

Powder Actuated Fastenings

INTRODUCTION

Powder actuated fastening systems provide a cost effective method of attaching fixtures for light duty, static load conditions. Powers' systems consist of specially designed fasteners, installation tools, and powder loads which are designed to function in combination to provide optimum performance.

These systems provide the contractor with the ability to fasten directly into concrete, masonry, and structural steel without pre-drilling holes.

GENERAL APPLICATIONS AND USES

- Attaching Steel 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-2024 (Formerly ER-5330)
- International Code Council, Evaluation Service (ICC-ES), ESR-1995
- City of Los Angeles (COLA) Research Report LARR-25304
- FM Global (Factory Mutual) - File No. J.I. 3002070 (Threaded Studs)

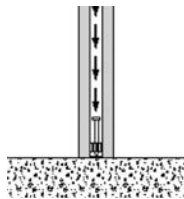
FUNCTIONING PRINCIPLES

Operating Principle

Powder actuated systems, often described as forced entry systems, require special installation tools which are critical components of a successful fastening. Two types of tools have been used in the market which operate on different driving principles, direct acting and indirect acting. The basic design of the tools are similar in that each has a breech which holds the powder load and a barrel or guide mechanism to hold the fastener. However, the installation and safety characteristics of the tools are very different.

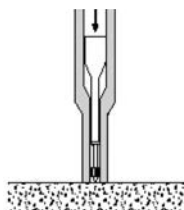
Direct Acting Principle

As the powder load is ignited in a direct acting tool, the expanding gases of the load act directly on the fastener to drive it down the barrel of the tool and into the base material. In a tool of this type, 100% of the energy developed by the powder load is transferred to the fastener. Penetration of the fastener into the base material is controlled primarily by the density of the base material and the load level selected. While the direct acting principle may allow fastenings to be made in very dense concrete and thick steel base materials, safety concerns have made the indirect principle the technology of choice. Powder actuated tools using this principle are no longer commercially available.



Indirect Acting Principle

In a tool which operates using the indirect acting principle, the expanding gases of the ignited powder load act directly on a captive piston which is housed within the barrel of the tool. The piston drives the fastener into the base material providing better control over the penetration of the fastener. In a tool of this type, most of the energy developed by the powder load is retained by the piston. Penetration of



the fastener into the base material is controlled by the design of the piston, the load level selected, and the density of the base material. All Powers' powder actuated tools operate using the indirect acting principle and are classified as low velocity tools.

Tool Classification

Powder actuated tools can be classified as low, medium, or high velocity. This classification system can apply to either direct or indirect acting tools and is based on a ballistic test. Using the strongest powder load and the lightest fastener commercially available from the manufacturer for a specific tool, the velocity of the tool is determined by measuring the average velocity of the fastener for ten individual tests. The velocity classifications based on ANSI A10.3 are as follows:

1. Low Velocity Tool

A tool in which the average test velocity does not exceed 328 feet per second (100 meters per second).

2. Medium Velocity Tool

A tool in which the average test velocity exceeds 328 feet per second (100 meters per second) but is less than 492 feet per second (150 meters per second). Medium velocity tools are no longer commercially available.

3. High Velocity Tool

A tool in which the average test velocity exceeds 492 feet per second (150 meters per second). High velocity tools are no longer commercially available.

Tool Safety

Powder actuated fasteners must be installed by properly trained and licensed operators as described in ANSI Standard A 10.3. Authorized Powers distributors offer complete training programs for end users. Contact your local Powers branch office or distributor for complete details. While the powder actuated tools are summarized in this section of the manual, only trained and licensed operators are allowed to use the tools. These summaries are for general information only.

SECTION CONTENTS	Page No.
Functioning Principles	3
Powder Loads	4
Fastener Types	4
Functioning in Concrete	5
Functioning in Steel	5
Fastener Behavior	6
Base Material Suitability.....	7
Applied Loads.....	7
Design Reference Guide for Concrete	7
Design Reference Guide for Steel.....	9
Performance Data	10

.300" Head Drive Pins with Top Hat

PRODUCT DESCRIPTION

These pins are used primarily for applications fastening drywall track to concrete or steel. Pins are assembled with a metal top hat to provide faster insertion into the driving tool with reduced possibility of pricking a finger during load and to provide extra bearing surface against the drywall track.

FASTENERS SIZE

Cat.No.	Shank Length	Shank Diameter	Standard Box	Standard Carton	Wt./100
50136	1/2" (K)	0.145"	100	5,000	0.6
50138	5/8" (K)	0.145"	100	5,000	0.7
50140	3/4"	0.145"	100	5,000	0.7
50144	1"	0.145"	100	5,000	0.8

(K) = knurled

