



COMMERCIAL HINGES



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**PLAIN BEARING
STANDARD WEIGHT**



**2 BALL BEARING
STANDARD WEIGHT**



**4 BALL BEARING
HEAVY WEIGHT**



**SPRING HINGE
STANDARD WEIGHT**



**POWER TRANSFER
STANDARD OR
HEAVY WEIGHT**

Features

**NON-REMOVABLE
PIN (NRP):**

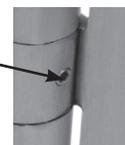
- Included with all 2 and 4 ball bearing, std and heavy weight hinges.
- Groove in pin accepts set screw in center barrel.
- Set screw secured using a 3/32" hex (allen) wrench and is not accessible when door is closed.

TYPE:

- Full Mortise. Hinge leaves are mortised into the door and frame.

SWAGGED:

- Standard.
- Provides 1/16" of clearance between both leaves when the hinge is in the closed position.



Specifications

MATERIALS:

- **STEEL** — Applications: Interior doors, non-corrosive environments.
- **STAINLESS STEEL** — Applications: Exterior, doors, corrosive environments

PACKAGING:

- Qty of Hinges Per Individual Carton:
3ea for Plain, 2 Ball Bearing and 4 Ball Bearing Hinges
3ea for Spring Hinges
1ea for Electrified Hinges
- Qty of Hinges Per Master Carton:
48ea for Plain, 2 Ball Bearing and 4 Ball Bearing Hinges

FASTENERS:

- All hinges packed with Machine Screws (12-24 x 1/2" FHMS) and Wood Screws (12 x 1-1/4" FHWS)

**CERTIFICATIONS,
LISTINGS, COMPLIANCES:**

- Conforms with the requirements of NFPA 80-2013, Section 6.4.3.1.
- Certified to ANSI/BHMA A156.1-2006:
 - Grade 1, 4 Ball Bearing (HB) 2,500,000 cycles
 - Grade 2, 2 Ball Bearing (BB) 1,500,000 cycles
 - Grade 3, Plain Bearing (PL) 350,000 cycles
- UL 10C Listed:
 - SH Series Spring Hinges
 - EL Series Electrified Hinges

WARRANTY:

- Five (5) year limited warranty

FULL MORTISE HINGES	DESCRIPTION	FINISH ANSI (US)	PDQ HINGE MODEL
PLAIN BEARING			
	5 Knuckle Base Material: Steel with Steel Pin Size: 4" x 4" Hinge Weight: Standard Frequency of Use: Low Thickness: .130" 3 .005" ANSI 8133	600 (P)	35 ST PL 4040 600
		652 (26D)	35 ST PL 4040 652
	5 Knuckle Base Material: Steel with Steel Pin Size: 4-1/2" x 4-1/2" Hinge Weight: Standard Frequency of Use: Low Thickness: .130" 3 .005" ANSI 8133	600 (P)	35 ST PL 4545 600
		613 (10B)	35 ST PL 4545 613
		619(US15)	35 ST PL 4545 619
		652 (26D)	35 ST PL 4545 652
2 BALL BEARING			
	5 Knuckle Base Material: Steel with Steel Pin Size: 4-1/2" x 4" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A8112	652 (26D)	35 ST BB 4540 652 NRP
	5 Knuckle Base Material: Steel with Steel Pin Size: 4-1/2" x 4-1/2 " Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A8112	600 (P)	35 ST BB 4545 600 NRP
		605 (3)	35 ST BB 4545 605 NRP
		613 (10B)	35 ST BB 4545 613 NRP
		619(US15)	35 ST BB 4545 619 NRP
	5 Knuckle Base Material: Steel with Steel Pin Size: 4" x 3-1/2" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A5112	652 (26D)	35 ST BB 4545 652 NRP
		630 (32D)	35 SS BB 4035 630 NRP
	5 Knuckle Base Material: Steel with Steel Pin Size: 4" x 4" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A5112	630 (32D)	35 SS BB 4040 630 NRP
	5 Knuckle Base Material: Stainless Steel with Stainless Steel Pin Size: 4-1/2" x 4" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A5112	630 (32D)	35 SS BB 4540 630 NRP
	5 Knuckle Base Material: Stainless Steel with Stainless Steel Pin Size: 4-1/2" x 4-1/2" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI A5112	630 (32D)	35 SS BB 4545 630 NRP
4 BALL BEARING			
	5 Knuckle Base Material: Steel with Steel Pin Size: 4-1/2" x 4-1/2" Hinge Weight: Heavy Frequency of Use: High Thickness: .180" 3 .005" ANSI 8111	600 (P)	35 ST HB 4545 600 NRP
		605 (3)	35 ST HB 4545 605 NRP
		613 (10B)	35 ST HB 4545 613 NRP
		619(US15)	35 ST HB 4545 619 NRP
		652 (26D)	35 ST HB 4545 652 NRP

FULL MORTISE HINGES	DESCRIPTION	FINISH ANSI (US)	PDQ HINGE MODEL
4 BALL BEARING			
	5 Knuckle Base Material: Steel with Steel Pin Size: 5" x 4-1/2" Hinge Weight: Heavy Frequency of Use: High Thickness: .180" 3 .005" ANSI 8111	652 (26D)	35 ST HB 5045 652 NRP
	5 Knuckle Base Material: Stainless Steel with Stainless Steel Pin Size: 4-1/2" x 4-1/2" Hinge Weight: Heavy Frequency of Use: High Thickness: .180" 3 .005" ANSI 5111	630 (32D)	35 SS HB 4545 630 NRP
	5 Knuckle Base Material: Stainless Steel with Stainless Steel Pin Size: 5" x 4-1/2" Hinge Weight: Heavy Frequency of Use: High Thickness: .180" 3 .005" ANSI 5111	630 (32D)	35 SS HB 5045 630 NRP
	5 Knuckle Base Material: Stainless Steel with Stainless Steel Pin Size: 5" x 5" Hinge Weight: Heavy Frequency of Use: High Thickness: .180" 3 .005" ANSI 5111	630 (32D)	35 SS HB 5050 630 NRP

SPRING HINGES	DESCRIPTION	FINISH ANSI (US)	PDQ HINGE MODEL
	3 Knuckle  Base Material: Steel Size: 4-1/2" x 4-1/2" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI K8107-1F	600 (P)	35 ST SH 4545 600
		613 (10B)	35 ST SH 4545 613
		619 (US15)	35 ST SH 4545 619
		652 (26D)	35 ST SH 4545 652
	3 Knuckle  Base Material: Stainless Steel Size: 4-1/2" x 4-1/2" Hinge Weight: Standard Frequency of Use: Medium Thickness: .134" 3 .005" ANSI K5107-1F	630 (32D)	35 SS SH 4545 630

Electrified Hinges

	FEATURES	OPTION DESIGNATOR	DESCRIPTION
 <p>UL Fire Listed for use with electrified mortise or cylindrical locks, exit devices with electric latch retraction, electric strikes, locks or exit devices with monitoring or request to exit switches</p>	<p>Electrical Specifications Concealed electric through-wire: 50 volts AC/DC @ 3.5 amps continuous, 16 amps pulse (maximum pulse width: 400msec., 10 sec minimum off time between pulses) Concealed electric monitor: 30 VDC @ .5 amps</p>	EL 2	Concealed electric through-wire (2 wires, 22GA)
		EL 4	Concealed electric through-wire (4 wires, 28GA)
		EL 10	Concealed electric through-wire (10 wires, 28GA)
		EL 24	Concealed electric through-wire (2 wires @ 22GA, 4 wires @ 28GA)
		ELM 3	Concealed electric monitor (3 wires, 28GA)
		ELM 4	Concealed electric through-wire and monitor (4 through wires and 3 monitor wires, all 28GA)
		ELM 6	Concealed electric through-wire and monitor (6 through wires and 3 monitor wires, all 28GA)
		ELM 8	Concealed electric through-wire and monitor (8 through wires and 3 monitor wires, all 28GA)

How to Order

QUANTITY	SERIES	MATERIAL	STYLE	SIZE	FINISH	SECURITY FEATURE ²	ELECTRIFIED OPTIONS ¹
10	35	ST	BB	4545	630	NRP	—
	35 — Full Mortise	ST — Steel SS — Stainless Steel	PL — Plain Bearing BB — 2 Ball Bearing HB — 4 Ball Bearing SH — Spring Hinge	4035 — 4" X 3-1/2" 4040 — 4" X 4" 4540 — 4-1/2" X 4" 4545 — 4-1/2" X 4-1/2" 5045 — 5" x 4-1/2" 5050 — 5" x 5"	600 — Prime Coated 605 — Bright Brass 613 — Oil Rub Bronze 619 — Satin Nickel 652 — Satin Chrome 630 — Satin Stainless Steel	NRP — Non Removable Pin	EL 2 — Concealed electric through-wire (2 wire, 22 ga) EL 4 — Concealed electric through-wire (4 wire, 28 ga) EL 10 — Concealed electric through-wire (10 wire, 28 ga) EL 24 — Concealed electric through-wire (2 wires @ 22 ga, 4 wires @ 28ga) ELM 3 — Concealed electric monitor (3 wire, 28 ga) ELM 4 — Concealed electric through-wire and monitor (4 through wires and 3 monitor wires, all 28GA) ELM 6 — Concealed electric through-wire and monitor (6 through wires and 3 monitor wires, all 28GA) ELM 8 — Concealed electric through-wire and monitor (8 through wires and 3 monitor wires, all 28GA) ³

Ordering example: Plain bearing hinge: 35 ST PL 4545 600
4 Wire Std Weight Hinge: EL 4 35 SS BB 4545 630 NRP

Notes:

- 1- EL Series only available in 2 and 4 ball bearing. Includes NRP.
- 2 - NRP only available in 2 and 4 ball bearing.
- 3 - Not available in 4 ball bearing heavy weight hinges.

Accessories

PART	DESCRIPTION
 85004	MORTAR GUARD FOR ELECTRIFIED HINGES

Quick Reference Guide

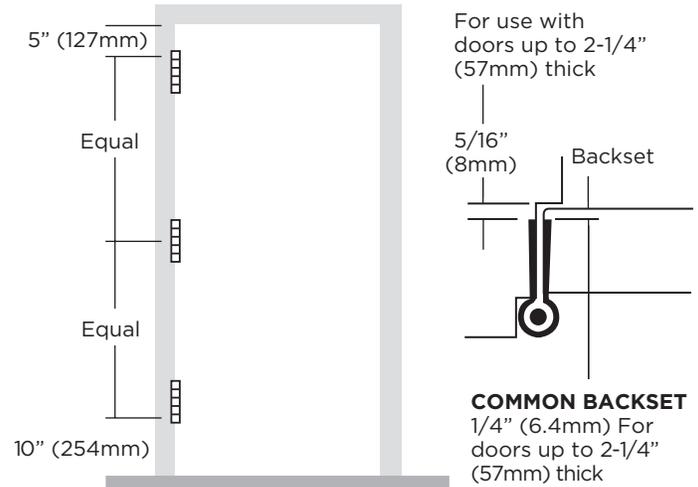
PDQ HINGE MODEL*	FINISH ANSI (US)	ANSI NUMBER*	STYLE	BASE MATERIAL	SIZE	FREQUENCY	WEIGHT	THICKNESS	SWAGING
FULL MORTISE HINGES									
35 ST PL 4040 600	600 (P)	A8133	PLAIN	STEEL	4" x 4"	LOW		.130"3.005"	2 LEAVES
35 ST PL 4040 626	652 (26D)								
35 ST PL 4545 600	600 (P)								
35 ST PL 4545 613	613 (10B)								
35 ST PL 4545 626	652 (26D)								
35 ST BB 4545 600 NRP	600 (P)	A8112 w/NRP	2 BALL BEARING	STEEL	4-1/2" x 4-1/2"	MEDIUM	STANDARD		
35 ST BB 4545 605 NRP	605 (3)								
35 ST BB 4545 613 NRP	613 (10B)								
35 ST BB 4545 626 NRP	652 (26D)								
35 ST BB 4540 626 NRP									
35 SS BB 4035 630 NRP	630 (32D)	A5112 w/NRP		STAINLESS STEEL	4" x 3-1/2"	HIGH	HEAVY		
35 SS BB 4040 630 NRP									
35 SS BB 4540 630 NRP									
35 SS BB 4545 630 NRP									
35 ST HB 4545 600 NRP	600 (P)	A8111 w/NRP	4 BALL BEARING	STEEL	4-1/2" x 4-1/2"	HIGH	HEAVY	.180" 3.005"	
35 ST HB 4545 605 NRP	605 (3)								
35 ST HB 4545 613 NRP	613 (10B)								
35 ST HB 4545 626 NRP	652 (26D)								
36 ST HB 5045 626 NRP									
35 SS HB 4545 630 NRP	630 (32D)	A5111 w/NRP		STAINLESS STEEL	4-1/2" x 4-1/2"	HIGH	HEAVY		
35 SS HB 5045 630 NRP									
35 SS HB 5050 630 NRP									
SPRING HINGES									
35 ST SH 4545 613	613 (10B)	K8107-1F		STEEL	4-1/2" x 4-1/2"	MEDIUM	STANDARD	.134+-0.005	2 LEAVES
35 ST SH 4545 613	613 (10B)								
35 ST SH 4545 626	652 (26D)								
35 SS SH 4545 630	630(32D)	K5107-1F		STAINLESS STEEL					
ELECTRIFIED HINGES									
See Full Mortise Hinge Table above, 2 and 4 Ball Bearing Series.									

Recommended Number of Hinges

On doors up to 5' (1.52m) use two hinges and an additional hinge for each additional 2.5' (.76m) or fraction thereof.

See table below:

DOOR HEIGHT (UP TO)		RECOMMENDED # OF HINGES
FT	M	
5	1.52	2
7-1/2	2.29	3
10	3.05	4
12-1/2	3.81	5
15	4.57	6



Hinge Locations on Door

- Top hinge 5" (127mm) from frame rabbet to top of hinge barrel.
- Bottom hinge 10" (254mm) from bottom edge of hinge barrel to finished floor.
- Center third hinge between top and bottom hinges.

NOTE: This information is for reference only. Actual placement may vary according to code requirements and guidelines provided by the door manufacturer..

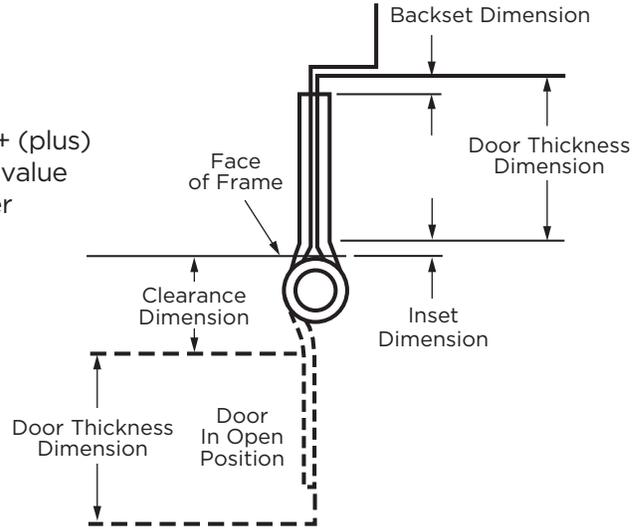
Hinge Width

DOOR THICKNESS		CLEARANCE REQUIRED		WIDTH OF HINGE IN OPEN POSITION	
INCHES	MM	INCHES	MM	INCHES	MM
1-3/8"	34.9	1-1/4"	31.8	3-1/2"	88.9
		1-3/4"	44.5	4"	101.6
1-3/4"	44.5	1"	25.4	4"	101.6
		1-1/2"	38.1	4-1/2"	104.3
		2"	50.8	5"	127
		3"	76.2	6"	152.4
2"	50.8	1"	25.4	4-1/2"	114.3
		1-1/2"	38.1	5"	127
		2-1/2"	63.5	6"	152.4
2-1/4"	57.15	1"	25.4	5"	127
		2"	50.8	6"	152.4
2-1/2"	63.5	3/4"	19	5"	127
		1-3/4"	44	6"	152.4
3"	76.2	3/4"	19	6"	152.4
		2-3/4"	69.9	8"	203.2
		4-3/4"	120.7	10"	254

Hinge Width Formula

Calculation to determine hinge width requirements for extra clearance

Take thickness of door - (subtract) backset x (multiply) 2 + (plus) inset (if applicable) = (equals) hinge width. If the resulting value does not match a standard hinge width, use the next larger hinge (width).



Typical Door Weights

DOOR MATERIAL	DOOR THICKNESS					
	INCHES	MM	INCHES	MM	INCHES	MM
	1-3/8"	34.9	1-3/4"	44.5	2"	50.8
	lbs/ft ²	kg/m ²	lbs/ft ²	kg/m ²	lbs/ft ²	kg/m ²
Ash	4	19.5	5	24.4	6	29.3
Birch	4.25	20.8	5.5	26.9	6.25	30.5
Fir	3	14.6	3.5	17.1	4	19.5
Mahogany	3.5	17.1	4.5	22	5.25	25.6
Oak	5	24.4	7	34.2	8	39.1
White Pine	3	14.6	3.5	17.1	4	19.5
Hollow Core	2	9.8	2.5	12.2	—	—
Particle Core	4	19.5	5	24.4	—	—
Solid Core	3.5	17.1	4.5	22	5.25	25.6
Kalamein	—	—	5	24.4	—	—
Mineral Core	3.5	17.1	4	19.5	—	—
Lead Lined Wood w/ 1/16" thick lead	—	—	8.7	42.5	—	—
Lead Lined Wood w/ 1/8" thick lead	—	—	12.4	60.5	—	—
Lead Lined Wood w/ 3/16" thick lead	—	—	16.1	78.6	—	—
Lead Lined Wood w/ 1/4" thick lead	—	—	19.8	96.7	—	—
Lead Lined Wood w/ 3/8" thick lead	—	—	27.2	132.8	—	—
Lead Lined Wood w/ 1/2" thick lead	—	—	34.6	168.9	—	—
Hollow Metal 18 gauge	4.3	21	4.6	22.5	—	—
Hollow Metal 16 gauge	5.4	26.4	5.8	28.3	—	—
Hollow Metal 15 gauge	6.2	30.3	6.5	31.7	—	—
Hollow Metal 14 gauge	7	34.2	7.3	35.6	—	—
Hollow Metal 13 gauge	8.3	40.5	8.7	42.5	—	—
Hollow Metal 12 gauge	9.9	48.3	10.2	49.8	—	—
Hollow Metal 11 gauge	11.2	54.7	11.6	56.6	—	—
Hollow Metal 10 gauge	12.8	62.5	13	63.5	—	—

The above chart indicates approximate weights for common door types. These estimations do not include the additional weight of any door hardware.

Hinge Selection for Labeled Fire Doors

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6.4.3* Builders Hardware.

6.4.3.1 Hinges. Hinges shall be as specified in individual door manufacturer's published listings or Table 6.4.3.1.

6.4.3.1.1 Doors up to 60 in. (1.52 m) in height shall be provided with two hinges and an additional hinge for each additional 30 in. (0.76 m) of door height or fraction thereof.

Table 6.4.3.1 Builders Hardware Mortise, Surface, and Full Length Hinges, Pivots, or Spring Hinges for Swinging Doors

DOOR RATING (HR)	MAXIMUM DOOR SIZE WIDTH	MAXIMUM DOOR SIZE HEIGHT	MINIMUM HINGE SIZE WIDTH	MINIMUM HINGE SIZE THICKNESS	HINGE TYPE
FOR 1-3/4 IN. (44.5-MM) OR THICKER DOORS					
3 or Less	4 ft. (1.22m)	10 ft. (3.05m)	4.5 in. (114.3mm)	0.180 in. (4.57mm)	Steel, mortise or surface
3 or Less	4 ft. (1.22m)	8 ft. (2.44m)	4.5 in. (114.3mm)	0.134 in. (3.40mm)	Steel, mortise or surface
1-1/2 or Less	3-1/6 ft. (0.96m)	8 ft. (2.44m)	6 in. (152.4mm)	0.225 in. (5.72mm)	Steel, olive knuckle or paumelle
3 or Less	4 ft. (1.22m)	10 ft. (3.05m)	4 in. (101.6mm)	0.225 in. (5.72mm)	Steel pivots (including top, bottom, and intermediate)
1-1/2 or Less	3 ft. (0.91m)	5 ft. (1.52m)	4 in. (101.6mm)	0.130 in. (3.30mm)	Steel, mortise or surface
1-1/2 or Less	2 ft. (0.61m)	3 ft. (0.91m)	3 in. (76.2mm)	0.092 in. (2.34mm)	Steel, mortise or surface
3 or Less	3 ft. (0.91m)	7 ft. (2.13m)	4.5 in. (114.3mm)	0.134 in. (3.40mm)	Steel mortise or surface (labeled, self closing, spring type)
3 or Less	3 ft. (0.91m)	7 ft. (2.13m)	4 in. (101.6mm)	0.106 in. (2.67mm)	Steel mortise or surface (labeled, self closing, spring type)
FOR 1-3/8 IN. (34.93-MM) OR THICKER DOORS					
3 or Less	3 ft. (0.91m)	7 ft. (2.13m)	3.5 in. (88.9mm)	0.123 in. (3.12mm)	Steel, mortise or surface
3 or Less	2-2/3 ft. (0.81m)	7 ft. (2.13m)	3.5 in. (88.9mm)	0.105 in. (2.67mm)	Steel mortise or surface (labeled, self closing, spring type)

6.4.3.1.1.1 The distance between hinges shall be permitted to exceed 30 in (0.76 m).

6.4.3.1.1.2 Where spring hinges are used, at least two shall be provided.

6.4.3.1.2 All hinges or pivots, except spring hinges, shall be of the ball bearing type.

6.4.3.1.2.1 Hinges or pivots employing other anti-friction bearing surfaces shall be permitted if they meet the requirements of ANSI/BHMA A156.1, Standard for Butts and Hinges.

6.4.3.1.2.2 Spring hinges shall be labeled and shall meet the requirements of ANSI/BHMA A156.17, Standard for Self Closing Hinges & Pivots, Grade 1.

6.4.3.1.3 Hinges 4 1/2 in. (114 mm) high and 0.180 in. (4.57 mm) thick shall be permitted for use on wide and heavy doors or doors that are subjected to heavy use or unusual stress.

Hinge Selection for Labeled Fire Doors (Cont.)

6.4.3.1.4 Fire doors with hinges of lighter weight that are not of the ball bearing type shall be permitted under the following conditions:

1. They are part of a listed assembly.
2. They meet the test requirements of ANSI/BHMA A156.1, Standard for Butts and Hinges.
3. They have been tested to a minimum of 350,000 cycles.

6.4.3.1.5 Pivot sets made up of components that are smaller or of a lighter gauge than shown in Table 6.4.3.1 shall be permitted to be used, provided they meet the requirements of ANSI/BHMA A156.4, Standard for Door Controls (Closers), and are in accordance with the manufacturer's label service procedures.

6.4.3.2 Attaching Hinges to Doors.

6.4.3.2.1 Hinges shall be secured in accordance with the listing and the manufacturer's installation instructions.

6.4.3.2.2 Mortise hinges shall be secured to reinforcements in the doors with steel machine screws.

6.4.3.2.3 Mortise hinges shall be secured to wood and plastic-covered composite doors or wood core doors with No. 12 x 1 1/4 in. (31.75 mm) flat, threaded-to-the-head, steel wood screws. Pilot holes shall be drilled that are 5/32 in. (4 mm) in diameter.

6.4.3.2.4 Surface hinges shall be attached with steel through-bolts.

6.4.3.3 Attaching Hinges to Frames. Hinges shall be secured to frames with steel screws.

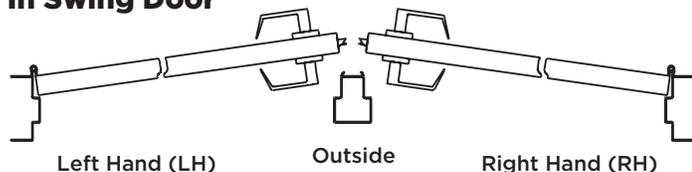
6.4.3.3.1 Types of screws shall be permitted to vary depending on material use for the manufacture of labeled door frames.

6.4.3.3.2 The manufacturer's instructions and published listings for labeled door frames shall be referenced for specific screw requirements.

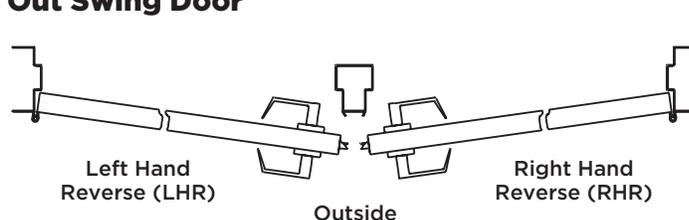
6.4.3.3.4 Shimming. When required to meet the clearances stated in 6.3.1.7, the shimming of hinges using steel shims shall be permitted.

Handing

In Swing Door



Out Swing Door



Finishes

Architectural



605 (US3)
Bright Brass



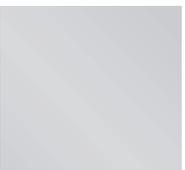
613 (US10B)
Oil Rubbed
Bronze



619 (US15)
Satin Nickel

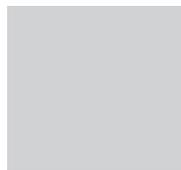


629 (US32)
Bright
Stainless Steel



630 (US32D)
Satin
Stainless Steel

Painted



600 (P)
Prime Coated



652 (US26D)
Satin Chromium



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