accessories for glueing and finishing are available online.

## Glue application on large surfaces

When applying glue to large surfaces, as is common in veneering, professional glue rollers are an excellent, but also expensive tool. A favourable alternative is a toothed spatula (e.g. Bindan® Adhesive Trowel, No. 800499).

A limited amount of glue is poured into the middle of the surface and spread with a toothed spatula. It is important to always work quickly from the centre outwards. At the edges, the excess glue sticks to the spatula, keeping the edges clean.

Wash the glue spatula thoroughly under running water directly after application or simply remove the dried glue residues from the spatula later.



Step 1: Apply the glue to the middle of the surface.



Step 2: Spread the glue from the centre outwards.



Step 3: The surface is evenly covered and ready to lay the veneers.

## Vide

You can find a video containing more information on this on our YouTube channel.

Glue	Open assembly time	Closed assembly time	Evaporation time/ waiting time
Titebond® No-Run, No-Drip Wood Glue	3-5 min	10 min	-
Bindan-BB® Wood Glue	4-12 min	4 min **	-
Bindan®-Blitz Wood and Assembly Glue	6-8 min	4 min **	8 min***

\*\* With hardwood \*\*\* Do not assembly until the open assembly time has passed



### Titebond® No-Run, No-Drip Wood Glue

This viscous glue does not drip and is therefore ideal for vertical glue joints and overhead applications such as cornice mountings, reveals and ceiling mouldings.

- No dripping, no running
- Provides a strong initial tack and fast speed of set, yet allows realignment
- Excess glue can be wiped off with water
- Excellent sandability without softening
- Unaffected by finishes

Translucent glue line.

237 g

**No. 450388**

*Polyvinyl acetate glue\**

*\* Storage life min. 12 months from purchase.*

## WORKSHOP

### PRACTICAL KNOWLEDGE - GLUES AND ADHESIVES

The course will teach you all you need to know about numerous glues and adhesives; modern white glues, adhesives for special applications, reaction adhesive, traditional bone and hide glue, etc.

#### Content:

- Functional principles of wood glues, contact adhesives and reaction adhesives
  - Different wood glues and their applications
  - Terms used in adhesive technology and their meaning
- ... and much more**

► For further information see [www.dictum.com/workshops](http://www.dictum.com/workshops)



Clamping time	Final strength	Indoors	Moisture	Outdoors	Standard	Processing temperature
30 min	24 h	+	-	-	(D1)	10-30 °C
22 min	24 h	+	+	+/-	D3	10-20 °C
16-24 min	24 h	+	+	+/-	D3	12-20 °C

## Bindan® glues

For over 80 years, the company Bindulin in Germany has been specialising in the production of glues and adhesives. With twenty different wood glues under the Bindan brand alone, Bindulin offers an exceptionally wide range of products suitable for many applications.



### Bindan-BB® Wood Glue

Non-toxic glue for use in sensitive applications, such as bedrooms, children's rooms, nursery schools, etc. Good bonding strength, suitable for waterproof bonds with softwood, chipboard and also handicrafts.

- Absolutely free of pollutants
- Translucent glue line
- Excess glue can be wiped off with water
- Solvent-free

100 g     **No. 450526**

280 g     **No. 450527**

*Polyvinyl acetate dispersion\**

### Bindan®-Blitz Wood and Assembly Glue

This glue hardens very quickly and is therefore ideal for assembly work. It features an outstanding bonding strength and is suitable for the waterproof glueing of wood, chipboards and fibreboards. Also suitable for workpieces that are subject to higher loads, such as windows and doors. Ideal for prefinished parquet floors (tongue and groove glueing).

- Rapid curing
- Translucent glue line
- Excess glue can be wiped off with water
- Solvent-free

280 g     **No. 450531**

*Polyvinyl acetate glue\**

Glue	Open assembly time	Closed assembly time	Evaporation time/waiting time	Clamping time
Bindan-IQ® Wood Glue	10-15 min	4 min **	-	20 min
Bindan-P® »Propellerleim®« Wood Glue	5-10 min	4 min **	10 min ***	30 min

\*\* In case of hardwood \*\*\* Do not assemble until the open assembly time has passed



### Bindan-IQ® Wood Glue

The ideal wood glue for the water-proof glueing of light woods or woods containing tanning agents that tend to change colour. The normal white glue has an acidic pH value, which in combination with tannic acids and other wood constituents can lead to stains and colour changes. The IQ wood glue is pH-neutral, which prevents colour changes on woods such as maple, Douglas fir, chestnut, larch, lime, walnut, etc. (not suitable for ferrous oak).

- Neutral pH
- Long open assembly time
- Excess glue can be wiped off with water
- Solvent-free

280 g **No. 450530**

280 g **No. 450529**

800 g **No. 450383**

*Polyvinyl acetate glue\**

*\* Storage life 6 months from purchase.*



► Accessories for glueing and finishing available online

[www.dictum.com](http://www.dictum.com)

Final strength	Indoors	Moisture	Outdoors	Standard	Processing temperature
24 h	+	+	+/-	D3	15-25 °C
24 h	+	+	+/-	D3	10-20 °C



### **Bindan-P »Propellerleim«® Wood Glue**

High-quality, ready-to-use glue with outstanding bonding strength for water-proof bonds in windows and external doors and workpieces that are subject to higher loads. For wood, wood composites cardboard polystyrene, felt, fabric and leather.

- Extremely high breaking strength
- Translucent glue line
- Excess glue can be wiped off with water
- Solvent-free

100 g      **No. 450528**

280 g      **No. 450529**

800 g      **No. 450383**

*Synthetic resin glue\**

*\* Storage life min. 12 months from purchase.*

## Glueing times

Important time concepts in glueing explained in sequence.

Adhesives that you mix by yourself need a »**maturing time**« to swell or to obtain a homogeneous structure before they can be processed.

»**Pot life**« indicates for how long a two-component adhesive can be processed after mixing.

»**Evaporation time**« is the minimum time during which the (contact) adhesive should degas before the parts to be joined can be brought into contact with each other.

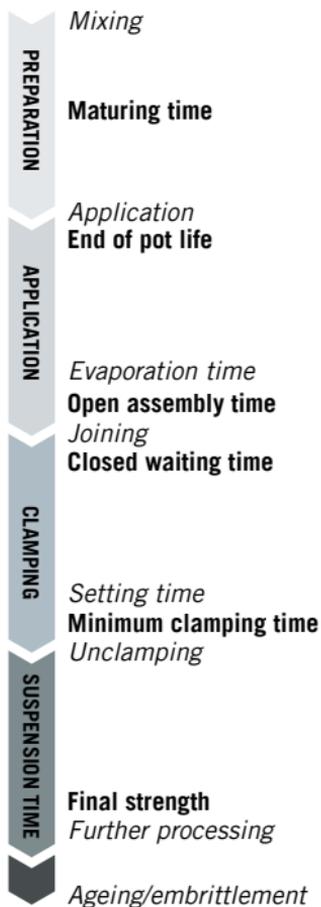
»**Open assembly time**« is the maximum time span between the application of the adhesive and the joining of the parts.

»**Closed assembly time**« is the maximum time span between joining the parts and clamping them.

»**Setting time**« is the time required for an adhesive to reach what is referred to as hand strength.

The »**minimum clamping time**« is the time when the clamps can be released again or the workpiece can be moved again without load.

The »**final strength**« is achieved when curing is complete and the adhesive has reached its maximum strength.



## Waterproof, water-resistant and the standards

Glues are divided into different durability classes, which classify them according to their behaviour when exposed to moisture and water.

In Germany and the EU, adhesives are divided into four durability classes according to EN 204. Glues of group D1 have the lowest water-resistance and are only suitable for interior use. D2 glues are suitable for interior use with occasional short-term exposure to running or condensed water. Glues of group D3 are intended for interior applications with frequent short-term exposure to running or condensed water. D3 glues are also suitable for exterior use without direct exposure to the weather. By adding hardener, D3 glues become glues of group D4, which are considered to be resistant to boiling water and are used indoors with frequent long-term exposure to draining water. For exterior use and weathering they also require appropriate surface protection.

The European standard EN 204 refers to applications such as those used in window construction or in load-bearing timber construction. However, the US ANSI/HPVA standard, which is specified for Titebond adhesives, for example, refers to plywood production. The terminology used varies accordingly.

### **ANSI Type I: Waterproof**

Suitable for outdoor use. The glue joint will resist constant moisture (rain). Not suitable for use under water.

### **ANSI Type II: Water-resistant**

Suitable for outdoor use. The glue joint will resist occasional moisture (rain) as long as it is not permanently wet.

**ANSI Type I thus approximately corresponds to groups D3-D4, and ANSI Type II approximately to D2-D3.** The term »waterproof« is interpreted differently in the two standards. In the ANSI/HPVA standard, »waterproof« means »resistant to constant exposure to moisture (rain)«, while in EN 204 it means »frequent short-term exposure to running or condensed water«.

## Vide

*You can find a video containing more information on this on our YouTube channel.*

## Solvent-based contact adhesives

The adhesive substances are dissolved in the solvents. The transition from the processing state to the final solid state is achieved by diffusion of the solvents.

### Contact adhesives

They are called contact adhesives because two adhesive films are brought into contact with each other and immediately bond together when pressed (Velcro principle).

**Advantages:** short clamping time, immediate resilience, elasticity, moist substrates can be bonded.

**Disadvantages:** hazardous to health, limited durability.



### Kövulfix Contact Adhesive

Professional solvent-based contact adhesive for use with leather. Adhesive achieves full strength after a single application of pressure. Also suitable for rubber (soles, seals), rainwear, hard PVC and soft foam (polyurethane foam, carpet backing), paper, cardboard, textiles, felt, cork, and wood. 60 g

**No. 451980**

 **Tip:** With contact adhesives such as Kövulfix, the initial pressure is decisive for the strength of the bond. In the professional sector, this pressure is achieved by strong clamping. In domestic applications, you can achieve this with a single, powerful blow of a hammer. Allow the Kövulfix adhesive to evaporate as described in the instructions, place the parts to be joined in the correct position and then tap them firmly with one or more blows of the hammer. Of course, this only works when glueing hard-wearing materials such as leather and rubber to wood or metal. Make sure that the hammer is clean!



Glue	Evaporation time/ waiting time	Clamping time	Final strength	In- doors	Mois- ture	Out- doors	Processing temperature
Kövulfix Contact Adhesive	10-90 min	8-15 sec	4 h	+	+	+	+ 18 °C

## Chemical and reaction adhesives



### Titebond® Instant Bond Wood Adhesive

Fast-action glue for small contact surfaces with a narrow joining gap especially for glueing together wood and wood composites. Other materials such as natural rubber, aluminium, stainless steel, fibreglass, PVC or porcelain can also be easily glued together or to wood and composites. The individual types differ in viscosity and hardening time. **Advantages:** Solvent-resistant, ideal for glueing mitres of MDF and porous wood, high ageing resistance and unaffected by finishes. Translucent glue line.

55 g

- |          |                   |
|----------|-------------------|
| 1 Gel    | <b>No. 450377</b> |
| 2 Thick  | <b>No. 450376</b> |
| 3 Medium | <b>No. 450375</b> |
| 4 Thin   | <b>No. 450378</b> |

Cyanoacrylate glue - Storage life min. 12 months from purchase

 **Tip:** Use superglue instead of clamps!

Applying clamps can sometimes be tricky, especially when working with small profiled strips and sloping or rounded workpieces. However, small light workpieces can be easily mounted with the following trick. Apply a trace or a few drops of instant adhesive next to the glue bead on the workpiece. The superglue sets after just a short pressing time and then takes over the function of a clamp. Now the glue itself can set.



### Superglue Activator

The activator accelerates the hardening of superglue (cyanoacrylate adhesive). Used on strongly absorbing, porous surfaces, at low air humidities and temperatures, or with thick layers of adhesive. Can be used with Titebond Instant Bond Wood Adhesive. 200 ml  
**No. 451981**



Glue	Open/Closed assembly time	Clamping time	Final strength	In-doors	Mois-ture	Out-doors	Processing temperature
Titebond® Instant Bond Wood Adhesive	3-5 sec/ 20-30 sec	30-60 sec	8 h	+	-	-	10-30 °C

## You can glue almost everything with two-component adhesives

Glue	Open assembly time	Closed assembly time	Evaporation time/waiting time	Clamping time
Bindulin Duo-Col®	2 h processing time		-	10 h
Ber-Fix® Epoxy Glue	5/30 min processing time		-	10 min

### Reaction adhesives

Solvent-free adhesives with 100 % solids content. They are liquid or pasty in their application state and achieve their final strength through a chemical reaction involving at least two reactants.

With **one-component adhesives** (PUR adhesive, superglue), the reaction takes place by means of an initiator (e.g. air humidity, accelerator).

**Two-component adhesives** (epoxy resin adhesives) cure by mixing two reactive substances (resin and hardener).

**Advantages:** high durability, adaptation to application methods through formulation.

**Disadvantages:** hazardous to health, difficult application/mixing.



### Bindulin Duo-Col® Two-Component Glue

Slow-curing epoxy resin glue for chemical »welding« of metals, steel, plastics and hard materials as well as glass, porcelain, concrete and wood. Resistant to water and chemicals.

Temperature resistant from -20 to max. +70 °C; light-yellow glue line.

Two tubes with 20 g each.

**No. 450382**

*Two-component epoxy resin adhesive\**

	Final strength	Indoors	Moisture	Outdoors	Processing temperature
	24 h	+	+	+	10-30 °C
	24 h	+	+	+	10-30 °C

## Ber-Fix® Epoxy Glue

Quick-setting epoxy resin glue. Glues almost anything, including materials such as metal, wood, glass, hard plastics, porcelain, ebony and precious stones. Resistant to water and chemicals. Double syringe with attachable mixing nozzle.

25 g

*Open assembly time approx. 30 minutes*

Temperature resistance -50 to +80 °C.

**No. 450417**

*Open assembly time approx. 5 minutes*

Temperature resistance -55 to +80 °C.

**No. 450379**

*Two-component epoxy resin adhesive\**

*\* Storage life min. 12 months from purchase.*



## KEEP YOUR CLAMPS CLEAN WITH BATES®!

► *More on page 29 or at [www.dictum.com](http://www.dictum.com)*



## Glue Pots

For uncomplicated and gentle heating of hot glues, primers and waxes in a water bath.

### **Herdim Glue Pot, Plastic Container with Lid**

A built-in thermostat ensures the correct temperature within  $\pm 3$  °C. Designed for constant professional use, these glue pots have proved themselves over and over again in woodworking, restoration and instrument making. Nickel-plated brass housing with heat-resistant plastic handle and slip-proof base. Maximum temperature approx. 85 °C.



#### **250 ml**

Compact glue pot for violin making and other precision small scale work. Height 160 mm, Ø 105 mm, 120 W, **No. 736013**

#### **1 l**

For large-scale projects such as restoration, piano making, painting, stucco and gilding. Includes plastic glue container with lid. Height 220 mm, Ø 160 mm, 230 V, 240 W. **No. 736003**



## Adhesive tapes

Easy to handle, flexible and versatile. Adhesive tapes have a great advantage, they are ready for immediate use.

### Washi tape

Very thin and wet-strength adhesive tape made of Japanese Washi paper with specially formulated acrylate adhesive designed to perfectly bond to edges.

- High UV resistance
- Substrate-specific adhesive force
- Suitable for all kinds of interior and exterior painting work
- Creates very flat and sharp edges, prevents paint/varnish/blacking creep

### Veneer tape

This strongly adherent white veneer joint tape can be easily removed without leaving residues after veneering. 200 m roll. Width 20 mm.



### Gold Tape UV 90, gold

For smooth surfaces such as metal and glass (e.g. for taping off knife blades), for interior and exterior use, securely stays in place for up to 100 days and can be removed without leaving residues.

Overall length 50 m

Width 19 mm

Width 30 mm

**No. 820274**

**No. 820275**

**Perforated:** The three-row perforation offers both visibility of the joint and easy removing of the tape.

**No. 450138**

**Unperforated:** The unperforated surface ensures good adhesion performance even of smaller tape pieces, making this veneer joint tape ideal for intarsia and marquetry work.

**No. 450139**

## Choosing the right adhesive

	Adhesive	No.	Materials								
			Wood + wood	Wood + metal	Wood + paper	Wood + plastic	Wood + stone	Wood + leather	Plastic + plastic	Leather + plastic	
Glues of Animal Origin / Protein Glues	Bone Glue, Granulate	450141	••		•						
	Rabbit Skin Glue, Granulate	450153	••		•				•		
	Hide Glue, Granulate	450140	••		•				•		
	Isinglass Glue, Granulate	450142	••		••				•		
	Fish Glue (ready-to-use)	450188	••		•				•		
Dispersion Glues and Adhesives	Titebond® Original Wood Glue	450360	••		•				•		
	Titebond® II Premium Wood Glue	450364	•••		•				•		
	Titebond® II Extend Wood Glue	450387	•••		•				•		
	Titebond® III Ultimate Wood Glue	450362	•••		•				•		
	Titebond® Translucent Wood Glue	450396	••		•				•		
	Titebond® Liquid Hide Glue	450368	••		•				•		
	Titebond® No-Run, No-Drip Wood Glue	450388	••						•		
	Titebond® II Dark Wood Glue	450372	••		•				•		
	Titebond® Cold Press Veneer	450385	••		•				•		
	Bindan-BB® Wood Glue	450526/27	•••		•				•		
	Bindan® - Blitz Wood and Assembly Glue	450531	•••		•				•		
	Bindan-IQ® Wood Glue	450530	•••		•				•		
	Bindan-P® »Propeller Leim« Wood Glue	450383/529/528	•••		•				•		
Chemical and Reaction Adhesives	Kövuifix Contact Adhesive	451980	•	•	•	•	•	•	•	•	•
	Titebond® Instant Bond Adhesive	450375-450378	•	•	•	•	•	•	•	•	•
	Ber-Fix® Epoxy Glue	450379	•	•	•	•	•	•	•	•	•
	Bindulin Duo-Col®	450382	•	•	•	•	•	•	•	•	•

Requirements			
Water-resistant	Permanently waterproof	Temperature resistant	Resoftenable
-	-	-	++
-	-	-	++
-	-	-	++
-	-	-	++
-	-	-	++

-	-	-	+
+	-		
+	-		
+	+		
-	-		+
-	-		++
+	-	-	+
-	-	-	+
+	+	-/+	-
+	+	-/+	-
+	+	-/+	-

+	+	-	-
---	---	---	---

+	+	-	-
---	---	---	---

+	++	+	-
+	++	++	-

Setting behaviour				
Open assembly time	Closed assembly time	Evaporation time/ waiting time	Clamping time	Final strength
Process warm (60-65 °C) and join parts as quickly as possible. The end of the clamping time is reached when the excess glue that has been squeezed out of the joint is fully cured and can be removed.				
60 min	90 min	-	12 h	12 h

4-6 min	10 min	-	30 min	24 h
3-5 min	10 min	-	30 min	24 h
15 min	10 min	-	30 min	24 h
8-10 min	15 min	-	30 min	24 h
5 min	10 min	-	20 min	24 h
10 min	20 min	-	30-60 min	24 h
3-5 min	10 min		30 min	24 h
10 min	10 min	-	30 min	24 h
15 min	5 min	-	45-60 min	24 h
4-12 min	4 min	8 min	22 min	24 h
6-8 min	4 min	-	16-24 min	24 h
10-15 min	4 min	-	20 min	24 h
5-10 min	4 min	10 min	30 min	24 h

-	-	10-90 min	45 min	4 h
---	---	-----------	--------	-----

3-5 sec	20-30 sec	-	30-60 sec	8 h
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5 minutes processing time		10 min	24 h
2 hours processing time		10 h	24 h

## Application procedures

When mixing and applying adhesives, potential mistakes can have a negative effect on the strength and durability of the bonded joint. Great care is therefore required during these steps.

### The correct mixing ratio

When working with two-component adhesives, the mixing of the components also forms part of the application process in addition to the application itself. Special attention must be paid to the mixing ratio, as deviations can lead to a reduction in strength or even total failure of the adhesive. For example, adding additional hardener does not usually cause the adhesive to set faster or become firmer – on the contrary, the hardener components do not find any reaction partners and remain unbound in the mixture.

### Glue bead

The viscosity of PVAc wood glues is adjusted in such a way that they can be processed with different application methods. It is important that the glue is applied evenly. For simple application from the bottle, it is advantageous to apply the glue in bead form (left) and not in enclosed circles (right), as otherwise air pockets and thus unglued areas may occur during pressing.



Compared to the random application of glue (right), a zigzag-shaped glue bead (left) ensures an even and closed glue joint without air inclusions.

### **Tip:** *Glueing without clamps?*

*Wood glues do not need pressure to set – they cure without pressure. The pressure is needed to improve the joint fit and penetration. Small parts, such as spacer blocks or concealed feet, can also be easily glued on by rubbing. When both joint surfaces are clean and even, apply some glue to the block and press it on while moving it slightly back and forth until it is firmly seated and in the correct position. This method is only suitable for components that are not visible, as the glue smears the surrounding surface.*

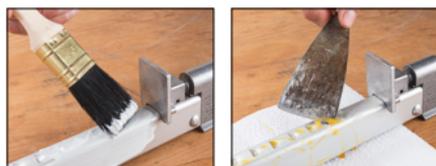
## KEEP YOUR CLAMPS CLEAN WITH BATES®!

Put an end to excess glue and encrusted clamps!

The fact that wood glue drips out during glueing and veneering is normal and in some ways even desirable. With a little experience, the application of glue can be controlled in such a way that only a little oozes out. However, it is difficult to avoid excess glue completely.

### The result:

clamps encrusted with glue and time-consuming cleaning using aggressive cleaning agents.



### The solution:

Use BATES® to protect your clamps. Simply apply with a brush, let it dry, and you're done!



### BATES® Release Agent for Cold Gluing Applications up to 38 °C

BATES is a silicone-free, water-based wax emulsion that can be used to make non-porous metal surfaces glue repellent. It prevents glues from adhering to machinery and equipment, thus reducing downtime for cleaning. Regular application prevents the need for harsh cleaning agents. Bates can be very easily applied with a cloth, brush, sponge or spray bottle.

- 1 l No. 714178
- 5 l No. 714179

## Vide

For an application video  
see [www.dictum.com](http://www.dictum.com)



For more information on BATES® see the DICTUM blog: [www.dictum.com/de/blog](http://www.dictum.com/de/blog)

## Application tools



### Pfohl Hand Glue Spreader, with Foam Rubber Roller

The Pfohl glue applicators by Gupfo are tried-and-tested hand tools that enable all glues and adhesives to be applied quickly and completely even. They are used wherever larger surfaces are to be coated with glue or adhesive. The mounted foam rubber roller with ribbed, non-porous surface is ideal not only for white glues, but also for glues with added hardener (Kaurit glue). This roller imparts a weaker glue application, e.g. for veneer work with coarse-pored veneer. Very easy to clean, not acid resistant. Incl. practical stand for hanging up the Pfohl glue applicator.

#### Advantages::

- Perfectly even and measured glue application
- No glue smearing at the edges for joints and grid glueing



- Effortless glue application on curved surfaces
- Possibility of using glues with shorter open times, even for large surfaces, enabling shorter pressing times
- Saves approx. 30 % glue compared to brush or trowel application
- Saves at least 50 % working time

**No. 721213**



### **Gupfo Leiminator**

Easy to fill and clean thanks to the screw cap on the storage container. For practical dosage and to protect against rapid drying out. Suitable for liquid adhesives, glues, solvents and thinners, paints, varnishes and oils. Incl. brush.

Capacity 1.2 l

**No. 721212**

### **Glue Bottle BabeBot™, HighBot™ und GluBot™**

A two-chamber system automatically ensures that there is glue in the ascending container at all times. It is therefore also possible to apply glue when the bottle is in an upright position. An airtight lid prevents the glue from drying out in the bottle. The glue dispenser can be equipped with glue tips for any purpose. Easy refilling via the large main chamber closure. Replacement parts (tips and caps) available.

120 ml **No. 716002**

180 ml **No. 716003**

475 ml **No. 716004**



### **TS-Boy Thrifty Glue Container**

For practical dosage and protection from quick drying up. Suitable for liquid adhesives, solvents, thinners, paints, varnishes and oils. Includes brush.

450 ml

**No. 706122**

### Glue Bottle

For targeted application of glue in small or hard-to-reach spaces. With hermetically sealing screw cap and nozzle for universal use.

Holds 500 ml

**No. 800496**



### Glue Brush with Natural Bristles

Pure natural bristles, with no plastic or metallic bond - preventing discolouration of the glue. Bristles are hard enough to remove glue remainings. Suitable for persons suffering from nickel allergy.

Head diameter

10 mm **No. 706192**

12 mm **No. 706193**

17 mm **No. 706194**

21 mm **Nr. 706199**

### Glue Brush

Light China bristles, long, untreated handle. Colourfast plastic ferrule prevents discolouration of the glue. Suitable for persons suffering from nickel allergy.

Head diameter

6 mm **No. 706156**

8 mm **No. 706157**

10 mm **No. 706158**

### Plastic Glue Brush

Light-coloured Chinese bristle, handle and binding made of robust and easy-to-clean plastic.

Head diameter

10 mm **No. 721208**

12 mm **No. 721209**

17 mm **No. 721211**



### Glue Application Set

The open glue tray simplifies mixing or diluting of adhesives and easy glue pick-up by brush or glue comb. Small workpieces can also be dipped directly into the glue. The two brush heads made of silicone rubber have a width of 15 and 30 mm. The ends of the handles are widened to form spatulas, e.g. for applying glue in narrow joints or cracks. The practical glue comb is used for larger areas. Brush heads, glue comb and tray are made of silicone rubber and are very easy to clean. Even dried glue can be removed completely and quickly. Glue tray 135 x 88 x 22 mm.

**No. 714607**



### Bindan® Adhesive Trowel

Flexible adhesive trowel, toothed on both sides for optimum glue application. Dimensions 150 x 80 mm

**No. 800499**



### Glue Injectors, 3-Piece Set

For the specific application of glue to hard-to-reach areas, e.g. in repairs of veneering or chair-leg bonds, cracks etc. Also ideal for the application of oil or the dosage of paints and other liquids. Can be dismantled for cleaning. Contains 1.0 / 2.5 / 5.0 ml, needle diameter 0.5 / 0.6 / 0.7 mm.

**No. 716232**



## Clamping tools



### **DICTUM® Spheroidal Cast Iron Screw Clamps**

This classic glueing clamp ensures effective force transmission while staying rigid and firm. The spheroidal cast iron (ductile iron) used for the clamp arms offers the best mechanical properties of all common cast materials. A powder-coated hollow profile bar combined with a strong trapezoidal thread and corrugated clamp arms allow clamping forces of up to 5000 N. High-quality plastic caps with cross-grooves ensure easy positioning and clamping of round pieces. Ball-jointed pressure plate, wooden handle.

Ø Pressure plate	Jaw depth	Jaw opening	
22 mm	60 mm	300 mm	<b>No. 720423</b>
32 mm	120 mm	600 mm	<b>No. 720417</b>



### **Bessey® Edge Clamp Device**

Auxiliary device for clamping edgings, veneers, etc. Can be used with most standard screw clamps with a maximum bar thickness of 13 mm. Spindle length 75 mm. 300 g

**No. 705793**



## DICTUM® Reverse Screw Clamps

Spreading and double clamping function:

Differently from standard screw clamps, the reverse clamp with its fixed spindle arm is a lot easier to tighten in many clamping situations. The rail can be equipped with additional arms which can be oriented in both ways for a spreading- as well as a double clamping mode. Designed for flexible, elastic clamping (metal and wood) and high strength at a low weight. Patented anti-slip system preventing the sliding arm from slipping away when clamping. The burnished trapezoidal spindle runs precisely in the guide. Ball-jointed pressure plate and space saving bending diamond handle.

Jaw depth	Jaw opening	
80 mm	400 mm	<b>No. 721013</b>

## Body Clamps

Clamp with exactly parallel guidance and large clamping faces for glueing furniture bodies and all types of frames. The plastic caps repel glue and prevent pressure points even on sensitive surfaces. The movable jaw runs on a powder-coated hollow profile bar and, by way of an anti-slip system, engages precisely in the desired position. Thanks to the wide back and the support clip at the end of the bar, the clamp can also be placed flat on the workbench. The supplied workpiece supports prevent direct contact between bar and workpiece, thus avoiding damage. Two-component plastic handle for an ergonomic grip. Clamping force up to 6900 N.

Jaw depth	Jaw opening	Weight	
95 mm	800 mm	2.7 kg	<b>No. 720420</b>
95 mm	1250 mm	2.9 kg	<b>No. 720421</b>





## Klemmsia® Clamps

The original from Germany: light, fast-acting clamps. The clamp features slip-resistant, surface-protecting cork pads and is therefore ideal for:

- Glueing of mouldings on panels or frames
- Clamping round workpieces without damaging the profile
- Glueing of overleap joints and dowelled joints of small workpieces without using support structures

The clamping pressure can be regulated via a cam lever. One movable clamp arm. Zinc-plated steel bar with hornbeam clamping arms.

Jaw depth	Jaw opening	Weight	
110 mm	200 mm	440 g	<b>No. 705810</b>
110 mm	400 mm	610 g	<b>No. 705823</b>
110 mm	600 mm	780 g	<b>No. 705812</b>
110 mm	800 mm	915 g	<b>No. 705824</b>
150 mm	200 mm	500 g	<b>No. 705825</b>
200 mm	200 mm	530 g	<b>No. 705811</b>



### Extension for Klemmsia® Clamps fitting

No. 705810 / 11 / 12 /  
18 / 23 / 24 / 25.  
**No. 705813**



#### **Tip: Distribute pressure correctly**

*Clamps can leave deep pressure marks in the wood during pressing. You can avoid these unsightly dents by adding allowances. Wooden blocks and battens distribute the pressure over a larger area and help to distribute the overall clamping force evenly over the workpieces. Glue the surface that is in contact with the workpiece during gluing with parcel tape beforehand to prevent the allowances from sticking to the workpiece. Sometimes it is difficult to place clamps, allowances and workpieces in the correct position at the same time. Helpful then are clamps (e.g. Gorilla Clamps), which you can use to clamp allowances to the workpiece.*

## Jorgensen® One-Handed Clamps

Due to the high clamping pressure of 150 kg, this sophisticated one-handed clamp is suitable not only for fixing components but also for glueing. Even sensitive surfaces can be clamped without damage with the long, smooth, soft plastic jaws. In addition to its spreading and clamping functions, the clamp has a patented extension system, making it possible to join two clamps together and thus double the jaw opening. Ergonomic two-component handles with release mechanism. Jaw depth 80 mm



Jaw opening

300 mm	<b>No. 721001</b>
450 mm	<b>No. 721002</b>
600 mm	<b>No. 721003</b>
900 mm	<b>No. 721004</b>



## DUBUQUE Aluminium Bar Clamps

These extremely lightweight aluminium glueing clamps are ideal for quick and comfortable working. Thanks to the U-shaped hollow section, they are sturdy and stay straight even under high tension. The movable expansion chuck has a spring claw which clicks into the carved runner (15 mm spacing). The quick adjustment ensures a save grip and one-handed use. Headpieces and spindle made of aluminium. Runner cross-section 22 x 35 mm.

Jaw depth	Jaw opening	Weight	
37 mm	600 mm	0.9 kg	<b>No. 707690</b>
37 mm	900 mm	1.1 kg	<b>No. 707691</b>
37 mm	1200 mm	1.3 kg	<b>No. 707692</b>



## Pony® Pipe Clamp Fixture Set, incl. Pipe 1 m

Length according to need:

Robust glueing clamps, optionally with or without pipe. The tail has a continuous quick multi-plate clutch for rapid adjustment. Crank handle. Set: Head and tail castings.



Pipe size / Outer-Ø	Jaw depth	Weight	
½ Inch (21 mm)	38 mm	1.9 kg	<b>No. 715465</b>
¾ Inch (27 mm)	42 mm	2.7 kg	<b>No. 715466</b>
¾ Inch, with Stand	53 mm	3.4 kg	<b>No. 715467</b>



## Heavy Duty I-Beam Bar Clamp

Sometimes you need a pressure reserve, e.g. when glueing door frames, staircases or thick panels. With its rigid I-profile, powerful trapezoid thread and robust hand crank, this door clamp is a match for the most difficult challenges. I-profile 85 x 42 x 4 mm, jaws 55 x 85 mm, spindle length 150 mm, jaw opening 1200 mm, weight 14.5 kg.

**No. 705827**



## Pony® Tape Tensioner

An ideal clamping aid for picture frames, shelves, furniture and other workpieces. The tension is fully adjustable via an eccentric lever. Incl. four plastic jaws and 4 m nylon strap.

Band length 4 m

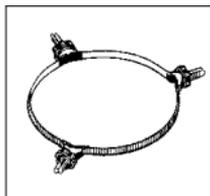
**No. 708908**



## Multi-Clip

Bonding, pressing and securing:  
Patented traction clamp for securing wooden parts for assembly or glueing, bundling cables, rods or wires, securing ladders, posts or pipes, etc. Jaw opening diameter 12-100 mm, two or more clamps can be combined to accommodate larger objects. Made of high-strength glue-repellent plastic. Clamping force max. 1 kN.

**No. 705870**





### Pony® Gorilla Spring Clamps, 4-piece Set

These inexpensive glueing clamps guarantee powerful clamping pressure, yet are extremely lightweight. Their swivel pressure pads adjust to the contours of the workpiece, while their fibre-reinforced arms withstand heavy-duty use.

Includes:

No. 721032, jaw depth 60 mm

No. 721033, jaw depth 70 mm

No. 721030, jaw depth 30 mm

No. 721031, jaw depth 40 mm

**No. 721034**

### Jorgensen® Handscrew Clamps

High-quality variable-angle wooden clamp. The jaws can be set parallel or at an angle, so you can conveniently clamp non-parallel surfaces as well. Even pressure distribution without torsion forces. The wooden jaws and handles are made of seasoned hard maple. Smooth-running galvanised steel spindles.



Jaw depth	Jaw opening	Weight	
70 mm	75 mm	470 g	<b>No. 708928</b>
100 mm	120 mm	810 g	<b>No. 708929</b>
120 mm	160 mm	1.40 kg	<b>No. 708930</b>

### Spring Mitre Bracket System

Lightweight spring brackets for quick and easy assembly of frames and other wooden constructions. Only one hand is required to operate the mitre pliers, so the other hand remains free for the workpiece. The ends are pointed. Brackets of hardened spring steel. Set includes four brackets.

Distance between centres 45 mm

For moulding width 35-50 mm

**No. 705741**



### Kunz® Glue Scraper

For removing dried, excess glue and scraping away extra varnish. Designed for heavy-duty use. Solid metal handle for two-handed use. High-quality, double-edged blade (60 HRC). Handle 315 mm.

Blade length 60 mm

**No. 703161**

## DICTUM® Glueing Aid

This metal glueing aid facilitates and accelerates the glueing of e.g. boards or steps. Thanks to the different recesses, body clamps (e.g. No. 720421), industrial I-bar clamps (e.g. No. 708926), aluminium bar clamps (e.g.



No. 708907) as well as pipe clamp fixture sets (e.g. No. 708931) with  $\frac{3}{4}$  inch (27 mm) outer diameter can be used for glueing without the clamps falling over.

Length 900 mm

**No. 746248**

## Connectors as glueing aids

As joints need to be clamped for glueing, using connectors to position the two parts to be glued can be helpful. This makes glueing faster and the result is more precise. In addition, connectors increase the glueing surface and block movement of the parts in one or more directions.

Both advantages (larger glueing surface and positive locking) significantly increase the strength of the joint. If there is no wood joint (such as an overleap joint, dovetails or mortise and tenon ...), connectors are the means of choice.

However, they can also be used as an additional aid.



The simplest option is to insert wooden dowels. To align the drill holes exactly on both sides, there are dowel markers (**No. 746241**) **1**. In addition, we recommend drill stands (**No. 716149**) **2** for the axial alignment of the drill holes.





Conical wooden nails are even easier to insert but remain visible. They can, however, add a decorative touch to your workpiece.



### Tapered Drill Bit

For drilling holes for conical wooden nails and screws.  
Made of HSS, not drifting.  
Hexagonal shaft.

Cutting length 35-85 mm

3,5 mm **No. 717520**

4,7 mm **No. 717521**

5 mm **No. 717522**

6 mm **No. 717523**

### Japanese Precision Wooden Nail

For decorative corner, T or L joints which are exposed to high mechanical loads, conical wooden nails are the first choice. After pre-drilling with an appropriate conical drill, the nails are put in with a gentle hammer stroke and a little glue. Available with diameters from 3.5 - 6 mm and lengths from 35 - 88 mm

**No. 717524 - 717531**

Joining machines and biscuit joiners are ideal for quickly positioning repeatable connectors.

### Festool Joining machine

#### DOMINO DF 500 Q-Set

More precise joints.

**No. 729951**



► You will find the complete product description at [www.dictum.com](http://www.dictum.com) or in our catalogue Power Tools & Machines



## Gluing checklist

### Planning

Consider the order in which the parts are to be assembled. Mark the workpieces so that their position in the finished piece of furniture is clearly identifiable. Do you have a sufficient number of clamps and cauls available? Or would it be better to glue in several steps? The ideal time for gluing is shortly before the end of the working day. The bonds can harden overnight, and the work can be continued the next day.

### Preparation

Make room to work! Put away tools that are not required. A workpiece is quickly scratched by a hammer lying around. Make sure you have ready a sufficient number of all the tools you need, such as glue bottle/brush, cauls, strips and clamps. Check all of the workpieces again: Are all the holes drilled? All inner surfaces ground? Do you know where which part belongs? In case of doubt, try assembling the parts without glue.

### Application

Keep windows and doors closed as draughts can cause a film to form on the glued surface. Strips create a distance between the workpiece and the workbench surface, dripping glue does not contaminate the workpiece, and clamps can be applied and positioned more easily. Cauls distribute the pressure evenly and prevent pressure marks. For larger workpieces, ask a helper to hold parts. Initially tighten the clamps with just moderate pressure. Only increase the pressure when all clamps are correctly positioned. Work quickly and efficiently, but do not rush. Observe the specified times (pot life, open assembly time, clamping time, etc.)

## Checking and corrections

Check all joints for open gaps and increase the clamping pressure of the clamps if necessary. If a gap does not close despite high pressure (and hammer blows), incorrect dimensions (e.g. tenon length) or contamination may be the reason. If this is the case, you must act quickly! Disassemble the affected parts swiftly and remove the glue immediately. Find the cause and remedy it. Check that the workpiece is at right angles. Compare the centre-to-centre distance of the two diagonals in the carcass/frame (a tutorial on how to measure the centre-to-centre distance can be found on our DICTUM YouTube channel).

## After glueing

Do not immediately remove glue which has been squeezed out of the joint with a cloth or scraper. This could spread the glue over the surface. We recommend that you let the glue set a little and then carefully cut it away with a knife or chisel. Sensitive surfaces can be covered with adhesive tape before glueing. Pay attention to the clamping time. The clamps should only be removed once the clamping time has passed. Pressure marks made by clamps can usually be removed by using moisture and heat.



### THE MOST IMPORTANT WORKSTEPS AT A GLANCE:

- Clearly mark the parts of your workpiece to keep track (e.g. with a cabinetmaker's triangle)
- Prepare the required tools
- Plan the assembly sequence; if necessary try it out without glue
- Close windows and doors
- Use strips and cauls
- Ask someone to lend you a helping hand when dealing with larger workpieces
- Initially tighten the clamps only with moderate pressure
- Observe specified times (open/closed assembly time)
- Check joints for open gaps/impurities
- Is the workpiece at right angles?
- Compare the centre-to-centre distance of the two diagonals in the carcass/frame
- Allow the squeezed out glue to set and cut it off
- Do not remove the clamps until the clamping time has passed

## Heat your workshop!

When it is cold in your workshop not only does your motivation suffer, but also your materials. While professionals heat their workshop with a wood or pellet stove during the colder season, many hobby craftspeople do without heating their garage or cellar. This can have disastrous consequences!

### Keeping workpieces at the right temperature

Wood reacts relatively strongly to fluctuations in humidity and temperature by changing its dimensions. In damp, cold rooms it expands, in warm and dry rooms it shrinks. The workshop should therefore have conditions which are as similar as possible to the rooms in which the furniture will later be used.

This is even more important for built-in parts than for free-standing furniture. If you store your wood in another room, you should bring it to your workshop at least one day before processing so that it can adapt. If you join woods with different temperatures and moisture content, the parts can dry out to different degrees and cracks and warping can occur.

### Glue suffers

The most commonly used glues are PVAc dispersion glues. In a dispersion, substances are not dissolved in a liquid, but very finely distributed. With most white glues the PVAc resin is dispersed in water, i.e. distributed. Water and synthetic resin react differently to low temperatures.



As the water contracts and freezes, the even distribution of the PVAc particles is lost and the PVAc forms larger polymer lumps. As a result, the glue loses its adhesiveness. Glues that have been stored below 5 °C can usually no longer be used. Always observe the processing temperature specifications on the glue containers.

### Rechargeable batteries lose their power

Older machine batteries in particular suffer in low temperature conditions. In modern lithium-ion batteries, the ions move back and forth between the cathode and anode in an electrolyte liquid. As temperatures fall, this electrolyte liquid becomes

increasingly viscous. The ions can only move slowly in it. The result is a voltage drop of the battery up to a sudden deep discharge, which can permanently damage the battery.

### **Store sensitive items in a warm place**

If you do not want to or cannot

heat your workshop permanently, you should at least store sensitive materials and equipment, along with battery-powered devices, in a heated room or air-conditioned cabinet.

Then, all you need to do is bring the workshop to a comfortable temperature before starting work.

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