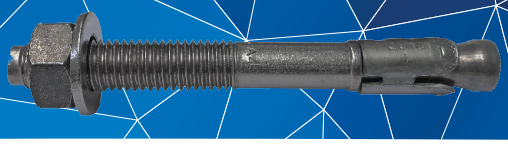
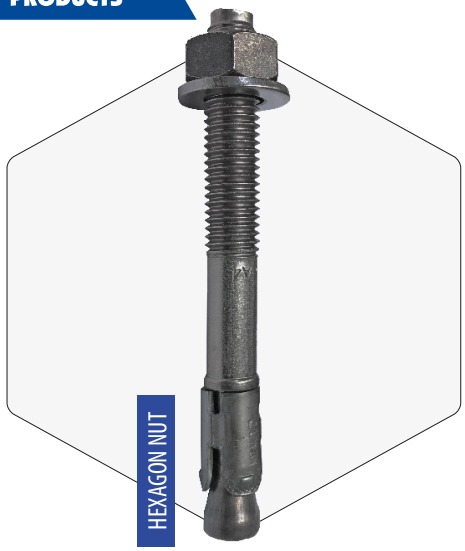
Option 1 Throughbolt
Stainless Steel





INFORMATION

The torque controlled Throughbolt is a stainless steel high performance anchor for use in cracked/non-cracked concrete and structural applications such as:

- Columns
- Guard rails
- Façades
- Staircases
- Silo installation
- Machines
- Cantilever beams

BASE MATERIAL

- Concrete C20/25 to C50/60
- Cracked Concrete
- Non-Cracked Concrete

FEATURES

- High Performance
- Wide Range Of Sizes
- Fast And Secure Installation
- Through Fixing
- Three way Expansion Sleeve
- Stainless Steel A4/316
- Close Spacing And Edge Distance
- Reduced Embedment Depth
- Reaction To Fire Class A1
- Fire Resistant Loading

APPROVALS

European Technical Assessment
Option 1 Cracked Concrete

ETA 13/0364
Fire Resistance

ETA 13/0364

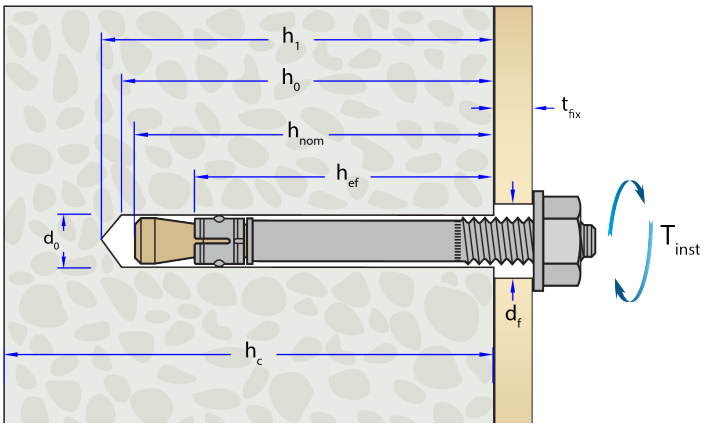
C1, C2
Seismic Performance Categories
(M10 to M20 with standard anchorage depths)

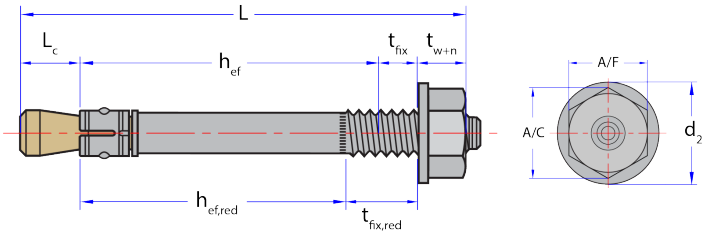
RELATED PRODUCTS

SDS+ Drill Bits

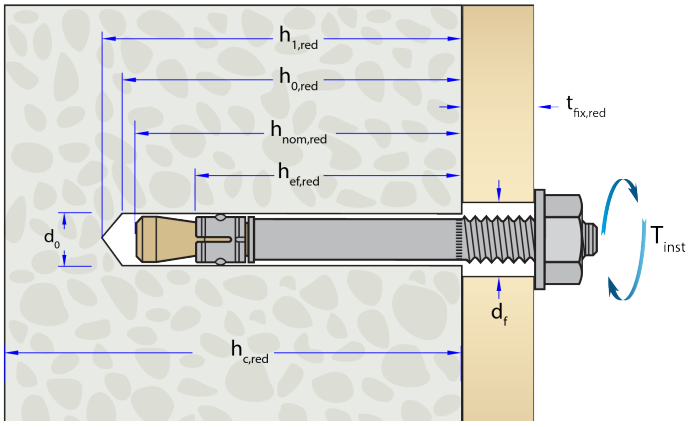
Hole Cleaning Pump

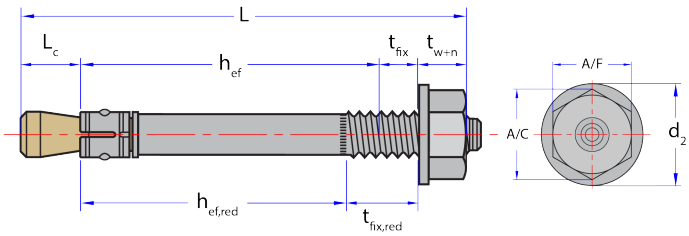
RANGE AND LOAD DATA





STANDARD EMBEDMENT





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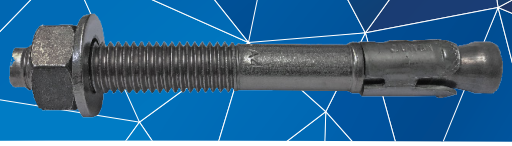
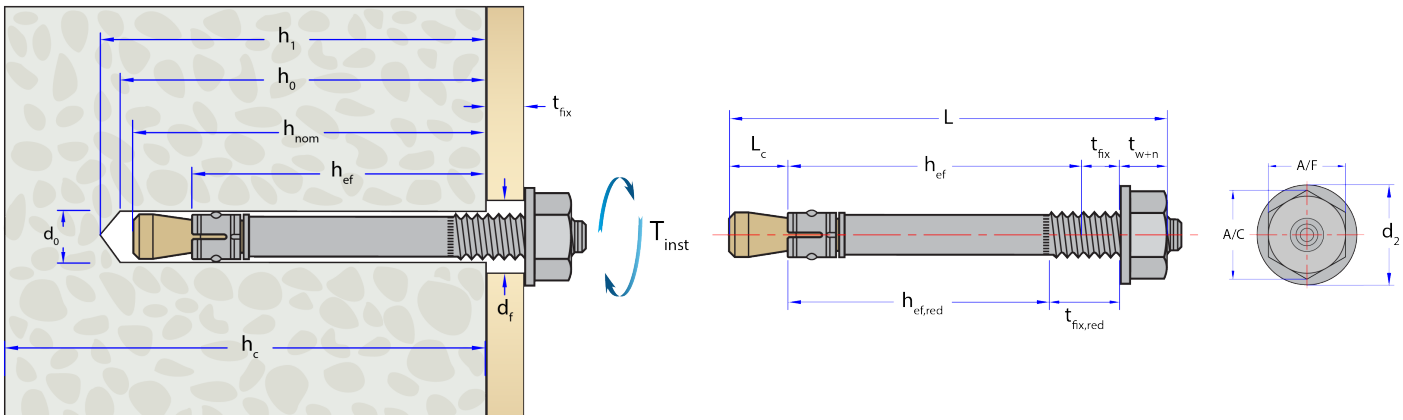


RANGE AND LOAD DATA

RANGE DATA														
Part Number	Size of Thread	Min. Structure Thickness	Drill Hole Diameter	Min Hole Depth	Fixture Clearance Hole	Cone Length	Effective Embedment Depth	Max Fixture Thickness	Washer and Nut Thickness	Total Length	Thread Length	Width Across Flats	Washer Outer diameter	Tightening Torque
	-	(h_c)	(d_0)	(h_1)	(d_f)	(L_c)	(h_{ef})	(t_{fix})	(t_{w+n})	(L)	(L_{th})	(A/F)	(d_2)	(T_{inst})
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Nm
STANDARD EMBEDMENT DEPTH														
ETA08080SS	M8	100	8	60	9	11	46	15	8	80	37	13	16	20
ETA08095SS								30		95	52			
ETA80115SS								50		115	72			
ETA10100SS	M10	120	10	75	12	10	60	20	10	100	52	17	20	35
ETA10130SS								50		130	82			
ETA10180SS								100		180	132			
ETA12110SS	M12	140	12	90	14	14	70	15	13	110	51	19	24	50
ETA12125SS								30		125	66			
ETA12160SS								65		160	101			
ETA12200SS								105		200	135			
ETA16135SS	M16	160	16	110	18	17	85	15	16	135	56	24	30	110
ETA16170SS								50		170	91			
ETA16220SS								100		220	80			
ETA20165SS	M20	200	20	125	22	21	100	30	21	165	50	30	37	200
ETA20195SS								60		195	70			
ETA20235SS								100		235	80			



STANDARD EMBEDMENT

For variations in structure thickness, reduced spacing and edge calculations download the free Anchor Calculation Program

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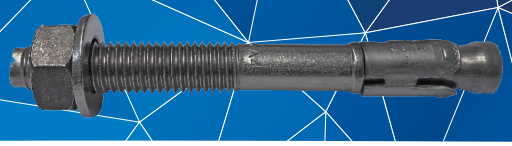
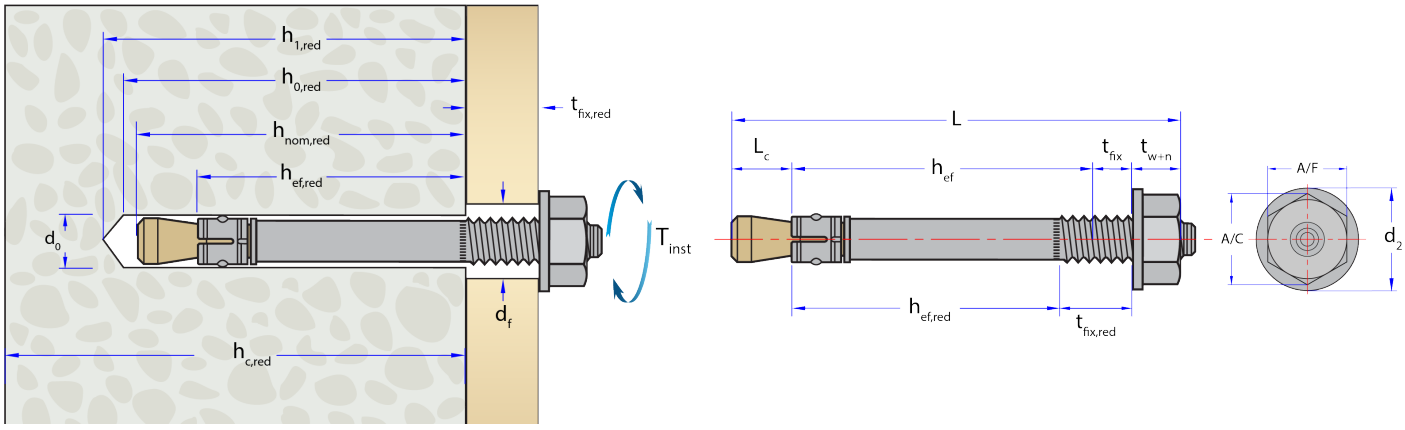


RANGE AND LOAD DATA

RANGE DATA														
Part Number	Size of Thread	Red. Min. Structure Thickness	Drill Hole Diameter	Red. Min. Hole Depth	Fixture Clearance Hole	Cone Length	Red. Effective Embedment Depth	Red. Max. Fixture Thickness	Washer and Nut Thickness	Total Length	Thread Length	Width Across Flats	Washer Outer diameter	Tight-ening Torque
	-	($h_{c,red}$)	(d_0)	($h_{1,red}$)	(d_f)	(L_c)	($h_{ef,red}$)	($t_{fix,red}$)	(t_{w+n})	(L)	(L_{th})	(A/F)	(d_2)	(T_{inst})
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Nm
REDUCED EMBEDMENT DEPTH														
ETA08065SS	M8	80	8	49	9	11	35	11	8	65	22	13	16	20
ETA08080SS								26		80	37			
ETA08095SS								41		95	52			
ETA80115SS								61		115	72			
ETA10080SS	M10	80	10	55	12	10	40	20	10	80	32	17	20	35
ETA10100SS								40		100	52			
ETA10130SS								70		130	82			
ETA10180SS								120		180	132			
ETA12095SS	M12	100	12	70	14	11.7	50	20	13	95	36	19	24	50
ETA12110SS								35		110	51			
ETA12125SS								50		125	66			
ETA12160SS								85		160	101			
ETA12200SS								125		200	135			
ETA16115SS	M16	140	16	90	18	17	65	15	17	115	36	24	30	110
ETA16135SS								35		135	56			
ETA16170SS								70		170	91			



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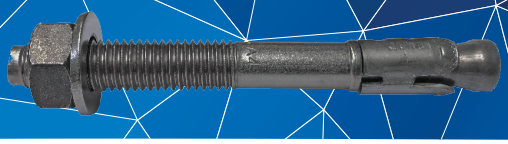


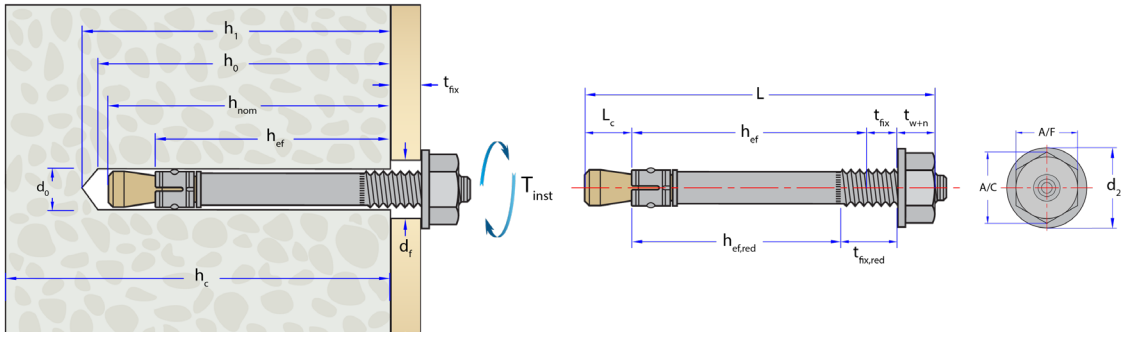
NON-CRACKED CONCRETE

REDUCED EMBEDMENT

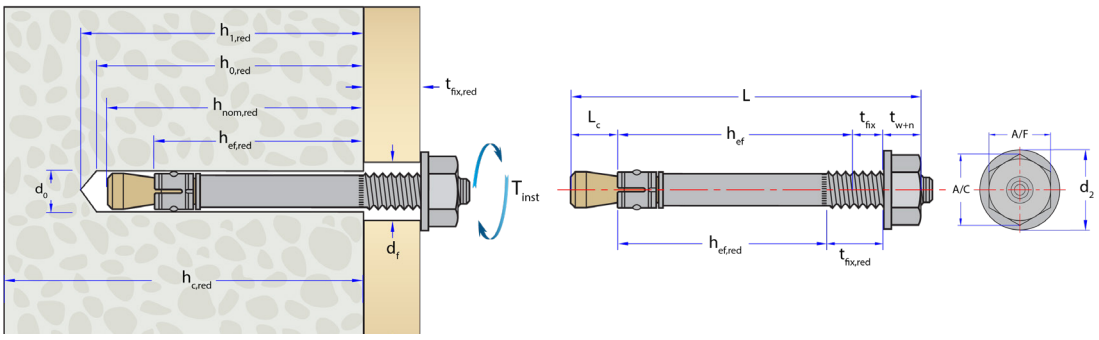
Performance Data (C20/25 non-cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (S)		Design Edge Distance (C)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile (N_{Ap})	Shear (V_{Ap})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	35	80	7.5	13.0	5.0	10.4	3.5	7.4	50	50	70	130
M10	40	80	9.0	20.0	6.0	16.0	4.2	11.4	85	70	70	210
M12	50	100	17.8	30.0	11.8	24.0	8.4	17.1	250	110	130	270
M16	65	140	26.4	63.5	17.6	42.3	12.5	30.2	200	200	170	400

STANDARD EMBEDMENT

Performance Data (C20/25 non-cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (S)		Design Edge Distance (C)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile (N_{Ap})	Shear (V_{Ap})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	46	100	12.0	13.0	8.0	10.4	5.7	7.4	80	40	80	120
M10	60	120	16.0	20.0	10.6	16.0	7.5	11.4	90	50	70	160
M12	70	140	25.0	30.0	16.6	24.0	11.8	17.1	200	60	120	220
M16	85	160	35.0	55.0	23.3	44.0	16.6	31.4	310	100	170	370
M20	100	200	50.5	86.0	33.6	61.4	24.0	43.8	440	100	220	460



STANDARD EMBEDMENT



REDUCED EMBEDMENT

Technical Data Sheet

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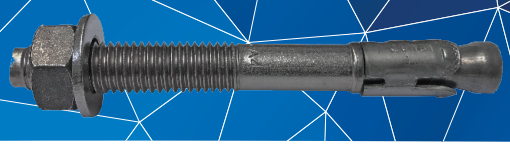


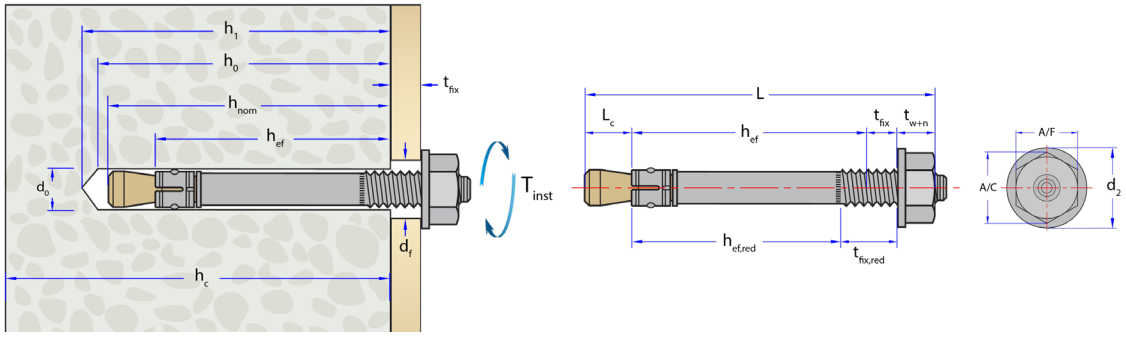
CRACKED CONCRETE

REDUCED EMBEDMENT

Performance Data (C20/25 cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (S)		Design Edge Distance (C)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile (N_{Ap})	Shear (V_{Ap})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	35	80	5.0	13.0	3.3	10.4	2.3	7.4	50	80	40	200
M10	40	80	7.5	21.8	5.0	14.5	3.5	10.3	80	120	65	270
M12	50	100	12.7	30.5	8.4	20.3	6.0	14.5	150	150	80	330
M16	65	140	18.8	45.2	12.5	30.1	8.9	21.5	200	200	100	400

STANDARD EMBEDMENT

Performance Data (C20/25 cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (S)		Design Edge Distance (C)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile (N_{Ap})	Shear (V_{Ap})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	46	100	5.0	13.0	3.3	10.4	2.3	7.4	40	40	40	170
M10	60	120	9.0	20.0	6.0	16.0	4.2	11.4	50	50	60	230
M12	70	140	16.0	30.0	10.6	24.0	7.5	17.1	110	90	80	320
M16	85	160	25.0	55.0	16.6	44.0	11.8	31.4	200	250	110	550
M20	100	200	36.0	86.0	24.0	61.4	17.1	43.8	300	250	150	670



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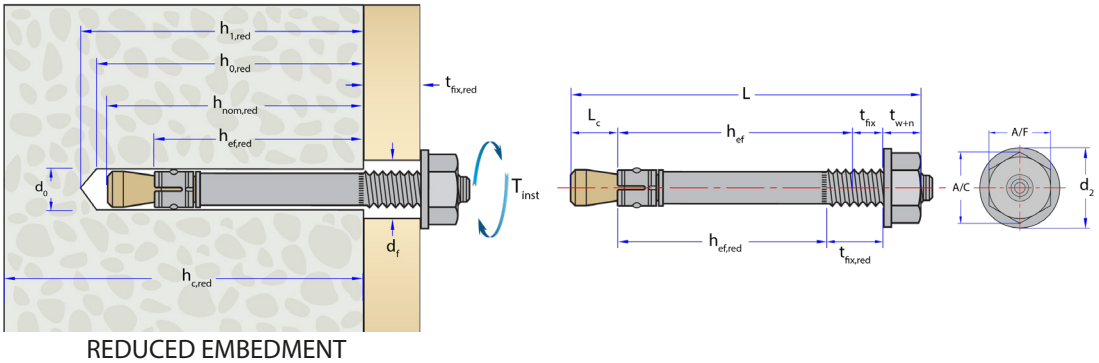

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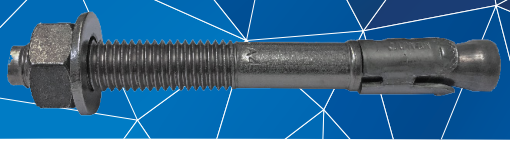

FIRE RESISTANCE DATA

Fire Resistance Data (C20/25 to C50/60 cracked or non-cracked concrete)*													
Size Of Thread	Effective Embedment Depth	Minimum Concrete Thickness	Characteristic Resistance (=Design Resistance)**						Approved Resistance					
			Tensile and shear						Tensile and shear					
			R30			R60			R30			R60		
			Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm
-	(h_{ef})	(h_{min})	$N_{Rk,s,fi}$	$V_{Rk,s,fi}$	$M^0_{Rk,s,fi}$	$N_{Rk,s,fi}$	$V_{Rk,s,fi}$	$M^0_{Rk,s,fi}$	$N_{Ra,s,fi}$	$V_{Ra,s,fi}$	$M^0_{Ra,s,fi}$	$N_{Ra,s,fi}$	$V_{Ra,s,fi}$	$M^0_{Ra,s,fi}$
mm	mm	mm	kN	kN	Nm	kN	kN	Nm	kN	kN	Nm	kN	kN	Nm
M8	46	100	3.8	3.8	3.8	2.9	2.9	2.9	2.7	2.7	2.7	2.1	2.1	2.1
M10	60	120	6.9	6.9	9.0	5.2	5.2	6.8	4.9	4.9	6.4	3.7	3.7	4.9
M12	70	140	11.5	11.5	17.9	8.6	8.6	13.3	8.2	8.2	12.8	6.1	6.1	9.5
M16	85	160	21.5	21.5	45.5	16.0	16.0	33.9	15.4	15.4	32.5	11.4	11.4	24.2
M20	100	200	33.5	33.5	88.8	25.0	25.0	66.1	23.9	23.9	63.4	17.9	17.9	47.2

Fire Resistance Data (C20/25 to C50/60 cracked or non-cracked concrete)*													
Size Of Thread	Effective Embedment Depth	Minimum Concrete Thickness	Characteristic Resistance (=Design Resistance)**						Approved Resistance					
			Tensile and shear						Tensile and shear					
			R90			R120			R90			R120		
			Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm	Tensile	shear without lever arm	shear with lever arm
-	(h_{ef})	(h_{min})	$N_{Rk,s,fi}$	$V_{Rk,s,fi}$	$M^0_{Rk,s,fi}$	$N_{Rk,s,fi}$	$V_{Rk,s,fi}$	$M^0_{Rk,s,fi}$	$N_{Ra,s,fi}$	$V_{Ra,s,fi}$	$M^0_{Ra,s,fi}$	$N_{Ra,s,fi}$	$V_{Ra,s,fi}$	$M^0_{Ra,s,fi}$
mm	mm	mm	kN	kN	Nm	kN	kN	Nm	kN	kN	Nm	kN	kN	Nm
M8	46	100	2.0	2.0	2.1	1.6	1.6	1.6	1.4	1.4	1.5	1.1	1.1	1.1
M10	60	120	3.5	3.5	4.5	2.7	2.7	3.4	2.5	2.5	3.2	1.9	1.9	2.4
M12	70	140	5.6	5.6	8.8	4.2	4.2	6.5	4.0	4.0	6.3	3.0	3.0	4.6
M16	85	160	10.5	10.5	22.2	7.8	7.8	16.4	7.5	7.5	15.9	5.6	5.6	11.7
M20	100	200	16.4	16.4	43.4	12.1	12.1	32.1	11.7	11.7	31.0	8.6	8.6	22.9

* The determination covers anchors with a fire attack from one side only. If the fire attack is from more than one side, the design method may be taken only, if the edge distance of the anchor is $c \geq 300$ mm and $\geq 2\ h_{ef}$.

**For combined loads and shear with lever arm use Anchor Calculation Program.

SUPPLEMENTARY DATA

Influence Of Concrete Strength (Cracked/Non-cracked Concrete)					
Concrete strength		C20/25	C30/37	C40/50	C50/60
Cylinder	N/mm²	20	30	40	50
Cube	N/mm²	25	37	50	60
Factor	-	1.0	1.22	1.41	1.55

Important Note:
When using concrete factors ensure that loads do not exceed Steel Design Resistance. It is advised to use JCP Anchor Calculation Program.

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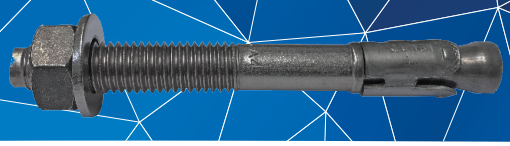
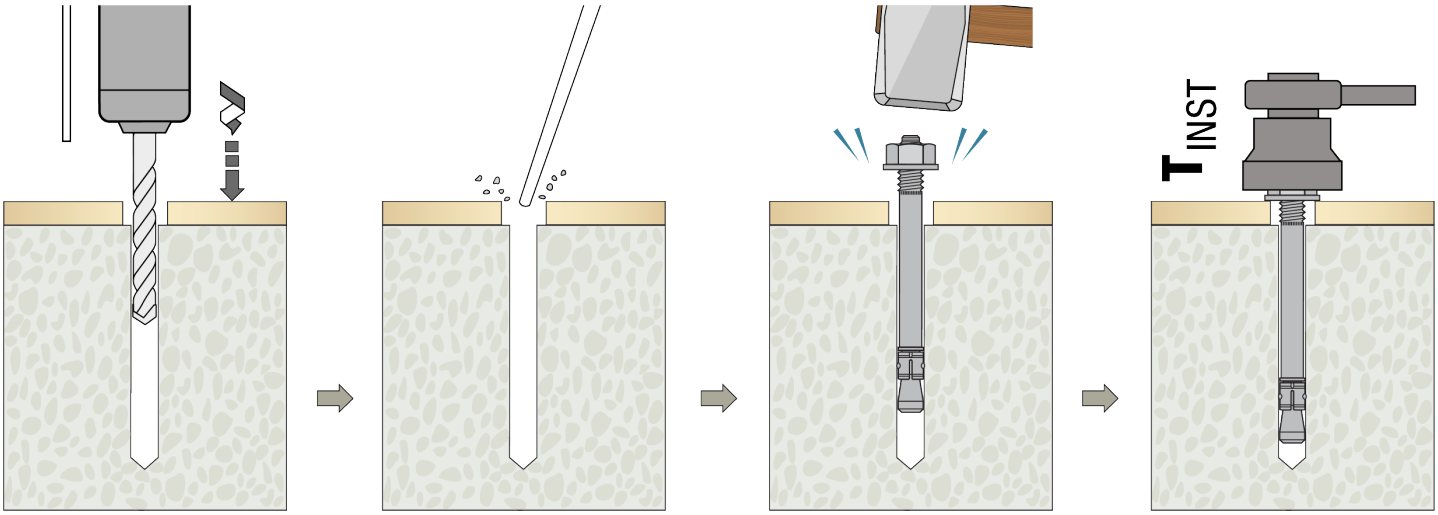


Steel Failure						
Size Of Thread	Tensile Resistance			Shear Resistance		
	Characteristic Resistance ($N_{Rk,s}$)	Design Resistance ($N_{Rd,s}$)*	Approved Resistance ($N_{Ra,s}$)	Characteristic Resistance ($V_{Rk,s}$)	Design Resistance ($V_{Rd,s}$)**	Approved Resistance ($V_{Ra,s}$)
-	kN	kN	kN	kN	kN	kN
M8	16.0	10.6	7.5	13.0	10.4	7.4
M10	27.0	18.0	12.8	20.0	16.0	11.4
M12	40.0	26.6	19.0	30.0	24.0	17.1
M16	64.0	42.6	30.4	55.0	44.0	31.4
M20	108.0	64.2	45.8	86.0	61.4	43.8

* A partial safety factor (γ_{MS}) equal to 1.50 for M8 to M16 (1.68 for M20) is included.
** A partial safety factor (γ_{MS}) equal to 1.25 for M8 to M16 (1.40 for M20) is included.

INSTALLATION INSTRUCTIONS



-Position fixture and drill correct diameter hole to corresponding depth

-Clean hole by blowing to remove drilling debris and dust

-Insert anchor through fixture into concrete and lightly hammer into concrete

-Tighten with torque wrench to recommended torque

INSTALLATION INSTRUCTIONS VIDEO

To watch the video and subscribe, please click on the link or scan the QR code:

How to install a Throughbolt - JCP Fixings

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