

Hinges

History

We do not know when hinges were invented but it is known that simple pivot hinges made from wood or stone were in use for temple doors and other sacred buildings as long ago as 1500BC.

Bronze hinges were certainly in use by the Egyptians and Romans around 500BC and in the Middle Ages, blacksmiths were routinely producing strap hinges and decorative hinges in wrought iron and other metals.

The past century has seen the development of many new variants, all designed to facilitate the opening and closing of doors according to the requirements of specific applications.

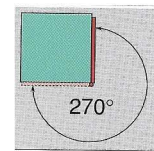
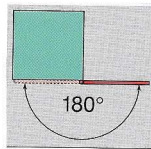
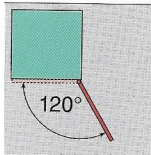
Nowadays there is an extremely wide range of hinges available to the panel builder. They are designed for concealed or visible fixing and there is a choice of various materials and opening angles to suit the installation.



Material

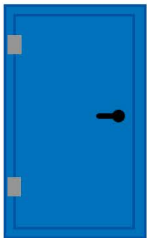
For use on industrial enclosures and panels, hinges are usually manufactured from die-cast zinc alloy, steel or stainless steel. Diecast hinges are readily available in many styles and normally are either chrome plated or black powder coated and are ideal for most applications. However where hinges (and locks) are to be used in harsh environments e.g. exposed locations, marine/offshore, petrochemical and food industries, we strongly advise the use of stainless steel. Many products are readily available in AISI 316 stainless steel and ideal for such applications. Polyamide hinges are also available and offer a low cost alternative to stainless steel in certain applications. The forces impacting on the hinge will determine their size and that's why individual hinge designs are frequently available in a range of sizes and opening angles.

Opening Angles



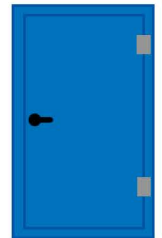
An opening angle of 120° will ensure that the door will not strike and damage that of an adjacent door when opened. A 180° hinge will open the door completely and keep the area in front of the enclosure clear from obstruction - check that there is no risk damaging adjacent panels (for typical hinges see Series 4-185). For free standing enclosures, a 270° hinge can be opened all the way round against the enclosure side.

Handing



left handed door

Although most hinges can be mounted on either side of the enclosure some, particularly lift-off types, are designed for either left or right hand mounting. This is based on the observer's viewpoint i.e. in front of the door to be opened. If the hinges are on the right then they are referred to as right hand hinges; if mounted on the left, then they are left hand hinges.



right handed door

Hinges

Some common types

A **Butt hinges:** can be fixed or lift-off; screw fixed, weld-on or push fit.

B **Concealed hinge:** Normally invisible when door is closed.

Continuous (piano) hinges: Basically a continuous length of butt hinge. See Knowledge Base article "Continuous Hinges" (ref: KB03.1) on our website.

Cut-out hinge: Neat and attractive option for small doors (see example).

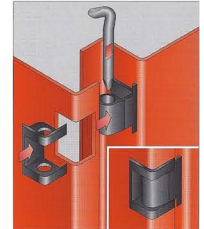
C **Friction hinge:** Controlled opening and closing; also known as detent hinges.

D **Lift-off hinge:** 2-part hinge; allows easy fitting and removal of doors.

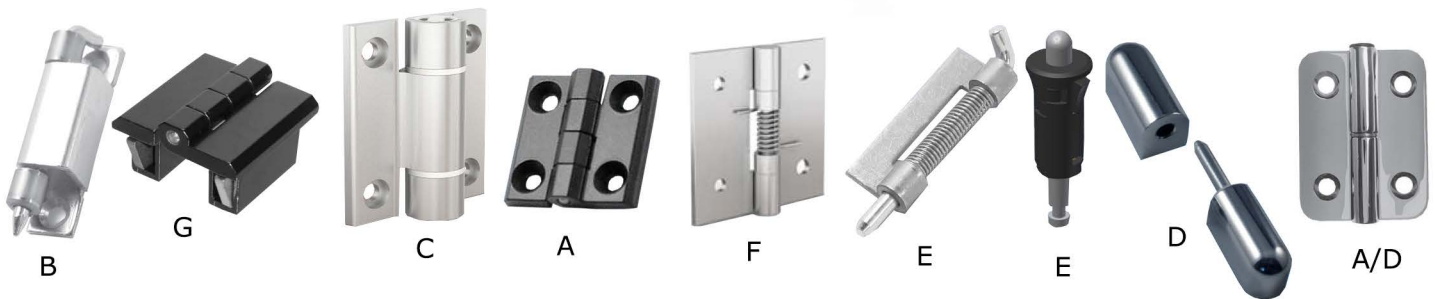
E **Pin hinge:** Incorporates spring loaded pin that locates in holes in frame.

F **Spring hinge:** Self-closing (or opening) hinge.

G **Snap-line hinges*** Robust push-fit hinges; do not require tools or fastenings. Saves up to 90% of assembly time compared to traditional hinges. (see fdb.co.uk/videos for more information or see our Knowledge Base guide KB07.1).



Cut-out hinge example



Load Bearing

Although manufacturers may provide results of load bearing tests it should be noted that these results usually relate to a specific hinge under defined conditions. It is not simply the weight of the door that needs to be considered but also any door-mounted equipment such as meters, relays etc. Also very tall doors may require three or four hinges to avoid possible bowing.

The specifier must be satisfied that the type and size of hinge is fit for purpose. To assist, please refer to the handy hinge calculator tool. This can be found at www.fdb.co.uk.



Also where enclosures are to be installed in exposed locations, it is prudent to fit wind stops to doors to guard against excessive force being placed on hinges and hinge mountings by sudden gusts of wind.

For more information on wind stops please see: part number 221-9001 (steel zinc plated) or part: 221-9101 (stainless steel) on our website.

For more Knowledge Base articles please go to www.fdb.co.uk/knowledge-base.

*D-Snap technology is a registered design of Dirak GmbH