

General Information

ORDERING INFORMATION

Delivery

Cleveland Steel Tool has a huge inventory of standard punches and dies in stock and ready for immediate shipment. Our stock tools can be shipped the same day. Non-stock sizes of standard tooling will ship within 24 hours (round, oblong, square, hexagon and rectangle).

Custom Tooling

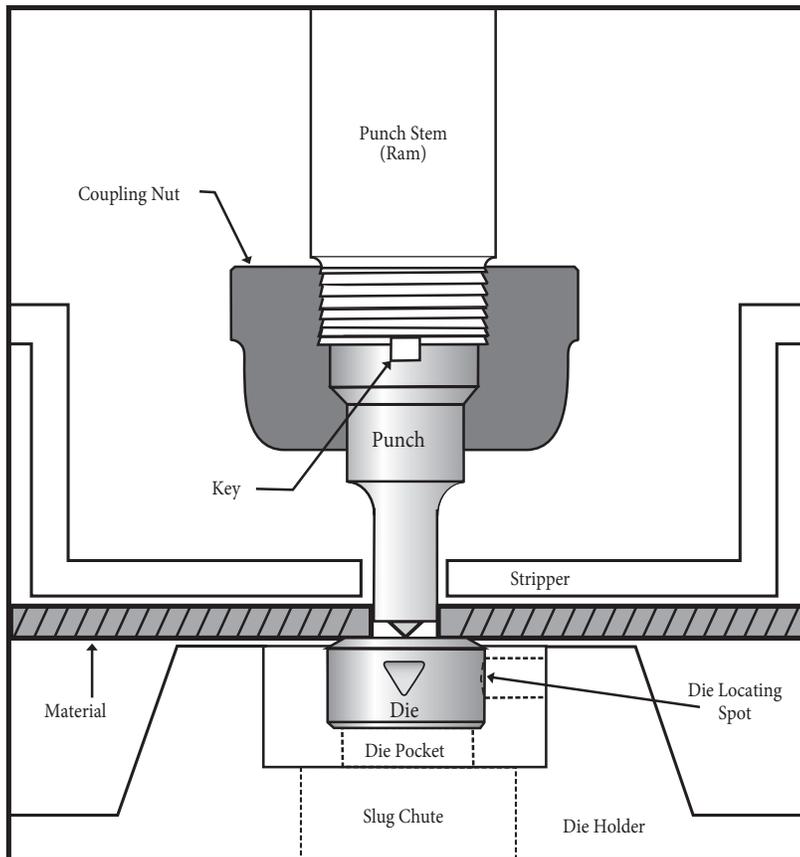
Cleveland Steel Tool specializes in the rapid turnaround of your custom items. Send us a drawing or a sample and we'll manufacture your part to your specifications. Or call us at 800-446-4402 and talk to our application specialists. **Non-stock and custom tooling is not returnable.**

Help Us Help You When Ordering

At Cleveland Steel Tool, we've built our reputation on exceeding our customer's expectations for quality, delivery and value. To help us make sure you get the right tools, we may ask for the following information:

- Machine manufacturer and model number
- Style of punch and die (if not known, have a sample for measurement)
- Use of keyways and/or spots to position shapes
- Type and thickness of material being punched
- Hole size (Note: hole size must be slightly larger than item being passed through material)

TYPICAL PUNCH SET-UP



Punch: The male (usually upper) portion of a punching set-up determines the hole size. The hole (punch) must be slightly larger than the bolt or rod passing through it.

Die: The female or bottom portion of the punching set-up. The hole of the die is slightly larger than the punch used. Clearance is determined by the type and thickness of material being punched. See Clearance Guide on the next page.

Stripping: Pulling the punch out of the material after punching.

Ensure Long Life of Tooling:

Every tool manufactured by Cleveland Steel Tool is made of the highest grade of tool steel. To maximize performance and tool life:

1. Maintain and frequently check alignment of the punch with the die.
2. Check that the stripper is properly positioned to prevent tilting of the work piece when the punch is retracted.
3. Coupling nuts and punch stems must be properly tightened to hold tooling securely.
4. Lubricate with Motor Honey® or STP® Oil Treatment whenever possible.
5. Replace worn tooling immediately.

WARNING: It is the responsibility of the user to set up and use machine and tooling in accordance with OSHA and ANSI B11.5 safety standards. Do not allow unqualified personnel to set up or operate machines. Use extreme care at all times.

CAUTION: Extreme pressures are generated in all metal punching applications. Use safety guards and follow all machine manufacturers safety precautions.

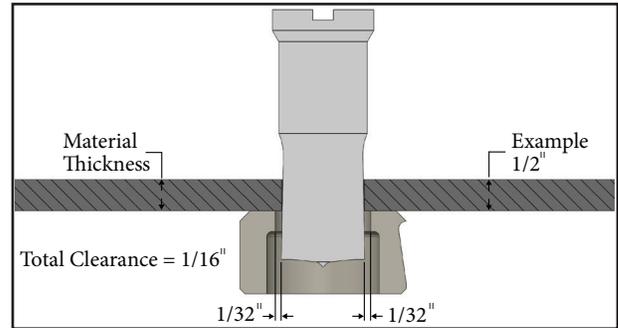
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CLEARANCE GUIDE

Clearance is the amount of extra space required in the hole of the die to allow the punch and slug to pass through to make the hole in the material. Clearance is determined by the type and thickness of the material being punched.

Clearance For Punching Mild Steel

Mild Steel Thickness	Clearance
16 gauge (.0598") and lighter	.006"
15 gauge (.0673) through 13 gauge (.0897)	.010"
3/32" up to 5/32"	1/64"
3/16" through 15/32"	1/32"
1/2" through 23/32"	1/16"
3/4" and over	3/32"
1" and over	1/8"



NOTE: The thickness of the material should not exceed the punch diameter.

Clearance Guide For Punching Other Material

Material	% of thickness
Soft Aluminum	10%
1/2 Hard Brass	11%
1/2 Hard Copper	12%
.50C Steel	18%
Stainless Steel	18%

EXAMPLE: To punch 1/2" (.500) mild steel
1/16" total clearance is needed

EXAMPLE: To punch 1/4" stainless
.250 X 18% = .045 clearance needed



Scan here for our on-line Die Clearance Calculator

PUNCHING TONNAGE GUIDE

For punching mild steel, approximately 65,000 psi

Round Holes

The following formula is the Cleveland Steel Tool recommended equation for computing the approximate tonnage required to punch a single round hole in mild steel.

$$\text{Punch Diameter} \times \text{Material Thickness} \times 80 = \text{Tonnage Required}$$

EXAMPLE: To punch a 1/2" (.500) hole through 1/4" (.250) thick mild steel:
.500 x .250 x 80 = 10 tons

Shaped Holes

The following formula is the Cleveland Steel Tool recommended equation for computing the approximate tonnage required to punch a single shaped hole in mild steel.

$$\frac{1}{3} \text{ of Perimeter} \times \text{Material Thickness} \times 80 = \text{Tonnage Required}$$

EXAMPLE: To punch a 9/16" x 1" rectangular hole through 1/2" (.500) thick mild steel:
(.33 x 3.125) x .500 x 80 = 41 tons

Tonnage Multiplier

For punching materials with different tensile strength, first determine the tonnage required for mild steel above, and then use the multiplier to the right.

Material Multiplier	
Aluminum	.38
Brass	.70
Copper	.56
Steel (mild)	1.00
Steel (50% carbon)	1.50
Steel Cold Drawn	1.20
Stainless Steel (303)	1.50



Scan here for our on-line Tonnage Calculator

Example: To punch a 1/2" (.500) hole through 1/4" (.250) stainless:
10 tons x 1.5 = 15 tons required for 1/4" stainless