Through-bolt expansion anchor with controlled torque, for use in cracked and non cracked concrete

A4 Stainless shaft. A4 Stainless clip.

PRODUCT INFORMATION

DESCRIPTION
Through- bolt anchors, with male thread, expansion by controlled torque.

SIZES
M8x68 to M16x220.

DESIGN LOAD RANGE
From 6,00 to 23,3 kN (non-cracked).
From 3,3 to 16,67 kN (cracked).

BASE MATERIAL
Concrete class from C20/25 to C50/60 cracked or non-cracked.


Stone


Concrete


Reinforced Concrete


Cracked Concrete

CHARACTERISTICS AND BENEFITS
- Easy installation.
- Use in cracked and non-craked concrete.
- Pre-installation or through the drill-hole of the fixture.
- Variety of lengths and diameters: flexibility in assembly.
- For static and quasi-static loads.
- Friction operation. Installation by controlled torque
- Use for medium loads.
- Assessed for fire resistance RF30 to RF120.
- A4 Stainless steel (AISI 316).
- Available at WISINE

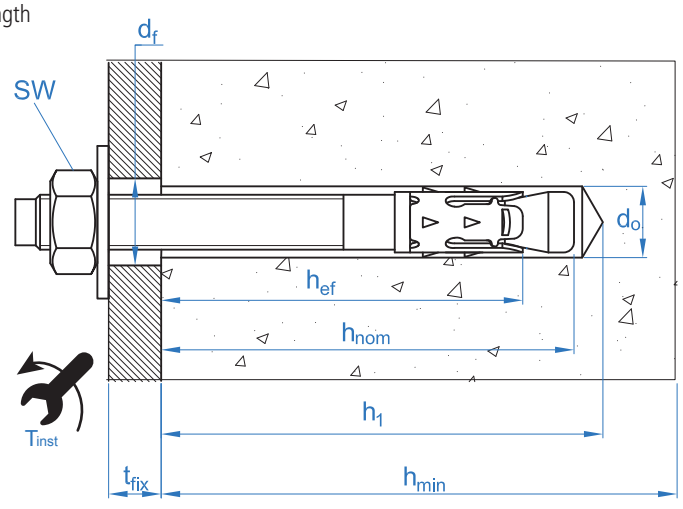
MATERIALS
Shaft: A4 Stainless steel.
Washer: DIN 125, A4 Stainless steel.
Nut: DIN 934, A4 Stainless steel.
Clip: A4 Stainless steel.

APPLICATIONS
- Structural fixings in cracked and non cracked concrete, including industrial and marine environments
- Safety barriers.
- Fixings of steel beams, perforated bracker guides, machinery, boilers, signage, staium seating, facade substructures, etc.
- Fixing of wood structures to concrete.

MECHANICAL PROPERTIES						
			M8	M10	M12	M16
Cone area section						
A_s	(mm^2)	Cone area section	22,9	41,8	55,4	103,9
$f_{u,s}$	(N/mm^2)	Chracteristic tension resistance	790	750	730	700
$f_{y,s}$	(N/mm^2)	Yield strength	632	600	585	560
Threaded area section						
A_s	(mm^2)	Cone area section	36,6	58,0	84,3	157,0
$f_{u,s}$	(N/mm^2)	Chracteristic tension resistance	600	600	600	600
$f_{y,s}$	(N/mm^2)	Yield Strength	480	480	480	480

INSTALLATION DATA						
SIZE			M8	M10	M12	M16
Code			APA408XXX	APA410XXX	APA412XXX	APA416XXX
d_0	Nominal diameter of drill bit	[mm]	8	10	12	16
T_{ins}	Installation torque moment	[Nm]	20	40	60	120
$d_f \leq$	Diameter of clearance hole in the fixture	[mm]	9	12	14	18
h_1	Minimum drill hole depth	[mm]	70	80	100	115
h_{nom}	Installation depth	[mm]	54	67	81	97
h_{ef}	Effective embedment depth	[mm]	48	60	72	86
h_{min}	Minimum base material thickness	[mm]	100	120	150	170
t_{fix}	Maximum thickness of fixture	[mm]	L-65	L-80	L-100	L-120
$s_{cr,N}$	Critical spacing	[mm]	144	180	216	258
$c_{cr,N}$	Critical edge distance	[mm]	72	90	108	129
$s_{cr,sp}$	Critical distance (splitting)	[mm]	144	180	216	258
$c_{cr,sp}$	Critical edge distance (splitting)	[mm]	72	90	108	129
s_{min}	Minimum spacing	[mm]	50	55	60	70
c_{min}	Minimum edge distance	[mm]	50	55	60	70
SW	Installation wrench		13	17	19	24

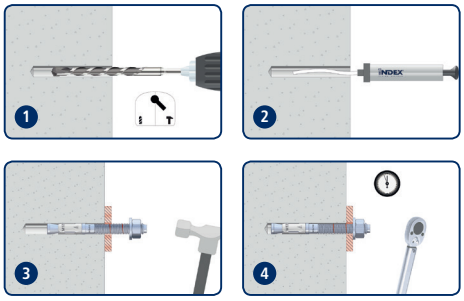
*L = Total anchor length



Through-bolt anchor for heavy duty

	INSTALLATION PRODUCTS
	Hammer drill
	Concrete Drill bits
	Blow pump
	Cleaning Brush
	Installation hammering tool
	Torque wrench
	Hexagonal socket

INSTALLATION



Resistances in C20/25 concrete for an isolated anchor, without effects of edge distance or spacing

Characteristic Resistance N_{Rk} and V_{Rk}

TENSION							SHEAR						
Size			M8	M10	M12	M16	Size			M8	M10	M12	M16
N_{Rk}	Non-cracked concrete	[kN]	9,0	16,0	20,0	35,0	V_{Rk}	Non-cracked concrete	[kN]	11,9	18,8	27,4	51,0
N_{Rk}	Cracked concrete	[kN]	5,0	9,0	12,0	25,0	V_{Rk}	Cracked concrete	[kN]	11,9	18,8	27,4	51,0

Design Resistance N_{Rd} and V_{Rd}

TENSION							SHEAR						
Size			M8	M10	M12	M16	Size			M8	M10	M12	M16
N_{Rd}	Non-cracked concrete	[kN]	6,0	10,7	13,3	23,3	V_{Rd}	Non-cracked concrete	[kN]	9,2	14,5	21,1	39,2
N_{Rd}	Cracked concrete	[kN]	3,3	6,0	8,0	16,7	V_{Rd}	Cracked concrete	[kN]	9,2	14,5	21,1	39,2

Maximum Loads Recommended N_{rec} and V_{rec}

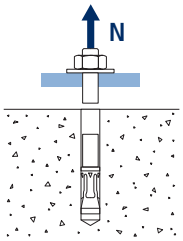
TENSION							SHEAR						
Size			M8	M10	M12	M16	Size			M8	M10	M12	M16
N_{rec}	Non-cracked concrete	[kN]	4,3	7,6	9,5	16,7	V_{rec}	Non-cracked concrete	[kN]	6,5	10,3	15,1	28,0
N_{rec}	Cracked concrete	[kN]	2,4	4,3	5,7	11,9	V_{rec}	Cracked concrete	[kN]	6,5	10,3	15,1	28,0

A4

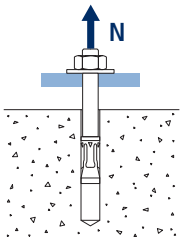
TENSION LOADS

- Steel design resistance: $N_{Rd,s}$
- Pull-out design resistance: $N_{Rd,p} = N^{o}_{Rd,p} \cdot \Psi_{c}$
- Concrete cone design resistance: $N_{Rd,c} = N^{o}_{Rd,c} \cdot \Psi_{b} \cdot \Psi_{s,N} \cdot \Psi_{c,N} \cdot \Psi_{re,N}$
- Concrete splitting design resistance: $N_{Rd,sp} = N^{o}_{Rd,c} \cdot \Psi_{b} \cdot \Psi_{s,sp} \cdot \Psi_{c,sp} \cdot \Psi_{re,N} \cdot \Psi_{h,sp}$

Steel Design resistance					
$N_{Rd,s}$					
Size		M8	M10	M12	M16
N^{o}_{Rd}	[kN]	14,0	22,7	32,7	58,7



Pull-out design resistance						
$N_{Rd,p} = N^{o}_{Rd,p} \cdot \Psi_{c}$						
Size			M8	M10	M12	M16
$N^{o}_{Rd,p}$	Non-cracked concrete	[kN]	6,0	10,7	13,3	23,3
$N^{o}_{Rd,p}$	Cracked concrete	[kN]	3,3	6,0	8,0	16,7



Concrete cone design resistance						
$N_{Rd,c} = N^{o}_{Rd,c} \cdot \psi_{b} \cdot \psi_{s,N} \cdot \psi_{c,N} \cdot \psi_{re,N}$						
Concrete splitting design resistance*						
$N_{Rd,sp} = N^{o}_{Rd,c} \cdot \psi_{b} \cdot \psi_{s,sp} \cdot \psi_{c,sp} \cdot \psi_{re,N} \cdot \psi_{h,sp}$						
Size			M8	M10	M12	M16
$N^{o}_{Rd,c}$	Non-cracked concrete	[kN]	11,2	15,6	20,6	26,9
$N^{o}_{Rd,c}$	Cracked concrete	[kN]	8,0	11,2	14,7	19,1

*Concrete splitting design resistance must only be considered for non-cracked concrete.