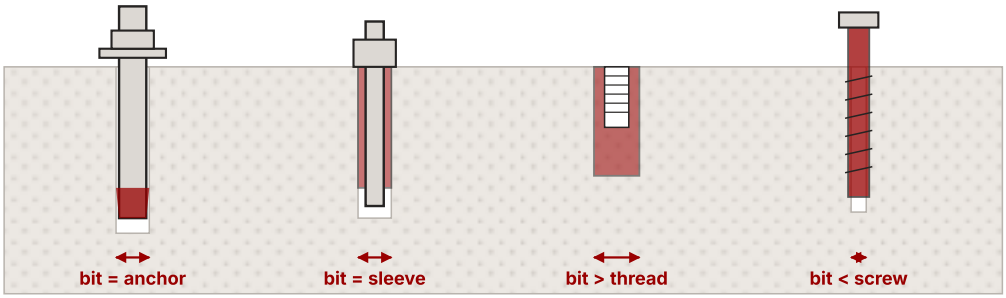
# Concrete Anchor Sizes

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J & E Supply & FASTENER CO.

**Drill bit size, minimum embedment, thread and wrench for wedge, sleeve and drop-in anchors, concrete screws, lag shields, calk-ins and expansion shields — where two anchor makers agree. No load ratings: those come from the maker of the anchor.**

Every concrete anchor is made for **one drill bit size**, and the hole matters as much as the anchor: too big and it won't grip, too small and it won't set. The bit isn't always the anchor's size — **wedge and sleeve anchors** take a bit the same diameter as the anchor, **drop-ins and shields** a larger one, **concrete screws** a smaller one. Pick the anchor for the base material and the job first (see Choosing the Right Anchor), then drill to this chart.




The part that grips is shown in red. Wedge and sleeve anchors go in a hole their own size; a drop-in sits flush in a larger hole; a concrete screw cuts its thread in a smaller one. Not to scale.

### Loads come from the maker

**No load figures on this chart.** What an anchor holds depends on the anchor itself, the strength and condition of the concrete or masonry, how deep it is set, and how close it is to an edge or the next anchor — and each maker tests and publishes its own anchors, with different results. For tension, shear or pull-out values use the maker's published data or ICC-ES evaluation report (ESR) for that exact anchor, and follow the engineer of record on anything structural, overhead or life-safety.

**Torque, edge distance and spacing** belong to the maker too — use the values in the maker's instructions for your anchor.

## Concrete anchor types — what each is for

| TYPE | HOW IT HOLDS | WHAT IT'S FOR | DRILL BIT |
|---|---|---|---|
| Wedge anchor | A threaded stud with a clip at the bottom; tightening the nut pulls the clip up into the hole wall | Permanent hold-downs in solid concrete: sill plates, racking, machinery | Same as the anchor |
| Sleeve anchor | A bolt inside a split sleeve; tightening the bolt draws a cone into the sleeve | Concrete, brick and block | Same as the sleeve |
| Drop-in anchor | An internally threaded shell set flush in the hole with a setting tool | A flush thread in concrete for a bolt or threaded rod that can be taken out later | Larger than the thread |
| Concrete screw | A hardened screw that cuts its own thread in a pre-drilled hole | Light to medium fastening in concrete, brick and block; removable | Smaller than the screw |
| Lag shield | A zinc alloy shell a lag screw expands as it is driven in | A lag screw in concrete, brick or block; short shield in hard material, long in soft | Larger than the lag screw |
| Calk-in anchor | A lead sleeve on a threaded cone, set by hammering the lead with a setting tool | A machine bolt in concrete, brick or block; light duty | Larger than the bolt |
| Single / double expansion shield | A zinc alloy shield that expands as a machine bolt is drawn into it | A machine bolt in concrete, brick or block | Larger than the bolt |

The sizes are in the tables below. Which anchor for which wall or floor: Choosing the Right Anchor.

## Wedge anchors — drill bit and setting (inches)

| ANCHOR | DRILL BIT | MIN. EMBEDMENT | STUD THREAD | NUT WRENCH |
|---|---|---|---|---|
| 1/4″ | 1/4″ | 1-1/8″ | 1/4″-20 | 7/16″ |
| 3/8″ | 3/8″ | — | 3/8″-16 | 9/16″ |
| 1/2″ | 1/2″ | 2-1/4″ | 1/2″-13 | 3/4″ |
| 5/8″ | 5/8″ | 2-3/4″ | 5/8″-11 | 15/16″ |
| 3/4″ | 3/4″ | — | 3/4″-10 | 1-1/8″ |
| 7/8″ | 7/8″ | — | 7/8″-9 | 1-5/16″ |
| 1″ | 1″ | 4-1/2″ | 1″-8 | 1-1/2″ |
| 1-1/4″ | 1-1/4″ | — | — | 1-7/8″ |

Wedge anchors take a bit the same diameter as the anchor. Minimum embedment as at least two makers list it for their own anchors; deeper is common, and the maker of your anchor governs. Stud thread is coarse; the nut is a standard hex nut. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Sleeve anchors — drill bit and bolt (inches)

| SLEEVE | DRILL BIT | BOLT THREAD | HEX NUT WRENCH |
|---|---|---|---|
| 1/4″ | 1/4″ | — | 3/8″ |
| 5/16″ | 5/16″ | 1/4″-20 | 7/16″ |
| 3/8″ | 3/8″ | 5/16″-18 | 1/2″ |
| 1/2″ | 1/2″ | 3/8″-16 | 9/16″ |
| 5/8″ | 5/8″ | 1/2″-13 | 3/4″ |
| 3/4″ | 3/4″ | 5/8″-11 | 15/16″ |

A sleeve anchor is sized by its sleeve; the bolt inside is smaller. Wrench for hex nut and acorn nut heads. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Drop-in anchors — drill bit and hole (inches)

| THREAD SIZE | DRILL BIT | MIN. EMBEDMENT (FLUSH) | BODY LENGTH | INTERNAL THREAD |
|---|---|---|---|---|
| 1/4″ | 3/8″ | 1″ | 1″ | 1/4″-20 |
| 3/8″ | 1/2″ | — | 1-9/16″ | 3/8″-16 |
| 1/2″ | 5/8″ | 2″ | 2″ | 1/2″-13 |
| 5/8″ | 7/8″ | 2-1/2″ | 2-1/2″ | 5/8″-11 |
| 3/4″ | 1″ | 3-3/16″ | — | 3/4″-10 |

A drop-in anchor is named by its internal thread, so its bit is larger than the thread. Set flush, the hole is as deep as the anchor is long. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Concrete screws — drill bit and driver (inches)

| SCREW | DRILL BIT | MIN. EMBEDMENT | HEX WASHER HEAD | PHILLIPS FLAT HEAD |
|---|---|---|---|---|
| 3/16″ | 5/32″ | 1″ | 1/4″ | #2 |
| 1/4″ | 3/16″ | 1″ | 5/16″ | #3 |

Concrete screws (Tapcon-type) cut their own thread, so the bit is smaller than the screw. Maximum embedment differs between makers and isn't on this chart. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Lag shields — drill bit and embedment (inches)

| LAG SCREW | SHIELD | DRILL BIT | MIN. EMBEDMENT |
|---|---|---|---|

| LAG SCREW | SHIELD | DRILL BIT | MIN. EMBEDMENT |
|---|---|---|---|
| 1/4″ | Short | 1/2″ | 1″ |
| 1/4″ | Long | 1/2″ | 1-1/2″ |
| 5/16″ | Short | 1/2″ | 1-1/4″ |
| 5/16″ | Long | 1/2″ | 1-3/4″ |
| 3/8″ | Short | 5/8″ | 1-3/4″ |
| 3/8″ | Long | 5/8″ | 2-1/2″ |
| 1/2″ | Short | 3/4″ | 2″ |
| 1/2″ | Long | 3/4″ | 3″ |
| 5/8″ | Short | 7/8″ | 2″ |
| 5/8″ | Long | 7/8″ | 3-1/2″ |
| 3/4″ | Short | 1″ | 2″ |

Sized by the lag screw that goes in it. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Calk-in anchors — drill bit (inches)

| BOLT SIZE | DRILL BIT |
|---|---|
| #8 | 5/16″ |
| #10 | 3/8″ |
| 1/4″ | 1/2″ |
| 5/16″ | 5/8″ |
| 3/8″ | 3/4″ |
| 1/2″ | 7/8″ |

A lead calking anchor for a machine bolt, named by the bolt. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Double expansion shields — drill bit (inches)

| BOLT SIZE | DRILL BIT |
|---|---|
| 1/4″ | 1/2″ |
| 5/16″ | 5/8″ |
| 3/8″ | 3/4″ |
| 1/2″ | 7/8″ |
| 5/8″ | 1″ |
| 3/4″ | 1-1/4″ |

Zinc alloy shield for a machine bolt, named by the bolt. A dash: the makers we checked differ, or only one lists it — your anchor's maker governs.

## Single expansion shields — drill bit (inches)

| BOLT SIZE | DRILL BIT |
|---|---|
| 1/4″ | 1/2″ |
| 5/16″ | 5/8″ |
| 1/2″ | 7/8″ |
| 5/8″ | 1″ |

Zinc alloy shield for a machine bolt, named by the bolt. Not on this chart: 3/8″ — the makers we checked list different bits. A dash: the

makers we checked differ, or only one lists it — your anchor's maker governs.

### Drilling and setting

**Drill with a carbide-tipped bit made to ANSI B212.15**, in a hammer drill, the size on the chart for your anchor.

**Clean the dust out of the hole** before setting the anchor.

**Wedge anchors:** the bit is the anchor's diameter; drill deeper than the anchor will be embedded. Wedge anchors are for solid concrete, not brick or block.

**Sleeve anchors:** the bit is the sleeve's diameter. Sleeve anchors are used in concrete and in masonry.

**Drop-in anchors** are named by their internal thread and set with the setting tool made for that size. Drill the hole as deep as the anchor is long so it sits flush. Thread the bolt or rod in at least one diameter.

**Concrete screws:** use the bit size made for the screw, and drill at least 1/4″ deeper than the screw will be embedded.

**Lag shields:** drill the hole deeper than the shield is long. A short shield is for hard material, a long shield for softer material.

**Calk-in anchors** are set with their setting tool, hammering the lead sleeve down around the cone.

## Quick answers

**What size drill bit for a 1/2 inch wedge anchor?**
A **1/2″** carbide bit — a wedge anchor takes a bit the same diameter as the anchor (two makers on our chart agree size by size).

**What size bit for a Tapcon or concrete screw?**
A 3/16″ concrete screw takes a **5/32″** bit and a 1/4″ screw takes a **3/16″** bit. The screw cuts its own thread, so the bit is smaller than the screw.

**What size hole for a 1/2 inch drop-in anchor?**
A 1/2″ drop-in (1/2″-13 internal thread) takes a **5/8″** bit, drilled 2″ deep to set it flush. Drop-ins are named by their thread, so the hole is bigger than the bolt.

**What size drill bit for a 3/8 lag shield?**
A **5/8″** bit, for both the short and the long 3/8″ lag shield.

**How much weight can a concrete anchor hold?**
There is no one number: it depends on the anchor, the concrete or masonry, the embedment, and the edge and spacing distances, and each maker publishes its own values. Use the maker's published data or ICC-ES evaluation report for that exact anchor, and follow the engineer of record for structural work.

**What size wrench for a 1/2 inch wedge anchor?**
A **3/4″** wrench — the nut on a 1/2″-13 wedge anchor is a standard hex nut.

Reference values drawn from the governing standards. For critical applications, confirm against the standard and the manufacturer's published data. Technical information disclaimer →