



# P-System

Save time daily  
Differentiate your product



**NEW**  
**Divario P-18**  
**Tenso P-14 Clip**



Divario P-18



Tenso P-14



Clamex P-14



# Form-locking, tool-free installation of Lamello P-System fittings



The P-System is based on a groove with an undercut, into which connectors with various functions can be inserted, ensuring form-locking anchorage. During the process, the cutter moves downwards to the maximum depth and moves sideways in order to create the profile groove.

**There are two options for creating the P-System groove:**

## Power tool

Quick and easy to handle, with a range of applications

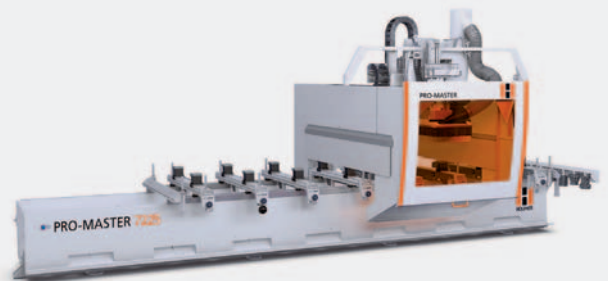


### Advantages of the Zeta P2

Any angle can be cut in a very short space of time, as no set-up time, software or programming is required. The cutting depth can be adjusted in next to no time. The machine is therefore ideal for cutting individual parts, smaller series, prototypes or working on site.

## CNC technology

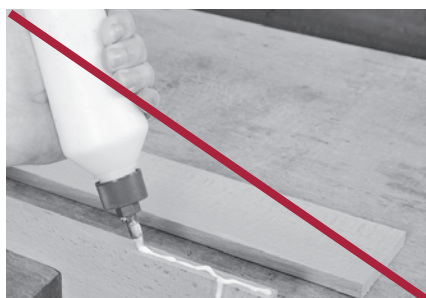
Ideal for series production



### Advantages with the CNC machine

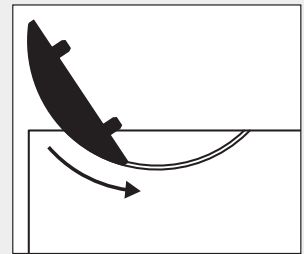
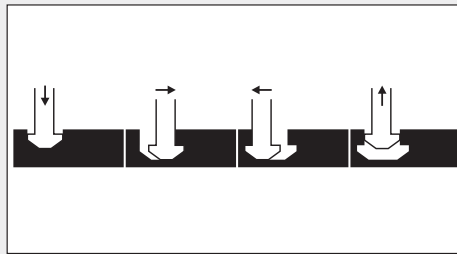
From CAD to the CAM system, direct to the CNC machine – this makes the process faster, reduces the planning time and lowers the risk of errors for repeat orders. The speed when processing larger series on the CNC machine makes the P-System an extremely quick, efficient system, from processing through to assembly.

## Quick manual insertion without the need for glue or screws



# P-System

Form-locking anchorage  
without tools

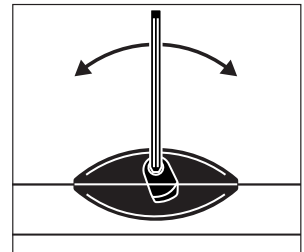
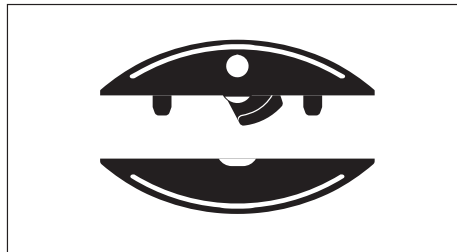


## Fast installation

Inserting instead of screwing or  
glueing

# Clamex P

Detachable connecting fitting



## Detachable

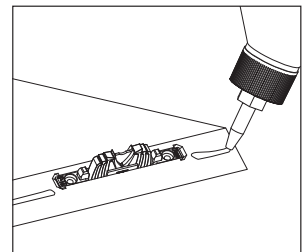
Open the connection time and  
time again with the rotating  
lever

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# Tenso P

with preload clip

Self-clamping fitting as  
glueing aid, for all angles



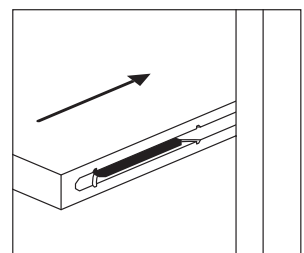
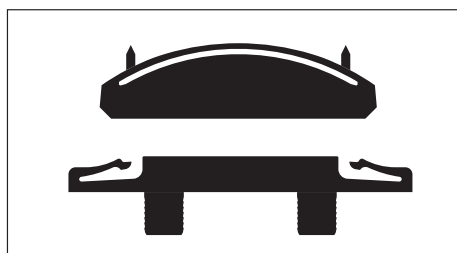
## Glueing

Fixed joints of two workpieces

Page 12

# Divario P

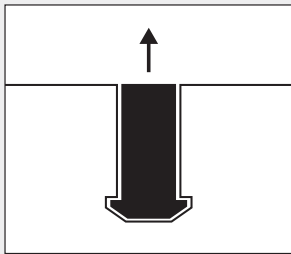
Self-clamping, invisible  
fitting for slide insertion



## Sliding insertion

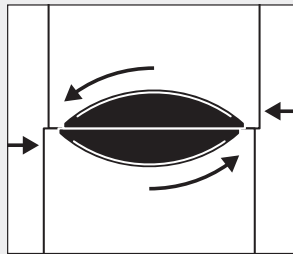
Insertion between two fixed  
sides or shelves via a guiding  
groove

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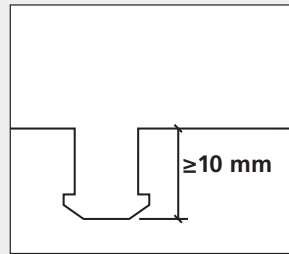
## Strong

Form-locking anchorage across large surface areas



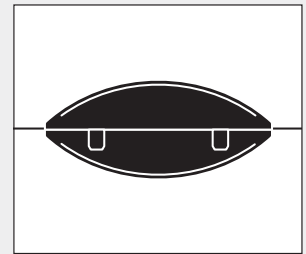
## Lateral tolerance

Perfect, flush alignment of both work pieces



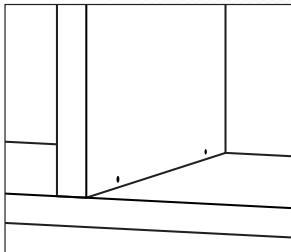
## Shallow depth

Minimal cutting depth with maximum tensile strength



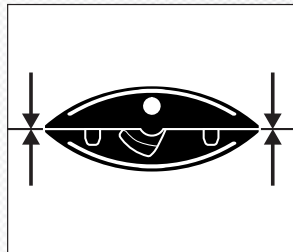
## No twisting

The positioning pins prevent twisting without additional dowels



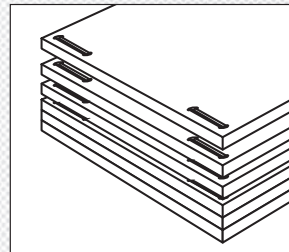
## Aesthetic

The small, hardly visible opening (Ø = 6 mm) serves to close and open the connector



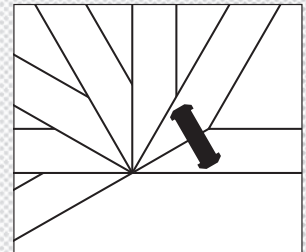
## High clamping force

Clamp and glue work pieces at any angle, ~ 80 kg



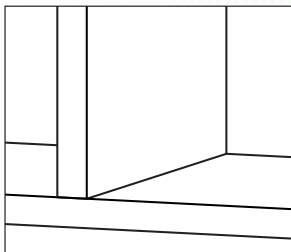
## Stackable

Work pieces with pre-installed P-System fittings are stackable for storage and transport



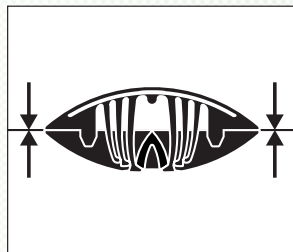
## Versatile

The shallow element depth allows for mitres from 22.5° – 180°, surface, corner and dividing panel connections



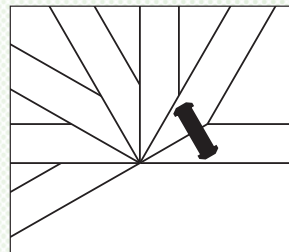
## Invisible

No visible fitting



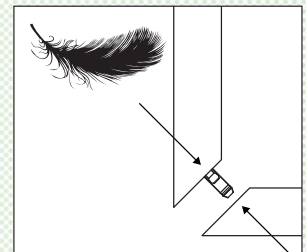
## High clamping force

Allows for perfect alignment and clamps the workpieces ~ 15 kg



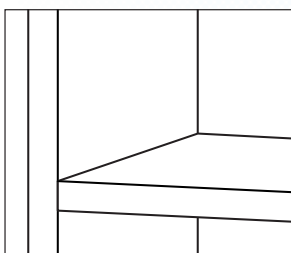
## Versatile

Simple glueing of mitre joints



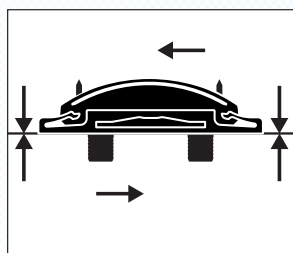
## Lower assembly force

Only a short power impulse necessary to join, regardless of the number of connectors



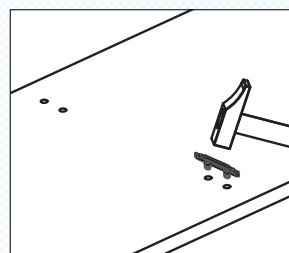
## Invisible

Guiding groove covers the fittings



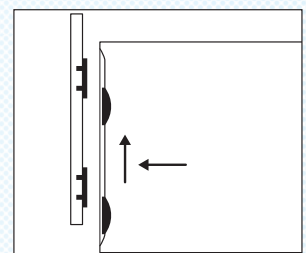
## Clamped joint

No resistance while inserting until shortly before building the clamping force



## Fast installation

Quick installation of the fittings without glue after transport.



## Assembly by sliding

Partially routed guiding groove for completely invisible furniture joints

# Clamex P

Detachable connecting fitting



## Advantages and properties

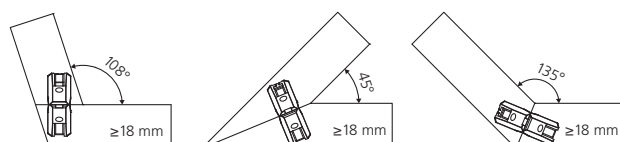
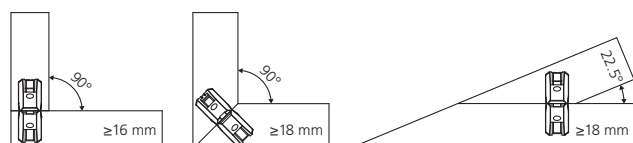
- **Small opening 6mm**, differentiation to furniture standards
- **Stackable with pre-installed fittings**, advantages in packaging, transport and logistics
- **Short assembly time on site**, minimal installation cost

- **Versatility for all angles**, same system for all joining situations
- **Freedom of choice during assembly**, detachable or glued construction



## Clamex P-14

For panels from 16 mm



## Technical data

|                             |                               |
|-----------------------------|-------------------------------|
| Size.....                   | 64 × 27 × 9.7 mm              |
| Cutter.....                 | Ø 100.4 × 7 × 22              |
| Material of connector.....  | fibreglass reinforced plastic |
| Material of lever.....      | zinc die cast                 |
| Installation tolerance..... | longitudinal ± 1 mm           |

## Tensile strength (N)

|                |        |
|----------------|--------|
| MDF            | ~ 900  |
| Particle board | ~ 800  |
| Beech          | ~ 1000 |

## Clamex P-14

## Art.No.

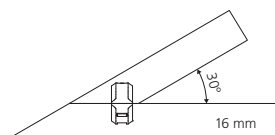
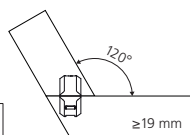
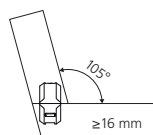
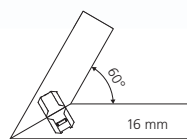
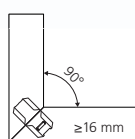
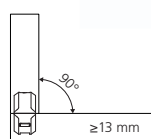
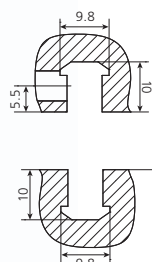
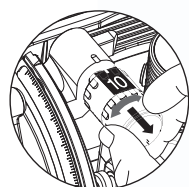
|                              |               |
|------------------------------|---------------|
| Carton with 80 pairs .....   | <b>145334</b> |
| Carton with 300 pairs .....  | <b>145346</b> |
| Carton with 1000 pairs ..... | <b>145356</b> |

|                          |               |
|--------------------------|---------------|
| Drill jig P-System ..... | <b>125344</b> |
|--------------------------|---------------|



# Clamex P-10

For panels from 13 mm



## Technical data

|                              |                               |
|------------------------------|-------------------------------|
| Size.....                    | 52 × 19 × 9.7 mm              |
| Cutter.....                  | Ø 100.4 × 7 × 22              |
| Material of connector.....   | fibreglass reinforced plastic |
| Material of lever.....       | zinc die cast                 |
| Installation tolerance ..... | longitudinal ± 0.5 mm         |

## Tensile strength (N)

|                |       |
|----------------|-------|
| MDF            | ~ 600 |
| Particle board | ~ 600 |
| Beech          | ~ 900 |

## Clamex P-10

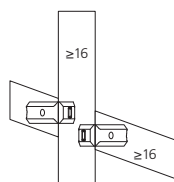
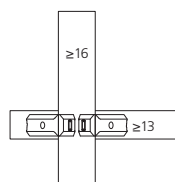
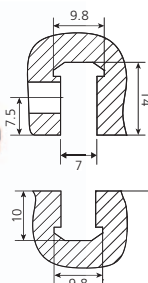
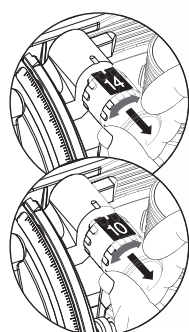
## Art.No.

|                              |               |
|------------------------------|---------------|
| Carton with 80 pairs .....   | <b>145372</b> |
| Carton with 300 pairs .....  | <b>145373</b> |
| Carton with 1000 pairs ..... | <b>145374</b> |

|                          |               |
|--------------------------|---------------|
| Drill jig P-System ..... | <b>125344</b> |
|--------------------------|---------------|

# Clamex P-Medius 14/10

For centre panels from 16 mm



## Technical data

|                              |                               |
|------------------------------|-------------------------------|
| Size.....                    | 64 × 13.5 × 9.7 mm            |
|                              | 52 × 7.5 × 9.7 mm             |
| Cutter.....                  | Ø 100.4 × 7 × 22              |
| Material of connector.....   | fibreglass reinforced plastic |
| Material of lever.....       | zinc die cast                 |
| Installation tolerance ..... | longitudinal ± 1 mm           |

## Load (N) (19 mm) Tensile strength (N)

|                |        |       |
|----------------|--------|-------|
| MDF            | ~ 700  | ~ 800 |
| Particle board | ~ 550  | ~ 600 |
| Beech          | ~ 2400 | ~ 900 |

## Clamex P Medius 14/10

## Art.No.

|                              |               |
|------------------------------|---------------|
| Carton with 80 pairs .....   | <b>145370</b> |
| Carton with 300 pairs .....  | <b>145371</b> |
| Carton with 1000 pairs ..... | <b>145375</b> |

|                          |               |
|--------------------------|---------------|
| Drill jig P-System ..... | <b>125344</b> |
|--------------------------|---------------|

# Bisco P

Aligning element suitable for Clamex P-14  
and Tenso P-14

## Advantages and properties

- **Ideal addition to Clamex P and Tenso P**, fits into the P-System grooves, **without requiring a different cutter**
- **Bisco P-14 is ideal for dry-assembly before glueing a joint with Tenso P-14**
- **For aligning P-System grooves**, aligning function without glue

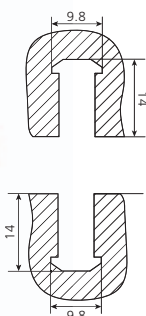
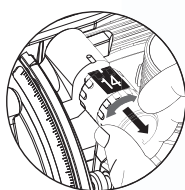
- **Surface structure allows use as a connecting element** when glueing work pieces with PVA glue

## Applications of Bisco P

- Separation walls
- Furniture with large depth
- Glueing of work pieces

## Bisco P-14

Aligning element suitable for Clamex P-14  
and Tenso P-14



## Technical data

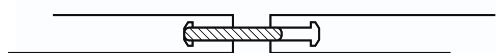
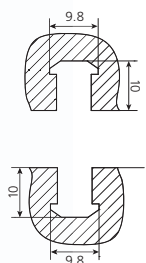
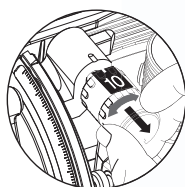
|                                      |                     |
|--------------------------------------|---------------------|
| Size Bisco P-14 .....                | 65 × 27 × 7 mm      |
| Size Bisco P-10 .....                | 52 × 19 × 7 mm      |
| Cutter .....                         | Ø 100.4 × 7 × 22    |
| Material .....                       | plastic             |
| Installation tolerance .....         | longitudinal ± 2 mm |
| Tensile strength with adhesive ..... | ~ 400 N ≈ 40 kg     |

| Bisco P-14                    | Art.No. |
|-------------------------------|---------|
| Carton with 80 pieces .....   | 145301  |
| Carton with 300 pieces .....  | 145302  |
| Carton with 1000 pieces ..... | 145303  |

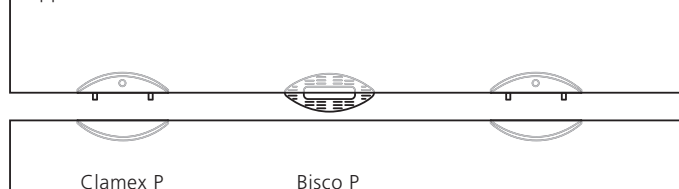
| Bisco P-10                   | Art.No. |
|------------------------------|---------|
| Carton with 80 pieces .....  | 145304  |
| Carton with 300 pieces ..... | 145305  |

## Bisco P-10

Aligning element suitable for Clamex P-10



Application:





## Furniture manufacturing / Interior fitting

Your advantages with Clamex P

### Aesthetic solution

- Differentiation to furniture standards

### Stackable with pre-installed fittings

- Advantages in packaging, transport and logistics

### Short assembly time on site

- Minimal installation cost

- |                                                                                                       |                                                                                                     |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  Detachable          |  Fast installation |
|  Aesthetic           |  Strong            |
|  High clamping force |  Lateral tolerance |
|  Stackable           |  Shallow cutting   |
|  Versatile           |  No twisting       |

### Applications

sideboards | shelves | wardrobes | display cases |  
kitchen furniture | TV furniture | etc.

### Production process

#### 1. P-groove with CNC

- **Same profile groove for both workpieces**
- Short process time
- Direct data transfer from CAD / CAM
- No additional dowels for alignment necessary

#### 2. Storage

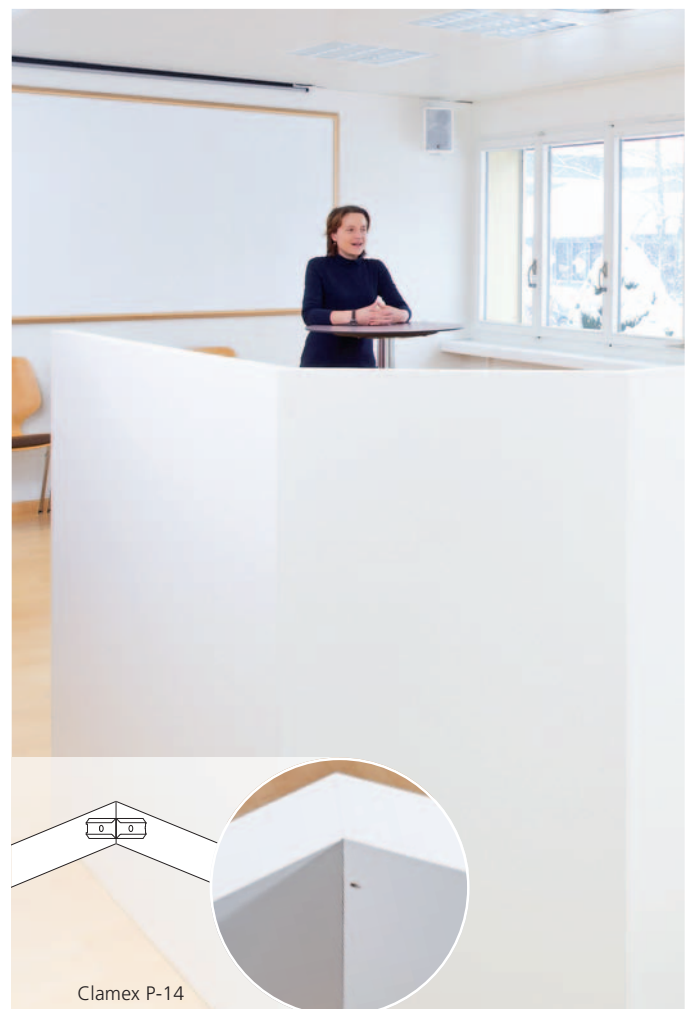
- **Small storage volume when stacking despite installed connector**
- Remove the connector for surface treatment – fast and easy
- Short reaction time for finishing of standard parts

#### 3. Delivery in parts

- **Small transport volume** with pre-installed fittings due to stackability
- **Smaller stock volume** for the dealer
- Easy transport of the parts into the building

#### 4. Assembly on site

- **Shorter assembly time at the customer's due to the pre-installed connectors**
- Easy to assemble for a lay person with an allen key
- No second person necessary
- No dowels for lining-up necessary
- Easy to take apart when moving



# Clamex P – applications

## Furniture manufacturing / Interior fitting

Your advantages with Clamex P

### Aesthetic solution

– Differentiation to furniture standards

### Stackable with pre-installed fittings

– Advantages in packaging, transport and logistics

### Short assembly time on site

– Minimal installation cost

- |                                                                                                         |                                                                                                                          |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| ✓  Detachable          | ✓  Fast installation                    |
| ✓  Aesthetic           | ✓  Strong and form-locking              |
| ✓  High clamping force | ✓  Lateral tolerance in P-System groove |
| ✓  Stackable           | ✓  Shallow cutting depth                |
| ✓  Versatile           | ✓  No twisting                          |

### Applications

sideboards | shelves | wardrobes | display cases |  
kitchen furniture | TV furniture | etc.



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## Shop fitting / kitchen manufacturing

Your advantages with Clamex P

### Stackable with pre-installed fittings

– Advantages in packaging, transport and logistics

### Versatility for all angles

– Same system for all joining situations

### Freedom of choice during assembly

– Detachable or glued construction

### Short assembly time on site

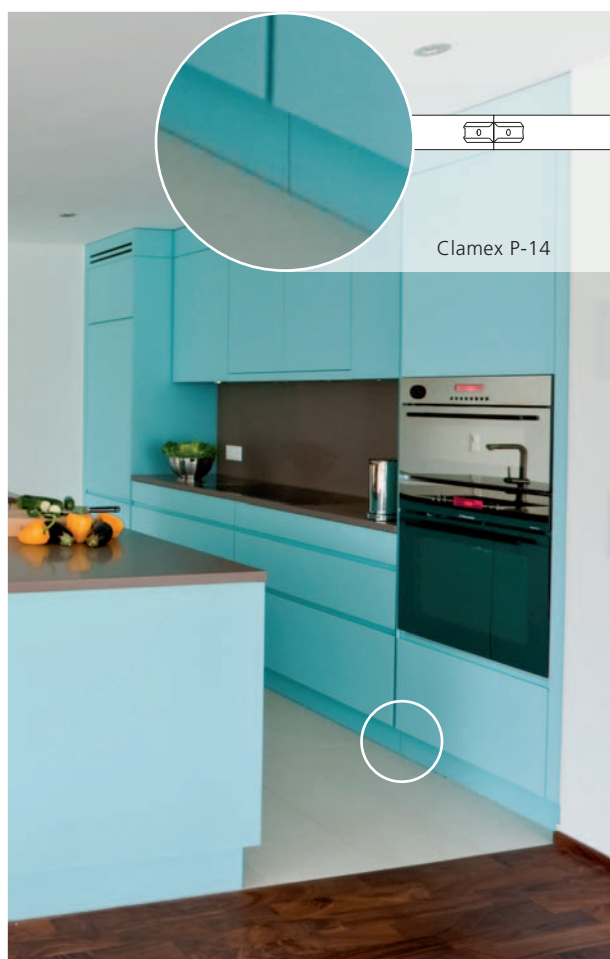
– Minimal installation cost

- |                                                                                                           |                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| ✓  Detachable          | ✓  Fast installation                    |
| ✓  Aesthetic           | ✓  Strong and form-locking              |
| ✓  High clamping force | ✓  Lateral tolerance in P-System groove |
| ✓  Stackable           | ✓  Shallow cutting depth                |
| ✓  Versatile           | ✓  No twisting                          |

### Applications

wall elements | furniture | show cases | changing rooms |  
stools | etc.





# Tenso P

glue faster, for all angles

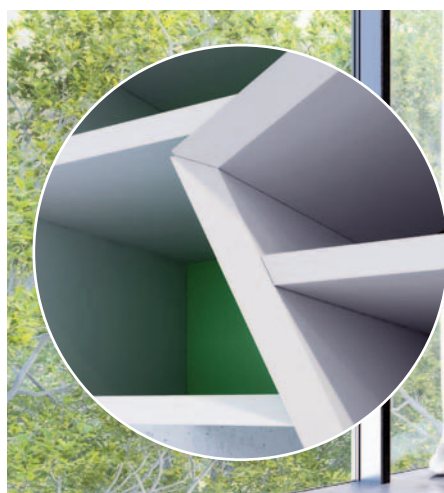


## Tenso P-14, advantages and properties

- **Can be used as a glueing aid**, with high tightening force/ clamping force (no clamps or presses necessary)
- **A perfect look**, completely concealed/invisible
- **Reliable and quick**, tool-free connector installation (simple and quick, without screws or adhesive)

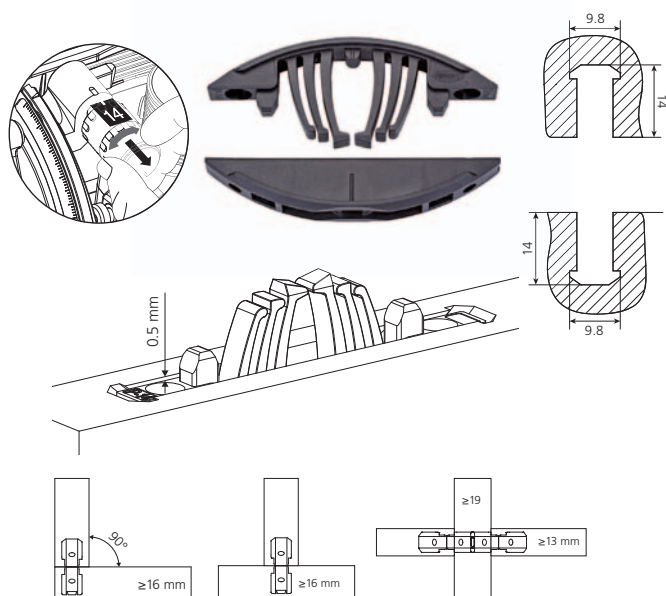
## Tenso P-14 with preload clip, advantages and properties

- Versatile, simple gluing of mitre joints
- Minimum force required, only a short force impulse is needed for insertion
- Effortless connection, regardless of the number of connectors



# Tenso P-14

Self-clamping fitting as glueing aid



## Technical data

|                              |                               |
|------------------------------|-------------------------------|
| Size.....                    | 66 × 27 × 9.7 mm              |
| Cutter.....                  | Ø 100.4 × 7 × 22              |
| Material .....               | fibreglass reinforced plastic |
| Installation tolerance ..... | longitudinal ± 1 mm           |

## Clamping force (N)

|             |       |
|-------------|-------|
| Per fitting | ~ 150 |
|-------------|-------|

| Tenso P-14 with preload function                   | Art.No. |
|----------------------------------------------------|---------|
| Carton with 80 pairs (without preload clip).....   | 145415  |
| Carton with 300 pairs (without preload clip).....  | 145425  |
| Carton with 1000 pairs (without preload clip)..... | 145435  |

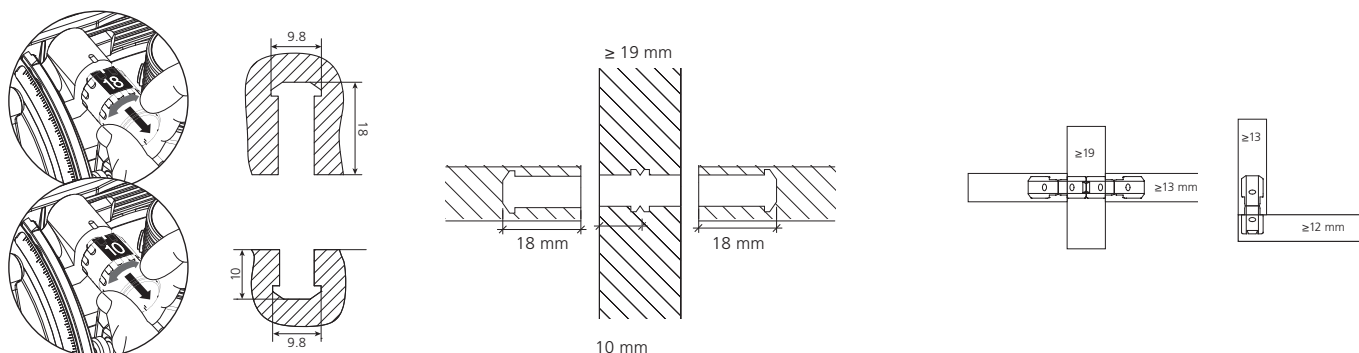
## Important:

The aligning element Bisco P-14 is ideal to dry-assemble the joints before glueing



2013

## Installation with off-set

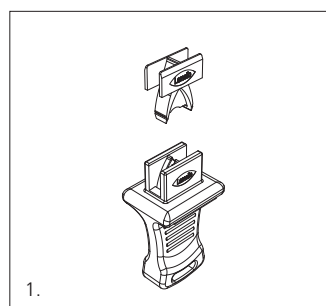
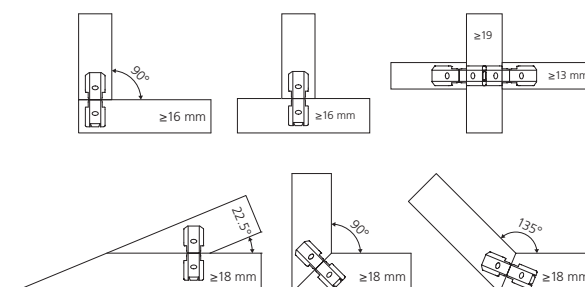


## Tenso P-14 + preload clip

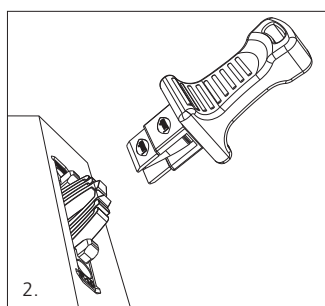
Self-clamping fitting as glueing aid,  
for all angles

| Tenso P-14 Starter-Set                         | Art.No.        |
|------------------------------------------------|----------------|
| Carton with 80 pairs (with preload clip).....  | <b>1454155</b> |
| Carton with 300 pairs (with preload clip)..... | <b>1454255</b> |

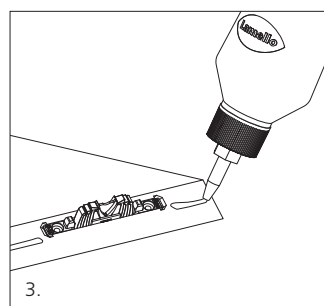
| Preload clip                  | Art.No.       |
|-------------------------------|---------------|
| Carton with 300 pieces .....  | <b>145426</b> |
| Carton with 1000 pieces ..... | <b>145436</b> |



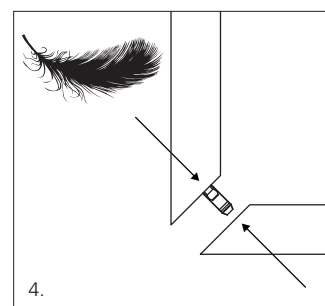
1.  
Insert preload clip into  
installation tool



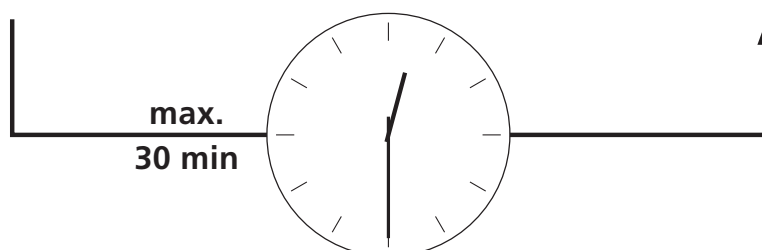
2.  
Preload the Tenso  
P-14



3.  
Apply glue



4.  
Assemble Work pieces



# Tenso P-14 – applications

## Furniture manufacturing / Interior fitting

Your advantages with Tenso P-14

### Fast glueing process

- Time saving without clamps and protectors
- Ship workpieces immediately after assembly, no waiting time for the glue to dry

### Clamps the joint from the inside

- Clamping force perfectly perpendicular to the glue surface
- Glueing of shaped workpieces
- Simultaneously aligns and clamps

- |                                                                                                           |                                                                                                       |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| ✓  Glueing               | ✓  Fast installation |
| ✓  Invisible             | ✓  Strong            |
| ✓  High clamping force   | ✓  Lateral tolerance |
| ✓  Versatile             | ✓  Shallow cutting   |
| ✓  Lower assembly force | ✓  No twisting      |

## Applications

furniture | shelves | stools | sideboards | wardrobes |  
separating walls | cladding | decorative strips | covering panels |  
plinths | face frames etc.

## Production process

### 1. Cutting the groove with Zeta P2

- Quick, easy and precise work with the well-known Lamello system
- Quick, easy and precise work with the well-known Lamello system

### 2. Temporary storage

- Small volume due to stackability with pre-installed fittings
- Remove fittings without tools for the surface treatment

### 3. Assembly in the factory

- Quick and efficient glueing
- No additional clamping device necessary
- No pressure marks and damage due to protectors or clamps on the work piece
- Excess glue is removed with ease right after assembly
- Furniture is automatically in the correct angle
- No additional person helping with applying the clamps

### 4. Delivery: product already assembled

- Short assembly time on site with pre-assembled elements / furniture parts



# Shop fitting

## Your advantages with Tenso P-14

### Stackable with pre-installed fittings

– Advantages in packaging, transport and logistics

### Short assembly time on site

– Quick and easy gluing without additional aids  
– Minimal installation cost

- |                                                                                   |                      |                                                                                   |                   |
|-----------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------|-------------------|
|  | Glueing              |  | Fast installation |
|  | Invisible            |  | Strong            |
|  | High clamping force  |  | Lateral tolerance |
|  | Versatile            |  | Shallow cutting   |
|  | Lower assembly force |  | No twisting       |

## Applications

furniture | shelves | stools | sideboards | wardrobes | show cases |  
sales counters | separating walls | cladding | face frames etc.

## Production process

### 1. Cutting the groove with CNC

– Same profile groove for both workpieces  
– Direct data transfer from CAD / CAM

### 2. Temporary storage

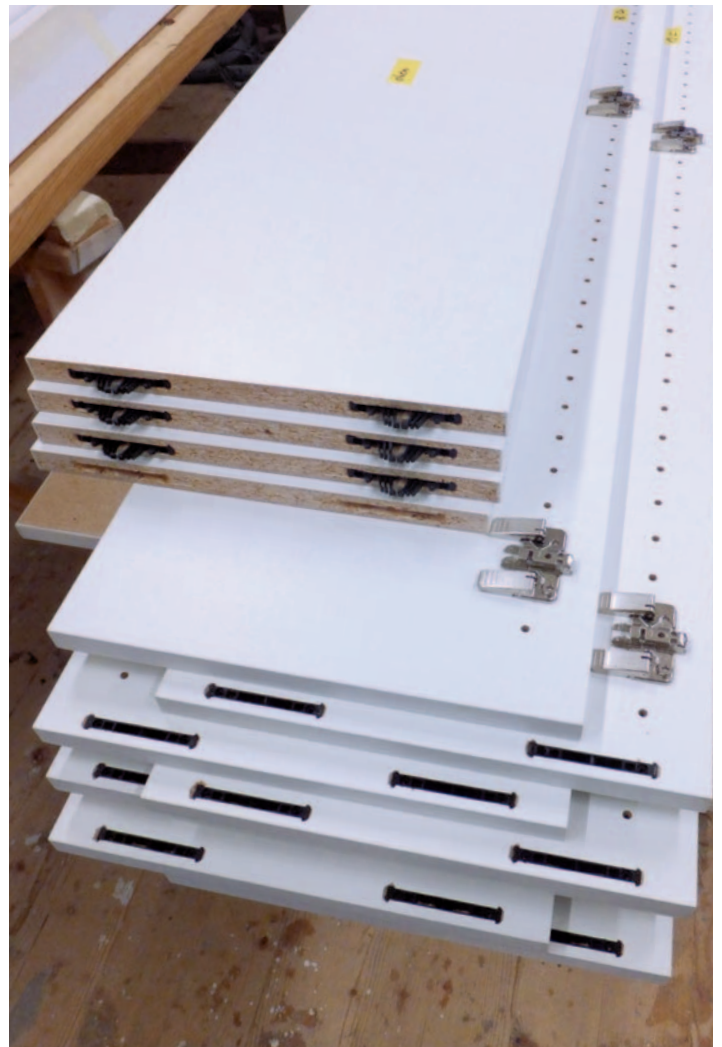
– Small volume with pre-installed fittings due to stackability  
– Remove fittings without tools for the surface treatment

### 3. Delivery: product in parts

– Small transport volume (flat pack)  
– Easier transport of the workpieces to the job site  
– Reduced amount of assembly aids without the need of clamps and protectors

### 4. Assembly on site

– Quick and efficient assembly on site  
– No waiting time before the clamps are removed  
– No transporting clamps and protectors to and from the job site  
– Customer-friendly, quick and clean installation



# Divario P

Self-clamping, invisible fitting  
for slide insertion



## Advantages and properties

- **Completely invisible joint** for highest quality standards
- **Joins and clamps** during insertion for perfectly closed joints
- **Efficient machining and installation**  
with a CNC or a Zeta based on the P-System

- Narrow element for the use in **shelves from 19 mm**
- No resistance while inserting until shortly before building the clamping force
- **Insertion of shelves** after transport for lower transport weight



# Divario P-18

Self-clamping, invisible fitting  
for slide insertion

## Technical data

|                                |                               |
|--------------------------------|-------------------------------|
| Half for P-System groove ..... | 65 × 16 × 9.7 mm              |
| Half for drill holes.....      | Ø8 × 9 mm, distance 32 mm     |
| Cutter.....                    | Ø100.4 × 7 × 22               |
| Material .....                 | fibreglass reinforced plastic |
| Installation tolerance .....   | longitudinal ± 1 mm           |

## Load per fitting (N)

|                | 19 mm | 22 mm | 25 mm | 30 mm |
|----------------|-------|-------|-------|-------|
| Particle board | 500   | 600   | 700   | 1000  |
| MDF            | 600   | 700   | 800   | 1000  |
| Spruce         | 800   | 900   | 1300  | 1400  |
| Beech          | 1700  | 2000  | 2000  | 2000  |

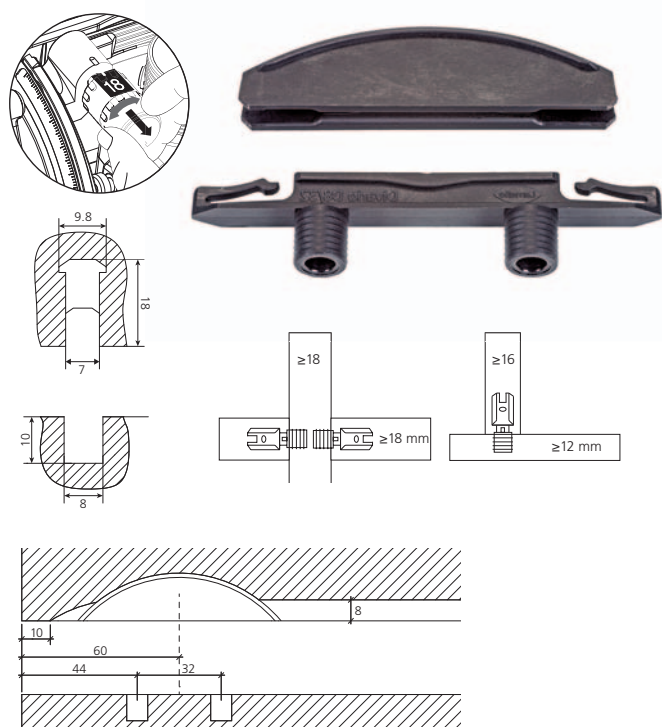
## Tensile strength (N)

|               |     |
|---------------|-----|
| all materials | 600 |
|---------------|-----|

## Divario P-18

## Art.No.

|                                                                                                            |                |
|------------------------------------------------------------------------------------------------------------|----------------|
| <b>Starter-Set</b> 80 pairs incl. Installation tool .....                                                  | <b>145550S</b> |
| <b>Starter-Set</b> 80 pairs in Systainer Size I,<br>incl. Installation tool and marking jig in metal ..... | <b>145551</b>  |
| Carton with 80 pairs .....                                                                                 | <b>145550</b>  |
| Carton with 300 pairs .....                                                                                | <b>145560</b>  |
| Carton with 1000 pairs .....                                                                               | <b>145570</b>  |
| Divario P-18 Installation tool.....                                                                        | <b>125500</b>  |
| Divario P-18 marking jig in metal incl. drill .....                                                        | <b>125510</b>  |
| Divario P-18 marking jig in plastic.....                                                                   | <b>125511</b>  |





## Furniture manufacturing / Interior fitting

Your advantages with Divario P-18

### Efficient installation

- Fitting to insert by hand or install by hammer
- Fixing pins to drive into the wood for efficient installation
- Drilling into the surface possible with a CNC machine without angle aggregates (e.g. nesting machines)
- Possible in the factory or on site with a CNC or a Zeta P2

### Clamped joints

- Joint with high tensile strength
- Reinforcing tall cupboards with fixed shelves
- perfect look with closed joints
- No clamps or presses necessary

### Sliding insertion in a second process

- The outer cabinet can be joined in a first process
- Transport of the empty cabinet to save weight
- Assembly of the complete furniture piece on site possible (flat pack)
- Insertion of the shelves without glue or clamping aids
- Detachable for transport

- |                                                                                     |                     |                                                                                     |                   |
|-------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------|-------------------|
|  | Sliding insertion   |  | Fast installation |
|  | Invisible           |  | Strong            |
|  | Clamped joint       |  | Lateral tolerance |
|  | Fast installation   |  | Shallow cutting   |
|  | Assemble by sliding |  | No twisting       |

## Applications

Cabinets, shelves, open room dividers, wine racks, side boards, cupboards, separating walls, showcases, hanging elements etc.



hülsta, D-48702 Stadthoehn



2015

# Joining with the **Zeta P2**

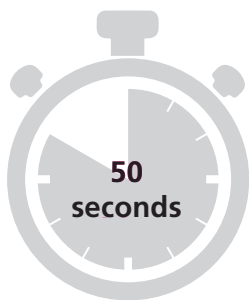


# Zeta P2

The machine for the evolving P-System, saving you time daily! Differentiate your products from the standard!



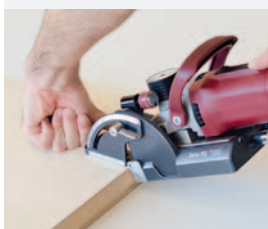
Watch the video:  
[www.lamello.com](http://www.lamello.com)



## Fastest joining system with a power tool

Connection is complete within seconds, without the need for waiting time, clamps, or secondary processes

### Connected in seconds with Clamex – detachable



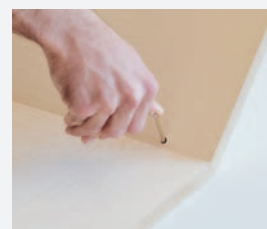
1. Cut



2. Drill



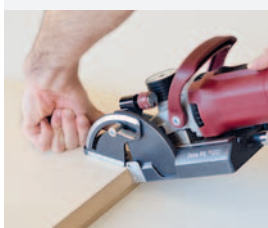
3. Insert



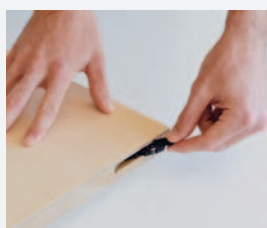
4. Connect – finished!

| Time for one connector pair |                   |
|-----------------------------|-------------------|
| 1. Cut                      | 25                |
| 2. Drill                    | 15                |
| 3. Insert                   | 5                 |
| 4. Connect – finished!      | 5                 |
| <b>Ready in</b>             | <b>50 seconds</b> |

### Connected in seconds with Tenso – glued



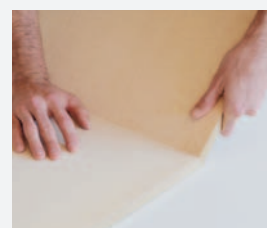
1. Cut



2. Insert



3. Apply glue



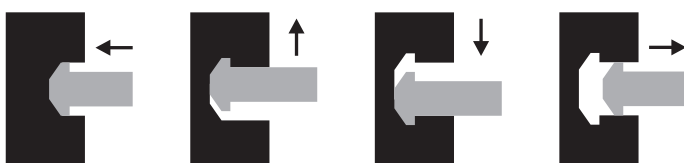
4. Connect – finished!

| Time for one connector pair |                   |
|-----------------------------|-------------------|
| 1. Cut                      | 25                |
| 2. Insert                   | 5                 |
| 3. Apply glue               | 5                 |
| 4. Connect – finished!      | 5                 |
| <b>Ready in</b>             | <b>40 seconds</b> |



## Advantages and properties

- Zeta P2, the power tool **for fast, form-locking anchorage of all P-System connecting fittings** for wood joints
- The **automatic vertical movement** creates a profile groove enabling manual insertion of the connecting fittings
- **Time saving when installing fittings** due to the innovative profile groove concept which saves labour cost as well as the cost for glue or screws, insertion of the fittings by hand, without using glue or screws, greatly reduces labour time while also negating the need for additional fastening materials

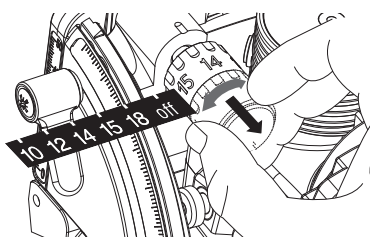


Vertical mechanical drive (VMD)

## Profile groove function

The vertical mechanical drive is the core of the machine

- **Fast ~ 1 second**
- **User-friendly** with automatic operation of the cutting process
- **Switch off the VMD** to use the machine as a standard biscuit joiner enabling 11 more applications



- **Depth 18** for Divario P-18
- **Depth 14** for Tenso P-14, Clamex P-14 and Clamex P Medius (larger side), Bisco P-14
- **Depth 10** for Clamex P-10 and Clamex P Medius (smaller side), Bisco P-10
- **Depth «off»** for groove millings without profile groove = for standard biscuit joiner

## Zeta P2-Set

## Art.No.

|                                                            |                 |
|------------------------------------------------------------|-----------------|
| with carbide tipped profile groove cutter in Systainer.... | <b>101402S</b>  |
| cutter supplied .....                                      | <b>132141</b>   |
| with diamond tipped profile groove cutter in Systainer..   | <b>101402DS</b> |
| cutter supplied .....                                      | <b>132140</b>   |

## Technical data

|                        |                                 |
|------------------------|---------------------------------|
| Power / Voltage.....   | 1050 W / 230 V                  |
|                        | 800 W / 120 V                   |
| Speed .....            | 9'000 min <sup>-1</sup>         |
| P-System Cutter .....  | Carbide tipped / Diamond tipped |
|                        | Ø 100 × 7 × 22 mm               |
| Teeth .....            | Z3                              |
| Cutting depth max..... | 20 mm                           |
| Weight.....            | 3.7 kg                          |

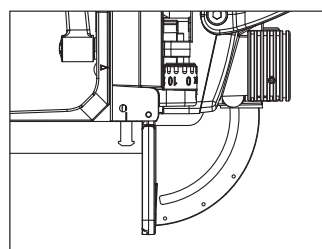
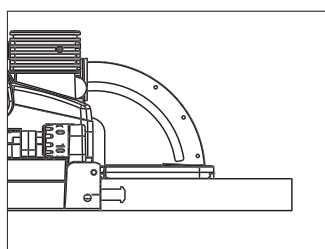
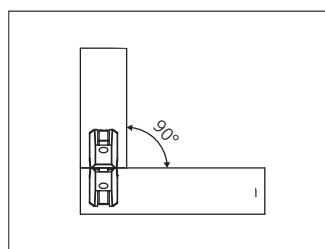
## Kit contains

- |                           |                                  |
|---------------------------|----------------------------------|
| – Zeta P2                 | – Disc for angles                |
| – P-System cutter 7 mm    | – Spacer 2 + 4 mm                |
| – Stop square             | – Tools                          |
| – Suction stub 23 + 36 mm | – P-System drill jig incl. drill |



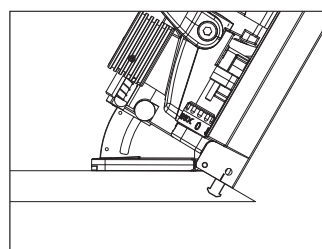
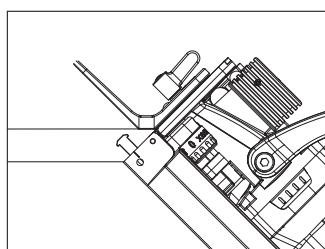
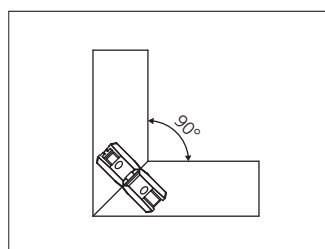
With the Zeta P2, you can quickly and flexibly connect parts with a range of angles and joining situations. Suitable for individual pieces of furniture as well as prototypes and series.

### 90° corner or dividing panel connection



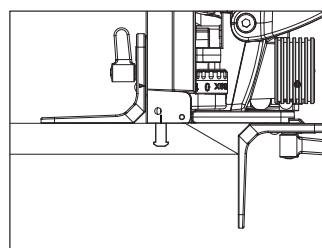
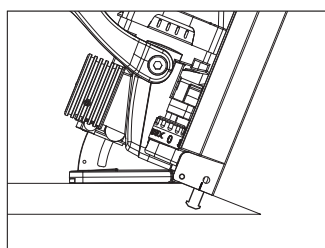
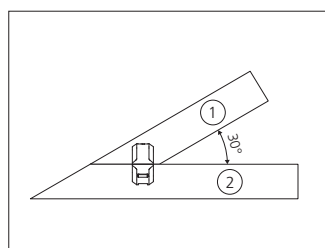
Swivel down the front and apply on the outer sides of the workpieces when cutting. The two workpieces will then fit perfectly together, even when the material thicknesses are different.

### Mitre connection 45° – 180°



For 45° or 22.5° angles, slide the stop square onto the front and place it on the outer side of the workpiece. For all other angles, swivel the front stop forward and make the cut applying on the inner side.

### Obtuse mitre connection, 22.5° – 120°



Swivel the front stop to the correct angle and place the machine on the inner side. Copy the centre position of the cut onto the other workpiece, slide the stop square onto the front and cut

## Working with centre marking



1. Cut and mark the centre of the cut



2. Copy the centre to the second workpiece



3. Align the Zeta P2 with the marking



4. Produce connections at all angles



## P-System drill jig

**Art.No.**

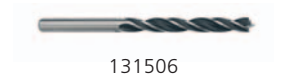
|                                                        |               |
|--------------------------------------------------------|---------------|
| P-System drill jig incl drill, from 22.5° .....        | <b>125344</b> |
| for all Clamex P fittings (P-10, P-14, P Medius 14/10) |               |
| Angle for drill jig .....                              | <b>255250</b> |
| Quick-change biscuit joiner P-10 .....                 | <b>255251</b> |
| Quick-change biscuit joiner P-14 .....                 | <b>255252</b> |



## P-System drill jig long

**Art.No.**

|                                                                      |               |
|----------------------------------------------------------------------|---------------|
| Drill jig for thick work pieces 100 mm, (P-14, P Medius 14/10) ..... | <b>125345</b> |
|----------------------------------------------------------------------|---------------|



## Drill

**Art.No.**

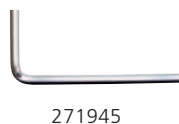
|                                                                        |               |
|------------------------------------------------------------------------|---------------|
| Spiral drill Ø 6 mm with centering point, for standard drill jig ..... | <b>131506</b> |
| Spiral drill Ø 6 mm with centering point, for long drill jig .....     | <b>131508</b> |
| Depth adjuster for drill, 6 mm diameter .....                          | <b>255243</b> |



## Clamex P assembly tool

**Art.No.**

|                                                                          |               |
|--------------------------------------------------------------------------|---------------|
| for all angles, fast and flexible,<br>Hex 4 x 30 mm, length 290 mm ..... | <b>251993</b> |
|--------------------------------------------------------------------------|---------------|



## Allen key

**Art.No.**

|                         |                |
|-------------------------|----------------|
| 4 mm, 75 x 55 mm .....  | <b>271945</b>  |
| 4 mm, 120 x 50 mm ..... | <b>271945A</b> |



## Systainer T-Loc Size II empty

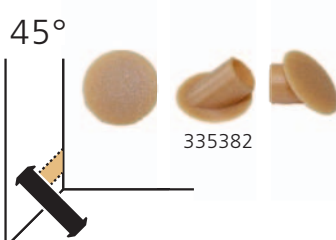
**Art.No.**

|                          |                |
|--------------------------|----------------|
| incl. 2 separators ..... | <b>331565V</b> |
|--------------------------|----------------|



## Cover caps, 100 pieces

| 90°                        | Art.No.                                                                                           |                             | Art.No.                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------|
| RAL 9010, White.....       |  <b>335280</b> | RAL 9002, Grey-white .....  |  <b>335285</b> |
| RAL 9011, Black.....       |  <b>335281</b> | RAL 7035, Light grey .....  |  <b>335286</b> |
| RAL 1014, Ivory.....       |  <b>335282</b> | RAL 7040, Window grey ..... |  <b>335287</b> |
| RAL 1011, Brown beige..... |  <b>335283</b> | RAL 7031, Blue grey.....    |  <b>335288</b> |
| RAL 8007, Brown.....       |  <b>335284</b> |                             |                                                                                                     |
| RAL 8017, Dark brown.....  |  <b>335289</b> |                             |                                                                                                     |



| 45°                   |                                                                                     | Art.No.       |                             | Art.No.                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------|---------------|-----------------------------|-----------------------------------------------------------------------------------------------------|
| RAL 9010, White ..... |  | <b>335380</b> | RAL 1011, Brown beige ..... |  <b>335383</b> |
| RAL 9011, Black ..... |  | <b>335381</b> | RAL 8017, Dark brown .....  |  <b>335384</b> |
| RAL 1014, Ivory ..... |  | <b>335382</b> | RAL 7022, Umbra grey .....  |  <b>335388</b> |



## Divario P-18 Installation tool

Art.No.

Divario P-18 Installation tool for fixing the Divario in the workpiece ..... **125500**

## Divario P-18 Marking jig in metal with marking points

Art.No.

Marking jig incl. drill with centering point and rotating depth collar for the precise drilling of Divario drill holes by hand ..... **125510**

## Divario P-18 Marking jig in plastic, to mark with a pencil

Art.No.

Marking jig to mark the Divario holes with a pencil..... **125511**



145430

## Tenso P-14 Preload tool

Art.No.

Tool to pre-load the Tenso P-14 ..... **145430**



132140



132141

## P-System groove cutter, Ø 100.4 x 7 x 22 mm

Art.No.

Z3, diamond dipped ..... **for Zeta (P-System)..... 132140**

## P-System groove cutter, Ø 100.9 x 7 x 22 mm

Art.No.

Z3, carbide tipped ..... **for Zeta (P-System)..... 132141**



251044

## Stop square for Zeta P2, Top 21, Classic X

Art.No.

For stabilising the biscuit joiner in the vertical position, ideal for obtuse mitre joints..... **251044**



253026

## Spacer for biscuit joiner

Art.No.

5 mm, Aluminium for 18 mm panels ..... **for Top 21 / Zeta / Classic..... 253027**

2 mm, Plastic for 16 mm panels ..... **for Top 21 / Zeta / Classic..... 253023**

4 mm, Plastic for mitres..... **for Top 21 / Zeta / Classic..... 253026**

# Joining with the **CNC technology**

---



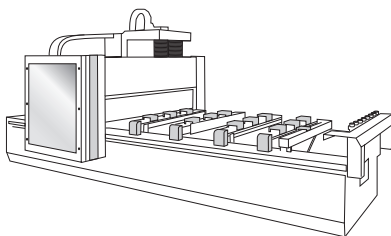
# CNC partners

Design and production software, aggregates, cutting tools and CNC machining – these companies assist you with the efficient manufacturing with the P-System:

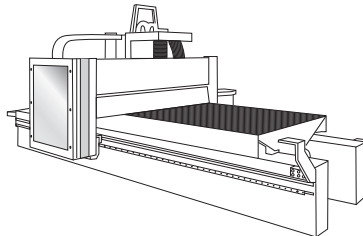


To see more of our partners, visit [Lamello.com](http://Lamello.com)

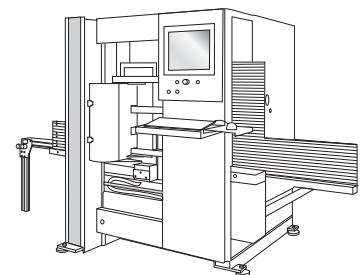
## Installation options with CNC



CNC processing centres with  
**pad and rails**



CNC processing centres with  
**nesting technology**



**Vertical** CNC processing centres

CNC machines with equipment options for particularly efficient processing



BHX 200



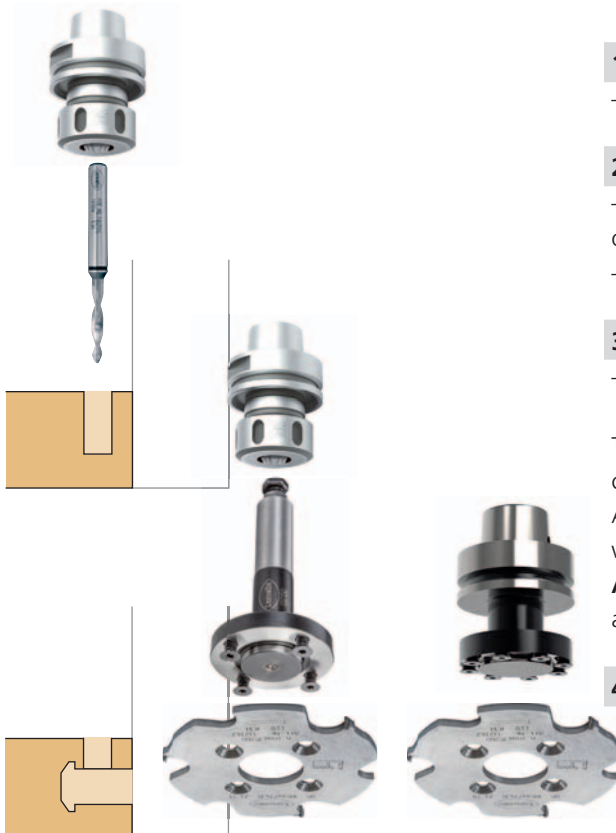
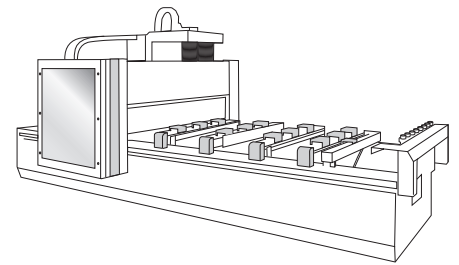
Evolution 7405



Brema Eko 2.1

# CNC machines

What setup do I need if I want to create P-System grooves with my CNC machine?



## 1. CNC machine

- Machine with 3/4/5 axes + angle aggregate

## 2. CNC software

- Purchase software/macro/component from the manufacturer or
- Program the macro yourself

## 3. Suitable angle aggregate

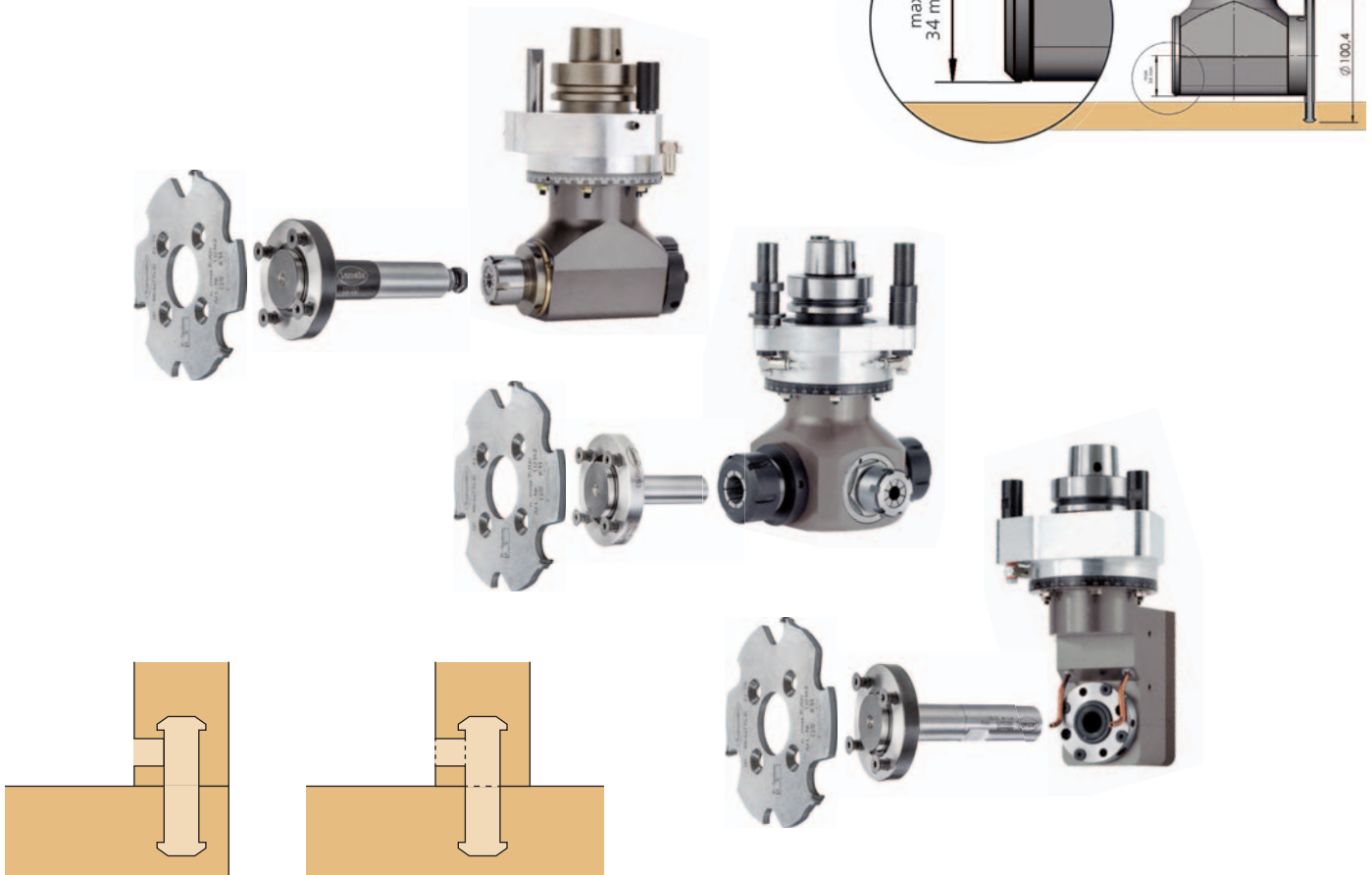
- Aggregate sub program

The angle aggregate also enables the P-System groove to be cut in the centre of the surface

An overview of other aggregates is available on our website: [www.lamello.com](http://www.lamello.com)

**Attention:** Get the approval to use the P-System cutter on the aggregate from the CNC manufacturer

## 4. P-System cutting tool





| <b>P-System CNC drill bit</b>                                         | <b>Art.No.</b> |
|-----------------------------------------------------------------------|----------------|
| 6 mm, solid carbide, for mitres,<br>L = 100 / 35 mm, shaft = 10 ..... | <b>131556</b>  |



| <b>P-System CNC groove cutter, Ø 100.4 × 7</b>                                      | <b>Art.No.</b> |
|-------------------------------------------------------------------------------------|----------------|
| × 30 mm, 4 / 6.6 / DTK 48 mm, Z3, suitable for all cutter arbors listed below ..... | <b>132142</b>  |
| × 30 mm, 4 / 6.6 / DTK 48 mm, Z6, suitable for all cutter arbors listed below ..... | <b>132145</b>  |
| × 40 mm, 4 / 5.5 / DTK 52 mm, Z3 .....                                              | <b>132143</b>  |
| E.g. for angle aggregates, Flex 5, Flex 5+                                          |                |
| × 16 mm, 4 / 5.5 / DTK 28 mm, Z3 .....                                              | <b>132144</b>  |
| E.g. for corner notching aggregate                                                  |                |
| × 35 mm, 4 / 5.5 / DTK 50 mm, Z3 .....                                              | <b>132148</b>  |



| <b>P-System CNC cutter arbors 30 / DTK 48 mm</b>                          | <b>Art.No.</b> |
|---------------------------------------------------------------------------|----------------|
| Shaft Ø 20 × 50, L = 102 mm .....                                         | <b>132150</b>  |
| Shaft Ø 25 × 60, L = 102 mm .....                                         | <b>132151</b>  |
| Shaft Ø 16 × 50, L = 85 mm .....                                          | <b>132152</b>  |
| Shaft Ø 16 × 55, L = 68 mm .....                                          | <b>132153</b>  |
| Shaft Ø 16 × 50, L = 85 mm, with clamping surface (2°- angle) .....       | <b>132154</b>  |
| E.g. for aggregate for door locks                                         |                |
| Shaft Ø 20 × 50, L = 85 mm, with clamping surface (2°- angle) .....       | <b>132155</b>  |
| E.g. for aggregate for door locks                                         |                |
| M6 × 16 mm Torx countersunk bolt, 4 pcs, suitable for cutter arbors ..... | <b>132159</b>  |
| Screwdriver with cross-grip, Torx T20 × 100 .....                         | <b>271919</b>  |



| <b>P-System CNC shaft tool cutter</b>                     | <b>Art.No.</b> |
|-----------------------------------------------------------|----------------|
| Solid carbide, shaft Ø 12 × 40, L = 80 mm .....           | <b>131342</b>  |
| Only for machining panel centres with 5 axis CNC machines |                |



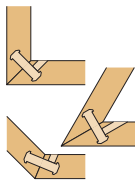
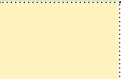
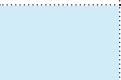
| <b>Positioning pins for Zeta P2</b>                                    | <b>Art.No.</b> |
|------------------------------------------------------------------------|----------------|
| Ø 5 mm, 1 pairs .....                                                  | <b>251048</b>  |
| Ø 8 mm, 1 pairs .....                                                  | <b>251066</b>  |
| For positioning in positioning holes with a diameter of Ø 5 mm or 8 mm |                |



| <b>Positioning clip for Zeta P</b>               | <b>Art.No.</b> |
|--------------------------------------------------|----------------|
| Ø 6 mm .....                                     | <b>251067</b>  |
| For positioning in the Clamex access hole (6 mm) |                |

# Requirements for CNC machines:

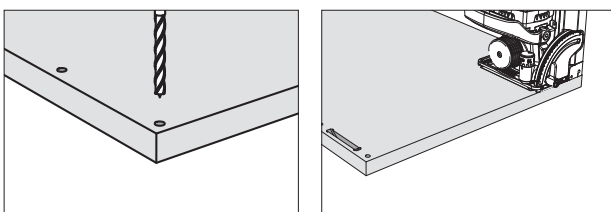
- Either the macro and component software for the desired angle are provided or you have programmed these yourself
- Aggregate sub program is available

| Machines | Axes | Equipment<br>(Varies depending on machine and aggregate)                            |                                                                                 | Surface<br>180°                                                                     | Corner<br>90°                                                                         | Centre wall<br>90°                                                                                                                                                                                                                                                | Mitre<br>22.5° – 180°                                                                                                                                                       |                                                                                       |
|----------|------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|          |      |                                                                                     |                                                                                 |    |    |                                                                                                                                                                                |                                                                                          |                                                                                       |
| Portal   | 3/4  | —                                                                                   | 1 × P-System cutter<br>1 × cutter arbor<br>1 × drill Ø 6 mm                     |    |    |                                                                                                                                                                                |                                                                                          |                                                                                       |
|          |      |    | 2 × P-System cutter<br>(2) × cutter arbor<br>1 × drill Ø 6 mm                   |    |    |                                                                                                                                                                                |                                                                                          |                                                                                       |
|          |      |    | 1 × P-System cutter<br>1 × cutter arbor<br>1 × P-System drill Ø 6 mm            |    |    |                                                                                                                                                                                |                                                                                          |                                                                                       |
|          | 4    |   | 1 × P-System cutter + adaptor<br>1 × P-System drill Ø 6 mm + adaptor            |    |    |                                                                                                                                                                                |                                                                                          |                                                                                       |
|          | 5    | —                                                                                   | 1 × P-System cutter<br>1 × cutter arbor<br>1 × P-System drill Ø 6 mm            |  |  |    |                                                                                        |                                                                                       |
|          |      |  | 2 × P-System cutter<br>(2) × P-System cutter arbor<br>1 × P-System drill Ø 6 mm |  |  |                                                                                                                                                                              |                                                                                        |                                                                                       |
| Nesting  | 3/4  | —                                                                                   | —                                                                               | 1 × drill Ø 5 mm<br>1 × drill Ø 6 mm                                                |    |                                                                                                                                                                              |                                                                                        |  |
|          | 5    | —                                                                                   | —                                                                               | 1 × P-System cutter<br>1 × cutter arbor<br>1 × P-System drill Ø 6 mm                |    |                                                                                                                                                                              |   |  |

 Possible

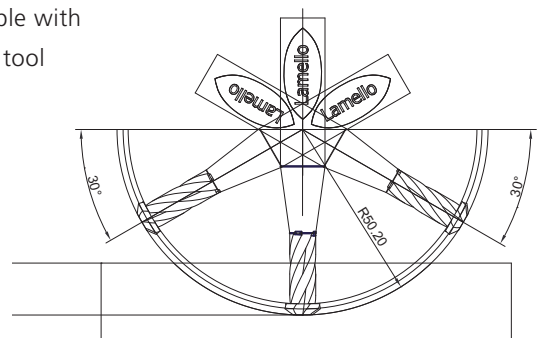
 Only possible with Zeta P2 and positioning pins

**Tip:** Instead of using an angle aggregate, the Zeta P2 power tool can be used to cut the P-System groove in the centre of the surface. To do so, drill two 5 mm positioning holes spaced at 101 mm in the work piece surface using the CNC machine. These are required to align the Zeta P2 on the work piece.



 Possible with shaft tool

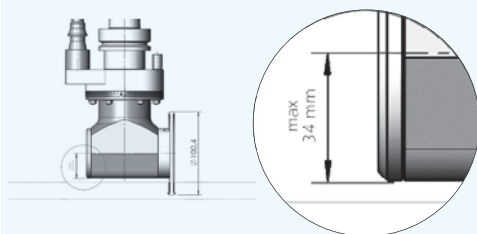
 Not possible



For more information, visit: [www.lamello.com](http://www.lamello.com)

## Aggregates

### A Angle aggregate

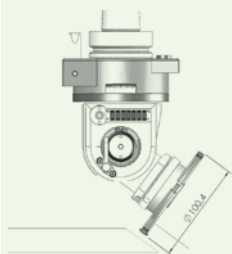


#### Possible angle aggregates

- One to four spindle angle aggregates
- Corner notching aggregate
- Aggregate for door locks

An aggregate overview can be found on the Lamello website: [www.lamello.com](http://www.lamello.com)

### B Manually adjustable swivelling aggregates



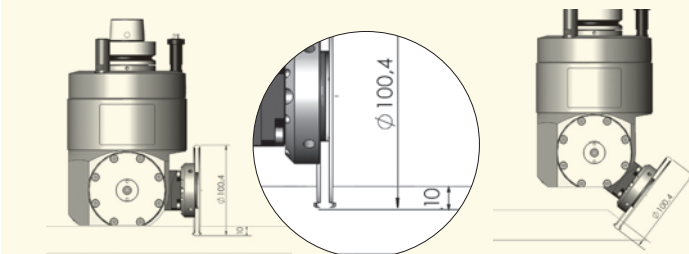
**Information:** The use of several aggregates is required. Several tool changes required for angle cuts, drilling and P-System grooves

**Information:** The cutting depth in the centre of the

surface may be restricted depending on the model

**Tip:** For mitres, spare yourself a tool change and drill the hole using a manual drill jig!

### C Automatically adjustable swivelling aggregates (Flex 5+C, from manufacturing year 2015)



**Note:** Automatically adjustable swivelling aggregate with automatic tool changer. The profile groove is restricted to 10 mm in the centre of the surface

## Advantages in the production process

### 1. P-System groove with CNC



- Same profile groove for both work pieces
- Short process time
- Less processing than for other connection methods
- Direct data transfer from CAD / CAM

### 2. Storage



- Small storage volume due to stacking despite installed connector
- Shorter reaction time for the continuation of the next process

### 3. Delivery: in parts



- Smaller transport volume without damaging the parts
- Easy transport of the parts into the building (stairs, elevator)

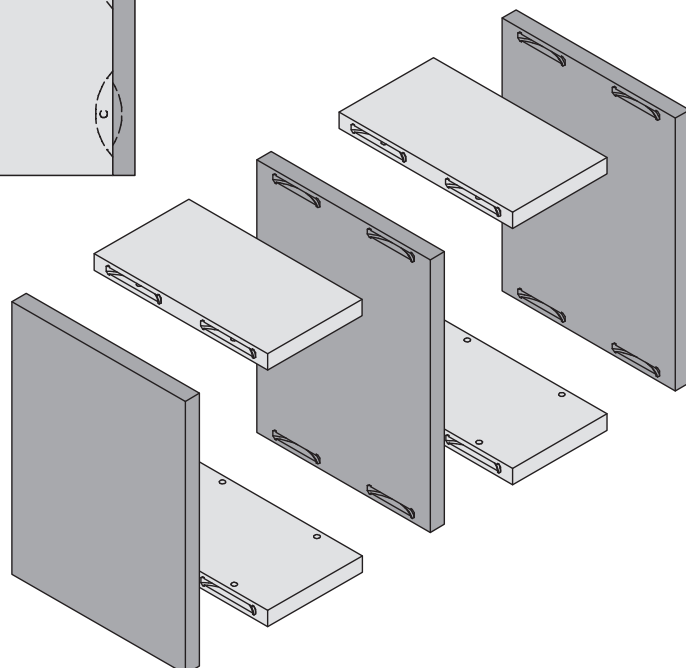
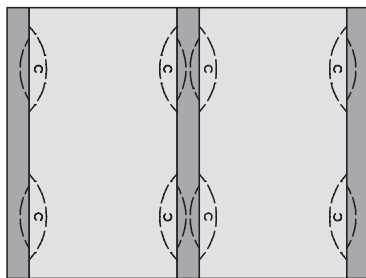
### 4. Assembly on site

1. Easy assembly by customer possible
  2. Assembly by sales personnel or tradesman
- Shorter assembly time on site

# Ideas for standardising the machining on a CNC machine

**Depth 10 mm** for all P-System grooves **in the surface**

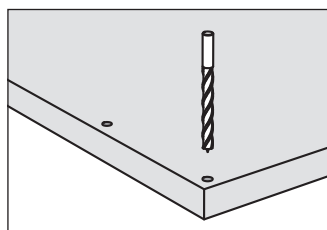
**Depth 14 mm** for all P-System grooves **in the edge**



|                                            | Art.No.       |
|--------------------------------------------|---------------|
| <b>Clamex P-14, element with the lever</b> |               |
| box with 2'000 pcs .....                   | <b>145338</b> |
| <b>Clamex P-10, element without lever</b>  |               |
| box with 2'000 pcs .....                   | <b>145358</b> |
| <b>Clamex P-10, element Medius</b>         |               |
| box with 2'000 pcs .....                   | <b>145369</b> |

## Ideal combination of CNC machines and Zeta P2

Positioning drill holes on a CNC



Combining strengths: Precise drilling on a CNC machine; use these drill holes to position the Zeta P2 to cut the P-System grooves.

This application is especially ideal for nesting machines, when the cost for an additional aggregate can't be justified or the machine cannot be upgraded anymore.

This method combines the precision and efficiency of a CNC machine and uses the simple and fast machining of a P-System groove with a Zeta P2.



| Positioning pin Zeta P2 | Art.No.       |
|-------------------------|---------------|
| Ø 5 mm .....            | <b>251048</b> |
| Ø 8 mm .....            | <b>251066</b> |

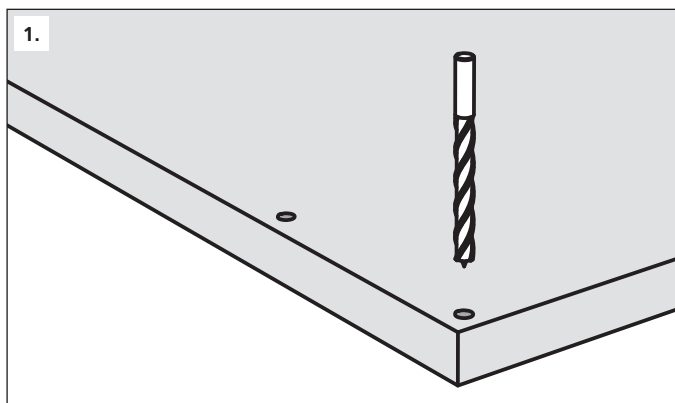
### Advantages and properties

- Save time and money!
- Short setup time with a Zeta P2
- No specific angle aggregates, software or CNC tools necessary
- Precise positioning for center panels

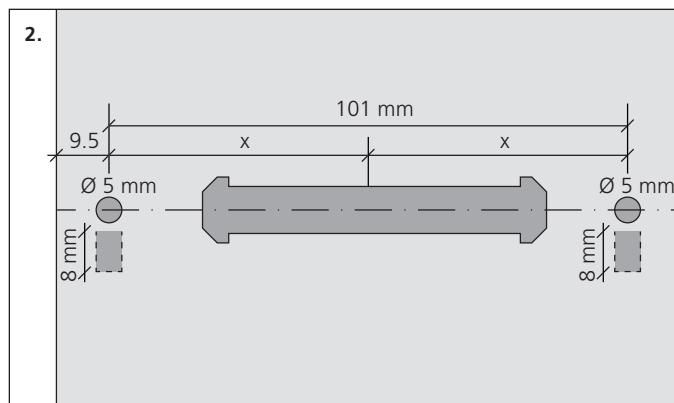


| Positioning clip for Zeta P2                     | Art.No.       |
|--------------------------------------------------|---------------|
| Ø 6 mm .....                                     | <b>251067</b> |
| For positioning in the Clamex access hole (6 mm) |               |

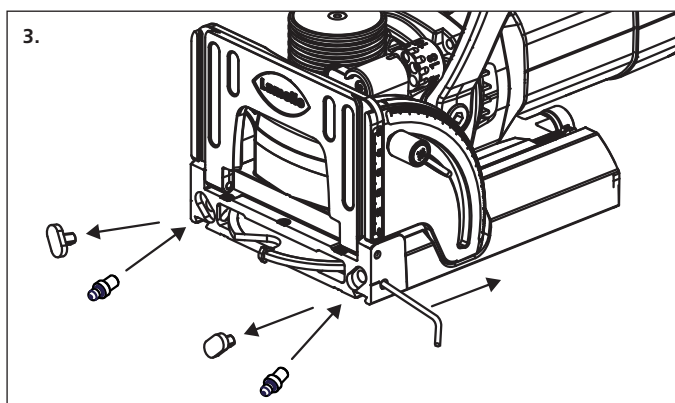
## Cutting the groove in the surface



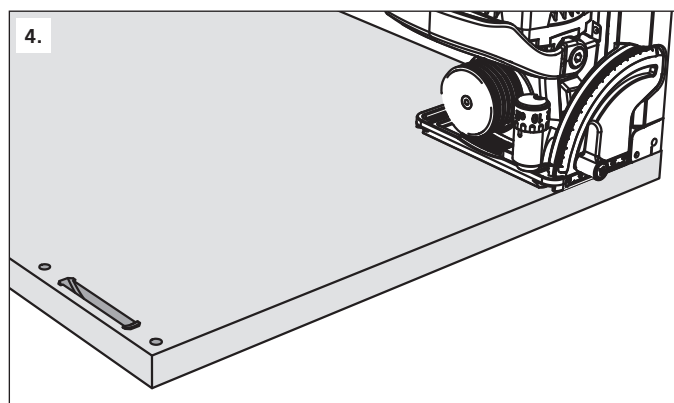
Drill the positioning holes with the CNC,  $\varnothing 5 \text{ mm} / \varnothing 8 \text{ mm}$



Hole pattern of the positioning drill holes

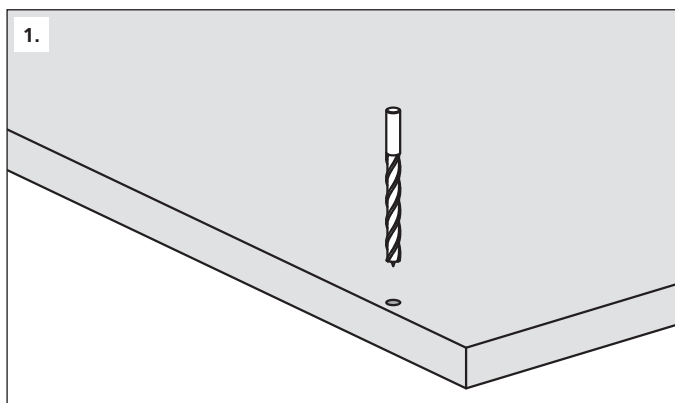


Insert the positioning pins in the Zeta P2

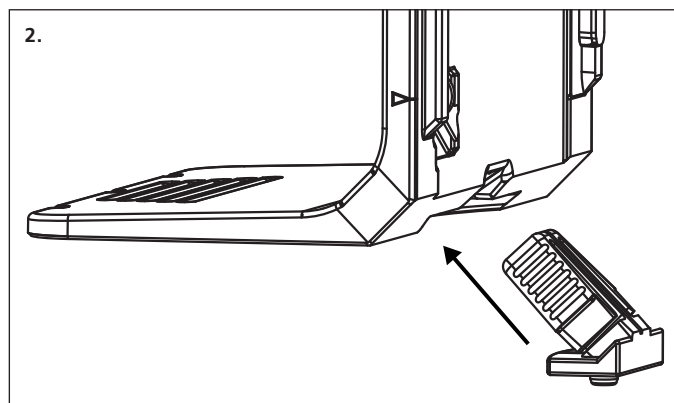


Position the machine in the drill holes

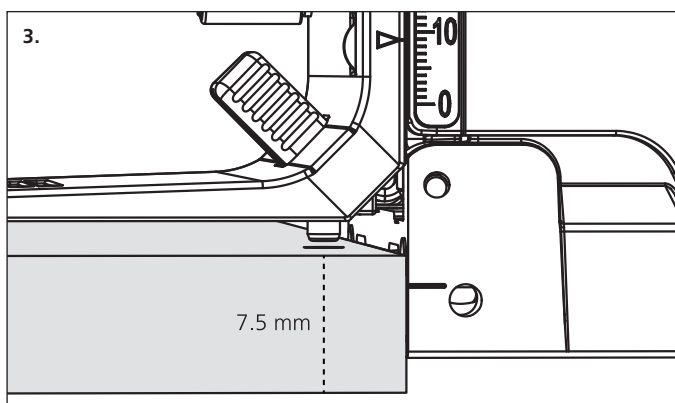
## Cutting the groove in the edge



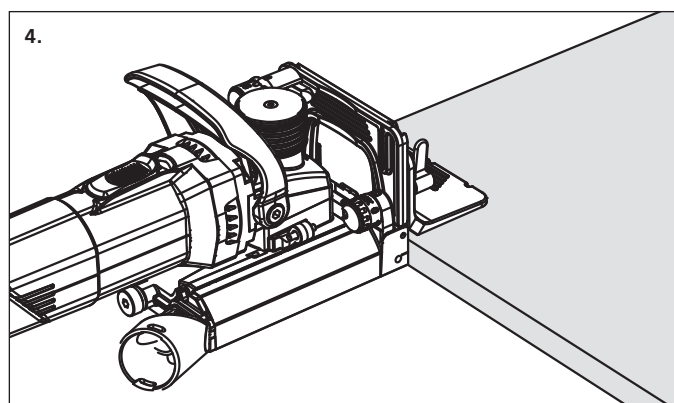
Drill the positioning hole with the CNC,  $\varnothing 6 \text{ mm}$



Insert the positioning clip



Insert the positioning clip in the drill hole  $\varnothing 6 \text{ mm}$



Cut the groove with the positioned machine



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