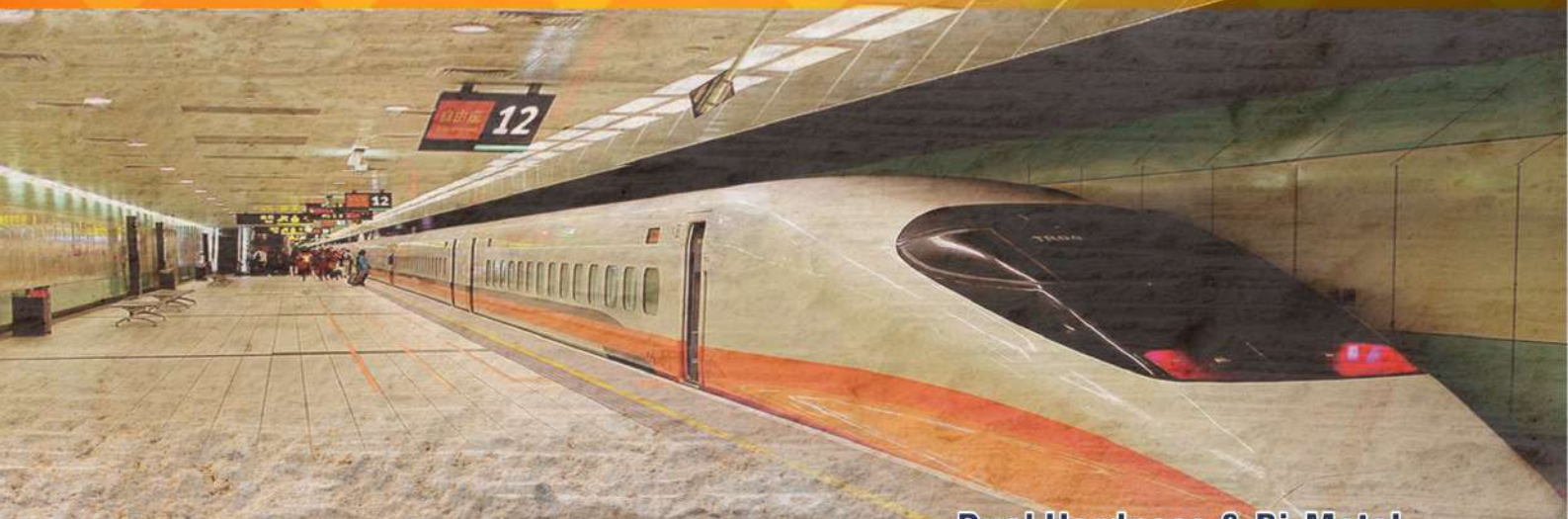
世鎧精密股份有限公司

SHEH KAI PRECISION CO.,LTD.



Dual Hardness & Bi-Metal

Concrete Screw Anchors

世鎧精密股份有限公司

SHEH KAI PRECISION CO.,LTD.

TAIWAN EXCELLENCE 2017

ICC ES ESR-4376

Concrete Screw Anchors

- Normal Galvanized
- Mechanical Galvanized
- Stainless Steel (SS 304/SS 316) Bi-Metal
- Size: 1/4" - 3/4" (max. L 10")

https://www.shehkai.com

Hammer Drill Bits

- Size :1/8"~1-3/8"

Contents / Certified

Certified

afaq ISO 9001 Quality · AFAQ · TAF QC017

Sheh Kai complies with international quality standard

afaq ISO 14001 Environment · TAF EC012

Sheh Kai complies with international environment standard

ICC ES ESR-4376

Concrete screw anchors are ICC certified

Company Profile / Quality Control

Company Profile

SHEH KAI PRECISION CO., LTD. was established in 1992 in Kaohsiung, Taiwan. Our main plant is located at the center of Gangshan industrial park. Specialized in manufacturing premium stainless steel Bi-metal self-drilling screws, Bi-Metal self-tapping screws, and Bi-Metal concrete screws, and SDS plus hammer drill bits with material of tungsten carbide. As a global leader of manufacturer of Bi-Metal fastener, in these thirty years, we have developed a superior and unique production process such as dissimilar metal welding and induction heat treatment which are suitable for producing premium Bi-Metal products that meet the highest end requirements worldwide. With dedicated support from our own stainless steel wire drawing factory, the stainless steel raw materials of the fasteners can be easily planned and acquired for mass production. As a forerunner of the bi-metal fastener industry, we constantly strive to provide our customers with unique innovative solutions, high quality products as well as professional service along.

ICC Products Assessment and Quality Control

Sheh Kai is one of the best OEM/ODM of Bi-Metal fasteners with very good reputation worldwide. Our products quality has been well proved by our existing high end customers. To be compliant with the customer's special requirements, we commit to devote ourselves in continuous improvement on expanding the range of premium products with our exclusive Bi-Metal production technology. We set out to be innovative, professional, and efficient as our policies for service at our company. An intensive quality control practice has being emphasized for years to ensure that the highest standard is upheld. As an ISO 9001:2015 and ISO 14001:2015 certified manufacturer, our devotion drives us to provide the best service to our customers for these high end products and processes.

Fastening into Concrete

The Sheh Kai SK concrete screws are self-tapping concrete screws. The screws consist either of zinc plated carbon steel (gvz) or of bimetal (A4) with a hardened tip of the screw made of carbon steel. Our screw anchors are designed to fasten fixtures to concrete with strengthen threads interlocked with concrete. By its thread design, the lead threads of screw anchors will cut into the concrete member and provide high load anchoring. To fasten into the concrete, select the proper drill bit, as depicted below, to create the correct diameter hole with enough depth. After dust and debris are cleaned out, install with an impact screw driver until the fasten object and the screw anchor are fixed together. Performances varied with different types of concrete, as depicted below. Performance for different version of our screw anchors will be presented in the following sections.

Intended use

Anchorages subject to:

- Static and quasi-static loads:

Base materials:

- Reinforced or unreinforced normal weight concrete.
- Strength classes 2500psi to 8500psi.
- Uncracked or cracked concrete: all sizes.

Use conditions (Environmental conditions)

- Anchor subject to dry internal conditions: All screw types.
- Anchor subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp conditions: Screw types made of stainless steel with marking A4.

Design:

- Anchors are designed under the responsibility of an engineer experienced in anchor and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).

Edge Installation Test (3cm from the Edge)

Self-Tapping Screw Anchor

✅ **Perfectly Installed**

3cm

Internal Threaded Screw Anchor

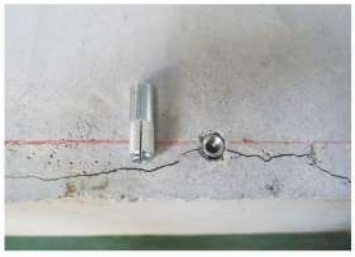
✅ **Perfectly Installed**

3cm

Expansion Anchor

❌ **Concrete Cracked**

3cm



Drop-in Anchor

❌ **Concrete Cracked**

3cm

Drill Bits Information

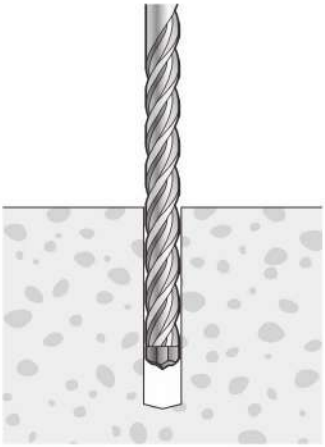
Below are the drill bits used, with various type of concrete member, and the application of the screw anchor during testing.

■ ANSI-B212.15

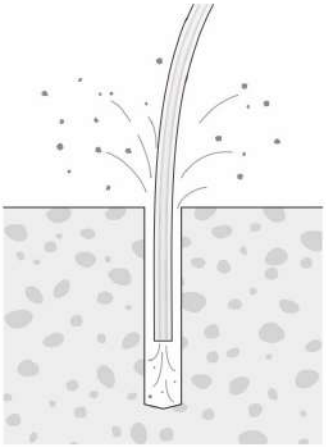
Anchor Size (in.)	Nominal Drill Diameter (in.)	Tolerance Range (in.)
1/4	1/4	0.260~0.268
3/8	3/8	0.390~0.398
1/2	1/2	0.520~0.530
5/8	5/8	0.650~0.660
3/4	3/4	0.775~0.787

Installation Process

- Hammer drilling only: all sizes and all embedment depths.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.
- After installation further turning of the anchor must not be possible.
- The head of the anchor must be supported on the fixture and is not damaged.

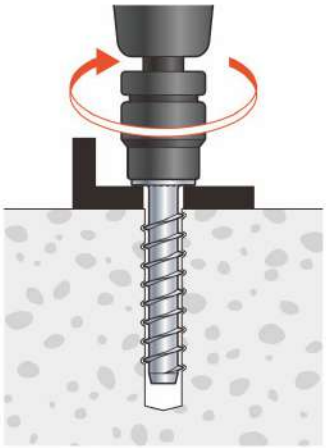


1. DRILL
Drill a hole into the base material to the required depth using a drill bit that meets the requirements of ANSI B212.15.



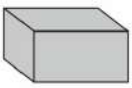
2. BLOW AND CLEAN
Remove dust and debris from the hole using a hand pump or compressed air.

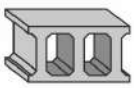
3. SELECT PROPER TOOL
Select a powered impact wrench or a torque wrench, attach an appropriate sized hex socket to the wrench and mount the screw anchor head into the socket.

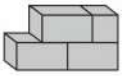


4. INSTALL
Drive the anchor through the fixture into the hole until the head of the anchor comes into contact with the fixture.

Base Applied (for cracked and uncracked concrete)

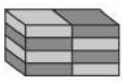

Uncracked Concrete

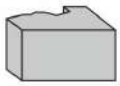

Hollow Concrete Block

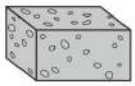

Hollow Brick


Hollow Solid Sand-lime Brick


Cracked Concrete


Dimension Stone


Solid Sand-lime Brick


Light-weight Aggregate Concrete

Page 03 Dual Hardness Concrete Screw Anchor

Features and Benefits

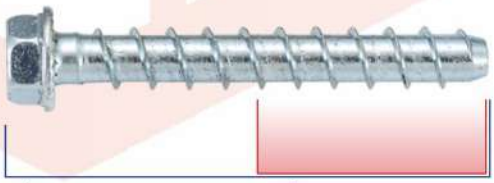
- ICC approval for cracked and uncracked concrete, with superior installation performance
- Fast installation and immediate loading minimizes downtime
- Qualifies for seismic and wind loads in concrete, will not slip
- No expansion forces transferred to the base material
- Applicable closer to the edge than traditional expansion anchors
- Removable and adjustable

Advantages of Dual Hardness Concrete Screw Anchor

- Code listed under IBC/IRC in accordance with ICC-ES AC193 and ACI 355.2 for cracked and uncracked concrete
- Deter against hydrogen assisted corrosion cracking
- Hardness controlled below Rockwell C34 in the loading section to be immune to hydrogen embrittlement issues
- Reliable loading performance for safety assurances
- Perfect for temporary fixing with removable capability on heavy duty items
- Option with Mechanical Galvanized Coating for better corrosion resistance

Two Steps Heat - Treatment

- **First step** - Case hardening on the head and shank of the screws with ductile strength, more endurable, and hydrogen embrittlement resistant characteristics
- **Second step** - Selective through hardening to provide the drill point and lead threads with good drilling and tapping performance.



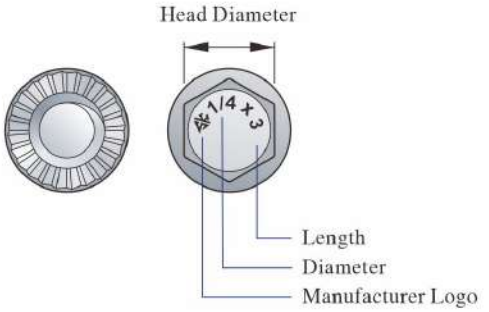
1st Step
Lower-hardness (below 34 HRC) load-bearing section

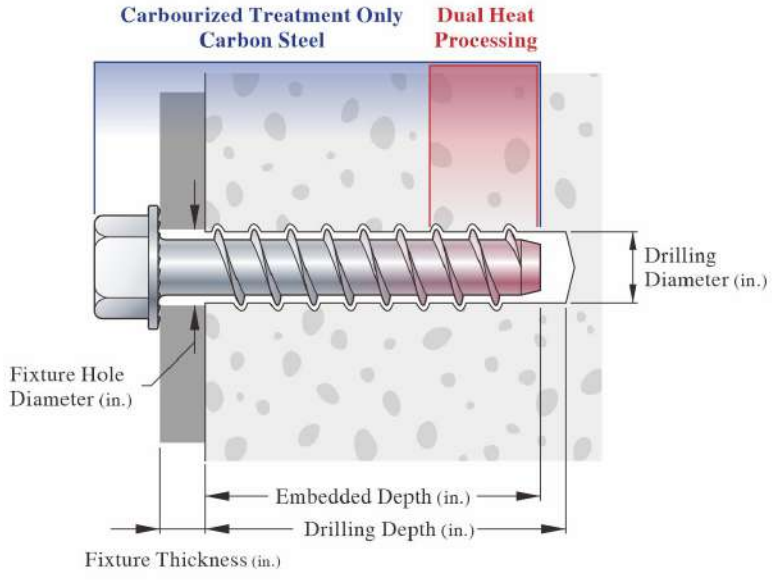
2nd Step
Higher-hardness (HRC 55min) drill point and lead threads for reliable drilling

Hydrogen embrittlement corrosion

Through diffusion of hydrogen into the metals as well corrosion in the application environment, the brittleness creates weakness, and cracks within the structure of the metal. Known as Hydrogen Assisted corrosion cracking, it fosters an environment with which the product could fail in an unpredictable manner.

Product Specifications & Selection for Application

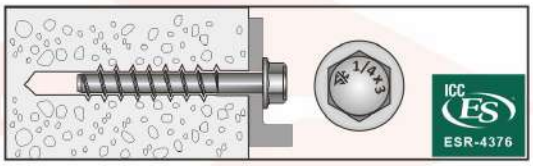


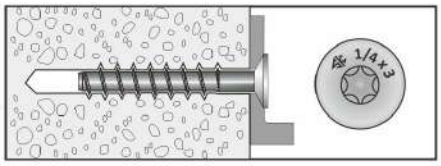


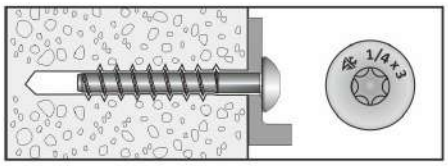
1. Non-threading body length is customizable
2. Fixture hole diameter should be larger than major diameter of screw

Dual Hardness Concrete Screw Anchor

SK Concrete Anchor (Carbon Steel)
Hex Washer Head / Flat Head / Pan Head







Part No.				Size (in.)	Drill Bit Diameter (in.)	Qty(pcs) / Box
Hex Washer Head		Flat Head	Pan Head			
Zinc	Mechanical	Zinc	Zinc			
SKH14178Z			SKP14178Z	1/4X1-7/8	1/4	100
		SKC14200Z		1/4X2	1/4	100
		SKC14212Z		1/4X2-1/2	1/4	100
SKH14258Z			SKP14258Z	1/4X2-5/8	1/4	100
SKH14300Z		SKC14300Z		1/4X3	1/4	100
SKH14312Z				1/4X3-1/2	1/4	100
SKH14400Z		SKC14400Z		1/4X4	1/4	100
SKH38134Z				3/8X1-3/4	3/8	50
SKH38212Z		SKC38212Z		3/8X2-1/2	3/8	50
SKH38300Z	SKH38300G	SKC38300Z		3/8X3	3/8	50
SKH38400Z	SKH38400G	SKC38400Z		3/8X4	3/8	50
SKH38500Z	SKH38500G			3/8X5	3/8	50
SKH38600Z	SKH38600G			3/8X6	3/8	50
SKH12212Z				1/2X2-1/2	1/2	25
SKH12300Z				1/2X3	1/2	25
SKH12400Z	SKH12400G			1/2X4	1/2	25
SKH12500Z	SKH12500G			1/2X5	1/2	25
SKH12600Z	SKH12600G			1/2X6	1/2	25
SKH12800Z	SKH12800G			1/2X8	1/2	25
SKH58400Z				5/8X4	5/8	15
SKH58500Z	SKH58500G			5/8X5	5/8	15
SKH58600Z	SKH58600G			5/8X6	5/8	15
SKH58612Z	SKH58612G			5/8X6-1/2	5/8	15
SKH58800Z	SKH58800G			5/8X8	5/8	15
SKH34400Z				3/4X4	3/4	10
SKH34500Z				3/4X5	3/4	10
SKH34600Z	SKH34600G			3/4X6	3/4	10
SKH34700Z				3/4X7	3/4	10
SKH34800Z				3/4X8	3/4	10
SKH341000Z				3/4X10	3/4	10

Dual Hardness Concrete Screw Anchor Technical Data

HEX WASHER HEAD ANCHOR INSTALLATION PARAMETERS[1]

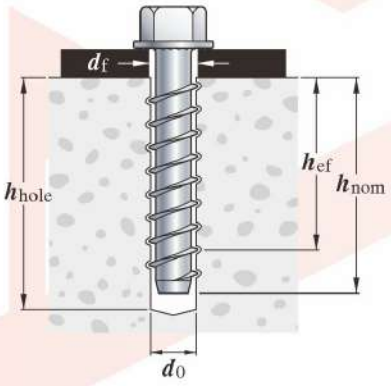
Characteristic	Symbol	Unit	Nominal Anchor Diameter														
			1/4"		3/8"			1/2"			5/8"				3/4"		
Drill Bit Diameter	d_0	in (mm)	1/4 (6.4)		3/8 (9.5)			1/2 (12.7)			5/8 (15.9)				3/4 (19.1)		
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)	3-1/4 (83)	2-1/4 (57)	3 (76)	4-1/4 (108)	3-1/4 (83)	4 (102)	5 (127)	5-1/2 (140)	4 (102)	5-1/2 (140)	6-1/4 (159)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)	2.62 (66.5)	1.66 (42.1)	2.30 (58.3)	3.37 (85.5)	2.54 (64.6)	3.19 (8.09)	3.99 (101.3)	4.42 (112.3)	3.14 (79.8)	4.41 (112.1)	5.05 (128.3)
Minimum Hole Depth	h_{hole}	in (mm)	2 (51)	2-7/8 (73)	2 (51)	2-7/8 (73)	3-5/8 (92)	2-5/8 (67)	3-3/8 (86)	4-5/8 (117)	3-5/8 (92)	4-1/2 (114)	5-3/8 (137)	6 (152)	4-1/2 (114)	6 (152)	6-3/4 (171)
Fixture Hole Diameter	d_f	in (mm)	3/8 (9.5)		1/2 (12.7)			5/8 (15.9)			3/4 (19.1)				7/8 (22.2)		
Maximum Installation Torque[2]	$T_{inst,max}$	ft.lb (Nm)	21 (29)		N/A			N/A			N/A				103 (140)		
Maximum impact wrench torque rating	$T_{impact,max}$	ft.lb (Nm)	135 (185)		135 (185)			260 (350)			260 (350)				440 (600)		
Minimum Concrete Thickness	h_{min}	in (mm)	3-5/8 (91)	4-1/2 (114)	3-5/8 (91)	4-1/2 (114)	5-1/4 (133)	4-1/4 (107)	5 (126)	6-1/4 (158)	5-1/4 (133)	6 (152)	7 (177)	7-1/2 (190)	6 (152)	7-1/2 (190)	8-1/4 (209)
Critical Edge Distance	C_{ac}	in (mm)	$1.5 \cdot h_{ef}$														
Minimum Edge Distance (c_{min})	C_{min}	in (mm)	1-3/4 (44)														
Minimum Spacing (s_{min})	S_{min}	in (mm)	3 (76)														
Wrench Socket Size	-	in	7/16		9/16			3/4			15/16				1-1/8		

1. The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. N/A – Manual torque wrench installation not evaluated.

HEX WASHER HEAD ANCHOR DESIGN INFORMATION[1,2]

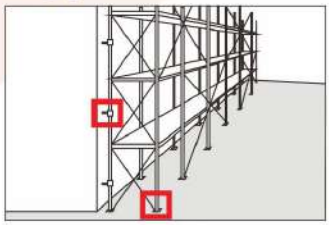
Characteristic	Symbol	Unit	Nominal Anchor Diameter														
			1/4"		3/8"			1/2"			5/8"				3/4"		
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)	3-1/4 (83)	2-1/4 (57)	3 (76)	4-1/4 (108)	3-1/4 (83)	4 (102)	5 (127)	5-1/2 (140)	4 (102)	5-1/2 (140)	6-1/4 (159)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)	2.62 (66.5)	1.66 (42.1)	2.30 (58.3)	3.37 (85.5)	2.54 (64.6)	3.19 (8.09)	3.99 (101.3)	4.42 (112.3)	3.14 (79.8)	4.41 (112.1)	5.05 (128.3)
Steel Strength in Tension and Shear																	
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	101,525 (700)		113,130 (780)			113,130 (780)			113,130 (780)				113,130 (780)		
Minimum specified yield strength	f_y	psi (N/mm^2)	81,220 (560)		90,505 (624)			90,505 (624)			90,505 (624)				90,505 (624)		
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0453 (29.2)		0.1020 (65.8)			0.1827 (117.9)			0.2888 (186.3)				0.4145 (267.4)		
Steel Strength in Tension	N_{sa}	lb (kN)	4,585 (20.4)		11,535 (51.3)			20,680 (92.0)			32,665 (145.3)				46,895 (208.6)		
Strength Reduction Factor for Steel Failure in Tension	Φ_{sa}	-	0.65														
Steel Strength in Shear	V_{sa}	lb (kN)	1,350 (6.0)		3,150 (14.0)			6,745 (30.0)			10,115 (45.0)				15,060 (67.0)		
Steel Strength in Shear, Seismic	$V_{sa,eq}$	lb (kN)	1,125 (5.0)		1,800 (8.0)			3,730 (16.6)			6,880 (30.6)				13,240 (58.9)		
Strength Reduction Factor for Steel Failure in Shear	Φ_{sa}	-	0.60														

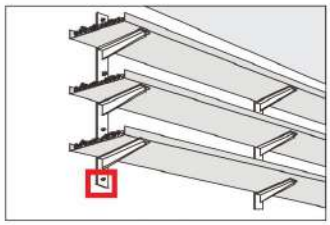
[1]The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
[2]The strength reduction factor applies when the load combinations from the IBC or ACI 318 are used and the requirements of ACI 318-19 17.5.3, ACI 318-14
17.3.3 or ACI 318-11 D.4.3, as applicable, are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of f must be determined in accordance with ACI 318-11 D.4.5.

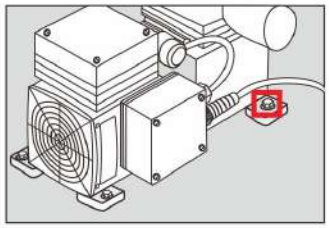


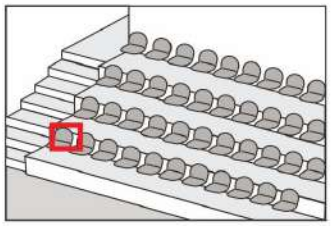
Characteristic	Symbol	Unit	Nominal Anchor Diameter														
			1/4"		3/8"			1/2"			5/8"				3/4"		
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)	3-1/4 (83)	2-1/4 (57)	3 (76)	4-1/4 (108)	3-1/4 (83)	4 (102)	5 (127)	5-1/2 (140)	4 (102)	5-1/2 (140)	6-1/4 (159)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)	2.62 (66.5)	1.66 (42.1)	2.30 (58.3)	3.37 (85.5)	2.54 (64.6)	3.19 (8.09)	3.99 (101.3)	4.42 (112.3)	3.14 (79.8)	4.41 (112.1)	5.05 (128.3)
Pullout Strength in Tension[3]																	
Pullout Strength in Uncracked Concrete	$N_{p,uncr}$	lb (kN)	N/A	4,025 (17.9)	1,395 (6.2)	2,990 (13.3)	N/A	N/A	4,115 (18.3)	7,485 (33.3)	N/A	6,585 (29.3)	8,320 (37.0)	N/A	N/A	N/A	N/A
Pullout Strength in Cracked Concrete	$N_{p,cr}$	lb (kN)	605 (2.7)	1,080 (4.8)	720 (3.2)	1,755 (7.8)	2,630 (11.7)	1,350 (6.0)	2,790 (12.4)	5,195 (23.1)	3,125 (13.9)	4,045 (18.0)	5,195 (23.1)	5,825 (25.9)	4,405 (19.6)	7,330 (32.6)	8,790 (39.1)
Pullout Strength in Cracked Concrete, Seismic	$N_{p,eq}$	lb (kN)	605 (2.7)	1,080 (4.8)	720 (3.2)	1,755 (7.8)	2,630 (11.7)	1,350 (6.0)	2,790 (12.4)	4,720 (21.0)	2,920 (13.0)	4,045 (18.0)	5,015 (22.3)	5,825 (25.9)	4,405 (19.6)	7,330 (32.6)	8,790 (39.1)
Normalization Exponent, Uncracked Concrete	n	-	0.50		0.50			0.50			0.50				0.50		
Normalization Exponent, Cracked Concrete	n	-	0.40		0.50			0.50			0.40				0.40		
Strength Reduction Factor for Pullout Strength in Tension	Φ_p	-	0.45	0.55	0.65	0.65	0.65	0.55	0.55	0.55	0.65	0.65	0.65	0.65	0.55	0.55	0.55
Concrete Breakout Strength in Tension																	
Effective embedment	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)	2.62 (66.5)	1.66 (42.1)	2.30 (58.3)	3.37 (85.5)	2.54 (64.6)	3.19 (80.9)	3.99 (101.3)	4.42 (112.3)	3.14 (79.8)	4.41 (112.1)	5.05 (128.3)
Effectiveness Factor for Uncracked Concrete	k_{uncr}	in-lb (SI)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)	27 (11.3)	24 (10.0)	24 (10.0)
Effectiveness Factor for Cracked Concrete	k_{cr}	in-lb (SI)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)	24 (10.0)	21 (8.8)	21 (8.8)
Strength Reduction Factor for Concrete Breakout Strength in Tension	Φ_{cb}	-	0.45	0.55	0.65	0.65	0.65	0.55	0.55	0.55	0.65	0.65	0.65	0.65	0.55	0.55	0.55
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lb/inch x10^5 (N/mm)	2.719 (48)	1.928 (34)	6.240 (109)	4.502 (79)	3.670 (64)	8.809 (154)	7.079 (124)	5.649 (99)	10.377 (182)	9.099 (159)	8.080 (141)	7.684 (135)	13.204 (231)	11.075 (194)	10.410 (182)
COV for β_{uncr}	v	%	38														
Axial stiffness in service load range in cracked concrete	β_{cr}	lb/inch x10^5 (N/mm)	1.451 (25)	1.100 (19)	3.318 (58)	2.563 (45)	2.179 (38)	4.887 (86)	4.120 (72)	3.487 (61)	6.134 (107)	5.568 (98)	5.117 (90)	4.941 (86.5)	8.063 (141)	7.119 (125)	6.825 (120)
COV for β_{cr}	v	%	48														
Concrete Breakout Strength in Shear																	
Nominal Diameter	d_o[2]	in (mm)	0.250 (6.4)		0.375 (9.5)			0.500 (12.7)			0.625 (15.9)				0.750 (19.1)		
Load Bearing Length of Anchor	l_e	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)	2.62 (66.5)	1.66 (42.1)	2.30 (58.3)	3.37 (85.5)	2.54 (64.6)	3.19 (80.9)	3.99 (101.3)	4.42 (112.3)	3.14 (79.8)	4.41 (112.1)	5.05 (128.3)
Reduction Factor for Concrete Breakout Strength in Shear	Φ_{cb}	-	0.70														
Concrete Pryout Strength in Shear																	
Coefficient for Pryout Strength	k_{cp}	-	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Reduction Factor for Pryout Strength in Shear	Φ_{cp}	-	0.70														

Applications


Scaffolding


Rack


Facility Fixing

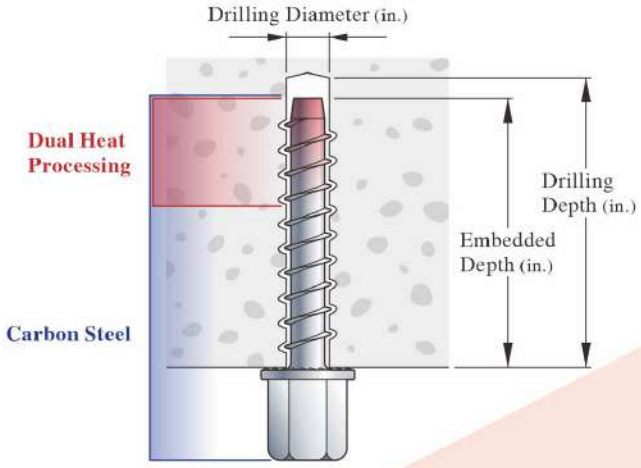

Seat Fixing

Page 07 Dual Hardness Hanger Bolt

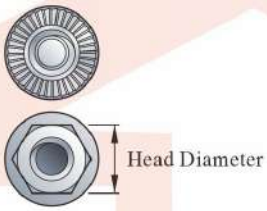
Product description

Suspending anchoring product for steel rods

Product Specifications & Selection for Application

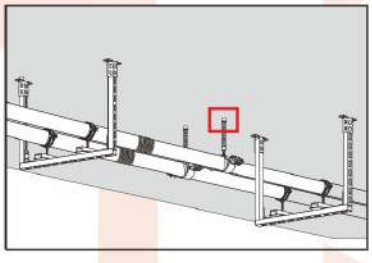


Reserve 3/8" drilling depth for installation.



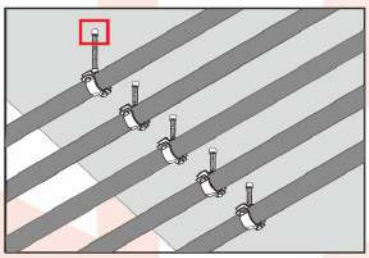
Benefits

- Ease of installation with power tools
- One piece equipment
- Removable
- Used in various concrete materials

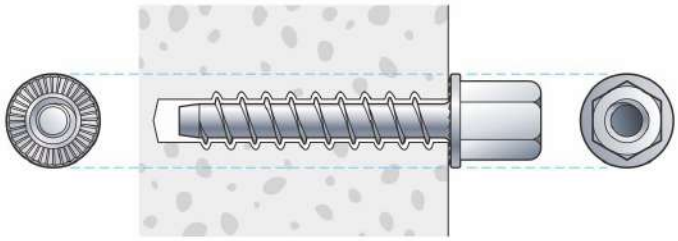


Applications

- Suspension for overhead ceilings
- Suspending air ducts and channels
- Suspending overhead equipment
- Overhanging Pipes
- Overhanging electrical systems and cables



Dual Hardness Hanger Bolt



Part No.	Size (in.)	Rod Size (in.)	Drill Bit Diameter (in.)	Qty(pcs)/Box
SKI1415814Z	1/4X1-5/8	1/4	1/4	50
SKI1421214Z	1/4X2-1/2	1/4	1/4	50
SKI1415838Z	1/4X1-5/8	3/8	1/4	50
SKI1421238Z	1/4X2-1/2	3/8	1/4	50
SKI3820038Z	3/8X2	3/8	3/8	50
SKI3821238Z	3/8X2-1/2	3/8	3/8	50
SKI3815812Z	3/8X1-5/8	1/2	3/8	50
SKI3821212Z	3/8X2-1/2	1/2	3/8	50

Edge Installation Test (3cm from the Edge)

Self-Tapping Screw Anchor

✅ Perfectly Installed

3cm

Internal Threaded Screw Anchor

✅ Perfectly Installed

3cm

Expansion Anchor

❌ Concrete Cracked

3cm

Drop-in Anchor

❌ Concrete Cracked

3cm

Dual Hardness Hanger Bolt Technical Data

HEX COUPLER HEAD ANCHOR INSTALLATION PARAMETERS[1]

Characteristic	Symbol	Unit	Nominal Anchor Diameter			
			1/4"		3/8"	
Drill Bit Diameter	d_0	in (mm)	1/4 (6.4)		3/8 (9.5)	
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)
Minimum Hole Depth	h_{hole}	in (mm)	2 (51)	2-7/8 (73)	2 (51)	2-7/8 (73)
Fixture Hole Diameter	d_f	in (mm)	3/8 (9.5)		1/2 (12.7)	
Maximum Installation Torque[2]	$T_{inst,max}$	ft.lb (Nm)	21 (29)		N/A	
Maximum impact wrench torque rating	$T_{impact,max}$	ft.lb (Nm)	135 (185)		135 (185)	
Minimum Concrete Thickness	h_{min}	in (mm)	4 (102)	4-3/8 (110)	4 (102)	4-3/8 (110)
Critical Edge Distance	C_{ac}	in (mm)	$1.5 \cdot h_{ef}$			
Minimum Edge Distance (c_{min})	C_{min}	in (mm)	1-3/4 (44)			
Minimum Spacing (s_{min})	S_{min}	in (mm)	3 (76)			
Internal Thread Size	-	in	1/4~20 or 3/8~16 (UNC coarse)		3/8~16 or 1/2~13 (UNC coarse)	

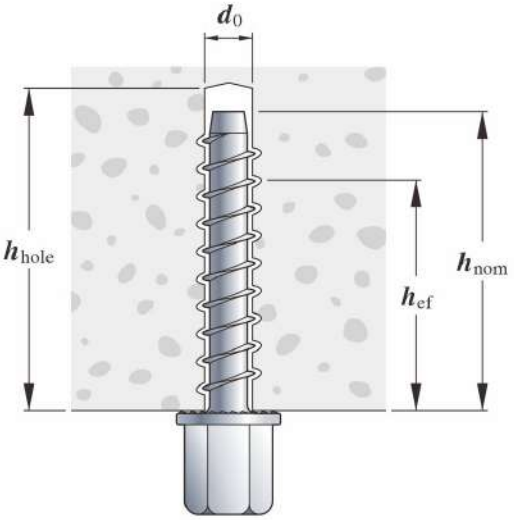
1. The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
2. N/A – Manual torque wrench installation not evaluated.

HEX COUPLER HEAD ANCHOR DESIGN INFORMATION[1,2]

Characteristic	Symbol	Unit	Nominal Anchor Diameter			
			1/4"		3/8"	
Drill Bit Diameter	d_0	in (mm)	1/4 (6.4)		3/8 (9.5)	
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)
Steel Strength in Tension and Shear						
Minimum specified ultimate strength	f_{uta}	psi (N/mm^2)	101,525 (700)		101,525 (700)	
Minimum specified yield strength	f_y	psi (N/mm^2)	81,220 (560)		81,220 (560)	
Effective stress area (screw anchor body)	A_{se}	in^2 (mm^2)	0.0453 (29.2)		0.1020 (65.8)	
Steel Strength in Tension	N_{sa}	lb (kN)	4,585 (20.4)		10,355 (46.1)	
Strength Reduction Factor for Steel Failure in Tension	Φ_{sa}	-	0.65			
Steel Strength in Shear	V_{sa}	lb (kN)	1,350 (6.0)		3,150 (14.0)	
Steel Strength in Shear, Seismic	$V_{sa,eq}$	lb (kN)	1,125 (5.0)		1,800 (8.0)	
Strength Reduction Factor for Steel Failure in Shear	Φ_{sa}	-	0.60			

Characteristic	Symbol	Unit	Nominal Anchor Diameter			
			1/4"		3/8"	
Drill Bit Diameter	d_0	in (mm)	1/4 (6.4)		3/8 (9.5)	
Nominal Embedment Depth	h_{nom}	in (mm)	1-5/8 (41)	2-1/2 (64)	1-5/8 (41)	2-1/2 (64)
Effective Embedment Depth	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)
Pullout Strength in Tension[3]						
Pullout Strength in Uncracked Concrete	$N_{p,uncr}$	lb (kN)	N/A	4,025 (17.9)	2,990 (13.3)	N/A
Pullout Strength in Cracked Concrete	$N_{p,cr}$	lb (kN)	605 (2.7)	1,080 (4.8)	1,755 (7.8)	2,630 (11.7)
Pullout Strength in Cracked Concrete, Seismic	$N_{p,eq}$	lb (kN)	605 (2.7)	1,080 (4.8)	1,755 (7.8)	2,630 (11.7)
Normalization Exponent, Uncracked Concrete	n	-	0.50		0.50	
Normalization Exponent, Cracked Concrete	n	-	0.40		0.50	
Strength Reduction Factor for Pullout Strength in Tension	Φ_p	-	0.45	0.55	0.65	0.65
Concrete Breakout Strength in Tension						
Effective embedment	h_{ef}	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)
Effectiveness Factor for Uncracked Concrete	k_{uncr}	in-lb (SI)	24 (10.0)	24 (10.0)	24 (10.0)	24 (10.0)
Effectiveness Factor for Cracked Concrete	k_{cr}	in-lb (SI)	17 (7.1)	17 (7.1)	17 (7.1)	17 (7.1)
Strength Reduction Factor for Concrete Breakout Strength in Tension	Φ_{cb}	-	0.45	0.55	0.65	0.65
Axial stiffness in service load range in uncracked concrete	β_{uncr}	lb/inch x10^5 (N/mm)	2.719 (48)	1.928 (34)	6.240 (109)	4.502 (79)
COV for β_{uncr}	v	%	38			
Axial stiffness in service load range in cracked concrete	β_{cr}	lb/inch x10^5 (N/mm)	1.451 (25)	1.100 (19)	3.318 (58)	2.563 (45)
COV for β_{cr}	v	%	48			
Concrete Breakout Strength in Shear						
Nominal Diameter	d_0[2]	in (mm)	0.250 (6.4)		0.375 (9.5)	
Load Bearing Length of Anchor	l_e	in (mm)	1.24 (31.6)	2.01 (51.1)	1.21 (30.8)	1.98 (50.3)
Reduction Factor for Concrete Breakout Strength in Shear	Φ_{cb}	-	0.70			
Concrete Pryout Strength in Shear						
Coefficient for Pryout Strength	k_{cp}	-	1.0	1.0	1.0	1.0
Reduction Factor for Pryout Strength in Shear	Φ_{cp}	-	0.70			

[1]The tabulated data is to be used in conjunction with the design criteria given in ACI 318 (-19 and -14) Chapter 17 or ACI 318-11 Appendix D, as applicable.
[2]The strength reduction factor applies when the load combinations from the IBC or ACI 318 are used and the requirements of ACI 318-19 17.5.3, ACI 318-14 17.3.3 or ACI 318-11 D.4.3, as applicable, are met. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of f must be determined in accordance with ACI 318-11 D.4.5.



Bi-metal Concrete Screw Anchor

Advantages of Bi-metal Concrete Screw Anchor

- Outdoor applications
- Long lifespan projects
- Hardness of frontal carbon alloy component allows for easy drilling and high quality anchoring during installation.
- Suitable for normal concrete, high strength concrete, and concrete over steel deck.
- Designed for consistent and reliable performance in cracked and non-cracked concrete.
- Superior corrosion resistance.

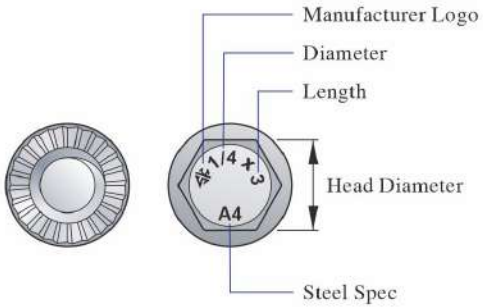
Unique Welding Technology

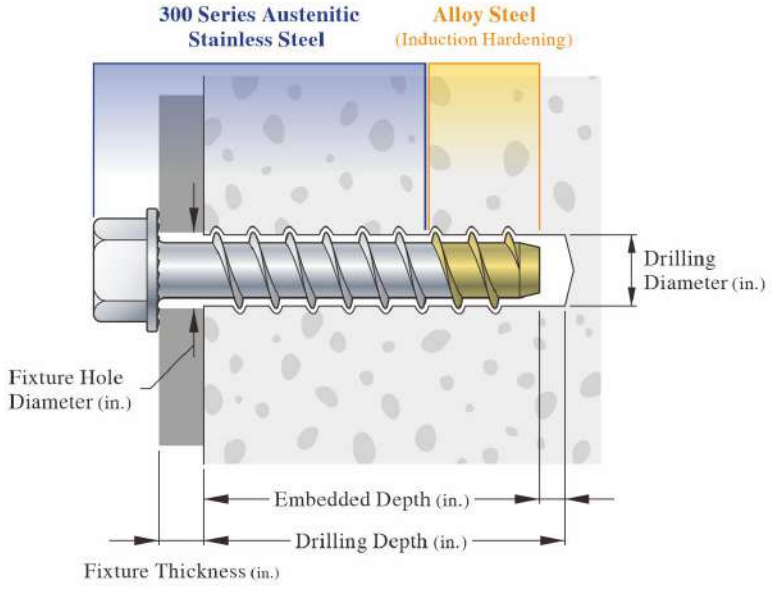
- **Fastening Part** - A4 or A2 Austenitic Stainless Steel to Provide longlife application and reliable fastening unit
- **Cutting Part** - Selective hardening to provide the better cut into the undercut of concrete

Fastening Part
Austenitic Stainless Steel

Cutting Part
Inductive Heating Tapper

Product Specifications & Selection for Application





1. Reserve 1/2" drilling depth for installation
2. Length of screw minus length of fixture is the installation length
3. Non-threading body length is customizable
4. Fixture hole diameter should be larger than major diameter of screw

Bi-metal screw anchor uses stainless steel that conforms to the EN-10263-5 standard

Steel type	Austenitic
Steel spec	**A2(304). A4(316)**
Strength level (min)	Tensile strength 50Kgf/mm² 500N/mm²

Bi-Metal Concrete Anchors (Stainless Steel) Hex Washer Head

Part No.	Size (in.)	Drill Bit Diameter (in.)	Installation Socket Size (in.)	Qty(pcs)/Box
SKH14200S	1/4x2	1/4	7/16	100
SKH14300S	1/4x3	1/4	7/16	100
SKH14400S	1/4x4	1/4	7/16	100
SKH14500S	1/4x5	1/4	7/16	100
SKH38212S	3/8x2-1/2	3/8	9/16	50
SKH38300S	3/8x3	3/8	9/16	50
SKH38400S	3/8x4	3/8	9/16	50
SKH38500S	3/8x5	3/8	9/16	50
SKH12300S	1/2x3	1/2	5/8	50
SKH12400S	1/2x4	1/2	5/8	50
SKH12500S	1/2x5	1/2	5/8	25
SKH12600S	1/2x6	1/2	5/8	25

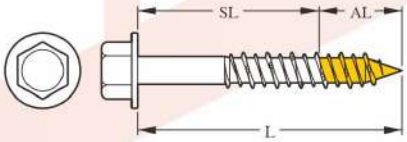
Bi-metal Concrete Screw

Advantage for Bi-Metal Concrete Screws

- Excellence Corrosion resistance and Longer Life Span
- Strong Tensile Strength provides Reliable quality
- Unique Thread Design provides remarkable drilling performance
- Better performance in wet areas, coastal line areas and industrial areas

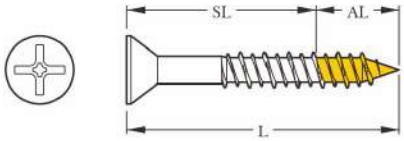
Bi-Metal Concrete Screws Hex Washer Head HI-LO Thread

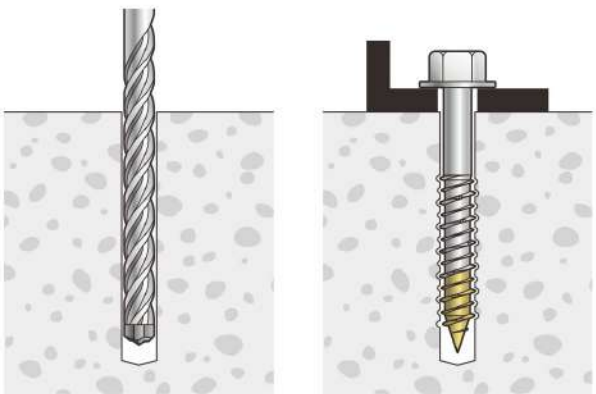
Part No.	Size (in.)	Driver	Drill Bit Diameter (in.)
SKH14114SCS	1/4x1-1/4	5/16" HEX	3/16
SKH14134SCS	1/4x1-3/4	5/16" HEX	3/16
SKH14214SCS	1/4x2-1/4	5/16" HEX	3/16
SKH14234SCS	1/4x2-3/4	5/16" HEX	3/16
SKH14314SCS	1/4x3-1/4	5/16" HEX	3/16
SKH14400SCS	1/4x4	5/16" HEX	3/16



Bi-Metal Concrete Screws Flat Head Phillips #3 Drive HI-LO Thread

Part No.	Size (in.)	Driver	Drill Bit Diameter (in.)
SKC14114SCS	1/4x1-1/4	#3 Phillips	3/16
SKC14134SCS	1/4x1-3/4	#3 Phillips	3/16
SKC14214SCS	1/4x2-1/4	#3 Phillips	3/16
SKC14234SCS	1/4x2-3/4	#3 Phillips	3/16
SKC14314SCS	1/4x3-1/4	#3 Phillips	3/16
SKC14400SCS	1/4x4	#3 Phillips	3/16





Applications

- Drill a hole with depth of 6mm than the total thread length, then install with impact driver.
- Best used in concrete & brick foundation building.
- RSP or Tufcote coatings provide extended corrosion resistance.

Testing Environment

Coating thickness testing machine

Vickers hardness testing machine

Non contact visual measuring microscope

Metallographic analysis microscop

Pull out testing machine

Computerized pullout testingmachine

Kesternich testing machine

Salt spray testing machine

Installation test

Torque test

Pull out test

Project

Tunnel Construction Project

Natural Stone Wall Cladding Project

High Way Acoustic Barriers

Pedestrian Walkway

Kaohsiung Rapid Transit Construction Project

Taiwan High Speed Rail Miaoli Station Construction Project

Stadium Seat Fixing

Railings Project

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