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#2 · English · pilot-hole-size-chart-no-2-en

#2 Screw Pilot Hole & Drill Bit Size

#2 · Body / lead hole / clearance hole plus the closest imperial and metric drills · FM 5-426 Table 2-4 practice-value basis · no value is computed where the source table is blank

A #2 wood screw takes a 1/16 in lead hole, that is 0.0625 in or 1.59 mm. The closest imperial drill bits are 1/16 (0.0625 in) and #52 (0.0635 in); the closest metric drills are 1.60 mm and 1.55 mm. Practice value from the source table, not a standard value.

#2 Screw Pilot Hole & Drill Bit Size

Screw body diameter 3/32 in · 2.18 mm · #1–#18

Parameter	Source-table column name	Fraction (in)	Decimal (in)	Millimetre (mm)	Source-table bit	Closest imperial drill bits	Closest metric drills
Screw body diameter Nominal body diameter of the screw, and the dimension the hole sizes are compared against.	NOMINAL SCREW BODY DIAMETER	3/32	**0.0860**	2.18	not listed in the source table	not listed in the source table	not listed in the source table
Lead hole (threads bite here) Drill this in the piece that carries the load, to roughly half to two thirds of the thread length.	STARTER HOLE DRILL SIZE	1/16	**0.0625**	1.59	no bit this small in the source table	1/16 · 0.0625 in · delta 0.0000 #52 · 0.0635 in · delta 0.0010 #53 · 0.0595 in · delta 0.0030	1.60 mm · delta 0.0005 in 1.55 mm · delta 0.0015 in 1.65 mm · delta 0.0025 in
Clearance hole (screw passes through) Drill this in the piece being fixed, so the screw passes through without biting.	PILOT HOLE DRILL SIZE	3/32	**0.0938**	2.38	no bit this small in the source table	3/32 · 0.0938 in · delta 0.0000 #42 · 0.0935 in · delta 0.0003 #41 · 0.0960 in · delta 0.0022	2.40 mm · delta 0.0007 in 2.35 mm · delta 0.0013 in 2.45 mm · delta 0.0027 in

Pilot Hole and Drill Bit Size Chart

The three rows are the screw body, the lead hole (the threads bite into it, and the source table calls it the STARTER HOLE) and the clearance hole (the screw passes through it, and the source table calls it the PILOT HOLE). Fractional and millimetre figures come from the source table; decimal inch figures are the same fractions converted at 25.4 mm per inch. The decimal inch column printed in the source table is deliberately not reproduced: it carries last-digit differences and one misplaced row, so every inch figure here is convertible from the millimetre value instead.

Name reversal in the source: FM 5-426 prints PILOT HOLE for the hole the screw passes through, and STARTER HOLE for the hole the threads bite into, which is the opposite of today's usage. This page uses the modern names (clearance hole and lead hole) and prints the original column name beside each row so the two cannot be read the wrong way round.

Screw size	Screw body diameter			Lead hole (threads bite here)			Clearance hole (screw passes through)		
	Fraction (in)	Decimal (in)	Millimetre (mm)	Fraction (in)	Decimal (in)	Millimetre (mm)	Fraction (in)	Decimal (in)	Millimetre (mm)
#1	5/64	0.0730	1.85	—	—	—	5/64	0.0781	1.98
#2	3/32	0.0860	2.18	1/16	**0.0625**	1.59	3/32	0.0938	2.38
#3	3/32	0.0990	2.51	1/16	**0.0625**	1.59	7/64	0.1094	2.78
#4	7/64	0.1120	2.84	5/64	**0.0781**	1.98	7/64	0.1094	2.78
#5	1/8	0.1250	3.17	5/64	**0.0781**	1.98	1/8	0.1250	3.17
#6	9/64	0.1380	3.51	3/32	**0.0938**	2.38	9/64	0.1406	3.57
#7	5/32	0.1510	3.84	7/64	**0.1094**	2.78	5/32	0.1562	3.97
#8	11/64	0.1640	4.17	7/64	**0.1094**	2.78	11/64	0.1719	4.37
#9	11/64	0.1770	4.50	1/8	**0.1250**	3.17	3/16	0.1875	4.76
#10	3/16	0.1900	4.83	1/8	**0.1250**	3.17	3/16	0.1875	4.76
#12	7/32	0.2160	5.49	9/64	**0.1406**	3.57	7/32	0.2188	5.56
#14	15/64	0.2420	6.15	5/32	**0.1562**	3.97	1/4	0.2500	6.35
#16	17/64	0.2680	6.81	3/16	**0.1875**	4.76	17/64	0.2656	6.75
#18	19/64	0.2940	7.47	13/64	**0.2031**	5.16	19/64	0.2969	7.54

Screw size	Source-table bit Lead hole (threads bite here)	Source-table bit Clearance hole (screw passes through)	Closest imperial drill bits	Closest metric drills
#1	no bit this small in the source table	no bit this small in the source table	5/64 · 0.0781 in · delta 0.0000 #47 · 0.0785 in · delta 0.0004	2.00 mm · delta 0.0006 in 1.95 mm · delta 0.0013 in
#2	no bit this small in the source table	no bit this small in the source table	1/16 · 0.0625 in · delta 0.0000 #52 · 0.0635 in · delta 0.0010	1.60 mm · delta 0.0005 in 1.55 mm · delta 0.0015 in
#3	no bit this small in the source table	no bit this small in the source table	1/16 · 0.0625 in · delta 0.0000 #52 · 0.0635 in · delta 0.0010	1.60 mm · delta 0.0005 in 1.55 mm · delta 0.0015 in
#4	no bit this small in the source table	no bit this small in the source table	5/64 · 0.0781 in · delta 0.0000 #47 · 0.0785 in · delta 0.0004	2.00 mm · delta 0.0006 in 1.95 mm · delta 0.0013 in
#5	no bit this small in the source table	no bit this small in the source table	5/64 · 0.0781 in · delta 0.0000 #47 · 0.0785 in · delta 0.0004	2.00 mm · delta 0.0006 in 1.95 mm · delta 0.0013 in
#6	no bit this small in the source table	no bit this small in the source table	3/32 · 0.0938 in · delta 0.0000 #42 · 0.0935 in · delta 0.0003	2.40 mm · delta 0.0007 in 2.35 mm · delta 0.0013 in
#7	no bit this small in the source table	no bit this small in the source table	7/64 · 0.1094 in · delta 0.0000 #35 · 0.1100 in · delta 0.0006	2.80 mm · delta 0.0008 in 2.75 mm · delta 0.0011 in
#8	no bit this small in the source table	no bit this small in the source table	7/64 · 0.1094 in · delta 0.0000 #35 · 0.1100 in · delta 0.0006	2.80 mm · delta 0.0008 in 2.75 mm · delta 0.0011 in
#9	no bit this small in the source table	no bit this small in the source table	1/8 · 0.1250 in · delta 0.0000 #30 · 0.1285 in · delta 0.0035	3.20 mm · delta 0.0010 in 3.10 mm · delta 0.0030 in
#10	no bit this small in the source table	no bit this small in the source table	1/8 · 0.1250 in · delta 0.0000 #30 · 0.1285 in · delta 0.0035	3.20 mm · delta 0.0010 in 3.10 mm · delta 0.0030 in
#12	no bit this small in the source table	No. 4 (4/16 in)	9/64 · 0.1406 in · delta 0.0000 #28 · 0.1405 in · delta 0.0001	3.60 mm · delta 0.0011 in 3.50 mm · delta 0.0028 in
#14	no bit this small in the source table	No. 4 (4/16 in)	5/32 · 0.1562 in · delta 0.0000 #22 · 0.1570 in · delta 0.0008	4.00 mm · delta 0.0013 in 3.90 mm · delta 0.0027 in
#16	no bit this small in the source table	No. 5 (5/16 in)	3/16 · 0.1875 in · delta 0.0000 #12 · 0.1890 in · delta 0.0015	4.75 mm · delta 0.0005 in 4.80 mm · delta 0.0015 in
#18	No. 4 (4/16 in)	No. 5 (5/16 in)	13/64 · 0.2031 in · delta 0.0000 #6 · 0.2040 in · delta 0.0009	5.20 mm · delta 0.0016 in 5.10 mm · delta 0.0023 in

delta is the difference between the drill and the hole in the row above: a negative delta means the drill is smaller than the hole, a positive delta means it is larger. Candidates are ordered by how close they are, so the first is the nearest available drill.

Where two designations share the same diameter (the letter series E and the fraction 1/4), both are kept as separate catalogue entries and neither replaces the other.

Softwood (measured) against hardwood (inferred)

The source table gives one value per screw size and does not divide by material or by species, so that value is the softwood column. The hardwood column applies the Forest Products Laboratory hardwood proportion to the same value and is an inference, not a measurement. Use the softwood column as the practice value; treat the hardwood column as a rule demonstration only.

Screw size	Softwood, source-table value measured practice value	Hardwood, inferred inferred · not measured · not a design value
#1	no lead hole value in the source table	no lead hole value in the source table
#2	0.0625 in (1.59 mm)	0.0562 in (1.43 mm) · inferred · not measured · not a design value
#3	0.0625 in (1.59 mm)	0.0562 in (1.43 mm) · inferred · not measured · not a design value
#4	0.0781 in (1.98 mm)	0.0703 in (1.79 mm) · inferred · not measured · not a design value
#5	0.0781 in (1.98 mm)	0.0703 in (1.79 mm) · inferred · not measured · not a design value
#6	0.0938 in (2.38 mm)	0.0844 in (2.14 mm) · inferred · not measured · not a design value
#7	0.1094 in (2.78 mm)	0.0985 in (2.50 mm) · inferred · not measured · not a design value
#8	0.1094 in (2.78 mm)	0.0985 in (2.50 mm) · inferred · not measured · not a design value
#9	0.1250 in (3.17 mm)	0.1125 in (2.86 mm) · inferred · not measured · not a design value
#10	0.1250 in (3.17 mm)	0.1125 in (2.86 mm) · inferred · not measured · not a design value
#12	0.1406 in (3.57 mm)	0.1265 in (3.21 mm) · inferred · not measured · not a design value
#14	0.1562 in (3.97 mm)	0.1406 in (3.57 mm) · inferred · not measured · not a design value
#16	0.1875 in (4.76 mm)	0.1688 in (4.29 mm) · inferred · not measured · not a design value
#18	0.2031 in (5.16 mm)	0.1828 in (4.64 mm) · inferred · not measured · not a design value

Where the single value in the table comes from

FM 5-426 gives one value per screw size and does not divide it by material or species. The manual states three purposes for the holes: to locate the screw accurately, to prevent splitting, and to save time. Its scope is softwood construction carpentry, so the single value is best read as a field practice value for softwood work rather than as a checked design allowance. That is why the table above has one column and not a material matrix.

Assumption behind the hardwood column

The hardwood figures assume that the lead hole in the source table was drilled to the thread root diameter, and then scale it by the Forest Products Laboratory hardwood proportion of 90 per cent. The thread root diameter has no standard value that may be quoted from a public-domain source, so the hardwood column is a rule demonstration only: it is not measured, it is not a design value, and it is not a basis for a quotation.

The load-design rule, for contrast

For a load-carrying joint the lead hole is specified as a proportion of the thread root diameter: about 70 per cent in softwood and about 90 per cent in hardwood. The hardwood proportion is larger because the rule comes from the applicability conditions of the pull-out equation, not from any material preference. The same rule runs back from the Wood Handbook through NBSIR 77-1282 to the 1926 NBS paper, which is where it is first recorded.

Source sentence, quoted in short: “This equation is applicable when screw lead holes have a diameter of about 70% of the root diameter of the threads in softwoods, and about 90% in hardwoods.”

Basis of that rule: the thread root diameter, not the shank diameter and not the body diameter. A different rule in the same chapter applies to lag screws and uses the shank diameter as its basis, so the two must not be mixed.

The rule and the value in the table above come from different places: the table value is a field practice figure for softwood carpentry, the rule is a load-design proportion. In practice they differ by around two fifths for the sizes here, so one must not be converted into the other or averaged with it.

The thread root diameter: two estimates, kept apart

The first estimate is the industry practice recorded by the National Bureau of Standards in 1977: the root diameter is the body diameter multiplied by 0.67, which is 0.0576 in (1.46 mm) for this screw.

The second estimate is the starter hole value in the source table itself, taken as the root diameter. That is the cabinetmaking habit which the 1926 National Bureau of Standards paper records and recommends discontinuing.

These two are alternative estimates with different origins, not two measurements of one quantity, so they are shown side by side and are not averaged or merged into a single root diameter.

Source-table column names in modern terms

Read the table above with this mapping beside it. The reversal in the first two rows is the reason this chart prints the original column name next to every row.

FM 5-426 column	Modern name
SCREW SIZE	Screw gauge (the column header of the source table; that table has no material column)
NOMINAL SCREW BODY DIAMETER	Body diameter (today also called the major diameter of the screw)
PILOT HOLE DRILL SIZE	Clearance hole: the hole the screw passes through. The source table calls this the pilot hole, the opposite of modern usage
PILOT HOLE BIT SIZE	Auger bit number for that clearance hole; the bit number n is n/16 in and is not a diameter
STARTER HOLE DRILL SIZE	Lead hole: the hole the threads bite into, which is what is meant by a pilot hole today
STARTER HOLE BIT SIZE	Auger bit number for that lead hole, on the same n/16 in basis

References

Every figure and rule above is taken from a United States Government work in the public domain. The copyrighted standards for wood screws and for drill series are named only so that their existence is on record: no table value is reproduced from them, and the thread root diameter is not specified in any of them.

- Drill size constants for the number, letter and fraction series
- FED-STD-H28/2B Unified Inch Screw Threads (1984) — https://assist.dla.mil
- FF-S-111D Screw, Wood, US Federal Specification (1974) — https://www.woodencrates.org/standards/FF-S-111.pdf
- FM 5-426 Carpentry, US Army (source table) (1995) — https://archive.org/download/FM5-426/FM5-426.pdf
- FPL-GTR-190 Wood Handbook chapter 8, Fastenings, USDA Forest Service (1999)
- TC 9-524 Fundamentals of Machine Tools, US Army (1996) — https://www.militarynewbie.com/wp-content/uploads/2013/11/US-Army-Fundamentals-of-Machine-Tools-TC-9-524.pdf
- NAVEDTRA 14043 Builder 3 and 2, US Navy (1994) — https://www.militarynewbie.com/wp-content/uploads/2013/11/US-Navy-course-Builder-3-2-Volume-1-NAVEDTRA-14043.pdf
- NBS Technologic Paper 319, Holding Power of Wood Screws (1926) — https://upload.wikimedia.org/wikipedia/commons/7/79/Holding_power_of_wood_screws._(IA_holdingpowerof1926319fair).pdf
- NBSIR 77-1282, National Bureau of Standards (1977) — https://www.govinfo.gov/content/pkg/GOVPUB-C13-e93972a2d4f083839042c2f4c509e982/pdf/GOVPUB-C13-e93972a2d4f083839042c2f4c509e982.pdf

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