GENERAL INFORMATION

CSI SPIRAL DRIVE PINS

High Performance Domed Head Pins

PRODUCT DESCRIPTION

CSI Spiral Drive Pins are designed for permanently fastening a fixture to concrete, concrete over steel deck, concrete masonry walls and A36 or A572 / A992 structural steel. The fasteners are manufactured with an 8mm head and 0.157" diameter shank in various lengths. A spiral knurled shank design provides consistent optimized performance in steel base materials. For single fasteners, a plastic washer is mounted on the pin shank to retain the drive pin in the barrel of the tool and provide centered guidance during the driving operation. The fasteners are also available in collated strips.

GENERAL APPLICATIONS AND USES

- Attaching light gauge steel to concrete, concrete over steel deck, concrete masonry or steel
- Attaching wood members to concrete, concrete masonry or steel
- Attaching accessories, fixtures and components to concrete, concrete over steel deck, concrete masonry or steel
- Sill plate and perimeter anchorage

APPROVALS AND LISTINGS

- International Code Council, Evaluation Service (ICC-ES), ESR-2024
- Code compliant with the International Building Code/International Residential Code: 2018 IBC/IRC, 2015 IBC/IRC, 2012 IBC/IRC, and 2009 IBC/IRC
- Tested in accordance with ASTM E1190 and ICC-ES AC70 for use in concrete, lightweight concrete, concrete over steel deck, concrete masonry and steel

GUIDE SPECIFICATION

- CSI Divisions: 03 15 00 - Concrete Accessories, 05 05 23 - Metal Fastenings, 06 05 23 - Wood, Plastic and Composite Fastenings, 09 22 16.23 - Fasteners.Power-driven fasteners shall be CSI spiral drive pins as supplied by DEWALT, Towson, MD. Fasteners shall be installed in accordance with published instructions and the Authority Having Jurisdiction.

SELECTION GUIDE

Pin / Fastener Description	Dimensions		Base Material					DEWALT Tools						Approvals & Listings
	Shank Diameter	Shank Length	Concrete	Lightweight Concrete	Concrete over Steel Deck	Concrete Masonry (CMU)	Steel	P1000 / T1000	P2201	P35s	P3500 / PA3500	Sniper	DFD270	
CSI Spiral Drive Pins	0.157"	16mm to 37mm (5/8" to 1-1/2")	●	●	●	●	●		o	●	●	●	●	ICC-ES ESR-2024
	0.157"	52mm to 72mm (2" to 2-7/8")	●	●	●	o	o		o		●		●	ICC-ES ESR-2024
CSI Spiral Pins with Tapered Shank	0.145"	13mm to 16mm (1/2" to 5/8")	o	o	o	o	●		o	●	●	●	●	ICC-ES ESR-2024
CSI Spiral Drive Pins with Washer	0.157"	19mm to 32mm (3/4" to 1-1/4")	●	●	●	●	●		o	●	●	●	●	ICC-ES ESR-2024
	0.157"	62mm to 72mm (2-1/2" to 2-7/8")	●	●	●	o	o		o		●		●	ICC-ES ESR-2024

● Suitable o May be Suitable

Collated fasteners can only be loaded into the DFD270 with magazine.

SECTION CONTENTS

CSI SPIRAL PIN

CSI SPIRAL PIN COLLATED

CSI SPIRAL PINS WITH WASHER

SUITABLE BASE MATERIALS

- Normal-weight concrete
- Lightweight concrete
- Concrete over steel deck
- Grouted concrete masonry (CMU)
- Hollow concrete masonry (CMU)
- Steel

FASTENER SIZE RANGE

- 1/2" (13mm) length through 2-7/8" (72mm) length

CODE LISTED
ICC-ES ESR-2024
CONCRETE, MASONRY, STEEL

PERFORMANCE DATA

Allowable Load Capacities for CSI Spiral Fasteners in ASTM A36 Steel[1,2,3,7,8]

Fastener Description		Nominal Steel Thickness (inch)									
		1/8		3/16		1/4		3/8		≥ 1/2[4,5,6]	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
CSI Spiral Drive Pin (0.157" Shank)		280 (1.2)	540 (2.4)	515 (2.3)	585 (2.6)	735 (3.3)	535 (2.4)	615 (2.7)	495 (2.2)	535 (2.4)	565 (2.5)
CSI Spiral Taper Shank Pin (0.157" Shank)	1/2-inch long	-	-	-	-	210 (0.9)	390 (1.7)	240 (1.1)	390 (1.7)	245 (1.1)	480 (2.1)
	5/8-inch long	-	-	-	-	265 (1.2)	465 (2.1)	290 (1.3)	465 (2.1)	320 (1.4)	480 (2.1)

1. Fastener capacities are based on the base steel with a minimum yield strength (Fy) of 36 ksi and a minimum ultimate tensile strength (Fu) of 58 ksi. The pointed portion of the fastener must penetrate the steel member unless otherwise noted.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected to the steel substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. The step shank fasteners with 0.157 inch shank must be embedded a minimum of 0.50 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
5. The 1/2-inch long tapered fasteners with 0.145 inch shank must be embedded a minimum of 0.43 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
6. The 5/8-inch long tapered fasteners with 0.145 inch shank must be embedded a minimum of 0.45 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
7. Fasteners must have a minimum spacing distance of 1-1/2 inches and a minimum edge distance of 1/2 inch in accordance with ASTM E 1190. Consideration of smaller spacing distances may be given based on application or jobsite testing.
8. Multiple fasteners are recommended for any attachment for increased reliability.

Allowable Load Capacities for CSI Spiral Fasteners in ASTM A572 or A992 Steel[1,2,3,7,8]

Fastener Description		Nominal Steel Thickness (inch)									
		1/8		3/16		1/4		3/8		≥ 1/2[4,5,6]	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
CSI Spiral Drive Pin (0.157" Shank)		325 (1.4)	510 (2.3)	550 (2.4)	630 (2.8)	795 (3.5)	580 (2.6)	660 (2.9)	535 (2.4)	580 (2.6)	610 (2.7)
CSI Spiral Taper Shank Drive Pin (0.145" Shank)	1/2-inch long	-	-	-	-	210 (0.9)	390 (1.7)	240 (1.1)	390 (1.7)	245 (1.1)	480 (2.1)
	5/8-inch long	-	-	-	-	265 (1.2)	465 (2.1)	290 (1.3)	465 (2.1)	320 (1.4)	480 (2.1)

1. Fastener capacities are based on the base steel with a minimum yield strength (F_y) of 50 ksi and a minimum ultimate tensile strength (F_u) of 65 ksi. The pointed portion of the fastener must penetrate the steel member unless otherwise noted.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected to the steel substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. The fasteners with 0.157 inch shank must be embedded a minimum of 0.50 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
5. The 1/2-inch long tapered fasteners with 0.145 inch shank must be embedded a minimum of 0.43 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
6. The 5/8-inch long tapered fasteners with 0.145 inch shank must be embedded a minimum of 0.45 inch into the steel; fastener point penetration through the steel is not necessary provided the minimum embedment is achieved.
7. Fasteners must have a minimum spacing distance of 1-1/2 inches and a minimum edge distance of 1/2 inch in accordance with ASTM E 1190. Consideration of smaller spacing distances may be given based on application or jobsite testing.
8. Multiple fasteners are recommended for any attachment for increased reliability.

Allowable Load Capacities for CSI Spiral Fasteners in Normal-Weight Concrete[1,2,3,4,5,6]

Fastener Description	Min. Embed. Depth in. (mm)	Minimum Concrete Compressive Strength, f 'c							
		2,500 psi		3,000 psi		4,000 psi		6,000 psi	
		Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)
CSI Spiral Drive Pin (0.157" Shank)	3/4 (19)	120 (0.5)	170 (0.8)	130 (0.6)	190 (0.8)	270 (1.2)	380 (1.7)	80 (0.4)	120 (0.5)
	1 (25)	190 (0.8)	245 (1.1)	225 (1.0)	280 (1.2)	270 (1.2)	520 (2.3)	205 (0.9)	300 (1.3)
	1-1/4 (32)	310 (1.4)	385 (1.7)	340 (1.5)	420 (1.9)	475 (2.1)	575 (2.6)	205 (0.9)	380 (1.7)

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected with the substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. Concrete member thickness must be a minimum of three times the fastener embedment depth.
5. Fasteners must have a minimum spacing distance of 4 inches and a minimum edge distance of 3-1/2 inches in accordance with ASTM E 1190. Consideration of smaller spacing and edge distances may be given based on application or jobsite testing.
6. Multiple fasteners are recommended for any attachment for increased reliability.

Load Capacities for CSI Spiral Fasteners in Lightweight Concrete and Sand-Lightweight Concrete over Steel Deck (3-inch Deep Profile)[1,2,3,8,9,10]

Fastener Description	Minimum Embed. Depth in. (mm)	Minimum Concrete Compressive Strength, f 'c = 3,000 psi					
		Directly into Concrete[4,5]		Through Soffit of Steel Deck Into Concrete			
				Upper Flute[6,7]		Lower Flute[6,7]	
		Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)
CSI Spiral Drive Pin (0.157" Shank)	3/4 (19)	185 (0.8)	270 (1.2)	185 (0.8)	430 (1.9)	130 (0.6)	355 (1.6)
	1 (25)	260 (1.2)	375 (1.7)	250 (1.1)	510 (2.3)	190 (0.8)	355 (1.6)
	1-1/8 (29)	350 (1.6)	425 (1.9)	250 (1.1)	560 (2.5)	200 (0.9)	425 (1.9)
	1-1/4 (32)	350 (1.6)	440 (2.0)	350 (1.6)	610 (2.7)	200 (0.9)	450 (2.0)
	1-1/2 (38)	460 (2.0)	520 (2.3)	475 (2.1)	610 (2.7)	205 (0.9)	450 (2.0)

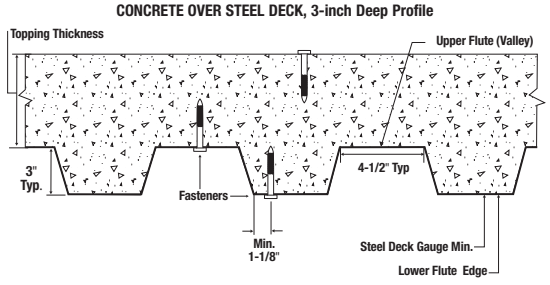
1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected with the substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. For fasteners installed directly into concrete, the member thickness must be a minimum of three times the embedment but not necessary to be greater than 3.25 inches.
5. Fasteners must have a minimum spacing distance of 4 inches and a minimum edge distance 3-1/2 inches in accordance with ASTM E 1190. Consideration of smaller spacing and edge distances may be given based on application or jobsite testing.
6. For fasteners installed into the upper flute of the steel deck profile, the concrete thickness above the deck (topping thickness) must be a minimum of 3.25 inches. For fasteners installed into the lower flute of the steel deck profile, the concrete thickness above the deck (topping thickness) must be a minimum of 2.25 inches.
7. Fasteners installed into the steel deck profile must have a minimum spacing distance of 4 inches (upper and lower flute) and a minimum edge distance of 1-1/8 inches (lower flute); minimum deck end distance is 3-1/2 inches. Consideration of smaller spacing distances may be given based on application or jobsite testing.
8. Embedment is measured from the surface of the steel deck; the steel deck panel must have a base-metal thickness of 0.030-inch (22 gauge) to 0.060-inch (16 gauge).
9. Multiple fasteners are recommended for any attachment for increased reliability.
10. Fasteners may be installed in 2,500 psi concrete provided the allowable loads are reduced by 11 percent.

Allowable Load Capacities for CSI Spiral Fasteners in Lightweight Concrete and Sand-Lightweight Concrete over Steel Deck (1-1/2-inch Deep Profile, Inverted Deck Profile Suitable)[1,2,3,8,9]

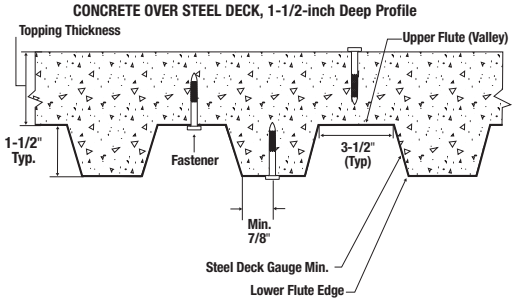
Fastener Description	Minimum Embed. Depth in. (mm)	Minimum Concrete Compressive Strength, f 'c = 3,000 psi			
		Directly into Concrete[4,5]		Through Soffit of Steel Deck Into Concrete	
				Upper or Lower Flute[6,7]	
		Tension lbs (kN)	Shear lbs (kN)	Tension lbs (kN)	Shear lbs (kN)
CSI Spiral Drive Pin (0.157" Shank)	3/4 (19)	185 (0.8)	270 (1.2)	120 (0.5)	410 (1.8)
	1 (25)	260 (1.2)	375 (1.7)	200 (0.9)	410 (1.8)
	1-1/8 (29)	350 (1.6)	425 (1.9)	200 (0.9)	410 (1.8)
	1-1/4 (32)	350 (1.6)	440 (2.0)	210 (0.9)	415 (1.8)

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected with the substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. For fasteners installed directly into concrete, the member thickness must be a minimum of three times the embedment but not necessary to be greater than 3.25 inches.
5. Fasteners must have a minimum spacing distance of 4 inches and a minimum edge distance 3-1/2 inches in accordance with ASTM E 1190. Consideration of smaller spacing and edge distances may be given based on application or jobsite testing.
6. For fasteners installed into the upper flute of the steel deck profile, or for fasteners installed into the lower flute of the steel deck profile, the concrete thickness above the deck (topping thickness) must be a minimum of 2.25 inches.
7. Fasteners installed into the steel deck profile must have a minimum spacing distance of 4 inches (upper and lower flute) and a minimum edge distance of 7/8 inches (lower flute); minimum deck end distance is 3-1/2 inches. Consideration of smaller spacing distances may be given based on application or jobsite testing.
8. Embedment is measured from the surface of the steel deck; the steel deck panel must have a base-metal thickness of 0.030-inch (22 gauge) to 0.060-inch (16 gauge).
9. Multiple fasteners are recommended for any attachment for increased reliability.

CONCRETE OVER STEEL DECK, 3-inch Deep Profile



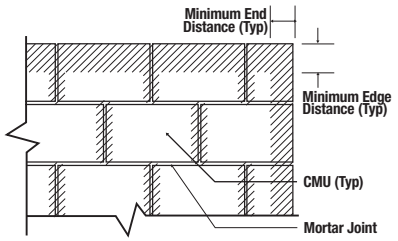
CONCRETE OVER STEEL DECK, 1-1/2-inch Deep Profile



Allowable Loads for CSI Spiral Fasteners Driven into Concrete Masonry Units[1,2,3,8,9,10]

Fastener Description	Embed. Depth in. (mm)	Allowable Loads lbs (kN)									
		Hollow CMU[4,7]				Grouted CMU[5,6,7]					
		Face Shell		Horizontal Mortar Joint		Face Shell		Horizontal Mortar Joint		Top and Center of Grouted Wall	
		Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear	Tension	Shear
CSI Spiral Drive Pin (0.157" Shank	1 (25)	185 (0.8)	210 (0.9)	70 (0.3)	115 (0.5)	140 (0.6)	165 (0.7)	120 (0.5)	185 (0.8)	120 (0.5)	145 (0.6)

1. Fasteners must not be driven until the masonry has reached the minimum designated compressive strength. Concrete masonry must be minimum 8-inch wide, minimum Grade N, Type II, lightweight, medium-weight or normal-weight units conforming to ASTM C90. Mortar must be minimum Type N complying with ASTM C270. Grout must be coarse grout complying with ASTM C476.
2. The tabulated tension and shear values are for the fasteners only. Steel or wood members connected with the substrate must be investigated for compliance with the applicable code.
3. Allowable load capacities are calculated using minimum required factors of safety in accordance with ICC-ES AC70; the minimum applied factor of safety is 5.0. Consideration of additional safety factors may be necessary depending on the application such as life safety.
4. Fasteners installed into the face or end of hollow CMU must have a minimum end distance of 3-3/4 inches. No more than one fastener may be installed in an individual hollow concrete masonry unit cell.
5. Fasteners installed into grout-filled concrete masonry must have a minimum spacing distance of 4 inches and a minimum edge and end distance 3-3/4 inches.
6. For installations into grout-filled concrete masonry walls, fasteners may be placed into the bed joint (horizontal mortar joint) provided the fasteners have a minimum spacing distance of 8 inches along the bed joint and have a minimum edge distance of 8 inches.
7. Installations directly into the head joint (vertical mortar joint) and within 1-1/2 inch of the head joint is not recommended and must not be permitted.
8. Allowable shear loads may be applied in any direction.
9. Multiple fasteners are recommended for any attachment for increased reliability.
10. Successful fastening into the face shell of hollow CMU and into the horizontal mortar joint is typically conducted with the lowest powder load level.



Wall Face
Permissible Anchor Locations
(Un-hatched Area)

Nominal and Available Pull-Over Strengths for Light Gauge Steel Framing with Power-Driven Fasteners[1,2,3]

Fastener Description	Shank Diameter	Minimum Thickness of Steel or Framing Member									
		16 Gauge		18 Gauge		20 Gauge		22 Gauge		25 Gauge	
		Nominal (lbs)	Available (lbs)	Nominal (lbs)	Available (lbs)	Nominal (lbs)	Available (lbs)	Nominal (lbs)	Available (lbs)	Nominal (lbs)	Available (lbs)
CSI Spiral Drive Pin	0.157"	1,270	425	1,015	340	765	255	635	210	445	150
CSI Spiral Drive Pin with 1" Washer	0.157"	2,420	805	1,935	645	1,455	485	1,210	405	845	280

1. Tabulated pull-over strengths were calculated in accordance with ICC-ES AC70 and AISI S100-16. Allowable load values are based on a safety factor of 3.0.
2. Allowable pullover capacities of sheet steel or framing member should be compared to the fastener tensile capacity in concrete, masonry or steel to determine the controlling resistance load.
3. Steel or framing member with tensile strength of 45 ksi assumed for calculating tabulated values.

ORDERING INFORMATION

CSI Spiral Drive Pins (8mm Head Diameter)

Cat. No.	Shank Length	Shank Type	Shank Diameter	Ctn Qty.	Mstr Qty.
50178	1/2" I 13mm (K)	Tapered	0.145"	100	1,000
50181	5/8" I 16mm (K)	Tapered	0.145"	100	1,000
51201	5/8" I 16mm (K)	Straight	0.157"	100	1,000
50203	3/4" I 19mm (K)	Straight	0.157"	100	1,000
50204	7/8" I 22mm (K)	Straight	0.157"	100	1,000
50205	1" I 27mm (K)	Straight	0.157"	100	1,000
50208	1-1/4" I 32mm (K)	Straight	0.157"	100	1,000
50207	1-1/2" I 37mm (K)	Straight	0.157"	100	1,000
50209	2" I 52mm (K)	Straight	0.157"	100	1,000
50241	2-1/2" I 62mm (K)	Straight	0.157"	100	1,000
50211	2-7/8" I 72mm (K)	Straight	0.157"	100	1,000

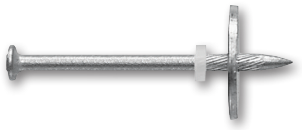
(K)- Knurled

CSI Spiral Drive Pins Collated (8mm Head Diameter)

Cat. No.	Shank Length	Shank Type	Shank Diameter	Ctn Qty.	Mstr Qty.
50238N	1/2" I 13mm (K)	Tapered	0.145"	100	1,000
50241N	5/8" I 16mm (K)	Tapered	0.145"	100	1,000
51450	5/8" I 16mm (K)	Straight	0.157"	100	1,000
50452	3/4" I 19mm (K)	Straight	0.157"	100	1,000
50454	7/8" I 22mm (K)	Straight	0.157"	100	1,000
50456	1" I 27mm (K)	Straight	0.157"	100	1,000
50458	1-1/4" I 32mm (K)	Straight	0.157"	100	1,000
50460	1-1/2" I 37mm (K)	Straight	0.157"	100	1,000
50461	1-5/8" I 42mm (K)	Straight	0.157"	100	1,000
50462	2" I 52mm (K)	Straight	0.157"	100	1,000

(K)- Knurled

CSI Spiral Drive Pins with Washer (8mm Head Diameter)



Cat. No.	Shank Length	Shank Type	Shank Diameter	Washer Diameter	Ctn Qty.	Mstr Qty.
50245	3/4" I 19mm (K)	Straight	0.157"	3/4"	100	1,000
50247	1" I 27mm (K)	Straight	0.157"	3/4"	100	1,000
50261	1-1/4" I 32mm (K)	Straight	0.157"	1"	100	1,000
50263	2-1/2" I 62mm (K)	Straight	0.157"	1"	100	1,000
50265	2-7/8" I 72mm (K)	Straight	0.157"	1"	100	1,000

(K)- Knurled