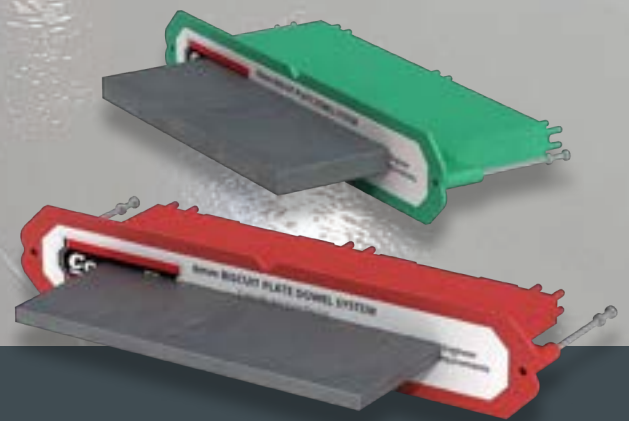




Biscuit Plate Dowels

for slab-on-ground applications



Leviat

We imagine, model and make engineered products and innovative construction solutions that help turn architectural visions into reality and enable our construction partners to build better, safer, stronger and faster.

Leviat is a world leader in connecting, fixing, lifting and anchoring technology.

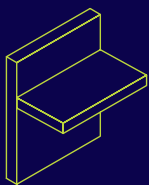
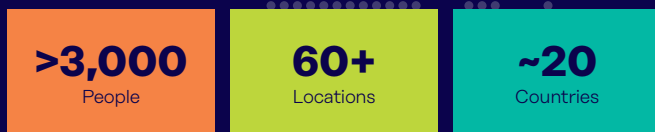
From the build of new schools, hospitals, homes and infrastructure, to the repair and maintenance of heritage structures, our engineering skills are making a difference around the world.

We provide technical design assistance at every stage of a project, from initial planning to installation and beyond.

Our technical support services range from simple product selection through to the development of a fully customised project-specific design solution.

Every promise we make locally, has the commitment and dedication of our global team behind it. We employ almost 3,000 people at 60 locations across North America, Europe and Asia-Pacific, providing an agile and responsive service worldwide.



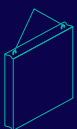


Structural Connections

Systems to form robust, efficient connections, and continuity of concrete reinforcement as necessary, between walls, slabs, columns, beams and balconies, providing structural integrity as well as enhanced thermal and acoustic performance.

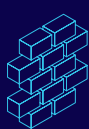
- Insulated balcony connectors
- Reinforcing bar couplers
- Concrete Connections
- Reinforcement continuity systems
- Punching shear reinforcement
- Shear load connectors
- Floor Joint Systems
- Precast / Reinforced Columns
- Infrastructure Products
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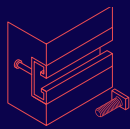
Lifting & Bracing

Systems for the safe and efficient transportation, lifting and temporary bracing of cast concrete elements and tilt-up panels before permanent structural connections are made.



Façade Support & Restraint

Systems for the safe and thermally-efficient fixing of the external building envelope, including brick and natural stone, insulated sandwich panels, curtain walling and suspended concrete façades, and also the repair and strengthening of existing masonry installations.



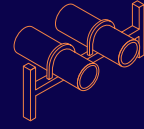
Anchoring & Fixing

Systems for fixing secondary fixtures to concrete, including anchor channels, bolts and inserts; also tension rod systems for roofs and canopies.



Formwork & Site Accessories

Non-structural accessories that complement our engineered solutions and help keep your construction environment operating safely and efficiently, including moulds for casting standard and special concrete elements and construction essentials such as reinforcing bar spacers.



Industrial Technology

Mounting channels, pipe clamps and other versatile framing systems that provide safe fixing in a wide range of industrial applications.

Leviat product ranges:

Ancon | Aschwanden | Connolly | Halfen | Helifix | Isedio | Meadow Burke | Modersohn | Moment | Plaka | Scaldex | Thermomass

Biscuit Plate Dowels

A Plate Dowel and Sleeve system designed to transfer loads across construction joints in slab-on-ground applications.

Connolly Biscuit Plate Dowels and Sleeves are designed to transfer loads across construction joints in slab-on-ground applications. The plastic sleeve encases one half of the plate dowel to de-bond the dowel from the concrete. Connolly Biscuit Plate Dowels allow for expansion, contraction and lateral movement at the joint.

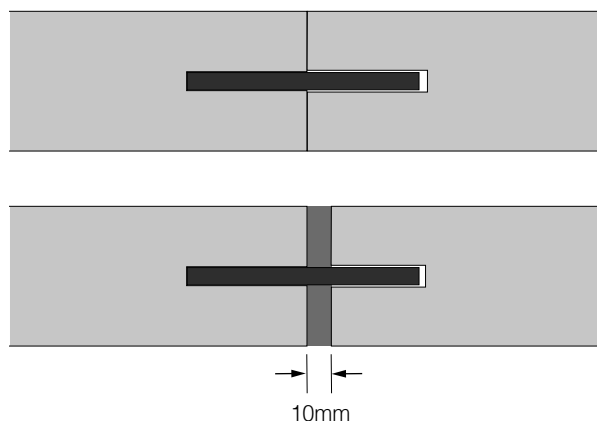
Connolly Biscuit Plate Dowels are available in 6mm and 10mm thickness in black, hot-dip galvanised and stainless steel finish.

With pre-installed nails, and V-notches on all sides, Connolly Biscuit Dowel Sleeves can be easily and accurately installed on conventional formwork, ensuring perfect dowel alignment.

Injection moulded from polystyrene for accuracy and stiffness, the Biscuit Dowel Sleeve minimises the vertical movement across the joint. Biscuit Dowel Sleeves are colour coded to indicate the plate dowel thickness.

Connolly Biscuit Plate Dowels and Sleeves can be used:

- In Contraction Joints - the second slab is poured against the first slab, after the formwork has been removed, leaving no gap between the two slabs at the time of pour but allowing contraction of the adjacent slabs.
- In Expansion Joints - using Connolly Biscuit Plate Dowels and a layer of compressible filler in the joint allows the adjacent slabs to expand and contract.





- Minimises differential deflection between slabs
- Allows for contraction, expansion and lateral movement
- V-notches and pre-installed nails for ease of installation
- Speeds up dowel installation
- Ability to fix to timber and steel formwork with ease
- Ideally suited for construction joints



Manufactured in an
ISO accredited factory



Made in
Australia



Cost-effective
solution



Nationwide
distribution network



Dedicated sales and
technical support



Standard items
available ex stock

Biscuit Plate Dowel Components

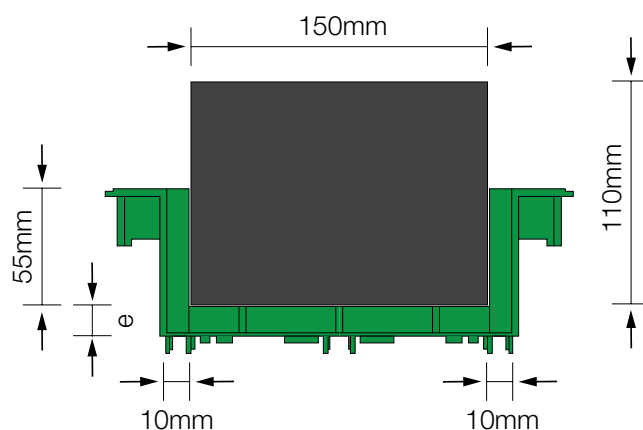
The Connolly Biscuit Plate Dowel is available in standard sizes of 6mm and 10mm thick.

The system includes one polystyrene sleeve which comes fitted with duplex nails and one steel dowel which is available in black, hot-dip galvanised or stainless steel.



Specifications

Product	Connolly Biscuit Plate Dowel 6mm	Connolly Biscuit Plate Dowel 10mm
	Steel Plate Dimensions	
Length x Width	110mm x 150mm	110mm x 150mm
Dowel Thickness	6mm	10mm
Steel Grade	AS/NZS 3679.1-300	AS/NZS 3679.1-300
Hot-dip Galvanised	35µm – AS/NZS 4680:2006	55µm – AS/NZS 4680:2006
	Sleeve Properties	
Colour	Red	Green
Material	Polystyrene	Polystyrene
End Expansion (e)	5mm	12mm
Lateral Expansion	10mm each side	10mm each side
Connection	Duplex nails to timber formwork pre-installed	
	Ordering Information	
Finish	Part no. for complete set including plate dowel, sleeve and nails	
HDG	CBPS6-GAL	CBPS10-GAL
Black	CBPS6-BLK	CBPS10-BLK
Stainless Steel	CBPS6-S/S	CBPS10-S/S



Biscuit Plate Dowel Design Capacities

The use of the Connolly Biscuit Plate Dowels ensures that shear loads are safely transferred across the joint through dowels. We recommend referring to *TR34, Fourth Edition – Concrete Industrial Ground Floors* to determine the dowel capacity.

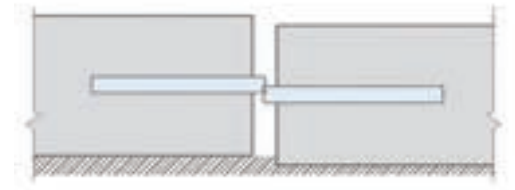
Section 6.5 of TR34 provides guidance on the calculation of dowel capacities for the following failure modes:

Dowel Shear Capacity

The shear capacities for the plate dowels provided in the table below have been calculated using equation 18 of TR34.

Dowel Shear Capacity

Sleeve Size	Thickness (t) (mm)	Finish	Shear Area ($0.9 \cdot A$) (mm ²)	Capacity ($P_{sh \text{ plate}}$) (kN)
CBPS6	6	Black/HDG	810	135.2
CBPS10	10	Black/HDG	1,350	225.4
CBPS6	6	Stainless	810	86.6
CBPS10	10	Stainless	1,350	144.4

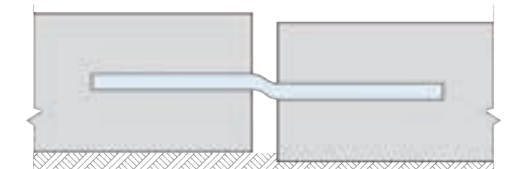


For the standard configurations of the plate dowel, the shear strength will never govern the capacity of the joint.

Dowel Bearing/Bending Capacity

Bearing/Bending is a combined failure mode that checks the bending capacity of the dowel as well as the bearing capacity of the surrounding concrete. Equation 19 of TR34 defines the bearing/bending capacity of a dowel.

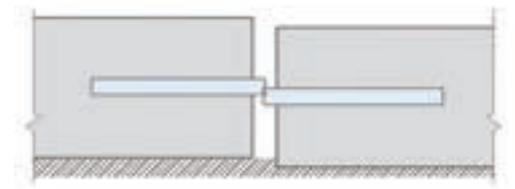
Please find the dowel bearing/bending capacities for different conditions in the combined capacity tables on page 8 and 9.



Punching Shear (Bursting Force)

Section 6.5.3 of TR34 recommends calculating the bursting load of the concrete by adapting the EC2 approach for punching failure using an effective depth of 0.75 times the depth between the dowel and the surface of the concrete slab.

Please find the punching shear capacities for different conditions in the combined capacity tables on page 8 and 9.



Biscuit Plate Dowel Design Capacities

Single Dowel Design Capacities

The following tables provide single dowel capacities for 6mm and 10mm Biscuit Plate Dowels calculated in accordance with TR34 for various joint widths and concrete compressive strengths. The capacities provided in the table are minimum values from the failure modes dowel shear, dowel bearing/bending and punching/bursting. Colour coding indicates the governing failure mode.

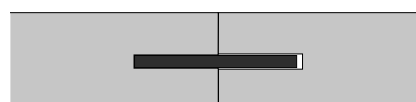
Single Dowel Design Capacity - Contraction Joint

Biscuit Plate Dowel - Single Dowel Design Capacity - 6mm mild steel dowel					
Slab Thickness (mm)	Joint Width (mm)	Concrete Strength (MPa)			
		25	32	40	45
125	5	11.7	13.3	14.8	15.7
	10	11.5	13.0	14.5	15.4
	15	11.3	12.8	14.3	15.1
150	5	15.8	17.8	19.9	21.1
	10	15.5	17.5	19.6	20.8
	15	15.2	17.2	19.2	20.4
200	5	25.5	28.8	32.2	34.2
	10	25.1	28.4	31.8	33.7
	15	24.7	28.0	31.3	33.2
250	5	37.4	42.3	47.3	50.1
	10	36.9	41.8	46.7	49.5
	15	36.5	39.3	40.8	41.6
300	5	51.4	58.2	65.1	69.0
	10	46.4	49.6	52.3	53.7
	15	37.6	39.3	40.8	41.6



Single Dowel Design Capacity - Contraction Joint

Biscuit Plate Dowel - Single Dowel Design Capacity - 10mm mild steel dowel					
Slab Thickness (mm)	Joint Width (mm)	Concrete Strength (MPa)			
		25	32	40	45
150	5	15.1	17.0	19.1	20.2
	10	14.8	16.8	18.7	19.9
	15	14.5	16.5	18.4	19.5
200	5	24.6	27.8	31.1	33.0
	10	24.3	27.4	30.7	32.5
	15	23.9	27.0	30.2	32.1
250	5	36.3	41.1	46.0	48.7
	10	35.9	40.6	45.4	48.1
	15	35.4	40.1	44.8	47.5
300	5	50.2	56.8	63.5	67.4
	10	49.7	56.2	62.9	66.7
	15	49.2	55.6	62.2	66.0
350	5	66.3	75.0	83.9	89.0
	10	65.7	74.3	83.1	88.2
	15	65.1	73.6	82.3	87.3



The tables show capacities for mild steel dowels (black and HDG) for standard conditions. Please contact Leviat for custom applications and for stainless steel dowel capacities. See Page 9 for colour coding of failure modes.

Combined Design Capacities

Single Dowel Design Capacities

The table on the right shows the colour coding that is used in the capacity tables on pages 8 and 9 to indicate the governing failure mode.

Dowel bearing/
bending failure mode



Punching failure mode



Single Dowel Design Capacity - Expansion Joint

Biscuit Plate Dowel - Single Dowel Design Capacity - 6mm mild steel dowel					
Slab Thickness (mm)	Joint Width (mm)	Concrete Strength (MPa)			
		25	32	40	45
125	10	11.5	13.0	14.5	15.4
	15	11.5	13.0	14.5	15.4
	20	11.5	13.0	14.5	15.4
150	10	15.5	17.5	19.6	20.8
	15	15.5	17.5	19.6	20.8
	20	15.5	17.5	19.6	20.8
200	10	25.1	28.4	31.8	33.7
	15	25.1	28.4	31.8	33.7
	20	24.1	28.4	31.8	33.4
250	10	36.9	41.8	46.7	49.5
	15	36.9	39.3	40.8	41.6
	20	31.1	32.2	33.0	33.4
300	10	46.4	49.6	52.3	53.7
	15	37.6	39.3	40.8	41.6
	20	31.1	32.2	33.0	33.4



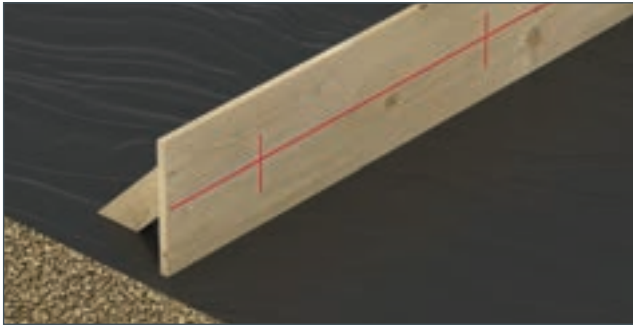
Single Dowel Design Capacity - Expansion Joint

Biscuit Plate Dowel - Single Dowel Design Capacity - 10mm mild steel dowel					
Slab Thickness (mm)	Joint Width (mm)	Concrete Strength (MPa)			
		25	32	40	45
150	10	14.8	16.8	18.7	19.9
	15	14.8	16.8	18.7	19.9
	20	14.8	16.8	18.7	19.9
200	10	24.3	27.4	30.7	32.5
	15	24.3	27.4	30.7	32.5
	20	24.3	27.4	30.7	32.5
250	10	35.9	40.6	45.4	48.1
	15	35.9	40.6	45.4	48.1
	20	35.9	40.6	45.4	48.1
300	10	49.7	56.2	62.9	66.7
	15	49.7	56.2	62.9	66.7
	20	49.7	56.2	62.9	66.7
350	10	65.7	74.3	83.1	88.2
	15	65.7	74.3	83.1	88.2
	20	65.7	74.3	78.6	80.4



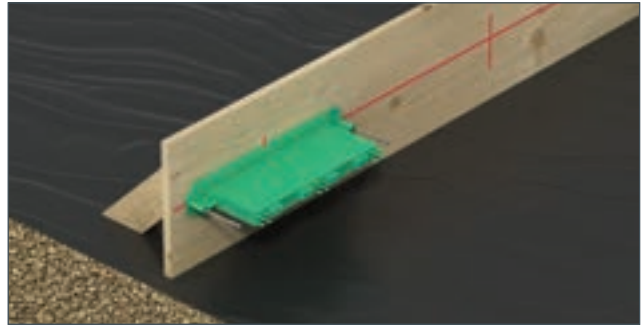
The tables show capacities for mild steel dowels (black and HDG) for 10mm expansion joints. Please contact Leviat for custom applications and for stainless steel dowel capacities. See Page 9 for colour coding of failure modes.

Installation Guidance



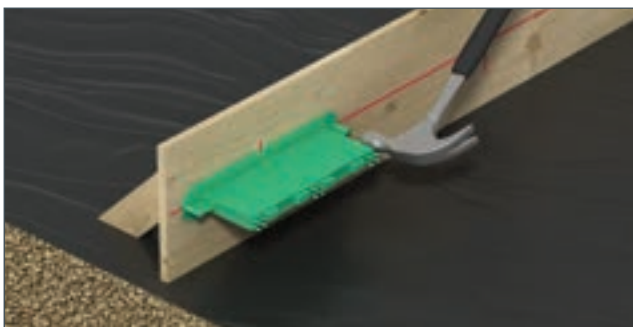
Step 1

Mark centre line of the biscuit plate dowel and dowel spacing on the formwork.



Step 2

Place the Biscuit Dowel Sleeve at the marked location by using the V-notches at the top and bottom and both sides to ensure correct placement.



Step 3

Nail the Biscuit Dowel Sleeve to the formwork using the pre-installed nails.



Step 4

After pouring the first slab remove the formwork. After removal of formwork, the Biscuit Dowel Sleeve will be exposed as shown above.



Step 5

Firmly place the Biscuit Plate Dowel into the insertion hole in the sleeve by punching through the sticker as shown above.



Step 6

Once plates have been correctly positioned, install the specified reinforcement and carry out the next pour. (For expansion joints, install compressible material before second pour)

Connolly Product Range

Key Joint

Connolly Key Joints are a continuous pour solution for contraction joints in slab on ground applications. Key Joints are a roll formed galvanised steel section used as a leave-in-place formwork to control shrinkage induced cracking. The profile is fixed in place using our patented peg and wedge system. Key Joints are available in 3 and 6m lengths for slab thicknesses from 100mm to 300mm.

Dowel Cradles

Connolly Dowel Cradles are used for load transfer in saw cut contraction joints. They are a welded wire assembly that ensures the horizontal and vertical alignment of dowels at the correct spacing and height. Manufactured in 3m lengths from 6mm wire, dowel cradles are available in a wide range of configurations to suit a variety of slab thicknesses and load requirements.

Expansion Joint System

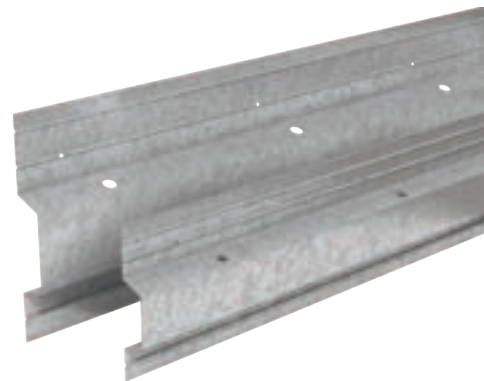
Connolly Expansion Joint System is a continuous pour solution for expansion joints in slab on ground applications. They are a roll formed galvanised steel section with 10mm cross linked foam to provide a leave-in-place formwork that allows for joint expansion. The profile has pre drilled holes that allows it to be used in conjunction with Connolly Universal Dowel Sleeves. The expansion joint profile is available in 3m lengths for slab thickness from 100mm to 200mm. Custom lengths and heights are available on request.

Universal Dowel Sleeves

Connolly Universal Dowel Sleeves are available for round and square dowels allowing load transfer across joints in slab-on-ground applications. The sleeve encases one half of the dowel to de-bond the dowel from the concrete. All universal dowel sleeves allow for expansion and contraction at the joint with the square variety also allowing for lateral movement at the joint.

Safety Caps

Connolly Safety Cushion Caps are designed to reduce the risk of injury on-site. Made from recyclable plastic, the safety caps are suitable for steel reinforcing bars N12-N32mm, as well as Star Pickets.



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