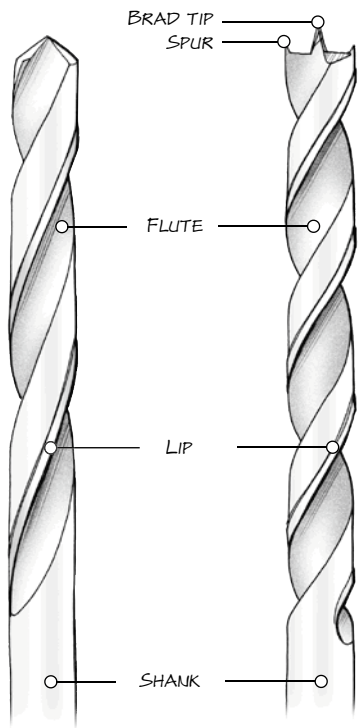


TWIST

BRAD-POINT



TWIST BIT

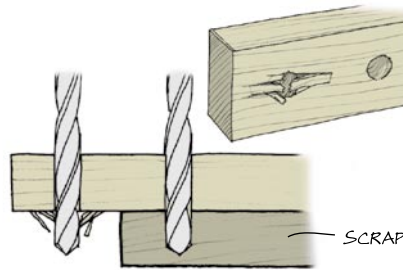
DESIGNED TO DRILL METAL, FREQUENTLY USED FOR WOODWORKING, TOO. CAN BE TRICKY TO GET THE BIT STARTED IN THE EXACT SPOT REQUIRED.

BRAD-POINT BIT

POINTED TIP ALLOWS DRILL TO START INTO WOOD WITHOUT WANDERING, GUARANTEEING AN ACCURATE HOLE. SPUR TIPS CUT A CLEANER HOLE, AND REDUCE SPLINTERING ON THE HOLE'S ENTRY POINT AND TEAR-OUT ON THE BACK SIDE. CAN BE STARTED AT AN ANGLE. BETTER CHOICE FOR WOODWORKING.

COMMON DRILLING PROBLEMS

PROBLEM: WORK SPLINTERS WHEN THE BIT EXITS.
SOLUTION: BACK UP WORK WITH SCRAP.



PROBLEM: BIT CATCHES AGAINST SIDES OF HOLE AND PULLS WORK FROM YOUR HANDS.
SOLUTION: SECURE WORKPIECE TO THE TABLE. USE A SLOWER DRILL SPEED.

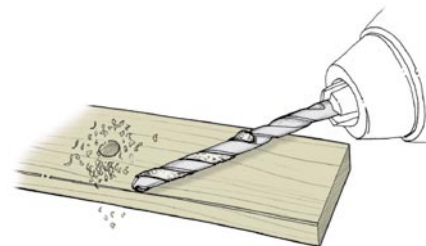
PROBLEM: BIT WANDERS; HOLE ISN'T CENTERED.
SOLUTION: MARK CENTER WITH PUNCH AND USE BIT WITH LEAD POINT; DRILL PILOT HOLE FIRST; FEED BIT SLOWLY UNTIL TIP CUTS.

PROBLEM: SIDES OF HOLE ARE ROUGH.
SOLUTION: USE A CLEAN AND SHARP BIT; REDUCE FEED RATE; INCREASE DRILL SPEED; USE APPROPRIATE BIT FOR WOOD TYPE.

PROBLEM: BIT SLIPS IN DRILL CHUCK.
SOLUTION: TIGHTEN CHUCK; CLEAN CHUCK; DEBURR SHANK OF BIT.

PROBLEM: BIT WOBBLER IN CHUCK.
SOLUTION: BIT NOT CENTERED IN JAWS OR HAS A BURR ON THE SHANK. RECHUCK BIT OR DEBURR SHANK WITH FILE.

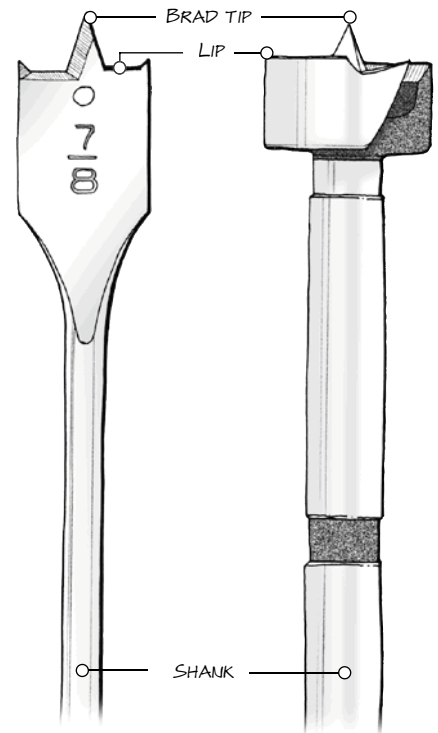
PROBLEM: DRILL BIT BURNS WOOD.
SOLUTION: USE A CLEAN AND SHARP BIT; CLEAR BIT OF WOOD CHIPS OFTEN; REDUCE DRILL SPEED AND FEED RATE.



PROBLEM: FLUTES CLOG WITH CHIPS.
SOLUTION: CLEAN FLUTES AND POLISH LIPS. REMOVE BIT DURING CUT TO ALLOW CHIPS TO CLEAR.

SPADE

FORSTNER



SPADE BIT

BEST USED FOR SPEED WHEN ACCURACY IS NOT AN ISSUE. USED FOR HOLES RANGING FROM 1/4" TO 1 1/4" DIAMETER AND WITH A SLOWER DRILLING SPEED. BRAD TIP PREVENTS BIT FROM WANDERING. LIP CUTS HOLE TO FINAL DIAMETER AND WORKS SIMILAR TO PLANE BLADE, SHEARING MATERIAL. A SPADE CAN MAKE NEARLY FLAT-BOTTOMED HOLES. CAN BE STARTED AT AN ANGLE.

FORSTNER BIT

USED FOR CLEAN, ACCURATE HOLES RANGING IN SIZE FROM 1/4" TO 2" DIAMETER AND WITH A SLOWER DRILL SPEED. SHORTER BRAD TIP ALLOWS FOR NEARLY PERFECT FLAT-BOTTOMED HOLES. LIP EDGE SHEARS AWAY MATERIAL; CUTTING LIP AT PERIMETER CLEANLY DEFINES OUTER EDGE OF HOLE. CAN BE STARTED AT AN ANGLE. BETTER CHOICE FOR WOODWORKING.

SUGGESTED BRAD-POINT BIT SPEEDS

BIT DIAMETER (INCHES)	REVOLUTIONS PER MINUTE (RPM)	
	HARDWOOD	SOFTWOOD
1/8	1,000	1,700
3/16	950	1,650
1/4	900	1,600
5/16	800	1,550
3/8	750	1,500
7/16	700	1,450
1/2	600	1,400
5/8*	400	1,300
3/4*	350	1,200
7/8*	300	1,100
1*	250	1,000

*THESE SIZES ARE UNCOMMON.

OPTIMUM SPEED MAY VARY CONSIDERABLY DEPENDING ON DENSITY OF WOOD AND FORCE APPLIED TO FEED BIT. SPEEDS IN CHARTS REPRESENT STARTING POINT.

SOURCE: "THE WOODWORKING HANDBOOK" BY TOM BEGNAL (BETTERWAY BOOKS)

SUGGESTED FORSTNER BIT SPEEDS

BIT DIAMETER (INCHES)	REVOLUTIONS PER MINUTE (RPM)	
	HARDWOOD	SOFTWOOD
1/4	1,000	2,000
5/16	975	1,950
3/8	950	1,900
7/16	925	1,850
1/2	900	1,800
5/8	850	1,700
3/4	800	1,600
7/8	750	1,500
1	700	1,400
1 1/8	600	1,200
1 1/4	500	1,000
1 1/2	350	700
1 3/4	300	600
2	250	500