



Nexus
CONSTRUCTION SYSTEMS

construction handbook

www.nexus.com.au

August 2023

company profile

Nexus
CONSTRUCTION SYSTEMS



Nexus Construction Systems was established in 1981 and remains 100% Australian-owned, with branches in Melbourne, Sydney, Brisbane and Perth.

Today it is one of the country's few national suppliers to the precast and tilt-up concrete construction industries, providing a complete service from start to finish.

Nexus offers a personalised service that includes a comprehensive product range of cast-in consumables, panel formwork, bond breakers, lifting clutches and brace

hire Australia-wide. This includes in-house engineering design of bracing solutions and custom manufactured braces — all of which comply with all relevant Codes of Practice and with Australian Standards.

Nexus maintains effective relationships with major stakeholders in the precast construction industry and also contributes in an advisory capacity.

If you're looking for a professional supplier of engineered products and services with a commitment to precast industry standards, compliance with construction regulations, and the experience to ensure your next small, medium or major project runs smoothly, then look no further than Nexus Construction Systems.

Precast & Tilt-Up Accessories
Bracing & Lifting Accessories
Engineering & Design

Table of Contents

Safety Information	4
General & Technical Information	5
T14 Panel Brace	6
Bracing	8
Bi-Pod System	9
Corner Bracing	11
Shear Pin	12
Brace Capacity Charts	13
Bracing Bolts	15
Nexus Bracing Bolt	16
T16 Temporary Angle Bracket Connection	17
T19 Double Brace Foot	18
M81 Levelling Shim	20
P82 Olivetti Anchor	21
P82 Olivetti Anchor Installation	23
P83 Olivetti Void Former	24
How to use the Olivetti Edge Lift Anchor and Void Former	25
P86 Olivetti Ring Clutch	26
Inspection P86 Olivetti Clutch	27
Rigging - Panel Precast Handling	28
P52 Foot Anchor	31
P53 Eye Anchor	34
P60 Tension Bar	35
P55 Rubber Void Former	36
P57 Steel Void Former	38
P56 Articulated Void Former	39
P50 Lifting Clutch	40
Using the P50 Lifting Clutch	41
Simplify the Panel Lift	42
T41 Face Lift Insert	43
Ground Release Clutch	45
Using the T43 Ground Release Clutch	46
Olivetti 7t Face Lift Anchor	47
T42 Double Face Lift System	48
T75 Emergency Lifting Plate	49
T52 Edge Lift Anchor	50
T84 Olivetti Edge Lift Anchor	51
Rigging Set-up	54
Strongbacks	56
T18 Strongback Bolt	57
Emergency Strongback Bolt	58
F43 Standard Ferrule Inserts	59
F44 Star Ferrule	60
F47 TB Coupler	61
F54 Threaded Bar Ferrule	62
Appendix A. Chemical TDS & SDS	63

Safety Information

WARNING

Incorrectly using any Nexus Construction System product can result in accidents that may lead to serious injury or death.

The information in this handbook should be read carefully and fully understood prior to using any of the equipment that is listed.

If there is any doubt about the correct procedures, please contact the nearest Nexus Construction Systems office for more information

Only use Nexus Construction Systems products for the purpose outlined in this handbook. Never allow any component to exceed its prescribed working load limit as detailed in this handbook or approved Nexus literature. Users of Nexus products must be trained and experienced in the intended use of the products and all state and national codes of practice, standards and regulations must be strictly adhered to.

Inspection

All Nexus Construction Systems equipment must be inspected regularly to ensure it is not damaged and is fit for use. Reusable products are subject to wear and possible incorrect use could result in damage. The end user must schedule a regular inspection of all products to ensure they are not damaged in any way. The schedule should be based on the appropriate Australian Standard and/or Codes of Practice and the specific product information detailed in this handbook.

Other Safety Notes

Nexus Construction Systems products should not be altered in any way (including welding, cutting or bending). Such alterations can significantly reduce the working capacity of the product.

Nexus Construction Systems products should never be used with components from other manufacturers.

Never mix components from different working load limit rated systems.

Nexus reserves the right to alter product designs, dimensions and working load limits at any time.

General & Technical Information

Engineering Services

Many of the products used for successful construction with precast concrete require competent engineering input for each specific application and project. Nexus employs professional engineers to provide engineering services to customers, particularly with regard to safe lifting and bracing of precast and tilt-up elements, including the design of brace footings and connections.

Nexus services include:

- Consultation / Recommendations
- Panel Lifting & Erection Details
- Bracing Requirements
- Additional lifting reinforcement, if required
- Strongback requirements, if required

Factors of Safety

The working load limit for Nexus Constructions Systems' range of products is based on the factor of safety identified by AS3850:2015

Product Type	Factor of Safety
Wall Braces	2.0
Cast-in Brace Anchors	2.25
Lifting Inserts	2.25
Reusable Lifting Hardware	4

Safety Notes

The working load limits published in this handbook are based on the following conditions:

1. Products must be in good condition and have not been damaged or altered in any way.
2. All lifting and fixing inserts are embedded in correctly vibrated concrete that has been produced and poured in accordance with AS1379, AS3600 and any other relevant standard.
3. All lifting and fixing inserts are fixed in place so that the longitudinal axis of the inserts is perpendicular to the lifting surface and will not move during the pouring process.
4. During the lift the concrete compressive strength (f_{cm}) is at the minimum strength listed in the tables throughout this handbook.
5. Ensure any products bolted to fixing inserts are fully bearing on the concrete surface and the bolt bears completely on the hardware.
6. Care must be taken to ensure loads are not applied at an angle as this may cause additional loading to lifting inserts and fixings.
7. Ensure bolts are in good condition and are well tightened to prevent hardware from moving and/or bolt bending.
8. All bolts and other threaded products are installed into fixings at the minimum required engagement length.
9. All inserts are located at least the minimum edge distance as per the requirements published in this handbook.
10. All inserts must also meet the spacing requirements published throughout the handbook. If none are published, the minimum required spacing is twice the minimum edge distance.
11. No welding, bending or other alteration to any lifting or fixing inserts, braces, brace components or lifting hardware has taken place.

T14 Panel Brace

Precast or tilt-up panels are rarely connected into the final structure during erection. The Nexus Panel Brace is used to temporarily support the panel in its final position while these connections are installed. The T14 Panel Brace is only designed to resist the wind loads of the concrete panel that it is supporting. Do not apply deadload or super imposed construction loads to the braces. The Nexus brace must not be used to support block, brick or other masonry walls. Designed and tested in compliance with AS3850 and the National Code of Practice for Precast, Tilt-Up and Concrete Elements in Building Construction, each model of brace carries an appropriate rating plate.

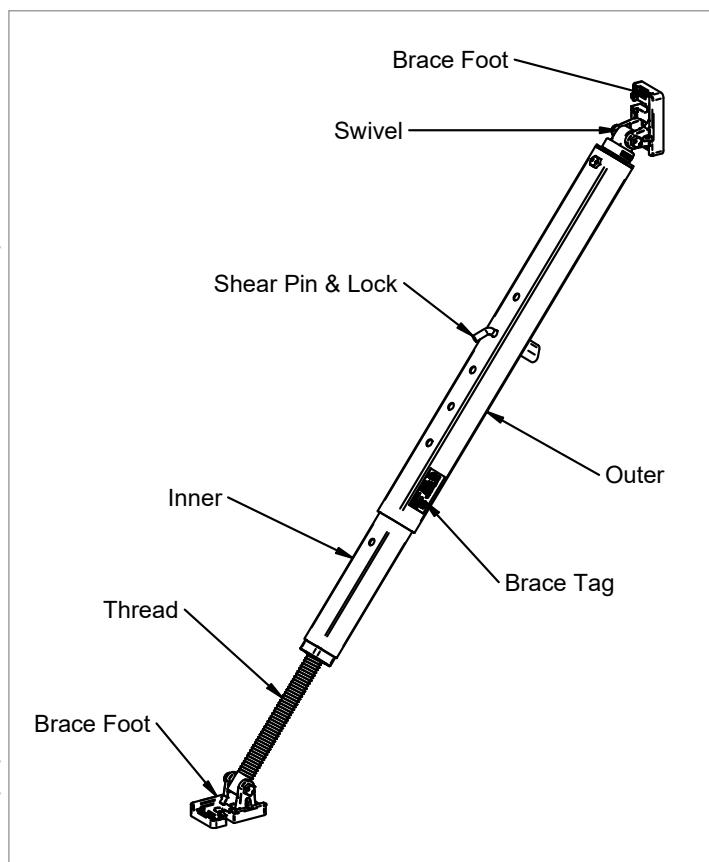
The brace foot at the swivel end of the braces is bolted to the panel prior to lifting, using either a 19mm coil or standard M20 metric bolt into a previously cast-in ferrule with a spring washer under the head of the bolt. If using bolts supplied by Nexus, ensure they are tightened to requirements as set out in this handbook. After the panel is lifted, the threaded end of the braces are bolted to either the concrete slab, deadmen or strip footing. Typically, this is either a previously cast ferrule or using the Nexus Bracing Bolt. The feet at each end of the brace have raised lugs to prevent the accidental disengagement of the bolt from the brace foot slot. The brace feet must be flat against the concrete surface with a bolted connection creating a hinge point for the main brace section.

The Nexus panel brace has two forms of adjustment; the inner and outer sections of the braces can be rough adjusted in increments of 150mm by aligning the pin holes in the two pipes. Inserting a shear pin and lock will keep this adjustment while the thread will allow for finer adjustments by turning the whole pipe assembly clockwise or counter clockwise.

Not all brace types are available to all Nexus locations and brace lengths can slightly vary to avoid issues on site. Always consider the braces to be 150mm longer than the minimum and 150mm shorter than the maximum length.

Nexus panels braces are for the sole purpose of bracing the tilt-up panel in the fully erected position against wind loads. Braces are not to be used as props in the support of concrete formwork or panels that have an earth load applied to them; braces are not designed to sustain high dead loads.

Bracing anchors and braces are not designed to sustain impact loads. Precautions must be taken to arrange the panel erection sequence so as to avoid the potential for impacting panels or braces. Bracing recommendations for other loads or forces that might be applied to brace anchors and braces are beyond the scope of Nexus.



T14 Panel Brace

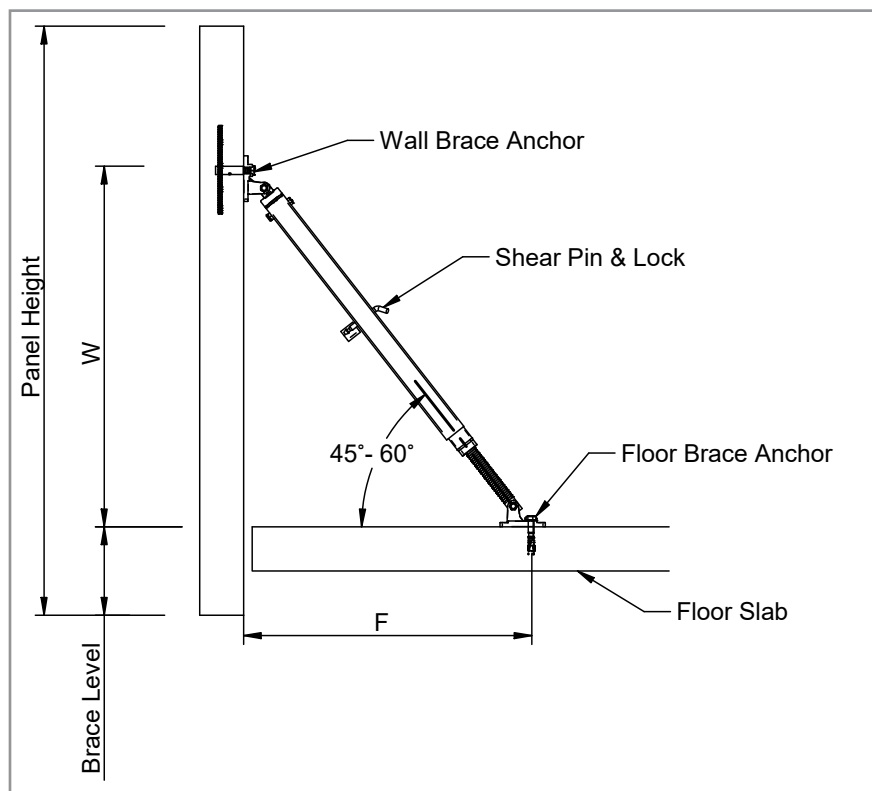
Bracing design must be carried out on each project to ensure that the braces to be used will be within their Working Load Limit (WLL). Many factors need to be considered when calculating which brace is required. The “Whatever Length Will Fit” approach is not acceptable. If drawings are not available showing bracing design, Nexus can provide such as service.

The factors that need to be considered for each panel include:

- Panel Area
- Wind Terrain Category of Project
- Design Wind Speed
- Height of Panel
- Centre of Surface Area of the Panel
- Angle of Brace
- Length of Brace
- Number of Braces per Panel
- Floor Height / Deadman Level

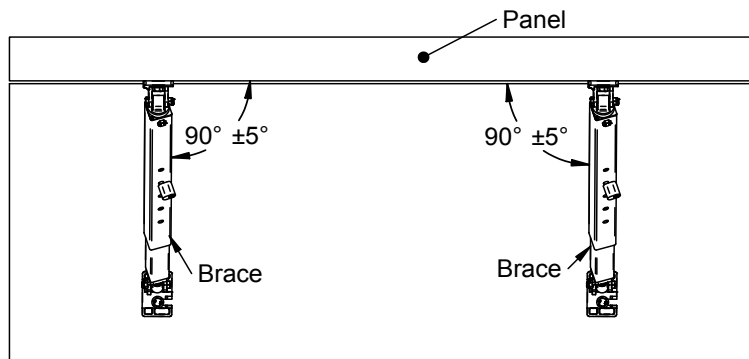
Brace Type	Closed length (mm)	Open length (mm)	Mass (kg)
Nexus S0	1450	2200	23
Nexus S1	2500	3700	35
Nexus S2	3500	5400	48
Nexus S3	4600	6700	54
Nexus S5	6800	9400	79
Nexus S6	6500	9700	105
Nexus S8	8700	11600	142
Nexus Bi-Pod S6 ¹	6600	11000	108
Nexus Bi-Pod S8 ¹	8600	14200	145

¹requires secondary braces added separately on site.



Bracing

Braces must always be installed at $90^\circ \pm 5^\circ$ to the panel face unless the bracing design specifically permits the braces to be installed at a different angle.



Brace Anchor Location

The location of both brace anchor points is critical in determining the loads that are applied to any bracing system. Shop drawings will usually show the location of the wall panel cast in brace point. However, the location of the floor brace point is just as important as the location of this point. This will normally be indicated on the drawing. On Nexus bracing designs it is located on the right hand side and known as the “F” distance. In our experience this measurement is overlooked by many panel erectors. This measurement is important because it determines three things:

1. The brace load
2. The brace length
3. The load that is applied to the floor brace anchor.

If this brace point is too close to the panel it will increase the brace load as well as the tension load applied to the floor brace point, possibly taking either one beyond its working load limit. Too far away from the panel increases the brace length. As the brace gets longer it also reduces its WLL. Once again it could potentially take the applied load beyond its working limit. As such, the distance out should always be strictly followed when bolting down the braces. Floor brace locations should always be within 150mm of the distance out shown by the appropriate engineering drawing. The braces must always be within 5 degrees of perpendicular of the panel, as shown in the plan view drawing above. It is also important that the brace points are at least 600mm above the centre of gravity of the panel.

Plumbing Panels

Tilt-up panels in particular should be as plumb as possible prior to the installation of the floor brace anchor. When installing, panels do not allow the braces to carry the weight of the panels if the top of the panel is more than 100mm out of plumb. When plumbing, make certain this panel is clear of all previously erected panels or other fixtures. If the panel is to be installed between other panels or fixtures with minimal clearance, measurements should be taken to ensure the panel will fit prior to lifting.

Releasing Crane Load

When releasing the crane load, do so slowly and with great care, keeping a careful eye on both the panel and bracing for any unusual activity. If at any stage during the process the bracing seems inadequate, do not release the crane load. If using the bi-pod system, the panel must be perfectly plumb with the whole bi-pod system installed prior to releasing the crane load.

Securing Base of Panel

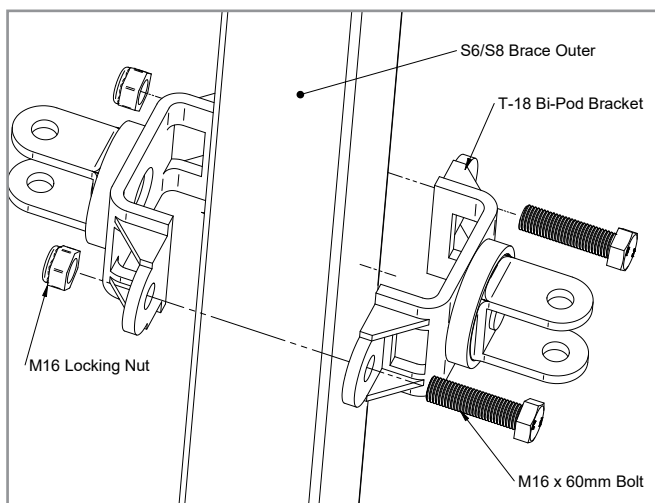
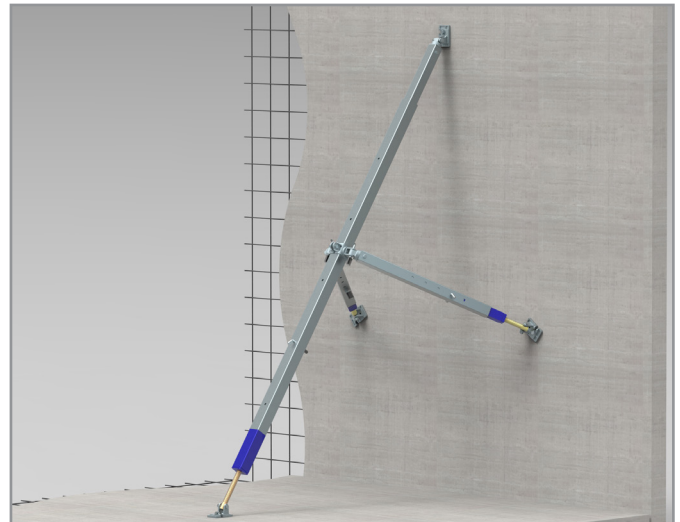
Panel must be secured at the bottom to prevent the panel from “walking” off the panel footing in gusty conditions and to prevent extremely strong winds or construction loads from kicking out the bottom of the panel. This is typically done by installing the in-service connections at the base of the panel prior to releasing the crane. If this is not possible, contact the bracing engineer for alternative options.

Bi-Pod System

Nexus offers an innovative option to increase the capacity of existing S6 and S8 braces with the addition of secondary bracing. A pair of supplementary knee braces can be safely and easily secured to the main brace outer section at the brace mid-point to halve the effective length and thus dramatically increase the load capacity of the brace.

Features of the Nexus Bi-Pod System

- Allows a normal main brace to increase capacity up to x4
- Can be fixed at the S6 or S8 mid-point for any extension
- Connection of secondary braces can be complete prior to lift
- No high-level access required to mid-point of main brace
- Swivel joint allows secondary braces to be oriented to suit

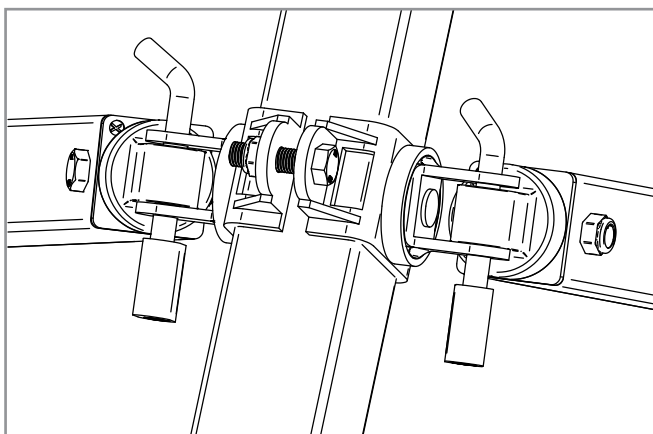


How it Works

The Nexus Bi-Pod Bracket swivel brace connector is designed to be clamped as a pair to the S6 or S8 brace outer section at the mid-point for any given extension and to allow the complete structural connection of a pair of secondary braces to the main brace prior to panel erection. Once the panel is placed and the lower ends of all braces are anchored the higher capacity values for the bracing are applicable, as per the bracing capacity tables.

The unique swivel feature of the bracket allows the connected secondary braces to be reoriented once the panel is erected from horizontal to vertical and allows flexibility for the installer to select the lower anchorage point to the structure below.

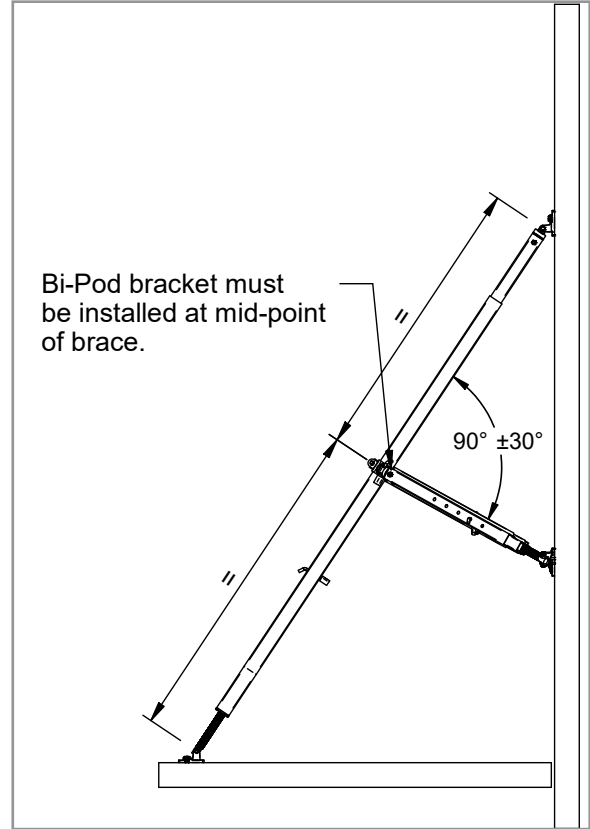
There is no requirement to reach or work at the main brace mid-point once the panel is lifted.



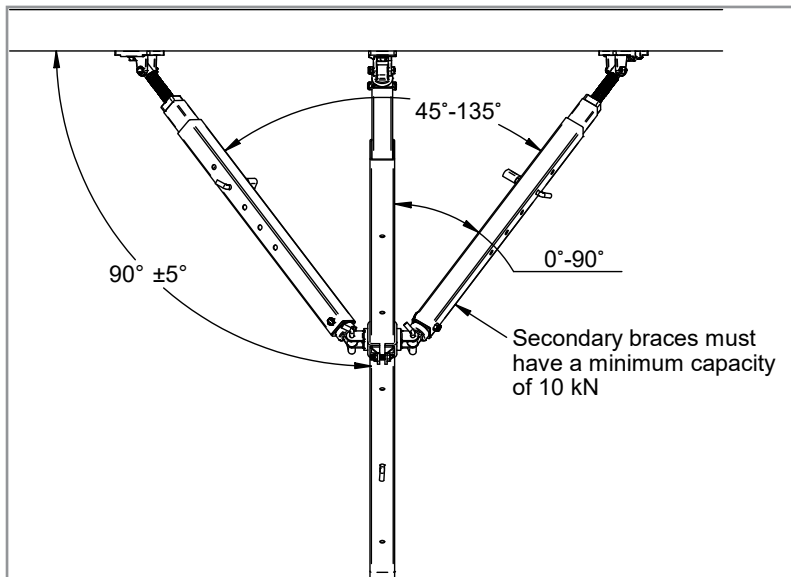
The shear pin and lock is used to connect the secondary braces to the bi-pod bracket.

Using the Bi-Pod System

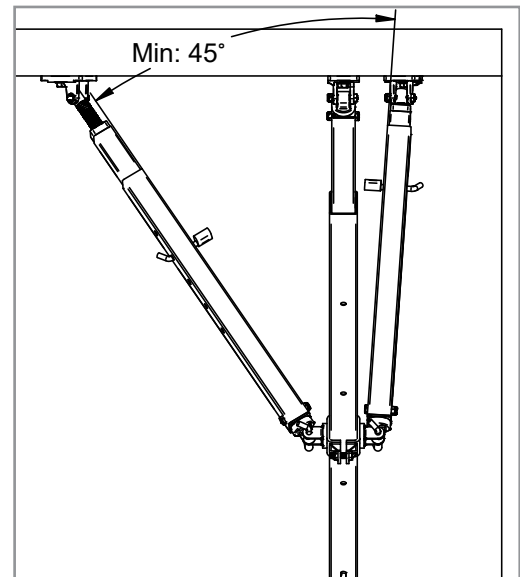
- At the mid-point of the main brace (half the specified brace length) secure 2 Bi-Pod Brackets by clamping around the main brace outer section and tightening the M16 bolts to 50-60Nm torque.
- Secure wall brace floor of the main brace to the panel as per the bracing design requirements.
- Attach the swivel end of each secondary brace to each Bi-Pod bracket with a conventional Nexus brace lock and pin, and temporarily strap the lower end to the main brace.
- Lift panel into position, anchor the lower foot of the main brace and plumb panel by rotation of main braces. Adjust so that the axis of the Bi-Pod Brackets is parallel to the wall.
- Ensure panel is plumb prior to securing the secondary bipod braces back to the panel. The main brace can not be adjusted to plumb the panel once the secondary bipod braces have been secured to the panel
- With crane still attached, remove each brace retaining strap and reorient each secondary brace and anchor as specified in the bracing design. The angle at which secondary braces are installed must be the criteria as detailed in the diagrams on this page. The secondary braces must have a minimum WLL of 10kN at that length.
- With all braces secured the crane may then be disconnected.



When looking at the Bi-Pod system from the side the secondary braces must be installed perpendicular to the main brace ±30°.



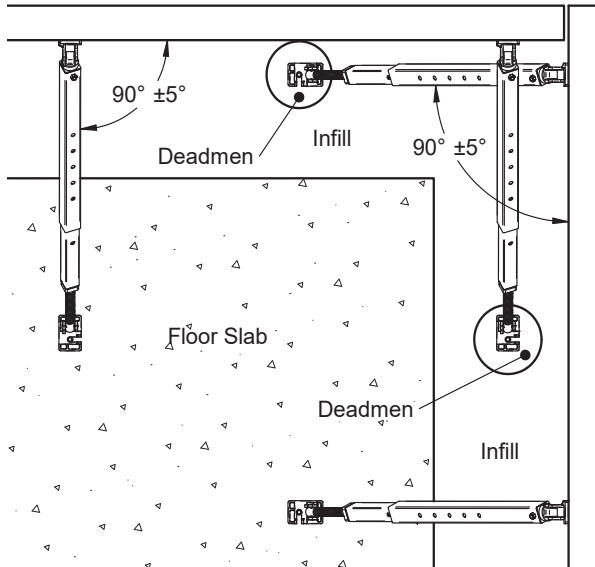
When looking at the Bi-Pod system from above the secondary braces must be installed 45°- 135° to each other and 0°- 90° to the main brace. Unless specifically designed otherwise the main brace must be 90°±5° to the face of the panel.



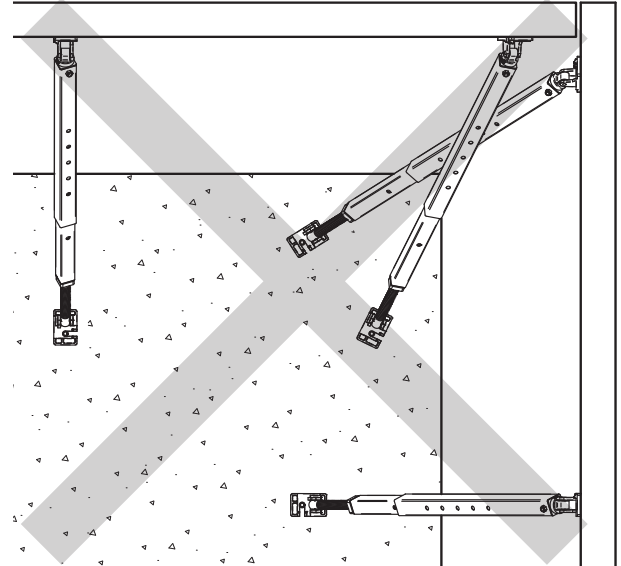
Should braces with the Bi-Pod system need to be installed close to a panel edge, install one of the secondary braces close to the main brace and have the other secondary brace at least at a 45° angle from it. This still complies with the requirements in the diagram to the left.

Corner Bracing

Correct



Incorrect



On jobs that will have a infill section between the slab and the panel, the correct method for bracing the corner panels is to pour deadmen inside the infill section as per the diagram above left. Ensure the deadmen are located so that the braces are the correct distance out and are $90^\circ \pm 5^\circ$ to panel face. DO NOT skew braces so they can be bolted to the floor as per the diagram above right. This can increase the load to the braces and reduce panel stability. Braces in the corner may need to have bracing locations offset to avoid the braces from hitting each other.

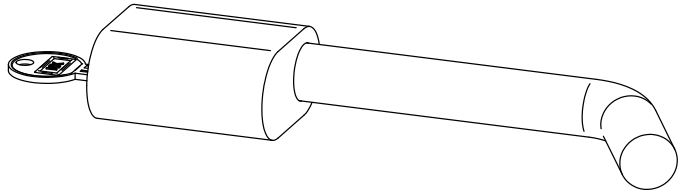
Point Summary of Bracing Installation

- Ensure a specific and complete bracing design is supplied to the project.
- Ensure braces to be used are rated and marked by the supplier in compliance with AS3850.
- Install braces perpendicular to panel face.
- Always check distance out or "F" measurement
- When using the bi-pod system, the panel must be plumb with the bi-pod system fully installed prior to the release of crane load.
- The bi-pod bracket must be located at mid-length of pipe brace.
- Every panel must have at least two braces for stability
- Brace connections to the slab or panel must be at least 300mm from any concrete edge, rebate or void.
- Only use the brace type and connections as specified by the bracing engineer ensuring that all distances are followed.
- Never use Nexus braces to support block, brick or other masonry structures.
- DO NOT allow earth loads to be applied to panels that are supported by Nexus braces
- Wall brace anchor must be at least 600mm above the centre of gravity of the panel.
- Deadmens must be constructed in accordance with bracing engineer specifications.
- Expansion anchors must be checked regularly as per manufacturer's instructions.
- For special conditions contact Nexus for recommendations.

Shear Pin

T13 Lock & Pin

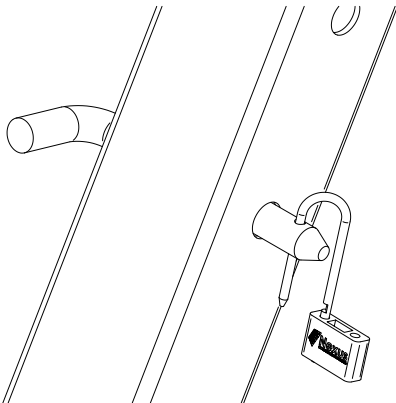
Nexus Construction Systems offers the T13 lock and pin to keep the inner and outer sections of the telescopic brace at the correct length. Once the inner section is at the best length to suit the situation, place the pin through the aligned holes of the inner and outer sections. Place the lock on the receiving end of the pin and push it on. You will feel a small click once it is engaged. Pull on the lock to ensure the locking mechanism is correctly engaged. The shear pin has a working load limit of 50kN in double shear.



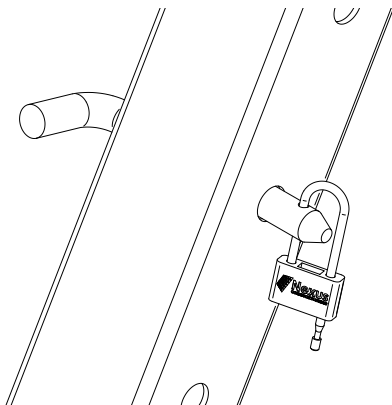
T134 Disposable Lock

As an alternative to the brace lock and pin Nexus Construction Systems offers the T134 Disposable Lock. They are used with T135 Brace Pin for Disposal lock, this pin has the benefit that there is no groove for the lock making insertion and retraction from the brace easier. The T135 Brace Pin has a working load limit of 50kN in double shear.

These are single use locks which can only be removed using a pair of steel snips or other cutting device, complying with AS3850 requirements that shear pin can only be removed with the use of a tool. The lock can not be reused after it is cut.



Prior to lifting panel set inner and outers of the brace to the correct length. Insert T135 Brace Pin through the closest aligned holes of the inner and outer. Insert the open end of the T-134 metal U-bar through the hole in the pin.



Spin the plastic part of the lock around so that the other hole in the plastic aligns with the open end of the steel U-bar. Push the plastic part on to the U-bar until you hear a small click. To confirm the lock is correctly engaged; by hand try and pull the plastic lock and metal U-bar apart.

Once engaged the lock can only be removed by using a tool such as metal cutting snips by cutting through the metal U-bar. The lock must be disposed of after cutting and cannot be reused.

Brace Capacity Charts

Brace Length (mm)	WLL (kN) ¹	
	S0	S1
1450	30.0	
1500	30.0	
1600	30.0	
1700	30.0	
1800	30.0	
1900	30.0	
2000	30.0	
2100	30.0	
2200	30.0	
2300		
2400		
2500		40.0
2600		40.0
2700		40.0
2800		40.0
2900		40.0
3000		40.0
3100		40.0
3200		40.0
3300		40.0
3400		40.0
3500		38.3
3600		36.7
3700		35.0

Brace Length (mm)	WLL (kN) ¹	
	S2	S3
3600	40.0	
3700	40.0	
3800	39.7	
3900	38.0	
4000	37.0	
4100	36.0	
4200	35.0	
4300	34.0	
4400	33.0	
4500	31.3	
4600	29.6	40.0
4700	27.9	38.3
4800	26.2	36.5
4900	24.5	34.8
5000	23.3	33.0
5100	22.0	31.3
5200	20.8	29.5
5300	19.5	27.8
5400	17.0	26.0
5500		24.3
5600		22.5
5700		20.8
5800		19.0
5900		17.9
6000		16.7
6100		15.6
6200		14.9
6300		14.3
6400		13.6
6500		13.0
6600		12.3
6700		11.7

Brace Length (mm)	WLL (kN) ¹	
	S5	S6
6500		41.7
6600		40.5
6700		39.3
6800	25.4	38.1
6900	24.1	37.0
7000	23.0	35.8
7100	21.8	34.6
7200	20.7	33.5
7300	19.5	32.5
7400	18.9	31.4
7500	18.3	30.3
7600	17.7	29.3
7700	17.1	28.2
7800	16.4	27.1
7900	15.8	26.1
8000	15.2	25.0
8100	14.6	24.0
8200	14.0	22.9
8300	13.4	21.8
8400	12.8	20.8
8500	12.2	19.7
8600	11.6	18.6
8700	11.0	17.6
8800	10.4	16.5
8900	9.8	15.8
9000	9.4	15.1
9100	9.1	14.4
9200	8.7	13.7
9300	8.3	13.1
9400	7.9	12.4
9500		11.7
9600		11.0
9700		10.3

1. Factor of Safety 2:1

2. Bi-Pod system fully installed

Brace Length (mm)	WLL (kN) ¹
	S8
8700	23.2
8800	22.6
8900	21.9
9000	21.3
9100	20.7
9200	20.0
9300	19.4
9400	18.8
9500	18.1
9600	17.5
9700	17.1
9800	16.6
9900	16.2
10000	15.8
10100	15.3
10200	14.9
10300	14.3
10400	13.6
10500	13.0
10600	12.3
10700	11.7
10800	11.0
10900	10.4
11000	9.9
11100	9.5
11200	9.0
11300	8.5
11400	8.1
11500	7.6
11600	7.1

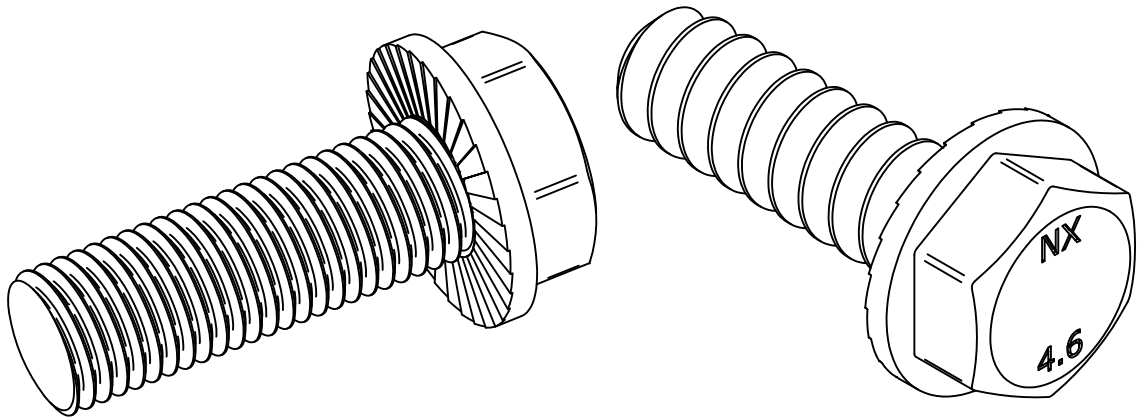
Brace Length (mm)	WLL (kN) ¹	
	S6 Bi-Pod ²	S8 Bi-Pod ²
6600	40.0	
6800	40.0	
7000	40.0	
7200	40.0	
7400	40.0	
7600	40.0	
7800	40.0	
8000	40.0	
8200	40.0	
8400	40.0	
8600	40.0	40.0
8800	40.0	40.0
9000	40.0	40.0
9200	40.0	40.0
9400	40.0	40.0
9600	40.0	40.0
9800	40.0	40.0
10000	39.1	40.0
10200	37.5	40.0
10400	36.2	40.0
10600	35.0	38.9
10800	33.9	37.5
11000	32.8	36.1
11200		34.9
11400		33.7
11600		32.5
11800		31.3
12000		30.2
12200		29.1
12400		28.1
12600		27.1
12800		26.2
13000		25.3
13200		24.5
13400		23.8
13600		23.1
13800		22.5
14000		21.9
14200		21.3

1. Factor of Safety 2:1

2. Bi-Pod system fully installed

Bracing Bolts

Nexus can provide a standard Metric M20 bolt or alternatively a coil bolt to suit the F432096 and F43C ferrules respectively. Both bolts are class 4.6, with an integrated serrated flanged head and for convenience both bolts use a 30mm socket for tightening, which is identical to the Nexus Bolt. Bracing bolts must only be used once, yield from over torquing or wear may lead to failure.

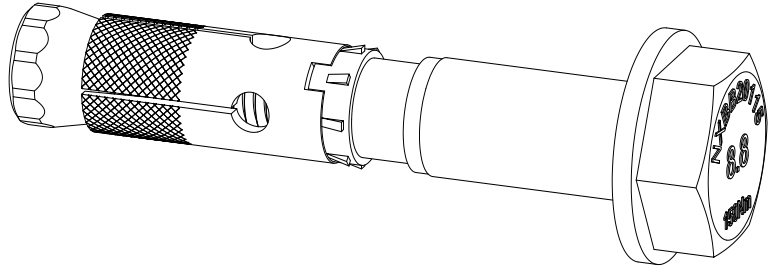


Bolt Technical Information

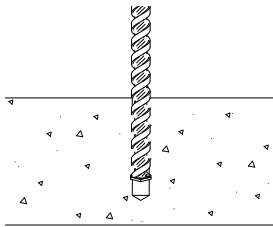
	Coil Bolt	M20 x 60 Bolt
Product Code	T5196046	T5206046
Insert Type	F-43 Coil Ferrule	F-43 M20x96 Ferrule
Bolt Diameter	19 mm	20mm
Colour	Silver	Silver
Flange Diameter	39 mm	39 mm
Overall Bolt Length	90 mm	70 mm
Threaded Length	60 mm	60 mm
Bolt Class	4.6	4.6
Steel Strength	400 MPa	400 MPa
Hex Head Socket Type	30 mm	30 mm
Tightening Torque	130-150 Nm	130-150 Nm

Nexus Bracing Bolt

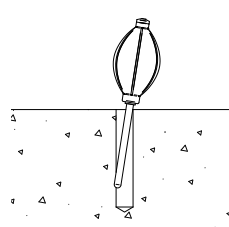
Nexus Construction Systems Bracing Bolt has been specifically designed for use as post installed anchor on braces supporting precast and tilt-up concrete panels. The Nexus Bracing bolt has been tested in accordance with the requirements of the AS3850.1 - 2015.



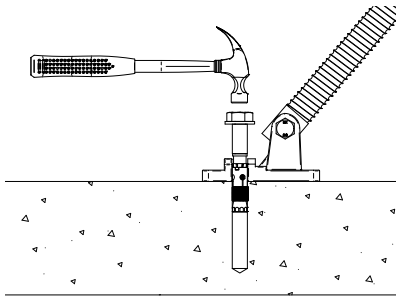
Installation



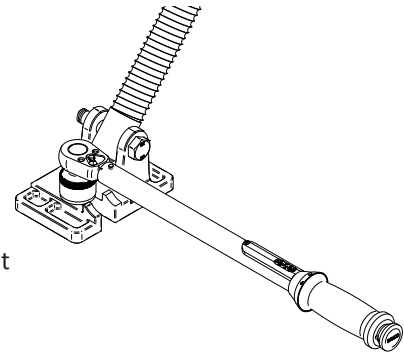
1. Using a 20mm Y-Cutter drill bit drill a hole to the correct depth. The depth must be not be greater than 80% of the base material thickness.



2. Using either a brush or compressed air clean the hole of dust and other material.



3. Insert the anchor through the slot in the brace foot, tap the head of the anchor down so the bolt head and washer seats firmly against the brace foot.



4. Tighten the Nexus Bracing Bolt to 150Nm using a torque wrench

General Information		Drill (mm)	Hole Depth (mm)	Fixture Thickness (mm)	Head Size (mm)	Installation Torque (Nm)	Qty
Part Number	Description						
NXBB20115	20mm x 115mm Nexus Bracing Bolt	20	95	20	30	150	25

Performance in 20 MPa Concrete

Characteristic Ultimate Strength (kN)			Working Load Limit (kN) ¹	
Part Number	Tension $R_{u,N}$	Shear $R_{u,V}$	Tension	Shear
NXBB20115	36.5	76.7	16.2	34.1

Anchor Spacing: 285mm; Edge Distance 300mm

Fixture Thickness: 20mm; Effective Depth: 95mm

Concrete Strength: 20MPa;

1. Factor of Safety 2.25:1

Slab thickness: 125mm

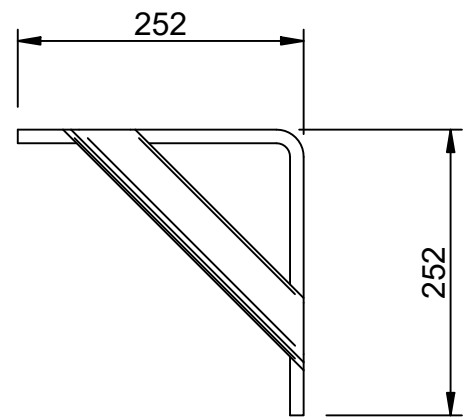
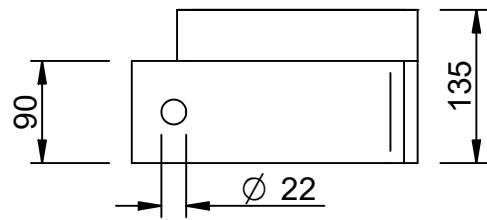
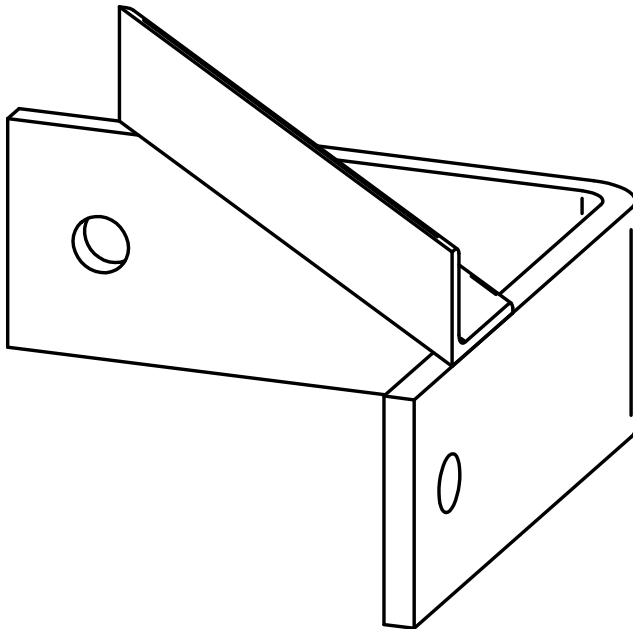
Combined Actions Interaction Equation

$$[N_s / (R_{u,N} / F)]^{1.5} + [V_s / (R_{u,V} / F)]^{1.5} < 1$$

Where: $R_{u,N}$ = Characteristic ultimate tensile strength of Nexus Bracing Bolt
 $R_{u,V}$ = Characteristic ultimate shear strength of Nexus Bracing Bolt
 N_s = Tension component of the unfactored applied load
 V_s = Shear component of the unfactored applied load
 F = Factor of Safety = 2.25

Refer to the Nexus Bolt Technical Data Sheet for further information

T16 Temporary Angle Bracket Connection



Following the advice of the Erection Design Engineer, the T-16 Temporary Angle Bracket Connection may be used to secure two perpendicular panels together.

Consultation with the Erection Design Engineer is imperative to ensure the perpendicular panels are adequately sized for sufficient support.

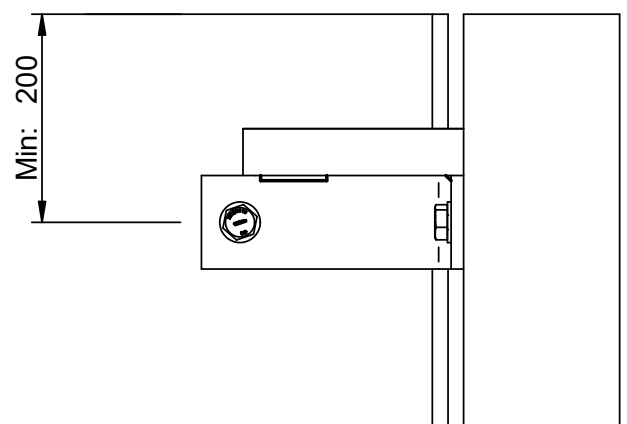
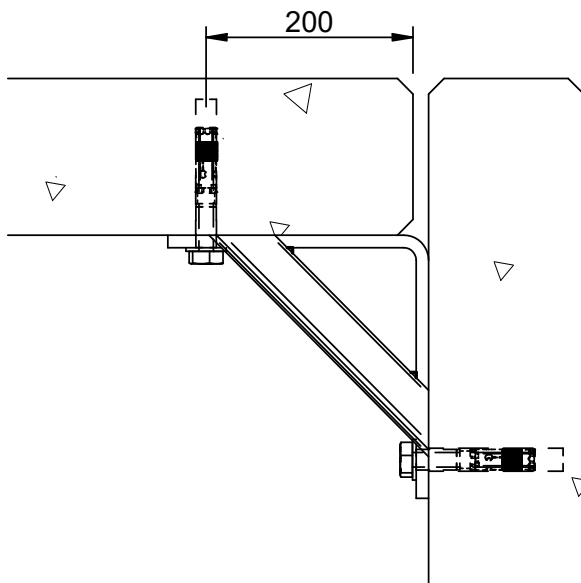
Unless otherwise approved by the Erection Design Engineer, the T-16 Temporary Angle Bracket Connection should be installed at the same height on the panels as the existing temporary panel braces.

Secure the T-16 Temporary Angle Bracket Connection to both panels using Nexus Brace Anchor Bolts (NXBB20115). Refer to the Nexus Brace Anchor Bolt (NXBB20115) installation instructions for the correct bolt installation procedure.

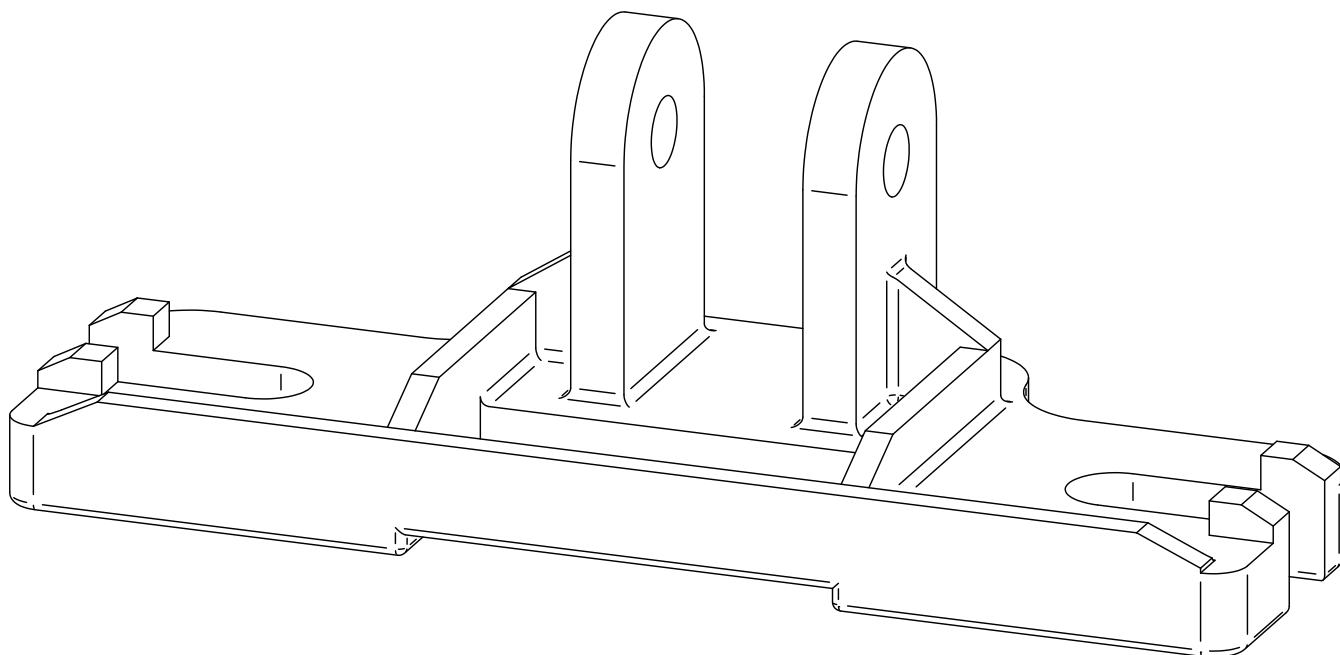
The T-16 Temporary Angle Bracket Connection anchor bolts require a 200mm minimum edge distance to any edge.

Each Nexus NXBB20115 anchor bolt has a maximum working load limit of 16.2kN in tension and 34.1kN in shear.

Use the T-16 Temporary Angle Bracket Connection against wind loads only, as specified by the Erection Design Engineer. Do not use as a permanent fixing or against dead or live loads.



T19 Double Brace Foot



The T19 Double Brace foot is designed to replace the standard brace foot on T14 Panel Brace. It's used when the limiting factor in brace design isn't the brace capacity but rather the capacity of the connection to either the panel itself or to the floor or brace footing.

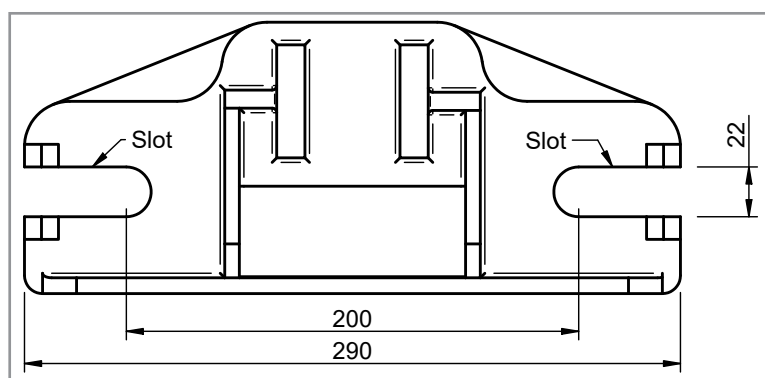
When in use 2 bolts of either 3/4" or 20mm (that comply to AS3850) must be used with double brace foot to connect to the panel, footing or slab with 1 in each slot.

To use this brace foot the standard foot must be removed from the brace and double brace foot bolted to either the swivel or threaded end using an M16 x 100mm grade 8.8 bolt. A locking nut must be fully engaged with the M16 bolt ensuring that it cannot be undone without a tool.

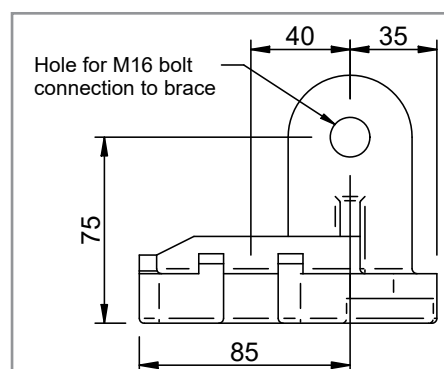
When installing braces that have a Double Brace Foot ensure that the requirements for both of the bolts that are used in each foot are met. These requirements can include, but not limited to: edge distances, spacing, concrete strength and installation torque.

When using the Double Brace foot with the Nexus Bracing Bolt (NXBB20115) use the following reduction values for each bolt.

Nexus Bolt Reduction Factors	Spacing	Tensile	Shear
NXBB20115	200mm	0.85	0.65



Top View of T19 Double Brace Foot

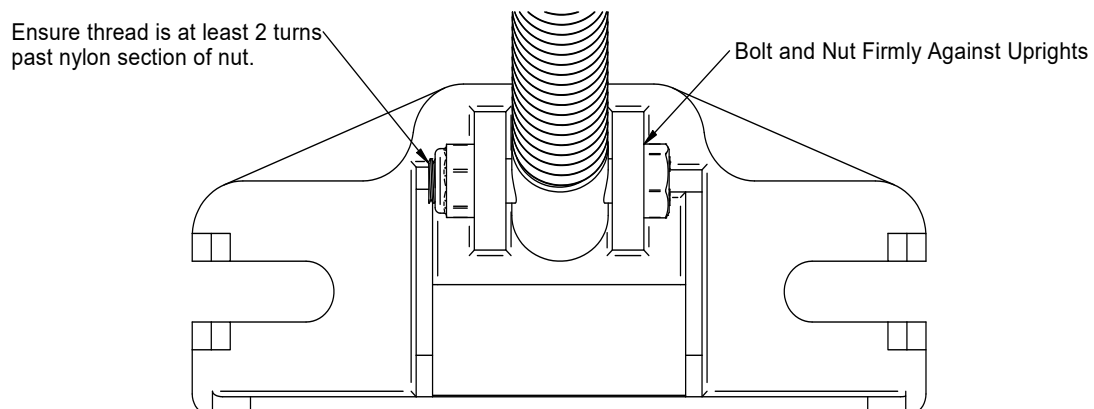
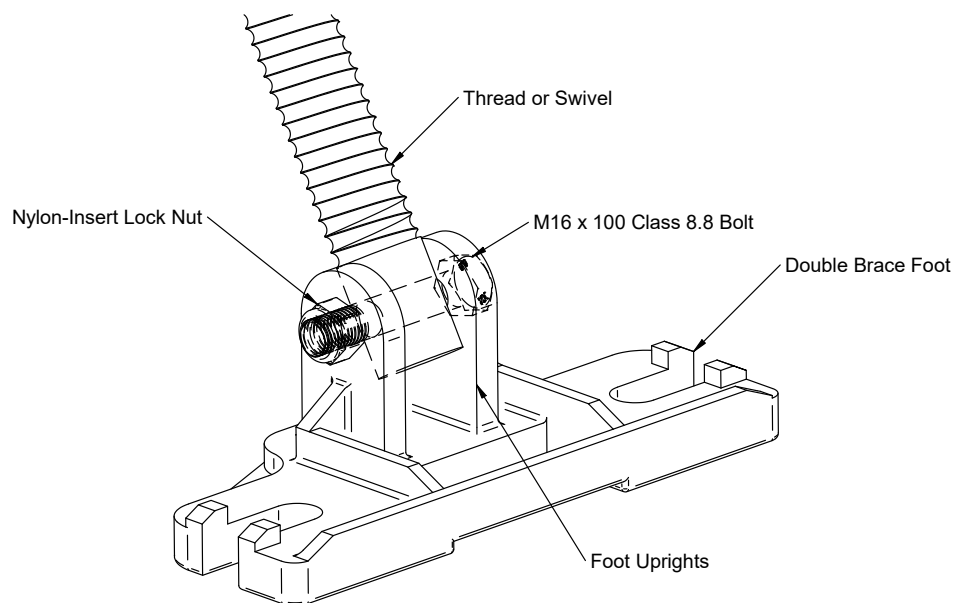


Side View of T19 Double Brace Foot

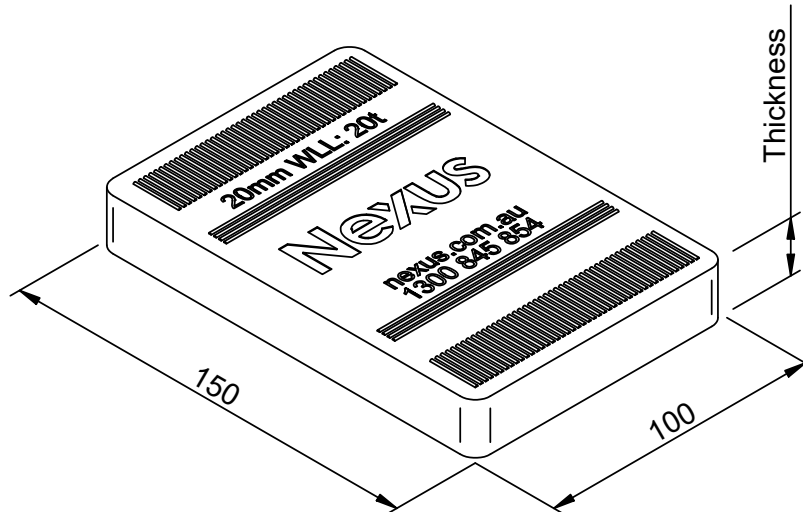
Attaching Double Brace foot to Brace

The double brace foot is typically installed on the threaded end of the brace, however in some circumstances it may be installed on the swivel end of the brace or both end of the braces. These procedures apply to both ends of the braces and must be completed prior to the installation of the panel.

1. Using 2 wrenches undo the current M16 bolt and nut on the foot that needs to be changed.
2. Removed the bolt and foot from the brace thread/swivel. Old nut and bolt to be disposed of and not reused.
3. Place the uprights of the double brace foot over the brace thread/swivel and align the holes of the brace foot uprights with the hole in the thread/swivel.
4. Use a new M16 x 100 Class 8.8 bolt and put through the uprights and the hole in the thread/swivel.
5. Thread a new Nylon-Insert Lock Nut onto the bolt and turn the nut clockwise with your hand until it no longer turns.
6. Using 2 wrenches continue to screw the nut along the thread until the nut and the head of the bolt sit firmly against the surface of the brace foot upright.
7. Ensure the that threaded section of the bolt is at least 2 turns past the nylon section of the nut.



M81 Levelling Shim



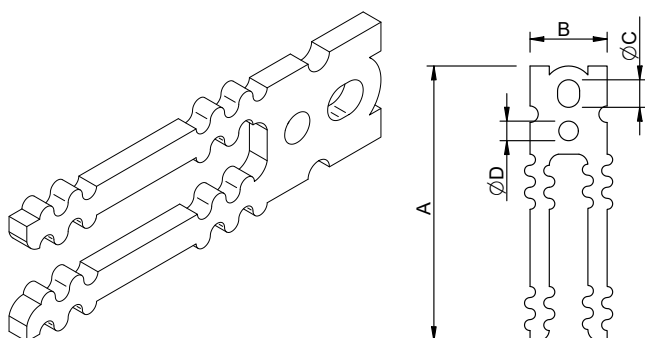
- Tested and rated to comply with AS3850 and the National Code of Practice for Precast, Tilt-up and Concrete Elements in Building Construction (NCoP).
- Made in Australia
- Formed with non-skid ridges.
- Marked with Nexus Identification, as per structural requirements
- Colour Coded
- Nexus Panel Levelling Full Shims are rated for a WLL of 20t
- Negligible creep up to 48hr.
- Chemically and environmentally inert.

M81 Level Shim Sizes			
Thickness (mm)	Product Code	Colour	Pack Quantity
1	M811NX	Brown	200
2	M812NX	Blue	200
3	M813NX	Green	100
5	M815NX	Yellow	100
10	M8110NX	Black	40
15	M8115NX	Grey	40
20	M8120NX	White	30

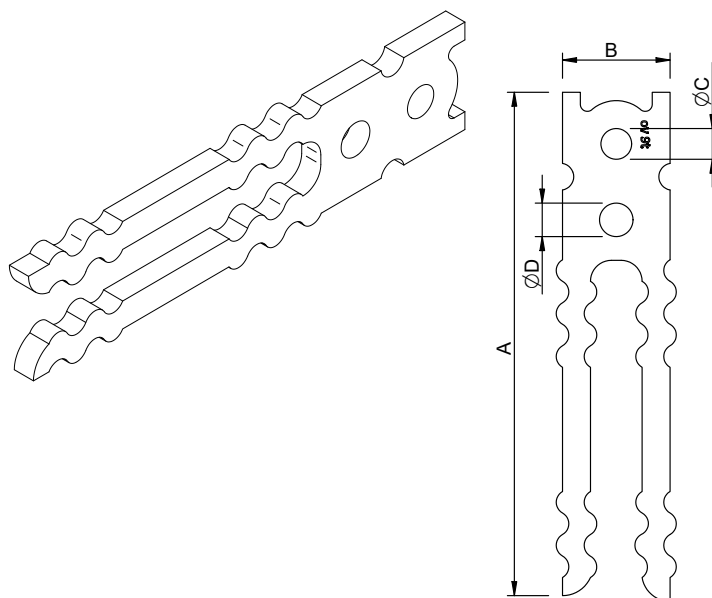
P82 Olivetti Anchor

The P82 Olivetti Anchor is engineered from G350 steel plate and designed to be used with the P86 Olivetti ring clutch for edge lifting of precast and tilt-up panels. The ears on the head of the Olivetti Anchor prevent the ring clutch head from applying load to the concrete, minimising concrete spalling. All Olivetti Anchors are hot-dip galvanised and designed to accept the required shear bar and a tension bar where specified for additional capacity.

P82 3t Olivetti Anchor

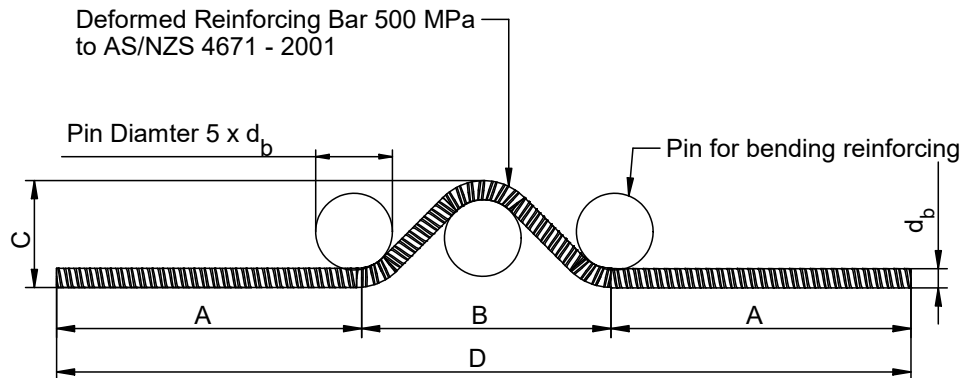


P82 9t Olivetti Anchor



P82 Olivetti Anchor							
Size (t)	Product Code	Dimensions (mm)					
		A (Overall Length)	B (Width)	C (Clutch Hole Diameter)	D (Tension Bar Hole Diameter)	Thickness	Mass (kg)
3t	P823	200	58	16	14	10	0.5
9t	P829	365	78	22	24	16	2.04

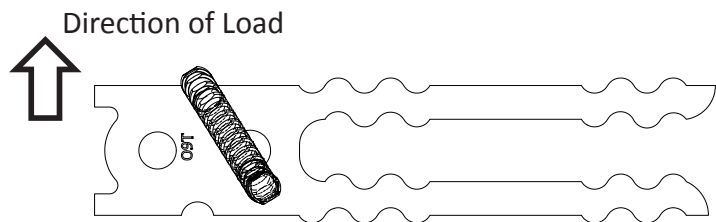
P59 Shear Bar



P59 Shear Bar						
Anchor Size (t)	Rebar Size (d_b)	Minimum Dimension (mm)				Mass (kg)
		A	B	C	D	
3	N12	190	160	68	540	0.43
7,9	N16	250	210	90	710	1.23

Direction of Load

P59 Shear Bar must be installed with all P82 anchors that are to be used in shear. These are to be installed on the same side of the anchor as the direction of lift (see diagram to side). If the anchor is to have a shear load applied in both directions then the P59 shear bar must be installed on both sides of the anchor. Anchors must be installed at the centre of the panel.

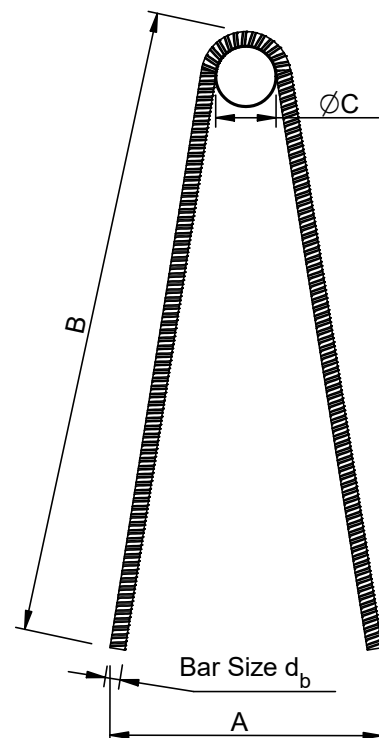


P60 Tension Bar

The P60 Olivetti Anchor is manufactured with meandering legs that resist pullout during normal erection situations. The Working Load Limit (WLL) chart following shows two sets of tension values. A higher tension load is achievable by installing a tension bar, which must be installed through the lower hole.

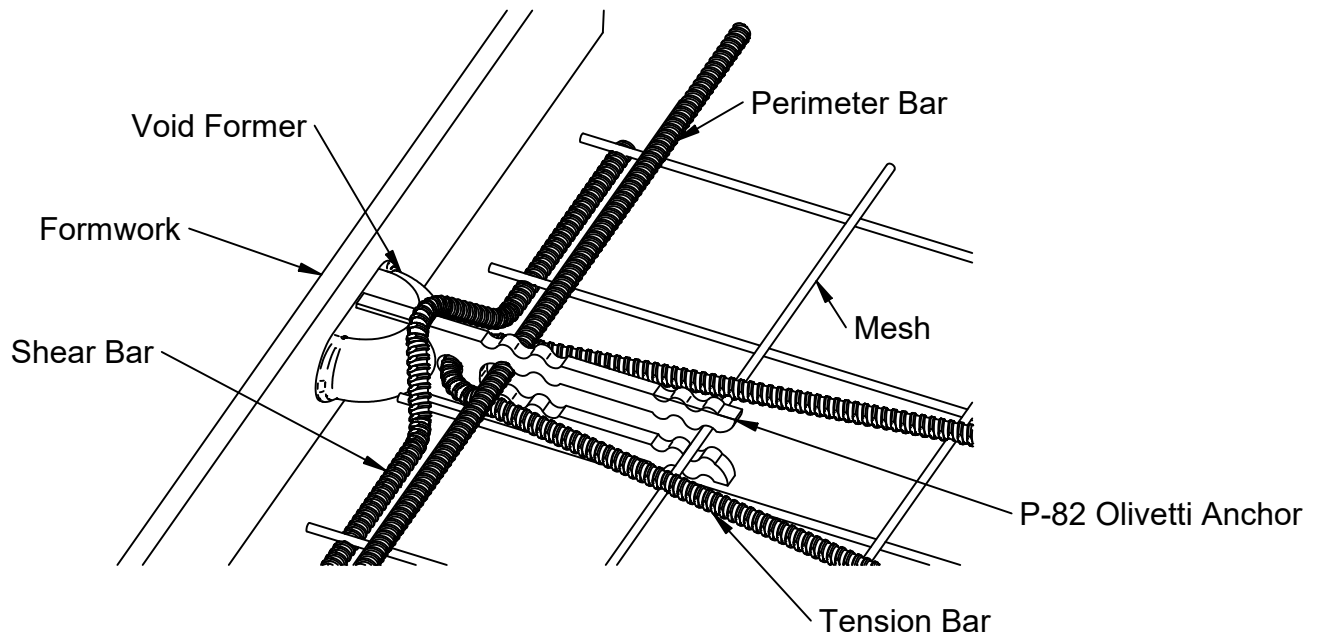
The tension bar must be made from deformed N grade reinforcing bar ($f_y = 500\text{MPa}$) that complies to AS/NZS 4671—2001. Precautions must be taken bending the bar — the bar must be bent around a pin with a diameter no smaller than 5 x the bar diameter.

P60 Tension Bar					
Anchor Size (t)	Rebar Size (d_b)	Dimension (mm)			Mass
		A	B	C	
3	N12	190	550	60	0.9kg
5	N16	250	700	80	2.2kg
7,9	N16	250	700	80	2.2kg



P82 Olivetti Anchor Installation

Olivetti Anchor with tension bar installed



P82 Olivetti Anchor Capacity Chart

Concrete Strength (MPa)				15	20	25	30
Anchor Rating	Panel Thickness	Type of Lift	Additional Reinforcing Required	Working Load Limit (t)			
3t	100mm	Tension ¹	N12 x 1100 Tension Bar	2.6	2.8	3	3
3t	125mm	Shear	N12 Shear Bar	1.1	1.2	1.3	1.7
		Tension ¹	N12 x 1100 Tension Bar	3	3	3	3
9t	150mm	Shear	N16 Shear Bar	1.9	2.1	2.3	2.5
		Tension ¹	N16 x 1400 Tension Bar	8.2	8.4	9	9
9t	175mm	Shear	N16 Shear Bar	2.3	2.5	2.7	2.9
		Tension ¹	N16 x 1400 Tension Bar	8.6	8.8	9	9
9t	200mm	Shear	N16 Shear Bar	2.5	2.7	2.9	3
		Tension ¹	N16 x 1400 Tension Bar	9	9	9	9

Factor of Safety: 2.25 to 1

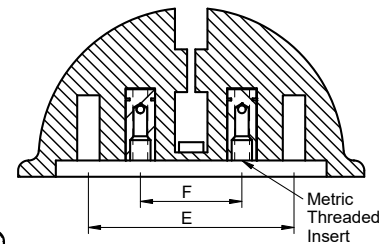
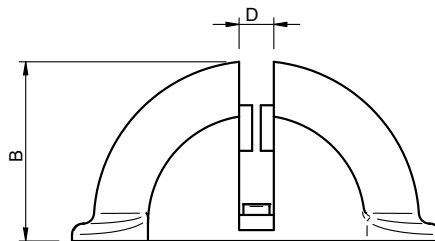
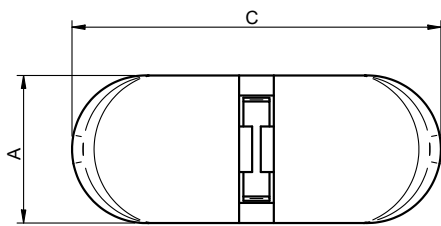
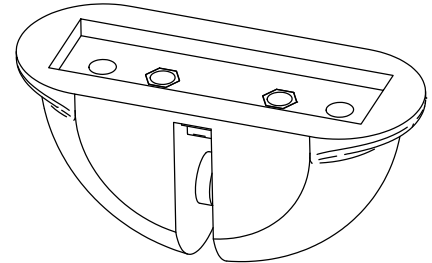
Minimum Panel Reinforcement: SL82, N16 Perimeter Bar (Central)

¹Tension Bar required Min: Refer to specification table)

Minimum Edge Distance: 950mm, Minimum Spacing 1900mm

P83 Olivetti Void Former

The P83 Olivetti void holds the Olivetti anchor in place during the concrete pour and creates a void in the concrete so that the clutch can engage with the anchor. It can be fixed to form work using either a P84 holding rod or a P85 nailing plate.



P83 Olivetti Void Former Selection Chart

Load Range (t)	Product Code	Dimensions (mm)						Mass (g)
		A	B	C	D	E	F	
3	P833	43	45	105	10	58	30	130
7-9	P839	68	76	180	16	100	50	610

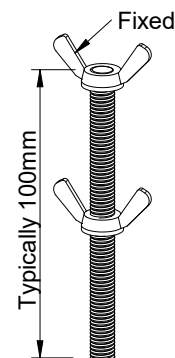
P84 Holding Stud & P85 Nailing Plate

The P85 nailing plate can be used to fix the P83 Void Former to timber forms. It is also used in conjunction with the P84 Holding Stud to ensure the void cannot open during concrete placement.

P84 Olivetti Void Former Holding Stud

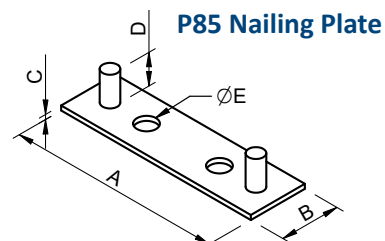
Load Range (t)	Product Code	Rod Length (mm)	Thread Size
7-10	P849	100	M8

P84 Holding Stud



P85 Nailing Plate

Load Range (t)	Product Code	Dimensions (mm)						Mass (g)
		A	B	C	D	ØE		
3	P853	70	13	3	20	4		50
7-9	P859	130	37	3	20	13		131

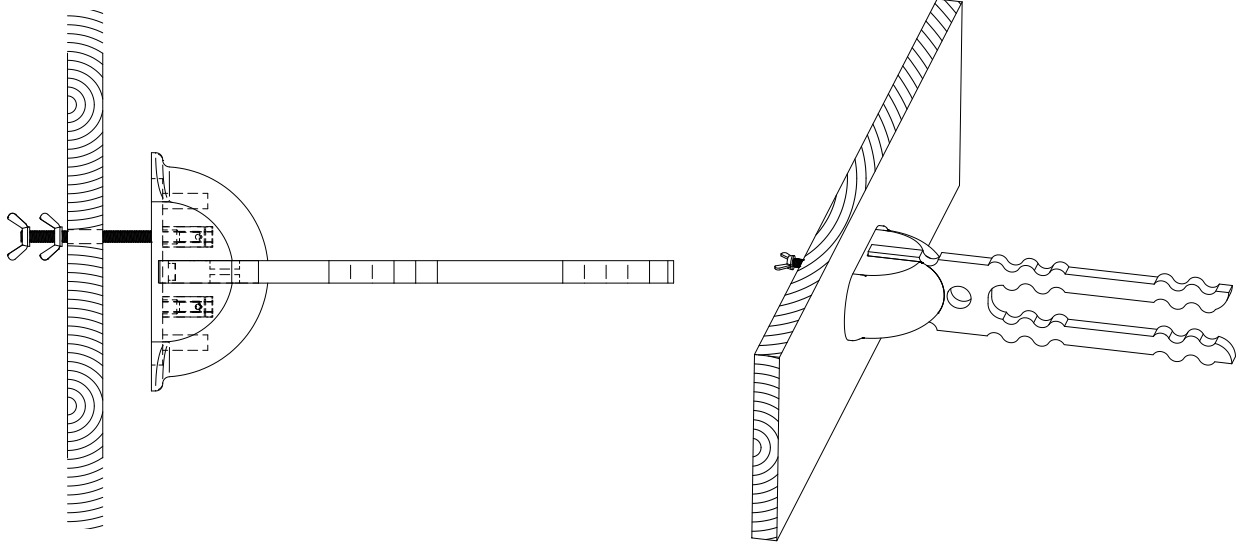


How to use the Olivetti Edge Lift Anchor and Void Former

Attaching the void using the holding stud

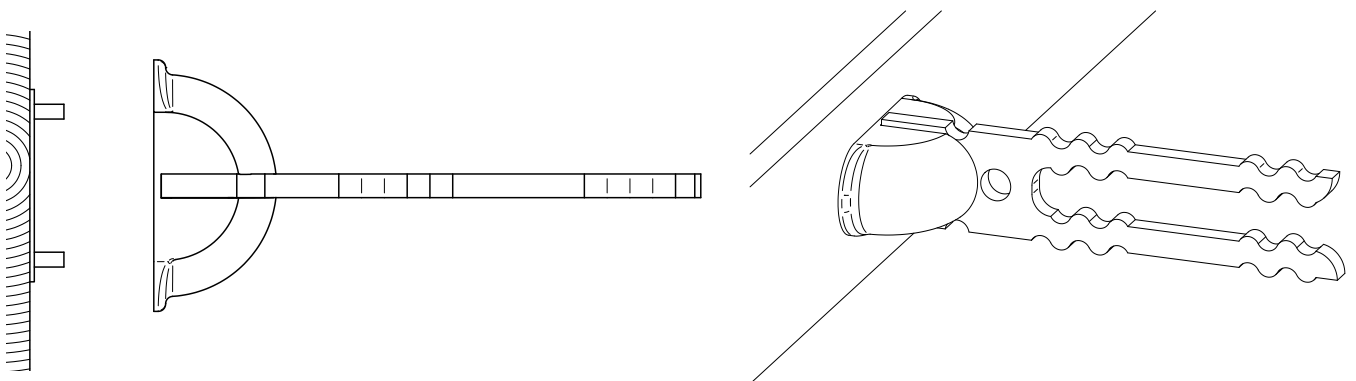
Drill hole through form 1mm larger than the holding stud diameter, ensure that the hole is drilled at the correct height. Place the void near the form and place the holding stud through the hole. Using the fixed wing nut on the stud, screw the holding stud into the void as far as possible using finger tight pressure.

Place the void against the form and screw the non-fixed wing nut to ensure the void is hard up against the form using finger tight pressure.



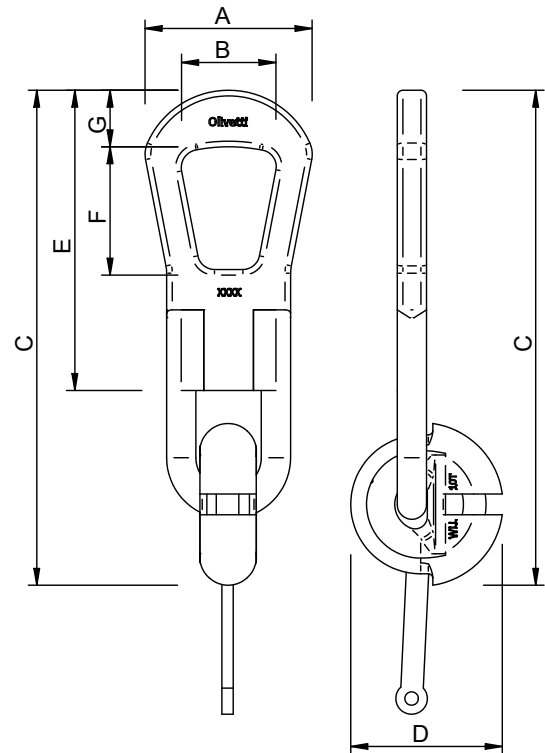
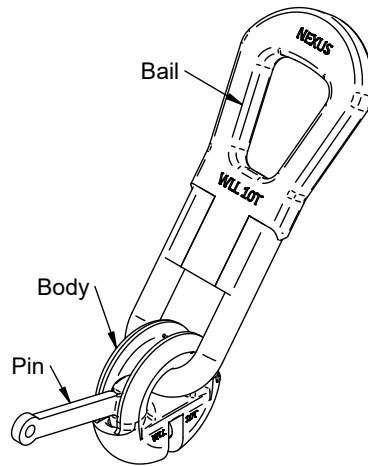
Attachment Using a Nailing Plate

Screw or nail the nailing plate to the form, simply slide the void form over the nailing plate's studs.



P86 Olivetti Ring Clutch

The P86 Olivetti Ring Clutch has three main components: the doughnut shaped body, the bail section for crane attachment and the pin. The pin rotates back and forth around the body of the clutch, allowing easy engagement with the lifting anchor.

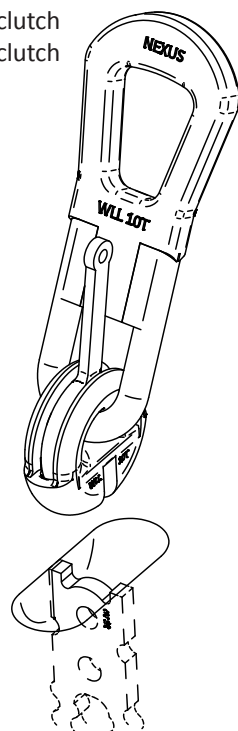


P86 Olivetti Lifting Clutch									
Load Range (t)	Product Code	Dimensions (mm)							Mass (kg)
		A	B	C	D	E	F	G	
3	P863	95	60	267	76	178	76	25	1.7
5	P865	113	65	325	103	214	124	40	4.1
7-10	P8610	144	72	415	134	275	103	56	9.2

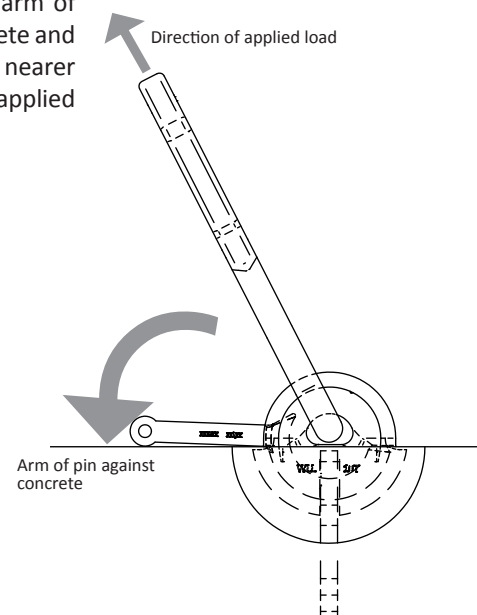
Factor of Safety: 4:1

Using P86 Ring Clutch

1. Slide the pin around so the clutch is in the Open position. Lower clutch on to the lifting anchor.



2. Engage pin, with the arm of the pin against the concrete and on the side of the clutch nearer the direction of the applied load.



Inspection P86 Olivetti Clutch

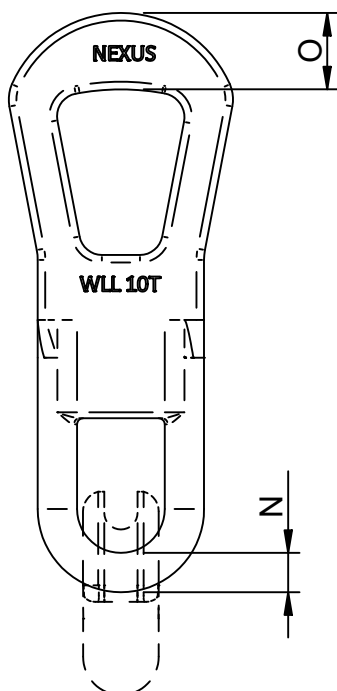
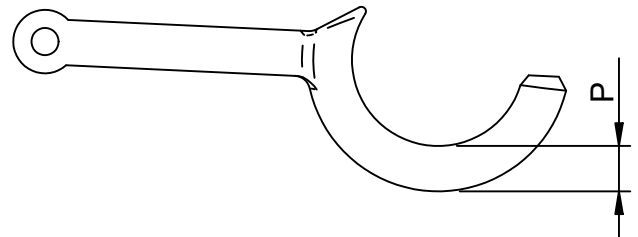
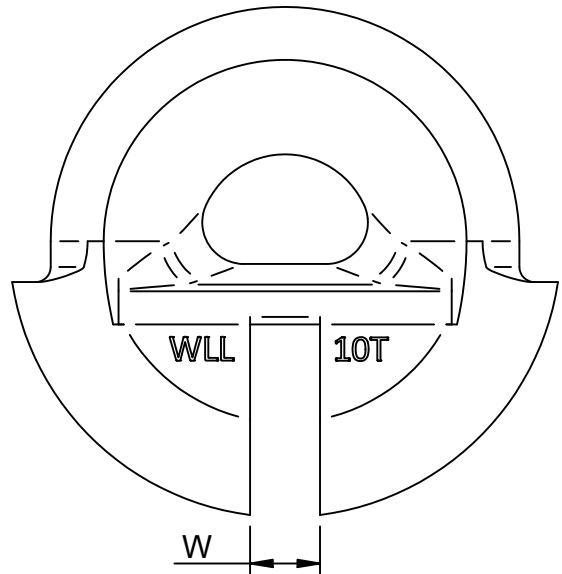
As per the National Code of Practice and Australian Standards AS3850 the clutch must be proof loaded to 1.2 times its WLL at least once every 12 months. Nexus also recommends a non destructive crack test on each clutch is performed annually; such as magnetic particle inspection.

It is also important that they are regularly checked for wear or other damage. Nexus Construction Systems recommends this be done at the beginning of each day.

Inspections should consist of the following:

- Check the overall condition of the clutch, ensuring that nothing is bent or damaged.
- Move the bail around, make sure it can move in any direction without snagging, that it isn't twisted or bent.
- If the clutch has been welded, other than during the manufacture, it must be scrapped. There should never be signs of welding on either the body or the pin.
- Slide the pin back and forth, make sure it is not bent or worn and can slide easily.
- Confirm that the clutch meets the critical discard dimensions.
- If the bail is bent the clutch must be discarded.

Additionally, between each use a quick visual inspection should be performed on the clutch to ensure no damage occurred during the previous lift. Clutches found to be damaged, worn or bent must be scrapped; do not attempt repair the clutch.

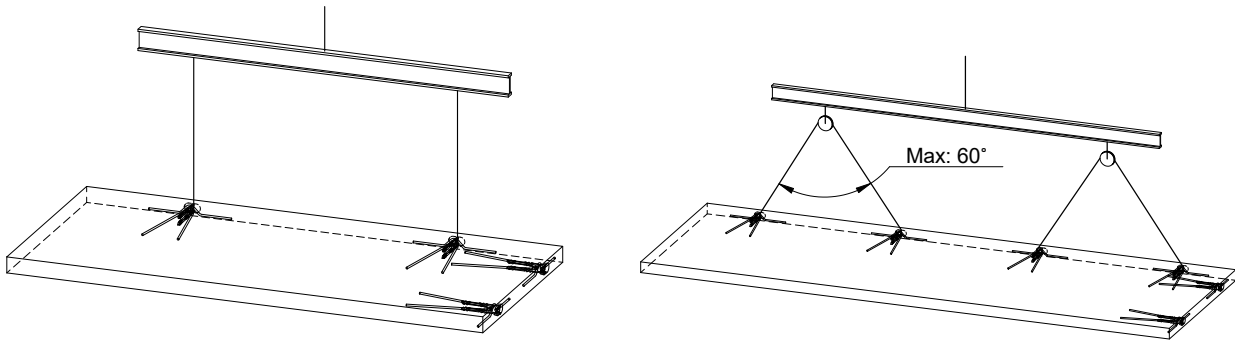


Working Load Limit (t)	Load Range (t)	Product Code	Critical Discard Dimensions (mm)			
			"N" Min	"O" Min	"P" Min	"W" Max
3	3	P863	12.5	30.0	12.0	14
5	5	P865	18.5	28.0	15.5	21
10	7-10	P8610	23.0	36.0	19.0	23

Rigging - Panel Precast Handling

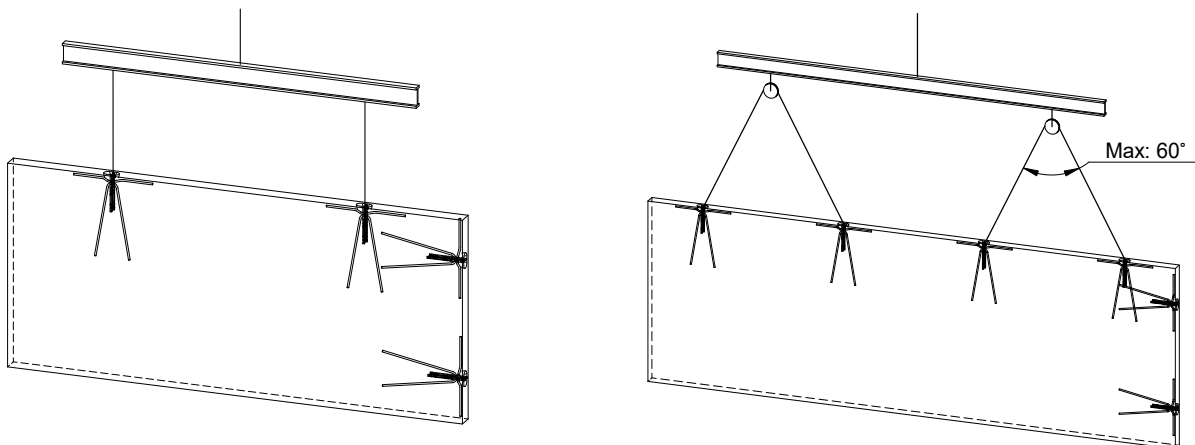
Stripping from beds

When stripping precast beds use the rigging shown below for panels with 2 or 4 side lifters.



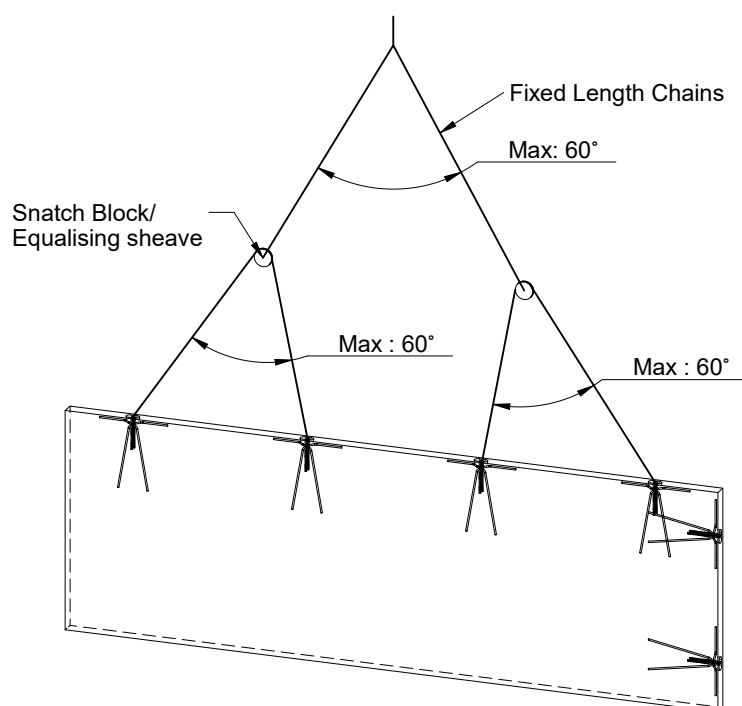
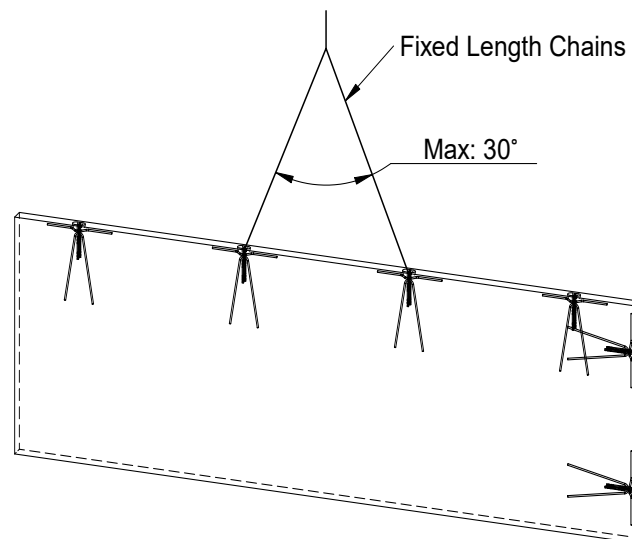
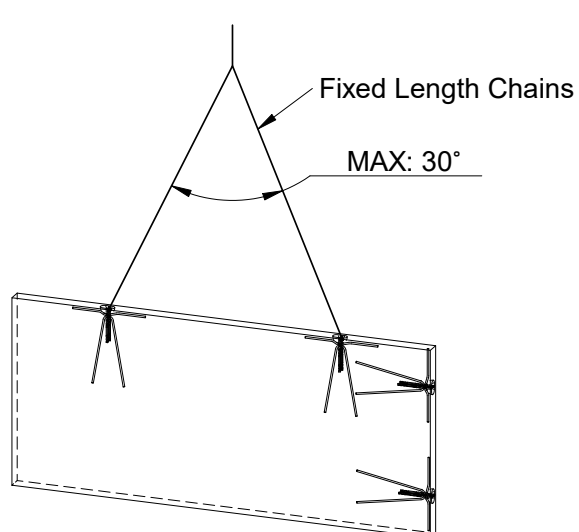
Handling in yard

Once panels are in the vertical position use the rigging as per below for handling.



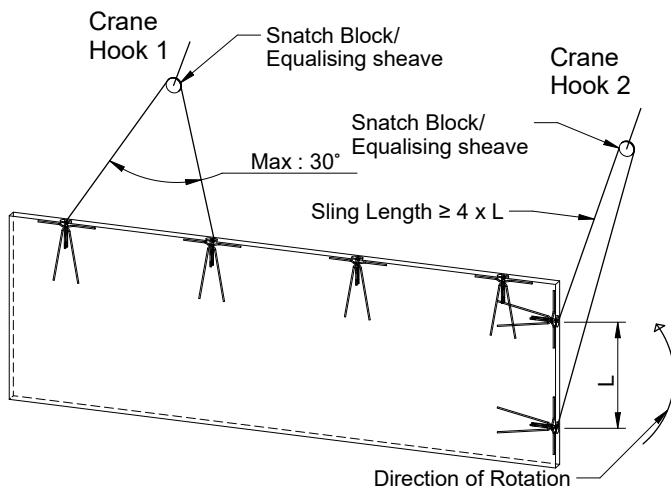
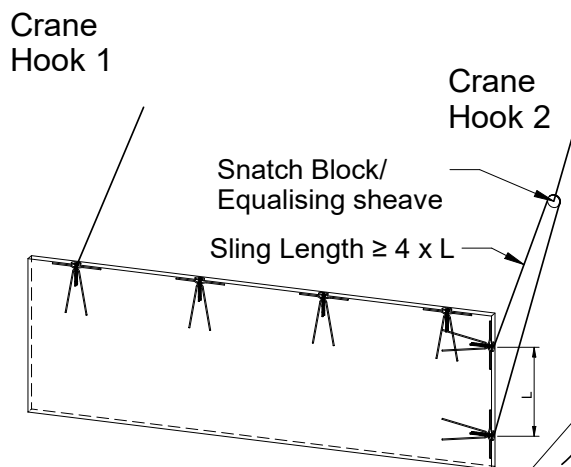
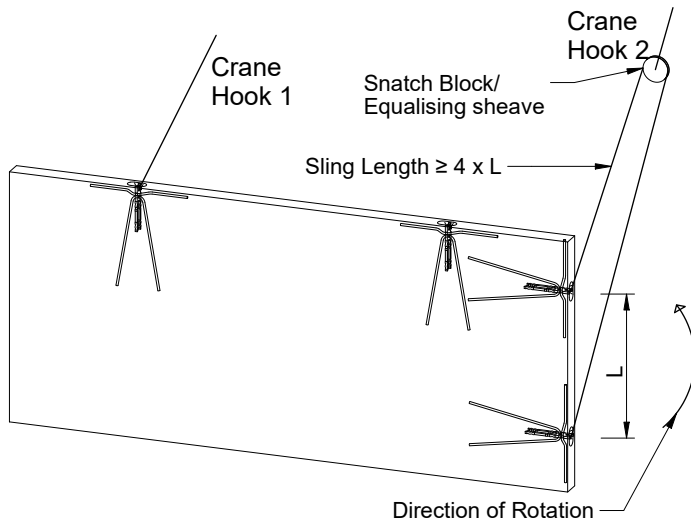
Onsite Panel Handling

When unloading from "A" frame on truck use the below rigging configurations. Panel must be in the vertical position



Panel Rotation

When rotation panel use the following rigging configurations.

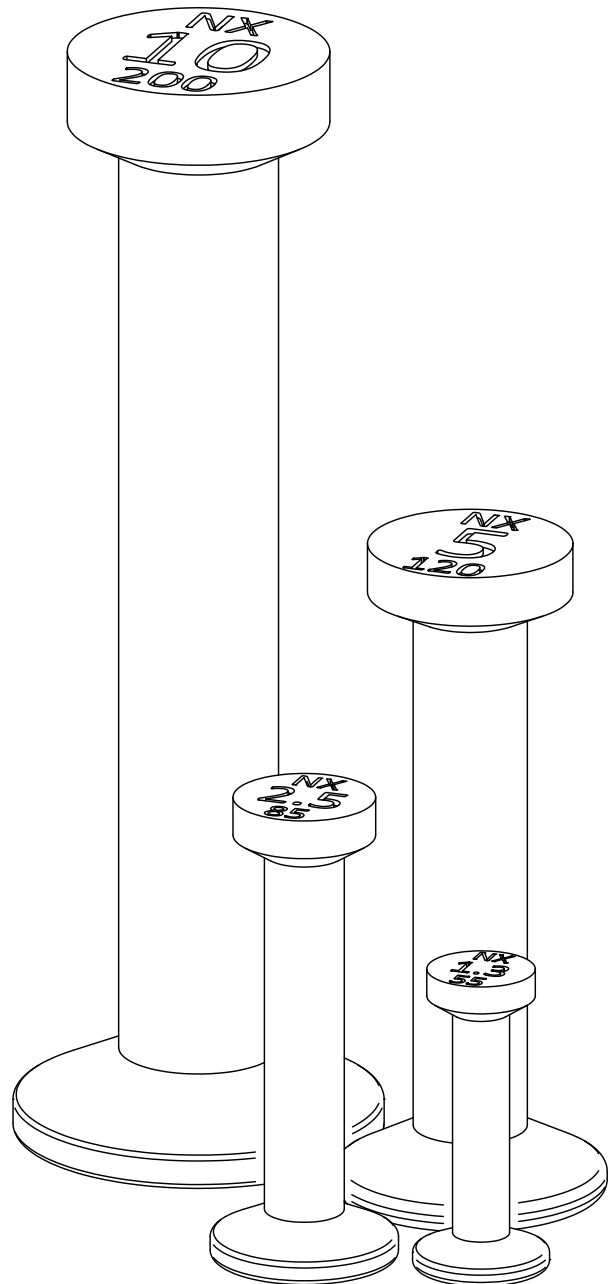
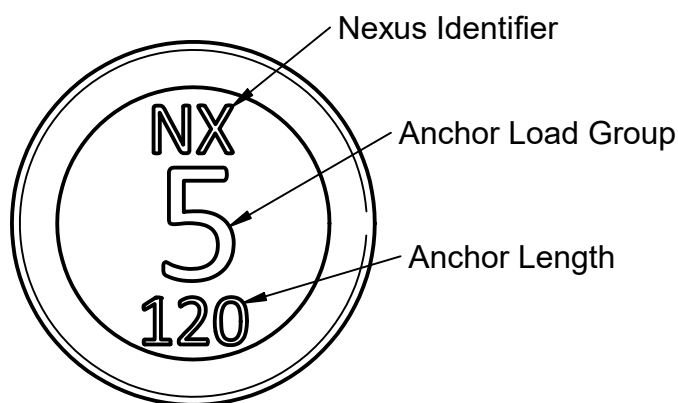


P52 Foot Anchor

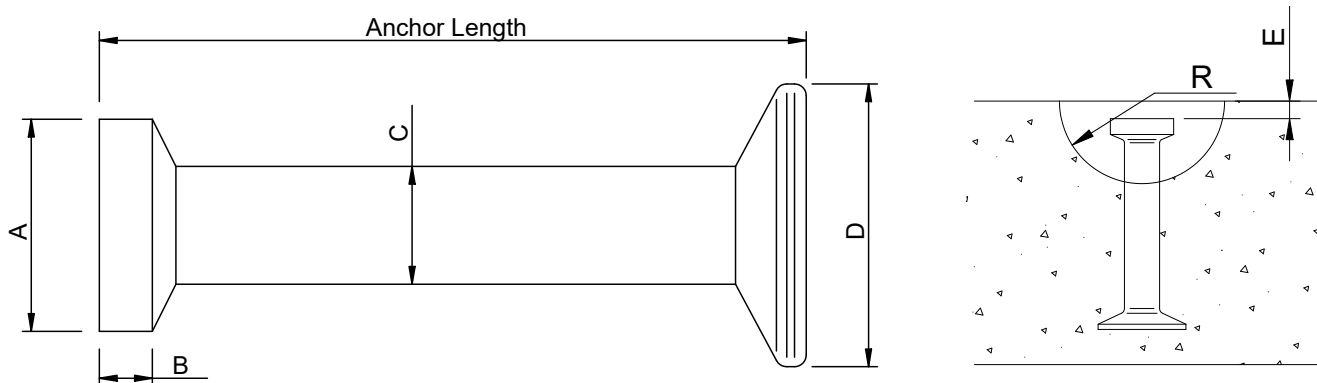
The P52 Foot Anchor is forged from carbon steel that obtains the minimum 2.25 factor of safety as set out in AS3850:2015. Both ends of the anchor are hot forged, the head designed to suit the P50 Clutch, while the foot creates a large shear cone in the concrete when under load. The anchors are hot dipped galvanised for corrosion protection and are available in grade 316 stainless steel upon request.

Nexus anchors can be identified through the unique marking that is on top of the Foot Anchor. The diagram opposite shows the typical head of a standard foot anchor. The initials "NX" or "TLE" identify this as one of our foot anchors. Also marked on the head of the foot anchor is the load group of the anchor, as well as the overall length of the anchor.

Please note that the anchor load group is based on the strength of the steel of the anchor and is not necessarily the WLL based on concrete failure of the particular anchor.



P52 Foot Anchor



Anchor Load Group	Product Code	Anchor Length (mm)	Dimension (mm)						Clutch Size	Mass g
			A	B	C	D	E	R		
1.3t	P52135	35	19	5	10	24	10	30	1.3	44
	P52145	45	"	"	"	"	"	"	"	50
	P52155	55	"	"	"	"	"	"	"	56
	P52165	65	"	"	"	"	"	"	"	62
	P52185	85	"	"	"	"	"	"	"	75
	P521120	120	"	"	"	"	"	"	"	96
	P521240	240	"	"	"	"	"	"	"	170
2.5t	P52255	55	25	7	14	33	11	37	2.5	121
	P52275	75	"	"	"	"	"	"	"	145
	P52285	85	"	"	"	"	"	"	"	157
	P522120	120	"	"	"	"	"	"	"	199
	P522170	170	"	"	"	"	"	"	"	260
	P522280	280	"	"	"	"	"	"	"	392
5t	P52575	75	36	9	20	48	15	47	5	333
	P52595	95	"	"	"	"	"	"	"	382
	P525120	120	"	"	"	"	"	"	"	444
	P525140	140	"	"	"	"	"	"	"	493
	P525170	170	"	"	"	"	"	"	"	566
	P525240	240	"	"	"	"	"	"	"	739
10t	P5210150	150	46	13	28	65	15	59	10	1057
	P5210200	200	"	"	"	"	"	"	"	1297
	P5210340	340	"	"	"	"	"	"	"	1972
20t	P5220250	250	68	15	39	95	15	80	20	3345
	P5220340	340	"	"	"	"	"	"	"	4187
	P5220500	500	"	"	"	"	"	"	"	5684

Anchor lengths are standard stock sizes, other sizes are available on request.

All anchors stocked in hot-dipped galvanised finish.

Anchors in Grade 316 Stainless Steel available on request.

Working Load Limits

The table below lists the working load of the P52 Foot Anchor for various lengths and concrete strengths. When the P52 foot anchor is properly embedded in normal weight concrete, the tabulated working loads are applicable for any direction of loading. This applies even if the direction of load is parallel to the axis of the anchor, perpendicular or any other direction.

Working Load Limit (Tonnes)					
Anchor Load Group	Anchor Length (mm)	Concrete Compressive Strength @ Lift (MPa)			
		15	20	25	30
1.3	35	0.47	0.55	0.61	0.67
	45	0.93	1.08	1.2	1.30
	55	1.21	1.30	1.30	1.30
	65	1.26	1.30	1.30	1.30
	85	1.30	1.30	1.30	1.30
	120	1.30	1.30	1.30	1.30
2.5	55	1.08	1.30	1.40	1.52
	75	1.70	1.98	2.2	2.40
	85	2.15	2.40	2.50	2.50
	120	2.50	2.50	2.50	2.50
	170	2.50	2.50	2.50	2.50
	280	2.50	2.50	2.50	2.50
5	75	2.13	2.46	2.75	3.01
	95	2.92	3.37	3.77	4.13
	120	4.03	4.65	5.00	5.00
	140	5.00	5.00	5.00	5.00
	170	5.00	5.00	5.00	5.00
	240	5.00	5.00	5.00	5.00
10	150	4.95	5.72	6.40	7.01
	200	7.45	8.00	8.90	9.80
	340	10.0	10.0	10.0	10.0
20	250	14.0	17.0	19.8	20.0
	340	20.0	20.0	20.0	20.0
	500	20.0	20.0	20.0	20.0

Minimum edge distance is 3 x anchor length; Minimum anchor spacing is 6 x anchor length.

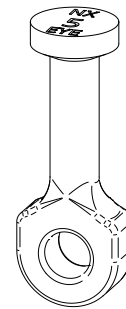
Do not attempt to use the foot anchor in concrete that is less than 15 MPa.

Factor of Safety: 2.25 to 1

Italics represents those conditions that are limited by steel and clutch strength.

P53 Eye Anchor

In applications requiring high capacity lifting in thin sections using tension only, the P53 Eye Anchor is the ideal solution. The P53 Eye Anchor uses the same clutch and void as the P52 Foot Anchor series. However, it also requires a bent reinforced tension bar to develop the full working load. The tension bar is fed through the hole that has been forged at bottom of the eye anchor.

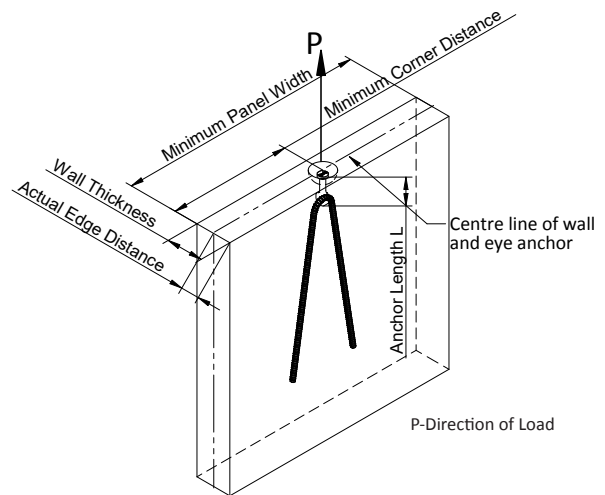


Using the P53 Eye Anchor

The P53 Eye Anchor is installed into the void in the same manner as the P52 Foot Anchor. However, the P53 Eye Anchor requires the additional installation of a P60 Tension Bar to develop its working load capacity. The tension bar transfers the load deep into the concrete section. The tension bar is made from 500MPa steel reinforcing (details on the following page). The tension bar must be tied to mesh so it doesn't move during the concrete pour.

The P53 Eye Anchor is ideally used in thin sections where edge distance can drastically reduce the tensile capacity of the P52 Foot Anchor. The anchor must be installed in the centre of the wall, ensuring it is the minimum distance from the corner. If two or more are used, the minimum spacing between the anchors is twice the minimum corner distancing.

Never use the P53 Eye Anchor for lifting thin panels in shear.



P53 Eye Anchor Selection Chart

Anchor Rated Load (tonnes)	Anchor Length (mm)	Minimum Wall Thickness (mm)	Actual Edge Distance (mm)	Minimum Corner Distance (mm)	Minimum Panel Width (mm)	Working Load Limit (t)
1.3	50/65	75	40	200	400	1.3
2.5	90	75	40	100	200	2.5
5	120	95	48	125	250	5
10	180	120	60	175	350	10
20	250	180	90	215	430	20

WLL provides a factor of safety of 2.25 to 1 with a concrete strength of 25 MPa
Anchor must be used in conjunction with P60 Tension Bar in order to develop its published rate working loads.

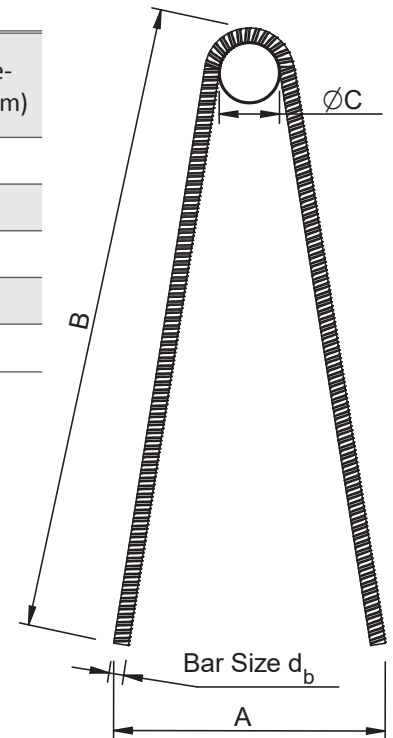
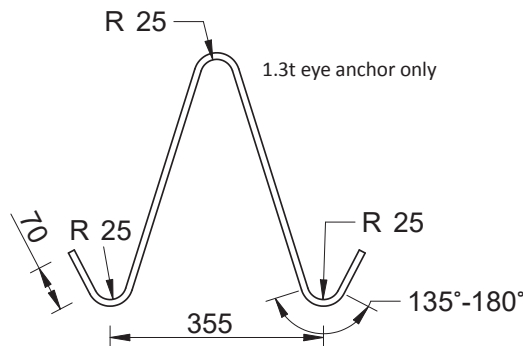
P60 Tension Bar

The P53 Eye Anchor must be used in conjunction with the P60 Tension bar in order for the eye anchor to develop its full working load limit.

Reinforcing Bar Dimensions

Anchor Rated Load	Reinforcing Bar Size d_b	Overall Rebar Length (mm)	Dimension "A" (mm)		Dimension "B" (mm)	Pin Diameter ϕC (mm)
			Standard	Maximum		
1.3	N10	1000	355		500	50
2.5	N12	1100	125	190	550	60
5	N16	1400	160	250	700	80
10	N20	1900	240	380	950	100
20	N32	4000	320	500	2000	160

Reinforcing bar to be 500 MPa Steel, complying with Australian Standards AS/NZS 4671-2001



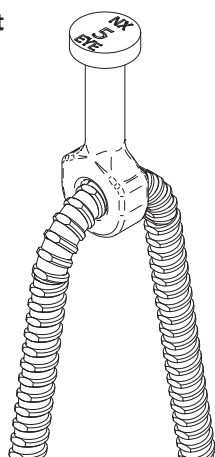
P60 Tension Bar Installation

The P60 Tension bar must be installed so that the tension bar remains in contact with the lower part of the eye and the legs must be of equal length either side of the eye anchor. Wire tie the tension bar to the mesh so the tension bar is in constant contact.

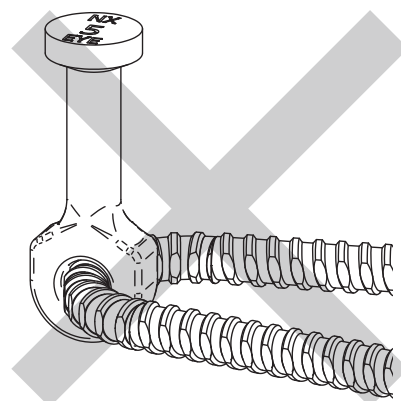
Place the tension bar through the eye of the anchor in such a manner that the tension bar contacts the bottom of the eye. Make certain the legs of the tension bar are equal on either side of the anchor. Wire the tension bar into position so that the tension bar will stay in contact with the bottom of the eye during the concrete pour and the legs are running in the same direction as the applied load.

Use bars that have been bent by the reinforcing bar supplier as per the dimension above. Reinforcing bars must be bent around the correct diameter pin as per manufacturer's specifications. Never use site bent reinforcing bars. Bars that have been bent to the wrong radius can have cracking in the micro-structure of the bar leading to premature failure.

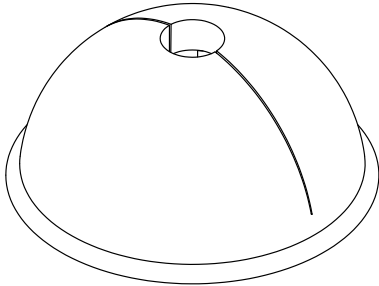
Right



Wrong



P55 Rubber Void Former

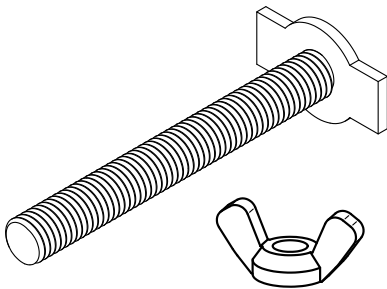


P55 Round Rubber Void Former

P55 Void Former

The P55 recess void former is used to form a cavity around the head of the foot anchor. The recess void form is bolted to the form using either a stud and wing nut combination (P63 Male Connector) or a tapped plate and bolt (P64 Female Connector). It positions the anchor for easy attachment and removal of the clutch.

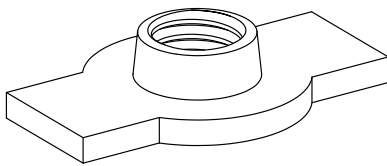
The recess void former has a slit which facilitates insertion of the anchor head and withdrawal when the formwork is stripped or the concrete has achieved final set. In order to remove the void former, insert screw drivers in the holes on the void former and pry open.



P63 Male Connector

P63 Male Connector

The stud and wing nut is used to bolt the P55 Void Former to formwork used in situations where the formwork can be removed by pulling the formwork directly out from the concrete surface. The formwork will slide out over the threaded stud.

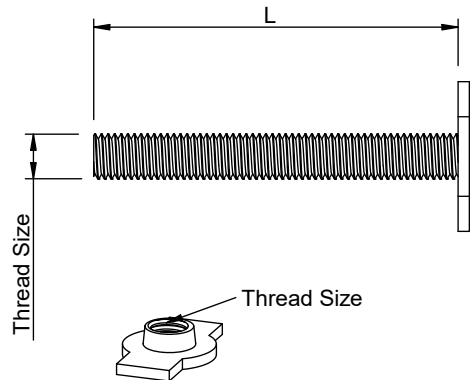
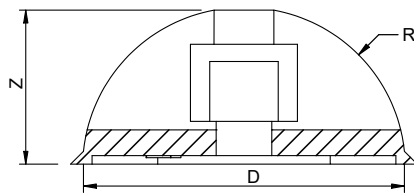
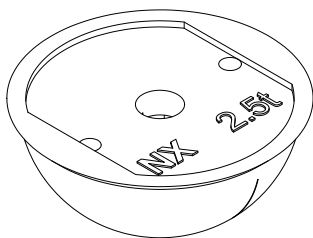


P64 Female Connector

P64 Female Connector

The threaded tapped plate is used to bolt the P55 Void Former to formwork used in situations where the formwork cannot be removed horizontally and must be stripped vertically. The formwork slides across the concrete surface. This can only be on concrete surfaces that are smooth. A standard metric bolt is used to bolt the void to the formwork.

Rubber void former dimensions



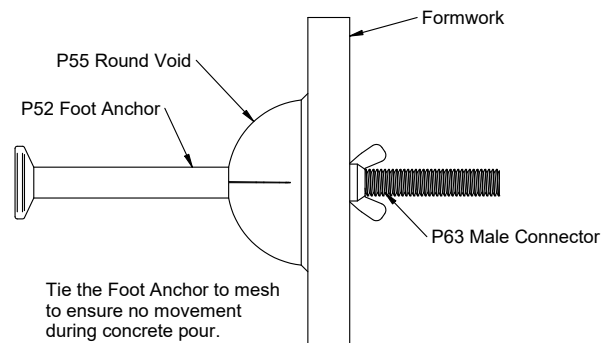
Rubber Void Former Dimensions						
Size	Colour	D mm	Z mm	R mm	L mm	Thread Size
1.3t	Blue	60	30	30	95	M8
2.5t	Yellow	74	37	37	95	M12
5t	Blue	94	47	47	95	M12
10t	Yellow	118	59	59	95	M12
20t	Black	160	80	80	95	M16

How to install P55 Recess Void Formers on P52 Anchors

With the male or female connectors installed, grasp the void former across the top diameter of the plug. Application of pressure by the thumb and fingers on the outer edge of the plug will cause the plug to open up to allow insertion of the anchor.

How attach the P55 Recess Void Former and P52 Anchors to Formwork

The stud or bolt is inserted through the form, tighten wing nut or bolt firmly against the form. This will close the slit in the void former ensuring no concrete can enter the void former, which may otherwise pose a problem when attaching the clutch.



Void former removal

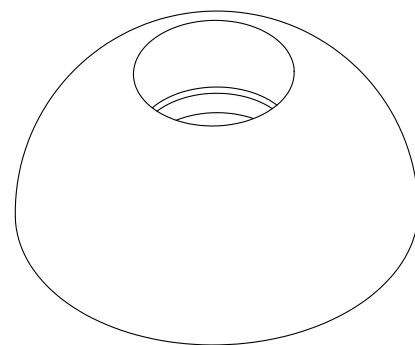
Once the formwork has been stripped remove the P55 Void Former by putting two screw drivers in the holds of the void former and prying each side of the void former out from the concrete.

P57 Steel Void Former

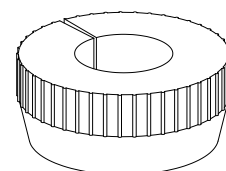
For concrete moulds where the same product is repetitively made, the P57 Steel Void Former is the ideal solution. Made from steel, it is long lasting and the only replacement part is the inexpensive P58 Rubber Ring.

The void comes with a threaded hole for easy attachment using standard metric bolts and, for a more permanent solution, can be welded or glued to the form.

Also available with inbuilt magnet that can be used to locate void former directly on steel formwork.



P57 Steel Void Former



P58 Rubber Ring

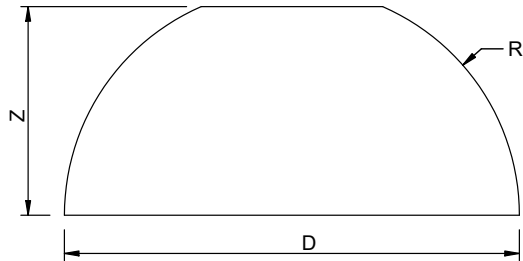
P58 Rubber Ring

The P58 Rubber Ring has a slit which allows it to be placed over the shaft of the foot anchor. This is pushed into opening of the steel void former holding the foot anchor head into position.

P57 Steel Void Former

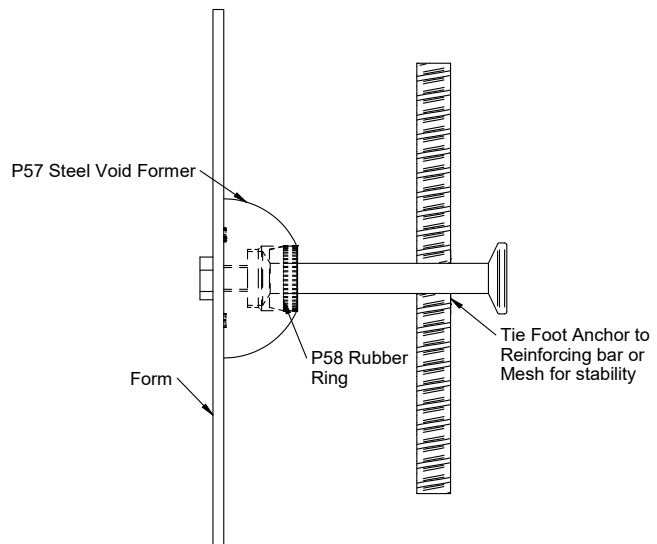
Steel Void Former Dimensions

Size	D mm	Z mm	R mm
1.3t	60	28	30
2.5t	74	34	37
5t	94	43	47



How to Use P57 Steel Void

It is recommended that when the P57 Steel Void Former is used the foot end of the anchor be supported to prevent dislodgement. Dislodgement may result in the anchor sitting lower in void than normal, making it impossible to engage the clutch.

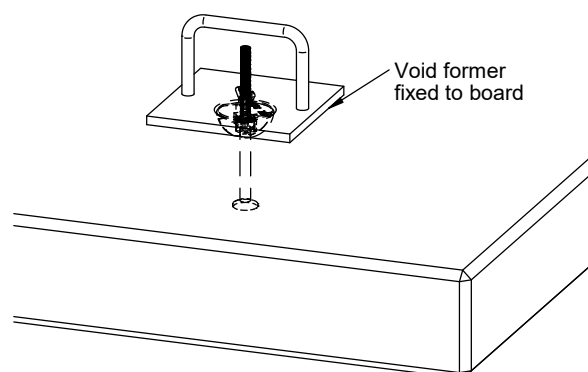


Puddling Foot Anchors

When a foot anchor is to be puddled in the top surface of a precast element, it is important that the void former is flush with the top of the concrete. This can only be satisfactorily achieved when the top surface is flat. Do not puddle foot anchors in on a concrete surface that is curved.

The void, with foot anchor, must be fixed to a flat board. Immediately after the concrete is poured, push the foot anchor into the concrete and keep pushing until the board is level with the top surface of the finished concrete. Light vibration around the foot anchor will aid in this process.

Always ensure the concrete in the vicinity of the anchor is correctly vibrated and when leaving the concrete to set make sure the board is still flush with the surface level.

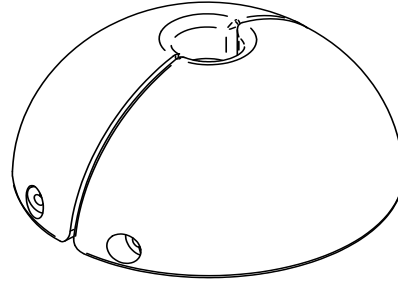


P56 Articulated Void Former

P56 Articulated Void Former

The P56 Articulated Void Former is an alternative to the rubber and solid steel void formers.

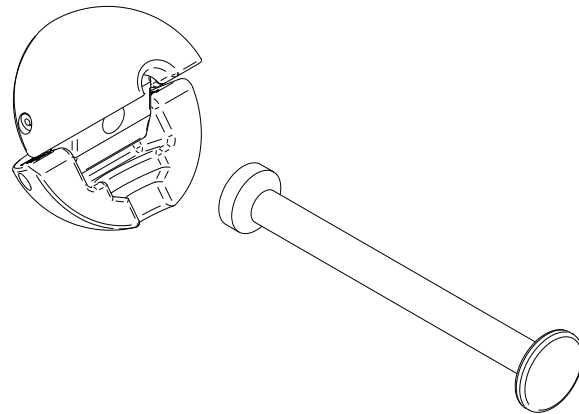
The half's rotate around a centre fixed section allowing easy insertion of the foot anchor and removal after concrete has set.



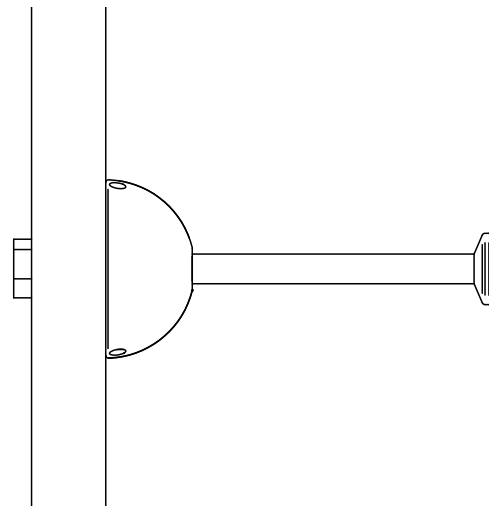
How to Use P56 Articulated Void Former

Open the 2 half's of the void former and place the head of the anchor hard up against centre section.

Close the half's around the foot anchor.



Use the thread in the centre section to bolt the void former to the formwork.

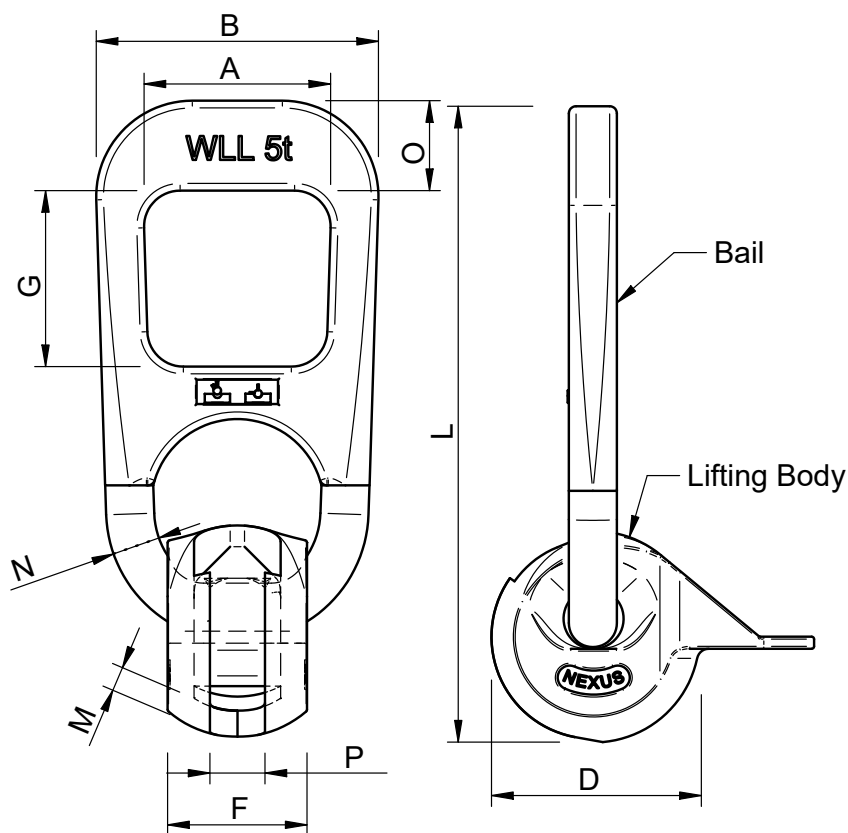


P50 Lifting Clutch

The P50 Lifting Clutch consists of the lifting body and bail. The lifting body has a slot that allows the head of the P52 Foot and P53 Eye Anchor to be quickly engaged.

Inspection

While appreciable wear does not normally occur, the general condition and degree of wear should be checked by the user prior to every use, as per AS3850. The Dimensions Requirements of the P50 clutch must be adhered to and inspected regularly, do not use clutch if bail is bent. As per the National Code of Practice and Australian Standards AS3850 the clutch must be proof loaded to 1.2 times its WLL at least once every 12 months. Nexus also recommends a non destructive crack test on each clutch is performed annually; such as magnetic particle inspection.

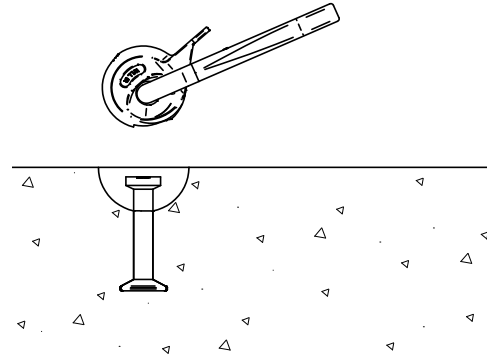


Dimension Requirement on P50 Lift Clutch					General Dimensions on P50 Lifting Clutch					
Working Load Limit	"M" Min	"N" Min	"O" Min	"P" Max	A	B	D	F	G	L
1.3	5.5 mm	11.5 mm	17.0 mm	13 mm	47 mm	75 mm	56 mm	32 mm	71 mm	188 mm
2.5	6.0 mm	13.0 mm	20.0 mm	18 mm	59 mm	91 mm	68 mm	41 mm	86 mm	230 mm
5	8.0 mm	18.5 mm	30.0 mm	25 mm	70 mm	118 mm	88 mm	57 mm	88 mm	283 mm
10	12.0 mm	26.0 mm	41.0 mm	32 mm	88 mm	160 mm	112 mm	72 mm	115 mm	401 mm
20	18.0 mm	36.0 mm	56.0 mm	46 mm	106 mm	180 mm	152 mm	110 mm	135 mm	506 mm

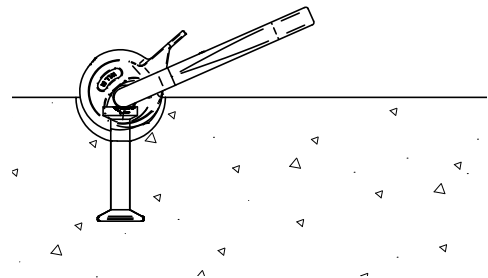
Factor of Safety: 4 to 1

Using the P50 Lifting Clutch

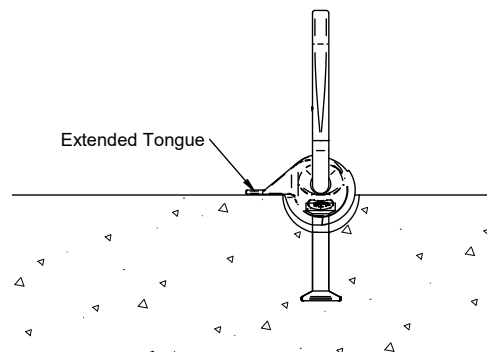
1. Install the P50 Lifting Clutch by rotating the lifting body around so that the opening to the slot is directly above the anchor head.



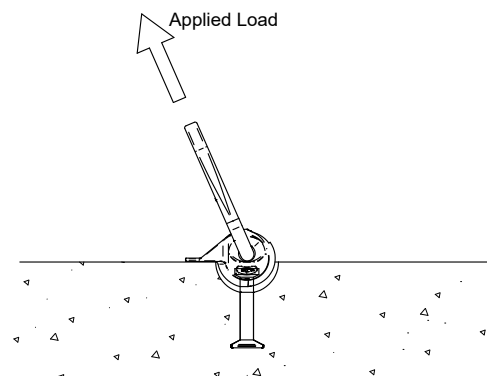
2. Lower the clutch so that the lifting body is encompassing the head of the anchor.



3. Once over the top of the anchor head, rotate the lifting body around so that the extended lift is sitting on the flat section of the concrete.



4. Initially apply a small amount of tension to the clutch to ensure that bail and the lifting body of the P50 Lifting Clutch are aligned in the direction of the applied load, ensuring that the extended tongue is on the same side as the applied load and remains touching the concrete surface.



Warning: When altering the angle of the bail while under-load care must be taken not to apply unintended loads to the anchor. Such as the crane hook jamming on the precast element edge.

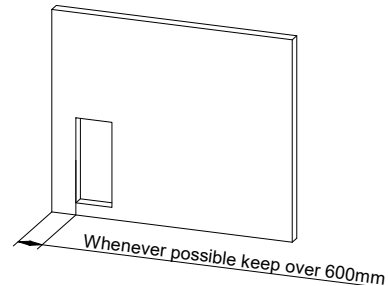
Simplify the Panel Lift

Panel Sizes & Shapes

If possible, some small changes to the shape and size of the panels, such as the location of doorways or footing design, can significantly reduce the amount of work required on lift day, saving time and money.

Panel Openings

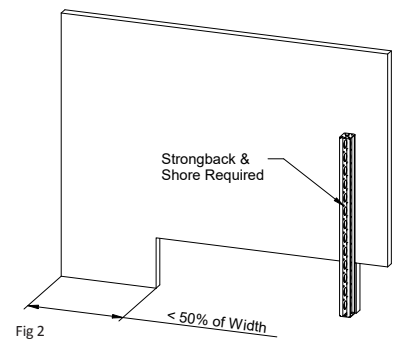
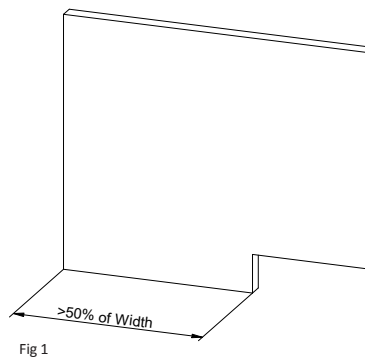
Whenever possible, openings should be located in the centre of the panel. If the opening can't be located in the centre of the panel try to keep it at least 600mm from the edge of the panel as this will reduce the need for strongbacks.



Panel Footings

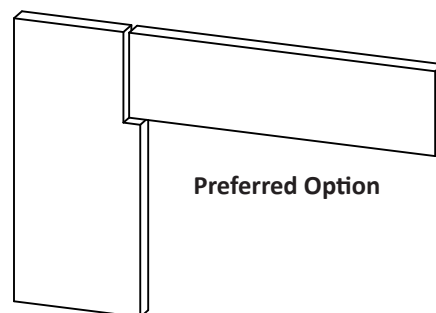
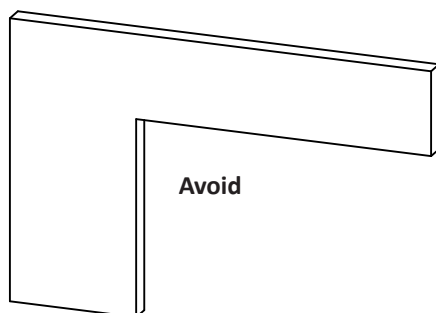
When the panel sits on footings that are at different reduced levels (RL), keep the bottom edge of the panel so that the side with the lower reduced level makes at least 50% of the overall width of the panel (Figure 1).

When the bottom edge of the panel is less than 50% (Figure 2) of the overall width, a strongback with shore will be required to ensure the panel lifts evenly.



Overheads

L-shaped panels have a large centre of gravity shift. This complicates rigging and can result in twisting of the panel during erection. For overheads, the preferred design is per the figure on the right with a completely separate panel making the overhead section.



T41 Face Lift Insert

The T41 Face Lift Insert is a simple and fast method of lifting concrete tilt-up wall panels into position. Ropes attached to the lifting clutch allow the clutch to be easily released from the ground.

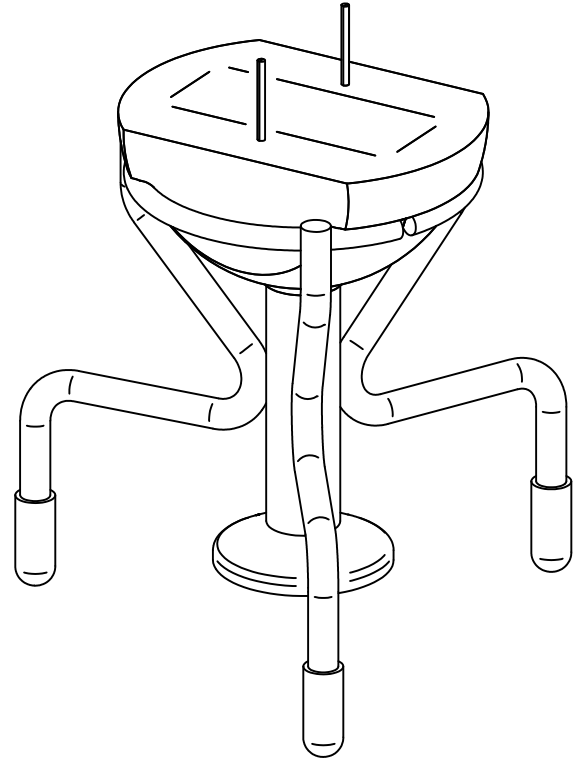
The T41 Face Lift Insert comes pre-assembled for a specific panel thickness, with height of the face lifter 3mm lower than panel thickness. Plastic antenna are moulded with the cap to allow for easy location on lift day.

The T41 is available in standard sizes: 100mm, 125mm, 150mm, 170mm, 175mm, 180mm, 190mm, 200mm, 220mm, 225mm. Additionally Nexus Construction Systems can supply the T41 Face Lifter in any size ranging from 100mm through to 500mm on special orders.

Nexus Construction Systems has also released the T81 Face Lifter. This is the 10t version of our T41, allowing clients to lift heavy panels with less rigging.

Nexus anchors also have the identifying marks as required by the National Code of Practice for Precast and Tilt-Up industries. The tonnage of the anchor, length and the Nexus identifying mark are all visible on the top of the lifting head. "NX" is the identifying mark for Nexus.

Note: Although the tonnage of the anchor may be 5 or 10 tonne, the Working Load Limit of the lifting anchor will, in most situations, be determined by the concrete strength, edge distance and overall length off the anchor. The Working Load Limit for the Face Lift Insert insert is set out in the table below. (Note: No additional reinforcing is required to achieve these working loads, additional reinforcing is required for lifter stability only.)



Working Load Limit for Face Lift Inserts

T41 Working Load Limit (Tonnes) - 5t Face Lifter				
Panel Thickness (mm)	Anchor Length (mm)	Concrete Strength (MPa)		
		20	25	32
100 - 120	75	2.46	2.75	3.1
125 - 145	95	3.31	3.7	4.18
150 - 170	120	4.86	5	5
175+	140	5	5	5

T81 Working Load Limit (Tonnes) - 10t Face Lifter				
Panel Thickness (mm)	Anchor Length (mm)	Concrete Strength (MPa)		
		20	25	32
170-175	140	5.3	5.8	6.6
180-190	150	5.7	6.4	7.2
200-225	170	6.8	7.6	8.6
250	200	8.0	8.9	10

Factor of Safety: 2.25 to 1, Uncracked Concrete

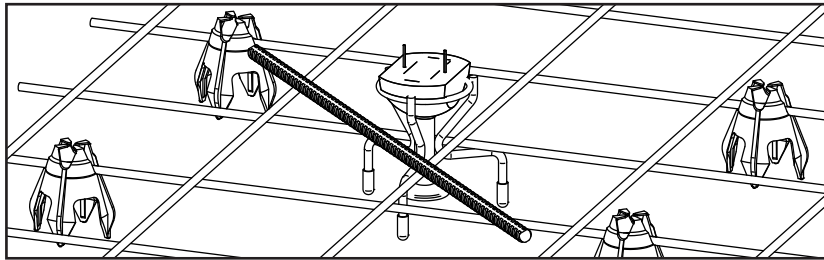
Italics Represents Working Load Limit determined by Lifting Hardware Minimum Edge Distance 3 x Anchor Length

Sling must be in line with lifter to achieve WLL, otherwise reductions must be considered.

Never use the T41 or T81 Face Lift Inserts for edge lifting.

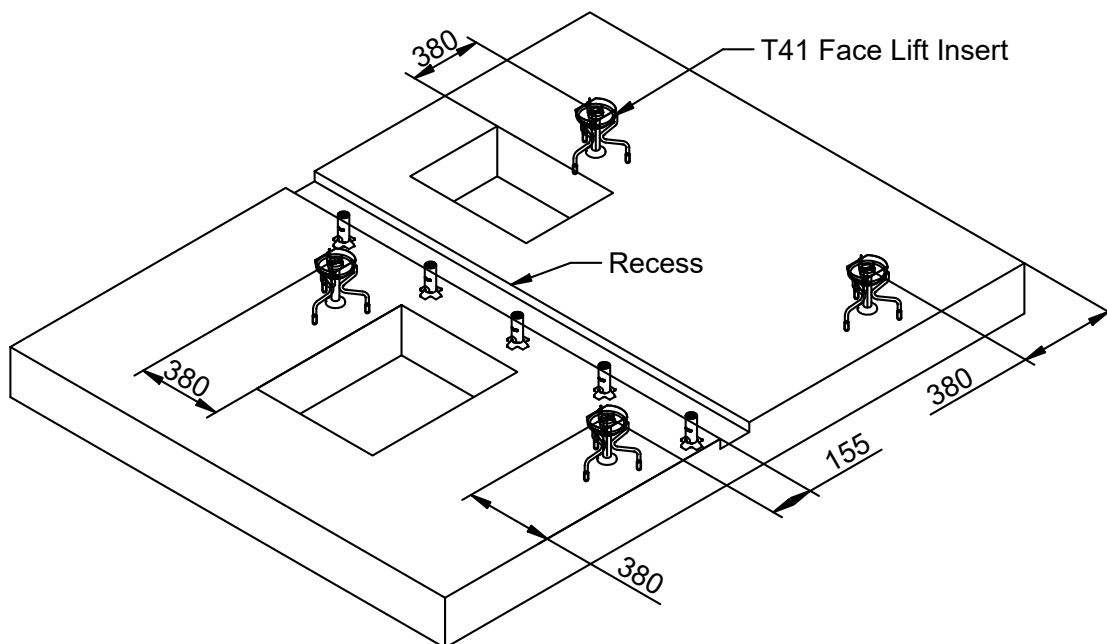
Installing the T41 Face Lift Insert

Place the T41 Face Lift Insert in the correct location. Ensure that the arrow on the label of T41 is pointing to either the top or bottom of the panel. Wire tie two of T41's legs to the surrounding mesh with a diagonally placed N12 x 300 reinforcing bar tied to the third leg. Should the insert need to be positioned away from the mesh wires, place additional N12x300 reinforcing bar to suit and tie those to the mesh. Place additional mesh supports around insert as shown to prevent vertical displacement. Please note the additional reinforcing bars are for stability only; they are not required to develop the working load limit of the lifting anchor.



T41 Face Lift Insert Installation Requirements

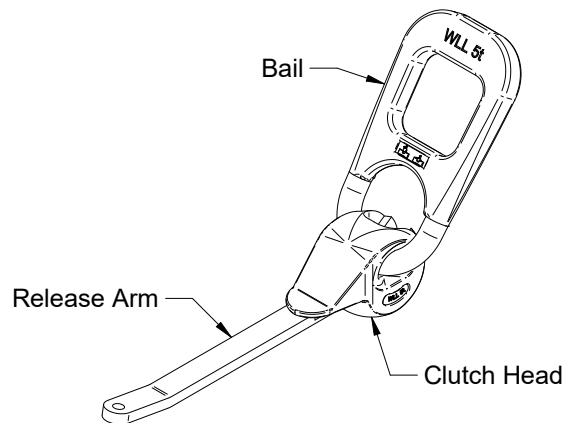
The T41 Face Lift Insert must be installed at least 380mm from any panel edge (including openings) and 155mm from a recess. Failure to meet the requirements will result in a reduced concrete cone and lower working load limit. Arrows that are indicated on top of the lifters must point to the top or bottom of the panel. The T41 face lifter must be tied to the surrounding mesh or reinforcing to ensure it doesn't move during the concrete pour.



Ground Release Clutch

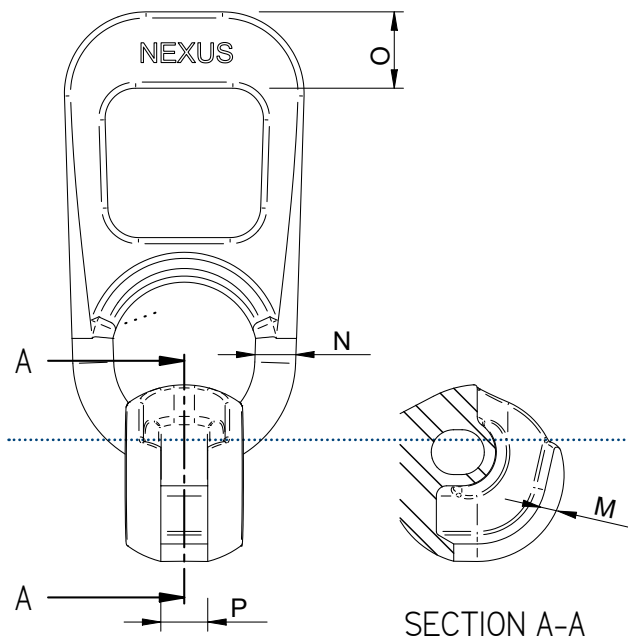
The T43R Ground Release clutch is a simple and quick method of lifting Tilt-Up panels. The bail has a large opening easily accepting any typical rigging equipment. The lifting body can be quickly attached to the T41 Face Lift Insert and a rope attached to the release arm allows the clutch to be released from the ground once the crane load is removed.

The T43R is available in 5t & 10t versions. As per the National Code of Practice and Australian Standards AS3850 the clutch must be proof loaded to 1.2 times its WLL at least once every 12 months.



T43R Ground Release Clutch

Warning: Only use the T43R ground release clutch for face lifting of tilt-up panels from the horizontal to the vertical position as per this handbook. Never use the either version of the clutch for edge lifting or as an alternative to using the P50 Lifting Clutch, the P50 Lifting Clutch has small bumps at the end of the T-slot to prevent accidental disengagement while under load. The T43 and T43R clutches are missing bumps to allow for remote release once the panel has been installed. Never use the T43R Ground release clutch in the release arm has been removed.



Inspection

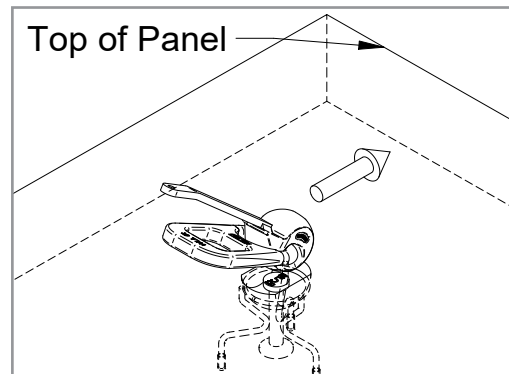
While appreciable wear does not normally occur, the general condition and degree of wear should be checked by the user prior to every use, as per AS3850. The Dimensions Requirements of the T43R clutch must be adhered to and inspected regularly, do not use clutch if bail is bent. As per the National Code of Practice and Australian Standards AS3850 the clutch must be proof loaded to 1.2 times its WLL at least once every 12 months. Nexus also recommends a non destructive crack test on each clutch is performed annually; such as magnetic particle inspection

Dimension Requirement on T43R Ground Release Clutch (mm)

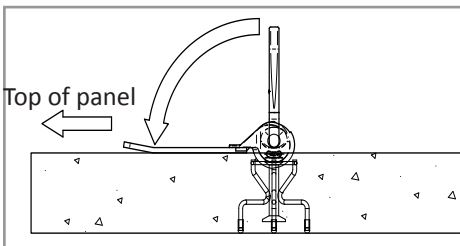
Working Load Limit	"M" Min	"N" Min	"O" Min	"P" Max
5	8.0 mm	18.5 mm	30.0 mm	25 mm
10	12.0 mm	26.0 mm	41.0 mm	32 mm

Using the T43 Ground Release Clutch

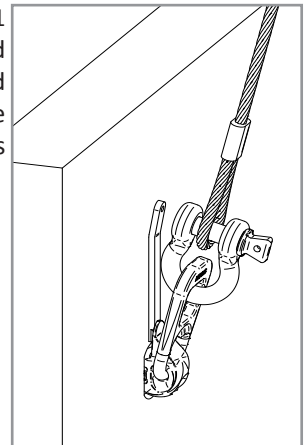
1. First remove the plastic cap by using the claw end of a claw hammer to lever each side out. Hold the T43R so that the opening of the lifting body is directly over the head of the anchor. Ensure that the release arm is closer to the top of the panel in comparison to the bail. Lower the whole clutch so that the lifting body encompasses the head of the anchor.



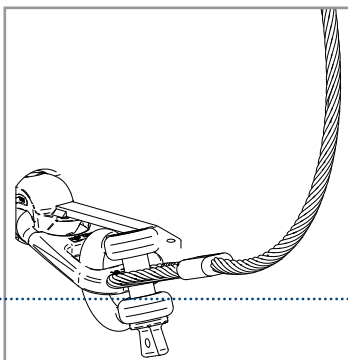
2. Lower the release arm, ensuring it points to the top of the panel and it is in contact with the concrete surface. Connect the crane rigging to the bail and run the rope that is attached to the release along side of the clutch down to the bottom of the panel. Ensure that the bail is in line with the crane sling.



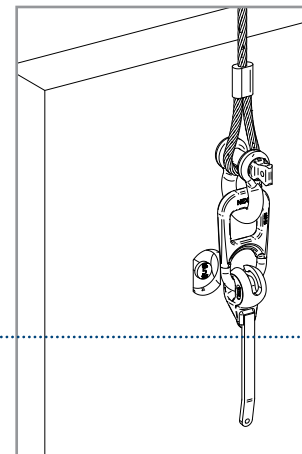
3. The release arm of the T41 Face Lift Insert will be trapped between the crane rigging and the panel. It will be impossible to release the clutch while it is under load.



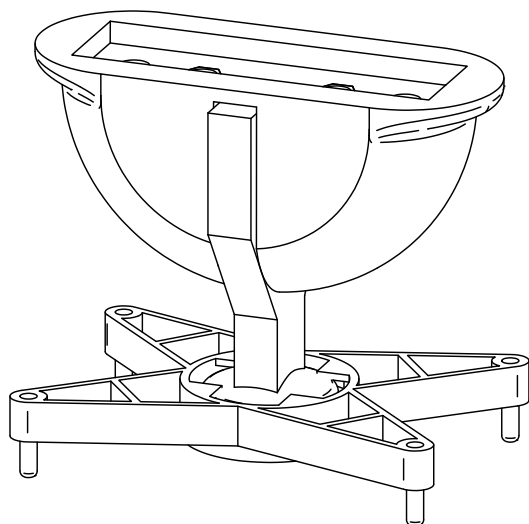
4. Once the panel is either correctly braced or supported by other means, slacken off the crane load. Once there is enough slack, pull on the rope running to the release arm to rotate the lifting body and release the T43R Ground Release Lifting clutch from the anchor.



5. The clutch is now ready to be connected to the next panel for lifting.



Olivetti 7t Face Lift Anchor



Description

The Olivetti 7t face lifter has been developed for those that use either the 7t or 9t Olivetti Edge Lift Anchors and want the convenience of a face lift anchor that can be used with the same clutch.

- Same void former and clutch components as for the Olivetti 7-9t Edge Lift anchors used in other panels. Fewer rigging changes are required.
- Olivetti-style anchor removes any risk of the clutch rotating around the anchor head / void as might happen with conventional “pin head” anchors.
- Can be tied back to panel mesh to secure its plan position, either directly to the anchor shaft or to a tied in cross bar.

Concrete Strength (MPa)	20	25	32	40	50
Working Load Limit (t)	4.4	4.9	5.6	6.2	7.0

Factor of Safety: 2.25 to 1, Uncracked Concrete

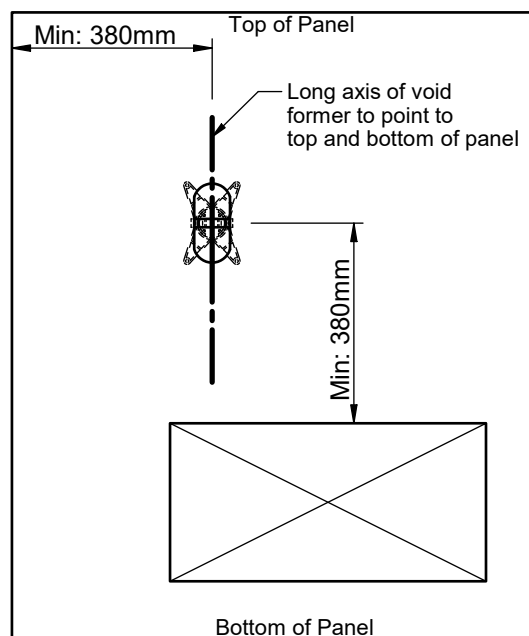
Italics Represents Working Load Limit determined by Lifting Hardware Minimum Edge Distance 3 x Anchor Length

Sling must be in line with lifter to achieve WLL, otherwise reductions must be considered.

Never use the T41 or T81 Face Lift Inserts for edge lifting.

Installation

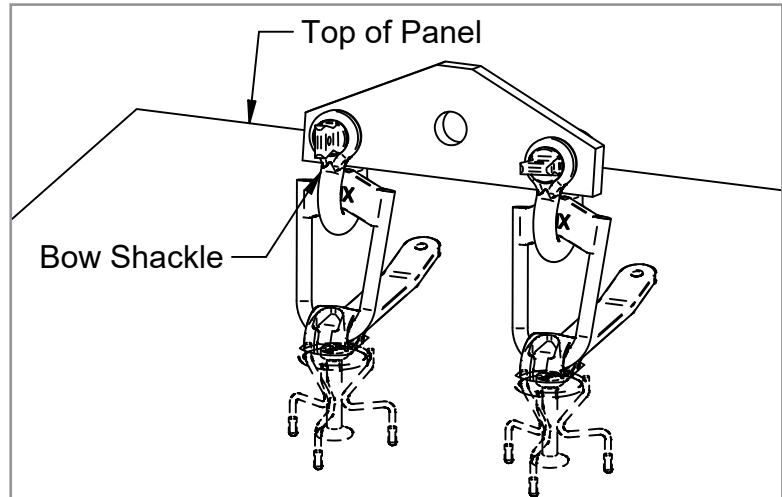
Orient the 7t Olivetti Face Lift Anchor with its void former (in the 150mm thick panel) so that the long axis of the void former points toward the panel base edge (about which it will rotate when lifted). The anchor plate will be at 90° to this. The chair may be oriented in any direction. Secure the complete anchor to adjoining reinforcement with tie-wire directly or via an added cross bar. Note that any cross bar contributes nil additional anchorage capacity, and is a fixing aid only.



T42 Double Face Lift System

The T42 Double Face Lift System combines the use of two T41 Face Lift Inserts with two T43 Lifting Clutches and a T46 Mini Spreader Beam to allow heavier panels to be picked without the associated cost of changing the crane rigging setup.

The two T41 Face Lift Inserts must be placed 305mm apart in order to develop the full working load limits listed in the table below. The T43 Ground Release Clutches are connected and released from the T41 Face Lift Insert in the same manner as you would using the clutch by itself.

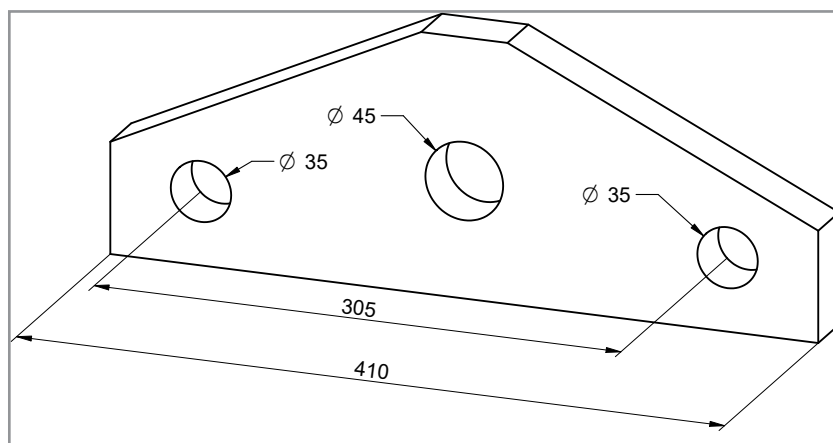


Double Face Lift System		
Panel Thickness (mm)	Anchor Length (mm)	Working Load Limit (tonnes)
125 - 145	95	5.6
150 - 170	120	7.25
175+	140	8.8

Working Load Limit based on concrete strength of 25MPa
Factor of Safety 2.25 to 1

T46 Mini Spreader

The T46 Mini Spreader is made from 32mm thick G300 steel plate. The working load limit of the mini spreader is 10t with a factor of safety of 5 to 1. The two outer holes are set 305mm apart. These are used with a bow shackle (supplied by others) to attach the T43 clutch to the mini spread beam. Nexus recommends that the minimum size for this bow shackle is 8.5t as smaller sizes don't supply adequate clearance. The large centre hole, which is 45mm in diameter, is used to attach the mini spread to the crane rigging. Like clutches, the T46 Mini Spreader must be proof loaded to 1.2 x working load limit every 12 months.



The T46 Mini Spreader has a maximum Working Load Limit of 10t (Factor of Safety: 5 to 1)
T46 mass = 11kg

T75 Emergency Lifting Plate

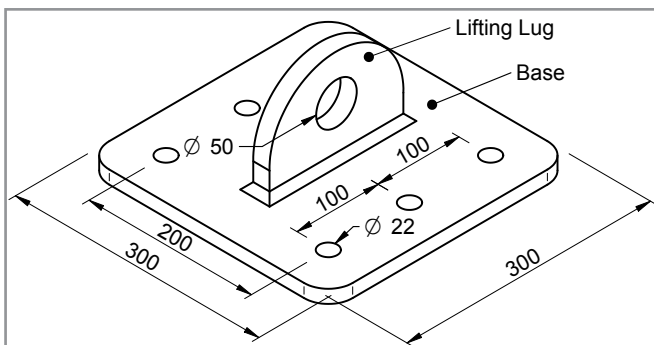
The T75 Emergency Lift Plate can be used in situations where a cast in lifter has become unusable, typically due to being misplaced or missing completely.

Installation

The centre of the lift must align with the centre of the lifter location ensuring that all minimum edge distance requirements are met. If the plate can't be installed in this location contact Nexus. Make sure lifting lug is aligned in the same direction as the slings, never apply side loads to the lifting lug.

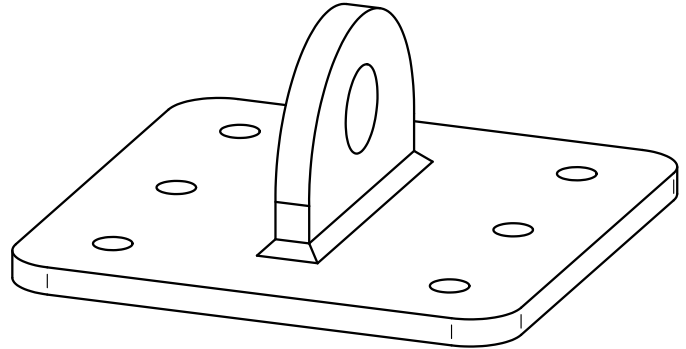
Bolt the T75 to the concrete using Nexus Bracing Bolts, carefully following the bolt installation instructions. Ensure appropriate M20 structural washers are used. Minimum concrete edge distance from each of the anchor bolts is 200mm. Edge distances of less than 200mm may result in a reduced lifting capacity. After the installation of all bolts each plate must be individually proof loaded prior to use.

The Working Load Limit of the installed T75 Emergency Lifting Plate & Nexus Bolts is shown on the right. The concrete must be at least 25 MPa at the time of lift. Either 4 or 6 bolts can be used to install the plate depending on the required lifting capacity.



The base of the emergency lifting plate measures 300 x 300 x 16mm thick and has 6 x 22mm diameter holes spaced as above. The lifting lug section has a 50mm diameter hole that will accept many different sizes of lifting shackles. The T-75 Emergency lifting plate weighs 13.5 kg.

As per the National Code of Practice and Australian Standards AS3850 the Emergency Lifting Plate must be proof loaded to 1.2 times its WLL at least once every 12 months.



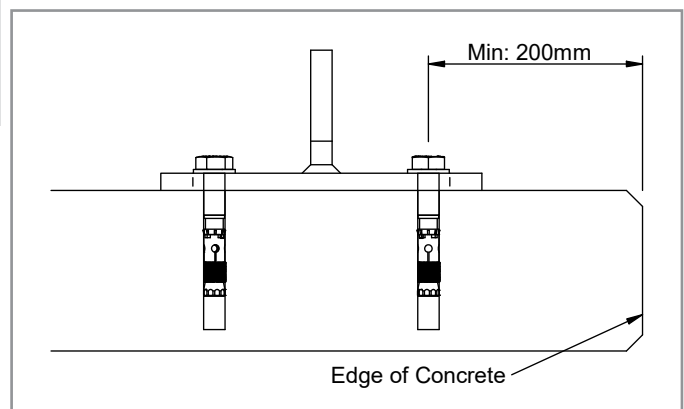
Bolt Details

Minimum Panel Thickness	125 mm
Nexus Bracing Bolt	NXBB20115
Minimum Embedment Depth	95 mm
Maximum Drilled Hole Depth	85% Thickness
Minimum Distance to Concrete Edge	200 mm
Installation Torque	150 Nm

T75 Plate Tensile or Shear Capacity

Number of Bolts	Working Load Limit
6 Bolts (3 per side)	5t
4 Bolts (1 in each corner)	3.5t

NOTE: The above WLL is based on a 2.25 factor of safety against concrete failure. The plate itself has a factor of safety for 4 to 1. Lifting lug must be in line with the direction of the lifting slings. Minimum concrete strength at time of lift 25 MPa & 200mm edge distance.



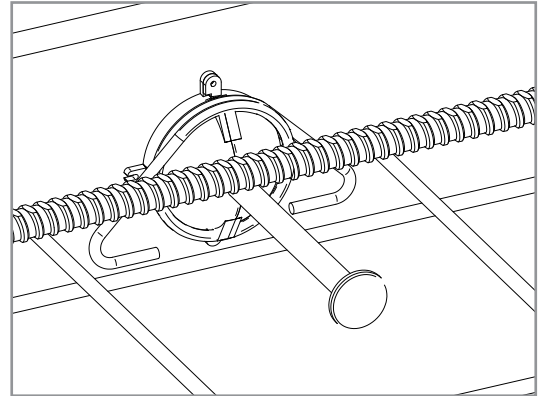
The bolts of the T-75 Emergency Lift Plate must be installed at least 200mm from any edge.

T52 Edge Lift Anchor

The T52 Edge Lift Anchor comes complete with a 6.3mm diameter shear bar. Attach the pre-assembled T52 to the formwork with the two hooks of the shear bar in the down position. Always install the edge lift unit below the perimeter bar of the panel as shown in the diagram. The perimeter bar must extend at least 500mm to either side of the anchor, and must be installed hard against anchor shaft and void former. Tie the anchor to the mesh to prevent movement during the pour.

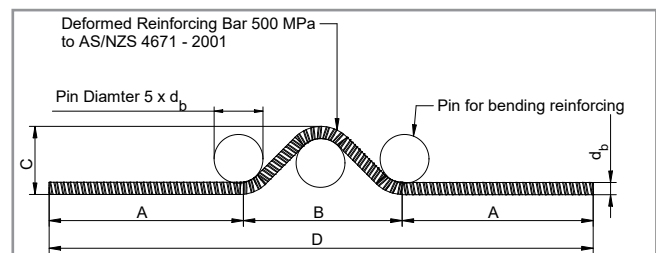
In panels less than 125mm thick, the round shear bar that comes with the 2.5t T52 edge lift anchor should be removed completely and a P59 Shear bar must be installed in its place.

Use the P50 Lifting Clutch to edge lift panels into position, never use the T43R Ground Release Clutch for edge lifting panels.

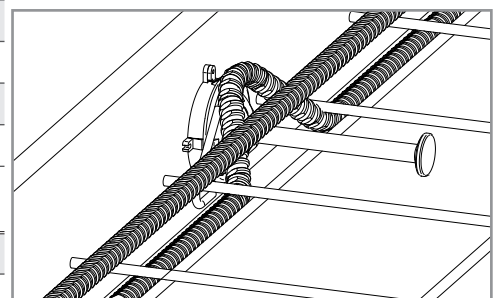


P59 Shear Bar

To gain extra load in shear, a P59 Shear Bar can be added above the anchor. As the diagram below shows, install the P59 shear bar against the 6.3 mm round bar. Please note that the P59 shear bar has no impact on tension loads.



P59 Shear Bar Dimensions					
Anchor Size	A	B	C	D	Rebar Size (d_b)
1.3 tonne	180 mm	127 mm	64 mm	487 mm	R10
2.5 tonne	230 mm	180 mm	75 mm	640 mm	N12
5 tonne	254 mm	229 mm	95 mm	737 mm	N16
10 tonne	305 mm	254 mm	97mm	864 mm	N20



Working Load Limit (Tonnes)					
Anchor Size	Anchor Length	Panel Thickness	Shear		Tension
			Without P59 Shear Bar	With P59 Shear Bar	
1.3 tonne	120	95	N/A	0.8	1.05
2.5 tonne	170	100	N/A	1.2	1.4
		125	1.5	1.8	1.9
		150	1.7	2	2.25
5 Tonne	240	150	2	2.2	3.2
		175	2.2	2.5	4

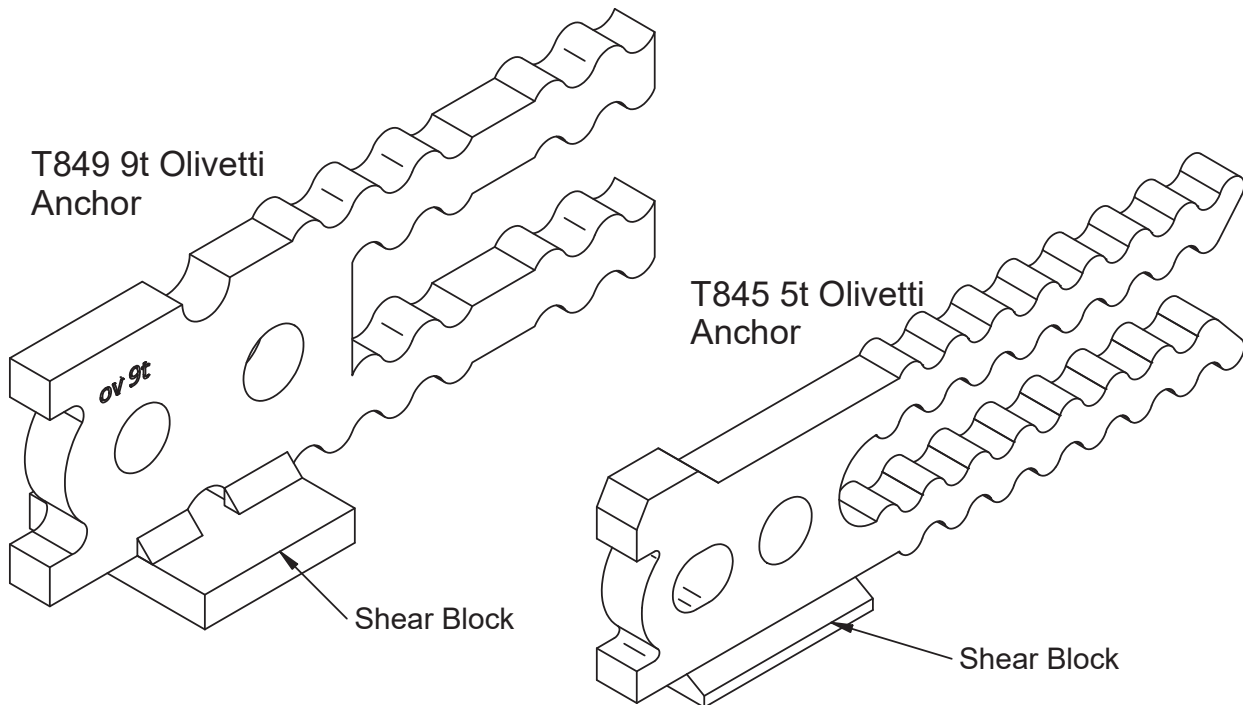
Working Load Limits Represent a factor of safety of 2.25 to 1.

Concrete strength 25 MPa

Minimum Corner Distance:

3 x Anchor Length; Minimum Spacing: 6 x Anchor Length

T84 Olivetti Edge Lift Anchor



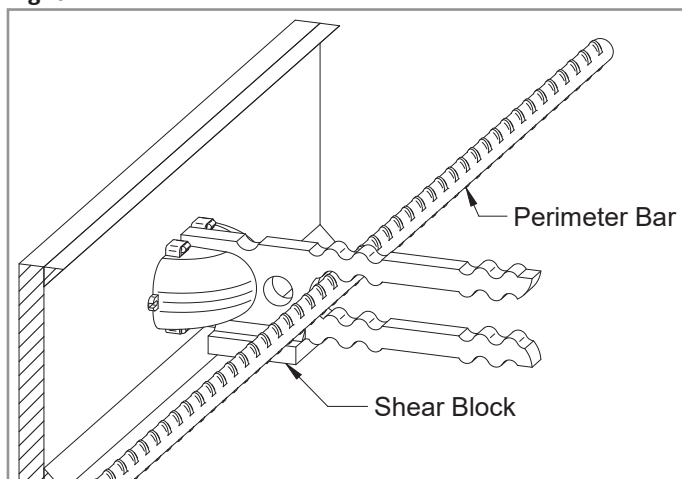
The T84 Olivetti Edge Lift Anchor is the ideal solution for edge lifting of precast & tilt-up panels. The large plate section of steel in the direction of shear prevents the anchor from bending and the ears on the head of the clutch stop it from bearing on the concrete significantly reducing concrete spalling compared to standard foot anchors.

The 5t version of the Olivetti Edge Lift comes with a disposal plastic void and shear plate welded to the bottom so the end user does not require rubber voids or shear bars. The T849 can be used in 175mm thick panels and thicker.

Installation

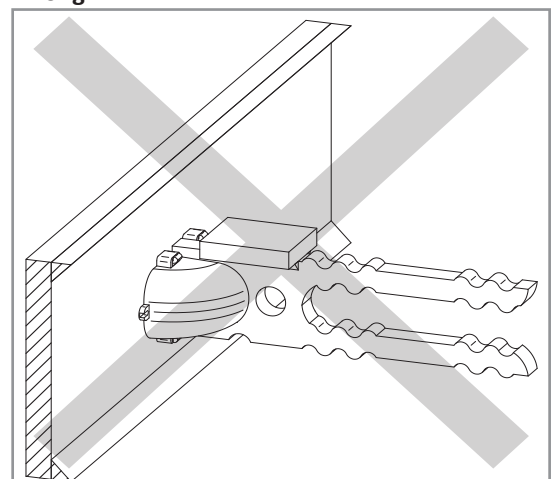
Install the T84 Olivetti Anchor, by nailing the void former to the formwork using the tabs and the end of the cap. Ensure that the shear block on the Olivetti Anchor is on the lower side of the panel. Never use the T84 Olivetti Anchor to flip panels and lay them down on the other face. There will be no shear capacity once the panel is flipped over. If this is required contact Nexus Construction Systems for alternatives.

Right



Always install the T84 Olivetti anchor with the shear block closer to the far face.

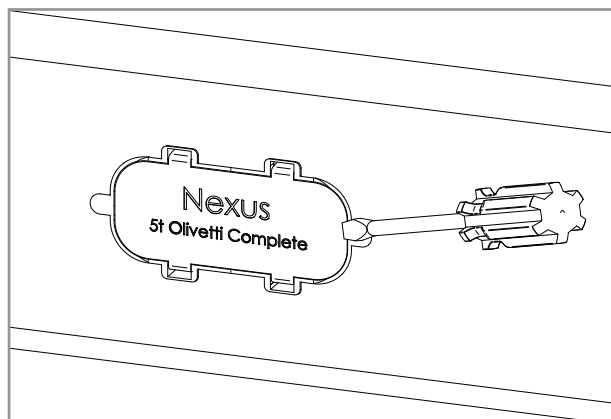
Wrong



Having the shear block installed incorrectly will significantly reduce its shear capacity.

Void Removal

Once formwork is removed use a screw driver on each side of the plastic void to pop out the void.



Anchor Size	Product Code	Min. Panel Thickness	Working Load Limit (Tonnes)		Clutch
			Shear	Tension	
5t	T845	150	1.9	5t ¹	P865
5t	T845	175	2.1	5t ¹	P865
5t	T845	200	2.3	5t ¹	P865
9t	T849	175	2.5	9t ²	P8610

Working Load Limits Represent a factor of safety of 2.25 to 1.

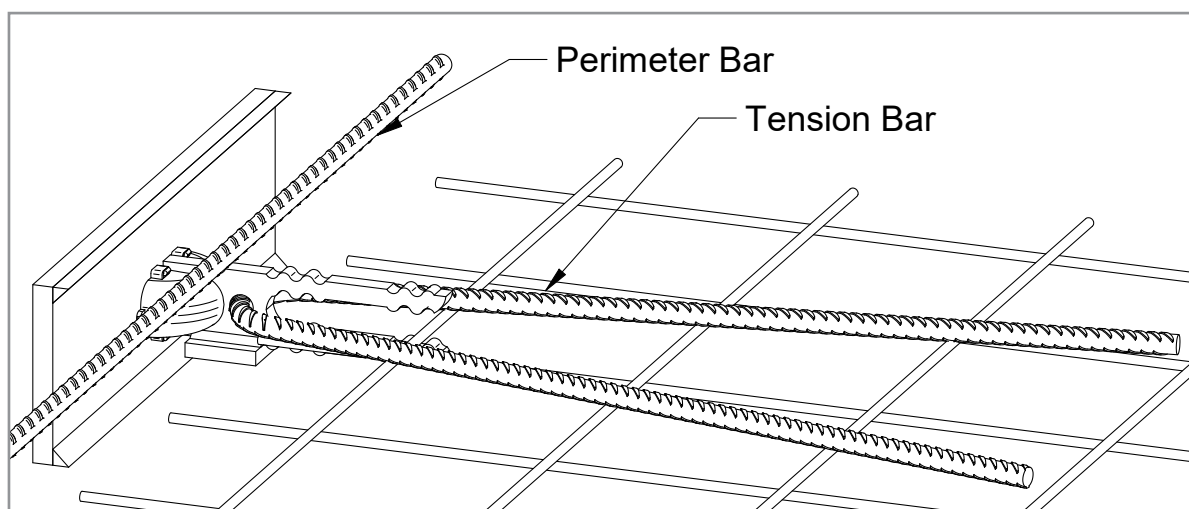
Concrete strength 25 MPa

Minimum Corner Distance:

3 x Anchor Length; Minimum Spacing: 6 x Anchor Length

¹ Must use anchor with N16 x 1400 Tension, see following page for details.

² Must use anchor with N20 x 1900 Tension, see following page for details.

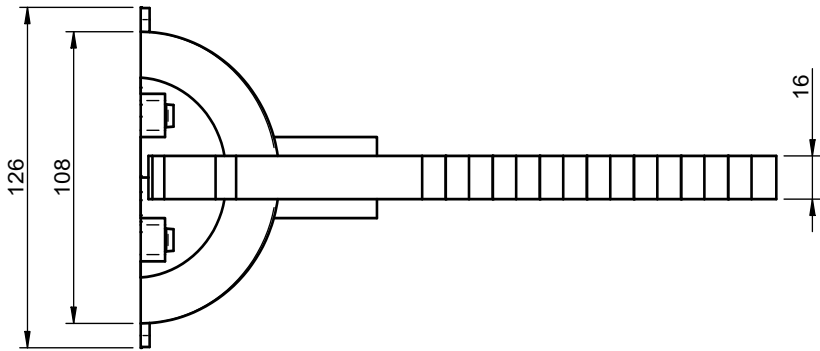
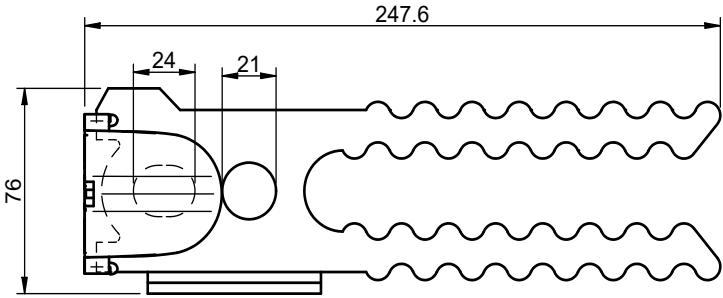
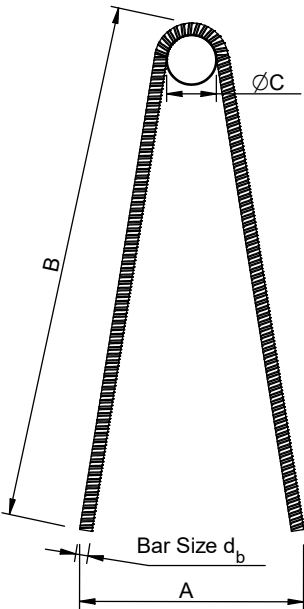


Using the T84 Olivetti Anchor with tension bar.

The T84 Olivetti Anchor is manufactured with meandering legs that resist pullout during normal erection situations. The Working Load Limit (WLL) chart following shows two sets of tension values. A higher tension load is achievable by installing a tension bar, which must be installed through the lower hole.

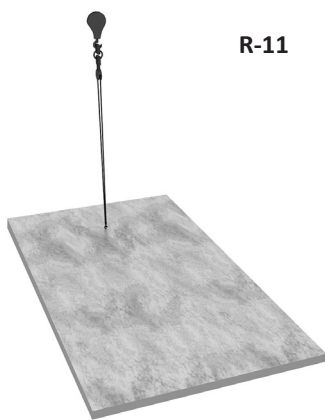
The tension bar must be made from deformed N grade reinforcing bar ($f_y = 500\text{MPa}$) that complies to AS/NZS 4671—2001. Precautions must be taken bending the bar — the bar must be bent around a pin with a diameter no smaller than 5 x the bar diameter.

P60 Tension Bar					
Tension Bar Size	Rebar Size (d_b)	Dimension (mm)			Mass
		A	B	C	
N16 x 1400	N16	250	700	80	2.2kg
N20 x 1900	N20	300	950	100	4.7kg



Rigging Set-up

The following diagrams show various types of rigging configurations. Although a 3-row lift has been shown here, it is recommended by Nexus and Australian Standard AS3850 to be avoided whenever possible due to the complex rigging that is involved; the difficulty in rigging these kind of panels can be seen in the diagram below. Unless otherwise specified on lifting design drawings, the following rigging configurations should always be used. Contractors must always use centre pick style spreader beams, as shown in the diagrams, as well as sheaves as required. This is to ensure that all lifters are loaded equally and that the panel will correctly rotate as the panel is been lifted. This is particularly important on panels where lifters have been offset from each other. The following rigging configurations represent those that will be used most of the time, very rarely for complicated panels, the rigging setup may vary slightly. In these cases the lifting engineer will indicate the type of rigging on the lifting design drawing. For panels that are edge lifted, the rigging setup is the same as for R-11, R-12 or R-14.



R-11



R-12



R-14



R-21



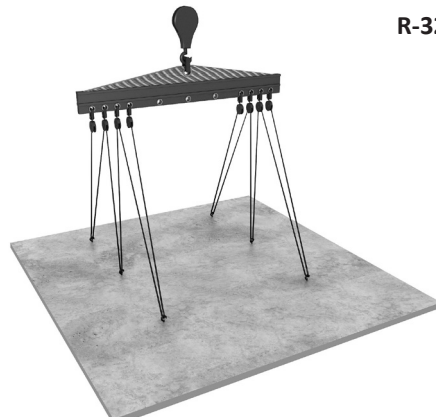
R-22



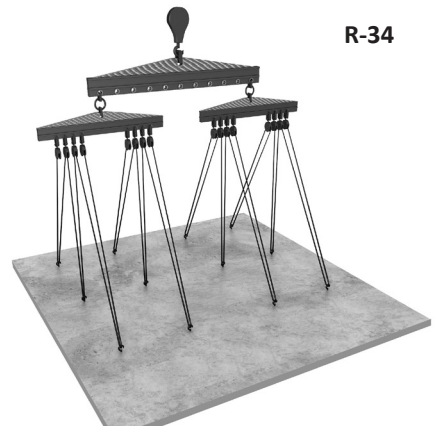
R-24



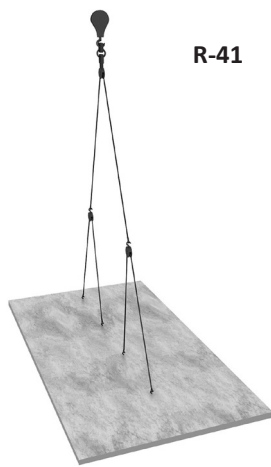
R-31



R-32



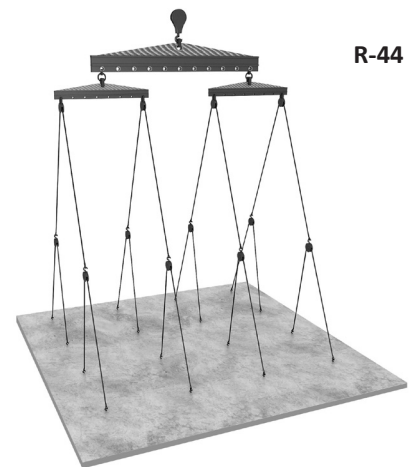
R-34



R-41



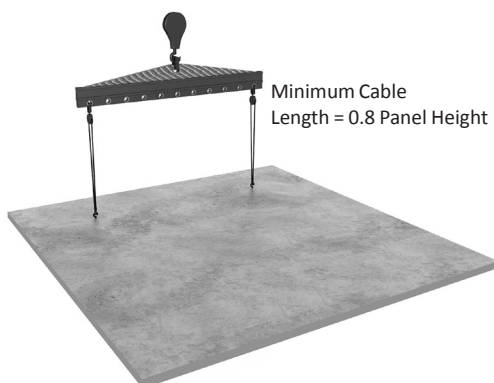
R-42



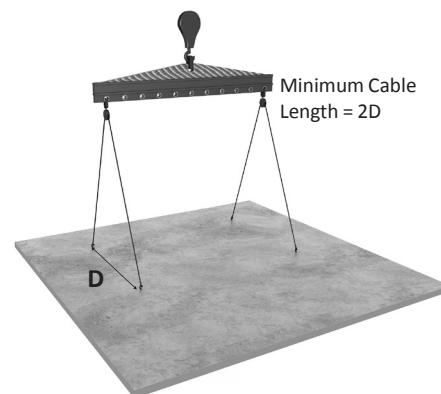
R-44

Slings can significantly change the bending moment in a panel. Shorter slings will try to pull the lifter inwards adding stress to a panel. All Nexus Construction Systems lifting designs are based on the minimum sling lengths shown in the diagrams below. Please note that the lifting design engineer may specify different length slings for any panel or any set of panels and it is extremely important that those specifications are adhered to. The diagrams below only shows the sling lengths for the 2-across setup. These same values apply if it is a 1, 4 or 8 across lift.

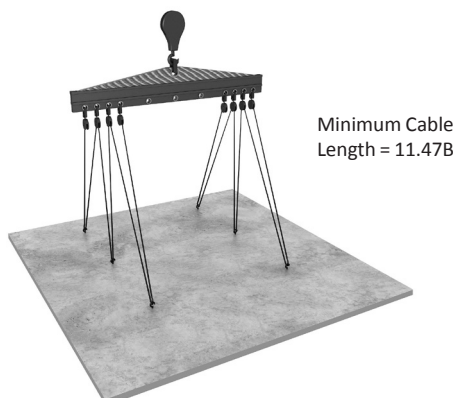
Single Row Rigging Lengths



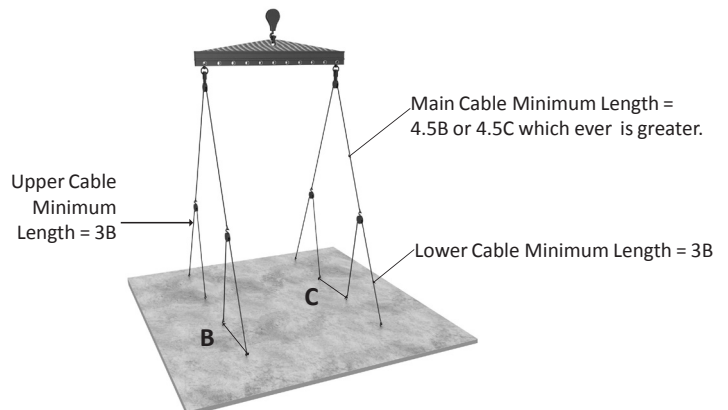
Two Row Rigging Lengths



Three Row Rigging Lengths



Four Row Rigging Lengths

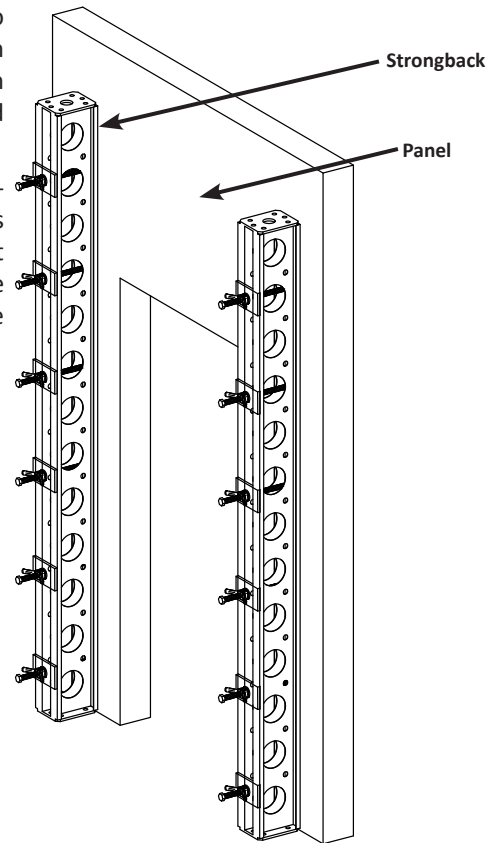
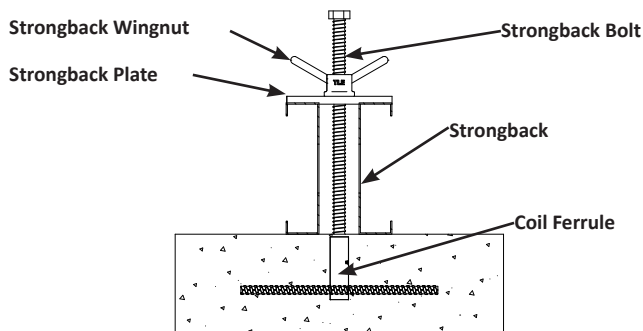


It is important that both the correct rigging configuration and sling lengths are used when lifting tilt up panels. Failure to do so may result in lifters being unequally loaded, resulting in a panel not rotating correctly and/or a lifter may fail. Sling lengths are extremely important in calculating the stresses in a panel, as such the use of a sling that is too short will result in stresses that are higher than calculated and potentially cause cracking of the panel during the lifting process.

Strongbacks

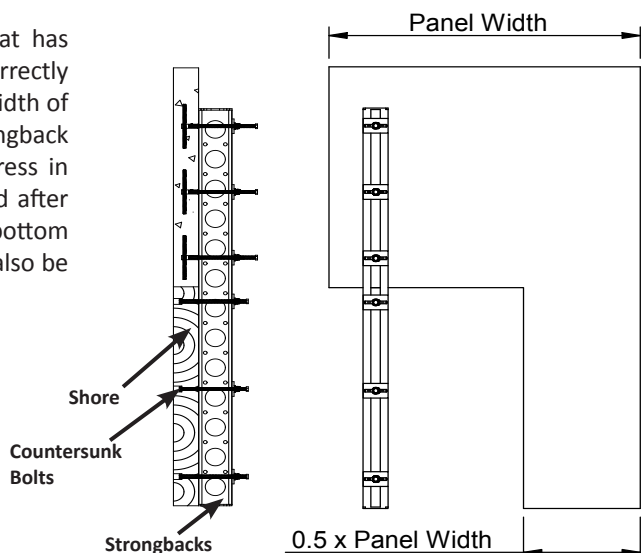
Tilting up panels with large openings can result in large stresses applied to the concrete sections either side of the opening that standard reinforcing can not handle. In order to stiffen these sections of concrete Nexus strongbacks can be used. These are bolted to the panel with strongback bolts that are screwed into previously cast coil ferrules.

Strongbacks can be removed once the panel is fully installed as per the in-service design specifications. Our offices have special lightweight steel Nexus Strongbacks that have the capacity to withstand 30kNm bending moment along the section or 18kNm across any bolted strongback joint. They are available in 1.8m, 2.7m and 3.6m lengths and can be joined together to make any combination length of those sizes.



Strongback - Shore

Unusual shaped panels will typically require strongback that has been shored to the same thickness as the panel in order to correctly lift. The shore must be the same thickness as the panel with a width of at least 180mm. It must also extend from the bottom of the strongback to the underside of the panel. This shore not only reduces stress in the concrete section but can help stabilise the panel during and after erection. They are always used for L-shaped panels that have a bottom section that is less than 50% of the overall panel width, but can also be used on other unusually shaped panels.



T18 Strongback Bolt

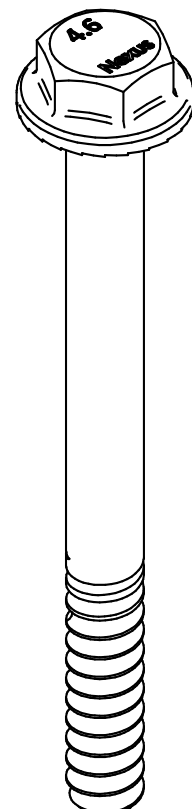
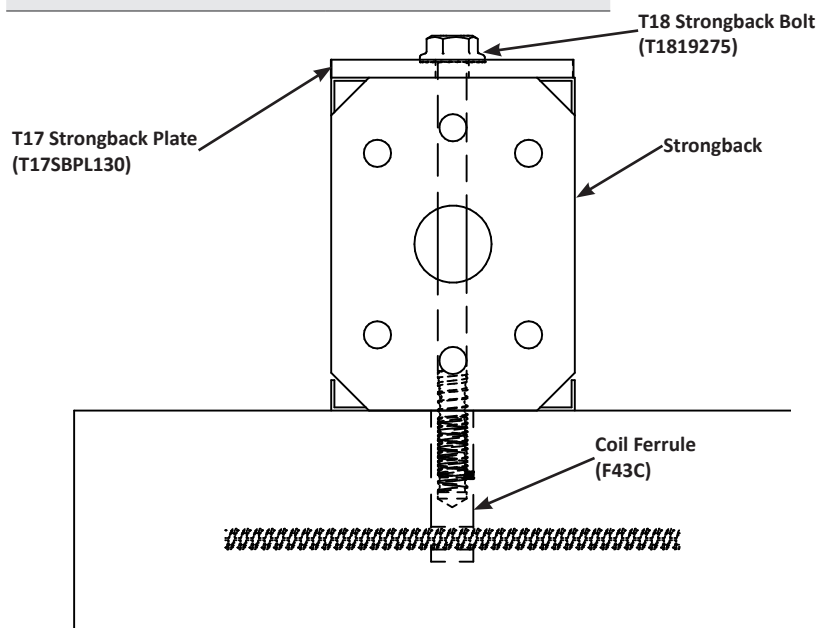
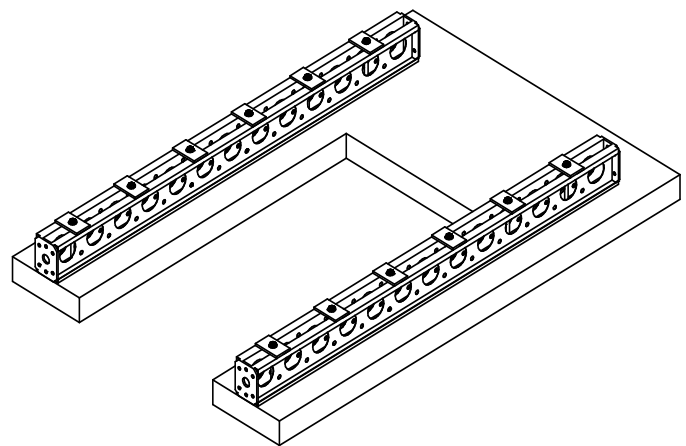
The T18 Strongback Bolt can be used instead of the strongback bolt and wing nut combination to bolt the strongback to the panel when using coil ferrules as the preferred connection method.

To use the T18 Strongback Bolt place the strongback sections over the coil ferrules once the antenna caps have been removed. Ensure that when multiple strongbacks sections are used they are bolted together using M16 Class 8.8 bolts.

Place a T17SBPL130 Strongback Plate on top of the strongback over the ferrule location and feed T18 Strongback Bolt through the plate into the coil ferrule cast into the concrete.

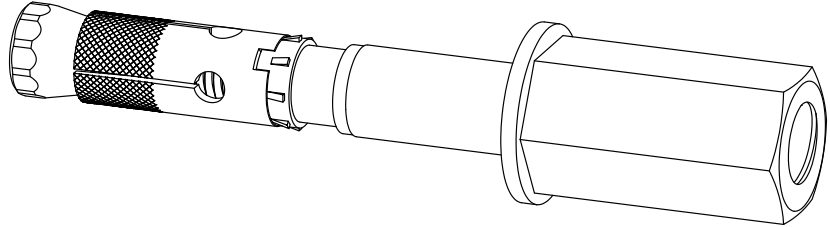
Tighten the T18 Strongback Bolt to the torque requirements set out in the table below.

T18 Strongback Bolt	
Product Code	T1819275
Insert Type	F43 Coil Ferrule
Bolt Diameter	19 mm
Colour	Silver
Head Colour	Red
Flange Diameter	39 mm
Overall Bolt Length	200 mm
Thread Length	60 mm
Bolt Class	4.6
Steel Strength	400 MPa
Hex Head Socket Type	30 mm
Tightening Torque	130-150 Nm



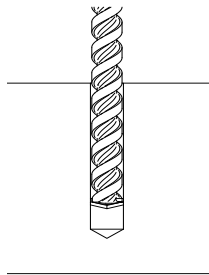
Emergency Strongback Bolt

The Emergency Strongback Bolt is a post installed bolt which has a special head with an incorporated female thread that is compatible with the Nexus Strongback Bolt. Used in situations where the strongback ferrule has been misplaced, not installed, tipped over or for any reason that has resulted in the strongback ferrule becoming unusable.

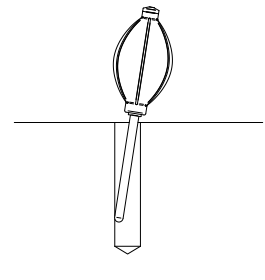


Installation

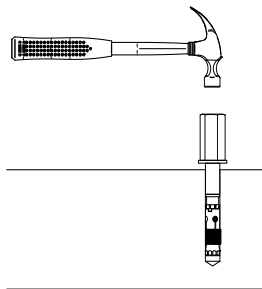
1. Drill Ø20mm Holes at locations dictated by the panels lifting design, these are to be no more than 80% of the depth of the panel. (For 125mm thick panels a 16-20mm thick steel plate must be used as spacer between the strongback and panel.)



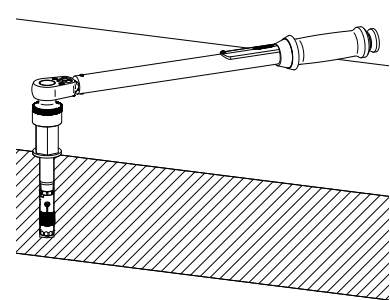
2. Using either compressed air or a brush clean out the hole of debris and dust.



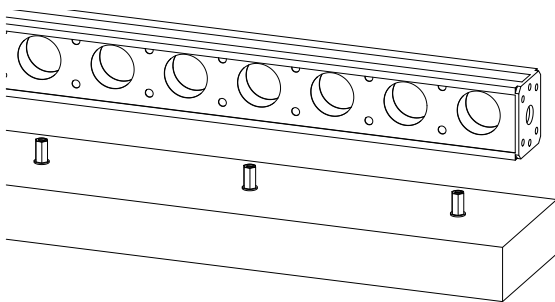
3. Using a hammer tap the Emergency Strongback Bolt down so that the underside of the washer is flat with the concrete surface.



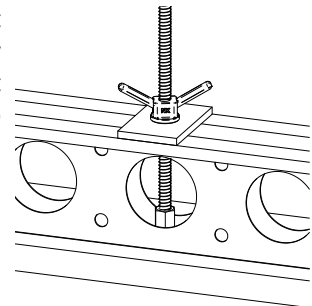
4. Using a torque wrench tighten the Emergency Strongback Bolt to 150 Nm.



5. Place the Nexus Strongback over the installed Emergency Strongback Bolts



6. Screw the strongback bolt into the head of the Emergency Strongback Bolt. Use the wingnut & plate to secure to strongback to the panel as per normal.



Emergency Strongback Bolt (NXESB20115)

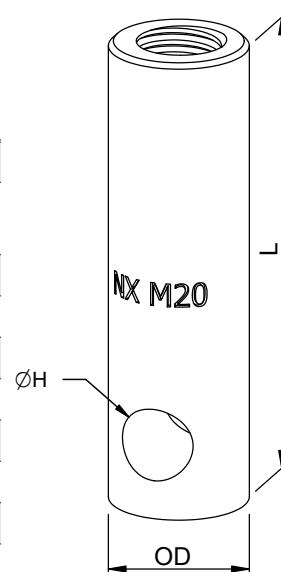
Allowable Tensile Capacity ¹	Allowable Shear Capacity	Minimum Edge Distance	Minimum Spacing	Installation Torque	Minimum Concrete Strength
16.2 kN	34.1 kN	300 mm	400mm	150 Nm	25 MPa

Working Load Limits Represent a factor of safety of 2.25 to 1.

F43 Standard Ferrule Inserts

Designed for heavy duty anchoring, F43 Ferrule inserts are cast-in anchors. Finishes include zinc plate, galvanized and also available in stainless steel. Standard Ferrules require an N12 x 300 mm reinforcing bar to be installed through the cross hole to achieve the full design capacity.

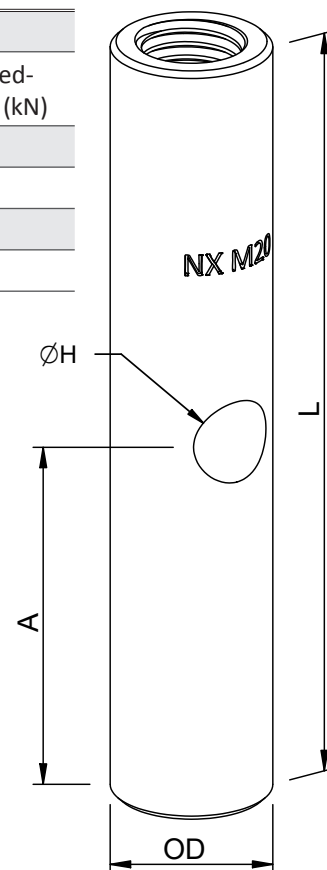
F43 Standard Ferrule with N12 x 300 Cross Bar						
Ferrule Size	Product Code	OD (mm)	L (mm)	ØH (mm)	Cross Bar Size	Design Tensile Embedded Capacity* ϕN_u (kN)
M12 x 75	F431275	28	75	15	N12 x 300	28.1
M12 x 96	F431296	28	96	15	N12 x 300	28.1
M16 x 75	F431675	28	75	15	N12 x 300	30.8
M16 x 96	F431696	28	96	15	N12 x 300	44.4
M20 x 75	F432075	28	75	15	N12 x 300	30.8
M20 x 96	F432096	28	96	15	N12 x 300	44.4
M24 x 100	F4324100	37	100	18	N16 x 300	46.0



F46 Double Ended Ferrules

Double ended Ferrules are the ideal solution when fixing is required on both sides of the panel. Double end ferrules require an N12 x 300 mm reinforcing bar to be installed through the cross hole to obtain the full working load.

F46 Double Ended Ferrules With N12 x 300 Cross Bar							
Ferrule Size	Product Code	OD (mm)	L (mm)	ØH (mm)	A (mm)	Cross Bar Size	Design Tensile Embedded Capacity* ϕN_u (kN)
M16 x 140	F4616140	28	140	15	70	N12 x 300	35.9
M20 x 140	F4620140	28	140	15	70	N12 x 300	35.9
M16 x 170	F4616170	28	170	15	85	N12 x 300	46.0
M20 x 170	F4620170	28	170	15	85	N12 x 300	46.0



* ($F_c=0.6$; $F_s=0.8$ Ultimate) Concrete Compressive strength: 32MPa Minimum edge distance: 300 mm, Minimum Spacing: 600 mm Bolt shear capacity and concrete strength will determine shear capacity.
Bolt capacity may be lower than ferrule or concrete capacity.
Load represents ultimate load at each end of the ferrule.
Refer Nexus Ferrule Inserts Design Manual for additional engineering information.

F44 Star Ferrule

Also designed for heavy duty anchoring, the F44 Star Ferrule inserts are cast-in anchors available in zinc plate finish, galvanised or stainless steel. Star Ferrules do not require a cross bar to be installed to obtain the full working load. However, a cross hole is provided to allow a 300mm long bar to be installed if required for ductility performance.

F44 Star Ferrules							
Ferrule Size	Product Code	OD (mm)	L (mm)	H (mm)	A (mm)	B (mm)	Design Tensile Embedded Capacity* ϕN_u (kN)
M12 x 55	F441255	17	55	8	43	34	24.0
M12 x 85	F441285	28	85	15	67	55	28.1
M16 x 75	F441675	28	75	15	57	55	38.1
M20 x 75	F442075	28	75	15	57	55	38.1
M16 x 85	F441685	28	85	15	67	55	46.0
M20 x 85	F442085	28	85	15	67	55	46.0
M20 x 110	F44201105	28	110	12	92	55	67.7

* ($F_c=0.6$; $F_s=0.8$ Ultimate) Concrete Compressive strength: 32MPa

Minimum edge distance: 300 mm, Minimum Spacing: 600 mm

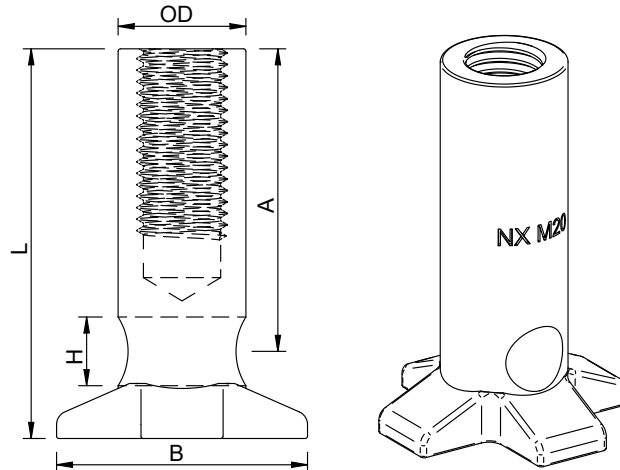
Bolt shear capacity and concrete strength will determine shear capacity.

Bolt capacity may be lower than ferrule or concrete capacity.

Load without cross bar.

All ferrules stocked in hot-dipped galvanised finish.

Grade 316 available for M12x55, M16x85, M20x85.



Ferrules used for Temporary Bracing

AS 3850 uses permissible stress design for the calculation of brace forces in temporarily braced tilt-up and precast panels. This standard dictates that cast-in brace fixings have a factor of safety of 2.25 to 1. Standard and Coil Ferrules require an N12 x 300 mm reinforcing bar to be installed through the cross hole to obtain the full working load.

Ferrules For Temporary Bracing							
Ferrule Size	Product Code	OD (mm)	L (mm)	H (mm)	Cross Bar Size	Working Load Limit Tension (kN)**	
						15Mpa	25Mpa
M20 x 96 Standard Ferrule	F432096R	28	96	15	N12 x 300	18.5	26.2
Coil Ferrule	F43C	28	96	15	N12 x 300	18.5	26.2
M20 x 85 Star Ferrule	F442085	28	96	15	Not Required	19.1	27.1
Coil x 85 Star Ferrule	F442085	28	96	15	Not Required	19.1	27.1

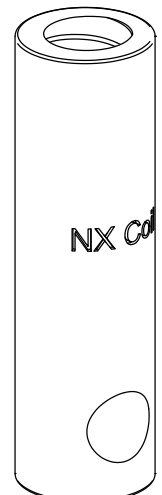
** Coil ferrule or M20 ferrules used for temporary panel bracing. (FOS 2.25:1)

Minimum edge distance a: 300 mm, Minimum Spacing: 600 mm

Bolt shear capacity and concrete strength will determine shear capacity.

Bolt capacity may be lower than ferrule or concrete capacity.

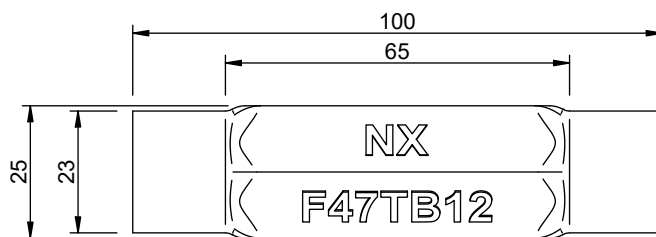
Always use a Class 4.6 bolt for securing braces to ferrules.



F47 TB Coupler

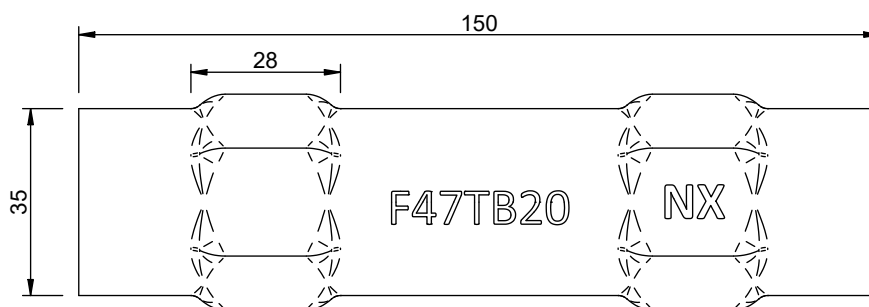
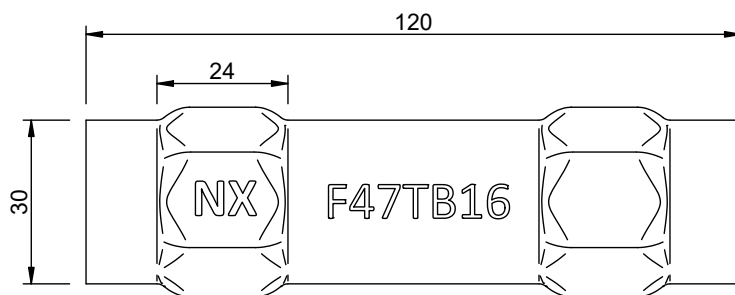
Nexus's TB coupler is available in three sizes to suit N12, N16 and N20 Threaded Bar

It is designed as an in-line full strength connector for two lengths of the reinforcing Threaded Bar screwed in with minimal effort to achieve the full breaking strength of the reinforcing bar.



Bar Size	Product Code	Minimum Thread Engagement Length (mm)	Mass (kg)
N12	F47TB12	45	0.23
N16	F47TB16	55	0.38
N20	F47TB20	70	0.68

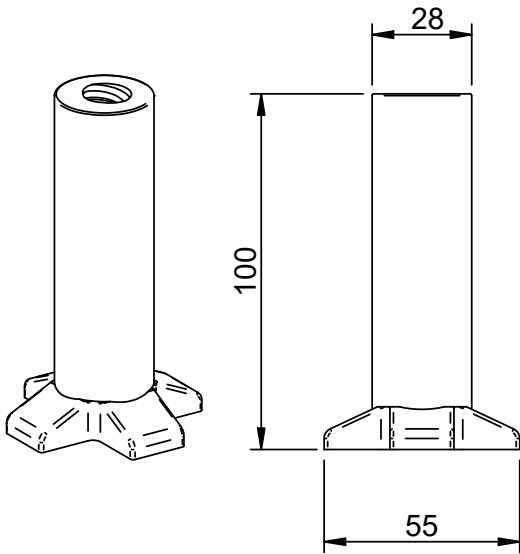
Installation: Screw in both lengths of Threaded Bar by hand until they stop, tighten both lengths of bar using a 300mm wrench. Ensure both ends have been installed with the minimum thread engagement length.



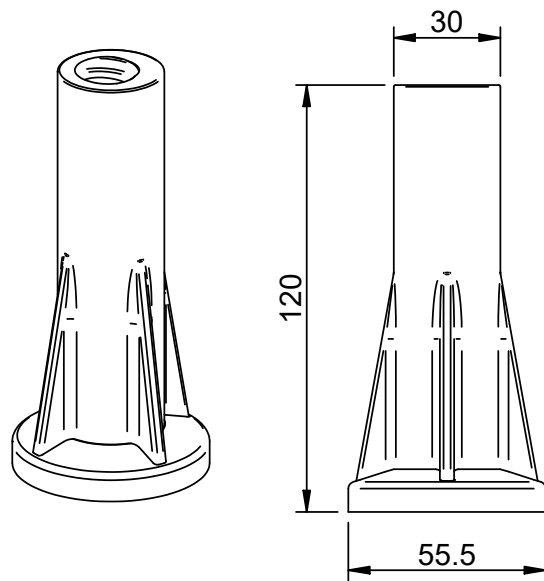
F47 Threaded Bar couplers will develop the full breaking strength of the bar

Bar Size	f_y (MPa)	F_y (kN)	F_u (kN)
N12	500	56	61
N16	500	100	108
N20	500	157	169

F54 Threaded Bar Ferrule



F5412100 N12 x 100 Threader Bar Ferrule



F5416120 N16 x 120 Thread Bar Ferrule

Nexus's Threaded Bar Ferrules are currently available in two sizes to suit 12mm and 16mm Threaded Reinforcing Bars. Ideally suited for starter bar connections to floor slabs and mezzanine floors.

They can easily be installed in the near face, far face and side of tilt-up and precast concrete panels. No additional cross bar is required to develop this ferrule's working load limit.

Description	Product Code	Reinforcing Bar Size	Overall Length (L) mm	Min Thread Engagement Length (mm)*
N12 x 100 Threaded Bar Ferrule	F5412100	N12	100	50
N16 x 120 Threaded Bar Ferrule	F5416120	N16	120	80

* Reinforcing bar must be fully installed until it stops and tightened into position with a 300mm wrench.

Reduced characteristic ultimate concrete tensile capacity

Ferrule Type	Tensile Capacity $\phi N_{u,c}$ (kN)
N12 x 100	45.2
N16 x 120	80.4

$\phi_c = 0.6$; $f_{cm} = 32\text{MPa}$,

Minimum edge distance 3 x effective depth

Minimum spacing 6 x effective depth

Appendix A. Chemical TDS & SDS

NX EzyLift TDS

NX EzyLift SDS

NX EzyLift WB TDS

NX EzyLift WB SDS

NX EZYLIFT

**Solvent-based, chemically active bondbreaker
for tilt-up, lift slab and precast construction.**

HOW IT WORKS

In contrast to most conventional bondbreakers, NX EZYLIFT does not contain any wax or hydrocarbon resins and, as a result, does not depend on a physical barrier deposited on top of the casting slab to prevent bonding. Instead, NX EZYLIFT is formulated with organic compounds that react chemically with excess limes present in the concrete surface to form metallic soaps which, when properly applied, prevents wall panel sticking. Site cast wall panels separate easily and completely without the need for pry bars or wedges commonly used with membrane-forming bondbreakers.

APPLICATIONS

- Use as a bondbreaker in tilt-up, lift slab and precast concrete construction when weather conditions do not allow for the use of water-based products.

ADVANTAGES

- Being chemically active and highly effective, NX EZYLIFT supplies part of the reaction product necessary for clean separation and the concrete provides the remaining portion. The amount of NX EZYLIFT necessary to achieve the proper cure and bondbreaking function is typically less when compared to the use of hydrocarbon resin or wax type bondbreakers. The savings in application time and material costs make NX EZYLIFT more economical to use than competing bondbreakers, irrespective of unit costs.
- NX EZYLIFT is an excellent value-engineered alternative when protection from the "osmotic effect" is not required.
- Achieves exceptional wall panel surface appearance.
- Leaves no residue or resulting staining on wall panel or casting slab floor surfaces when properly applied.
- Achieves a crisp, positive release that minimizes panel surface defects and reduces panel resurfacing/patching costs.
- Does not contain any wax or hydrocarbon resins like many conventional bondbreakers that often leave a difficult-to-remove residue on wall panel and casting slab surfaces. When this residue is not properly removed, it often causes floor and exterior wall panel paint and coating adhesion problems.
- Because it is solvent based, NX EZYLIFT dries faster than the water-based version NX EZYLIFT WB and is not affected by high humidity.
- Excellent resistance to washoff from normal rain showers and dew when applied directly to previously uncoated concrete surfaces.
- Dust, dirt and mud can be easily removed from casting slab floor surfaces by washing with low-pressure water.
- Resistant to sunlight-induced oxidation damage that can necessitate the reapplication of competitive bondbreakers even when panel concrete placement is delayed a few days.

▲ PRECAUTIONS ▲

- Not recommended for use as a bondbreaker on broom-finished or rough-finished concrete surfaces.
- Not recommended for application over any other manufacturer's inorganic silicate-based floor sealer, hardener or organic resin-based curing, sealing or combination cure and seal product. Failure to follow this recommendation can result in panel surface defects or panel sticking.
- If a delay of more than 2 weeks occurs between the final bondbreaker application coat and panel concrete placement, it will be necessary to check for a sufficient bondbreaker film on the casting slab. If the bondbreaker film is insufficient, the bondbreaker must be reapplied as necessary before concrete placement.
- Verify that product is within the "USE BY" date stated on product packaging. Do not use expired product. The use of expired product may result in poor product performance or failure.
- Not recommended for application over or in conjunction with any other manufacturer's tilt-up bondbreaker.
- Not recommended for application in the rain or if rain is anticipated within 2 hours of application. Surfaces exposed to rain or running water within this time period will require reapplication.
- It is not recommended to use a pressure washer to clean the casting/floor slab surface after the application of NX EZYLIFT and prior to the wall panel concrete being placed. If necessary, a low-pressure garden hose with a non-aggressive spray nozzle may be used to remove contamination and debris prior to placing wall panel concrete.
- Not recommended for bondbreaker application to casting slab surfaces previously cured with polyethylene or curing blankets without first removing all salt deposits. Failure to remove all salt deposits can result in panel surface blemishes or defects.
- Not recommended for application to casting slab surfaces that are frozen or when ambient temperatures are below 40° F (4° C) or expected to drop below 40° F (4° C) within 12 hours following application.
- Not recommended for application without the proper sprayer and correct spray tip. See USE INSTRUCTIONS for specific sprayer and tip size recommendations.
- Not recommended for use in tilt-up applications where casting slab or panel concrete mix design incorporates pozzolans, such as fly ash, without first contacting Nexus for specific recommendations regarding application procedures and rates. Failure to do so may result in panel surface blemishes and/or panel sticking.

USE INSTRUCTIONS

- Request current product literature, labels and safety data sheets from Nexus and read thoroughly before product use.
- Site environmental conditions, substrate conditions and construction have a major effect on product selection, application methods, procedures and rates, appearance and performance. Product literature provides general information applicable to some conditions. However, an adequate site test application by the purchaser or installer in advance of field scale use is mandatory (irrespective of any other verbal or written representations) to verify that product and quantities purchased can be satisfactorily applied and will achieve desired appearance and performance under intended use conditions.
- Recommended spray tip sizes are 8003-LP, 8004-LP and 8005-LP. The coarser (8005-LP) spray tip should be used on porous casting slab surfaces where additional bondbreaker is necessary to ensure sufficient film holdout. Use the less coarse (8003-LP) spray tip for application on less porous casting slab surfaces. The use of an improper sprayer and/or incorrect spray tip generally results in either over or under application.
- NX EZYLIFT should be applied in accordance with recommended procedures to achieve even and uniform coverage. Equipment should be clean and dry prior to use.
- Typical drying time is 30 minutes to 3 hours, but varies with the presence or absence of a moisture barrier beneath the casting slab, climatic conditions and application rate. Extended drying times in excess of 24 hours are possible when product is applied heavily during cool weather and a moisture barrier is present. Reducing the application rate and applying in multiple thin coats in lieu of one heavy coat will greatly reduce drying time.
- Avoid scouring the casting slab surface during panel concrete placement by using a deflection board.

BONDBREAKER APPLICATION

- Casting slab areas should be well cured, smooth and dense.
- Remove all dust, dirt, saw cut residue, standing water and other contaminants prior to applying bondbreaker coats with a broom, leaf/air blower or low-pressure garden hose. Do not pressure wash the surface.
- The number of bondbreaker coats and related application rate required to achieve complete, uniform coverage of casting slab varies with concrete mix design, placing and finishing procedures, weather conditions, etc. Because of this, it is not possible to prescribe application rates or procedures inclusive of all site variables.
- Best results are obtained when successive coats of NX EZYLIFT are applied at right angles (perpendicular) to each other.
- An adequate application is indicated by the presence of a dry, soap-like feel uniformly apparent to touch over the entire treated area with no indication of greater accumulations in

low spots or depressions. Following bondbreaker application and immediately prior to panel concrete placement, be certain casting slab surfaces evidence the dry soap-like feel, but do not evidence over application of NX EZYLIFT as indicated by a slippery or grease-like feel to the touch. Over application may result in retardation of panel skin or dusting, surface irregularities and/or discoloration, as well as unreacted bondbreaker residue on panel and floor surfaces.

- Typically, casting slab surfaces that are more porous, resulting from conditions such as improper curing, the addition of pozzolans such as fly ash or that received a more open or less tight finish, will require more NX EZYLIFT than slab surfaces that are less porous.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO EVALUATE THE VARIOUS CONDITIONS ON EACH PROJECT AND TO DETERMINE THE CORRECT APPLICATION RATE OF THE NX EZYLIFT BONDBREAKER COATS. IF UNSURE, CONTACT NEXUS FOR SPECIFIC RECOMMENDATIONS.
- CAUTION: THE PRIMARY REASON FOR PANELS STICKING TO CASTING SLABS IS AN INADEQUATE FILM OF BONDBREAKER ON THE CASTING SLAB SURFACE AT THE TIME OF PANEL CONCRETE PLACEMENT. IT IS YOUR RESPONSIBILITY TO VERIFY THAT A CONTINUOUS FILM OF BONDBREAKER CAN BE FELT ON THE CASTING SLAB SURFACE AS PREVIOUSLY DESCRIBED IMMEDIATELY PRIOR TO PLACEMENT OF PANEL CONCRETE.
- Rain occurring prior to product drying will necessitate reapplication of bondbreaker.
- Do not apply to reinforcing steel or lifting inserts.
- Avoid spray drifts, runs or puddles. Promptly wipe up any material excesses that can lead to subsequent adhesive failure of floor coatings and wall paints.
- When using NX EZYLIFT for sand bed casting, contact Nexus for specific written recommendations.
- To avoid wood sugar-related concrete retardation and dusting at panel edges and feature strip locations, use Nox-Crete's Clear Pre-Form to seal all wood that may contact panel concrete, including edge forms, blockout forms and chamfer and feature strips prior to bondbreaker application.

Existing Casting Slabs

- Verify concrete surface is free of substances that could adversely affect product performance.
- If a membrane-forming curing or sealing compound was used, it will be necessary to remove the coating from the casting slab surface prior to applying bondbreaker. Use Nox-Crete's Bio-Clean PLUS to chemically remove all coating residue.
- Apply successive coats of NX EZYLIFT until the casting slab surface appears uniformly dark in appearance for at least 2-3 hours following the last coat. If the treated slab appears light in color either generally or in spots within 2-3 hours of last application, excessive slab porosity is indicated. Reapply NX EZYLIFT to all light-colored areas. If areas of light color or dry appearance persist, thoroughly wet affected areas with water to fill concrete surface pores, squeegee off excess water and then immediately re-apply NX EZYLIFT.

NX EZYLIFT p. 2

- The typical effective coverage rate for all combined bondbreaker coats applied to an existing, clean and unsealed casting slab is 200-400 sf / gal (5-10 sm / L). The application rate can vary widely depending upon the specific conditions. Do not over or under apply.

STRIPPING

- To remove residual bondbreaker from casting slab floor surfaces resulting from over application of the bondbreaker, pretreat the areas to be stripped with Nox-Crete's Bio-Clean Plus. Scrub the treated surfaces using a floor-scrubbing machine equipped with nylogrit scrub brushes. Squeegee off the excess Bio-Clean Plus residue, rinse thoroughly with water and squeegee dry.
- To clean panel surfaces, pretreat the areas to be cleaned with a detergent solution consisting of 0.5 lbs (225 gms) of trisodium phosphate in 1 gal (3.8 L) of water. Rinse the detergent solution off with water using a minimum 4,000 psi power washer.
- Determine adequacy of the surface preparation of panels and casting slabs with appropriate site test to verify acceptable adhesion, appearance and performance of paints, coatings, adhesives, sealers, sealants, grouts, etc. prior to application. See ACI 551 for specific recommendations.

TECHNICAL DATA

Color	Red Liquid
Clarity	Clear
Bulk Density	6.70 lbs/gal (807 g/L)
VOC	726 g/L
Viscosity	43 SUS @ 100° F (37° C)
Flash Point	72° F PMCC
Gel Point	Below 0°F (-18°C)

SHELF LIFE

Packaged in 5.3 gal (20 L) pails and 52.8 gal (200 L) drums

SHELF LIFE

Shelf life is 1 year. Use before the "USE BY" date stated on product packaging.

HANDLING/STORAGE

Product is a flammable liquid. Store in a dry location within a temperature range between 40° F (4° C) and 100° F (38° C). NX EZYLIFT is not affected by freezing and does not require warming before use. Drums stored outside should be protected from water accumulation on drum head. Following each liquid removal, tightly reseal all container bungs or caps promptly to prevent loss of necessary volatile solvents.

CAUTION: FAILURE TO PROPERLY STORE PRODUCT CAN RENDER IT UNSUITABLE FOR USE.

AVAILABILITY & TECHNICAL SERVICES

For source or technical information, call Nexus at (03) 9988 7707

LIMITED WARRANTY

NOTICE-READ CAREFULLY

CONDITIONS OF SALE

Nox-Crete offers this product for sale subject to, and Buyer and all users are deemed to have accepted, the following conditions of sale and limited warranty which may only be varied by written agreement of a duly authorized corporate officer of Nox-Crete. No other representative of or for Nox-Crete is authorized to grant any warranty or to waive limitation of liability set forth below.

WARRANTY LIMITATION

Nox-Crete warrants this product to be free of manufacturing defects. If the product when purchased was defective and was within use period indicated on container or carton, when used, Nox-Crete will replace the defective product with new product without charge to the purchaser.

Nox-Crete makes NO OTHER WARRANTY, either express or implied, concerning this product. There is NO WARRANTY OF MERCHANTABILITY. In no case shall Nox-Crete be liable for special, indirect or consequential damages resulting from the use or handling of the product and no claim of any kind shall be greater in amount than the purchase price of the product in respect of which damages are claimed.

INHERENT RISKS

Nox-Crete MAKES NO WARRANTY WITH RESPECT TO THE PERFORMANCE OF THE PRODUCT AFTER IT IS APPLIED BY THE PURCHASER, AND PURCHASER ASSUMES ALL RISKS ASSOCIATED WITH THE USE OR APPLICATION OF THE PRODUCT.

EZYLIFT BONDBREAKER

Infosafe No.: LQAHM
ISSUED Date : 11/04/2021
ISSUED by: NEXUS CONSTRUCTION
SYSTEMS

1. IDENTIFICATION

GHS Product Identifier

EZYLIFT BONDBREAKER

Company Name

NEXUS CONSTRUCTION SYSTEMS (ABN 76 005 928 987)

Address

UNIT 4 25-27 OLIVE GROVE KEYSBOROUGH
VIC 3173 AUSTRALIA

Telephone/Fax Number

Tel: 03 9988 7701

Recommended use of the chemical and restrictions on use

Solvent-based tilt-up cure and bondbreaker.

2. HAZARD IDENTIFICATION

GHS classification of the substance/mixture

Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.

Classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Flammable Liquids: Category 3

Carcinogenicity: Category 1

Eye Damage/Irritation: Category 1

STOT Single Exposure: Category 3 (narcotic)

STOT Single Exposure: Category 3 (respiratory tract irritation)

STOT Repeated Exposure: Category 2

Toxic to Reproduction: Category 1A

Skin Corrosion/Irritation: Category 2

Aspiration Hazard: Category 1

Acute Toxicity - Inhalation: Category 4

Hazardous to the Aquatic Environment - Long-Term Hazard: Category 3

Signal Word (s)

DANGER

Hazard Statement (s)

H226 Flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

H336 May cause drowsiness or dizziness.

H350 May cause cancer.

H360 May damage fertility or the unborn child.

H373 May cause damage to organs through prolonged or repeated exposure.
H412 Harmful to aquatic life with long lasting effects.

Pictogram (s)

Health hazard, Flame, Corrosion, Exclamation mark



Precautionary statement – Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash contaminated skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement – Response

P308+P313 IF exposed or concerned: Get medical advice/attention.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P370+P378 In case of fire: Use dry chemical, foam, carbon dioxide for extinction.

Precautionary statement – Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Precautionary statement – Disposal

P501 Dispose of contents/container to an approved waste disposal plant.

Other Information

This product contains an Ototoxic substance.
Combination with noise exposure, even at safe levels, could still cause auditory injuries and hearing loss.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Name	CAS	Proportion
Hydrotreated Light Distillate		0-100 %
Alcohol	N/A	0-100 %
Toluene	108-88-3	<11 %
1,2,4-trimethyl benzene	95-63-6	<10 %
Xylene	1330-20-7	<10 %
cumene	98-82-8	<1 %
Ethylbenzene	100-41-4	<1 %
Ingredients determined not to be hazardous		Balance

4. FIRST-AID MEASURES

Inhalation

If inhaled, remove affected person from contaminated area. Apply artificial respiration if not breathing. Seek medical attention.

Ingestion

Do NOT induce vomiting. Wash out mouth and lips with water. Where vomiting occurs naturally have affected person place head below hip level in order to reduce risk of aspiration. Seek immediate medical attention.

Skin

Remove all contaminated clothing immediately. Wash affected area thoroughly with soap and water. Wash contaminated clothing before reuse or discard. Seek medical attention.

Eye contact

If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Seek immediate medical attention.

First Aid Facilities

Eyewash, safety shower and normal washroom facilities.

Advice to Doctor

Treat symptomatically.

Other Information

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use dry chemical, foam, carbon dioxide.

Unsuitable Extinguishing Media

Water jet.

Hazards from Combustion Products

Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide and oxides of nitrogen.

Specific Hazards Arising From The Chemical

Flammable liquid and vapour. Vapour/air mixtures may ignite explosively. Flashback along the vapour trail may occur. Runoff to sewer may create fire or explosion hazard.

Hazchem Code

•3Y

Decomposition Temperature

Not available

Precautions in connection with Fire

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. In case of fire the product may be violently or explosively reactive. Use water spray to disperse vapours. This product should be prevented from entering drains and watercourses.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures

Wear appropriate personal protective equipment and clothing to prevent exposure. Extinguish or remove all sources of ignition and stop leak if safe to do so. Increase ventilation. Evacuate all unprotected personnel. If possible contain the spill. Spillage can be slippery. Place inert absorbent, non-combustible material onto spillage. Use clean non-sparking tools to collect the material and place into suitable labelled containers for subsequent recycling or disposal. Dispose of waste according to the applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water and waste management authorities in accordance with local regulations.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Avoid contact with skin and eyes. Wear overalls, impervious gloves and safety glasses. Use in designated areas with local exhaust ventilation, away from sparks, flames and other ignition sources. Use approved flammable liquid storage containers in the work area. Prevent release of vapours and mists into workplace air. Keep containers tightly closed. Take precautionary measures against static discharges. Do not empty into drains. Ensure a high level of personal hygiene is maintained when using this product, that is, always wash hands before eating, drinking, smoking or using the toilet facilities.

Avoid exposure. Do not handle until all safety precautions have been read and understood. It is recommended that pregnant or breastfeeding women should not handle this product unless adequate exposure protection can be assured at all times. Female personnel planning pregnancy should be made aware of the potential risks.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well-ventilated area away from sources of ignition, foodstuffs, clothing and incompatible materials such as oxidising agents. Keep containers closed when not in use, securely sealed and protected against physical damage. Inspect regularly for deficiencies such as damage or leaks. Have appropriate fire extinguishers available in and near the storage area. Take precautions against static electricity discharges. Use proper grounding procedures. Ensure that storage conditions comply with applicable local and national regulations.

For information on the design of the storeroom, reference should be made to Australian Standard AS1940 - The storage and handling of flammable and combustible liquids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limit values

No exposure standards have been established for this material. However, the available exposure limits for ingredients are listed below:

Oil mist, refined mineral

TWA: 5 mg/m³

Trimethylbenzene

TWA: 25 ppm, 123 mg/m³

Toluene

TWA: 50 ppm, 191 mg/m³

STEL: 150 ppm, 574 mg/m³

Notices: Sk,

Cumene

TWA: 25 ppm, 125 mg/m³

STEL: 75 ppm, 375 mg/m³

Notices: Sk, Carc. 1B

Ethylbenzene

TWA: 100 ppm, 434 mg/m³

STEL: 125 ppm, 543 mg/m³

Xylene

TWA: 80 ppm, 350 mg/m³

STEL: 150 ppm, 655 mg/m³

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

STEL (Short Term Exposure Limit): The average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

'Sk' Notice: Absorption through the skin may be a significant source of exposure. The exposure standard is invalidated if such contact should occur.

'Category 1B (Carc. 1B)' Notice: Presumed to have carcinogenic potential for humans.

Source: Safe Work Australia

Biological Limit Values

Name: Xylene

Determinant: Methylhippuric acids in urine

Value: 1.5 g/g creatinine

Sampling time: End of shift

Name: Ethylbenzene

Determinant: Sum of mandelic acid and phenylglyoxylic acid in urine

BEI®: 0.15 g/g creatinine

Sampling time: End of shift

Notation: Ns.

Name: Toluene

Determinant: toluene in urine

Value: 0.03 mg/l

Sampling time: end of shift.

Name: Toluene

Determinant: toluene in blood:

Value: 0.02mg/l

Sampling time: prior to last shift of workweek

Name: Toluene

Determinant: o-Cresol in urine*

Value: 0.3mg/g creatinine

Sampling time: end of shift.

Source: American Conference of Industrial Hygienists (ACGIH)

Appropriate Engineering Controls

This substance is hazardous and should be used with a local exhaust ventilation system, drawing vapours away from workers' breathing zone. A flame-proof exhaust ventilation system is required. If the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn. Refer to relevant regulations for further information concerning ventilation requirements.

Refer to AS 1940 - The storage and handling of flammable and combustible liquids and AS/NZS 60079.10.1 Explosive atmospheres - Classification of areas - Explosive gas atmospheres, for further information concerning ventilation requirements.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements.

Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with full face shield should be used. Eye protection devices should conform to relevant regulations. Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 (series) - Eye Protectors for Industrial Applications.

Hand Protection

Wear gloves of impervious and chemical resistant material. Final choice of appropriate gloves will vary according to individual circumstances. i.e. methods of handling or according to risk assessments undertaken. Occupational protective gloves should conform to relevant regulations.

Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

Body Protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties	Description	Properties	Description
Form	Liquid	Appearance	Liquid
Colour	Red	Odour	Mild solvent
Decomposition Temperature	Not available	Melting Point	Not available
Boiling Point	94 °C	Solubility in Water	Insoluble
pH	Not available	Vapour Pressure	Not available
Vapour Density (Air=1)	Not available	Evaporation Rate	Not available
Odour Threshold	Not available	Viscosity	Not available
Volatile Component	VOC content: 726g/l	Partition Coefficient: n-octanol/water	Not available
Density	0.81 Kg/L	Flash Point	24 °C (Pensky-Martens Closed Cup)
Flammability	Flammable	Auto-Ignition Temperature	Not available
Flammable Limits - Lower	Not available	Flammable Limits - Upper	Not available
Explosion Properties	Product is not explosive, however, formation of explosive air/vapour mixtures are possible.	Oxidising Properties	Not available

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions of storage and handling.

Reactivity and Stability

Reacts with incompatible materials.

Conditions to Avoid

Heat, open flames and other sources of ignition. Sparks. Flammable liquid and vapour, may form flammable/explosive vapour-air mixture.

Incompatible materials

Strong acids, bases, oxidizers and select amines.

Hazardous Decomposition Products

Thermal decomposition may result in the release of toxic and/or irritating fumes, smoke and gases including: various hydrocarbon derivatives, carbon dioxide and carbon monoxide.

Possibility of hazardous reactions

Not available

Hazardous Polymerization

Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information

No toxicity data available for this material.

Ingestion

May be fatal if swallowed and enters airways. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause severe pulmonary injury that may lead to death. May cause irritation to the mouth, throat, esophagus and stomach with symptoms of nausea, abdominal discomfort, vomiting and diarrhoea.

Inhalation

Harmful if inhaled. Inhalation of product vapours can cause irritation of the nose, throat and respiratory system.

Skin

Causes skin irritation. Skin contact will cause redness, itching and swelling. Repeated exposure may cause skin dryness and cracking and may lead to dermatitis.

Eye

Causes eye damage. Eye contact will cause stinging, blurring, tearing, severe pain and possible burns, necrosis, permanent damage and blindness.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Skin Sensitisation

Not expected to be a skin sensitiser.

Germ cell mutagenicity

Not considered to be a mutagenic hazard.

Carcinogenicity

May cause cancer. Classified as a Known or presumed human carcinogen.

Cumene and ethylbenzene are listed as a Group 2B: Possibly carcinogenic to humans according to International Agency for Research on Cancer (IARC).

Xylene and toluene are listed as a Group 3: Not classifiable as to carcinogenicity to humans according to International Agency for Research on Cancer (IARC).

Reproductive Toxicity

May damage fertility or the unborn child. Classified as a Known or presumed human reproductive or developmental toxicant.

STOT-single exposure

May cause respiratory irritation. May cause drowsiness or dizziness.

STOT-repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Other Information

This product contains an Ototoxic substance.

Combination with noise exposure, even at safe levels, could still cause auditory injuries and hearing loss.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects.

Persistence and degradability

Not available

Mobility

Not available

Bioaccumulative Potential

Not available

Other Adverse Effects

Not available

Environmental Protection

Do not discharge this material into waterways, drains and sewers.

13. DISPOSAL CONSIDERATIONS

Disposal considerations

Dispose of waste according to applicable local and national regulations. Labels should not be removed from containers until they have been cleaned. Advise flammable nature. Empty containers may contain flammable residues. Do not cut, puncture or weld on or near containers. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers. Wastes including emptied containers are controlled wastes and should be disposed of in accordance with all applicable local and national regulations. Do not allow into drains or watercourses or dispose of where ground or surface waters may be affected.

14. TRANSPORT INFORMATION

Transport Information

Road and Rail Transport (ADG Code):

This material is a Class 3 - Flammable Liquid according to The Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Class 3 - Flammable Liquids are incompatible in a placard load with any of the following:

- Class 1: Explosives
- Division 2.1: Flammable Gases.
(Division 2.1 and Class 3 are incompatible in transport if both are in tanks or other receptacles with a capacity individually exceeding 500 L)
- Division 2.3: Toxic Gases
- Division 4.2: Spontaneously Combustible Substances
- Division 5.1: Oxidising substances
- Division 5.2: Organic Peroxides
- Class 6: Toxic or Infectious Substances
(where the flammable liquid is nitromethane)
- Class 7: Radioactive materials unless specifically exempted

Marine Transport (IMO/IMDG):

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

Class/Division: 3

UN No: 1263

Proper Shipping Name: PAINT RELATED MATERIAL

Packing Group: III

EMS: F-E, S-E

Special Provisions: 163, 223, 367, 955

Air Transport (ICAO/IATA):

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

Class/Division: 3

UN No: 1263

Proper Shipping Name: Paint related material

Packing Group: III

Packaging Instructions (passenger & cargo): 355

Packaging Instructions (cargo only): 366

Hazard Label: Flammable liquid
Special Provisions: A3, A72, A192

U.N. Number

1263

UN proper shipping name

PAINT RELATED MATERIAL

Transport hazard class(es)

3

Packing Group

III

Hazchem Code

•3Y

IERG Number

14

IMDG Marine pollutant

No

Transport in Bulk

Not available

Special Precautions for User

Not available

15. REGULATORY INFORMATION

Regulatory information

Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.

Classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Poisons Schedule

S5

16. OTHER INFORMATION

Date of preparation or last revision of SDS

SDS reviewed: April 2021

Supersedes: January 2021

References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.

Standard for the Uniform Scheduling of Medicines and Poisons.

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants.

Adopted biological exposure determinants, American Conference of Industrial Hygienists (ACGIH).

Globally Harmonised System of Classification and Labelling of Chemicals.

Code of Practice: Managing Noise and Preventing Hearing Loss at Work.

END OF SDS

© Copyright Chemical Safety International Pty Ltd

Copyright in the source code of the HTML, PDF, XML, XFO and any other electronic files rendered by an Infosafe system for Infosafe SDS displayed is the intellectual property of Chemical Safety International Pty Ltd.

Copyright in the layout, presentation and appearance of each Infosafe SDS displayed is the intellectual property of Chemical Safety International Pty Ltd.

The compilation of SDS's displayed is the intellectual property of Chemical Safety International Pty Ltd.

Copying of any SDS displayed is permitted for personal use only and otherwise is not permitted. In particular the SDS's displayed cannot be copied for the purpose of sale or licence or for inclusion as part of a collection of SDS without the express written consent of Chemical Safety International Pty Ltd.

NX EZYLIFT WB

**Water-based, chemically active bondbreaker
for tilt-up, lift slab and precast construction.**

HOW IT WORKS

NX EZYLIFT WB is a new generation tilt-up bondbreaker. In contrast to most conventional cure and bondbreakers, NX EZYLIFT WB does not contain any wax or hydrocarbon resins and, as a result, does not depend on a physical barrier deposited on top of the casting slab to prevent bonding. Instead, NX EZYLIFT WB consists of a special formulation of chemically reactive organic compounds in a predominately water based solvent system which chemically reacts with calcium hydroxide, a byproduct of the cement hydration reaction, present in the concrete surface pores. The reaction products are amorphous gels which, in conjunction with other combined special organic compounds in NX EZYLIFT WB, effectively seal concrete surface pores. Properly applied, NX EZYLIFT WB positively prevents the bonding of tilt wall panels to casting slab floor surfaces.

APPLICATIONS

- Use as a bondbreaker in tilt-up, lift slab and precast concrete construction.

ADVANTAGES

- Provides improved resistance to the "osmotic effect" by restricting the natural tendency for water to migrate from freshly placed panel concrete through the bondbreaker film and into the less moist casting slab. Reducing the "osmotic effect" greatly improves panel concrete surface appearance resulting in a smooth, uniform surface profile, color and appearance.
- Achieves exceptional wall panel surface appearance.
- Leaves no residue or resulting staining on wall panel or casting slab floor surfaces when properly applied.
- Achieves a crisp, positive release that minimizes panel surface defects and reduces panel resurfacing/patching costs.
- Does not contain any wax or hydrocarbon resins like many conventional bondbreakers which often leave a difficult-to-remove residue on wall panel and casting slab surfaces. When this residue is not properly removed, it often causes floor and exterior wall panel paint and coating adhesion problems.
- Improved formulation eliminates the need for a Hazardous Material label, reducing delivery costs and increasing job site safety.
- Excellent resistance to washoff from normal rain showers and dew when applied directly to previously uncoated concrete surfaces.
- Dust, dirt and mud can be easily removed from casting slab floor surfaces by washing with low pressure water.
- Resistant to sunlight induced oxidation damage that can necessitate the reapplication of competitive bondbreakers even when panel concrete placement is delayed a few days.

▲ PRECAUTIONS ▲

- Not recommended for use as a bondbreaker on broom finished or rough finished concrete surfaces.
- Not recommended for application over any other manufacturer's inorganic silicate based floor sealer, hardener or organic resin based curing, sealing or combination cure and seal product. Failure to follow this recommendation can result in panel surface defects or panel sticking.
- If a delay of more than 2 weeks occurs between the final bondbreaker application coat and panel concrete placement, it will be necessary to check for a sufficient bondbreaker film on the casting slab. If the bondbreaker film is insufficient, the bondbreaker must be reapplied as necessary before concrete placement.
- Protect from freezing. If allowed to freeze, product packaging may rupture and the emulsion stability of this product may be affected, making it difficult to keep product mixed during application. Product which is suspected of freezing should not be used.
- Verify that product is within the "USE BY" date stated on product packaging. Do not use expired product. The use of expired product may result in poor product performance or failure.
- Not recommended for application over or in conjunction with any other manufacturer's tilt-up bondbreaker.
- Not recommended for application in the rain or if rain is anticipated within 12 hours of application. Surfaces exposed to rain or running water within this time period will require reapplication.
- It is not recommended to use a pressure washer to clean the casting/floor slab surface after the application of Silcoseal and prior to the wall panel concrete being placed. If necessary, a low pressure garden hose with a non-aggressive spray nozzle may be used to remove contamination and debris prior to placing wall panel concrete.
- Not recommended for bondbreaker application to casting slab surfaces previously cured with polyethylene or curing blankets without first removing all salt deposits. Failure to remove all salt deposits can result in panel surface blemishes or defects.
- Not recommended for application to casting slab surfaces which are frozen or when ambient temperatures are below 40° F (4° C) or expected to drop below 40° F (4° C) within 12 hours following application.
- Not recommended for application without the proper sprayer and correct spray tip. See USE INSTRUCTIONS for specific sprayer and tip size recommendations.
- Not recommended for use in tilt-up applications where casting slab or panel concrete mix design incorporates pozzolans such as fly ash without first contacting Nexus for specific recommendations regarding application procedures and rates. Failure to do so may result in panel surface blemishes and/or panel sticking.

USE INSTRUCTIONS

- Request current product literature, labels and safety data sheets from manufacturer and read thoroughly before product use.
- Site environmental conditions, substrate conditions and construction have a major effect on product selection, application methods, procedures and rates, appearance and performance. Product literature provides general information applicable to some conditions. However, an adequate site test application by the purchaser or installer in advance of field scale use is mandatory (irrespective of any other verbal or written representations) to verify that product and quantities purchased can be satisfactorily applied and will achieve desired appearance and performance under intended use conditions.
- Use the Drum Agitator (request one from Nexus if required) or other suitable mechanical agitator to adequately mix product before withdrawing from container and before each use.
- Recommended spray tip sizes are 8003-LP, 8004-LP and 8005-LP. The coarser (8005-LP) spray tip should be used on porous casting slab surfaces where additional bondbreaker is necessary to ensure sufficient film holdout. Use the less coarse (8003-LP) spray tip for application on less porous casting slab surfaces. The use of an improper sprayer and/or incorrect spray tip generally results in either over or under application.
- NX EZYLIFT WB should be applied in accordance with recommended procedures to achieve even and uniform coverage. Equipment should be clean and dry prior to use.
- Typical drying time is 30 minutes to 3 hours, but varies with the presence or absence of a moisture barrier beneath the casting slab, climatic conditions and application rate. Extended drying times in excess of 24 hours are possible in cure coat applications when product is applied heavily during cool weather and a moisture barrier is present. Reducing the application rate and applying in multiple thin coats in lieu of one heavy coat will greatly reduce drying time.
- Avoid scouring the casting slab surface during panel concrete placement by using a deflection board.

BONDBREAKER APPLICATION

- Casting slab areas should be well cured, smooth and dense.
- Remove all dust, dirt, saw cut residue, standing water and other contaminants prior to applying bondbreaker coats with a broom, leaf/air blower or low pressure garden hose. Do not pressure wash the surface.
- The number of bondbreaker coats and related application rate required to achieve complete, uniform coverage of casting slab varies with concrete mix design, placing and finishing procedures, weather conditions, etc. Because of this, it is not possible to prescribe application rates or procedures inclusive of all site variables.
- Best results are obtained when successive coats of NX EZYLIFT WB are applied at right angles (perpendicular) to each other.

NX EZYLIFT WB p. 2

- An adequate application is indicated by the presence of a dry, soap-like feel, uniformly apparent to touch, over the entire treated area with no indication of greater accumulations in low spots or depressions. Following bondbreaker application and immediately prior to panel concrete placement, be certain casting slab surfaces evidence the dry soap-like feel, but do not evidence over application of NX EZYLIFT WB as indicated by a slippery or grease-like feel to the touch. Over application may result in retardation of panel skin or dusting, surface irregularities and/or discoloration as well as unreacted bondbreaker residue on panel and floor surfaces.
- Typically, casting slab surfaces which are more porous resulting from such conditions as improper curing, the addition of pozzolans such as fly ash or which received a more open or less tight finish will require more NX EZYLIFT WB than slab surfaces which are less porous.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO EVALUATE THE VARIOUS CONDITIONS ON EACH PROJECT AND TO DETERMINE THE CORRECT APPLICATION RATE OF THE NX EZYLIFT WB BONDBREAKER COATS. IF UNSURE, CONTACT NEXUS FOR SPECIFIC RECOMMENDATIONS.
- CAUTION: THE PRIMARY REASON FOR PANELS STICKING TO CASTING SLABS IS AN INADEQUATE FILM OF BONDBREAKER ON THE CASTING SLAB SURFACE AT THE TIME OF PANEL CONCRETE PLACEMENT. IT IS YOUR RESPONSIBILITY TO VERIFY A CONTINUOUS FILM OF BONDBREAKER CAN BE FELT ON THE CASTING SLAB SURFACE AS PREVIOUSLY DESCRIBED IMMEDIATELY PRIOR TO PLACEMENT OF PANEL CONCRETE.
- Rain occurring prior to product drying will necessitate reapplication of bondbreaker.
- Do not apply to reinforcing steel or lifting inserts.
- Avoid spray drifts, runs or puddles. Promptly wipe up any material excesses which can lead to subsequent adhesive failure of floor coatings and wall paints.
- When using NX EZYLIFT WB for sand bed casting, contact Nexus for specific written recommendations.
- To avoid wood sugar related concrete retardation and dusting at panel edges and feature strip locations, use Nox-Crete's Clear Pre-Form to seal all wood that may contact panel concrete, including edge forms, blockout forms and chamfer and feature strips prior to bondbreaker application.

Existing Casting Slabs

- Verify concrete surface is free of substances that could adversely affect product performance.
- If a curing or sealing compound was used, it will be necessary to remove the coating from the casting slab surface prior to applying bondbreaker. Use Nox-Crete's Bio-Clean PLUS to chemically remove all coating residue.
- Apply successive coats of NX EZYLIFT WB until the casting slab surface appears uniformly dark in appearance for at least 2-3 hours following the last coat. If the treated slab appears light in color either generally or in spots within 2-3 hours of last application, excessive slab porosity is indicated. Reapply NX EZYLIFT WB to all light-colored areas. If areas of light color or dry appearance persist,

thoroughly wet affected areas with water to fill concrete surface pores, squeegee off excess water and then immediately re-apply NX EZYLIFT WB.

- The typical effective coverage rate for all combined bondbreaker coats applied to an existing, clean and unsealed casting slab is 200-400 sf / gal (5-10 sm / L). The application rate can vary widely depending upon the specific conditions. Do not over or under apply.

STRIPPING

- To remove residual bondbreaker from casting slab floor surfaces resulting from over application of the bondbreaker, pretreat the areas to be stripped with Nox-Crete's Bio-Clean Plus. Scrub the treated surfaces using a floor-scrubbing machine equipped with nylogrit scrub brushes. Squeegee off the excess Bio-Clean Plus residue, rinse thoroughly with water and squeegee dry.
- To clean panel surfaces, pretreat the areas to be cleaned with a detergent solution consisting of 0.5 lbs (225 gms) of trisodium phosphate in 1 gal (3.8 L) of water. Rinse the detergent solution off with water using a minimum 4,000 psi power washer.
- Determine adequacy of the surface preparation of panels and casting slabs with appropriate site test to verify acceptable adhesion, appearance and performance of paints, coatings, adhesives, sealers, sealants, grouts, etc. prior to application. See ACI 551 for specific recommendations.

TECHNICAL DATA

Color	White Liquid
Clarity	Opaque Emulsion
Bulk Density	8.1 lbs./gal. (970 g/L)
VOC	Meets All Federal & State VOC Reqs.
Viscosity	3 cps @ 25° C (77° F)
Flash Point, ASTM D-93	102° F PMCC (39° C)

PACKAGING

Product is packaged in lined steel 5.3 gal (20 L) pails and 52.8 gal (200 L) drums. Drums are equipped with a 2-inch center port opening for use with a Drum Agitator.

SHELF LIFE

Shelf life is one year. Use before the "USE BY" date stated on product packaging.

HANDLING/STORAGE

Product is a combustible liquid. Store in a dry location within a temperature range between 40° F (4° C) and 100° F (38° C). Following each liquid removal, tightly reseal all container bungs or caps to include mixer port cap that seals opening for drum agitator handle promptly to prevent loss of necessary volatile solvents. CAUTION: FAILURE TO PROPERLY STORE PRODUCT CAN RENDER IT UNSUITABLE FOR USE.

CAUTION: FAILURE TO PROPERLY STORE PRODUCT CAN RENDER IT UNSUITABLE FOR USE.

AVAILABILITY & TECHNICAL SERVICES

For source or technical information, call Nexus at (03) 9988 7707

LIMITED WARRANTY

NOTICE-READ CAREFULLY

CONDITIONS OF SALE

Nox-Crete offers this product for sale subject to, and Buyer and all users are deemed to have accepted, the following conditions of sale and limited warranty which may only be varied by written agreement of a duly authorized corporate officer of Nox-Crete. No other representative of or for Nox-Crete is authorized to grant any warranty or to waive limitation of liability set forth below.

WARRANTY LIMITATION

Nox-Crete warrants this product to be free of manufacturing defects. If the product when purchased was defective and was within use period indicated on container or carton, when used, Nox-Crete will replace the defective product with new product without charge to the purchaser.

Nox-Crete makes NO OTHER WARRANTY, either express or implied, concerning this product. There is NO WARRANTY OF MERCHANTABILITY. In no case shall Nox-Crete be liable for special, indirect or consequential damages resulting from the use or handling of the product and no claim of any kind shall be greater in amount than the purchase price of the product in respect of which damages are claimed.

INHERENT RISKS

Nox-Crete MAKES NO WARRANTY WITH RESPECT TO THE PERFORMANCE OF THE PRODUCT AFTER IT IS APPLIED BY THE PURCHASER, AND PURCHASER ASSUMES ALL RISKS ASSOCIATED WITH THE USE OR APPLICATION OF THE PRODUCT.

EZYLIFT WB WATER BASED BONDBREAKER

Infosafe No.: LQAHN
ISSUED Date : 11/04/2021
ISSUED by: NEXUS CONSTRUCTION
SYSTEMS

1. IDENTIFICATION

GHS Product Identifier

EZYLIFT WB WATER BASED BONDBREAKER

Company Name

NEXUS CONSTRUCTION SYSTEMS (ABN 76 005 928 987)

Address

UNIT 4 25-27 OLIVE GROVE KEYSBOROUGH
VIC 3173 AUSTRALIA

Telephone/Fax Number

Tel: 03 9988 7701

Recommended use of the chemical and restrictions on use

Water-Based Tilt-Up Concrete Cure and Bondbreaker

2. HAZARD IDENTIFICATION

GHS classification of the substance/mixture

Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.

Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Flammable Liquids: Category 3

Carcinogenicity: Category 2

STOT Repeated Exposure: Category 2

Acute Toxicity - Dermal: Category 4

Acute Toxicity - Oral: Category 4

Acute Toxicity - Inhalation: Category 4

Eye Damage/Irritation: Category 1

STOT Single Exposure: Category 3 (narcotic)

STOT Single Exposure: Category 3 (respiratory tract irritation)

Skin Corrosion/Irritation: Category 2

Aspiration Hazard: Category 1

Signal Word (s)

DANGER

Hazard Statement (s)

H226 Flammable liquid and vapour.

H302 Harmful if swallowed.

H304 May be fatal if swallowed and enters airways.

H312 Harmful in contact with skin.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

H336 May cause drowsiness or dizziness.

H351 Suspected of causing cancer.

H373 May cause damage to organs (central nervous system) through prolonged or repeated exposure.

Pictogram (s)

Health hazard, Flame, Exclamation mark, Corrosion



Precautionary statement – Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash contaminated skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement – Response

P308+P313 IF exposed or concerned: Get medical advice/attention.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P330 Rinse mouth.

P331 Do NOT induce vomiting.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P363 Wash contaminated clothing before reuse.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER or doctor/physician.

P370+P378 In case of fire: Use dry chemical, foam, carbon dioxide for extinction.

Precautionary statement – Storage

P403+P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Precautionary statement – Disposal

P501 Dispose of contents/container to an approved waste disposal plant.

Other Information

This product contains an Ototoxic substance.

Combination with noise exposure, even at safe levels, could still cause auditory injuries and hearing loss.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Name	CAS	Proportion
Butene, homopolymer		0-100 %
Solvent Naphtha		0-100 %
Hydrotreated Light Distillate		0-100 %
1,2,4-trimethyl benzene	95-63-6	<10 %
Xylene	1330-20-7	<10 %
n-butanol	71-36-3	<10 %
Ethylbenzene	100-41-4	<1 %
Ingredients determined not to be hazardous		Balance

4. FIRST-AID MEASURES

Inhalation

If inhaled, remove affected person from contaminated area. Apply artificial respiration if not breathing. Seek medical attention.

Ingestion

Do NOT induce vomiting. Wash out mouth and lips with water. Where vomiting occurs naturally have affected person place head below hip level in order to reduce risk of aspiration. Seek immediate medical attention.

Skin

Remove all contaminated clothing immediately. Wash affected area thoroughly with soap and water. Wash contaminated clothing before reuse or discard. Seek medical attention.

Eye contact

If in eyes, hold eyelids apart and flush the eyes continuously with running water. Remove contact lenses. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Seek immediate medical attention.

First Aid Facilities

Eyewash, safety shower and normal washroom facilities.

Advice to Doctor

Treat symptomatically.

Other Information

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use dry chemical, foam, carbon dioxide.

Unsuitable Extinguishing Media

Water jet.

Hazards from Combustion Products

Under fire conditions this product may emit toxic and/or irritating fumes, smoke and gases including carbon monoxide, carbon dioxide and oxides of nitrogen.

Specific Hazards Arising From The Chemical

Flammable liquid and vapour. Vapour/air mixtures may ignite explosively. Flashback along the vapour trail may occur. Runoff to sewer may create fire or explosion hazard. Does not sustain combustion.

Decomposition Temperature

Not available

Precautions in connection with Fire

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. In case of fire the product may be violently or explosively reactive. Use water spray to disperse vapours. This product should be prevented from entering drains and watercourses.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures

Wear appropriate personal protective equipment and clothing to prevent exposure. Extinguish or remove all sources of ignition and stop leak if safe to do so. Increase ventilation. Evacuate all unprotected personnel. If possible contain the spill. Spillage can be slippery. Place inert absorbent, non-combustible material onto spillage. Use clean non-sparking tools to collect the material and place into suitable labelled containers for subsequent recycling or disposal. Dispose of waste according to the applicable local and national regulations. If contamination of sewers or waterways occurs inform the local water and waste management authorities in accordance with local regulations.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Avoid contact with skin and eyes. Wear overalls, impervious gloves and safety glasses. Use in designated areas with local exhaust ventilation, away from sparks, flames and other ignition sources. Use approved flammable liquid storage containers in the work area. Prevent release of vapours and mists into workplace air. Keep containers tightly closed. Take precautionary measures against static discharges. Do not empty into drains. Ensure a high level of personal hygiene is maintained when using this product, that is, always wash hands before eating, drinking, smoking or using the toilet facilities.

Avoid exposure. Do not handle until all safety precautions have been read and understood.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well-ventilated area away from sources of ignition, foodstuffs, clothing and incompatible materials such as oxidising agents. Keep containers closed when not in use, securely sealed and protected against physical damage. Inspect regularly for deficiencies such as damage or leaks. Have appropriate fire extinguishers available in and near the storage area. Take precautions against static electricity discharges. Use proper grounding procedures. Ensure that storage conditions comply with applicable local and national regulations.

For information on the design of the storeroom, reference should be made to Australian Standard AS1940 - The storage and handling of flammable and combustible liquids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limit values

No exposure standards have been established for this material. However, the available exposure limits for ingredients are listed below:

Oil mist, refined mineral

TWA: 5 mg/m³

Trimethylbenzene

TWA: 25 ppm, 123 mg/m³

Ethylbenzene

TWA: 100 ppm, 434 mg/m³

STEL: 125 ppm, 543 mg/m³

Xylene

TWA: 80 ppm, 350 mg/m³

STEL: 150 ppm, 655 mg/m³

n-Butanol

TWA: 50 ppm, 152 mg/m³ (Peak limitation)

TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-

hour working day, for a five-day week.

STEL (Short Term Exposure Limit): The average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

Peak Limitation: A ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

Source: Safe Work Australia

Biological Limit Values

Name: Xylene

Determinant: Methylhippuric acids in urine

Value: 1.5 g/g creatinine

Sampling time: End of shift

Name: Ethylbenzene

Determinant: Sum of mandelic acid and phenylglyoxylic acid in urine

BEI®: 0.15 g/g creatinine

Sampling time: End of shift

Notation: Ns.

Source: American Conference of Industrial Hygienists (ACGIH)

Appropriate Engineering Controls

This substance is hazardous and should be used with a local exhaust ventilation system, drawing vapours away from workers' breathing zone. A flame-proof exhaust ventilation system is required. If the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn. Refer to relevant regulations for further information concerning ventilation requirements.

Refer to AS 1940 - The storage and handling of flammable and combustible liquids and AS/NZS 60079.10.1 Explosive atmospheres - Classification of areas - Explosive gas atmospheres, for further information concerning ventilation requirements.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements.

Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with full face shield should be used. Eye protection devices should conform to relevant regulations.

Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337 (series) - Eye Protectors for Industrial Applications.

Hand Protection

Wear gloves of impervious and chemical resistant material. Final choice of appropriate gloves will vary according to individual circumstances. i.e. methods of handling or according to risk assessments undertaken. Occupational protective gloves should conform to relevant regulations.

Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

Body Protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties	Description	Properties	Description
Form	Liquid	Appearance	Liquid
Colour	Milky	Odour	Mild
Decomposition Temperature	Not available	Melting Point	Not available
Boiling Point	94 °C	Solubility in Water	Miscible
pH	Not available	Vapour Pressure	Not available
Vapour Density (Air=1)	Not available	Evaporation Rate	Not available
Odour Threshold	Not available	Viscosity	Not available
Volatile Component	Regulatory VOC: Less than 700 g/l Actual VOC : Less than 120 g/l	Partition Coefficient: n-octanol/water	Not available
Density	0.97 Kg/L	Flash Point	39 °C (Pensky-Martens Closed Cup) (ASTM D-93) 71 °C (Cleveland Open Cup) (ASTM D-92)
Flammability	49 CFR Appendix H test confirms product is a non-sustained burning material.	Auto-Ignition Temperature	Not available
Flammable Limits - Lower	Not available	Flammable Limits - Upper	Not available
Explosion Properties	Product is not explosive, however, formation of explosive air/vapour mixtures are possible.	Oxidising Properties	Not available

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions of storage and handling.

Reactivity and Stability

Reacts with incompatible materials.

Conditions to Avoid

Heat, open flames and other sources of ignition. Sparks. Flammable liquid and vapour, may form flammable/explosive vapour-air mixture.

Incompatible materials

Strong acids, bases, oxidizers and select amines.

Hazardous Decomposition Products

Thermal decomposition may result in the release of toxic and/or irritating fumes, smoke and gases including: various hydrocarbon derivatives, carbon dioxide and carbon monoxide.

Possibility of hazardous reactions

Not available

Hazardous Polymerization

Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information

No toxicity data available for this material.

Ingestion

May be fatal if swallowed and enters airways. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause severe pulmonary injury that may lead to death. Harmful if swallowed. May cause irritation to the mouth, throat, esophagus and stomach with symptoms of nausea, abdominal discomfort, vomiting and diarrhoea.

Inhalation

Harmful if inhaled. Inhalation of product vapours can cause irritation of the nose, throat and respiratory system.

Skin

Harmful in contact with skin. Product can be absorbed through skin with resultant harmful systemic effects. Causes skin irritation. Skin contact will cause redness, itching and swelling. Repeated exposure may cause skin dryness and cracking and may lead to dermatitis.

Eye

Causes eye damage. Eye contact will cause stinging, blurring, tearing, severe pain and possible burns, necrosis, permanent damage and blindness.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Skin Sensitisation

Not expected to be a skin sensitiser.

Germ cell mutagenicity

Not considered to be a mutagenic hazard.

Carcinogenicity

Suspected of causing cancer. Classified as a suspected human carcinogen.

Ethylbenzene is listed as a Group 2B: Possibly carcinogenic to humans according to International Agency for Research on Cancer (IARC).

Xylene is listed as a Group 3: Not classifiable as to carcinogenicity to humans according to International Agency for Research on Cancer (IARC).

Reproductive Toxicity

Not considered to be toxic to reproduction.

STOT-single exposure

May cause respiratory irritation. May cause drowsiness or dizziness.

STOT-repeated exposure

May cause damage to organs (central nervous system) through prolonged or repeated exposure.

Aspiration Hazard

May be fatal if swallowed and enters airways.

Other Information

This product contains an Ototoxic substance.

Combination with noise exposure, even at safe levels, could still cause auditory injuries and hearing loss.

12. ECOLOGICAL INFORMATION

Ecotoxicity

No ecological data available for this material.

Persistence and degradability

Not available

Mobility

Not available

Bioaccumulative Potential

Not available

Other Adverse Effects

Not available

Environmental Protection

Do not discharge this material into waterways, drains and sewers.

13. DISPOSAL CONSIDERATIONS

Disposal considerations

Dispose of waste according to applicable local and national regulations. Labels should not be removed from containers until they have been cleaned. Advise flammable nature. Empty containers may contain flammable residues. Do not cut, puncture or weld on or near containers. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers.

14. TRANSPORT INFORMATION

Transport Information

Not classified as Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition)

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

U.N. Number

None Allocated

UN proper shipping name

None Allocated

Transport hazard class(es)

None Allocated

IMDG Marine pollutant

No

Transport in Bulk

Not available

Special Precautions for User

Not available

Other Information

This product does not sustain combustion and has passed a suitable combustibility test. It therefore complies with the requirements of subsection 2.3.1.3 as specified by the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG 7th Edition) and International Maritime Dangerous Goods Code (IMDG Code) for transport by sea (39-18) and subsection 3.3.1.3 as specified by International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air (62nd edition) and is therefore not subject to these Dangerous Goods regulations.

15. REGULATORY INFORMATION

Regulatory information

Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) including Work, Health and Safety Regulations, Australia.

Classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Poisons Schedule

S5

16. OTHER INFORMATION

Date of preparation or last revision of SDS

SDS reviewed: April 2021

Supersedes: January 2021

References

Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.

Standard for the Uniform Scheduling of Medicines and Poisons.

Australian Code for the Transport of Dangerous Goods by Road & Rail.

Model Work Health and Safety Regulations, Schedule 10: Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.

Workplace exposure standards for airborne contaminants.

Adopted biological exposure determinants, American Conference of Industrial Hygienists (ACGIH).

Globally Harmonised System of Classification and Labelling of Chemicals.

Code of Practice: Managing Noise and Preventing Hearing Loss at Work.

END OF SDS

© Copyright Chemical Safety International Pty Ltd

Copyright in the source code of the HTML, PDF, XML, XFO and any other electronic files rendered by an Infosafe system for Infosafe SDS displayed is the intellectual property of Chemical Safety International Pty Ltd.

Copyright in the layout, presentation and appearance of each Infosafe SDS displayed is the intellectual property of Chemical Safety International Pty Ltd.

The compilation of SDS's displayed is the intellectual property of Chemical Safety International Pty Ltd.

Copying of any SDS displayed is permitted for personal use only and otherwise is not permitted. In particular the SDS's displayed cannot be copied for the purpose of sale or licence or for inclusion as part of a collection of SDS without the express written consent of Chemical Safety International Pty Ltd.

Victoria (Head Office)

Services Victoria, South Australia & Tasmania
Unit 4 / 25-27 Olive Grove
Keysborough Vic 3173
(03) 9988 7701

Sydney

Services New South Wales & Australian Capital Territory
2 Nursery Road
Campbelltown NSW 2560
(02) 8089 1580

Brisbane

Services Queensland & Northern Territory
619 Kingston Road
Loganlea Qld 4131
(07) 3910 2442

Perth

Services Western Australia
17 Forward Street
Gnangara WA 6077
(08) 6144 3690

Nexus
CONSTRUCTION SYSTEMS