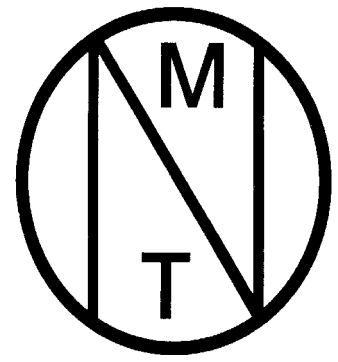


Nyrock M & T Corp

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tooling and equipment

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Tonnage required for punching round holes in
mild steel (50,000 psi)

Hole Diameter in inches	20 ga .036	18 ga .048	16 ga .060	14 ga .075	12 ga .105	11 ga .120	10 ga .135	3/16 .187	1/4 .250	5/16 .312	3/8 .375	1/2 .500
1/8	.35	.47	.59	.74	1.0	1.2						
3/16	.53	.71	.89	1.1	1.6	1.8	2.0	2.8				
1/4	.71	.94	1.2	1.5	2.1	2.4	2.7	3.7	4.9			
5/16	.88	1.2	1.5	1.9	2.6	3.0	3.3	4.6	6.2	7.8		
3/8	1.1	1.4	1.8	2.2	3.1	3.5	4.0	5.5	7.4	9.2	11.1	
7/16	1.2	1.7	2.1	2.6	3.6	4.1	4.6	6.5	8.6	10.8	13.0	17.2
1/2	1.4	1.9	2.4	2.9	4.1	4.7	5.3	7.4	9.8	12.3	14.8	19.7
9/16	1.6	2.1	2.7	3.3	4.7	5.3	6.0	8.3	11.0	13.8	16.6	22.1
5/8	1.8	2.4	2.9	3.7	5.2	5.9	6.6	9.2	12.3	15.4	18.5	24.6
11/16	1.9	2.6	3.2	4.1	5.7	6.5	7.3	10.2	13.5	16.9	20.3	27.1
3/4	2.1	2.8	3.5	4.4	6.2	7.1	8.0	11.1	14.8	18.4	22.1	29.5
13/16	2.3	3.1	3.8	4.8	6.7	7.7	8.6	12.0	16.0	20.0	24.0	32.0
7/8	2.5	3.3	4.1	5.2	7.2	8.3	9.3	12.9	17.2	21.5	25.8	34.4
15/16	2.7	3.5	4.4	5.5	7.7	8.8	10.0	13.8	18.5	23.0	27.7	36.9
1	2.8	3.8	4.70	5.9	8.3	9.4	10.6	14.8	19.7	24.6	29.5	39.4
1-1/2	4.2	5.6	7.0	8.8	12.3	14.1	15.8	22.1	29.5	36.8	44.2	58.9
2	5.6	7.5	9.4	11.7	16.4	18.8	21.1	29.5	39.3	49.1	58.9	78.5
2-1/2	7.1	9.4	11.7	14.7	20.5	23.6	26.4	36.8	49.1	61.4	73.6	98.2
3	8.5	11.3	14.1	17.6	24.6	28.2	31.7	44.2	58.9	73.6	88.4	118.0
3-1/2	9.9	13.1	16.4	20.5	28.8	32.7	37	51.5	68.7	85.9	103.0	137.0
4	11.3	15.0	18.8	23.5	32.8	37.6	42.2	58.9	78.5	98.2	118.0	157.0
4-1/2	12.7	16.9	21.2	26.4	37.0	42.4	47.5	66.3	88.4	110.0	133.0	177.0
5	14.1	18.7	23.5	29.3	41.1	47.1	52.8	73.6	98.2	123.0	147.0	196.0

To obtain tonnage required for punching round holes in mild steel, multiply as follows:

3.1416 x diameter of hole x material thickness x 25 (mild steel 50,000 psi)

35 (Stainless 70,000 psi)

12 (Aluminum 25,000 psi)

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