



# 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):**

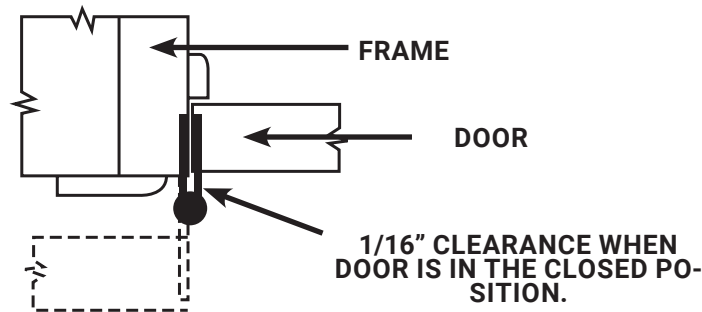
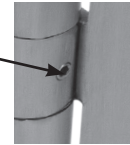
- Included with all 2 and 4 ball bearing, std and heavy weight hinges.
- Groove in pin accepts set screw in center barrel.
- Set screw secured using a 3/32" hex (allen) wrench and is not accessible when door is closed.

**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



|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MATERIALS:</b>                                     | <ul style="list-style-type: none"> <li>• <b>STEEL</b> — Applications: Interior doors, non-corrosive environments.</li> <li>• <b>STAINLESS STEEL</b> — Applications: Exterior, doors, corrosive environments</li> </ul>                                                                                                                                                                                                                                                     |
| <b>PACKAGING:</b>                                     | <ul style="list-style-type: none"> <li>• Qty Of Hinges Per Individual Carton:<br/>3 ea For Plain, 2 Ball Bearing and 4 Ball Bearing Hinges<br/>3 ea For Spring Hinges<br/>1 ea for Electrified Hinges</li> <li>• Qty Of Hinges Per Master Carton:<br/>48 ea For Plain, 2 Ball Bearing and 24 Ball Bearing Hinges</li> </ul>                                                                                                                                                |
| <b>FASTENERS:</b>                                     | <ul style="list-style-type: none"> <li>• All hinges packed with Machine Screws (12-24 x 1/2" FHMS) and Wood Screws (12 x 1-1/4" FHWS)</li> </ul>                                                                                                                                                                                                                                                                                                                           |
| <b>CERTIFICATIONS,<br/>LISTINGS,<br/>COMPLIANCES:</b> | <ul style="list-style-type: none"> <li>• Conforms with the requirements of NFPA 80-2010, Section 6.4.3.1.</li> <li>• Certified to ANSI/BHMA A156.1-2013: <ul style="list-style-type: none"> <li>— Grade 3, Plain Bearing (PL) 350,000 cycles</li> <li>— Electrified hinges tested to over 100,000 cycles</li> </ul> </li> <li>• UL listed: <ul style="list-style-type: none"> <li>— SH Series Spring Hinges</li> <li>— EL Series Electrified Hinges</li> </ul> </li> </ul> |
| <b>WARRANTY:</b>                                      | <ul style="list-style-type: none"> <li>• Five (5) year limited warranty</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         |

## Plain Bearing

| FULL MORTISE HINGES                                                               | DESCRIPTION                                                                                                                                                         | QTY OF HINGES PER CARTON | FINISH ANSI (US) | PDQ HINGE MODEL   |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|-------------------|
|  | 5 Knuckle<br>Base Material: Steel<br>Size: 4" x 4"<br>Hinge Weight: Standard<br>Frequency of Use: Low<br>Thickness: .130" ± .005"<br>Certified to ANSI 8133         | 3ea                      | 600 (P)          | 35 ST PL 4040 600 |
|                                                                                   |                                                                                                                                                                     |                          | 652 (US26D)      | 35 ST PL 4040 652 |
|  | 5 Knuckle<br>Base Material: Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Low<br>Thickness: .130" ± .005"<br>Certified to ANSI 8133 | 3ea                      | 600 (P)          | 35 ST PL 4545 600 |
|                                                                                   |                                                                                                                                                                     |                          | 613E             | 35 ST PL 4545 613 |
|                                                                                   |                                                                                                                                                                     |                          | 619(US15)        | 35 ST PL 4545 619 |
|                                                                                   |                                                                                                                                                                     |                          | 622 (US19)       | 35 ST PL 4545 622 |
|                                                                                   |                                                                                                                                                                     |                          | 652 (US26D)      | 35 ST PL 4545 626 |

## 2 Ball Bearing

| FULL MORTISE HINGES                                                                 | DESCRIPTION                                                                                                                                                                       | QTY OF HINGES PER CARTON | FINISH ANSI (US) | PDQ HINGE MODEL       |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|-----------------------|
|    | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 4" x 3-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .118" ± .005"<br>Certified to ANSI A5112     | 3ea                      | 630 (US32D)      | 35 SS BB 4035 630 NRP |
|  | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 4" x 4"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .118" ± .005"<br>Certified to ANSI A5112         | 3ea                      | 630 (US32D)      | 35 SS BB 4040 630 NRP |
|  | 5 Knuckle<br>Base Material: Steel<br>Size: 4-1/2" x 4"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Certified to ANSI A8112               | 3ea                      | 652 (US26D)      | 35 ST BB 4540 626 NRP |
|  | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 4-1/2" x 4"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Certified to ANSI A5112     | 3ea                      | 630 (US32D)      | 35 SS BB 4540 630 NRP |
|  | 5 Knuckle<br>Base Material: Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Certified to ANSI A8112           | 3ea                      | 600 (P)          | 35 ST BB 4545 600 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 605 (US3)        | 35 ST BB 4545 605 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 613E             | 35 ST BB 4545 613 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 619 (US15)       | 35 ST BB 4545 619 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 622 (US19)       | 35 ST BB 4545 622 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 652 (US26D)      | 35 ST BB 4545 652 NRP |
|  | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Certified to ANSI A5112 | 3ea                      | 622 (US19)       | 35 SS BB 4545 622 NRP |
|                                                                                     |                                                                                                                                                                                   |                          | 630 (US32D)      | 35 SS BB 4545 630 NRP |

## 4 Ball Bearing

| FULL MORTISE HINGES                                                                 | DESCRIPTION                                                                                                                                                                     | QTY OF HINGES PER CARTON | FINISH ANSI (US) | PDQ HINGE MODEL       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|-----------------------|
|    | 5 Knuckle<br>Base Material: Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Heavy<br>Frequency of Use: High<br>Thickness: .180" ± .005"<br>Certified to ANSI 8111               | 3ea                      | 600 (P)          | 35 ST HB 4545 600 NRP |
|                                                                                     |                                                                                                                                                                                 |                          | 605 (US3)        | 35 ST HB 4545 605 NRP |
|                                                                                     |                                                                                                                                                                                 |                          | 613E             | 35 ST HB 4545 613 NRP |
|                                                                                     |                                                                                                                                                                                 |                          | 619 (US15)       | 35 ST HB 4545 619 NRP |
|                                                                                     |                                                                                                                                                                                 |                          | 622 (US19)       | 35 ST HB 4545 622 NRP |
|                                                                                     |                                                                                                                                                                                 |                          | 652 (US26D)      | 35 ST HB 4545 626 NRP |
|    | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Heavy<br>Frequency of Use: High<br>Thickness: .180" ± .005"<br>Designed to meet ANSI 5111 | 3ea                      | 630 (32D)        | 35 SS HB 4545 630 NRP |
|    | 5 Knuckle<br>Base Material: Steel<br>Size: 5" x 4-1/2"<br>Hinge Weight: Heavy<br>Frequency of Use: High<br>Thickness: .180" ± .005"<br>Designed to meet ANSI 8111               | 3ea                      | 652 (US26D)      | 35 ST HB 5045 626 NRP |
|   | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 5" x 4-1/2"<br>Hinge Weight: Heavy<br>Frequency of Use: High<br>Thickness: .180" ± .005"<br>Designed to meet ANSI 5111     | 3ea                      | 630 (32D)        | 35 SS HB 5045 630 NRP |
|  | 5 Knuckle<br>Base Material: Stainless Steel<br>Size: 5" x 5"<br>Hinge Weight: Heavy<br>Frequency of Use: High<br>Thickness: .180" ± .005"<br>Designed to meet ANSI 5111         | 3ea                      | 630 (32D)        | 35 SS HB 5050 630 NRP |

## Spring Hinges

| SPRING HINGES                                                                                                                                                              | DESCRIPTION                                                                                                                                                                              | QTY OF HINGES PER CARTON | FINISH ANSI (US) | PDQ HINGE MODEL   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|-------------------|
| <br> | 3 Knuckle<br>Base Material: Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Designed to meet ANSI K8107-1F           | 3ea                      | 600 (P)          | 35 ST SH 4545 600 |
|                                                                                                                                                                            |                                                                                                                                                                                          |                          | 613E             | 35 ST SH 4545 613 |
|                                                                                                                                                                            |                                                                                                                                                                                          |                          | 619 (US15)       | 35 ST SH 4545 619 |
|                                                                                                                                                                            |                                                                                                                                                                                          |                          | 622 (US19)       | 35 ST SH 4545 622 |
|                                                                                                                                                                            |                                                                                                                                                                                          |                          | 652 (US26D)      | 35 ST SH 4545 626 |
|                                                                                                                                                                            |                                                                                                                                                                                          |                          | 605 (US3)        | 35 ST SH 4545 605 |
| <br> | 3 Knuckle<br>Base Material: Stainless Steel<br>Size: 4-1/2" x 4-1/2"<br>Hinge Weight: Standard<br>Frequency of Use: Medium<br>Thickness: .134" ± .005"<br>Designed to meet ANSI K5107-1F | 3ea                      | 630 (32D)        | 35 SS SH 4545 630 |

## Prepackaged Hinge Sets — Everything you could need, in one convenient package.

|                                                                                   | DESCRIPTION                                 | FINISH | PDQ PART NUMBER    |
|-----------------------------------------------------------------------------------|---------------------------------------------|--------|--------------------|
|  | 2-Spring Hinge 4545<br>1-Ball Bearing Hinge | 626    | 35 ST SHP 4545 626 |

## Electrified Hinges

|                                                                                   | FEATURES                                                                          | QTY OF HINGES PER CARTON | CODE        | DESCRIPTION                                                                           |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------|-------------|---------------------------------------------------------------------------------------|
|  |  | 1ea                      | EL 4        | Concealed electric through-wire (2 wires @ 20ga, 2 wires @ 26ga)                      |
|                                                                                   |                                                                                   |                          | EL 8        | Concealed electric through-wire (8 wires, 28ga)                                       |
|                                                                                   |                                                                                   |                          | EL 4 - ISMC | Concealed electric through-wire (2 wires @ 20ga, 2 wires @ 26ga) with molex connector |
|                                                                                   |                                                                                   |                          | EL 8 - ISMC | Concealed electric through-wire (8 wires, 28ga) with molex connector                  |

## How to Order

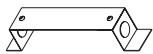
| QUANTITY | SERIES            | MATERIAL                           | STYLE                                                                                 | SIZE                                                                                                                         | FINISH                                                                                                                                                                               | SECURITY FEATURE <sup>2</sup> | ELECTRIFIED OPTIONS <sup>1</sup>                                                                                                                                                                                                                                              |
|----------|-------------------|------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10       | 35                | ST                                 | BB                                                                                    | 4545                                                                                                                         | 630                                                                                                                                                                                  | NRP                           | —                                                                                                                                                                                                                                                                             |
|          | 35 — Full Mortise | ST — Steel<br>SS — Stainless Steel | PL — Plain Bearing<br>BB — 2 Ball Bearing<br>HB — 4 Ball Bearing<br>SH — Spring Hinge | 4035 — 4" X 3-1/2"<br>4040 — 4" X 4"<br>4540 — 4-1/2" X 4"<br>4545 — 4-1/2" X 4-1/2"<br>5045 — 5" x 4-1/2"<br>5050 — 5" x 5" | 600 — Prime Coated<br>605 — Bright Brass<br>613E — Dark Oxidized Satin Bronze (Equivalent)<br>619 — Satin Nickel<br>622 — Black<br>626 — Satin Chrome<br>630 — Satin Stainless Steel | NRP — Non Removable Pin       | EL 4 — Concealed electric through-wire (2 wires @ 20ga, 2 wires @ 26ga)<br>EL 8 — Concealed electric through-wire (8 wires, 28ga)<br>EL 4 - ISMC — Concealed electric through wire with molex connector<br>EL 8 - ISMC — Concealed electric through wire with molex connector |

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.

## Accessories

| PART                                                                                      | DESCRIPTION                         |
|-------------------------------------------------------------------------------------------|-------------------------------------|
|  85004 | MORTAR GUARD FOR ELECTRIFIED HINGES |

## Quick Reference Guide

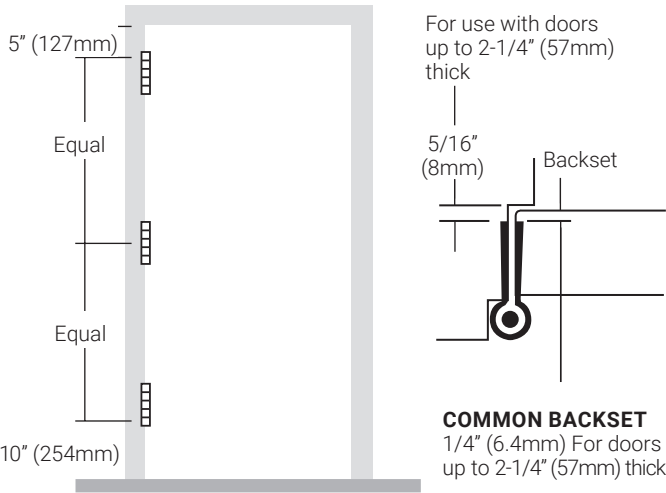
| PDQ HINGE MODEL *                                                | FINISH<br>ANSI (US) | ANSI<br>NUMBER* | STYLE          | BASE MATERIAL   | SIZE            | FREQUENCY | WEIGHT   | THICKNESS    | SWAGING  |
|------------------------------------------------------------------|---------------------|-----------------|----------------|-----------------|-----------------|-----------|----------|--------------|----------|
| FULL MORTISE HINGES                                              |                     |                 |                |                 |                 |           |          |              |          |
| 35 ST PL 4040 600                                                | 600 (P)             | A8133           | PLAIN          | STEEL           | 4" x 4"         | LOW       |          | .130"±.005"  | 2 LEAVES |
| 35 ST PL 4040 652                                                | 652 (26D)           |                 |                |                 |                 |           |          |              |          |
| 35 ST PL 4545 600                                                | 600 (P)             |                 |                |                 |                 |           |          |              |          |
| 35 ST PL 4545 613                                                | 613E                |                 |                |                 |                 |           |          |              |          |
| 35 ST PL 4545 652                                                | 652 (26D)           |                 |                |                 |                 |           |          |              |          |
| 35 ST PL 4545 622                                                | 622 (US19)          |                 |                |                 |                 |           |          |              |          |
| 35 ST BB 4545 600 NRP                                            | 600 (P)             | A8112 w/NRP     | 2 BALL BEARING | STEEL           | 4-1/2" x 4-1/2" | STANDARD  |          |              |          |
| 35 ST BB 4545 605 NRP                                            | 605 (3)             |                 |                |                 |                 |           |          |              |          |
| 35 ST BB 4545 613 NRP                                            | 613E                |                 |                |                 |                 |           |          |              |          |
| 35 ST BB 4545 622 NRP                                            | 622 (US19)          |                 |                |                 |                 |           |          |              |          |
| 35 ST BB 4545 652 NRP                                            | 652 (26D)           |                 |                |                 |                 |           |          |              |          |
| 35 ST BB 4540 652 NRP                                            |                     |                 |                |                 |                 |           |          |              |          |
| 35 SS BB 4035 630 NRP                                            | 630 (32D)           | A5112 w/NRP     |                | STAINLESS STEEL | 4" x 3-1/2"     | MEDIUM    |          |              |          |
| 35 SS BB 4040 630 NRP                                            |                     |                 |                |                 | 4" x 4"         |           |          |              |          |
| 35 SS BB 4540 630 NRP                                            |                     |                 |                |                 | 4-1/2 x 4"      |           |          |              |          |
| 35 SS BB 4545 630 NRP                                            |                     |                 |                |                 |                 |           |          |              |          |
| 35 SS BB 4545 622 NRP                                            | 622 (US19)          |                 |                |                 |                 |           |          |              |          |
| 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" ±.005" |          |
| 35 ST HB 4545 605 NRP                                            | 605 (3)             |                 |                |                 |                 |           |          |              |          |
| 35 ST HB 4545 613 NRP                                            | 613E                |                 |                |                 |                 |           |          |              |          |
| 35 ST HB 4545 622 NRP                                            | 622 (US19)          |                 |                |                 |                 |           |          |              |          |
| 35 ST HB 4545 652 NRP                                            | 652 (26D)           |                 |                |                 |                 |           |          |              |          |
| 35 ST HB 5045 652 NRP                                            |                     |                 |                |                 | 5" x 4-1/2"     |           |          |              |          |
| 35 SS HB 4545 630 NRP                                            | 630 (32D)           | A5111 w/NRP     |                | STAINLESS STEEL | 4-1/2" x 4-1/2" |           |          |              |          |
| 35 SS HB 5045 630 NRP                                            |                     |                 |                |                 | 5" x 4-1/2"     |           |          |              |          |
| SPRING HINGES                                                    |                     |                 |                |                 |                 |           |          |              |          |
| 35 ST SH 4545 613                                                | 613E                | K8107-1F        |                | STEEL           | 4-1/2" x 4-1/2" | MEDIUM    | STANDARD | .134+-.005   | 2 LEAVES |
| 35 ST SH 4545 613                                                | 613E                |                 |                |                 |                 |           |          |              |          |
| 35 ST SH 4545 652                                                | 652 (26D)           |                 |                |                 |                 |           |          |              |          |
| 35 ST SH 4545 622                                                | 622 (US19)          |                 |                |                 |                 |           |          |              |          |
| 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<br># 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..

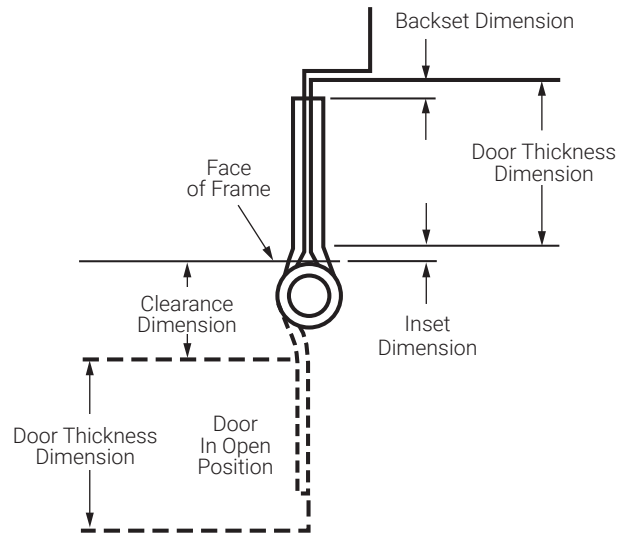
## Hinge Width

| DOOR THICKNESS |       | CLEARANCE REQUIRED       |                              | WIDTH OF HINGE IN OPEN POSITION |                                |
|----------------|-------|--------------------------|------------------------------|---------------------------------|--------------------------------|
| INCHES         | MM    | INCHES                   | MM                           | INCHES                          | MM                             |
| 1-3/8"         | 34.9  | 1-1/4"<br>1-3/4"         | 31.8<br>44.5                 | 3-1/2"<br>4"                    | 88.9<br>101.6                  |
| 1-3/4"         | 44.5  | 1"<br>1-1/2"<br>2"<br>3" | 25.4<br>38.1<br>50.8<br>76.2 | 4"<br>4-1/2"<br>5"<br>6"        | 101.6<br>104.3<br>127<br>152.4 |
| 2"             | 50.8  | 1"<br>1-1/2"<br>2-1/2"   | 25.4<br>38.1<br>63.5         | 4-1/2"<br>5"<br>6"              | 114.3<br>127<br>152.4          |
| 2-1/4"         | 57.15 | 1"<br>2"                 | 25.4<br>50.8                 | 5"<br>6"                        | 127<br>152.4                   |
| 2-1/2"         | 63.5  | 3/4"<br>1-3/4"           | 19<br>44                     | 5"<br>6"                        | 127<br>152.4                   |
| 3"             | 76.2  | 3/4"<br>2-3/4"<br>4-3/4" | 19<br>69.9<br>120.7          | 6"<br>8"<br>10"                 | 152.4<br>203.2<br>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 <sup>2</sup> | kg/m <sup>2</sup> | lbs/ft <sup>2</sup> | kg/m <sup>2</sup> | lbs/ft <sup>2</sup> | kg/m <sup>2</sup> |
| 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.

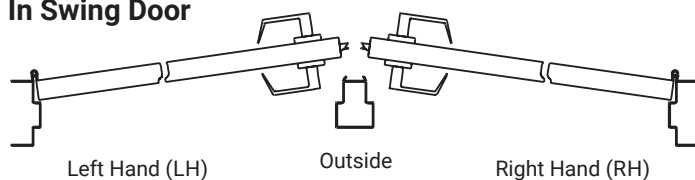
6.4.3.3.1 Types of screws shall be permitted to vary depending on material use for the manufacture of labeled door frames.

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

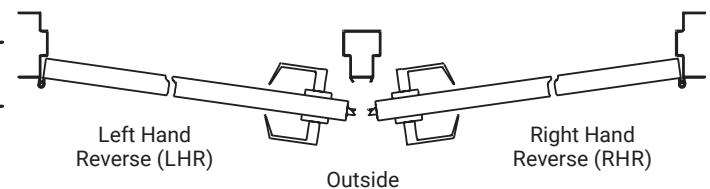
6.4.3.3.4 Shimming. When required to meet the clearances stated in 6.3.1.7, the shimming of hinges using steel shims shall be permitted.

## Handing

### In Swing Door



### Out Swing Door



## Finishes

### Architectural



605 (US3)  
Bright Brass



613E Dark  
Oxidized  
Satin Bronze  
(Equivalent)



619 (US15)  
Satin Nickel

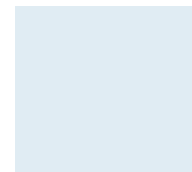


626 (US26D)  
Satin Chromium



630 (US32D)  
Satin  
Stainless Steel

### Painted



600 (P)  
Prime Coated



652 (US26D) Satin  
Chromium

## Cross Reference

| HINGE DESCRIPTION                                 | PDQ    | ANSI     | IVES    | HAGER     | MCKINNEY  | PBB  | BEST   |
|---------------------------------------------------|--------|----------|---------|-----------|-----------|------|--------|
| Plain Bearing, Standard Weight – Steel            | 35STPL | A8133    | 5PB1    | 1279      | T2714     | PB81 | F179   |
|                                                   |        |          |         | EC1100    | MP79      |      |        |
| 2 Ball Bearing, Standard Weight – Steel           | 35STBB | A8112    | 5BB1    | BB1279    | TA2714    | BB81 | FBB179 |
|                                                   |        |          |         | ECBB1100  | MPB79     |      |        |
| 2 Ball Bearing, Standard Weight – Stainless Steel | 35SSBB | A5112    | 5BB1    | BB1191    | TA2314    | BB51 | FBB191 |
|                                                   |        |          |         | (630/32D) | (630/32D) |      |        |
| 4 Ball Bearing, Heavy Weight – Steel              | 35STHB | A8111    | 5BB1 HW | BB1168    | T4A3786   | 4B81 | FBB168 |
|                                                   |        |          |         | ECBB1102  | MPB68     |      |        |
| 4 Ball Bearing, Heavy Weight – Stainless Steel    | 35SSHB | A5111    | 5BB1 HW | BB1199    | T4A3386   | 4B51 | FBB199 |
|                                                   |        |          |         | ECBB1103  | MPB68     |      |        |
| Spring Hinge, Self Closing – Steel                | 35STSH | K8107-1F | 3SP1    | 1250      | 1502      | SP81 | 2060R  |
|                                                   |        |          |         | EC1105    | MPS60     |      |        |



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