

# FASTENERS



## BUILDING DEPARTMENT

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This handout is intended only as a guide and is based in part on the 2015 Minnesota Residential Code, Minnetrista City ordinances, and good building practice. While every attempt has been made to insure the correctness of this handout, no guarantees are made to its accuracy or completeness. Responsibility for compliance with applicable codes and ordinances falls on the owner or permit applicant. For specific questions regarding code requirements, refer to the applicable codes or contact your local Building Department.

### ROOF TRUSSES TO TOP PLATES

Because toenails often split truss heels, it is recommended that trusses be attached with commercially available truss connectors installed in accordance with the manufacturers recommendations.

### CEILING JOIST AND RAFTER CONNECTIONS

For specific requirements on ceiling joist to rafter connections, see Section R802.3.1 or the 2015 Minnesota Residential Code.

### WOOD STRUCTURAL PANELS, SUBFLOOR, ROOF AND WALL SHEATHING, AND PARTICLEBOARD WALL SHEATHING TO FRAMING<sup>A, B, C, D</sup>

Table R602.3(1)

| Sheathing Thickness             | Type of Fasteners  | Spacing of Fasteners        |                                |
|---------------------------------|--|-----------------------------|--------------------------------|
|                                 |  | Edges (Inches) <sup>f</sup> | Intermediate Supports (Inches) |
| $\frac{5}{16} - \frac{1}{2}$    | 6d common nail (subfloor, wall)<br>8d common nail, (roof) <sup>e</sup> | 6                           | 12                             |
| $\frac{19}{32} - 1$             | 8d common nail   | 6                           | 12                             |
| $1 \frac{1}{8} - 1 \frac{1}{4}$ | 10d common nail or 8d deformed nail                                    | 6                           | 12                             |

a. All nails are smooth-common, box or deformed shanks except where otherwise stated.

b. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.

c. Four-foot-by-8-foot or 4-foot-by-9-foot wall panels must be applied vertically.

d. Wood structural panels include plywood, OSB or composite panels.

e. Nails for attaching wood structural panel roof sheathing to gable end wall framing must be spaced 6 inches on center.

f. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and at all roof plane perimeters. Blocking of roof or floor sheathing panel edges perpendicular to the framing members shall not be required except at intersection of adjacent roof planes. Floor and roof perimeters shall be supported by framing members or solid blocking.

## FIBERBOARD WALL SHEATHING TO FRAMING <sup>A, B, C</sup>

Table R602.3(1)

| Sheathing Type  | Type of Fastener  | Spacing of Fasteners |                                |
|---|---|----------------------|--------------------------------|
|   |   | Edges (Inches)       | Intermediate Supports (Inches) |
| 1/2" regular cellulosic fiberboard sheathing                  | 1 1/2" galvanized roofing nails; 6d common nails; staples 16 ga., 1 1/2" long | 3                    | 6                              |
| 1/2" structural cellulosic fiberboard sheathing               | 1 1/2" galvanized roofing nails; 8d common nails; staples 16 ga., 1 1/2" long | 3                    | 6                              |
| <sup>25</sup> /32" structural cellulosic fiberboard sheathing | 1 3/4" galvanized roofing nails; 8d common nails; staples 16 ga., 1 1/2" long | 3                    | 6                              |

- All nails are smooth-common, box or deformed shanks except where otherwise stated.
- Staples are 16-gauge wire and have a minimum 7/16-inch on diameter crown width.
- Four-foot-by-8-foot or 4-foot-by-9-foot wall panels must be applied vertically.

## GYPSUM BOARD

Table R702.3.5

| Thickness of Gyp Bd | Size of Fasteners to Wood Framing   |
|---------------------|---|
| 3/8"                | Nails: 13 gage, 1 1/4" long, <sup>19</sup> /64" head; 0.098 diameter, 1 1/4" long, annular-ringed; or 4d cooler nail, 0.080" diameter, 1 3/8" long, <sup>7</sup> /32" head.<br>Screws: Screws shall be Type S or W and penetrate into wood framing a minimum of <sup>5</sup> /8 inch.   |
| 1/2 "               | Nails: 13 gage, 1 3/8" long, <sup>19</sup> /64" head; 0.098 diameter, 1 1/4" long, annular-ringed; 5d cooler nail, 0.086" diameter, 1 5/8" long, <sup>15</sup> /64" head; or gypsum board nail, 0.086" diameter, 1 5/8" long, <sup>9</sup> /32" head.<br>Screws: Screws shall be Type S or W and penetrate into wood framing a minimum of <sup>5</sup> /8 inch. |
| 5/8"                | Nails: 13 gage, 1 5/8" long, <sup>19</sup> /64" head; 0.098 diameter, 1 3/8" long, annular-ringed; 6d cooler nail, 0.092" diameter, 1 7/8" long, 1/4" head; or gypsum board nail, 0.0915" diameter, 1 7/8" long, <sup>19</sup> /64" head.<br>Screws: Screws shall be Type S or W and penetrate into wood framing a minimum of <sup>5</sup> /8 inch.             |

- All applications are based on a stud spacing of 16" o.c. Where studs are spaced 24 inches, siding shall be applied to sheathing approved for that spacing.
- Nail is a general description and shall be T-headed, modified round head, or round head with smooth or deformed shanks.
- Staples must have a minimum crown width of 7/16" outside diameter and be manufactured of minimum No. 16 gauge wire.
- Nails or staples shall be aluminum, galvanized, or rust-preventative coated and shall be driven into the studs for fiberboard or gypsum backing.
- Aluminum nails must be used to attach aluminum siding.

## TABLE R602.3(1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

| DESCRIPTION OF BUILDING ELEMENTS  | NUMBER AND TYPE OF FASTENER <sup>a, b, c</sup> | SPACING OF FASTENERS   |
|---|--|--|
| <b>Roof</b>   |  |  |
| Ceiling joists to plate, toe nail   | 3-8d   | -  |
| Ceiling joists not attached to parallel rafter, laps over partitions, face nail   | 3-10d  | -  |
| Collar tie to rafter, face nail   | 3-10d  | -  |
| Rafter or roof truss to plate, toe nail   | 3-16d box nails or 3-10d common nails          | 2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss <sup>e</sup> |
| Roof rafters to ridge, valley or hip rafters: toe nail<br>face nail               | 4-16d<br>3-16d                                 | -  |
| <b>Wall</b>   |  |  |
| Built-up studs-face nail  | 10d  | 24" o.c.   |
| Abutting studs at intersecting wall corners, face nail                            | 16d  | 12" o.c.   |
| Built-up header, two pieces with 1/2" spacer                                      | 16d  | 16" o.c. along each edge   |
| Continuous header, two pieces   | 16d  | 16" o.c. along each edge   |
| Continuous header to stud, toe nail   | 4-8d   | -  |
| Double studs, face nail   | 10d  | 24" o.c.   |
| Double top plates, face nail  | 10d  | 24" o.c.   |
| Double top plates, minimum 24-inch offset of end joints, face nail in lapped area | 8-16d  | -  |
| Sole plate to joist or blocking, face nail  | 16d  | 16" o.c.   |

|   |               |   |
|---|---------------|---|
| Sole plate to joist or blocking at braced wall panels     | 3-16d         | 16" o.c.  |
| Stud to sole plate, toe nail                              | 3-8d or 2-16d | -   |
| Top or sole plate to stud, end nail                       | 2-16d         | -   |
| Top plates, laps at corners and intersections, face nail  | 2-10d         | -   |
| <b>Floor</b>  |               |   |
| Joist to sill or girder, toe nail                         | 3-8d          | -   |
| Rim joist to top plate, toe nail (roof applications also) | 8d            | 6" o.c.   |
| Rim joist or blocking to sill plate, toe nail             | 8d            | 6" o.c.   |
| Built-up girders and beams, 2-inch lumber layers          | 10d           | Nail each layer as follows: 32" o.c. at top and bottom and staggered. Two nails at ends and at each splice. |
| Ledger strip supporting joists or rafters                 | 3-16d         | At each joist or rafter   |

- a. All nails are smooth-common, box or deformed shanks except where otherwise stated.
- b. Staples are 16-gauge wire and have a minimum  $7/16$ -inch on diameter crown width.
- c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater.
- e. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe nails on one side of the rafter and toe nails from the ceiling joist to top plate in accordance with this schedule. The toe nail on the opposite side of the rafter shall not be required.

| <b>ROOFING</b>   |   |   |   |
|--|---|---|---|
| <b>Asphalt Shingles</b>  | <b>Mineral-surfaced Roll Roofing</b>  | <b>Wood Shingles</b>  | <b>Wood Shakes</b>  |
| Fasteners for asphalt shingles must be galvanized steel, stainless steel, aluminum, or copper roofing nails, minimum 12 gauge shank with a minimum $3/8$ " diameter head and of a length to penetrate through the roofing materials and a minimum of $3/4$ " inch into roof sheathing or when roof sheathing is less than $3/4$ " thick, the fastener shall penetrate through the sheathing. | Roll roofing must be installed in accordance with the manufacturer's installation instructions. | Fasteners for wood shingles must be corrosion-resistant with a minimum penetration of $1/2$ " into the sheathing. For sheathing less than $1/2$ " in thickness, the fastener shall extend through the sheathing. A minimum of two fasteners per shingle are required. | Fasteners for wood shakes must be corrosion-resistant with a minimum penetration of $1/2$ " into the sheathing. For sheathing less than $1/2$ " in thickness, the fastener shall extend through the sheathing. A minimum of two fasteners per shake are required. |

# EXTERIOR FINISHES<sup>a, b, c, d, e</sup>

Table R703.4

| SIDING MATERIAL   |                    | TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS  |   |   |   |   |
|---|--------------------|---|---|---|---|---|
|   |                    | Wood or wood structural panel sheathing   | Fiberboard sheathing into stud  | Gypsum sheathing into stud  | Direct to studs   | Number or spacing of fasteners  |
| Horizontal Aluminum<br><small>(must use aluminum fasteners)</small> | Without Insulation | 0.120” nail<br>1 ½” long  | 0.120” nail<br>2” long  | 0.120” nail<br>2” long  | Not allowed   | Same as stud spacing  |
|   | With Insulation    | 0.120” nail<br>1 ½” long  | 0.120” nail<br>2 ½” long  | 0.120” nail<br>2 ½” long  | Not allowed   |   |
| Hardboard panel siding-vertical                                     |                    | 0.092” nail, min. head diam. 0.225, nail must accommodate sheathing and penetrate framing 1.5 inches                                  | 0.092” nail, min. head diam. 0.225, nail must accommodate sheathing and penetrate framing 1.5 inches                                  | 0.092” nail, min. head diam. 0.225, nail must accommodate sheathing and penetrate framing 1.5 inches                                  | 0.092” nail, min. head diam. 0.225, nail must accommodate sheathing and penetrate framing 1.5 inches                                  | 6” panel edges, 12” intermediate supports   |
| Hardboard lap-siding-horizontal                                     |                    | Minimum shank diameter of 0.099”, min. head diameter of 0.240”, and nail length must accommodate sheathing and penetrate framing 1 ½“ | Minimum shank diameter of 0.099”, min. head diameter of 0.240”, and nail length must accommodate sheathing and penetrate framing 1 ½“ | Minimum shank diameter of 0.099”, min. head diameter of 0.240”, and nail length must accommodate sheathing and penetrate framing 1 ½“ | Minimum shank diameter of 0.099”, min. head diameter of 0.240”, and nail length must accommodate sheathing and penetrate framing 1 ½“ | Same as stud spacing, 2 per stud  |
| Steel siding  |                    | 0.113 nail – 1 ¾“ long, Staple – 1 ¾“ long  | 0.113 nail – 2 ¾“ long, Staple – 2 ½“ long  | 0.113 nail – 2 ½“ long, Staple – 2 ¼“ long  | Not allowed   | Same as stud spacing  |
| Plywood panel (exterior grade)                                      |                    | 0.099 nail – 2” long  | 0.113 nail – 2 ½” long  | 0.099 nail – 2” long  | 0.099 nail – 2” long  | 6” on edges   |
| Vinyl siding  |                    | 0.120” nail 1 ½” long, Staple 1 ¾” long   | 0.120” nail 2” long, Staple 2 ½” long   | 0.120” nail 2” long, Staple 2 ½” long   | Not allowed   | Same as stud spacing  |
| Wood rustic drop siding   |                    | Fastener penetration into stud – 1”   |   |   | 0.113 nail – 2 ½“ long, Staple – 2” long  | Face nailing up to 6” widths – 1 per bearing; 8” widths and over, 2 nails per bearing |
| Wood shiplap siding   |                    |   |   |   |   |   |
| Wood bevel siding   |                    |   |   |   |   |   |
| Wood butt tip siding  |                    |   |   |   |   |   |

## NAILS PER POUND (APPROX.)

| Roofing Nails      | Siding Nails       | Shingle Nails      | Drywall Nails      |
|--------------------|--------------------|--------------------|--------------------|
| 1 ¼" – 202 nails/# | 2" – 194 nails/#   | 1 ¼" – 450 nails/# | 1 ¼" – 352 nails/# |
| 1 ½" – 180 nails/# | 2 ¼" – 172 nails/# | 1 ½" – 392 nails/# | 1 ⅜" – 321 nails/# |
| 1 ¾" – 156 nails/# | 2 ½" – 123 nails/# | 1 ¾" – 344 nails/# | 1 ½" – 302 nails/# |
| 2" – 136 nails/#   | 3" – 103 nails/#   | 2" – 232 nails/#   | 1 ⅝" – 274 nails/# |
|                    |                    | 2 ¼" – 185 nails/# | 1 ¾" – 259 nails/# |

| COMMON, BOX, FINISHING, AND CASING NAILS |        |        |                       |                     |                       |                       |                       |
|--|--------|--------|-----------------------|---------------------|-----------------------|-----------------------|-----------------------|
| Nail Type                                |        | Common |                       | Box                 |                       | Finishing             | Casing                |
| Size                                     | Length | Gauge  | Approx. No. per Pound | Gauge               | Approx. No. per Pound | Approx. No. per Pound | Approx. No. per Pound |
| 2d                                       | 1"     | 15     | 845                   | 15 ½                | 940                   | 1473                  | 1090                  |
| 3d                                       | 1 ¼"   | 14     | 540                   | 14 ½                | 588                   | 880                   | 654                   |
| 4d                                       | 1 ½"   | 12 ½   | 290                   | 14                  | 453                   | 630                   | 489                   |
| 5d                                       | 1 ¾"   | 12 ½   | 250                   | 14                  | 389                   | 535                   | 414                   |
| 6d                                       | 2"     | 11 ½   | 165                   | 12 ½                | 225                   | 288                   | 244                   |
| 7d                                       | 2 ¼"   | 11 ½   | 150                   | 12 ½                | 200                   | 254                   | 215                   |
| 8d                                       | 2 ½"   | 10 ¼   | 100                   | 11 ½                | 136                   | 196                   | 147                   |
| 9d                                       | 2 ¾"   | 10 ¼   | 90                    | 11 ½                | 124                   | 178                   | 133                   |
| 10d                                      | 3"     | 9      | 65                    | 10 ½                | 90                    | 124                   | 96                    |
| 12d                                      | 3 ¼"   | 9      | 60                    | 10 ½                | 83                    | 113                   | 88                    |
| 16d                                      | 3 ½"   | 8      | 45                    | 10                  | 69                    | 93                    | 74                    |
| 20d                                      | 4"     | 6      | 30                    | 9                   | 50                    | 65                    | 53                    |
| 30d                                      | 4 ½"   | 5      | 20                    | 9                   | 45                    | Not usually stocked   | 47                    |
| 40d                                      | 5"     | 4      | 17                    | 8                   | 34                    | Not usually stocked   | 35                    |
| 50d                                      | 5 ½"   | 3      | 13                    | Not usually stocked |                       | Not usually stocked   | Not usually stocked   |
| 60d                                      | 6"     | 2      | 10                    | Not usually stocked |                       | Not usually stocked   | Not usually stocked   |

| Nail Application Guide                          |                      |                                |
|---|----------------------|--------------------------------|
| How many nails will I need? (approximate count) |                      |                                |
| <b>Box Nails for Hardboard Siding</b>           |                      |                                |
| 12" Horizontal Siding                           | 6d – 16d             | 1200 nails per 1000 sq. ft     |
| 4' x 8' Panel Siding                            | 6d – 16d             | 3300 nails per 1000 sq. ft     |
| <b>Nails for Cedar and Redwood Wood Siding</b>  |                      |                                |
| ½" x 4" Siding                                  | 6d – 8d              | 2280 nails per 1000 board feet |
| ½" x 6" Siding                                  | 7d – 8d              | 1520 nails per 1000 board feet |
| ¾" x 8" Siding                                  | 8d – 10d             | 1140 nails per 1000 board feet |
| ¾" x 10" Siding                                 | 8d – 10d             | 912 nails per 1000 board feet  |
| ¾" x 12" Siding                                 | 10d                  | 760 nails per 1000 board feet  |
| <b>Fiber Cement Siding Nails</b>                |                      |                                |
| Lap Siding                                      | 6d – 16d             | 9 nails per 12' piece          |
| 4' x 8' Panel Siding                            | 6d – 16d             | 16" o.c. – 80 nails            |
| 4' x 8' Panel Siding                            | 6d – 16d             | 24" o.c. – 64 nails            |
| <b>Vinyl Siding Nails</b>                       |                      |                                |
| 1 ½", 2" and 2 ½"                               | 115 nails per square |                                |
| <b>Cedar Shake Siding Face Nails</b>            |                      |                                |
| 16" Shakes                                      | 6d                   | 360 nails per square           |
| 18" Shakes                                      | 6d                   | 310 nails per square           |
| <b>Cedar Shingle Nails</b>                      |                      |                                |
| 16" & 18" – New Roof                            | 3d                   | 860 nails per square           |
| Over old Roof                                   | 5d                   | 860 nails per square           |
| 24" – New Roof                                  | 4d                   | 570 nails per square           |
| Over old Roof                                   | 6d                   | 570 nails per square           |
| <b>Asphalt &amp; Fiberglass Shingle Nails</b>   |                      |                                |
| On a New Roof                                   | 1 ¼"                 | 320 nails per square           |
| Over an Old Roof                                | 1 ¾"                 | 320 nails per square           |
| <b>Decking Nails</b>                            |                      |                                |
| 5/4" x 6" Decking                               | 8d – 10d             | 330 nails per 100 square feet  |
| Joists spaced at 16" o.c.                       |                      |                                |
| 2 x 4 Decking                                   | 10d – 16d            | 550 nails per 100 square feet  |
| Joists spaced at 16" o.c.                       |                      |                                |

|  |             |                                     |
|--|-------------|-------------------------------------|
| 2" x 6" Decking<br>Joists spaced at 16" o.c. | 10d – 16d   | 330 nails per 100 square feet       |
| <b>Drywall Nails</b>                         |             |                                     |
| Single Layer 3/8" & 1/2"                     | 1 1/4"      | 2000 nails per 1000 per square feet |
| 5/8"   | 1 5/8"      | 2000 nails per 1000 per square feet |
| <b>Underlayment and Plywood Nails</b>        |             |                                     |
| 1/4" Pressed and Plywood Underlayment        | 1 1/4"      | 500 nails per 100 square feet       |
| 3/8" Pressed and Plywood Underlayment        | 1 1/2"      | 500 nails per 100 square feet       |
| 1/2", 5/8", & 3/4" Plywood Sheathing         | 2" & 2 1/2" | 150 nails per 100 square feet       |
| 1" Plywood Subfloor                          | 3"          | 150 nails per 100 square feet       |

| COUNTERBORE, SHANK & PILOT HOLE DIAMETERS |  |                                   |                              |                              |
|---|--|-----------------------------------|------------------------------|------------------------------|
| Screw Size                                | Counterbore Diameter<br>For Screw Head | Clearance Hole<br>for Screw Shank | Pilot Hole Diameter          |                              |
|   |  |                                   | Hard Wood                    | Soft Wood                    |
| #1  | .146 ( <sup>9</sup> / <sub>64</sub> )  | <sup>5</sup> / <sub>64</sub>      | <sup>3</sup> / <sub>64</sub> | <sup>1</sup> / <sub>32</sub> |
| #2  | <sup>1</sup> / <sub>4</sub>            | <sup>3</sup> / <sub>32</sub>      | <sup>3</sup> / <sub>64</sub> | <sup>1</sup> / <sub>32</sub> |
| #3  | <sup>1</sup> / <sub>4</sub>            | <sup>7</sup> / <sub>64</sub>      | <sup>1</sup> / <sub>16</sub> | <sup>3</sup> / <sub>64</sub> |
| #4  | <sup>1</sup> / <sub>4</sub>            | <sup>1</sup> / <sub>8</sub>       | <sup>1</sup> / <sub>16</sub> | <sup>3</sup> / <sub>64</sub> |
| #5  | <sup>1</sup> / <sub>4</sub>            | <sup>1</sup> / <sub>8</sub>       | <sup>5</sup> / <sub>64</sub> | <sup>1</sup> / <sub>16</sub> |
| #6  | <sup>5</sup> / <sub>16</sub>           | <sup>9</sup> / <sub>64</sub>      | <sup>3</sup> / <sub>32</sub> | <sup>5</sup> / <sub>64</sub> |
| #7  | <sup>5</sup> / <sub>16</sub>           | <sup>5</sup> / <sub>32</sub>      | <sup>3</sup> / <sub>32</sub> | <sup>5</sup> / <sub>64</sub> |
| #8  | <sup>3</sup> / <sub>8</sub>            | <sup>11</sup> / <sub>64</sub>     | <sup>1</sup> / <sub>8</sub>  | <sup>3</sup> / <sub>32</sub> |
| #9  | <sup>3</sup> / <sub>8</sub>            | <sup>11</sup> / <sub>64</sub>     | <sup>1</sup> / <sub>8</sub>  | <sup>3</sup> / <sub>32</sub> |
| #10                                       | <sup>3</sup> / <sub>8</sub>            | <sup>3</sup> / <sub>16</sub>      | <sup>1</sup> / <sub>8</sub>  | <sup>7</sup> / <sub>64</sub> |
| #11                                       | <sup>1</sup> / <sub>2</sub>            | <sup>3</sup> / <sub>16</sub>      | <sup>5</sup> / <sub>32</sub> | <sup>9</sup> / <sub>64</sub> |
| #12                                       | <sup>1</sup> / <sub>2</sub>            | <sup>7</sup> / <sub>32</sub>      | <sup>9</sup> / <sub>64</sub> | <sup>1</sup> / <sub>8</sub>  |

## Corrosion Resistant Nails

### Stainless Steel Nails

Approved stainless steel nails come as either Type 304 or Type 316. Stainless steel nails provide superior resistance to corrosion and are required for portions of the construction of wood foundation systems. If you are using a wood foundation system, make sure you are using the right fasteners in the right locations.

### Hot-dipped galvanized (zinc coated) steel nails

Nails are dipped in molten zinc to give each nail a thick coating of zinc. Hot dipped nails are required in wood foundation applications where stainless steel is not required and may be used in other situations which require corrosion resistant fasteners.

### Hot-tumbled galvanized (zinc coated) steel nails

Nails are galvanized by putting zinc chips into a hot, rotating barrel with the nails with the zinc then "washing" off on the nails. These nails may also be used in wood foundations where stainless steel nails are not required and may be used in other situations that require corrosion resistant fasteners.

### Electro galvanized steel nails

This method of corrosion protection uses electricity to put a thin shiny coating of zinc on the nails. Electro galvanized nails may not be used in the construction of wood foundations but may be used in others areas of building construction requiring corrosion resistant fasteners.

### Mechanical galvanized steel nails

This is a cold process that hammers zinc powder on to nails to give them a galvanized coating. Mechanically galvanized nails may not be used in the construction of wood foundations but may be used in others areas of building construction requiring corrosion resistant fasteners.

## COMMON CONSTRUCTION NAILS



**Common Nails** – Common nails are the most popular nails in use today. They are the basic nail for most construction. They are usually available with flat heads and diamond points, although they are sometimes manufactured with other head and point designs. Most common nails have a cement or vinyl coating that improves their

holding power. Suitable for a wide variety of purposes, common nails are used primarily for structural framing, scaffolding and general carpentry.



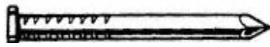
**Box Nails** – Box nails are used for light construction and rough work in soft woods. Box nails are of the same general design as common nails but are made of a smaller wire gauge. Because of their smaller diameter, they are easily driven and less likely to split wood. Most box nails have a cement or vinyl coating that improves their holding power.



**Finishing Nails** – Finishing nails are slightly smaller in diameter than common nails. Finishing nails are those made for interior trim, finish carpentry, cabinetwork, and furniture building. Their small, cupped head help to position the nail set to countersink the head of the nail below the surface of the wood.



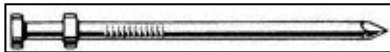
**Casing Nails** - Casing nails, with their deep, wedge-shaped heads, are used for interior trim, finish carpentry, cabinet making and furniture. They are most often used where a nail heavier than a finishing nail is required. Like finishing nails, they also have cupped heads for easier nail setting. In their corrosion resistant form, they are also used for exterior applications.



**Joist Hanger Nails** – Joist hanger nails are specially made for use with joist hangers. These nails have specific head sizes, thickness, steel and shank designs, and point configurations to insure conformity with the joist hanger manufacturers published values. When using any connector, the manufacturers published literature should be consulted to insure that the proper fastener is being used. Screws should not be substituted unless specified by the manufacturer.



**Cut Nails** – Cut nails are made from sheets of specially hardened steel in a wide range of lengths, dimensions and head designs. They are wedge-shaped with squared edges to cut through wood without splitting. Cut nails should be driven with their widest dimension parallel to the grain of the wood. The most widely used cut nail is the furring or concrete nail, for fastening wood or metal to cement, masonry or building block walls.



**Duplex Head Nails** – Duplex head nails are used for scaffolding, forms and other temporary construction. They are easy to pull, safe dismantling time, lumber and nails.



**Masonry Nails** – In addition to the cut nail, there are several other types of masonry nails. These nails are made of high carbon steel for maximum hardness to insure easiest possible penetration. They are mainly used for fastening lumber to concrete or masonry.



**Roofing Nails** – Roofing nails are designed for the application of asphalt and fiberglass shingles on new construction and reroofing jobs. Roofing nails are corrosion resistant. Their broad heads resist pulling through shingles during high winds. Nails should be long enough to penetrate  $\frac{3}{4}$  inch into the wood deck lumber or completely through plywood decking. Roofing nails also come in ring and spiral shanks for additional holding power in high-wind areas.



**Shingle Nails** - Shingle nails are used for the application of wood roofing products. Because of their smaller head, they should never be used for asphalt roofing applications. Shingle nails should always be corrosion resistant



**Drywall Nails** – Drywall nails are used for the application of drywall. Their ring shank design adds additional holding power





**Siding Nails** – Siding nails are designed for face and blind nailing differing types of manufactured siding products. Only corrosion resistant nails may be used for siding applications.



**Deformed Shank Nails** – Deformed shank nails are nails with ringed, screwed, threaded, clinched or barbed shanks to increase the withdrawal strength of the nail.



**Deck screws** – Deck screws are a popular fastener for fastening decking to framing on exterior decks because of their ease of installation and ability to resist withdrawal. Deck screws come in square drive, star drive, torx drive, and Phillips head.



**Cabinet screws** – Cabinet screws are use for cabinet assembly and installation. They come in a variety of lengths with both Phillips and #2 square heads.



**Drywall Screws** – Drywall screws are designed for holding power and ease of penetration. While both Type S and Type W drywall screws can be used to attach drywall to wood framing, only Type S screws can be used for application of drywall to steel studs.



**Wood screws** – Wood screws are used when a fastener stronger than a nail is needed. Wood screws are tapered so as to help draw wood together as the screw is inserted. Screw heads are usually flat, oval, or round depending on the desired final appearance. Screws should penetrate 2/3 of the combined thickness of the materials being joined. Galvanized or corrosion resistant screws should be used where rust could be a problem. Lubricating screws with soap or beeswax will ease installation. A pilot hole (usually 2 sizes smaller than the shank of the screw) should always be made before driving a screw. This is especially crucial in hardwoods or when driving a screw near the end of a board. When working with screws of a larger diameter, a pilot hole of the same diameter as the shank of the screw should be drilled into the wood to a depth of 1/3 the length of the screw.



**Anchor bolts** – Anchor bolts are set into concrete and masonry slabs and foundations for anchoring sills and plates. Anchor bolts must be a minimum of 1/2" diameter and extend a minimum of 7 inches into masonry or concrete.



**Carriage bolts**



**Carriage bolts**

**Carriage bolts, stove bolts, hex bolts, and lag screws** – are all used in wood framing when strength beyond what can be provided with nails is required. These fasteners come in a wide variety of sizes, strengths, and finishes.



**Stove bolt**



**Lag screws**



**Hex bolt**