CUTTING INTERNAL THREADS

The tap is held by the square in a tap wrench and is started into the hole by turning clockwise for right hand threads. Care must be taken to start the tap straight in line with the hole. As the tap is turned it cuts into the metal and starts to lead into the hole. The metal chips flow into the flute spaces and will cause the tap to turn hard unless the chips are broken. The chips are broken and pressure on the tap released by reversing the tap direction every 1/4 or 1/2 revolution depending on the material being tapped. This action is continued until the tap passes through the part or the desired depth of thread has been reached. In cases where it is necessary to tap a hole that does not pass through the part, or a so called blind hole, be sure to provide clearance at the bottom to accommodate chips and the chamfer section of the tap.

Because taps are very hard, as must be in order to cut steel, they will break very easily. Only slight side pressure or slightly heavy turning force can cause small taps to break. The fact that a tap breaks does not mean the tap was defective. Even journeyman tool makers expect to break taps from time to time.

WHEN USING TAPS

DO Drill correct size hole (see chart on Page 4).

DO Countersink hole to be tapped with grinding point or H.S.S. countersink.

DO Keep tap straight in line with the hole being tapped.

DO Reverse tap during use to break up chips.

DO Use correct lubrication (follow recommendations on Page 7).

DO Provide rigid holding of part being tapped.

DON'T Use too small a tap drill.

DON'T Crowd tap — Tap should be turned backwards slightly every 1/4 to 1/2 turn to clear chips from tap flutes.

DON'T Fail to clean tap before storage.

Fig. 4

WHAT IS A DIE?

A die is a precision tool used in cutting external or outside threads such as on a bolt. (See Fig. 4)

Hex Solid Die

Hex Solid Dies are designed with the correct cutting edges to cut standard size threads on bolts, studs and rods. The Hex dies are capable of being used with open end or box wrenches. The Hex will also fit the six or twelve point sockets to permit the use of the dies in limited access areas. A die stock to accommodate the Hex dies is included in the larger Hex sets.

TOOLS REQUIRED TO CUT AN EXTERNAL THREAD

A die of the correct size and thread form, a die stock to hold the die, and lubricating or cutting oil are needed. Die stocks are provided in two sizes to accommodate either the 1" O.D. dies (both Hex and round) and the 1 1/2" O.D. round and 1 7/16" Hex dies.

ADJUSTABLE GUIDE DIE STOCK

After selecting the proper size die, position and hold in the die stock, with the starting side next to the guide, by means of a set screw which tightens against the edge of the die. Next place the adjustment guide side of the die stock on the rod or bolt to be threaded. (See Figs. 6-7.)

(Continued on Page 5)

Fig. 6

Fig. 7

AMERICAN STANDARD AND METRIC TAP DRILL SIZES

Tap Size	Std.	Drill Size	Dec. Equiv.	Nearest Fractional Drill Size	Tap Size	Fractional Drill Std.	Dec. Size	Equiv.
4 x 40	NC	No. 43	.0890	3/32	7/16 x 20	NF	25/64	.3906
6 x 32	NC	No. 36	.1065	7/64	7/16 x 14	NC	3/8	.3750
8 x 32	NC	No. 29	.1360	9/64	1/2 x 13	NC	27/64	.4219
10 x 32	NF	No. 21	.1590	5/32	1/2 x 20	NF	29/64	.4531
10 x 24	NC	No. 25	.1495	5/32	9/16 x 12	NC	31/64	.4844
12 x 24	NC	No. 16	.1770	11/64	9/16 x 18	NF	33/64	.5156
1/4 x 20	NC	No. 7	.2010	13/64	5/8 x 11	NC	17/32	.5312
1/4 x 28	NF	No. 3	.2130	7/32	5/8 x 18	NF	37/64	.5781
5/16 x 18	NC	17/64	.2656	17/64	11/16 x 11	NC	19/32	.5937
5/16 x 24	NF	17/64	.2656	17/64	11/16 x 16	NF	5/8	.6250
3/8 x 24	NF	21/64	.3281	21/64	3/4 x 10	NC	21/32	.6562
3/8 x 16	NC	5/16	.3125	5/16	3/4 x 16	NF	11/16	.6875
1/8 Pipe		5/16	.3125	5/16	1/4 Pipe		7/16	.437

Tap Size	Drill Size	Dec. Equiv.	Nearest Fraction	Tap Size	Drill Size	Dec Equiv.	Nearest Fraction
3mm x .50mm	No. 38	.0995	3/32	8mm x 1.25mm	17/64	.265	17/64
3mm x .60mm	3/32	.0937	3/32	9mm x 1.00mm	5/16	.3125	5/16
4mm x .70mm	No. 30	.1285	1/8	9mm x 1.25mm	5/16	.3125	5/16
4mm x .75mm	1/8	.125	1/8	10mm x 1.25mm	11/32	.3437	11/32
5mm x .80mm	No. 19	.166	11/64	10mm x 1.50mm	"R"	.339	11/32
5mm x .90mm	No. 20	.161	5/32	11mm x 1.50mm	3/8	.375	3/8
6mm x 1.00mm	No. 9	.196	13/64	12mm x 1.50mm	13/32	.406	13/32
7mm x 1.00mm	15/64	.234	15/64	12mm x 1.75mm	13/32	.406	13/32
8mm x 1.00mm	"J"	.277	9/32	1/8 - 28BSP	21/64	.3281	21/64