brookfield industries, inc.

Brookfield Industries, Inc.
99 West Hillside Ave.
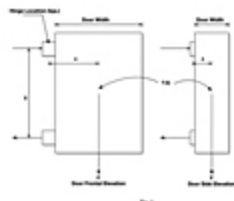Thomaston, CT 06787
Phone: 860-283-6211 • **Fax:** 860-283-6123
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Hinge Engineering Information

0 Items Available

Select the link under Additional Info on the right.

This section should assist the designer in choosing the correct hinge for the application.

How To Determine Applied Loads:

Nomenclature:

F = Thrust load or maximum door weight

P_{1A} = In plane radial load caused by moment arm of the door width

$\sum P_{1B}$ = Sum of any other in plane radial loads (such as those caused by a seismic event)

P_{2A} = Out of plane radial load caused by moment arm of very thick doors

$\sum P_{2B}$ = Sum of any other out of plane radial loads (such as those caused by wind, seismic or blast)

Ptot = Resultant radial load

Formulae:

$$P_{1A} = Fx / y$$

$$P_{2A} = Fz / y$$

$$P_{tot} = \sqrt{(P_{1A} + \sum P_{1B})^2 + (P_{2A} + \sum P_{2B})^2}$$

(general equation for resultant radial load applied to a single hinge)

Application:

A heavy duty industrial door weighs 2,300 lbs, is 22' high, 10' wide and is subjected to a 20 lb/ft2 wind load.

x = 5'

y= 20'

z= 3.063"

Step 1:

Calculate Ptot and choose a hinge with a radial capacity greater than or equal to Ptot.

P_{1A} = (2,300 lbs)(5') / 20' = 575 lbs

P_{2B} = 1,100 lbs

P_{2A} = (2,300 lbs)(3.063" / 12) / 20' = 29 lbs

P_{2b} = 1,100 lbs

 (one hinge's share of the wind load)

$$P_{tot} = \sqrt{(575 + 0)^2 + (29 + 1,100)^2} = 1,270 \ lbs$$

Choose a W100HD since the radial capacity of a W100HD (1,630 lbs) is greater than 1,270 lbs.

Hinge Location (typ.)

Door Width

x

y

F
Door Frontal Elevation

Door Width

z
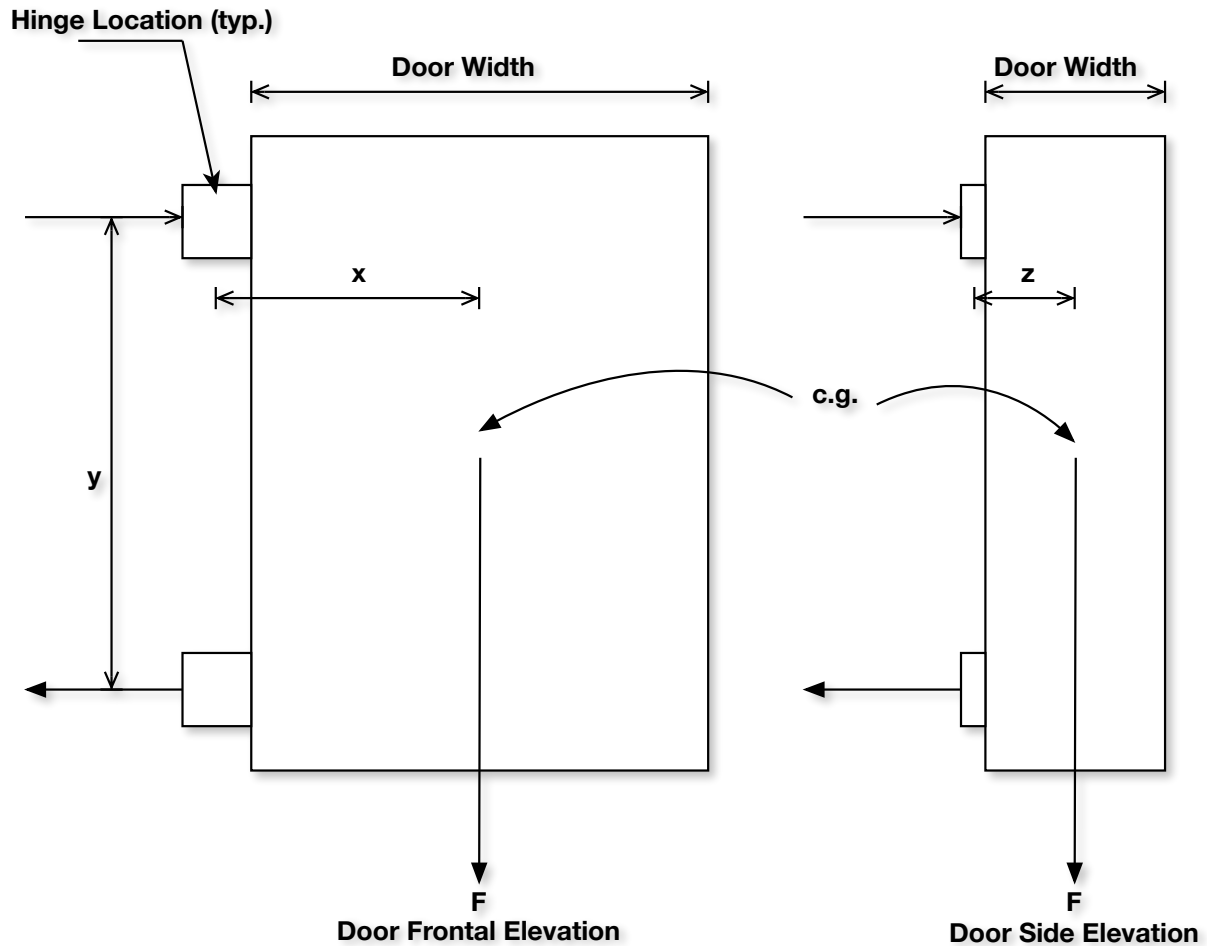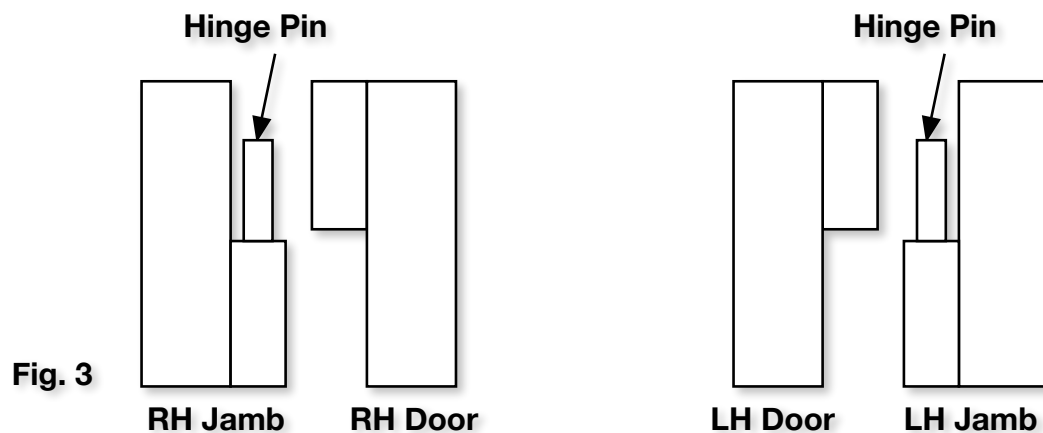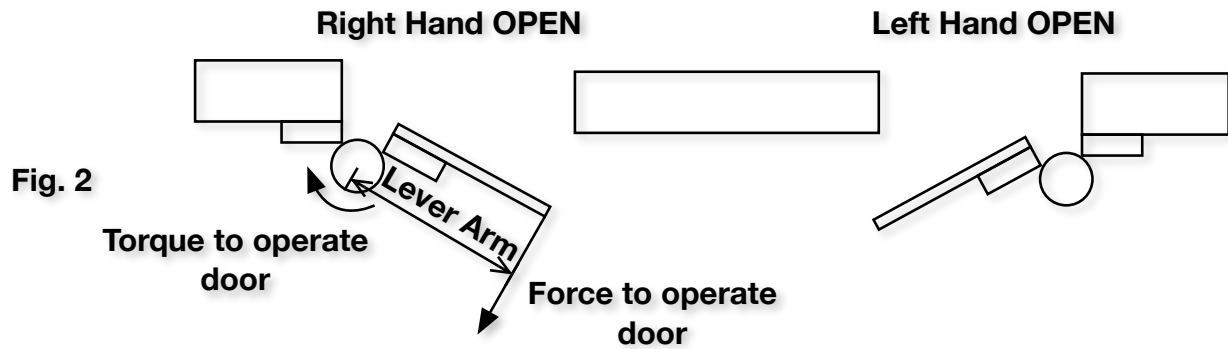
c.g.

F
Door Side Elevation

Fig. 1

Step 2:

Check applied thrust load or door weight and choose a thrust capacity
equal to or greater than the applied load.

Thrust capacity of W100 is 4,000 lbs.

Since 4,000 lbs is greater than 2,300 lbs, (2) W100HD hinges are acceptable for
this application.

How to Determine Hand of Hinge:

Right Hand OPEN

Left Hand OPEN

Fig. 2

Torque to operate door

Lever Arm

Force to operate door

Hinge Pin

Hinge Pin

Fig. 3

RH Jamb   **RH Door**

LH Door   **LH Jamb**

How to Determine Door Operating Force:

Door Operating Force = Torque to Operate Door in (lb-inch) / Lever Arm in (inches)