POWERDRIVE PK
Wedge Anchors

POWERDRIVE
YOUR FASTENING SOLUTION

Providing a secure, heavy-duty insitu anchorage for fixings to concrete, PK Wedge Anchors give complete support in shear for a stronger fastening against dynamic side loads, and are specifically designed for quick and ready installation.

Comprising a high strength steel bolt with a tough expansion collar, PK Wedge Anchors are torque set and suitable for preset or through fixings. To ensure a durable, high-performance anchorage, with high pull-out values, the collar is specifically designed to give controlled expansion within the substrate.

- A complete fastener unit.
- PK Anchor does not depend on bottom of hole to expand and therefore may be used in overdrilled holes.
- No special setting tools required.
- Smaller drill hole diameter than any other expansion anchor.
- Available in 2 versions:
  1. zinc plated steel,
  2. Grade 304 (A2) stainless steel.

Use in: *Concrete, hard rock.*

ADVANTAGES

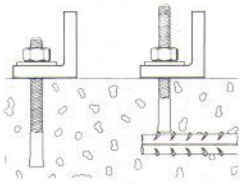
- High load capacities.
- Drill hole diameter equals thread diameter, therefore in-situ fastening is possible, i.e. the anchor hole may be drilled and PK Wedge Anchor inserted through the clearance hole in the fixture.
- Alignment problems eliminated.
- No need for prior marking out of drill holes in concrete.
- Fixtures may be removed and re-installed without disturbing the anchorage.

PERFORMANCE FEATURES OF PK WEDGE ANCHOR

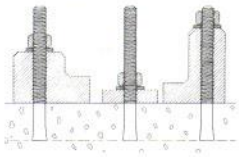
1. Extra long thread.
2. Expansion collar designed to clinch wall of drill hole to prevent turning during setting.
3. High taper base permits re-expansion when re-tightening is necessary.

LONG THREAD ADVANTAGE

PK Wedge Anchor's long thread feature overcomes subsurface obstruction problems.

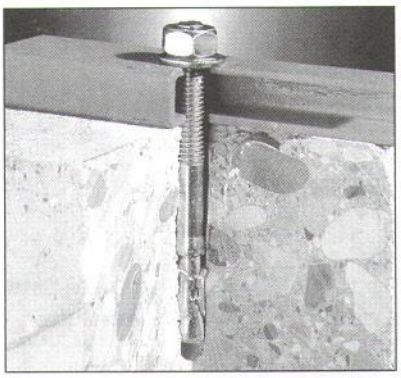


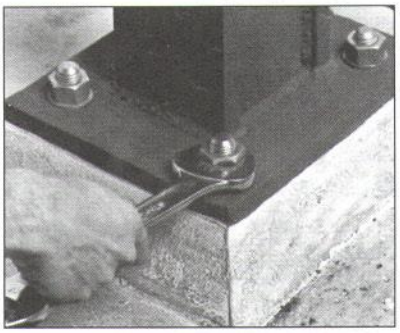
It accommodates various material thicknesses at the same embedment. One anchor length saves installation time and money.

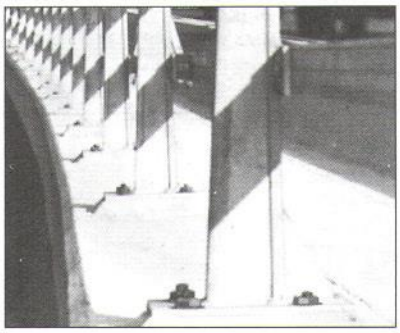


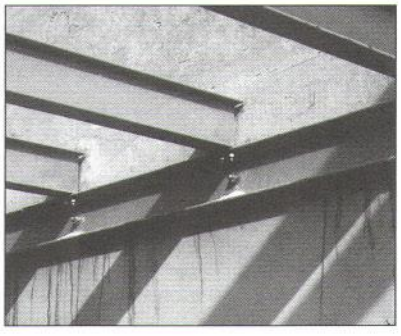
TYPICAL APPLICATIONS

- *Highway guard rail posts*
- *Scaffolding brackets*
- *Industrial doors and gates*
- *Curtainwall brackets*
- *Stainless steel anchoring in water supply and sewerage projects*

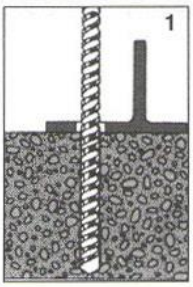




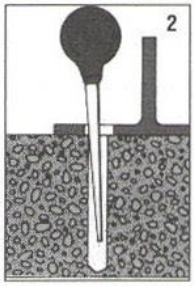




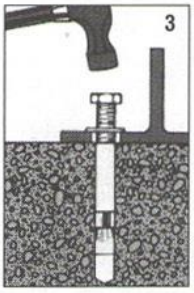
INSTALLATION PROCEDURE



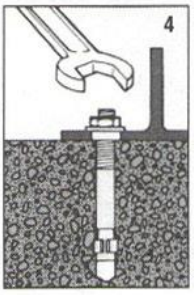
Drill a hole of sufficient depth using a carbide bit whose diameter is same as PK Wedge Anchor size.



After drilling, brush and blow out the dust from the hole.

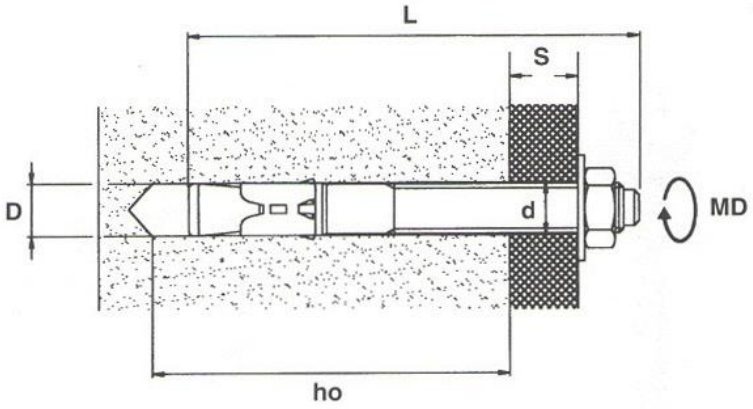


Tap in the anchor.



Expand anchor by turning nut.

INSTALLATION DIMENSIONS

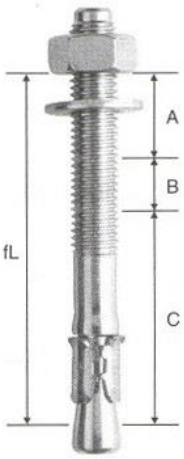


Type	Anchor Size d, mm	Overall Length L, mm	Fastening Length fL, mm	Hole Diameter D, mm	Thread Diameter dt, mm	Minimum Hole Depth ho, mm	Maximum Installation Torque MD, Nm	Clearance Hole Diameter D2, mm
* PK08065	M8	65	49	8.0	M8	40	20	10.0
PK10075	M10	75	54	10.0	M10	50	45	12.0
* PK10080	M10	80	59	10.0	M10	50	45	12.0
PK10100	M10	100	79	10.0	M10	50	45	12.0
**PK12080	M12	80	54	12.0	M12	60	65	14.0
PK12100	M12	100	74	12.0	M12	60	65	14.0
PK12130	M12	130	104	12.0	M12	60	65	14.0
PK12150	M12	150	124	12.0	M12	60	65	14.0
PK16100	M16	100	61	16.0	M16	80	120	18.0
PK16125	M16	125	186	16.0	M16	80	120	18.0
PK16140	M16	140	106	16.0	M16	80	120	18.0
PK20125	M20	125	83	20.0	M20	100	180	22.0
PK20160	M20	160	118	20.0	M20	100	180	22.0

* Stainless steel 304 material
** Carbon steel & Stainless steel 304 available

HOW TO SELECT THE CORRECT LENGTH PK WEDGE ANCHOR

Select a PK Wedge Anchor with sufficient fastening length fL to accommodate A + B + C (mm)



A. Fixture thickness

B. Depth of any air space or non-structural screed e.g. plaster

C. Anchorage depth (minimum 4d)

d = Anchor diameter

BOLT DATA

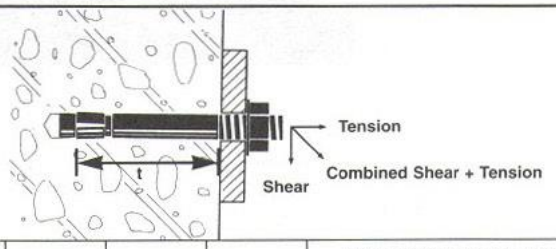
I. Mechanical Properties

Quality	Ultimate Tensile Strength	Yield Stress
	N/mm²	N/mm²
Carbon Steel	500	400
Stainless Steel		
≤ M16	700	450
≥ M20	500	250

II. Tensile Breaking Loads

Anchor Size	Stressed Cross-sectional Area	Minimum Breaking Loads	
		Carbon Steel	Stainless Steel 304
d, mm	As, mm²	ft, kN	ft, kN
M8	36.6	18.8	25.6
M10	58.0	29.0	40.6
M12	84.3	42.2	59.0
M16	157.0	78.5	109.9
M20	245.0	122.5	176.5

FIXING PERFORMANCE DATA

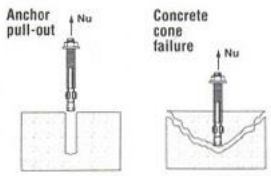


Anchor Size d, mm	Thread Diameter dt, mm	Hole Diameter D, mm	Effective Anchorage Depth t, mm	Concrete grade: C20 / C25 Concrete density: 20 / 25 N/mm² Ultimate Failure Loads, in kN	
				Tension, Nu	Shear, Vu
M8	8	8	45	10.3	12.0
M10	10	10	55	15.0	18.8
M12	12	12	65	22.4	31.4
M16	16	16	90	36.0	55.3
M20	20	20	110	49.7	66.0

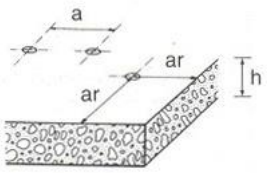
FAILURE MODES

Ultimate Failure – Tension
At anchorage depths of 4d, generally anchor pull-out for M8 and M10 anchors; concrete cone failure for the larger sizes. At anchorage depths between 5d and 6d, generally concrete cone failure.

Ultimate Failure – Shear
Failure of concrete beneath the anchor.

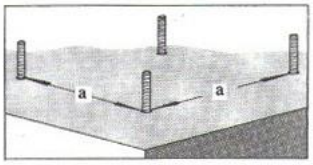


SAFE WORKING LOADS



Minimum base material strength, Bw		20 N/mm²				
Anchor size, d	mm	M8	M10	M12	M16	M20
Effective anchorage depth, t	mm	45	55	65	90	110
Maximum safe working loads at any direction of loading: shear, tension or combined shear-tension, for concrete strength 25 N/mm² or better, SWL	**kN**	**2.2**	**3.5**	**5.0**	**7.0**	**9.5**
Anchor-to-anchor distance for maximum loads, a	mm	100	120	150	190	240
Minimum anchor-to-anchor distance with reduction in load capacity, min. a	mm	70	80	110	130	170
Anchor-to-edge distance for maximum loads, ar	mm	80	100	120	160	200
Minimum anchor-to-edge distance with reduction in load capacity, min. ar	mm	40	50	60	80	100
Minimum base material thickness, h	mm	90	100	120	150	180

LOAD REDUCTION FACTORS FOR REDUCED ANCHOR-TO-ANCHOR & ANCHOR-TO-EDGE DISTANCES

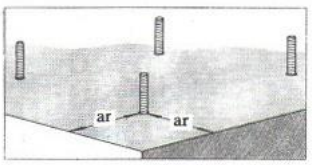


Reduction factors Ka

Anchor-to-Anchor Distances in mm

	M8	M10	M12	M16	M20
240					1.00
230					.96
220					.91
210					.87
200					.83
190				1.00	.79
180				.95	.74
170				.90	.70
160				.85	
150			1.00	.80	
140			.93	.75	
130			.85	.70	
120		1.00	.78		
110		.93	.70		
100	1.00	.85			
90	0.90	.78			
80	0.80	.70			
70	0.70				
	M8	M10	M12	M16	M20

Anchor Size



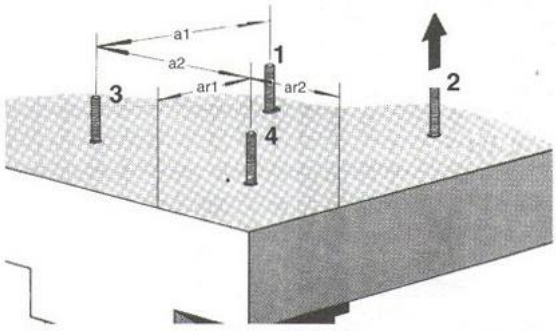
Reduction factors Kar

Anchor-to-Edge Distances in mm

	M8	M10	M12	M16	M20
200					1.00
190					.97
180					.94
170					.91
160				1.00	.88
150				.96	.85
140				.93	.82
130				.89	.79
120			1.00	.85	.76
110			.95	.81	.73
100		1.00	.90	.78	.70
90		.94	.85	.74	
80	1.00	.88	.80	.70	
70	.93	.82	.75		
60	.85	.76	.70		
50	.78	.70			
40	.70				
30					
	M8	M10	M12	M16	M20

Anchor Size

HOW TO CALCULATE REDUCED SAFE WORKING LOADS DUE TO REDUCED ANCHOR-TO-ANCHOR & ANCHOR-TO-EDGE DISTANCES



GIVEN: 4 nos M16 PK Wedge Anchors
Concrete = 25 N/mm²
Slab thickness = 150 mm
Load direction = Tension
Anchorage depth = 80 mm
Distance a1 = 160 mm
Distance a2 = 150 mm
Distance ar1 = 120 mm
Distance ar2 = 130 mm

CALCULATION:
Anchor 4 is the most unfavourably placed anchor.

Maximum SWL = 7.0 kN
Reduction factor Ka1 (160 mm) = 0.85
Reduction factor Ka2 (150 mm) = 0.80
Reduction factor Kar1 (120 mm) = 0.85
Reduction factor Kar2 (130 mm) = 0.89

Reduced SWL = SWL x Ka1 x Ka2 x Kar1 x Kar2
= 7.0 x 0.85 x 0.80 x 0.85 x 0.89
= 3.6 kN for each anchor