



PUNCH SELECTION CHART

For selecting the best type punch and the right clearance, according to hardness of material, thickness of material, and low or high production, where good die-making principles are followed.

NOTICE: The chart below does not include Pivot's PM punches. In many applications much longer tool life can be achieved by substituting PM where HSS or HSS Straight Ground are indicated. For more information, contact Pivot distributor.

SHEAR STRENGTH LBS. PER SQ. IN.	BRINELL 10 mm BALL	SHADING INDICATES TYPE OF PUNCH A-2 Steel High Speed Steel Straight Ground High Speed Steel Whipsleeve - High Speed Steel, Straight Grinding, and Tondra Treat are Standard The chart below is based primarily on average punching requirements where material thickness is one half or less than punch diameter. Guiding of punches and point length should be determined by punch diameter to thickness ratio.		MATERIAL THICKNESS .005-.020								MATERIAL THICKNESS .021-.062							
				TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS				TOTAL CLEARANCE IN PERCENT OF MATERIAL THICKNESS											
				SHORT RUNS		LONG RUNS		SHORT RUNS		LONG RUNS									
				A-2 STEEL	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®	A-2 STEEL	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®	A-2 STEEL	HIGH SPEED STEEL (HSS)	HSS STRAIGHT GROUND® (SG)	HSS (SG) WHIPSLEEVE®				
15,000 AND UNDER	35	PLASTIC PHENOLIC SHEET	PAPER LEATHER MASONITE	MIN.	3-3-1/2					3-1/2-4									
				STD.	4-4-1/2	1	2		3	2	4-1/2-5	1	2		3	2			
				MAX.	Var.						Var.								
20,000	45	ALUMINUM 2024-O SOFT		MIN.	3-1/2-4					4-5									
			STD.	5-6	1	2		3	2	6-7	1	2		3	2				
			MAX.	22%						22									
32,000	95	ALUMINUM 6061-T6 BRASS-YELLOW-SOFT	COPPER SOFT ZINC	MIN.	4-5					5-6									
				STD.	7-7-1/2	1	2		3	2	7-1/2-8	1	2		3	2			
				MAX.	24						24								
40,000 TO 50,000	110 TO 130	ALUMINUM - 2024-T-3 HARD STEEL - SAE 1018 HOT ROLLED	BRASS 1/2 HARD	MIN.	5-6					6-7									
				STD.	9-10	1	2		3	2	10-11	1	2		3	2			
				MAX.	24						24								
		STEEL - GALANVIZED - SAE 1018	GALVANIZED LONG TERN	MIN.	5-6					6-7									
				STD.	9-10	1	2	2	2	10-11	1	2	2	2					
				MAX.	24					24									
60,000	170	BRASS-YELLOW-HARD STEEL - SAE 1018 - COLD DRAWN		MIN.	5-6					6-7									
			STD.	10-11	1	2		3	2	11-12	1	2		3	2				
			MAX.	25						25									
85,000	185	STAINLESS STEEL (ANNEALED)	MONEL NICKOL	MIN.	6-8					8-10									
				STD.	11-12	1	2		3	2	12-13	1	2		3	2			
				MAX.	27						27								
100,000	200	TOOL STEEL (ANNEALED)		MIN.	7-8					8-10									
			STD.	12-13	1	2		3	2	13-14	1	2		3	2				
			MAX.	30						30									
110,000	220	PHOSPHER BRONZE (SRING TEMPERED)		MIN.	14-16					16-18									
			STD.	16-18	1	2		3	2	18-21	1	2		3	2				
			MAX.	30						30									
200,000	380	SPRING STEEL (TEMPERED)		MIN.	16-18					18-20									
			STD.	20-22	1	2		3	2	22-24	1	2		3	2				
			MAX.	30						30									
RATIO PIERCING		WHERE THE STOCK THICKNESS APPROACHES OR IS GREATER THAN THE POINT DIAMTER 2-1 MAXIMUM IN MILD STEEL - 115 BRINELL	MIN.	CHECK CLEAR ABOVE					CHECK CLEAR ABOVE										
			STD.																
			MAX.		1			1		1			1						
SHAVING PUNCHES		FOR MATERIALS LESS THAN 205 BRINELL	MIN.	METAL TO METAL					1-1-1/2										
			STD.		1		1	1		1		1	1						
			MAX.																
HOT PUNCHING		1550° FARENHEIT MAXIMUM	CASTINGS FORGINGS	MIN.						3-4									
				STD.						5-6									
				MAX.															