

Macksteel Warehouse, Inc.

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Recommended Fabricating Practices for Cold Forming

(Bend axis perpendicular to rolling direction “across the grain”)*

Suggested inside Radii for 90deg bends for thicknesses expressed in terms of “t” where t = mat. thickness

Steel

A36 – 36,000 psi Minimum Yield Strength

Thru .250”	1t
.250 to .500”	1 ½t
.500 to 1.00”	2t

Grade 50 – 50,000 psi Minimum Yield Strength - ASTM A570, A572, A607, and A935

Thru .187”	1 ½t
.187 thru .229”	2t
.187 thru .500”	2 ½t

Grade 50 - Improved Formability– 50,000 psi Minimum Yield Strength (ASTM - A656 T3, A715, and A936)

Thru .500”	1t
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Grade 80 – 80,000 psi Minimum Yield Strength (ASTM A656)

Thru .250”	2 ½t
Over .250”	3t

AR200 - 70,000 psi Typical Yield Strength (No ASTM exists)

Thru .187”	1 ½t
.187 thru .229”	2t
.187 thru .500”	2 ½t

T1 – 100,000 psi Minimum Yield Strength (ASTM A514 Gr B)

Thru .250”	2t
.250 to .500”	2 ½t
.500 to 1.00”	3t

AR400 – 155,000 psi Typical Yield Strength (No ASTM exists)

Thru .787”	3t (use 13.5t bottom die opening)
Over .787”	4t (use 18t bottom die opening)

Aluminum

3003 - H14

Thru .062”	½ t
Over .062”to .188”	1t
Over .188” to .250”	1 ½ t
Over .250 to .500”	2t

5052 – H32

Thru .062”	1t
Over .062”thru .375”	1 ½ t
Over .375” to .500”	2t

6061 – T6

Thru .031”	1t
Over .031” thru .062”	1 ½ t
Over .062” thru .125”	2 ½ t
Over .125” thru .250”	4 t

* Larger minimum radii should be used for bending parallel to the rolling direction “with the grain”.

** The radii listed are the minimum recommended for bending sheets and plates without fracturing in a standard press brake with air bend dies. Other types of bending operations may require larger radii or permit smaller radii. The minimum permissible radii will also vary with the design and condition of the tooling.

*** Before bending, special attention should be paid to the condition of the plate edges transverse to the bend lines. Flame cut edges of hardenable steels should be machined or softened by heat treatment. Nicks should be ground out and sharp corners should be rounded.