

Title:

Dowel Pin Handbook

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Summary:

Dowel Pins are industrial fasteners that are used in aerospace, military, construction and other industrial industries. Their primary function is for fastening two components but they are frequently used as an alignment or locating pin for components that are disassembled and reassembled. Frequently they are used as a hinge pin between pivoting components or as an axel for a rotating element.

Keywords:

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Article Body:

Dowel Pins are industrial fasteners that are used in aerospace, military, construction and other industrial industries. Their primary function is for fastening two components but they are frequently used as an alignment or locating pin for components that are disassembled and reassembled. Frequently they are used as a hinge pin between pivoting components or as an axel for a rotating element.

[Dowel Pins](http://www.rinomechanical.com/dowel-pin.htm) can be made out of any rigid material including wood, steel and plastic. The most common materials for industrial applications are hardened alloy steel and stainless steel. Wood and plastic is most frequently used for fastening wooden objects such as furniture. Dowel Pins are available in a wide range of diameters and lengths in both imperial (inch) and metric (mm) sizes. Dowel Pins are made to commercial diameter tolerances of approximately plus or minus 0.005 inch (0.13mm) or to precision diameter tolerances which are normally plus or minus 0.0001 inch (0.0025mm).

Dowel pins are an important component when it comes to fastening. They are widely used and serve the purpose well.

**Definition of dowel pins**

A dowel pin is used to secure two objects together. A hole is bored in one or

both of the objects and the dowel is inserted into the hole(s). They are non - threaded fasteners. These fasteners can be quickly assembled and removed from components and do not need extra fastening hardware. [Dowel pins](http://www.rinomechanical.com/dowel-pin.htm) can be straight, tapered, rolled or grooved and provide perfect alignment, holding parts in absolute relation to one another. They also prevent slippage due to high motion.

**Types of dowel pins:**

**Parallel dowel pins** - The most common of dowel pins and sometimes referred to as straight pins, they have a uniform diameter over the full length of the pin. These pins are especially useful application where the torque and high accuracy is important. They keep motion smooth and guard against any displacement of assembled parts.

**Stepped dowel pins** - These are [parallel dowel pins](http://www.rinomechanical.com/dowel-pin.htm) with two different diameters along their length.

**Pull dowel pins** - These are also parallel dowel pins which are supplied with a threaded hole in one end so that a screw can be inserted to help remove the pin from a blind hole.

**Commercial dowel pins** - These are parallel dowel pins that are made to commercial diameter tolerances of approximately plus or minus 0.005 inch (0.13mm).

**Precision dowel pins** - These are parallel dowel pins that are made to precision diameter tolerances which are normally plus or minus 0.0001 inch (0.0025mm). A precision dowel pin is needed for an interference fit.

**Tapered Dowel pins** - Tapered dowel pins are most commonly called Taper Pins and are produced with a diameter that reduces in size from one end to the other end. The large end is referred to as the Head. A taper pin is forcefully inserted into a tapered hole to make an extremely strong fastening between two components. The tapered hole can be made by first drilling a small diameter hole and then using a taper pin reamer to exactly shape the tapered hole. Alternatively, a small diameter hole can be drilled deep into the part followed by a larger drill to two thirds of the depth and finally the largest drill diameter to one third of the depth. The most common taper is 1/4" per foot. If there is access to the pin at the small end, the taper pin can easily be removed with slight force to the pin.

**Roll Pins (Spring Pins)** - These are parallel pins which are produced by forming strips of flat metal into a partial coil. From an end view they look like the letter C. These coiled pins can be made in a wide range of diameters and lengths. The biggest advantage to a coiled pin is in the fact that when they are forced into a hole that is intentionally undersize, the pins compress and then hold position with a great deal of force. Roll Pins can be used as a hinge pin.

**Spiral Pins** - These are similar to roll pins except that they are formed into a complete coil where the outside of the coil overlaps the inside by approximately 1-1/2 to 2 turns. Spiral Pins perform much like the Roll Pins however since they have a protruding edge along their diameter it is not recommended that they be used for hinge pins.

**Grooved Pins** - Sometimes called a groove pin, is a parallel dowel pin which has a portion of the diameter deformed with grooves that run parallel to the diameter. This functionality allows a portion of the pin to be tightly press fit into one component while another component can freely rotate or be easily removed from the end of the pin that has a smooth diameter.

**Spring Post** - a spring post is a parallel dowel pin with a radial groove around the diameter located at one end of the length. One end of the spring post is press fit into a component leaving the radial groove end exposed. The groove is used to attach an expansion spring.

One application which requires [dowel pins](http://www.rinomechanical.com/dowel-pin.htm) uses a grid pattern of holes to locate and mount other accessories. The main advantage in using a dowel pin system is the multiple dowel points provided by the multiple dowel pin locations. Components are typically faster and easier to mount with these systems since the dowel pins provide almost automatic location.

There are various [types of dowel pins](http://www.rinomechanical.com/dowel-pin.htm) available, each with its own set of pros and cons. Applications are limitless. They can be used to attach components of furniture, electronic equipment, appliances, automobiles and building structures. The selection of a dowel pin depends upon the type, size, shape and weight of the material being connected. Length of the pin should be appropriate. Environmental conditions such as temperature and humidity should be considered. Chemicals or other corrosive substances to which the dowel may be exposed should also be kept in mind.

If after all research, you are still confused about the type and measurement of

the dowel pin you need, you can always refer to the dowel pin technical data. There are many websites and catalogs which give a complete inventory on types and sizes of pins. This data combines all types and specifications along with other helpful charts and diagrams. The [dowel pin technical data](http://www.rinomechanical.com/dowel-pin.htm) also judges dowel pins according to the main sizing standards provided by ASTM (American Society for Testing and Materials), SAE (Society of Automotive Engineers) and ISO (International Organization for Standards).

**About the author**

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