



**Spike®**  
one piece  
pre-expanded (no tightening)  
vibration resistant

Distributed by:

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**GOLD COAST**

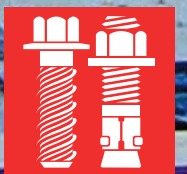
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## Other Powers fastening systems

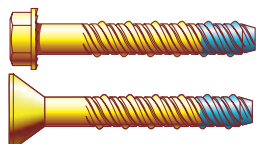
## Support



AC100® PRO  
High performance.  
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Styrene free vinyl ester  
Fire rated



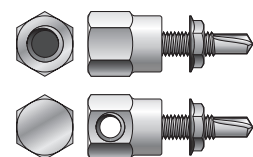
Training Facility  
Melbourne



Blue-Tip Screw-Bolt®  
Simple to install  
Removable  
Vibration resistant



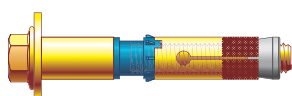
In-house Product &  
Application Testing  
Service Melbourne



Vertigo™  
One piece  
Various styles



National on Site  
Anchor Testing  
Service



PBI Structural® anchor  
High performance  
Economical  
Versatile



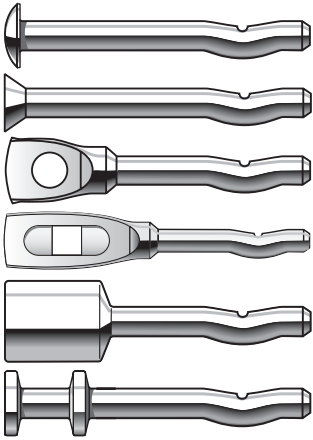
National On Site  
Service Powers  
Training Vehicles  
(PTV)

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## SPIKE®

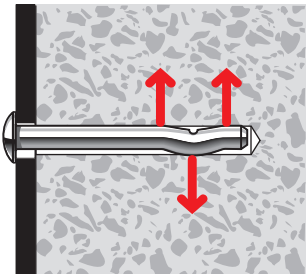
### Introduction



The Powers SPIKE is a patented, one-piece, vibration resistant anchor for use in concrete, block, brick, or stone. Several head styles and anchor materials are available.

### Description

Using a special manufacturing process, the SPIKE anchor is formed with an “s” shaped configuration at the working end of the anchor to create an expansion mechanism. The pre-expanded mechanism is activated as the anchor is driven into the drilled hole and creates a spring type compression force against the walls of the hole. To develop the spring action of the expansion mechanism, manufacturing processes such as heat treatment and cold working are used.



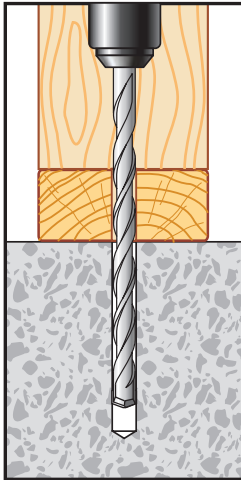
The basic working principle is the same for all versions. As the anchor is driven into the hole, the expansion mechanism is compressed and flexes to accommodate the size of the hole. Once seated at the required embedment, residual spring force developed in the expansion mechanism provides three compression forces at three different levels, at the bottom of the anchor hole. When a vibratory load is applied to some anchors, the area of the base material around the expansion mechanism may experience localized pulverization at the point of contact. The Powers SPIKE has been designed to overcome this problem. When subjected to vibratory loads, the SPIKE will expand due to the residual spring action of the expansion mechanism if localized pulverization occurs.

Use of the SPIKE anchor reduces installation time. Since the anchor is pre-expanded, there is no secondary tightening operation required which greatly reduces the overall cost of an anchor installation. The simple installation procedure helps to insure a quality application each time the SPIKE anchor is used.

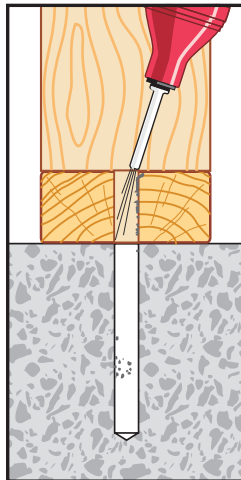
### Material specifications

Anchor component	Material	
	Carbon steel	Stainless steel
Anchor body	Class 10.9 Carbon Steel	Grade 316
Plating	Electroplated zinc. Coating thickness 5 microns min.	

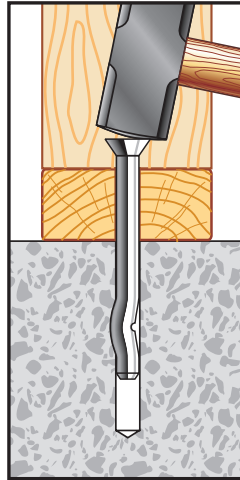
**Installation - Mushroom and Countersunk SPIKE®**



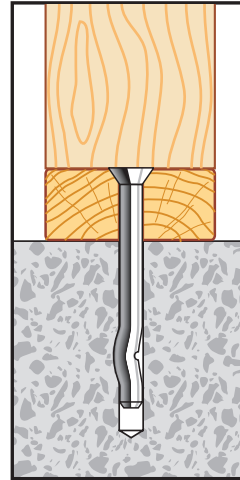
Using the proper diameter bit, drill a hole into the base material to a depth of at least one anchor diameter deeper than the embedment required



Blow the hole clean of dust and other material.

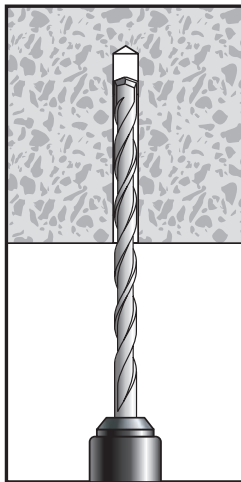


Drive the anchor through the fixture into the anchor hole until the head is firmly seated against the fixture.

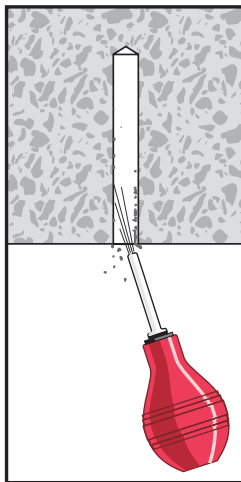


Be sure the anchor is driven to the required embedment depth.

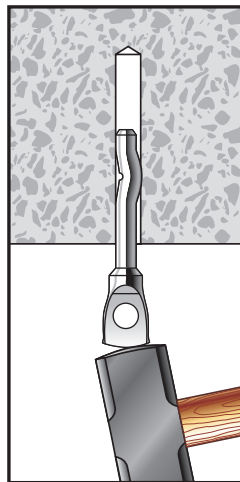
**Installation - Tie-wire SPIKE®**



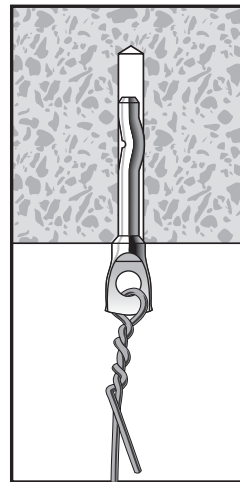
Using the proper diameter bit, drill a hole into the base material to a depth of at least one anchor diameter deeper than the embedment required



Blow the hole clean of dust and other material.

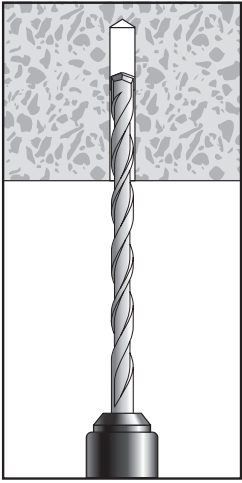


Drive the anchor into the anchor hole until the head is firmly seated against the concrete.

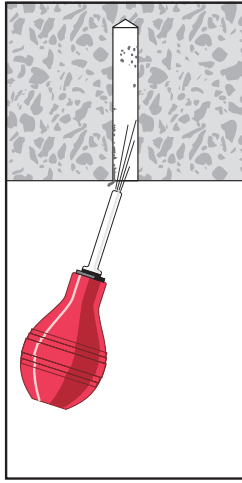


Attach wire through eyelet.

### Installation - Long Tie-wire SPIKE®



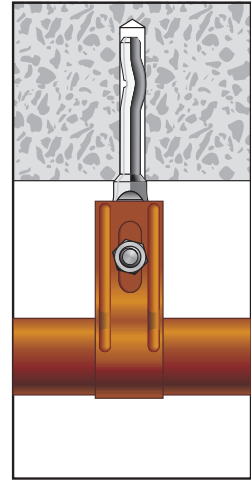
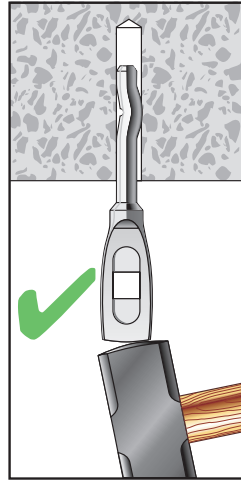
Using the proper diameter bit, drill a hole into the base material to a depth of at least one anchor diameter deeper than the embedment required



Blow hole clean of dust and other material

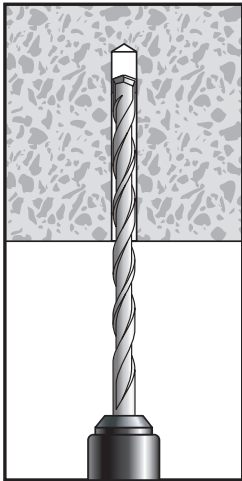


Place the anchor in the hole and align the Tie-Wire Spike head in the same direction as the pipe work. Drive the anchor into the hole until head is seated against the surface of the base material.

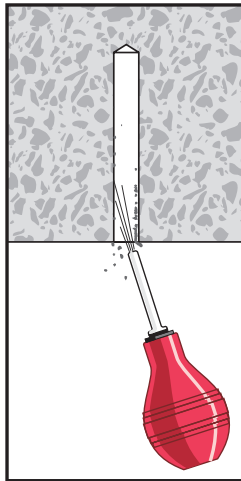


Attach pipe clamp.

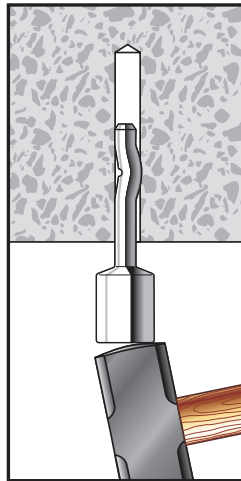
### Installation - Pipe SPIKE®



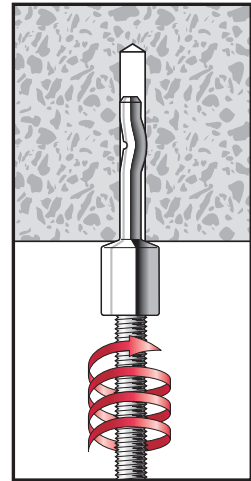
Using the proper diameter bit, drill a hole into the base material to a depth of at least one anchor diameter deeper than the embedment required



Blow the hole clean of dust and other material.

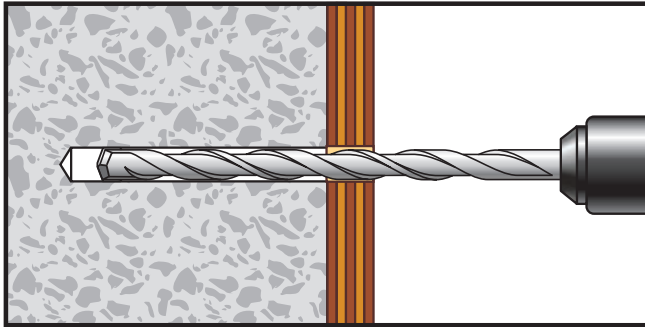


Drive the anchor into the anchor hole until the head is firmly seated against the surface of the base material.

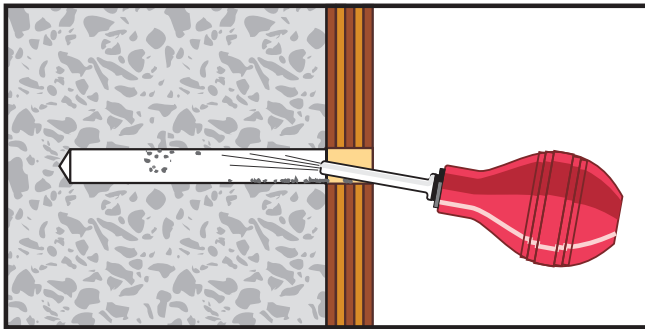


Screw in threaded rod

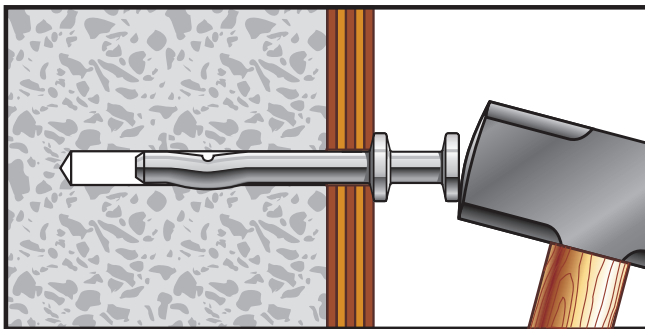
## Installation - Forming SPIKE®



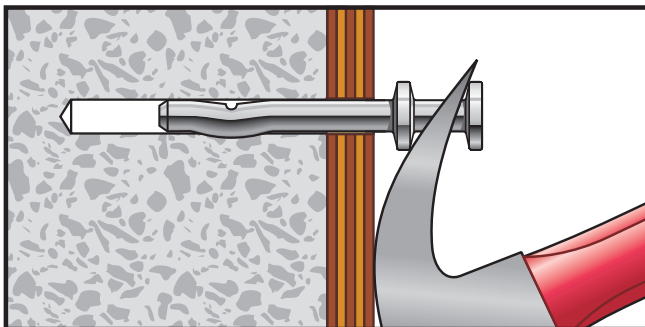
Using the proper diameter bit, drill a hole into the base material to a depth of at least one anchor diameter deeper than the embedment required.



Blow the hole clean of dust and other material.



Hammer in Forming SPIKE®



When job completed, remove Forming SPIKE® with claw hammer, crow bar or wrecking bar.

## Anchor sizes and styles

The following tables list the many sizes and styles of SPIKE anchors. To select the proper length, determine the embedment depth required to obtain the desired load capacity. Then add the thickness of the fixture, including any spacers or shims, to the embedment depth. This will be the minimum anchor length required. On the Tie-Wire, Long Tie-Wire and Pipe Spike versions, no fixture is used. These anchors should be driven in until the head is seated against the surface of the base material.

### Mushroom Head SPIKE® Carbon Steel (Clear Zinc)



Part No	Description METRIC	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty
MH53MM	5 x 25mm	5	3	100	1000
MH510MM	5 x 32mm		10		
MH56MM	5 x 38mm		6		
MH519MM	5 x 50mm		19		
MH653MM	6.5 x 25mm	6.5	3		
MH656MM	6.5 x 38mm		6		
MH6519MM	6.5 x 50mm		19		
MH6532MM	6.5 x 63mm		32		
MH6544MM	6.5 x 75mm		44		
MH6568MM	6.5 x 102mm		68		

Part No	Description IMPERIAL	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty
MH382	3/8" x 2"	10	6	25	250
MH38212	3/8" x 2-1/2"		19		
MH383	3/8" x 3"		32		
MH384	3/8" x 4"		57		

### Mushroom Head SPIKE® Stainless Steel (316 Grade)



Part No	Description METRIC	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty	
MH53MMSS	5 x 25mm	5	3	100	1000	
MH510MMSS	5 x 32mm		10			
MH56MMSS	5 x 38mm		6			
MH519MMSS	5 x 50mm		19			
MH656MMSS	6.5 x 38mm	6.5	6			
MH6519MMSS	6.5 x 50mm		19			
MH6544MMSS	6.5 x 75mm		44			
MH6568MMSS	6.5 x 102mm		68			500

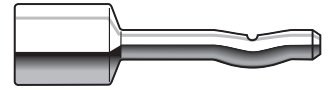
Part No	Description IMPERIAL	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty
MH382SS	3/8" x 2"	10	6	25	250
MH383SS	3/8" x 3"		32		



**Pipe SPIKE® Carbon Steel (Zinc Clear)**

Part No	Description	Drill Ø mm	Internal thread mm	Box qty	Carton qty
PS514*	1/4" UNC internally threaded rod hanger	5	1/4"	100	1000
PS6538*	3/8" UNC internally threaded rod hanger	6.5	3/8"	50	500
PS56MM	6mm internally threaded rod hanger	5	M6	100	1000
PS658MM	8mm internally threaded rod hanger	±6.5 or 7	M8	100	1000
PS6510MM	10mm internally threaded rod hanger		M10		

‡ Performance data available for both hole sizes \* discontinued item once current stock exhausted



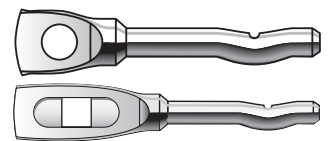
**Countersunk SPIKE® Carbon Steel (Zinc Clear)**

Part No	Description	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty
CS565MM	5 x 65mm	5	33	100	1000
CS575MM	5 x 75mm		43		
CS5100MM	5 x 100mm		68		
CS6538MM	6.5 x 38mm	6.5	6	100	1000
CS6550MM	6.5 x 50mm		18		
CS6565MM	6.5 x 65mm		33		
CS6575MM	6.5 x 75mm		43		
CS65100MM	6.5 x 100mm		68		



**Tie-Wire SPIKE® Carbon Steel (Zinc Clear)**

Part No	Description	Drill Ø mm	Hole Ø mm	Box qty	Carton qty
TW3700	5mm Tie-Wire Suspension SPIKE	5	5.5	100	500
TW3759	6.5mm Tie-Wire Suspension SPIKE	6.5	7		
LTWS65060	Long Tie-Wire SPIKE 6.5 x 60mm	6.5	7x7sq		



**Forming SPIKE® Carbon Steel (Zinc Clear)**

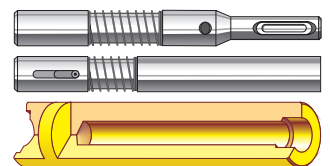
Part No	Description	Drill Ø mm	Fixture thickness mm	Box qty	Carton qty
FWS538MM	5 x 38mm Removable forming SPIKE	5	6	100	1000
FWS550MM	5 x 50mm Removable forming SPIKE		18		
FWS570MM	5 x 70mm Removable forming SPIKE		38		
FWS6570MM	6.5 x 70mm Removable forming SPIKE	6.5	38	100	1000
FWS65100MM	6.5 x 100mm Removable forming SPIKE		68		



**SPIKE® Setting Tool**

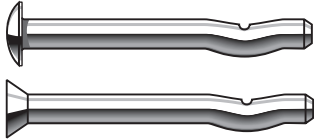
While the SPIKE anchor can easily be installed using a hammer, a specially designed series of drivers provide a fast, easy to use method for installing SPIKE anchors into concrete and masonry materials. The tools allow the SPIKE anchor to be installed in confined areas and prevent damage to the fixture from stray hammer blows.

Part No	Description	Box qty	Carton qty
3790	SDS Plus Fitting for 5, 6.5 Mush, Csk, Tie-wire	1	N/A
3791	Crown Fitting for 5, 6.5 Mush, Csk, Tie-wire		
HT1SPIKE CROWN	Crown Fitting for 6.5 Pipe SPIKE		



**Performance data**

**Working stress design – carbon steel, mushroom and c/s head SPIKE®**



Allowable working load capacities for carbon steel SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	22	1.0	1.6	1.1	1.6	1.1	1.7
		25	1.0	2.2	1.2	2.4	1.2	2.4
		32	1.2	2.8	1.5	3.1	1.8	3.3
6.5	6.5	22	1.0	2.6	1.2	2.8	1.3	3.0
		25	1.2	2.9	1.4	3.1	1.5	3.3
		32	1.4	3.1	2.0	3.5	2.2	4.0
10 (3/8")	10	45	3.1	7.9	3.7	8.8	4.4	9.1
12 (1/2")	13	65	4.3	11.3	6.0	13.9	6.8	15.1

NOTE: Incorporated safety factor (Tension and shear)  $F_{sc}=3$  (concrete).

**Limit state design – carbon steel, mushroom and c/s head SPIKE®**

Limit state design load capacities for carbon steel SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	22	1.7	2.9	1.9	3.0	2.0	3.1
		25	1.8	3.9	2.2	4.2	2.2	4.2
		32	2.2	5.1	2.7	5.5	3.3	5.9
6.5	6.5	22	1.8	4.6	2.1	5.0	2.3	5.4
		25	2.2	5.3	2.6	5.6	2.7	6.0
		32	2.5	5.7	3.5	6.2	3.9	7.2
10 (3/8")	10	45	5.7	14.3	6.6	15.9	8.0	16.3
12 (1/2")	13	65	7.7	20.4	10.9	24.9	12.2	27.2

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

**Working stress design – stainless steel, mushroom head SPIKE®**



Allowable working load capacities for stainless steel SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	22	0.9	1.4	1.1	1.6	1.1	1.6
		25	1.0	2.1	1.2	2.2	1.3	2.3
		32	1.2	2.7	1.5	2.9	1.8	3.1
6.5	6.5	22	1.0	2.5	1.1	2.7	1.2	2.9
		25	1.2	2.9	1.3	2.9	1.4	3.2
		32	1.4	3.1	1.8	3.3	2.1	3.6
10 (3/8")	10	45	2.6	7.1	3.1	8.0	3.3	8.3
12 (1/2")	13	65	6.2	9.9	7.0	10.1	7.2	10.5

NOTE: Incorporated safety factor (Tension and shear)  $F_{sc}=3$  (concrete).

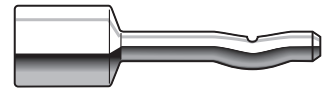
**Limit state design – stainless steel, mushroom head SPIKE®**

Limit state design load capacities for stainless steel SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	22	1.6	2.6	1.9	2.8	2.0	2.9
		25	1.8	3.7	2.2	4.0	2.4	4.1
		32	2.2	4.8	2.7	5.3	3.2	5.6
6.5	6.5	22	1.8	4.5	2.0	4.8	2.2	5.2
		25	2.2	5.2	2.3	5.3	2.6	5.7
		32	2.4	5.5	3.3	5.9	3.8	6.4
10 (3/8")	10	45	4.6	12.9	5.6	14.3	5.9	14.9
12 (1/2")	13	65	11.2	17.7	12.5	18.1	12.9	18.8

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

**Working stress design – carbon steel, Pipe SPIKE®**

Allowable working load capacities for carbon steel Pipe SPIKE								
THREAD SIZE	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
1/4" M6	5	32	1.5	1.2	1.8	1.2	2.0	1.2
M8 3/8" M10	6.5	44	2.3	2.7	2.7	2.7	3.2	2.7
M8 3/8" M10	7		2.0	2.7	2.4	2.7	2.9	2.7



NOTE: Incorporated safety factor (Tension and shear)  $F_{sc} = 3$  (concrete).

**Limit state design – carbon steel, Pipe SPIKE®**

Limit state design load capacities for carbon steel Pipe SPIKE								
THREAD SIZE	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
1/4" M6	5	32	2.8	2.1	3.2	2.1	3.6	2.1
M8 3/8" M10	6.5	44	4.2	4.9	4.9	4.9	5.7	4.9
M8 3/8" M10	7		3.5	4.9	4.3	4.9	5.2	4.9

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

**Working stress design – carbon steel, Tie-Wire SPIKE®**

Allowable working load capacities for Tie-Wire SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	32	1.2	1.2	1.3	1.2	1.4	1.2
6.5	6.5		1.4	1.6	1.4	1.6	1.6	1.6



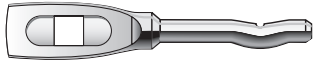
NOTE: Incorporated safety factor (Tension and shear)  $F_{sc} = 3$  (concrete).

**Limit state design – carbon steel, Tie-Wire SPIKE®**

Limit state design load capacities for Tie-Wire SPIKE								
ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	20 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	32	2.2	2.1	2.4	2.1	2.6	2.1
6.5	6.5		2.4	3.0	2.6	3.0	2.8	3.0

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

**Working stress design – carbon steel, Long Tie-Wire SPIKE®**



Allowable working load capacities for Long Tie-Wire SPIKE (For use with pipe clamps)

ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	15 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
6.5	6.5	32	1.3	1.5	1.4	1.5	1.5	1.5

NOTE: Incorporated safety factor (Tension and shear)  $F_{sc} = 3$  (concrete).

**Limit state design – carbon steel, Long Tie-Wire SPIKE®**

Limit state design load capacities for Long Tie-Wire SPIKE (For use with pipe clamps)

ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	15 MPa concrete		32 MPa concrete		40 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
6.5	6.5	32	2.3	2.7	2.5	2.7	2.7	2.7

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

**Working stress design – carbon steel, Forming SPIKE®**



Allowable working load capacities for Forming SPIKE

ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	15 MPa concrete		20 MPa concrete		32 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	32	0.9	2.0	1.1	2.3	1.7	2.6
6.5	6.5	32	0.9	2.0	1.4	2.3	1.8	2.9

NOTE: Incorporated safety factor (Tension and shear)  $F_{sc} = 3$  (concrete).

**Limit state design – carbon steel, Forming SPIKE®**

Limit state design load capacities for Forming SPIKE

ANCHOR SIZE mm	DRILL SIZE mm	EMBEDMENT DEPTH mm	15 MPa concrete		20 MPa concrete		32 MPa concrete	
			Tension kN	Shear kN	Tension kN	Shear kN	Tension kN	Shear kN
5	5	32	1.6	3.6	2.0	4.2	3.1	4.7
6.5	6.5	32	1.6	3.6	2.5	4.2	3.2	5.2

NOTE: Incorporated strength reduction factor (Tension and shear)  $\phi = 0.6$

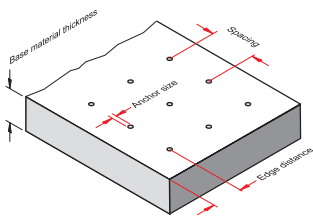
**Design criteria**

**Base material thickness**

The minimum recommended thickness of base material, BMT, when using the Hollow set SPIKE is 125% of the embedment to be used for solid materials. For example, when installing an anchor to a depth of 100mm, the base material thickness should be 125mm

**Spacing between anchors**

To obtain the maximum load in tension or shear, a spacing, S, of 10 anchor diameters (10d) should be used. The minimum recommended anchor spacing, S, is 5 anchor diameters (5d) at which point the load should be reduced by 50%. The following table lists the load reduction factor, Rs, for each anchor diameter, d, based on the center to center anchor spacing.



ANCHOR SIZE Ø	Spacing distance, S (mm) Tension and Shear					
	10d	9d	8d	7d	6d	5d
5	50	45	40	35	30	25
6.5	65	58.5	52	45.5	39	32.5
10	100	90	80	70	60	50
12	120	108	96	84	72	60
<b>Rs</b>	<b>1.00</b>	<b>0.90</b>	<b>0.80</b>	<b>0.70</b>	<b>0.60</b>	<b>0.50</b>

### Edge distance – Tension

An edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum tension load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the tension load should be reduced by 20%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor centre to edge distance.

ANCHOR SIZE Ø	Edge distance, E (mm) Tension only							
	12d	11d	10d	9d	8d	7d	6d	5d
5	60	55	50	45	40	35	30	25
6.5	78	71.5	65	58.5	52	45.5	39	32.5
10	120	110	100	90	80	70	60	50
12	144	132	120	108	96	84	72	60
<b>Re(t)</b>	<b>1.00</b>	<b>0.97</b>	<b>0.94</b>	<b>0.91</b>	<b>0.89</b>	<b>0.86</b>	<b>0.83</b>	<b>0.80</b>

### Edge distance – Shear

For shear loads, an edge distance, E, of 12 anchor diameters (12d) should be used to obtain the maximum load. The minimum recommended edge distance, E, is 5 anchor diameters (5d) at which point the shear load should be reduced by 50%. The following table lists the load reduction factor, Re, for each anchor diameter, d, based on the anchor centre to edge distance.

ANCHOR SIZE Ø	Edge distance, E (mm) Shear only							
	12d	11d	10d	9d	8d	7d	6d	5d
5	60	55	50	45	40	35	30	25
6.5	78	71.5	65	58.5	52	45.5	39	32.5
10	120	110	100	90	80	70	60	50
12	144	132	120	108	96	84	72	60
<b>Re(s)</b>	<b>1.00</b>	<b>0.93</b>	<b>0.86</b>	<b>0.79</b>	<b>0.71</b>	<b>0.64</b>	<b>0.57</b>	<b>0.50</b>

## Suggested specification

	Example
Product name	Mushroom head SPIKE®
Part number	MH6544
Size	6.5 x 75mm
Head style	Mushroom
Embedment depth	30mm
Minimum spacing and edge distance	Spacing: 65mm, Edge distance: 80mm
	Product to be installed in accordance with published installation procedure



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