

TENN JACKBOLT Sleeve Anchors

Torque-Controlled Expansion Anchors

Jackbolt Sleeve Anchors are torque-set through-bolts and are designed for use in concrete and solid brickwork. Their high taper base generates expansion over a larger contact surface area to give high performance anchorage.

- Very simple in-situ installation procedure.
- Jackbolts do not depend on bottom of hole to force anchor expansion and therefore may be used in overdrilled holes.
- No special setting tools required.

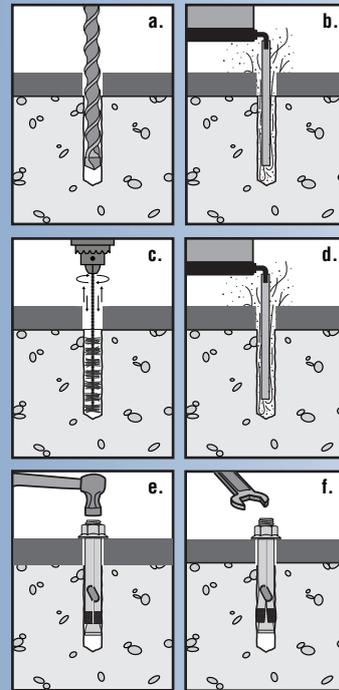
Typical Applications

- Fastening electrical fixtures, e.g. cable trays, control boxes, etc.
- L-brackets to concrete wall and floor.
- Shelving braces.
- Aluminium door, windows, shopfronts.

Bolt Material Properties

	Material: Carbon steel 4.6	Ultimate Tensile Strength	Min. Yield Stress
	Surface coating: Zinc electroplating to Zn2, with yellow chromate passivation (min. 5 micrometers total coating thickness)	f_t , N/mm ²	f_y , N/mm ²
		460	375

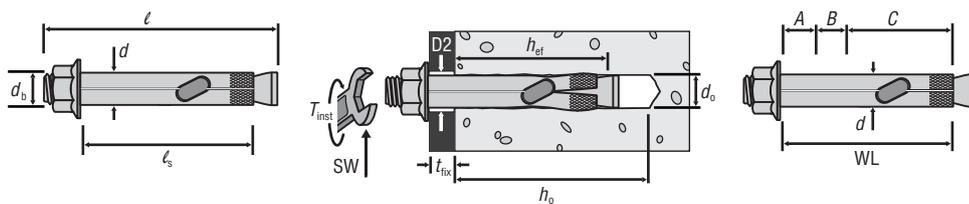
INSTALLATION PROCEDURE



- Drill hole to correct diameter and depth.
- Blow out dust.
- Brush sides of hole.
- Blow out dust.
- Insert anchor.
- Apply tightening torque.



INSTALLATION DATA



Select an anchor with sufficient working length WL to accommodate A+B+C (mm):

- A. Thickness of attachment
- B. Depth of any non-structural layer
- C. Embedment depth

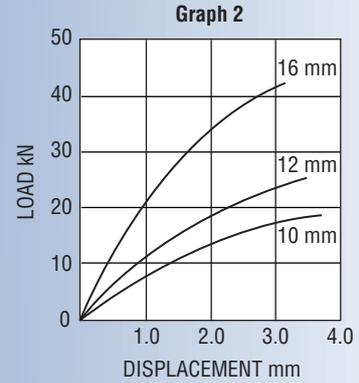
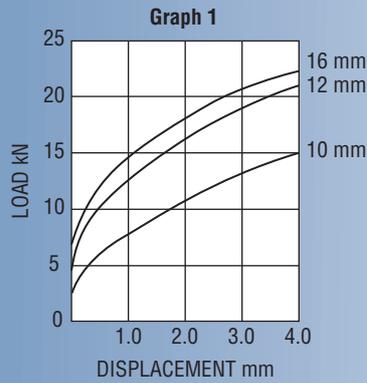
Type	Anchor Size d , mm	Sleeve Dia./ Drill-Hole Dia. d_s/d_o , mm	Bolt Dimensions $d_b \times l$, mm	Sleeve Length l_s , mm	Maximum Attachment Thickness t_{fix} , mm	Minimum Drill-Hole Depth h_o , mm	Maximum Tightening Torque*		Wrench Size SW, mm	Clearance Hole Diameter D2, mm
							T_{inst} , Nm	T_{inst} , ft. lb.		
JB.06M05026	6	6	M5 x 26	5	5	25	2.7	2.7	8	7
JB.06M05038	6	6	M5 x 38	6	6	35	2.7	2.7	8	7
JB.06M05058	6	6	M5 x 58	25	25	55	2.7	2.7	8	7
JB.08M06048	8	8	M6 x 48	10	10	40	4.5	4.5	8	9
JB.08M06070	8	8	M6 x 70	40	40	65	4.5	4.5	8	9
JB.10M08048	10	10	M8 x 60	45	10	70	11	8	13	11
JB.10M08057	10	10	M8 x 70	55	20	80	11	8	13	11
JB.10M08084	10	10	M8 x 85	70	35	95	11	8	13	11
JB.12M10068	12	12	M10 x 75	55	10	85	22	16	17	13
JB.12M10083	12	12	M10 x 85	65	20	95	22	16	17	13
JB.12M10106	12	12	M10 x 105	85	35	115	22	16	17	13
JB.16M12079	16	16	M12 x 75	55	10	90	39	29	19	18
JB.16M12126	16	16	M12 x 120	100	55	135	39	29	19	18

*for concrete only

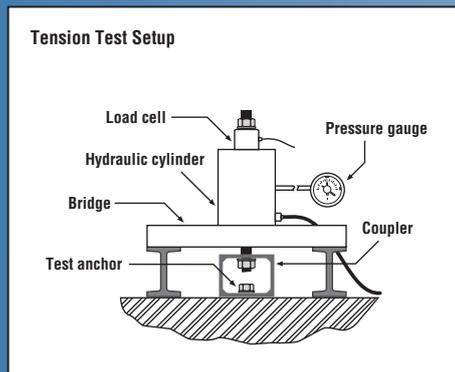
TYPICAL LOAD vs. DISPLACEMENT GRAPHS FOR TENN JACKBOLT SLEEVE ANCHORS

Graph 1 shows direct tension load vs. displacement in 25 N/mm² concrete

Graph 2 shows 90° shear load vs. displacement in 25 N/mm² concrete



TEST DATA



All tests were conducted in accordance with ASTM E-488-96 "Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements" in 25 N/mm² unreinforced concrete. Edge effect, concrete strength and rebar location, if any, will affect anchorage performance.

Jackbolt Anchor Size <i>d</i> , mm	Drill-Hole Diameter <i>d_o</i> , mm	Average Ultimate Pull-out Loads, <i>N_u</i> (kN)					
		Embedment Depth, <i>h_{ef}</i>					
		35 mm	45 mm	55 mm	65 mm	75 mm	85 mm
6	6	8.0*	8.5**	-	-	-	-
8	8	-	10.3*	13.9**	-	-	-
10	10	-	13.7*	16.8**	23.5**	-	-
12	12	-	14.5*	18.5**	26.4**	33.6**	-
16	16	-	-	24.4**	31.2**	35.5**	41.7**

Jackbolt Anchor Size <i>d</i> , mm	Drill-Hole Diameter <i>d_o</i> , mm	Average Ultimate Shear Loads, <i>V_u</i> (kN)							
		Embedment Depth, <i>h_{ef}</i>							
		35 mm	45 mm	55 mm	65 mm	75 mm	90 mm	110 mm	130 mm
6	6	7.3 [^]	7.9 ^{^^}	-	-	-	-	-	-
8	8	-	12.0 [^]	14.9 [^]	-	-	-	-	-
10	10	-	-	18.8 [^]	27.3 [^]	-	-	-	-
12	12	-	-	22.5 [^]	31.4 [^]	32.8 [^]	-	-	-
16	16	-	-	-	-	45.9 [^]	55.3 [^]	-	-

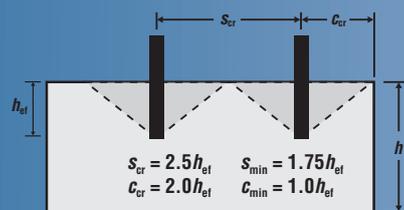
*Pull-out failure **Concrete-cone failure [^]Lateral concrete-cone failure ^{^^}Steel failure

SAFE WORKING LOADS

ULTIMATE AND SAFE WORKING LOADS for Jackbolt Sleeve Anchors

Anchor Size <i>d</i> , mm	Drill-Hole Dia. <i>d_o</i> , mm	Effective Embedment Depth <i>h_{ef}</i> , mm	Minimum Concrete Thickness <i>h</i> , mm	Critical Spacing <i>s_{cr}</i> , mm	Critical Edge Distance <i>c_{cr}</i> , mm	Concrete grade: C20/25			
						Ultimate Loads		Safe Working Loads	
						Tension <i>N_u</i> , kN	Shear <i>V_u</i> , kN	Tension <i>N_{rec}</i> , kN	Shear <i>V_{rec}</i> , kN
6	6	35	75	90	70	8	7.3	1.8	2.1
8	8	45	90	115	90	10.3	12	2.6	3.1
10	10	55	100	140	110	16.8	18.8	3.8	4.7
12	12	65	120	165	130	26.4	31.4	5.6	7.9
16	16	90	150	225	180	41.7	55.3	10.4	13.8

LOAD REDUCTION FACTORS



- **Critical Spacing *s_{cr}*.** The least centre-to-centre spacing to achieve the safe working loads listed above.
- **Critical Edge Distance *c_{cr}*.** The least anchor-to-edge distance to achieve the safe working loads listed above.
- **Min. Spacing *s_{min}* / Min. Edge Distance *c_{min}*.** The absolute minimum spacing and edge distance allowed.

- **Reduction factors.** Safe working loads for anchors with centre-to-centre spacing less than *s_{cr}* or anchor-to-edge distance less than *c_{cr}* should be reduced by a percentage corresponding to the percentage of reduction in critical spacing and critical edge distance. It may be necessary to apply more than one reduction factor to the anchor's safe working load if the anchor is unfavourably affected by more than one edge distance or close spacing.

- **Group capacity.** The capacity of a group of anchors shall be the capacity of the most unfavourably placed anchor in the group multiplied by the number of anchors in the group.

- **Combined tension-shear loading.** If the anchor is loaded in both tension and shear, the combined load must satisfy the following equation:

$$\frac{\text{Actual tension load}}{\text{Safe working tension load}} + \frac{\text{Actual shear load}}{\text{Safe working shear load}} \geq 1.4$$

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