

Kwik Bolt 3 Expansion Anchor 4.3.5

Countersunk Kwik Bolt Anchor Product Line

Size	Length in. (mm)	Box Quantity	Item No.	
			Carbon Steel	304 SS
C1/4 x 2	2 (51)	100	286037	-
C1/4 x 3	3 (76)	100	286038	286044
C1/4 x 5	5 (127)	100	286039	-
C3/8 x 2-1/4	2-1/4 (57)	100	286040	-
C3/8 x 3	3 (76)	100	286041	-
C3/8 x 4	4 (102)	50	286042	286045
C3/8 x 5	5 (127)	50	286043	-

Rod Coupling Kwik Bolt 3 Anchor Product Line

Size	Length in. (mm)	Thread Length in. (mm)	ID Stamp	Box Quantity	Item No.
					Carbon Steel
3/8 x 2-1/4	2-1/4 (57)	7/8 (22)	B	100	283470

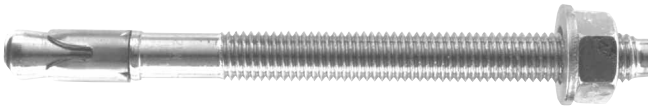
HHDCa Ceiling Anchor Product Line

Size	Length in. (mm)	Eyelet Size in.	Box Quantity	Item No.
				Carbon Steel
1/4 x 2	2-1/32 (52)	5/16	100	412669

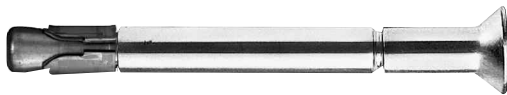
Kwik Bolt 3 Anchor



Long Thread Kwik Bolt 3 Anchor



Countersunk Kwik Bolt 3 Anchor



Rod Coupling Kwik Bolt 3 Anchor (3/8" x 2 1/4" only)



HHDCa Ceiling Hanger (1/4" x 2" only)



4.3.5 Kwik Bolt 3 Expansion Anchor

4.3.5.7 Kwik Bolt 3 Anchor Sample Calculations

Given:

2-1/2 in. KB3 anchors under static tension load as shown.

$h_{ef} = 3.25$ in.

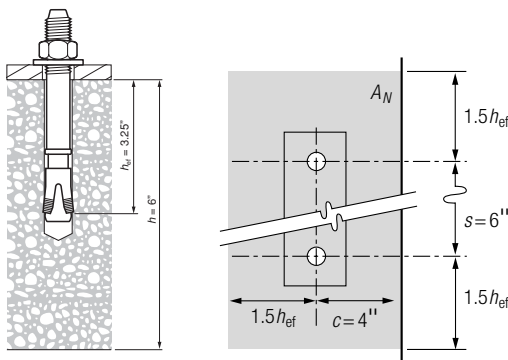
Normal wt. concrete, $f'_c = 3,000$ psi

No supplementary reinforcing.

Assume uncracked concrete.

Condition B per ACI 318-05 D.4.4(c)

Calculate the allowable tension load for this configuration.



Calculation per ACI 318-05 Appendix D and this report.	Code Ref.	Report Ref
Step 1. Calculate steel strength of anchor in tension: $N_{sa} = n A_{se} f_{ut} = (2) (0.11) (106,000) = 23,320$ lb	D.5.1.2	Table 17
Step 2. Calculate steel capacity $\phi N_{sa} = (0.75) (23,320) = 17,490$ lb.	D.4.4 a)	
Step 3. Calculate concrete breakout strength of anchor in tension $N_{cbg} = \frac{A_{Nc}}{A_{Nco}} (\Psi_{ec,N}) (\Psi_{ed,N}) (\Psi_{c,N}) (\Psi_{cp,N})$	D.5.2.1	
Step 3a. Verify minimum member thickness, spacing and edge distance: $h_{min} = 6$ in. ≤ 6 in. \therefore ok From Table 3; $c_{a,min} = 1.625$ in. when $s \geq 4.25$ in. \therefore ok	D.8	Table 17
Step 3b. Check: $1.5 h_{ef} = (1.5) (3.25) = 4.88$ in. $> c$ $3.0 h_{ef} = (3.0) (3.25) = 9.75$ in. $> s$	D.5.2.1	Table 17
Step 3c. Calculate A_{No} and A_N for the anchorage: $A_{No} = 9 h_{ef}^2 = (9) (3.25)^2 = 95.1$ in ² $A_N = (1.5 h_{ef} + c) (3 h_{ef} + s) = [(1.5) (3.25) + 4] [(3) (3.25) + 6] = 139.8$ in ² $< 2 \times A_{No} \therefore$ ok	D.5.2.1	
Step 3d. Calculate $\Psi_{ec,N} : e_N' = 0 : \Psi_{ec,N} = 1.0$	D.5.2.4	
Step 3e. Calculate $N_b : N_b = k_{unbr} \sqrt{f'_c} (h_{ef})^{1.5}$ $N_b = 24 \sqrt{3000} (3.25)^{1.5} = 7,702$ lb	D.5.2.4	
Step 3f. Calculate modification factor for edge distance: $\Psi_{ed,N} = 0.7 + 0.3 \left[\frac{4}{(1.5) (3.25)} \right] = 0.95$	D.5.2.5	Table 17
Step 3g. Calculate modification factor for splitting: $\Psi_{cp,N} = \frac{\max c_{a,min} : 1.5 \times h_{ef} }{c_{ac}} = \frac{\max 4 : 1.5 \times 3.25 }{6.75} = 0.72$	D.5.2.7	Table 17
Step 3h. Calculate N_{cbg} : $N_{cbg} = \left(\frac{139.8}{95.1} \right) (1.0) (0.95) (1.0) (0.72) (7,702) = 7,744$ lb	D.5.2.1	Table 17
Step 4. Check pullout strength: per Table 3, $N_{p, unbr} = (2) (6890) \sqrt{\frac{3000}{2500}} = 15,095$ lb Does not control	D.5.3.2	Table 17
Step 5. Controlling strength: $\phi N_{cbg} = (0.65) (7,744$ lb) = 5,034 lb, controls	D.4.4 c)	
Step 6. Convert value to ASD: $N_{allow} = \frac{5,034}{1.4} = 3,595$ lb	—	

In The United States

PAYMENT TERMS:	Net 30 days from date of invoice. Customer agrees to pay all costs incurred by Hilti in collecting any delinquent amounts, including attorney's fees.
FREIGHT:	All sales are F.O.B. Destination with transportation allowed via Hilti designated mode. Delivery dates are estimates only. Additional charges for expedited shipments, special handling requirements, and orders below certain dollar amounts shall be the responsibility of Customer. Fuel surcharges may apply depending on market conditions.
CREDIT:	All orders sold on credit are subject to Credit Department approval.
RETURN POLICY:	Products must be in saleable condition to qualify for return. Saleable condition is defined as unused items in original undamaged packaging and unbroken quantities and in as-new condition. All returns are subject to Hilti inspection and acceptance, and a \$125 restocking charge if returned more than 90 days after invoice date. Proof of purchase is required for all returned materials. Special orders products and discontinued items are not eligible for return credit. Dated materials are only returnable in case quantity, and within 30 days after invoice date.
WARRANTY:	<p>Hilti warrants that for a period of 12 months from the date it sells a product it will, at its sole option and discretion, refund the purchase price, repair, or replace such product if it contains a defect in material or workmanship. Absence of Hilti's receipt of notification of any such defect within this 12-month period shall constitute a waiver of all claims with regard to such product.</p> <p>THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Hilti shall in no event be liable for, and Customer hereby agrees to indemnify Hilti against all claims related to special, direct, indirect, incidental, consequential, or any other damages arising out of or related to the sale, use, or inability to use the product.</p>
ACCEPTANCE OF ORDER:	Acceptance is limited to the express terms contained herein, and terms are subject to change by Hilti without notice. Additional or different terms proposed by Customer are deemed material and are objected to and rejected, but such rejection shall not operate as a rejection of the offer unless it contains variances in the terms of the description, quantity, price or delivery schedule of the goods. Orders are not deemed "accepted" by Hilti unless and until it ships the associated items.
DOMESTIC ORIGIN:	Any non-domestic Hilti product will be so identified on shipping documents and invoices for customers who properly identify themselves as a federal government entity. All other customers may obtain such information by written request to Hilti, Inc., Contract Compliance, P.O. Box 21148, Tulsa, Oklahoma 74121. Hilti's Quality Department personnel are the only individuals authorized to warrant the country of origin of Hilti products.
BUSINESS SIZE:	Hilti is a large business.
PRICES:	Prices are those stated on the order, and unless otherwise noted are based on purchasing all items on the order — pricing for individual products may vary for purchases of different quantities or item combinations. Hilti does not maintain most favored customer records, makes no representation with respect to same, and rejects any price warranty terms proposed by Customer. Hilti's published net price list is subject to change without notice.
CONSENT TO JURISDICTION:	All transactions made pursuant hereto shall be deemed to have been made and entered into in Tulsa, Oklahoma. Any and all disputes arising directly or indirectly from such transactions shall be resolved in the courts of the County of Tulsa, State of Oklahoma, to the exclusion of any other court, and any resulting judgment may be enforced by any court having jurisdiction of such an action. All transactions shall be governed by and construed in accordance with the laws of the State of Oklahoma.
INDEMNIFICATION:	Customer hereby agrees to indemnify Hilti for any costs, including attorney's fees, incurred by Hilti as a result, in whole or in part, of any violation by Customer of any Federal, State or Local statute or regulation, or of any nationally accepted standard. It shall be Customer's sole responsibility to comply with all applicable laws and regulations regarding the handling, use, transportation, or disposal of products upon taking possession of same.
AUTHORIZATION:	HILTI LEGAL DEPARTMENT PERSONNEL ARE THE ONLY INDIVIDUALS AUTHORIZED TO MODIFY THESE TERMS AND CONDITIONS, WARRANT PRODUCT SUITABILITY FOR SPECIFIC APPLICATIONS, OR EXECUTE CUSTOMER DOCUMENTS, AND ANY SUCH ACTION IS NULL AND VOID UNLESS IN WRITTEN FORM SIGNED BY SUCH INDIVIDUAL.

In Canada

PAYMENT TERMS:	Net 30 days from date of invoice. Customer agrees to pay all costs incurred by Hilti in collecting delinquent amounts, if any, including reasonable attorney's fees.
FREIGHT:	Sales are F.O.B. Destination Point with transportation allowed via Hilti designated mode. Additional charges may apply for expedited delivery, special handling requirements, and order under certain limits. A fuel surcharge may apply depending on market conditions.
CREDIT:	All orders sold on credit are subject to Credit Department approval.
RETURN POLICY:	Product may be returned prepaid (unless otherwise authorized) to Hilti provided: <ul style="list-style-type: none"> i) it is returned by the original purchaser ii) it is not dated product returned more than 30 days after the original delivery date iii) it is not discontinued, clearance or special order product iv) it is unused, in original packaging and in unbroken quantities. <p>Hilti will inspect product and, if the above requirements are satisfied, will credit to customer the original purchase price. A 15% restocking fee may apply.</p>
WARRANTY:	Other than the manufacturer's published warranty, no warranties or conditions, express or implied, written or oral, statutory or otherwise are implied. Any and all conditions and warranties implied by law or by the Sale of Goods Act or any similar statutes of any Province are hereby expressly waived.
TITLE TO PRODUCT:	Title to product remains with Hilti until the total purchase price of product is paid.
PRICES:	Customer agrees to pay Hilti prices set out on invoice. Customer agrees to pay taxes as indicated on invoice unless Hilti receives acceptable exemption certificates.
INDEMNIFICATION:	Customer agrees to use product at own risk and to indemnify Hilti against all liabilities, including legal fees, to third parties arising out of the use or possession thereof. Hilti shall in no event be liable for special, incidental or consequential damages.
CHANGES:	Hilti sales personnel are not authorized to modify these Terms and Conditions or modify Customer's credit terms. Terms are subject to change by Hilti with reasonable notice to Customer.
CASH SALES:	Payment in full is due prior to goods being released.
QUOTATIONS:	All terms and conditions apply once customer agrees to purchase product. Quotations on special promotion products are only valid until end of promotion period.