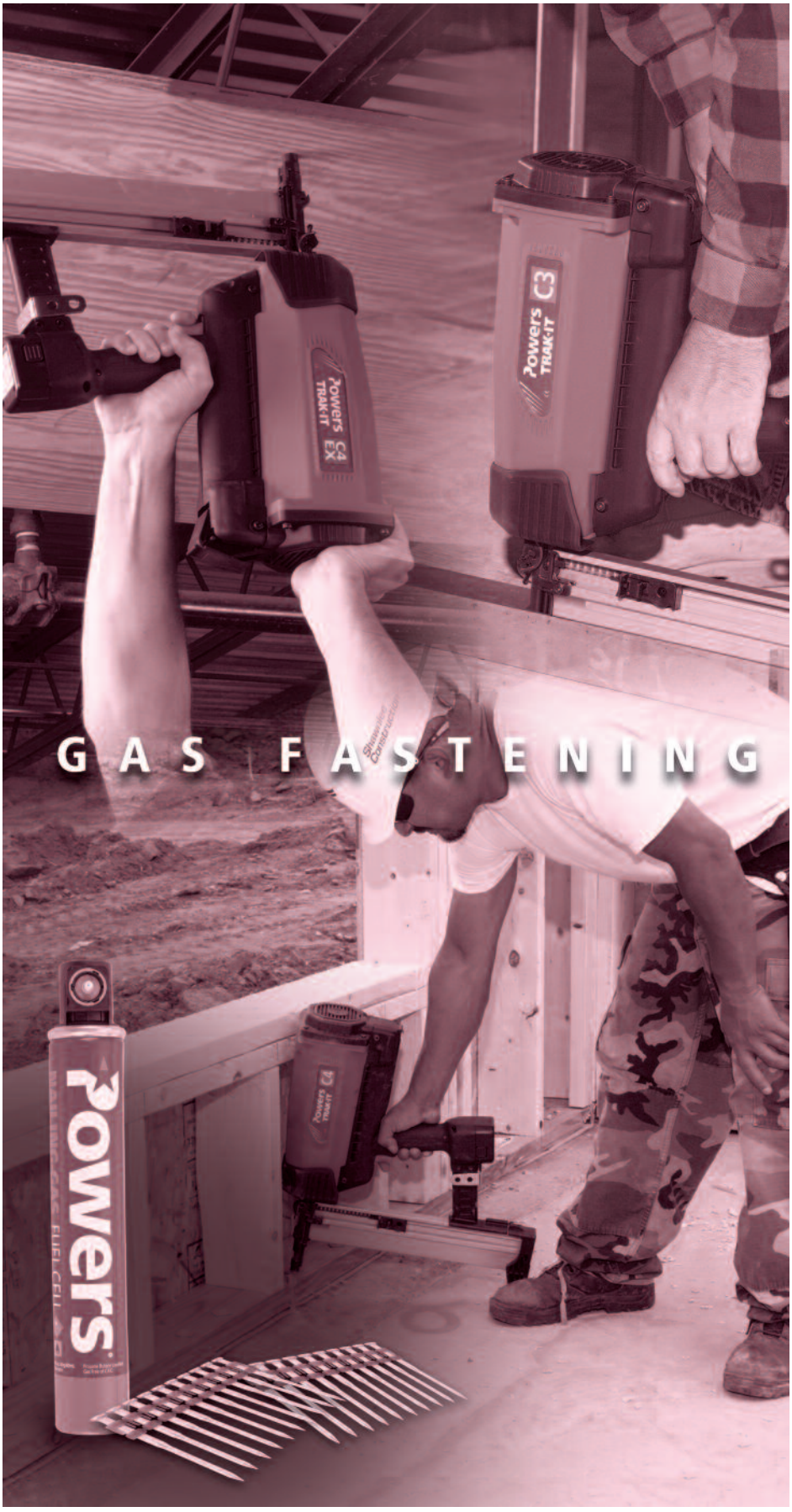


SECTION CONTENTS

Tools and Fasteners

Gas Actuated Fastening

INTRODUCTION

Gas fastening systems provide a cost effective method of attaching fixtures and assemblies for light duty, static load conditions. Powers' systems consist of specially designed fasteners, installation tools, and fuel cells which are designed to function in combination to provide optimum performance. Historically, this method of fastening was developed commercially during the early 1990's as an alternative to pneumatic tools. Soon after the initial tool introduction, gas fastening technologies were launched for the drywall, electrical, and mechanical contractor. Gas fastening can significantly reduce the in place cost as compared to powder sometimes pnuematic fastening. Gas fastening also significantly reduces the stresses on the user and is much quieter than powder actuated fastening. These systems provide the contractor with the ability to fasten into concrete, masonry, and structural steel without pre-drilling holes. For most applications, this eliminates time consuming layout or hole spotting resulting in faster installation and reduced costs. In addition, gas fastening systems are completely portable and are ideal for locations that are difficult to access. Today, gas fastening technology has become a standard method of attachment for many applications in the construction industry. Powers offers a complete line of high quality, gas tools, fasteners, assemblies, and accessories.

SECTION CONTENTS

GENERAL APPLICATIONS AND USES

- Attaching Steel members to Concrete, Block or Steel
- Attaching Wood members to Concrete, Block or Steel
- Attaching accessories to Concrete, Block or Steel
- Attaching ceiling clips and threaded rod to Concrete or Steel

APPROVALS AND LISTINGS

- Tested in accordance to ASTM E 488 and E 1190
- International Code Council, Evaluation Service (ICC-ES), ESR-2036 (Formerly ER-6157)
- International Code Council, Evaluation Service (ICC-ES), ESR-2249
- City of Los Angeles (COLA) Research Report LARR-25523 and 25856

FUNCTIONING PRINCIPLES

Operating Principle

Gas systems, often described as forced entry systems, require special installation tools which are critical components of a successful fastening. The installation of fasteners using gas tools begins with a precise amount of fuel dispensed into the combustion chamber. This fuel is ignited by the spark, typically produced by a battery. This combustion of the fuel then drives a piston into the fastener head, which in turn drives the fastener into the base material.

Tool Safety

Gas fasteners should be installed by properly instructed operators as described in OSHA 1926.21(b)(2).

FUEL CELLS

The energy source used to drive a gas fastener into the base material is a fuel cell. Specific fuel cells are designed for each unique gas tool. Powers tools use fuel cells in which the propellant is housed in a metal canister with a valve top.

Fuel Cell Identification

In the commercial market, fuel cell design varies. The amount of fuel dispensed for an individual fastening could vary for each individual fuel cell. This amount of fuel dispensed equates to the amount of power for an individual tool. Currently there is no industry standard for color coding/power rating system for fuel cells and the amount of power produced in an individual fastening. Please refer to manufacturer's product literature for the appropriate fuel cells to be used with specific tools.

FASTENER TYPES

Several fastener types are available including straight shank, tapered shank, step shank pins along with application-specific assemblies.

Typical Drive Pins

Straight pins (typically in a collation strip) are one of the most commonly specified types of gas fastener. They are used to fasten a fixture directly to the base material in one operation for permanent applications. Pins are available in several head configurations. Each of the head configurations has a corresponding shank diameter and a variety of lengths. Some pins designed for use in steel have a knurled shank to provide increased load capacities. Other pins have a narrow shank diameter close to its point and a wider shank diameter comprising the upper portion. This design is known as "step shank" and is used to penetrate denser base materials more consistently.

FASTENER GUIDANCE AND MATERIAL SPECIFICATIONS

Fastener Guidance

Pins are typically pre-mounted in collated strips for loading into a loading track for automated advancement. During the driving process, the collations break free and act as a second point of guidance for the fastener. Generally, head guidance is provided by the diameter of the fastener head.

Fastener Material Specifications

Mechanical Properties

Gas fasteners are subjected to extremely high stresses as they are driven into the base material. A key aspect of their design is to manufacture them from a material that is tough enough to prevent deformation of the fastener during the driving process with ductility to prevent shattering. Powers gasfasteners are specially manufactured using a proprietary process to meet these requirements. The fasteners are manufactured from ASTM A510 Grade 1060 to 1065 steel and austempered to a core hardness of RC 51 to 55.

Corrosion Resistance

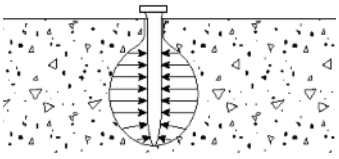
Gas fasteners are designed to be used in a noncorrosive atmosphere unless application specific corrosion testing has been performed. To reduce the possibility of the embrittlement of a heat treated part, the standard finish for all Powers gas fasteners is mechanically applied zinc meeting the requirements of ASTM B 695, Class 5, Type 1 providing an average minimum thickness of 5 microns (0.0002") with no supplementary coating.

FUNCTIONING OF GAS ACTUATED FASTENERS

Functioning in Concrete

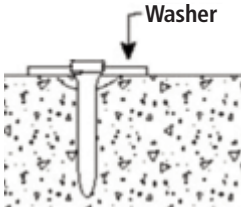
The load capacity of a gas actuated fastener when installed into concrete or masonry base materials is based on the following factors:

1. Strength of the base material
2. Hardness and concentration of the aggregate
3. Shank diameter of the fastener
4. Depth of embedment into the base material
5. Fastener spacing and edge distance



When a gas fastener is driven into concrete, it displaces the volume of concrete around the embedded area of the fastener shank. As this occurs, the concrete directly surrounding the fastener is compressed and in turn presses back against the shank of the fastener. Additionally, the driving action generates heat which causes particles within the concrete to fuse to the shank of the fastener. This combination of compression and fusion holds the fastener in the concrete base material.

A similar action occurs when fastening into block masonry. Generally, the performance of the fastener in a given concrete strength will increase with greater embedment depths in a certain range. Depending on the fastener style and base material strength, embedment depths range from 5/8" to 1-1/2". For depths greater than this range, there is the possibility of fastener bending or "fishhooking" which may decrease expected load capacities. For typical embedment depths achieved, refer to the upcoming section on load capacities.



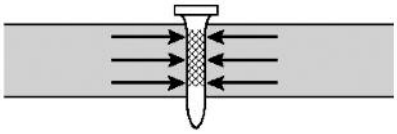
During the driving action, some localized surface spalling of the concrete or masonry may occur. Normally, this is a surface effect which does not affect the performance of the fastener. However, it may pose an aesthetic problem for exposed applications where a fixture is not used. In cases such as this, one method that can be used to improve the appearance of the fastening is to drive the fastener through a steel washer.

FUNCTIONING OF GAS ACTUATED FASTENERS (Continued)

Functioning in Steel

The load capacity of a gas actuated fastener when installed into steel base materials is based on the following factors:

1. Thickness of the steel
2. Tensile strength of the steel
3. Shank diameter of the fastener
4. Depth of point penetration through the steel
5. Fastener spacing and edge distance.

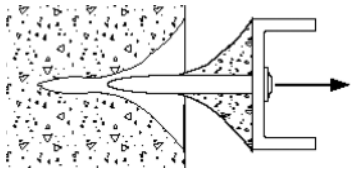


When a gas fastener is driven into steel, it displaces the steel laterally 360 degrees around the shank of the fastener. Since steel is an elastic material, it presses back against the shank of the fastener to hold it in place. As the diameter of the fastener shank is increased, the load capacity obtained will generally increase provided the steel thickness is sufficient to accept the fastener. To further increase fastener performance in steel, some fasteners have a knurled shank which allows the steel to form a key lock into the grooves to provide higher capacities than those obtained with a smooth shank. For typical performance, the fastener point should completely penetrate the steel. In thicker steel base materials, adequate load capacities may be obtained for applications in which the point of the fastener does not fully penetrate the steel. See product literature for specific information. Job site performance tests are recommended.

Fasteners should not be used in areas that have been welded or cut with a torch as these procedures may have caused local hardening of the steel. Over driving of the fastener should be avoided as the rebound created may reduce the load capacity or cause damage to both the fastener and the tool. When fastening into unsupported long steel members, it may be necessary to provide support in the area of the fastening to prevent spring action which can cause inconsistent penetration and a reduction in load capacity.

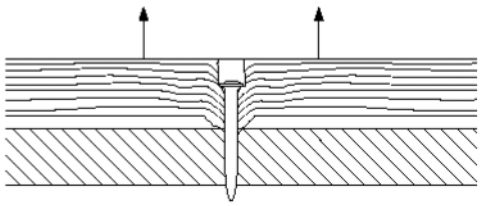
FASTENER BEHAVOR

An understanding of the performance characteristics of a gas actuated fastener is an important aspect of the selection process. At ultimate failure, the following modes of failure can be expected.



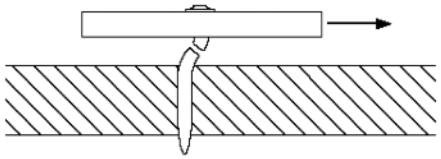
Base Material Failure Fastener Pullout

The fastener pulls out of the base material when subjected to a tension load. In concrete, a typical cone type failure can be expected while in steel the fastener pulls out cleanly.



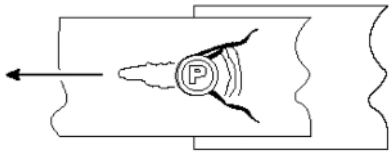
Pullover Failure

The fixture or material fastened pulls over the head of the fastener. This is a common occurrence when fastening lumber or thin metal materials. To help improve pullover resistance for applications such as this, Powers gas actuated fasteners can be applied with Stick-E steel washers.



Shank Failure

The shank of the fastener is broken due to an applied lateral load such as shear. This can also happen when a bending load is created.



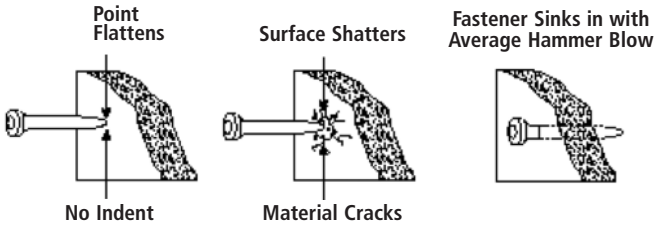
Bearing Failure

The fixture or material fastened tears as a lateral load is applied and is pulled over the head of the fastener.

BASE MATERIAL SUITABILITY

While gas fasteners can be used successfully in concrete, certain masonry materials, A 36 and A572 steel, some materials are completely unsuitable. Fasteners should never be fired into hard or brittle materials such as cast iron, tile, glass, or rock. These materials can shatter easily resulting in a potential safety hazard. In addition, soft base materials such as wallboard, plaster, or wood are not appropriate as the fastener could pass completely through these materials. The user should never guess when fastening into any base material.

A Center Punch Test should always be performed to determine the suitability of the base material for a gas fastening. This test is relatively simple and can help to ensure a safe, successful fastening. Be sure to wear the appropriate eye protection when performing this test. To begin, select the fastener to be used for the job. Then place the point of the fastener against the proposed base material. Strike the fastener with a single hammer blow and then examine the point. If the point of the fastener is not blunted and the base material has a clear point indentation, it is acceptable to proceed with the first test installation.Use of a gas actuated system is not recommended if the following occurs during the Center Punch Test:

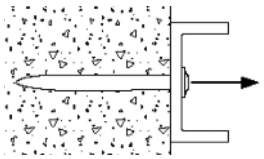


1. The fastener point has been blunted. This indicates that the base material is too hard.
2. The base material cracks or shatters. This indicates that the base material is too brittle.
3. When using an average hammer blow, the fastener penetrates the base material easily. This indicates that the base material is too soft.

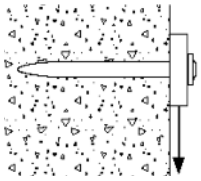
APPLIED LOADS

The type of load and the manner in which it is applied by the fixture or other attachment is a primary consideration in the selection of a gas fastener. Gas fastening systems provide a cost effective method of attaching fixtures for light duty, static load conditions. The load capacities for gas fasteners published in this manual represent the results of laboratory testing conducted according to ASTM Standards E 488 and E 1190. As always, the suitability of a fastener for a specific application should be determined by a qualified design professional responsible for the product installation.

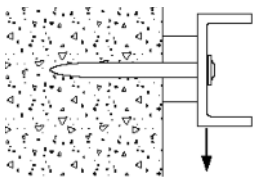
Tension Load
A tension load is applied directly in line with the axis of the fastener.



Shear Load
A shear load is applied perpendicular to the fastener directly along the surface of the base material.



Bending Loads



The potential effect of bending resulting from the application of static shear load should be considered for fixtures. This can occur in softer material such as lumber used for sill plates or when shims or spacers are placed between the fixture and the base material. In situations such as this, the load is applied at a distance from the surface of the base material creating a lever type action on the fastener. When a bending load is applied to a fastener, it is often the physical strength of the fastener material, not the tension or shear load capacities that limit the strength of the connection. For sill plate applications, Powers publishes test data based on the use of 2x lumber to develop the capacities. The allowable bending load should be calculated by a design professional based on the material from which the fastener is manufactured. For step shank pins, it is important to remember that the point of maximum stress is at the interface of the shank and the base material. For example, when calculating the bending load for a fastener such as a Trak-It C4 step shank pin, it is important to use the shank diameter of shank at the location where the bending is occurring.

DESIGN RECOMMENDATIONS FOR CONCRETE

Allowable Load Capacities

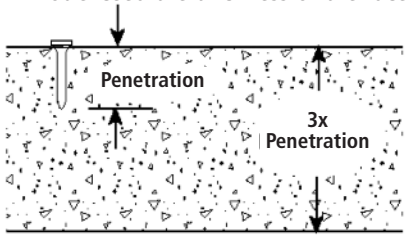
The allowable load capacity which may be applied to a gas fastener is based on applying a safety factor to the average ultimate load capacity obtained from testing according to ASTM Standards E 488 and E 1190. One purpose of the safety factor is to allow for field variations which may differ from the testing conditions in the laboratory. An example is the type and strength of the base material. For proper performance, gas fasteners must be installed by properly instructed operators. In concrete and masonry materials, the values for allowable loads are based on applying a safety factor of 5:1 or greater to the ultimate loads. Loads are based on testing fasteners installed in base materials having the designated strength at the time of installation. Values are for the fastener only; connected parts must be investigated separately. Due to the variability of gas fasteners installed in concrete or masonry materials, use of multiple fasteners is recommended to increase reliability. The design data listed in the tables are suggested allowable load capacities based on the safety factors noted below each table. These safety factors are based on industry experience and may need to be increased based on the application requirements or local codes as determined by the design professional responsible for the product installation. Proper spacing and edge distance guidelines must be followed.

Base Material Strength

As discussed earlier in this manual, the strength of concrete and masonry base materials can vary widely. For installations in concrete, load capacities are published for gas fasteners in normal-weight concrete in various compressive strength ranges. Linear interpolation of the data to calculate load capacities for fasteners installed in intermediate concrete strengths is permitted. Normally, the load capacities can be expected to increase as the compressive strength of the concrete base material increases. However, some types of high compressive strength concrete or concrete with a very hard aggregate may not be suitable for gas fastenings. Job site installation tests are recommended to determine fastener suitability. For structural lightweight concrete, values are published for minimum 3,000 psi concrete with and without steel deck. For masonry base materials, the published load capacities are based on testing in a wall constructed from ASTM C 90, Grade N, lightweight block. Since the consistency of masonry block can vary widely, especially within the mortar used, these values should be used solely as a guide. Job site tests are recommended to determine actual load capacities when used in masonry walls.

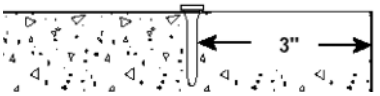
Base Material Thickness

Concrete base material should be at least three (3) times as thick as the fastener embedment penetration Unless specific fastener testing has been conducted to qualify the condition and location. If the concrete is too thin, the compressive forces forming at the fasteners point can cause the free face of the concrete to break away. This can create a dangerous condition from flying concrete and/or the fastener and also results in a reduction of fastener holding power. For applications in the face shell of concrete masonry block, select a fastener length which will not exceed the thickness of the face shell.



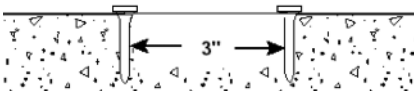
Edge Distance

Do not fasten closer than 3" from the edge of concrete. If the concrete cracks, the fastener may not hold. Closer edge distances for applications such as sill plates may be permitted if specific fastener testing has been conducted.



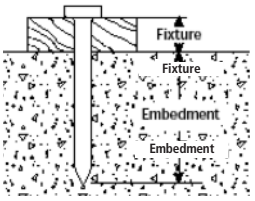
Spacing

Setting fasteners too close together in concrete or masonry can cause cracking. The recommended minimum distance between fasteners is 3" center to center. Unless specific fastener testing has been conducted to qualify the condition and location. Setting fasteners too close together in concrete or masonry can cause cracking. The recommended minimum distance between fasteners is 3" center to center.



Length Selection

For permanent applications using pins in concrete, first determine the thickness of the fixture to be fastened. To this, add the required embedment or penetration into the base material. This will be the fastener shank length required. For applications in the face shell of masonry block, select a fastener length which will not exceed the thickness of the face shell.



DESIGN REFERENCE GUIDE FOR STEEL

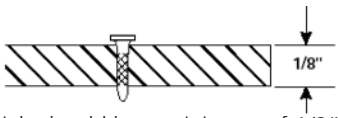
Allowable Load Capacities

The allowable load capacity which may be applied to a gas fastener is based on applying a safety factor to the average ultimate load capacity obtained from testing according to ASTM Standards E 488 and E 1190. One purpose of the safety factor is to allow for field variations which may differ from the testing conditions in the laboratory. An example is the type and strength of the base material. For proper performance, gas fasteners must be installed by properly instructed operators. In steel materials, the values listed are based on a safety factor of 5:1 or greater to the ultimate loads. Values are for the fastener only; connected parts must be investigated separately. Use of multiple fasteners is recommended to increase reliability. The design data listed in the tables are suggested allowable load capacities based on the safety factors noted below each table. This safety factor is based on industry experience and may need to be increased based on the application or local code requirements as determined by the design professional responsible for the product installation. Proper spacing and edge distance guidelines must be followed.

Base Strength

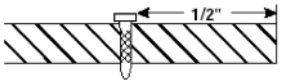
The published allowable load capacities are based on testing conducted in ASTM A 36 structural steel with the fastener point fully penetrating the steel member. For use in higher strength steel, applications where the point of the fastener will not penetrate a thickness of steel greater than those listed in the tables, job site tests are recommended to determine the suitability of the application and the actual load capacities.

Base Material Thickness



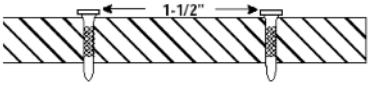
Steel base materials should be a minimum of 1/8" in thickness.

Edge Distance



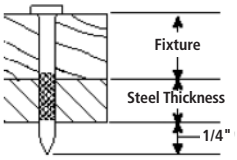
For installations in steel, 1/2" is the recommended minimum edge distance.

Spacing



The recommended minimum distance between fastenings is 1-1/2" center to center for installations in steel.

Length Selection



For permanent applications when using pins in steel, first determine the thickness of the fixture to be fastened. To this, add the thickness of the steel base material plus a minimum of 1/4" to allow for proper point penetration in thicker steel base materials, it may be allowable if the fasteners point does not penetrate the steel. See product literature for allowable embedment depths.. This will be the minimum fastener shank length required. Do not select a fastener length longer than that required for the application. An excessively long shank can burnish or polish the hole created in the steel resulting in a reduction in load capacity.

GAS FASTENING SELECTION GUIDE

Legend ■ Suitable □ May be Suitable

Pin Category		Trak-It C3 Pins							Trak-It C4						
Product		**1/2" Steel Pin (Step Shank with Rolled Point)**	**Standard Pins (Smooth Shank with Rolled Point)**	**Standard Pins with Break Free Collation (Smooth Shank with Rolled Point)**	**Perma-Seal Coated Standard Pins**	**Plywood to Steel (Spiral Knurl Shank with Rolled Point)**	**Bullseye Pins (Step Shank with Rolled Point)**	**Stick-E Pin (Step Shank)**	**Straight Pin (Smooth Shank)**	**Striahgt Pin (Smooth Shank)**	**Straight Pin (Knurled Shank)**	**Straight Pin (Tapered Shank)**	**Steel Pins**	**Step Shank Pins**	**Coated Step Shank Pins (ACQ)**
Page		**362**	**362**	**362**	**362**	**362**	**362**	**362**	**366**	**366**	**366**	**366**	**366**	**366**	**366**
Pin Dimensions	Diameter (inches)	0.102" / 0.120"	0.102"	0.102"	0.102"	0.102"	0.102" / 0.120"	0.088" / 0.102"	0.102"	0.145"	0.145"	0.137"	0.120"	0.102" / 0.145"	0.102" / 0.145"
	Length (inches)	1/2"	3/4" 1" 1 1/4" 1 1/2"	3/4" 1 1/4" 1 1/2"	3/4" 1"	1 3/8"	11/16" 3/4" 1"	0.780" 1"	3/4" 1" 1 1/4" 1 1/2" 2 1/4" 2 1/2"	3/4" 1"	1" 1 1/4" 2"	2 9/16"	0.500" 0.680" 0.730"	1 1/4" 1 1/2" 1 7/8" 2 1/4" 2 1/2" 2 3/8"	1" 1 1/4" 2"
Base Material	Concrete		■	■	■			■	■	■	■	■		■	■
	High Strenth Concrete / Precast Concrete						■	□		□				■	■
	Lightweight Concrete		■	■	■			■	■	■	■	■			□
	Lightweight Concrete over Metal Deck		■	■	■			■	■	■	■				
	Wood Sill Plate to Concrete											■			
	Grouted Concrete Masonry		■	■	■			■	□	□		■		□	□
	Hollow Concrete Masonry		■	■	■			■	□	□	□	□		□	□
	Brick Masonry		□	□	□			□	□						□
	Plywood to Light Gage Steel					■									
	A36 / A572 Steel	■									■		■		
	Wood to Steel														■
Stick-E Accessory						Denz-Glass Washer		■	■						

Trak-It® C3 *Gas Fastening System*

PRODUCT DESCRIPTION

The Trak-It C3 gas fastening system was developed for use in light-duty static applications, including attaching drywall track to concrete, block or steel, lath to concrete or block, furring strips to concrete or block, and plywood to concrete or block base materials. The system is designed for speed, efficiency and consistency. Operation of a gas fastening system does not require licensing.

GENERAL APPLICATIONS AND USES

- Attaching steel track to concrete, block or steel
- Attaching plywood to concrete or block
- Attaching lath to concrete, block or steel
- Attaching furring strips to concrete or block

FEATURES AND BENEFITS

+ No licensing required
+ Each fuel cell contains enough gas to install up to 1,000 fasteners
+ Available for use with Stick-E™ accessories
+ Short or long track versions

APPROVALS AND LISTINGS

International Code Council, Evaluation Service (ICC-ES), ESR-2036 (Formerly ER-6157)
City of Los Angeles (COLA) Research Report LARR-25523

GUIDE SPECIFICATIONS

CSI Divisions: 03151–Concrete Anchoring, 04081-Masonry Anchorage, 05090-Metal Fastenings, 06090-Wood and Plastic Fastenings, 09260-Finishes. Gas fastening systems shall be Trak-It® as supplied by Powers Fasteners, Inc.

TOOL SPECIFICATIONS

Trak-It C3 Tool

Tool Body	Precision Moulded Aluminum and Plastic
Tool Length	17"
Tool Weight	8 lbs
Pin Length	2-1/2" total length
Pin Capacity	42 pins (22 pins - short track)
Power Capacity	90 Joules
Approximate Shots per Fuel Cell	1,000 pins
Approximate Shots per Battery Charge	5,500

SECTION CONTENTS

Trak-It C3 Tool

Trak-It C3-ST Tool
(Short Track)

SUITABLE BASE MATERIALS

Normal-Weight Concrete
Structural Lightweight Concrete
Concrete Masonry
Steel

PERFORMANCE DATA

Allowable Load Capacities for Trak-It C3 Fasteners Installed in Normal-Weight Concrete[1]

Shank Diameter in. (mm)	Min. Embed. in. (mm)	Min. Spacing in. (mm)	Min. Edge Distance in. (mm)	Minimum Concrete Compressive Strength (f'_c)							
				2,000 psi (13.8 MPa)		**3,000 psi** (20.7 MPa)		**4,000 psi** (27.6 MPa)		**5,000 psi** (34.5 MPa)	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
0.102 (2.59)	5/8 (15.9)	4 (101.6)	3 (76.2)	70 (0.31)	80 (0.36)	75 (0.33)	90 (0.40)	80 (0.36)	100 (0.44)	85 (0.38)	110 (0.49)
	3/4 (19.1)	4 (101.6)	3 (76.2)	80 (0.36)	130 (0.58)	105 (0.47)	170 (0.76)	130 (0.58)	210 (0.93)	155 (0.69)	250 (1.11)
	7/8 (22.2)	4 (101.6)	3 (76.2)	80 (0.36)	160 (0.71)	105 (0.47)	190 (0.85)	130 (0.58)	220 (0.98)	155 (0.69)	250 (1.11)
	1 (25.4)	4 (101.6)	3 (76.2)	80 (0.36)	190 (0.85)	105 (0.47)	210 (0.93)	130 (0.58)	230 (1.02)	155 (0.69)	250 (1.11)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.

Allowable Load Capacities for Trak-It C3 Installed in Structural Lightweight Concrete[1]

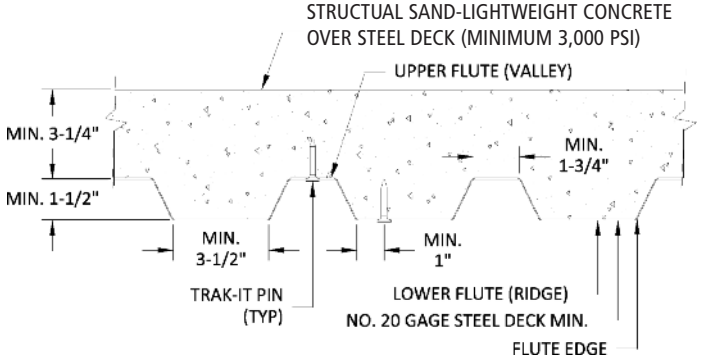
Shank Diameter in. (mm)	Min. Embedment in. (mm)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
				3,000 psi (20.7 MPa)		**4,000 psi** (27.6 MPa)		**5,000 psi** (34.5 MPa)	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
0.102 (2.59)	3/4 (19.1)	4 (101.6)	6 (152.4)	100 (0.44)	120 (0.53)	110 (0.49)	190 (0.85)	110 (0.49)	255 (1.13)
	7/8 (22.2)	4 (101.6)	6 (152.4)	110 (0.49)	125 (0.56)	120 (0.53)	190 (0.85)	120 (0.53)	260 (1.16)
	1 (25.4)	4 (101.6)	6 (152.4)	110 (0.49)	130 (0.58)	120 (0.53)	190 (0.85)	120 (0.53)	265 (1.18)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.

Allowable Load Capacities for Trak-It C3 Fasteners Installed Through Steel Deck into Structural Lightweight Concrete[1,2,3,4]

Shank Diameter in. (mm)	Min. Embedment in. (mm)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Minimum Concrete Compressive Strength (f'_c)			
				3,000 psi (20.7 MPa)		**4,000 psi** (27.6 MPa)	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
0.102 (2.59)	3/4 (19.1)	4 (101.6)	1 (25.4)	80 (0.36)	105 (0.47)	85 (0.38)	115 (0.51)
	7/8 (22.2)	4 (101.6)	1 (25.4)	85 (0.38)	120 (0.53)	90 (0.40)	130 (0.58)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. For fasteners installed through steel deck, the minimum edge distance is 1 inch from the edge of the deck rib and 6 inches from the end of the deck. Allowable shear loads may be applied in any direction.
3. Fasteners are permitted to be installed in the lower or upper flute of the steel deck provided that proper installation procedures are maintained.
4. The allowable values are applicable to fasteners installed through the underside of a steel deck at the ribs and into minimum 3,000 psi structural lightweight concrete. The steel deck must have a minimum base-metal thickness of 0.034 inch (20 gage) with a minimum yield point, Fy, of 33,000 psi and conform to the Steel Deck institute requirements for Standard Wide Rib Deck.



PERFORMANCE DATA

Allowable Load Capacities for Trak-It C3 Fasteners Installed in Concrete Masonry Units[1,2]

Shank Diameter in. (mm)	Min. Embedment in. (mm)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Hollow or Grouted (Any Location) $f'_m \geq$ 1,500 psi (10.4 MPa)	
				Tension lbs. (kN)	Shear lbs. (kN)
0.102 (2.59)	7/8 (22.2)	4 (101.6)	3 3/4 (95.3)	65 (0.29)	80 (0.36)
	1 (25.4)	4 (101.6)	3 3/4 (95.3)	65 (0.29)	120 (0.53)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Tabulated load values are for fasteners installed in minimum 6-inch wide, Minimum Grade N, Type II lightweight, medium and normal-weight concrete masonry units conforming to ASTM C 90. The face shell thickness of the concrete masonry units shall be a minimum of 1-1/4 inch.

Allowable Load Capacities for Trak-It C3 Fasteners Installed in ASTM A 36 Steel[1,2,3]

Fastener Type (Style)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Nominal Steel Thickness 3/16"		1/4"		3/8"		1/2"	
			Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/2 inch Steel Pin	1 (25.4)	1/2 (12.7)	115 (0.51)	260 (1.16)	165 (0.73)	260 (1.16)	175 (0.78)	255 (1.13)	175 (0.78)	205 (0.91)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Steel members must have a minimum yield strength, f_y, of 36,000 psi
3. Fasteners installed in 1/2-inch-thick steel must have a minimum embedment depth of 3/8-inch.

Allowable Load Capacities for Trak-It C3 Fasteners Installed in ASTM A 572 Steel[1,2,3]

Fastener Type (Style)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Nominal Steel Thickness 3/16"		1/4"		3/8"		1/2"	
			Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/2 inch Steel Pin	1 (25.4)	1/2 (12.7)	145 (0.64)	290 (1.29)	175 (0.78)	290 (1.29)	215 (0.96)	270 (1.20)	165 (0.73)	250 (1.11)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Steel members must have a minimum yield strength, f_y, of 50,000 psi
3. Fasteners installed in 1/2-inch-thick steel must have a minimum embedment depth of 3/8-inch.

Allowable Load Capacities for Trak-It C3 Plywood Pin Installed Through Plywood into Steel Track[1]

Fastener Type (Style)	Shank Diameter in. (mm)	16 Gage Steel Track Tension lbs. (kN)	18 Gage Steel Track Tension lbs. (kN)
Plywood to Steel Pin	0.102 (2.59)	65 (0.29)	40 (0.18)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.

Allowable Negative Transverse Loads Using Plywood/Densglass® Pin and Denz-Tight™ Washer Fasteners[1]

Fastener Type (style)	Sheathing	Minimum Steel Stud Thickness (gage)	Minimum Stud Spacing (inches)	Fastener Spacing (inches)	Allowable Negative Pressure (psf)
Plywood/Densglass® 0.102" Diameter	Densglass® Gold	16	24	6-1/2	50

1. Allowable load capacities are based on a minimum safety factor of 3.0.
Densglass® is a registered trademark of Georgia Pacific

ORDERING INFORMATION

C3 Tools and Accessories

Trak-It C3 Tools

Cat No.	Discription	STD Box	STD Ctn.
55011	C3 Trak-It	1	1
55002	C3-ST Trak-It	1	1

Tool comes with case, charger and two batteries.

Trak-It Fuel Cell

Cat No.	Discription	STD Box	STD Ctn.
55010	C3 Trak-It Fuel Cell	20	80

Fuel cell works in temperatures down to 10°F.

Trak-It Pole Tools

Cat No.	Discription	STD Box	STD Ctn.
55048	6' Pole Tool & One Trak-It C3-ST (Short Track) Tool	1	1
55051	8' Pole Tool & One Trak-It C3-ST (Short Track) Tool	1	1
55053	6' Pole Tool	1	1
55055	8' Pole Tool	1	1

1/2" Steel Pin (Step Shank with Rolled Point)

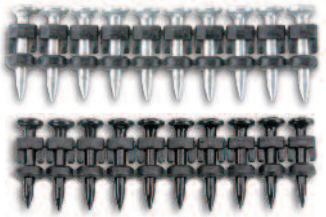
Cat. No.	Description	Shank Diameter	Standard Box	Standard Carton
55020	1/2" Steel Pin	0.120/0.102"	1,000	5,000

Designed for use in A36 and A572 steel beams, purlins, and bar joist. All pins are zinc plated for minimum level of corrosion resistance (mild service condition). Each box of pins come packaged with one fuel cell.

Standard Pins (Smooth Shank with Rolled Point)

Cat. No.	Description	Shank Diameter	Standard Box	Standard Carton
55022B	3/4" Black	0.102"	1,000	5,000
55024	1" Zinc	0.102"	1,000	5,000
55026	1 1/4" Zinc	0.102"	1,000	5,000
55028	1 1/2" Zinc	0.102"	1,000	5,000

Designed for use in concrete and masonry. All pins are zinc plated or coated with black oxide for a minimum level of corrosion resistance (mild service condition). Each box of pins come packaged with one fuel cell.



Standard Pins with Break-free Collation (Smooth Shank with Rolled Point)

Cat. No.	Description	Shank Diameter	Standard Box	Standard Carton
55032	3/4" Black	0.102"	1,000	5,000
55033	1" Zinc	0.102"	1,000	5,000
55034	1 1/4" Zinc	0.102"	1,000	5,000
55035	1 1/2" Zinc	0.102"	1,000	5,000

Designed for use in concrete and masonry. All pins are zinc plated or coated with black oxide for a minimum level of corrosion resistance (mild service condition). Plastic collation breaks completely free of pin during installation.
Each box of pins come packaged with one fuel cell.

Plywood/Densglass® to Steel Pin (Spiral Knurl Shank with Rolled Point)

Cat. No.	Description	Shank Diameter	Standard Box	Standard Carton
55036	1 3/8" Zinc	0.102"	1,000	5,000

Designed for use to attach plywood to light gage steel framing. All pins are zinc plated for a minimum level of corrosion resistance (mild service condition). Each box of pins come packaged with one fuel cell.

Stick-E Pins (Step Shank)

Cat. No.	Description	Shank Diameter	Standard Box	Standard Carton
55080	780 Step Shank Pin	0.120/0.102"	1,000	5,000
55081	1" Step Shank Pin	0.120/0.088"	1,000	5,000
55087	730 Step Shank Pin	0.120/0.102"	1,000	5,000
55085	680 Step Shank Pin	0.120/0.102"	1,000	5,000

Designed for use in hard aggregate and precast concrete. All pins are zinc plated for minimum level of corrosion resistance (mild service condition). Each box of pins come packaged with one fuel cell.

Trak-It® C4 *High Performance Gas Fastening System*

PRODUCT DESCRIPTION

The Trak-It C4 and C4EX gas fastening systems were developed for use in high volume production applications. Powerful rugged tools for fastening wood to concrete or steel. The systems are designed for speed, increased power and durability.
The C4 CZ tool was designed for use with single shot powder pins together with gas fastening technology. Operation of a gas fastening system does not require licensing.

GENERAL APPLICATIONS AND USES

- Attaching wood to concrete, block or steel
- Attaching Steel to concrete, block or steel
- Attaching Plywood to Steel
- Attaching Steel track to concrete

FEATURES AND BENEFITS

+ No licensing required
+ Increased power and durability
+ Handles up to 2-9/16" length fasteners
+ Each fuel cell contains enough gas to install up to 800 fasteners
+ Pin diameter range 0.102" to 0.145"

APPROVALS AND LISTINGS

International Code Council , Evaluation Service (ICC-ES), ESR-2249

GUIDE SPECIFICATIONS

CSI Divisions: 03151–Concrete Anchoring, 04081-Masonry Anchorage, 05090-Metal Fastenings, 06090-Wood and Plastic Fastening. Gas fastening systems shall be Trak-It as supplied by Powers Fasteners, Inc.

TOOL SPECIFICATIONS

Trak-It C4 Tool/C4EX Tool

Tool Body	Precision Moulded Aluminum and Plastic
Tool Length	17-3/4"
Tool Weight	9.7 lbs
Pin Length	2-9/16" Total Length
Pin Capacity	42 pins
Power Capacity	120 Joules (C4) , 150 Joules (C4EX)
Approximate Shots per Fuel Cell	800 pins
Approximate Shots per Battery Charge	5,500

Trak-It C4 CZ Single Shot Tool

Tool Body	Precision Moulded Aluminum and Plastic
Tool Length	17-3/4"
Tool Weight	9.7 lbs
Pin Length	3" Total Length
Pin Capacity	Single Shot
Power Capacity	150 Joules
Approximate Shots per Fuel Cell	800 pins
Approximate Shots per Battery Charge	5,500

SECTION CONTENTS

Trak-It C4 Tool

Trak-It C4EX Tool

Trak-It C4CZ Tool

SUITABLE BASE MATERIALS

Normal-Weight Concrete
Structural Lightweight Concrete
Concrete Masonry
Steel

PERFORMANCE DATA

Allowable Load Capacities for Trak-It C4 Fasteners Installed in Normal Weight Concrete[1,2,3]

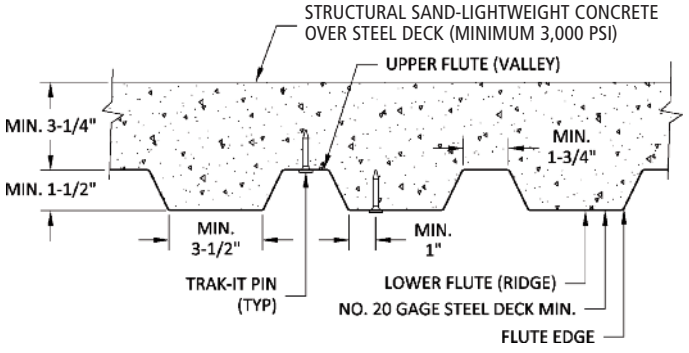
Shank Type	Shank Diameter in. (mm)	Minimum Embedment inches (mm)	Minimum Spacing inches (mm)	Minimum Edge Distance inches (mm)	Minimum Concrete Compressive Strength (f'c)			
					2,500 psi (17.2 mPa)		3,000 psi (20.7 mPa)	
					Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Straight	0.145 (3.68)	3/4 (19.1)	4 (101.6)	3 (76.2)	65 (0.29)	105 (0.47)	70 (0.31)	110 (0.49)
Straight	0.145 (3.68)	7/8 (22.2)			125 (0.56)	105 (0.47)	135 (0.60)	110 (0.49)
Step	0.145 (3.68)	3/4 (19.1)	4 (101.6)	3 (76.2)	80 (0.36)	220 (0.98)	90 (0.40)	235 (1.04)
Step	0.145 (3.68)	1 (25.4)			130 (0.58)	245 (1.09)	140 (0.62)	270 (1.20)
Taper	0.137 (3.48)	3/4 (19.1)	4 (101.6)	1-3/4 (44.5)	80 (0.36)	90 (0.40)	90 (0.40)	100 (0.44)
Taper	0.137 (3.48)	1 (25.4)	4 (101.6)	1-3/4 (44.5)	90 (0.40)	70 (0.31)	100 (0.44)	80 (0.36)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. The concrete thickness must be a minimum of 3 times the embedment depth of the fastener.
3. The tabulated allowable load values are for the fastener only. Wood or steel members connected to the steel substrate must be investigated in accordance with accepted design criteria.

Allowable Load Capacities for Trak-It C4 Fasteners Installed in Lightweight Concrete and Structural Sand-Lightweight Concrete over Steel Deck[1,2,3,4]

Shank Type	Shank Diameter in. (mm)	Minimum Embedment inches (mm)	Minimum Spacing inches (mm)	Minimum Edge Distance inches (mm)	Location	Minimum Concrete Compressive Strength (f'c)			
						2,500 psi (17.2 mPa)		3,000 psi (20.7 mPa)	
						Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Straight	0.145 (3.68)	3/4 (19.1)	4 (101.6)	1-1/8 (28.6)	Top	110 (0.49)	150 (0.67)	120 (0.53)	165 (0.73)
					Lower Flute	70 (0.31)	180 (0.80)	80 (0.36)	200 (0.89)
					Upper Flute	100 (0.44)	205 (0.91)	110 (0.49)	220 (0.98)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. The steel deck must have a minimum base material thickness of No. 20 gage.
3. Concrete thickness must be a minimum of 3 times the embedment depth of the fastener. i.e, minimum yield strength, Fy, of 33 ksi, and conform to the Steel Deck Institute requirements for Standard Wide Rib Deck, Type B.
4. The tabulated allowable load values are for the fastener only. Wood or steel members connected to the steel substrate must be investigated in accordance with accepted design criteria.



PERFORMANCE DATA

Allowable Load Capacities for Trak-It C4 Fasteners Installed in ASTM A36 Steel (minimum f_{ut} = 58 ksi)[1]

Fastener Type (Style)	**Shank Diameter** inches (mm)	**Minimum Spacing** inches (mm)	**Minimum Edge Distance** inches (mm)	**Minimum Steel Member Thickness** inches (mm)	**Tension** lbs (kN)	**Shear** lbs (kN)
1/2" Steel Pin	0.120 (3.05)	1 (25.4)	1/2 (12.7)	1/4 (6.4)	245 (1.09)	100 (0.44)
.680 Steel Pin	0.120 (3.05)				270 (1.20)	170 (0.75)
.730 Steel Pin	0.120 (3.05)				330 (1.46)	235 (1.04)
1" Steel Pin	0.145 (3.68)				360 (1.60)	360 (1.60)
1-1/4" Steel Pin	0.145 (3.68)				390 (1.73)	310 (1.38)
2" Steel Pin	0.145 (3.68)				240 (1.06)	280 (1.24)
2" Steel Pin (ACQ)	0.145 (3.68)				170 (0.75)	280 (1.24)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.

Allowable Load Capacities for C4 Coated Step Shank ACQ Pin in Normal-Weight Concrete [1,2]

Fastener Type (Style)	**Minimum Embedment** in. (mm)	Minimum Concrete Compressive Strength	
		4,000 psi (27.6 mPa)	
		Tension lbs. (kN)	Shear lbs. (kN)
C4 Coated Step Shank ACQ Pin	3/4 (19.1)	200 (0.89)	280 (1.24)

1. Allowable load capacities listed are calculated using a safety factor of 5.0 or greater. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
2. Tabulated values are listed for the fastener only. Wood or steel members connected to the concrete substrate must be investigated in accordance with accepted design criteria.

ORDERING INFORMATION

C4 Pins - Straight and Taper Pins

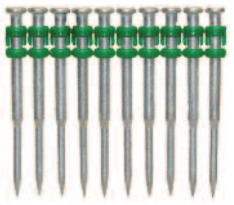
Cat No.	Description	Shank Diameter	STD Box	STD Ctn.
55111	3/4" Pin	0.102	800	4000
55113	1" Pin	0.102	800	4000
55130	3/4" Straight Shank Pin	0.145	800	4000
55132	1" Straight Shank Pin	0.145	800	4000
55124	2-1/4" Pin	0.102	800	4000
55128	2-1/2" Pin	0.102	800	4000
55145	2-9/16" Taper Pin	0.137	800	4000
55147	2-9/16" Taper Pin w/ Washer	0.137	800	4000
55161	.500 Pin, (K)	0.120	800	4000
55163	.680 Pin, (K)	0.102	800	4000
55165	.730 Pin, (K)	0.120	800	4000
55116	1-1/4" Pin	0.102	800	4000
55118	1-1/2" Pin	0.102	800	4000
55172	1" Wood / Steel Pin, (K)	0.145	800	4000
55173	1-1/4" Wood / Steel Pin, (K)	0.145	800	4000
55174	2" Wood / Steel Pin, (K)	0.145	800	4000

(K) = knurled
Each box of pins come packaged with one fuel cell.

55149	1" Square Washer (Stick E)	-	800	-

C4 Step Shank Pins

Cat No.	Description	Shank Diameter	STD Box	STD Ctn.
55134	1-1/4" Step Shank Pin	0.145/0.102	800	4000
55136	1-1/2" Step Shank Pin	0.145/0.102	800	4000
55141	1-7/8" Step Shank Pin, (K)	0.145/0.102	800	4000
55138	2-3/8" Step Shank Pin	0.145/0.102	800	4000
55140	2-1/2" Step Shank Pin	0.145/0.102	800	4000
55139	2-1/4" Step Shank Pin	0.145/0.102	800	4000



(K) = knurled
Each box of pins come packaged with one fuel cell.

C4 Coated Step Shank Pins (ACQ)

Cat No.	Description	Shank Diameter	STD Box	STD Ctn.
55167	1" Step Shank Pin ACQ, (K)	0.145	800	4000
55169	1-1/4" Step Shank Pin ACQ, (K)	0.145	800	4000
55171	2" Step Shank Pin ACQ, (K)	0.145	800	4000

(K) = knurled
Each box of pins come packaged with one fuel cell.

ORDERING INFORMATION

Cat No.	Description	STD Box	STD Ctn.
55160	C4 Insulation Washer	500	-

Cat No.	Description	Shank Diameter	STD Box	STD Ctn.
55180	2-1/4″ Duplex Kicker Pin	0.131″	800	4,000

Tools and Accessories

Trak-It C4 Tools

Cat No.	Description	STD Box	STD Ctn.
55112	C4 Trak-It	1	1
55127	C4 EX Trak-It	1	1
55133	C4 CZ Trak-It	1	1

Tools come with case, charger and two batteries.

Trak-It C4 Fuel Cell

Cat No.	Description	STD Box	STD Ctn.
55115	C4 Trak-It Fuel Cell	20	80

Fuel cell works in temperatures down to 10°F.

Stick-E™ *Accessories for Trak-It C3*

PRODUCT DESCRIPTION

The Stick-E fastening system uses Trak-It C3 gas technology with specially designed accessories for fastening typical applications encountered by electricians and mechanical contractors. The Stick-E fastening system allows direct fastening through the fixture with the magazine pin and accessory eliminating the need for drilling or anchoring.

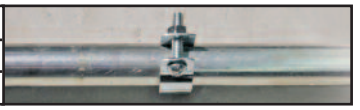
APPLICATIONS GUIDE

Cable Tie Donut

Application	For attaching small and large diameter cable ties to all types of walls and ceilings including wood, steel beams, concrete and block. Ideal for strapping wires and cable for hanging temporary lighting fixtures from all base materials. (fits ties up to 1/4" wide.)
Contractor(s)	Electricians
Suggested Pin Size(s)	780 Trak-It Step Shank Pins

Mini Conduit Clip

Application	For attaching conduit and piping to steel beams, wood and concrete ceilings.
Contractor(s)	Electricians
Suggested Pin Size(s)	780 Trak-It Step Shank Pins

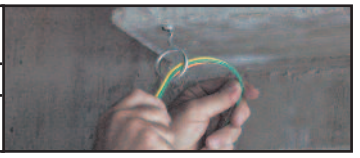


Conduit Clip (One Hole Strap)

Application	For attaching conduit and light duty pipe to walls and ceilings of any base material including wood, steel beams, concrete and steel purlins.
Contractor(s)	Electricians
Suggested Pin Size(s)	780 Trak-It Step Shank Pins

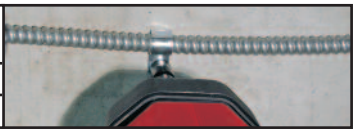
Bridal Ring

Application	For suspending single or multiple wires and cable in runs from overhead ceilings of all base materials including wood, steel beams, concrete and steel purlins.
Contractor(s)	Electricians
Suggested Pin Size(s)	780 Trak-It Step Shank Pins 1" Trak-It Step Shank Pins



BX Clip

Application	For attaching BX cable to walls and ceilings of any base material including wood, steel beams, concrete and steel purlins.
Contractor(s)	Cable Installers, Telecommunication Installers, Electricians
Suggested Pin Size(s)	780 Trak-It Step Shank Pins



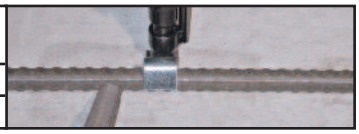
Strap Washer

Application	For attaching duct straps to suspend HVAC ductwork onto ceiling of various base materials.
Contractor(s)	Sheet Metal Contractors
Suggested Pin Size(s)	780 Trak-It Step Shank Pins

APPLICATIONS GUIDE

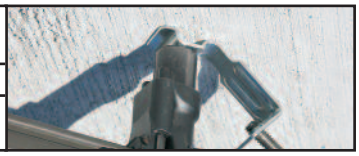
Rebar Basket Clip

Application	For attaching rebar to existing concrete or wood forms prior to a pour. Most popular in road and bridge construction and repair.
Contractor(s)	Concrete Contractors
Suggested Pin Size(s)	780 Trak-It Step Shank Pins



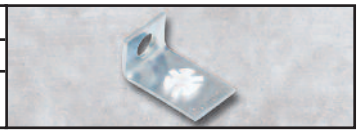
Rod Hanger

Application	Attaching rod overhead to steel beams, wood or concrete ceilings for the purpose of suspending utilities, cable trays, conduit and pipe.
Contractor(s)	Electricians, Plumbers, Mechanical Contractors
Suggested Pin Size(s)	780 Trak-It Step Shank Pins Break-Free Pins



Right Angle Clip

Application	For suspending acoustical ceiling systems or light fixtures.
Contractor(s)	Acoustical and Ceiling Contractors
Suggested Pin Size(s)	780 Trak-It Step Shank Pins Break-Free Pins

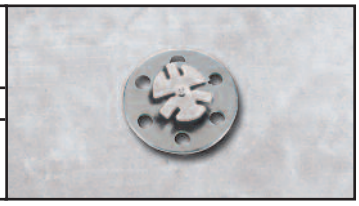


Insulation Washer

Application	For attaching exterior foam insulation to all base materials including wood, steel and concrete.
Contractor(s)	Insulation Contractors, Waterproofers
Suggested Pin Size(s)	780 Trak-It Step Shank Pins Break-Free Pins 1 1/4" Break Free Rolled Point Trak-It Pins (most base materials) 1 1/2" Break Free Rolled Point Trak-It Pins (most base materials)

Lathing Washer

Application	For attaching wire lathe to wood, steel, concrete or block for the purpose of troweling stucco in exterior applications or plaster in interior applications. Can also be used as a general purpose washer.
Contractor(s)	Drywall, Plaster, Exterior Siding Contractors
Suggested Pin Size(s)	780 Trak-It Step Shank Pins 1" Break Free Rolled Point Trak-It Pins (most base materials) 1 1/4" Break Free Rolled Point Trak-It Pins (most base materials)



Stainless Steel Sealing Washer

Application	For attaching waterproofing membrane to foundations and roofing applications.
Contractor(s)	Insulation Contractors, Waterproofers, Roofers
Suggested Pin Size(s)	3/4" Perma-Seal Coated Rolled Point Trak-It Pins (most base materials) 1" Perma-Seal Coated Rolled Point Trak-It Pins (most base materials)

Denz-Tight™ Washer

Application	For attaching Densglass® exterior sheathing to steel studs.
Contractor(s)	Drywall Contractors
Suggested Pin Size(s)	1-3/8" Plywood/Densglass® Pins

* Densglass® is a registered trademark of Georgia Pacific.

PERFORMANCE DATA

Ultimate Load Capacities for Stick-E Accessories Installed with 780 Pin into Concrete, Concrete Block, or Lightweight Concrete over Steel Deck[1,2]

Stick-E	Minimum Embed. Depth h_v in. (mm)	Ultimate Load	
		Tension lbs. (kN)	Shear lbs. (kN)
Conduit Clip	3/4 (19.1)	80 (0.35)	60 (0.27)
BX Clip	3/4 (19.1)	80 (0.35)	70 (0.31)
Bridal Ring	3/4 (19.1)	325 (1.44)	200 (0.89)
Cable Tie	3/4 (19.1)	50 (0.22)	60 (0.27)
Insulation Washer	3/4 (19.1)	300 (1.33)	400 (1.78)
Rebar Clip	3/4 (19.1)	275 (1.22)	275 (1.22)
Strap Washer	3/4 (19.1)	275 (1.22)	400 (1.78)
Rod Hanger	3/4 (19.1)	420 (1.86)	N/A
Right Angle Clip	3/4 (19.1)	300 (1.33)	400 (1.78)

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 5.0 or greater to determine the allowable working load. Consideration of safety factors of 10.0 or higher may be necessary depending on the application, such as life safety or overhead.
2. Minimum 2,000 psi Concrete or Concrete Block at time of installation.

Ultimate Load Capacities for Stick-E Accessories Installed with 780 Pin into A36 and A572 Steel[1]

Stick-E	Minimum Embedment Depth h_v in. (mm)	Ultimate Load					
		A36 Steel (3/16" Thick)		A572 Steel (1/8" Thick)		A572 Steel (12 Gage)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Conduit BX Clip	3/4 (19.1)	80 (0.35)	70 (0.35)	80 (0.35)	70 (0.35)	80 (0.35)	70 (0.35)
Bridal Ring	3/4 (19.1)	325 (1.44)	200 (0.89)	325 (1.44)	200 (0.89)	325 (1.44)	200 (0.89)
Cable Tie	3/4 (19.1)	50 (0.22)	60 (0.27)	50 (0.22)	60 (0.27)	50 (0.22)	60 (0.27)
Strap Washer	3/4 (19.1)	275 (1.22)	400 (1.78)	275 (1.22)	400 (1.78)	275 (1.22)	400 (1.78)
Rod Hanger	3/4 (19.1)	420 (1.86)	N/A	420 (1.86)	N/A	420 (1.86)	N/A

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 5.0 or greater to determine the allowable working load. Consideration of safety factors of 10.0 or higher may be necessary depending on the application, such as life safety or overhead.

Ultimate Load Capacites for Electrical Boxes Installed with 780 Trak-It Step Shank Pin into Concrete or Concrete Block[1,2,3]

Trak-It Pin	Minimum Embed. Depth h_v in. (mm)	Number of Pins (Per Box)	Maximum Spacing in. (mm)	Fastening Pattern	Ultimate Load		
					Tension lbs. (kN)	Shear Vert. Axis lbs. (kN)	Shear Horiz. Axis lbs. (kN)
780	5/8 (15.9)	2	1 (25.5)	Line	640 (2.85)	975 (4.34)	850 (3.78)
		3	2 (50.9)	Triangle	720 (3.20)	1,115 (4.96)	1,055 (4.69)
		4	2 (50.9)	Square/Diamond	900 (4.00)	1,840 (8.18)	1,840 (8.18)

1. The values listed above are ultimate load capacities which should be reduced by a minimum safety factor of 5.0 or greater to determine the allowable working load. Consideration of safety factors of 10.0 or higher may be necessary depending on the application, such as life safety or overhead.
1. Installations for Nominal 16 Gage Electrical Boxes, All Finishes.
2. Minimum 2,000 psi Concrete of Concrete Block at time of installation.

ORDERING INFORMATION

Stick-E Mini Conduit Clip

Cat. No.	Description	Standard Box	Standard Carton
55064	Mini Conduit Clip 1/2"	100	1,000
55066	Mini Conduit Clip 3/4"	100	1,000
55068	Mini Conduit Clip 1"	100	1,000

Stick-E Cable Tie Donut

Cat. No.	Description	Standard Box	Standard Carton
55076	Cable Tie Donut	100	1,000

Stick-E Conduit Clip (One Hole Strap)

Cat. No.	Description	Standard Box	Standard Carton
55059	Conduit Clip 1/2"	100	1,000
55061	Conduit Clip 3/4"	100	1,000
55063	Conduit Clip 1"	100	1,000

Stick-E BX Clip

Cat. No.	Description	Standard Box	Standard Carton
55054	Stick-E 3/8" BX Clips	100	1,000

Stick-E Bridal Ring

Cat. No.	Description	Standard Box	Standard Carton
55094	Bridal Ring 1 1/4"	100	1,000
55095	Bridal Ring 1 1/2"	100	1,000
55096	Bridal Ring 2"	100	1,000

Stick-E Strap Washer

Cat. No.	Description	Standard Box	Standard Carton
55062	Strap Washer 1/2" Diameter	100	1,000

Stick-E Rod Hanger

Cat. No.	Description	Standard Box	Standard Carton
55050	Rod Hanger 1/4"	100	1,000
55052	Rod Hanger 3/8"	100	1,000

Stick-E Rebar Basket Clip

Cat. No.	Description	Standard Box	Standard Carton
55070	#3 and #4 Bar	100	1,000

Stick-E Right Angle Clip

Cat. No.	Description	Standard Box	Standard Carton
55092	Right Angle Clip (Wirehole 0.278")	100	1,000

Stick-E Insulation Washer

Cat. No.	Description	Standard Box	Standard Carton
55042	Insulation Washer 1 7/16"	100	1,000

Stick-E Lathing Washer

Cat. No.	Description	Standard Box	Standard Carton
55040	Lathing Washer 1" with holes	100	1,000

Stick-E Stainless Steel Sealing Washer

Cat. No.	Description	Standard Box	Standard Carton
55043	SS Sealing Washer 3/4"	100	1,000

Stick-E Denz-Tight™ Washer

Cat. No.	Description	Standard Box	Standard Carton
55157	Denz-Tight™ Washer	100	1,000