ECONOMY THRU-BOLT

STUD ANCHOR

- Heavy duty Class 5.8 Carbon steel
- Thru fixing for fast installation
- Anchor Diameter = Hole Diameter (eg M12 anchor, 12mm Hole)
- Engineered Clip designed for high loads and prevents anchor rotation

ZINC INTERNAL | GAL EXTERNAL

Part No.	Part No.	M	Description	mm	mm	mm	torque Nm	qty	qty
ETB06085		M6	6 x 85mm	6	50	26	5	100	1000
ETB06120			6 x 120mm			61		50	500
ETB08080	ETB08080G	M8	8 x 80mm	8	55	15	15	50	500
ETB08100	ETB08100G		8 x 100mm			35		50	500
ETB10065	ETB10065G	M10	10 x 65mm	10	45	10	25	25	250
ETB10090	ETB10090G		10 x 90mm		60	17		25	250
ETB10120	ETB10120G		10 x 120mm			47		25	250
ETB12080	ETB12080G	M12	12 x 80mm	12	60	5	45	25	250
ETB12100	ETB12100G		12 x 100mm			25		25	250
ETB12140	ETB12140G		12 x 140mm		80	45		25	150
ETB12180	ETB12180G		12 x 180mm			85		25	100
ETB16105	ETB16105G	M16	16 x 105mm	16	80	5	110	25	100
ETB16125	ETB16125G		16 x 125mm		100	10		25	100
ETB16140	ETB16140G		16 x 140mm			20		25	100
ETB16190	ETB16190G		16 x 190mm			70		25	50
ETB20125	ETB20125G	M20	20 x 125mm	20	100	5	180	10	50
ETB20160	ETB20160G		20 x 160mm		120	20		10	40
ETB20200	ETB20200G		20 x 200mm			60		10	30

Anchor Size (mm)	Drill Size (mm)	Anchor Embedment Depth (mm)	N_{rec} ZINC & GAL TENSION 20MPa (kN)	32MPa (kN)	40MPa (kN)	V_{rec} ZINC & GAL SHEAR 20MPa (kN)	32MPa (kN)	40MPa (kN)
6	6	50	**2.2**	**2.9**	**3.4**	**2.1**	**2.1**	**2.1**
8	8	55	**3.7**	**4.8**	**5.6**	**3.8**	**3.8**	**3.8**
10	10	45	**3.2**	**4.1**	**4.5**	**3.2**	**4.1**	**4.5**
		60	**5.3**	**6.9**	**7.9**	**5.6**	**6.1**	**6.1**
12	12	60	**4.9**	**6.2**	**6.9**	**4.9**	**6.2**	**6.9**
		80	**7.6**	**9.9**	**11.7**	**8.8**	**8.8**	**8.8**
16	16	80	**8.4**	**10.7**	**11.9**	**16.3**	**16.3**	**16.3**
		100	**11.3**	**14.7**	**17.3**	**16.3**	**16.3**	**16.3**
20	20	100	**12.2**	**15.5**	**17.3**	**24.6**	**25.5**	**25.5**
		120	**13.8**	**18.2**	**19.9**	**25.5**	**25.5**	**25.5**

Note: Load capacities above incorporate a safety factor of 3 for concrete and 2.5 for steel. All loads are representative of a single anchor installed remote from an edge. The above information has been derived from laboratory test results using NATA calibrated equipment.
Limit State Design - Multiply the above loads by 1.8 (Concrete) and 2 (Steel) to determine the Limit State Design capacities.

STEEL GOVERNING

MATERIAL SPECIFICATIONS

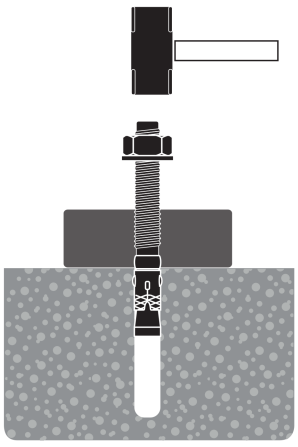
Thru-Bolt Stud Anchor

Anchor Part	Zinc Plated	Galvanised
Expander Clip	400 series S/S	400 series S/S
Washer	AISI1010	AISI1010
Nut	AISI1010	AISI1010
Anchor bolt	Class 5.8	Class 5.8
Plating	Electroplated Zinc Coating thickness 5 microns (min.)	Galvanised Coating thickness 45 microns (min.)

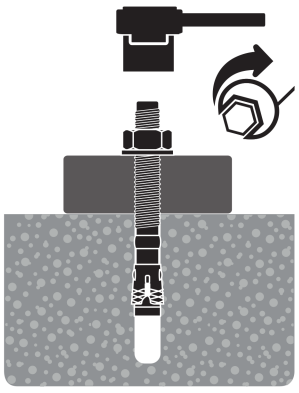
INSTALLATION

With the correct diameter drill bit, drill a hole to the correct depth.

Clean dust and other material from the hole.

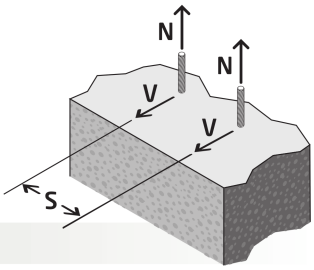


Insert anchor into position.



With correct size socket or spanner tighten anchor to specified torque. Installation complete!

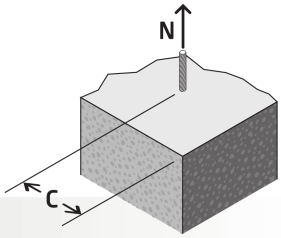
When anchor spacing or edge distances are less than critical distances, Recommended Working Load capacities must be multiplied by the appropriate reduction factors. Linear interpolation is allowed for intermediate anchor spacing and edge distances between critical and minimum distances. If an anchor/anchor group is affected by multiple reduced spacing and edge distances, the spacing and edge reduction factors must be multiplied together to give a total effect on the anchor / anchor group performance.



Spacing Reduction Factors (S_t + S_s) – tension and shear

	d (mm)	6	8	10		12		16		20	
	$h_{embed.}$	50	55	45	60	60	80	80	100	100	120
	S_{cr} (mm)	100	110	90	120	120	160	160	200	200	240
	$S_{min.}$ (mm)	50	55	45	60	60	80	80	100	100	120
Spacing (S) mm	45			0.50							
	50	0.50		0.56							
	55	0.55	0.50	0.61							
	60	0.60	0.55	0.67	0.50	0.50					
	70	0.70	0.64	0.78	0.58	0.58					
	80	0.80	0.73	0.89	0.67	0.67	0.50	0.50			
	90	0.90	0.82	1.00	0.75	0.75	0.56	0.56			
	100	1.00	0.91		0.83	0.83	0.63	0.63	0.50	0.50	
	110		1.00		0.92	0.92	0.69	0.69	0.55	0.55	
	120				1.00	1.00	0.75	0.75	0.60	0.60	0.50
	140						0.88	0.88	0.70	0.70	0.58
	160						1.00	1.00	0.80	0.80	0.67
	180								0.90	0.90	0.75
	200								1.00	1.00	0.83
	220										0.92
	240										1.00

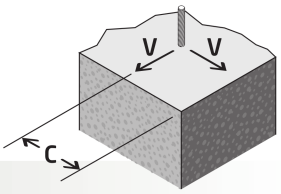
Note: To achieve 100% anchor capacity, critical spacing (S_{cr}) is equal to 2 x h_{embed}.
Minimum spacing (S_{min}) is equal to h_{embed} at which the anchor achieves 50% of capacity.



Edge Distance Reduction Factor (C_t) – tension

	d (mm)	6	8	10	12	16	20
	C_{cr} (mm)	72	96	120	144	192	240
	$C_{min.}$ (mm)	30	40	50	60	80	100
Edge Distance (C) mm	30	0.75					
	40	0.81	0.75				
	50	0.87	0.79	0.75			
	60	0.93	0.84	0.79	0.75		
	72	1.00	0.89	0.83	0.79		
	80		0.93	0.86	0.81	0.75	
	96		1.00	0.91	0.86	0.79	
	100			0.93	0.87	0.80	0.75
	120			1.00	0.93	0.84	0.79
	144				1.00	0.89	0.83
	192					1.00	0.91
	240						1.00

Note: To achieve 100% anchor capacity, critical edge distance (C_{cr}) is equal to 12d (12 x anchor diameter).
Minimum edge distance (C_{min}) is equal to (5d) at which the anchor achieves 75% of capacity.



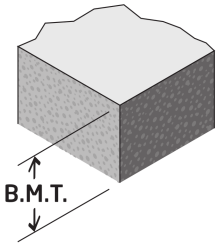
Edge Distance Reduction Factor (C_s) – shear

	d (mm)	6	8	10	12	16	20
	C_{cr} (mm)	72	96	120	144	192	240
	$C_{min.}$ (mm)	30	40	50	60	80	100
Edge Distance (C) mm	30	0.35					
	40	0.50	0.35				
	50	0.66	0.47	0.35			
	60	0.81	0.58	0.44	0.35		
	72	1.00	0.72	0.55	0.44		
	80	1.00	0.81	0.63	0.50	0.35	
	96		1.00	0.78	0.63	0.44	
	100		1.00	0.81	0.66	0.47	0.35
	120			1.00	0.81	0.58	0.44
	144			1.00	1.00	0.72	0.55
	192				1.00	1.00	0.78
	240					1.00	1.00

Note: To achieve 100% anchor capacity, critical edge distance (C_{cr}) is equal to 12d (12 x anchor diameter). Minimum edge distance (C_{min}) is equal to (5d) at which the anchor achieves 35% of capacity.

Base Material Thickness

Base material thickness should be 1.5 x $h_{embed.}$ or a minimum of 75mm, always use the greater of the two values.



Combined Tension & Shear Loading

For combined tension and shear load applications the following equations shall be satisfied;

$N_{applied} / N_{rec} \leq 1$ $V_{applied} / V_{rec} \leq 1$ $(N_{applied} / N_{rec}) + (V_{applied} / V_{rec}) \leq 1.2$

Where:

$N_{applied}$ = Applied Tension Load
N_{rec} = Recommended Tension Load
$V_{applied}$ = Applied Shear Load
V_{rec} = Recommended Shear Load